IW SPM IP Fault Management

What's New

The following features are new in the SN08 software release:

A00007121 - IW Bridge Map maintenance for deload logs

Four new logs, IWBM502, IWBM503, IWBM504, and IWBM505, were introduced for the IW SPM IP.

Fault management strategy

Alarm reporting system for SPM-based equipment

The alarm reporting system integrates event detection and alarm notification functions. An alarm becomes active when a reduced service, reliability, or test condition occurs in the network or network element. The alarm remains active until a system event or activity performed by operating company personnel clears the alarm condition. The alarm system includes audible notification and visual display through warning lights and the Maintenance and Administration Position (MAP) terminal.

Equipment alarms and alarm severity codes indicate the effect that a fault or event has on a single piece of equipment. There are three types of alarm severities:

- Critical alarm

  A critical alarm indicates a reduced service condition or complete loss of service. A critical alarm indicates that the system can no longer perform its design function. The alarm condition requires immediate correcting action so that the performance of the system can return to its design function.

- Major alarm

  A major alarm indicates lost redundancy. The next fault of the same type can cause a reduction or complete loss of service. There is no backup if another fault occurs on the active system. This alarm level

can be generated when service decreases below an operating company defined threshold.

- Minor alarm

  A minor alarm indicates a small loss of redundancy. The next fault of the same type will not cause degradation of service.

For IW SPM IP-based equipment, the MAP terminal displays alarm codes in the banner and the subsystem status summary field (SSSF). The alarm banner displays alarm codes that indicate the effect of the alarm event on the network or network element. The SSSF displays alarm codes that indicate equipment faults of system states.

Log reports

A log report is a record of a message that your system generates whenever a significant event has occurred in the switch or one of its peripherals. Log reports include status and activity reports, as well as reports on hardware or software faults, test results, changes in state, and other events or conditions likely to affect the performance of the switch. Either a system or a manual action can generate a log report. The figure below, Log report example for SPM630 log, gives an example of an information log.

Figure 1 Log report example for SPM630 log

```
SPM630 Feb 07 10:22:11 4700 INFO Device Protection
Location        SPM: 01  OC3 01
From:           Working
To:             Spare
```

Figure 2, Log report example for SPM332 log shows a REX failure log along with explanations for the various fields.

Figure 2 Log report example for SPM332 log

```
SPM332 JAN 24 01:57:54 2112 TBL SPM REX Aborted
SPM: 0          Type: IW
Reason: Stability check on CEM 0 failed
        SYSB in the past 12 hours
```

Field	Description
SPM REX Aborted	Indicates that the information to follow mentions why REX test on the SPM node was aborted
Node type	Indicates that the node type for this log is SPM
Node Number	SPM number (range is 0-85)
Type	Indicates the variant of the SPM (valid values are DMSCP, MG4K, IW, and DPT).
Reason	Provides the reason why the REX test was aborted (limited to three lines of text).

Tools and utilities

Fault management for alarms and logs is performed through the Maintenance and Administration Position (MAP) terminal.

Fault management indicators

The following table lists the fault management indicators generated by the IW SPM IP.

IW SPM IP fault management indicators

Log name and number	Explanation
BITS300	A BITS alarm has been raised.
BITS301	A BITS Timing Link Degradation (TLD) alarm has been set.
BITS500	A BITS timing link has had a state change.
BITS600	A BITS alarm has been cleared.
BITS601	A BITS TLD alarm has been cleared.
BITS610	A BITS timing reference SSM value has changed.
BITS612	A BITS timing reference source switch has occurred.
CLOCK500	Logs related to system synchronization state changes
IOAU112	The System REX Controller noted changes to the System REX Controller operation or schedule.
IWBM500	The C-side link, STS3cP carrier, the network state, or the address state for the IW bridge software goes out-of-service.
IWBM501	The C-side link, STS3cP carrier, the network state, or the address state for the IW bridge software returns to service.
IWBM502	A Bsy command for group state transitions is being requested for a set of IW SPM bridge terminals.
IWBM503	An Rts command for group state transitions is being requested for a set of IW SPM bridge terminals.
IWBM504	An Offl command for group state transitions is being requested for a set of IW SPM bridge terminals.
IWBM505	A Frls command for group state transitions is being requested for a set of IW SPM bridge terminals.
IWBM600	The IW bridge receives an invalid terminal ID during an attempt to free a bridge.

IW SPM IP fault management indicators

Log name and number	Explanation
IWBM601	The audit finds a problem and performs a corresponding action. For Example an audit action occurs when a bridge has incorrect connectivity or a pointer to a bridge's protected data is corrupt.
IWBM602	No bridge available - info.
IWBM603	Audit log - info.
IWBM700	Maintenance action log - info.
IWBM800	Number of available IW bridges exceeds the first threshold when attempting to retrieve and IW-bridge ID from the IW bridge manager. The first threshold is 70% of the available IW bridges in the IW-bridge manager exhausted or in use. Does not include offline carriers.
IWBM801	Number of available IW bridges falls to less than 65% of bridges in the pool in use. This log always occurs after IWBM800. Does not include offline carriers.
IWBM802	Number of available IW bridges exceeds second threshold when attempting to retrieve and IW-bridge ID from the IW bridge manager. The second threshold is 90% of the available IW bridges in the IW-bridge manager exhausted or in use. Does not include offline carriers.
IWBM803	Number of available IW bridges falls to less than 85% of bridges in the pool in use. This log always occurs after IWBM802. Does not include offline carriers.
IWBM900	Nortel design debug tool.
LINK300	A DS-512 hostlink is detected as misconnected between the ENET and the SPM-CEM. Check to find out which links are misconnected. • BSY the links from the ENET map • Connect the links from the ENET to correspond correctly with the CEM. The port on the CEM must be exactly as datafilled in table MNLINK. • RTS the MANB links from the ENET map ***Note:*** Refer to solution level logs to see other possible causes for the LINK300 log

IW SPM IP fault management indicators

Log name and number	Explanation
LINK500	Logs generated from the MS and ENET for the DS-512 links.
NODE300	Logs related to hardware faults in the RMs and CEM. Refer to log NODE303 below.
NODE302	Software Alarm
NODE303	Logs to indicate Wrong Application Data on the CEM. Core Integrated Node Maintenance (INM) detected wrong application data for one of the following reasons: • CEM restarted with wrong application data due to manually initiated Reset/Loadmod/InsvLD. • CEM restarted with wrong application data due to system initiated Reset/Loadmod. • Manual/system initiated RTS (bringing CEM back into service - INSV/ISTB) was attempted on CEM with wrong application data. ***Note 1:*** Refer to Log NODE303 format on page 19 for NODE303 format details. ***Note 2:*** See log Link300 (above) to help identify the misconnected DS-512 Link.
NODE326	Log NODE326 is generated when a hardware fault occurs in a unit of a node.
NODE500	Logs related to node state change and activity switching. Log NODE500 is generated whenever a state change happens in any of the units of a dual unit PM. NODE500 is an information log.
NODE600	System recovery action. Info log
NODE601	System status notification Info log.

IW SPM IP fault management indicators

Log name and number	Explanation
SPM300	Logs related to hardware faults in the RMs (clock hardware, RM hardware, or link hardware) which indicates a device fault has occurred. There are three severities of problem descriptions: • Info - information only log. • Non-Critical - A Non-Critical fault reported by the active CEM causes the affected RM to change to an ISTB state. • Critical - A Critical fault reported by the active CEM causes the RM to change to a SYSB state and spare, if it is active. Faults reported by the inactive CEM affect the RM state when that CEM becomes active, if they are not cleared prior to that CEM becoming active. The problem description field contains a text string indicating which problem occurred. The B-channel is busied or returned to service. Clear the fault using the appropriate procedure. ***Note:*** See Log SPM300 format on page 20 and SPM300 log problem descriptions on page 21 for detailed explanations.
SPM301	The clock oscillator tuning range has reached 70% or 90% of the maximum range.
SPM311	Software related to RM sparing.
SPM312	TBL trap.
SPM313	Module information memory (MIM) on an SPM.
SPM314	TBL IMC.
SPM330	The two CEMs have either come in to datasync or out of datasync.
SPM331	A device had a protection switch failure.
SPM332	SPM REX aborted. Reports stability or screening failures for REX operation. ***Note:*** See Log SPM332 Problem Descriptions (below) for REX test failure explanations.

IW SPM IP fault management indicators

Log name and number	Explanation
SPM333	SPM REX failed. Reports failures reasons for REX operation. Reasons for an SPM REX failure: • RESET step failed • OOS test step failed • RTS step failed CEM • CEM drops to SYSB or does not come to Insv state during post-RTS wait period • SWACT step failed (either rejected or failed from Local Agent) ***Note:*** If the reason in SPM333 is RESET, OOS test, or RTS step, collect NODE500 and NODE600 logs. A SYSB alarm will be raised on the MAP and PM Alarm Banner will be highlighted.
SPM335	A device had a protection switch failure. Clear the PROTFAIL alarm using the appropriate procedure
SPM340	Fail CM Warm Swact.
SPM341	An SRM has entered into Holdover state.
SPM344	The SRM Loss of BITS Redundancy (LOR) alarm has been set.
SPM350	There is the potential for resource exhaustion of a particular resource type. The log also generates when the alarm is cleared.
SPM370	An SPM370 log (Health Monitor Event log) is generated whenever a Health Monitor alarm is raised or a Health Monitor RMM action is taken. When the status is “Alarm Raised”, investigate the cause. The “Correlating logs with alarms” section of this document provides possible causes for the associated alarms. Refer to the SPMCP (SPM call processing) commands in the Security and Administration document, *NN10163-611* for additional information. ***Note:*** When the status is “Info”, no action is required.
SPM500	Logs related to RM state change and activity switching (sparing).
SPM501	The clock mode has changed from sync, freerun, holdover, or acquire to sync, freerun, holdover, or acquire.

IW SPM IP fault management indicators

Log name and number	Explanation
SPM600	Logs generated when the MS changes synchronization modes and is unable to notify an in-service SPM of the change.
SPM625	Generates if an audit, that automatically runs every day at 0900 to check DS-512 connected SPM nodes for crossover message channel configuration, detects a node that is not configured for cross over. It is recommended to configure any SPM nodes listed in the log for Message Channel Cross-Over Mode in order to ensure node stability. Refer to Managing the SPM 625 log on page 137
SPM630	A successful sparing event has occurred.
SPM632	SPM REX Info. A log generated to record the start time of REX operation.
SPM633	SPM REX Success. A successful REX operation has occurred. ***Note:*** Node 500 logs report state changes on the CEM during REX tests.
SPM641	An SRM has exited Holdover state.
SPM642	An SRM has exited Holdover24 state.
SPM644	The SRM Loss of BITS Redundancy (LOR) alarm has been cleared.
SPM645	Link Protocol & Messaging Interface Controller (LPMIC) Event Report. This information log is generated on every CEM and transported to the core. The log is generated periodically and whenever the number of events crosses a threshold value.
SPM650	A successful in-service loading procedure has occurred.
SPM651	Logs generated when an in-service CEM/RM loading operation on a circuit pack fails.
SPM670	An SPM670 log is generated when a Health Monitor event clears.
SPM680	“Message Buffer Manager (MBM) buffer usage high” log message.
SPM681	“Message Buffer Manager (MBM) buffer pool low” log message.

IW SPM IP fault management indicators

Log name and number	Explanation
SPM684	The Erase Flash information log indicates when the: • Erase flash command is initiated, • Erase flash command is completed, • Erase flash command failed, and • Erase flash command is rejected. None (This is an information log) The log displays the CEM and SPM number on which the Erasefl command is executed in addition to the userid of the craft who initiated the command.
SPM700	DDM audit fail.
SPM701	DDM audit succeeded.
SPM702	DDM dynamic update failed.
VOIP800	Cyclical Redundancy Check (CRC) alignment error.
VOIP801	Undersize packets
VOIP802	Oversize packets.
VOIP803	Fragments.
VOIP804	Jabber.
VOIP805	Drop events.
VOIP806	Broadcast packets.
VOIP807	Jitter.
VOIP808	Latency
VOIP809	Packets lost.
VOIP810	Decoder under run.

Log NODE303 Format

Log NODE303 reports Wrong Application Data. This means the CEM in slot 7 of the SPM is getting application data for CEM1, and the CEM in slot 8 is getting application data for CEM 0. Node303 displays actions required in response to this.

Note: The CEM cannot Return to Service with Wrong Application Data.

Log NODE303 format

```
NODE 303 **<mmmdd hh:mm:ss> <ssdd> TBL Wrong
Application Data
Location: <NODE>
Trouble:  CEM has Wrong Application Data
Action:  Check and re-connect DS-512 Links correctly
Integrated Node Maintenance Detailed Information
Trouble Reason:  DS-512 Link/Links may be
misconnected
Trouble Detail:  CEM in Slot <slot_number(7 or 8)>
has Application Data of CEM <cem_number(0 or 1)>
```

Log NODE303 format

Field	Description
TBL	Indicates the trouble condition with the node.
Wrong Application Data	Indicates that the information to follow is about Wrong Application Data on the node.
Location	Indicates the location of the peripheral event to which the event applies.
Trouble	Identifies the type of problem.
Action (User)	Indicates the suggested user action.
Trouble Reason	Indicates the reason for the trouble condition.
Trouble Detail	Provides more information about the trouble condition.

Log SPM300 Format

Log SPM300 reports a device fault.

Log SPM300 format

SPM 300 ** <mmmdd hh:mm:ss> <ssdd> TBL Device Fault Report
Location: <NODE> <DEVICE>
Status : Alarm Raised
Problem Description: Critical
7A: Check messaging: Inactive CEM to RM loopback test timeout.
Action : Refer to NTPs for Alarm Clearing Procedures.
Cardlist : No Cardlist Available.dlist Available.

Log SPM300 format

Field	Description
TBL	Indicates the trouble condition with the node.
Device Fault Report	Indicates that the information to follow is a device fault report on the indicated device.
Location	Indicates the location of the peripheral event and device to which the event applies.
Status	Indicates whether the alarm is raised or cleared
Problem Description	Indicates the type of fault (Info, Non-critical, Critical) along with the information on which CEM reported the fault and a text string indicating what fault occurred.
Action (User)	Indicates the suggested user action.
Cardlist	Indicates the cards to be replaced.

Log SPM300 Problem Descriptions

The following table provides details for the problem descriptions in the SPM300 log.

SPM300 log problem descriptions

Failure reason	Explanation
Check messaging: Inactive CEM to RM loopback test timeout	This log indicates that there is a problem communicated to the indicated RM from the inactive CEM. If the inactive CEM becomes active while this condition exists, the RM will go SYSB. If this log occurs: 1) Collect sysbuf and /aer/display all from the inactive CEM dshell. 2) Try to remlogin to the RM from the inactive CEM. If this fails, remlogin to the RM from the active CEM. Collect the footprint logs from the RM. 3) BSY/RTS the RM. 4) If the log reoccurs, BSY/RESETMOD/RTS the inactive CEM.

Log SPM332 Problem Descriptions

The following table provides details for the problem descriptions in the SPM332 log.

SPM332 log - REX test failure

Failure reason	Explanation
Node not in InSv/IsTb state	Stability check on node failed. <Node state> state SPM REX aborted
CEM not in InSv state, RM not in InSv/MANB/OFFL state	Stability check on <CPK type> <CPK no:> failed. <CPK state> state SPM REX aborted
CEM/RM having a non-state alarm	Stability check on <CPK type> <CPK no:> failed. <Alarmid> alarm SPM REX aborted

SPM332 log - REX test failure

Failure reason	Explanation
Protection group having an alarm	Stability check on <Prt grp type> <Prt grp id> failed. <Alarmid> alarm SPM REX aborted
Node having a non-state alarm	Stability check on node failed. <Alarmid> alarm SPM REX aborted
CM SWACT has occurred in the past 12 hours	CM SWACTed in the past 12 hours. Stability database may be stale. SPM REX aborted
CEMs do not have the same running load	CEM 0 and CEM 1 do not have the same load. SPM REX aborted
CEM/RM has been in ISTB/SYSB state in the past 12 hours	Stability check on <CPK type> <CPK no> failed. <CPK state> in the past 12 hours SPM REX aborted
CEM/RM had an alarm raised in the past 12 hours	Stability check on <CPK type> <CPK no> failed. <Alarm name> alarm in the past 12 hours SPM REX aborted
CEM/RM has been in Patched/Loaded/Provisioned within the stability period	Stability check on <CPK type> <CPK no> failed. <Event name> in the past <stability period> hours SPM REX aborted
Node had an alarm raised in the past 12 hours	Stability check on node failed. <Alarm id> alarm in the past 12 hours SPM REX aborted
Protection group had an alarm raised in the past 12 hours	Stability check on protection group failed. <Grp type> <Grp id> <Alarm id> alarm in the past 12 hours SPM REX aborted
Long duration maintenance activity in progress on RM	Long Maintenance activity on <RM type> <RM no>. SPM REX aborted

SPM332 log - REX test failure

Failure reason	Explanation
Long duration maintenance activity in progress on CEM	CEM <CEM no>. Long maintenance activity in progress. SPM REX aborted
REX test aborted by manual ABTK command from CEM MAP level	Rex test aborted manually. SPM REX aborted
REX test aborted by the system REX	REX test aborted by the system. SPM REX aborted

Viewing alarms on the SPM

At the MAP level

1 Post the SPM by typing

>MAPCI;MTC;PM;POST SPM <spm_no>

and pressing the Enter key.

where

spm_no
is the number of the SPM (0 to 85)

Example of a MAP screen:

```
 XAC       MS      IOD      Net       PM      CCS      Lns      Trks     Ext      APPL
  .        .      NO AMA    Istb     1 DPT   2   RS     .       81C..    1 Maj   SBS D+
                  *C*                *C*     *C*                *C*      M       *C*
SPM                                  SysB     ManB     OffL     CBsy     ISTb     InSv
 0 Quit           PM                    0        0        0        0       11       12
 2 Post_          SPM                   0        0        0        0        3        0
 3 ListSet
 4 ListRes    SPM    0  ISTb  Class: IW         BRG_Only
 5 Trnsl
 6            Shlf0 SL A Stat  Shlf0 SL A Stat  Shlf1 SL A Stat  Shlf1 SL A Stat
 7 ATMConn    -----  1 - ----  CEM 1  8 I ISTb  -----  1 - ----  -----  8 - ----
 8            -----  2 - ----  GEM 0  9 A ISTb  -----  2 - ----  -----  9 - ----
 9            -----  3 - ----  GEM 1 10 I ManB  -----  3 - ----  ----- 10 - ----
10            -----  4 - ----  ----- 11 - ----  -----  4 - ----  ----- 11 - ----
11 Disp_      -----  5 - ----  ----- 12 - ----  -----  5 - ----  ----- 12 - ----
12 Next       -----  6 - ----  ----- 13 - ----  -----  6 - ----  ----- 13 - ----
13 Select_   CEM 0  7 A ISTb  ----- 14 - ----  -----  7 - ----  ----- 14 - ----
14 QueryPM
15 ListAlm
16
17 SPERFORM
18 Upgrade_
  BHARSH
Time  13:12  >
```

2 Display alarms on the RMs on the SPM by typing

>QUERYPM FLT

and pressing the Enter key.

3 Display alarms on the SPM by typing

>LISTALM

and pressing the Enter key.

Clearing a CLKOOS alarm

At the MAP terminal

1 Access the PM level of the map screen by typing

>MAPCI;MTC;PM

and pressing the Enter key.

2 Display all the inservice-trouble (ISTb) SPMs by typing

>DISP STATE ISTb SPM

and pressing the enter key.

3 Post each ISTb SPM by typing

>POST SPM <spm_no>

and pressing the Enter key.

where

spm_no
is the number of the SPM (0 to 85)

Example of a MAP screen:

```
 XAC      MS     IOD      Net      PM     CCS     Lns     Trks    Ext     APPL
  .       .     NO AMA   Istb    1 DPT  2   RS    .      81C..   1 Maj  SBS D+
                 *C*             *C*     *C*             *C*      M      *C*
SPM                              SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit          PM                0       0       0       0      11      12
 2 Post_         SPM               0       0       0       0       3       0
 3 ListSet
 4 ListRes   SPM    0  ISTb  Class: IW        BRG_Only
 5 Trnsl
 6           Shlf0 SL A Stat  Shlf0 SL A Stat  Shlf1 SL A Stat  Shlf1 SL A Stat
 7 ATMConn   -----  1 - ----  CEM 1  8 I ISTb  -----  1 - ----  -----  8 - ----
 8           -----  2 - ----  GEM 0  9 A ISTb  -----  2 - ----  -----  9 - ----
 9           -----  3 - ----  GEM 1 10 I ManB  -----  3 - ----  ----- 10 - ----
10           -----  4 - ----  ----- 11 - ----  -----  4 - ----  ----- 11 - ----
11 Disp_     -----  5 - ----  ----- 12 - ----  -----  5 - ----  ----- 12 - ----
12 Next      -----  6 - ----  ----- 13 - ----  -----  6 - ----  ----- 13 - ----
13 Select_  CEM 0  7 A ISTb  ----- 14 - ----  -----  7 - ----  ----- 14 - ----
14 QueryPM
15 ListAlm
16
17 SPERFORM
18 Upgrade_
  BHARSH
Time  13:12  >
```

4 Select the ISTb common equipment module (CEM) by typing

>SELECT CEM <cem_no>

where

cem_no
is the number of the ISTb CEM (0 or 1)

Example of a MAP screen:

```
SPM   11 CEM   0  Act    ISTb

Loc : Row F  FrPos 64 ShPos  6 ShId 0 Slot  7
Default Load: SPMLOAD
Clock:
Input Ref:            Source:            Current Mode:
```

5 List the alarms on the CEM by typing

>LISTALM

and pressing the Enter key.

Example of a MAP screen:

```
SPM   11 CEM   0  Act    ISTb

Loc : Row F  FrPos 64 ShPos  6 ShId 0 Slot  7
Default Load: SPMLOAD
Clock:
Input Ref:            Source:            Current Mode:
ListAlm
ListAlm: SPM 11  CEM 0

SEVERITY    ALARM       ACTION
------------------------------
Critical    None
Major       CLKOOS         RPT
Minor       None
No_Alarm    None
```

6 Record the number of each SPM exhibiting the CLKOOS condition.

7 Access the MTC level of the MAP screen by typing

>MAPCI;MTC

and pressing the Enter key.

8 Check the alarm banner and determine whether there is an MS clock alarm.

If there is	Do
an MS clock alarm	step 9
not an MS clock alarm	step 10

9 Clear the MS clock alarm using the appropriate alarm clearing procedures. When you have completed the procedures, go to Step 13.

10 List the alarms on the CEM by typing

```
>LISTALM
```

and pressing the Enter key.

If the alarm list shows	Do
None	step 22
CLKOOS	step 11

11 Determine if sync fault condition is present on the downstream equipment driving the OC3 into the SPM.

If sync fault condition is	Do
present	step 12
not present	step 14

12 Clear sync fault condition on downstream equipment driving the OC3 into the SPM.

Note: Once a sync fault condition is corrected, the SPM clears the CLKOOS condition, but there will be a delay of between 20 and 40 minutes while the SPM evaluates the stability of the OC3 carrier frequency.

13 List the alarms on the CEM by typing

```
>LISTALM
```

and pressing the Enter key.

If the alarm list shows	Do
None	step 22
CLKOOS	step 14

14 Force the CEMs to switch activity by typing

```
>PROT;FORCE;QUIT
```

and pressing the enter key.

15 Select the active (A) CEM by typing

```
>SELECT CEM <cem_no>
```

and pressing the Enter key.

where

cem_no
is the number of the active CEM (0 or 1)

16 List the alarms on the CEM by typing

```
>LISTALM
```

and pressing the enter key.

If the alarm list shows	Do
None	step 17
CLKOOS	step 20

17 Force the CEMs to switch activity by typing

```
>PROT;FORCE;QUIT
```

and pressing the Enter key.

18 Select the active (A) CEM by typing

```
>SELECT CEM <cem_no>
```

and pressing the Enter key.

where

cem_no
is the number of the active CEM (0 or 1)

19 List the alarms on the CEM by typing

```
>LISTALM
```

and pressing the Enter key.

Example of a MAP screen:

```
SPM   11 CEM   0  Act    ISTb

Loc : Row F  FrPos 64 ShPos  6 ShId 0 Slot  7
Default Load: SPMLOAD
Clock:
Input Ref:            Source:            Current Mode:
ListAlm
ListAlm: SPM 11  CEM 0

SEVERITY    ALARM       ACTION
-------------------------------
Critical    None
Major       CLKOOS         RPT
Minor       None
No_Alarm    None
```

If the alarm list shows	Do
None	step 22
CLKOOS	step 20

20 Return to the SPM level and list the alarms on the CEM by typing

>LISTALM

and pressing the Enter key.

If the alarm list shows	Do
None	step 22
CLKOOS	step 21

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

22 You have completed this procedure. Return to the CI level of the MAP screen by typing

>QUIT ALL

and pressing the Enter key.

Clearing an ISTB alarm

At the MAP terminal

1 Access the PM level of the MAP screen by typing

>MAPCI;MTC;PM

and pressing the Enter key.

Example of a MAP screen:

```
     SysB     ManB     OffL     CBsy     ISTb     InSv
PM    1        1        1        3        2       12
```

2 Show the state of all PMs by typing

>STATUS

and pressing the Enter key.

3 Display the SPMs that are in-service trouble by typing

>DISP STATE ISTB SPM

and pressing the Enter key.

4 Record the number of the SPMs.

5 Post each in-service trouble SPM by typing

>POST SPM <spm_no>

and pressing the Enter key.

where

spm_no
is the number of the SPM (0 to 85)

6 Determine which of the modules is in-service trouble (ISTb) and select the modules by typing

>SELECT <module_type> <module_no>

and pressing the Enter key.

where

module_type
is the type of module (CEM, OC3, DSP, VSP, or DLC)

module_no
is the number of the module (0 to 27)

7 Show the actual software load by typing

>QUERYMOD

and pressing the Enter key.

Example of a MAP screen:

```
SPM 3    OC3 1    Act  ISTb

Loc : Row E  FrPos  8 ShPos 24 ShId 0 Slot 10   Prot Grp : 1
Default Load: SPMLOAD                           Prot Role: Working
QueryMod
SPM 12 OC3 0 Query: Request has been submitted.
OC3  0 ISTb Act    Loc: Row D  FrPos 64 ShPos  6 ShId 0 Slot  9
Default Load: SPMLOAD              Actual Load: SPMLOAD
```

8 Access the PROT level by typing

>PROT

and pressing the Enter key.

9 Perform a manual protection switch by typing

>MANUAL <active_cpk> <spare_cpk>

and pressing the Enter key.

where

active_cpk
is the number of the active circuit pack

spare_cpk
is the number of the spare circuit pack

Note: For CEMs, the active_cpk and spare_cpk parameters are not required.

10

If the circuit pack is	Do
a CEM	step 11
any other circuit pack	step 12

11 Load the CEM with its software load by typing

>LOADMOD INSVLD

and pressing the Enter key.

Go to step 13.

12 Download matching software for the circuit pack by typing

>LOADMOD MATE <active_cpk>

and pressing the Enter key.

where

active_cpk
is the number of the previously inactive circuit pack

13 Protection switch back to the original circuit pack by typing

>MANUAL <active_cpk> <inactive_cpk>

and pressing the Enter key.

where

active_cpk
is the number of the previously inactive circuit pack

inactive_cpk
is the number of the previously active circuit pack

Note: For CEMs, the active_cpk and spare_cpk parameters are not required.

14 Return to the posted circuit pack by typing

>QUIT

and pressing the Enter key.

15 List the alarms on the module by typing

>LISTALM

and pressing the Enter key.

16 Determine whether the alarm has cleared.

17 Perform an in-service test on the module by typing

>TST

and pressing the Enter key.

Example of a MAP screen:

```
SPM 3    OC3 1    Act  ISTb

Loc : Row E  FrPos  8 ShPos 24 ShId 0 Slot 10   Prot Grp : 1
Default Load: SPMLOAD                           Prot Role: Spare
Clock:Input Ref: Internal     Source: C Side 0   Current Mode:
Acquire
Tst
SPM 3 CEM 0 Test : Request has been submitted.
SPM 3 CEM 0 Test : Test passed.
```

18 Determine the test condition of the module.

19 Access the PROT level by typing

>PROT

and pressing the Enter key.

20 Perform a manual protection switch by typing

>MANUAL <active_cpk> <spare_cpk>

and pressing the Enter key.

where

active_cpk
is the number of the active circuit pack

spare_cpk
is the number of the spare circuit pack

Note: For CEMs, the active_cpk and spare_cpk parameters are not required.

21 Return to the posted circuit pack by typing

>QUIT

and pressing the Enter key.

22 Manual busy the module by typing

>BSY

and pressing the Enter key.

23 Perform an out-of-service test on the module by typing

>TST

and pressing the Enter key.

24 Determine the test condition of the module.

25 Return the module to service by typing

>RTS

and pressing the Enter key.

26 Determine the state of the module.

27 Replace the module, as appropriate. When you have completed the procedure, return to this point.

28 List the alarms on the module by typing

>LISTALM

and pressing the Enter key.

29 Determine whether the alarm has cleared.

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

31 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

and pressing the Enter key.

Clearing a MANB alarm

At the MAP terminal

1 Access the PM level of the MAP screen by typing

>MAPCI;MTC;PM

and pressing the Enter key.

Example of a MAP screen:

```
    SysB     ManB     OffL     CBsy     ISTb     InSv
PM   1        1        1        3        2        12
```

2 Show the state of all PMs by typing

>STATUS

and pressing the Enter key.

3 Display the SPM that are manual busy by typing

>DISP STATE MANB SPM

and pressing the Enter key.

4 Record the number of the SPMs

5 Post each manual busy SPM by typing

>POST SPM <spm_no>

and pressing the Enter key.

where

spm_no
is the number of the SPM (0 to 85)

Example of a MAP screen:

```
 XAC      MS     IOD     Net      PM     CCS     Lns     Trks    Ext     APPL
  .       .     NO AMA   Istb    1 DPT  2   RS    .      81C..   1 Maj  SBS D+
                 *C*             *C*    *C*             *C*     M      *C*
SPM                              SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit          PM                0       0       0       0      11      12
 2 Post_         SPM               0       0       0       0       3       0
 3 ListSet
 4 ListRes    SPM    0  ISTb  Class: IW        BRG_Only
 5 Trnsl
 6            Shlf0 SL A Stat  Shlf0 SL A Stat  Shlf1 SL A Stat  Shlf1 SL A Stat
 7 ATMConn    -----  1 - ----  CEM 1  8 I ISTb  -----  1 - ----  -----  8 - ----
 8            -----  2 - ----  GEM 0  9 A ISTb  -----  2 - ----  -----  9 - ----
 9            -----  3 - ----  GEM 1 10 I ManB  -----  3 - ----  ----- 10 - ----
10            -----  4 - ----  ----- 11 - ----  -----  4 - ----  ----- 11 - ----
11 Disp_      -----  5 - ----  ----- 12 - ----  -----  5 - ----  ----- 12 - ----
12 Next       -----  6 - ----  ----- 13 - ----  -----  6 - ----  ----- 13 - ----
13 Select_   CEM 0  7 A ISTb  ----- 14 - ----  -----  7 - ----  ----- 14 - ----
14 QueryPM
15 ListAlm
16
17 SPERFORM
18 Upgrade_
  BHARSH
Time  13:12  >
```

6 Determine which of the modules is manual busy (ManB) and select the modules by typing

>SELECT <module_type> <module_no>

and pressing the Enter key.

where

module_type
is the type of module (CEM, OC3, DSP, VSP, or DLC).

module_no
is the number of the module (0 to 27).

Example of a MAP screen:

```
SPM 3    OC3 1 Act mANb

Loc : Row E  FrPos  8 ShPos 24 ShId 0 Slot 10   Prot Grp : 1
Default Load: SPMLOAD                           Prot Role: Spare
```

7 If the status of the module is ManB, determine why the module was manual busied. Continue with Step 8 as soon as possible.

8 Return the module to service by typing

>RTS

and pressing the Enter key.

9 Determine the state of the module.

If the module is	Do
InSv	Step 16
SysB or IstB	Step 10
any other state	Step 12

10 Perform the alarm clearing procedures for SysB or IstB, as appropriate.

11 Determine the state of the module.

If the module is	Do
InSv	Step 16
any other state	Step 12

12 Replace the module as appropriate. When you have completed the card replacement procedure, return to this point.

13 List the alarms on the module by typing

```
>LISTALM
```

and pressing the Enter key.

14 Determine whether the alarm has cleared.

If the alarm list indicates	Do
MANB	Step 15
None	Step 16

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

16 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

and pressing the Enter key.

Clearing a MANBNA alarm

At the MAP terminal

1 Access the PM level of the MAP screen by typing

>MAPCI;MTC;PM

and pressing the Enter key.

Example of a MAP screen:

```
     SysB     ManB     OffL     CBsy     ISTb     InSv
PM    1        1        1        3        2        12
```

2 Display all the system busy SPMs by typing

>DISP STATE MANB SPM

and pressing the Enter key.

3 Record the number of the SPMs.

4 Post each manual busy not available SPM by typing

>POST SPM <spm_no>

and pressing the Enter key.

where

spm_no
is the number of the SPM (0 to 85)

Example of a MAP screen:

```
 XAC      MS     IOD      Net      PM     CCS     Lns     Trks    Ext     APPL
  .       .     NO AMA   Istb    1 DPT  2   RS    .      81C..   1 Maj  SBS D+
                 *C*             *C*    *C*                  *C*     M     *C*
SPM                              SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit          PM                0       0       0       0      11      12
 2 Post_         SPM               0       0       0       0       3       0
 3 ListSet
 4 ListRes   SPM    0  ISTb  Class: IW        BRG_Only
 5 Trnsl
 6           Shlf0 SL A Stat  Shlf0 SL A Stat  Shlf1 SL A Stat  Shlf1 SL A Stat
 7 ATMConn   -----  1 - ----  CEM 1  8 I ISTb  -----  1 - ----  -----  8 - ----
 8           -----  2 - ----  GEM 0  9 A ISTb  -----  2 - ----  -----  9 - ----
 9           -----  3 - ----  GEM 1 10 I ManB  -----  3 - ----  ----- 10 - ----
10           -----  4 - ----  ----- 11 - ----  -----  4 - ----  ----- 11 - ----
11 Disp_     -----  5 - ----  ----- 12 - ----  -----  5 - ----  ----- 12 - ----
12 Next      -----  6 - ----  ----- 13 - ----  -----  6 - ----  ----- 13 - ----
13 Select_  CEM 0  7 A ISTb  ----- 14 - ----  -----  7 - ----  ----- 14 - ----
14 QueryPM
15 ListAlm
16
17 SPERFORM
18 Upgrade_
  BHARSH
Time  13:12  >
```

5 List the status of the ENET links by typing

>TRNSL

and pressing the Enter key.

Example of a MAP screen:

```
SPM   11 CEM   0  Act    SysB (NA)

Loc : Row F  FrPos 64 ShPos  6 ShId 0 Slot  7
Default Load: SPMLOAD
Clock:
Input Ref:            Source:            Current Mode:
Trnsl
Link 1: ENET 0  0  30  0; Status: OK
Link 2: ENET 1  0  30  1; Status: NA
Link 3: ENET 0  0  30  2; Status: OK
Link 4: ENET 1  0  30  3; Status: OK
```

6 Determine whether the ENET links are in service.

If the status of the ENET links is	Do
OK	Step 9b
NA or UR	Step 7

7 If the status of the ENET links is NA (not available), Determine whether they were manual busied and why. Return the ENET links to service as soon as possible. When you have completed the procedure, return to this point.

Note: Contact your next level of support if you are not familiar with the procedures required to restore ENET links to service.

8 List the alarms on the SPM by typing

>LISTALM

and pressing the Enter key.

If the alarm list shows	Do
None	Step 10
MANBNA	Step 9

9 Perform the following substeps to record ENET information:

a List the status of the ENET links by typing

>TRNSL

and pressing the Enter key.

Example of a MAP screen:

```
SPM   11 CEM   0  Act    SysB (NA)

Loc : Row F  FrPos 64 ShPos  6 ShId 0 Slot  7
Default Load: SPMLOAD
Clock:
Input Ref:             Source:            Current Mode:
Trnsl
Link 1: ENET 0  0  30  0; Status: OK
Link 2: ENET 1  0  30  1; Status: NA
Link 3: ENET 0  0  30  2; Status: OK
Link 4: ENET 1  0  30  3; Status: OK
```

b Record the ENET shelf number (30 in the example above)

10 Do the following substeps to determine the MS card numbers:

a At the CI level of MAP screen, locate the MS card that the ENET is connected to by typing

>TABLE ENINV

and pressing the Enter key.

b Create a heading for the tuple by typing

>HEADING

and pressing the Enter key.

c Position on the tuple for the ENET shelf by typing

>POS <enet_shelf_no>

and pressing the Enter key.

where

enet_shelf_no
is the number of the ENET shelf

Example of a MAP screen:

```
CI:
>table eninv
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: ENINV
>heading
ENKEY ENCLASS FRTYPE FRNO    FRPEC    SHPEC MSCARD0 MSLINK0 MSPORT0 FLOOR0
ROW0 FRPOS0 SHELF0                            LOAD0 MSCARD1 MSLINK1 MSPORT1
FLOOR1 ROW1 FRPOS1 SHELF1                             LOAD1
------------------------------------------------------------------------------
>pos 0
    0     PRI    ENC    0 NT9X05AB NT9X0801       6       0       0       1
   F      2     39                           ENX08AX      10       0       0
     1    F      1     39                            ENX08AX
```

d Record the MS card numbers under `MSCARD0` and `MSCARD1` (`6` and `10` in the example above).

11 Locate the MS cards by typing

>MAPCI;MTC;MS;SHELF 0;CARD <ms_card_no>

and pressing the Enter key.

where

ms_card_no
is the number of the MS card

Example of a MAP screen:

```
Message Switch   Clock   Shelf  0       Inter-MS Link 0 1
MS 0      .        Master         F                    R R
MS 1      S         Slave          C                    C C

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

Card 06 Protocol Port  0_____3  4_____7  8____11  12___15
MS 0  .  DS512   64   . . . . . . . . . . P P  . . . .
MS 1  C   DS512   64   C P P P  P P P P  P P P P  P P P P
```

12 Do the following substeps to check the status of both ports (0 and 1) on both MS cards (MSCARD0 and MSCARD1).

a Determine the state of each MS card port that connects to the SPM with the SYSBNA alarm, by typing

>TRNSL <ms_card_port>

and pressing the Enter key.

where

ms_card_port
is the number of the MS card port (0 or 1)

Example of a MAP screen:

```
PORT  20=SPM  10 (OK  ,P:NA SYST ACC NP MSRR ^PSRR)
PORT  21=SPM  10 (OK  ,P:NA SYST ACC NP MSRR ^PSRR)
PORT  22=SPM  11 (OK  :UR SYST ACC NP MSRR PSRR)
PORT  23=SPM  11 (OK  :UR SYST ACC NP MSRR PSRR)
PORT  24=SPM  12 (OK  :AV SYST ACC NCP MSRR PSRR)
```

b Repeat Step 12a. for the second MS port.

c Repeat Step 11 for the other MS card and repeat Steps 12a. and 12b. to check the MS ports on that card. INSERT TABLE

If the status of the MS ports shows	Do
OK for all four ports	Step 15
NA or UR for any port	Step 13

13 Return the MS ports to service. When you have completed the procedure, return to this point.

Note: Contact your next level of support if you are not familiar with the procedures required to restore MS ports to service.

14 List the alarms on the SPM by typing

```
>LISTALM
```

and pressing the Enter key.

If the alarm list shows	Do
None	Step 16
SYSBNA	Step 15

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

16 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

and pressing the Enter key.

Clearing a NOSPARE alarm

At the MAP terminal

1 Access the PM level of the MAP screen by typing

>MAPCI;MTC;PM

and pressing the Enter key.

Example of a MAP screen:

```
      SysB     ManB     OffL     CBsy     ISTb     InSv
PM     1        1        1        3        2        12
```

2 Show the state of all PMs by typing

>STATUS

and pressing the Enter key.

3 Post all of the SPMs by typing

>POST SPM all

and pressing the Enter key.

4 List the alarms on each SPM by typing

>LISTALM

and pressing the Enter key.

Example of a MAP screen:

```
 XAC       MS      IOD      Net       PM      CCS      Lns      Trks     Ext      APPL
  .        .      NO AMA    Istb     1 DPT   2   RS     .       81C..    1 Maj   SBS D+
                   *C*              *C*      *C*                *C*      M       *C*
SPM                                 SysB     ManB     OffL     CBsy     ISTb     InSv
 0 Quit           PM                   0        0        0        0       11       12
 2 Post_          SPM                  0        0        0        0        3        0
 3 ListSet
 4 ListRes    SPM     0  ISTb  Class: IW          BRG_Only
 5 Trnsl
 6            Shlf0 SL A Stat   Shlf0 SL A Stat   Shlf1 SL A Stat   Shlf1 SL A Stat
 7 ATMConn    -----  1 - ----   CEM 1  8 I ISTb   -----  1 - ----   -----  8 - ----
 8            -----  2 - ----   GEM 0  9 A ISTb   -----  2 - ----   -----  9 - ----
 9            -----  3 - ----   GEM 1 10 I ManB   -----  3 - ----   ----- 10 - ----
10            -----  4 - ----   ----- 11 - ----   -----  4 - ----   ----- 11 - ----
11 Disp_      -----  5 - ----   ----- 12 - ----   -----  5 - ----   ----- 12 - ----
12 Next       -----  6 - ----   ----- 13 - ----   -----  6 - ----   ----- 13 - ----
13 Select_    CEM 0  7 A ISTb   ----- 14 - ----   -----  7 - ----   ----- 14 - ----
14 QueryPM
15 ListAlm
16
17 SPERFORM
18 Upgrade_
  BHARSH
Time  13:12  >
```

5 Record the number of each SPM with a NOSPARE alarm.

6 Determine which of the modules are not in service (InSv, CBsy, or IsTb) and select the modules by typing

`>SELECT <module_type> <module_number>`

and pressing the Enter key.

where

module_type
is the type of module (OC3, DSP, VSP, or DLC).

module_no
is the number of the module (0 to 27)

7 Locate the NOSPARE alarms on each module by typing

`>PROT;LISTALM`

and pressing the Enter key.

8 Determine the state of the module from the LISTALM display.

Example of a MAP screen:

```
 SPM   16  InSv
Prot Grp: VSP_GRP 1    Mode: Non-revertive    Schema: m_for_n
Sh0 U R A Stat   Sh0 U R A Stat   Sh1 U R A Stat   Sh1 U R A Stat
 1 -- - - ----    8 -- - - ----    1  0 W A ManB    8 -- - - ----
 2 -- - - ----    9 -- - - ----    2  1 W A ManB    9 -- - - ----
 3 -- - - ----   10 -- - - ----    3 -- - - ----   10 -- - - ----
 4 -- - - ----   11 -- - - ----    4 -- - - ----   11 -- - - ----
 5 -- - - ----   12 -- - - ----    5 -- - - ----   12 -- - - ----
 6 -- - - ----   13 -- - - ----    6 -- - - ----   13 -- - - ----
 7 -- - - ----   14 -- - - ----    7 -- - - ----   14 -- - - ----
ListAlm

ListAlm: VSP_GRP 1

SEVERITY    ALARM       ACTION
-----------------------------
Critical    None
Major       NOSPARE       RPT
Minor       None
No_Alarm    None
```

If the module is	Do
OffL	Step 9
ManB	Step 10
in any other state	Step 13

9 Return to the module level and set the module to manual busy by typing

>QUIT;BSY;RTS

and pressing the Enter key. Go to Step 11.

10 Return to the module level and return the module to service by typing

>QUIT;RTS

and pressing the Enter key.

11 List the alarms on the module at the protection level by typing

>PROT;LISTALM

and pressing the Enter key.

Example of a MAP screen:

```
ListAlm

ListAlm: VSP_GRP 1

SEVERITY    ALARM       ACTION
-----------------------------
Critical    None
Major       None
Minor       None
No_Alarm    None
```

12 Determine whether the NOSPARE alarm has cleared.

If the alarm list indicates	Do
NOSPARE	Step 13
None	Step 21

13 Determine the state of the module.

If the module is	Do
SysB	Step 14
in any other state	Step 20

14 Perform an in-service test on the module by typing

>TST

and pressing the Enter key.

Example of a MAP screen:

```
SPM 3    OC3 1    Act  ISTb

Loc : Row E  FrPos  8 ShPos 24 ShId 0 Slot 10   Prot Grp : 1
Default Load: SPMLOAD                           Prot Role: Spare
Clock:Input Ref: Internal     Source: C Side 0   Current Mode:
Acquire
Tst
SPM 3 CEM 0 Test : Request has been submitted.
SPM 3 CEM 0 Test : Test passed.
```

15 Determine the test condition of the module. I

If the test results show	Do
Test passed.	Step 16
Test failed.	Step 19

16 Return the module to service by typing

```
>RTS
```

and pressing the Enter key.

17 List the alarms on the module by typing

```
>LISTALM
```

and pressing the Enter key.

18 Determine whether the NOSPARE alarm has cleared.

If the alarm list indicates	Do
NOSPARE	Step 20
None	Step 21

19 Replace the module, as appropriate. When you have completed the procedure, return to this point.

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

21 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

and pressing the Enter key.

Clearing a PROTFAIL alarm

At the MAP terminal

1 Access the PM level of the MAP screen by typing

>MAPCI;MTC;PM

and pressing the Enter key.

Example of a MAP screen:

```
    SysB     ManB     OffL     CBsy     ISTb     InSv
PM   1        1        1        3        2        12
```

2 Show the state of all PMs by typing

>STATUS

and pressing the Enter key.

3 Post the all of the SPMs by typing

>POST SPM all

and pressing the Enter key.

Example of a MAP screen:

```
 XAC      MS     IOD      Net      PM     CCS     Lns     Trks    Ext     APPL
  .       .     NO AMA   Istb    1 DPT  2   RS    .      81C..   1 Maj  SBS D+
                 *C*             *C*    *C*             *C*     M      *C*
SPM                              SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit          PM                0       0       0       0      11      12
 2 Post_         SPM               0       0       0       0       3       0
 3 ListSet
 4 ListRes    SPM    0  ISTb  Class: IW        BRG_Only
 5 Trnsl
 6            Shlf0 SL A Stat  Shlf0 SL A Stat  Shlf1 SL A Stat  Shlf1 SL A Stat
 7 ATMConn    -----  1 - ----  CEM 1  8 I ISTb  -----  1 - ----  -----  8 - ----
 8            -----  2 - ----  GEM 0  9 A ISTb  -----  2 - ----  -----  9 - ----
 9            -----  3 - ----  GEM 1 10 I ManB  -----  3 - ----  ----- 10 - ----
10            -----  4 - ----  ----- 11 - ----  -----  4 - ----  ----- 11 - ----
11 Disp_      -----  5 - ----  ----- 12 - ----  -----  5 - ----  ----- 12 - ----
12 Next       -----  6 - ----  ----- 13 - ----  -----  6 - ----  ----- 13 - ----
13 Select_   CEM 0  7 A ISTb  ----- 14 - ----  -----  7 - ----  ----- 14 - ----
14 QueryPM
15 ListAlm
16
17 SPERFORM
18 Upgrade_
  BHARSH
Time  13:12  >
```

4 Record the number of each SPM with a PROTFAIL alarm.

5 Determine which of the modules are not in service (InSv, CBsy, or ISTb) and select the modules by typing

>SELECT <module_type> <module_no>

and pressing the Enter key.

where

module_type
is the type of module (OC3, DSP, VSP, or DLC)

module_no
is the number of the module (0 to 27)

Example of a MAP screen:

```
SPM 3    OC3 1    InAct  OffL

Loc : Row E  FrPos  8 ShPos 24 ShId 0 Slot 10   Prot Grp : 1
Default Load: SPMLOAD                           Prot Role: Spare
```

6 Locate the PROTFAIL alarms on each module by typing

>LISTALM

and pressing the Enter key.

Example of a MAP screen:

```
ListAlm
ListAlm: SPM 11   OC3

SEVERITY    ALARM       ACTION
-----------------------------
Critical    None
Major       PROTFAIL       RPT
Minor       None
No_Alarm    None
```

7 Determine the state of the module from the SELECT display.

If the module is	Do
SysB	Procedure 8
in any other state	Procedure 11

8 Perform an in-service test on the module by typing

>TST

and pressing the Enter key.

Example of a MAP screen:

```
SPM 11    OC3 1    Act  ISTb

Loc : Row E  FrPos  8 ShPos 24 ShId 0 Slot 10   Prot Grp : 1
Default Load: SPMLOAD                           Prot Role: Spare
Clock:Input Ref: Internal     Source: C Side 0   Current Mode:
Acquire
Tst
SPM 3 CEM 0 Test : Request has been submitted.
SPM 3 CEM 0 Test : Test passed.
```

9 Determine the test condition of the module.

If the test results show	Do
Test passed.	Procedure 10
Test failed.	Procedure 12

10 Return the module to service by typing

>RTS

and pressing the Enter key.

11 Determine the state of the module.

If the module is	Do
InSv	Procedure 13
in any other state	Procedure 17

12 Replace the module identified in Procedure 5. When you complete the card replacement procedure, go to Procedure 13 of this procedure.

13 Access the protection level of the MAP screen by typing

>PROT

and pressing the Enter key.

14 Do a manual protection switch with a module in the same protection group by typing

>MANUAL <from_unit_no> <to_unit_no>

and pressing the Enter key.

where

from_unit_no
is the number (0 to 27) of the module with the alarm.

to_unit_no
is the number (0 to 27) of the inactive module in the same protection group

Example of a MAP screen:

```
SPM 0 DSP 1 Manual: Request has been submitted.
SPM 0 DSP 0 Manual: Command completed.
```

15 List the alarms on the module by typing

>LISTALM

and pressing the Enter key.

16 Determine whether the alarm has cleared.

If the alarm list indicates	Do
PROTFAIL	Procedure 17
None	Procedure 18

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

18 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

and pressing the Enter key.

Clearing a SYSB alarm

At the MAP terminal

1 Access the PM level of the MAP screen by typing

>MAPCI;MTC;PM

and pressing the Enter key.

Example of a MAP screen:

```
    SysB     ManB     OffL     CBsy     ISTb     InSv
PM   1        1        1        3        2        12
```

2 Show the state of all PMs by typing

>STATUS

and pressing the Enter key.

3 Display the SPMs that are system busy by typing

>DISP STATE SYSB SPM

and pressing the Enter key.

4 Record the number of the SPMs.

5 Post each system busy SPM by typing

>POST SPM <spm_no>

and pressing the Enter key.

where

spm_no
is the number of the SPM (0 to 85)

Example of a MAP screen:

```
 XAC      MS     IOD      Net      PM     CCS     Lns     Trks    Ext     APPL
  .       .     NO AMA   Istb    1 DPT  2   RS    .      81C..   1 Maj  SBS D+
                 *C*             *C*    *C*             *C*      M     *C*
SPM                              SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit          PM                0       0       0       0      11      12
 2 Post_         SPM               0       0       0       0       3       0
 3 ListSet
 4 ListRes   SPM    0  ISTb  Class: IW        BRG_Only
 5 Trnsl
 6           Shlf0 SL A Stat  Shlf0 SL A Stat  Shlf1 SL A Stat  Shlf1 SL A Stat
 7 ATMConn   -----  1 - ----  CEM 1  8 I ISTb  -----  1 - ----  -----  8 - ----
 8           -----  2 - ----  GEM 0  9 A ISTb  -----  2 - ----  -----  9 - ----
 9           -----  3 - ----  GEM 1 10 I ManB  -----  3 - ----  ----- 10 - ----
10           -----  4 - ----  ----- 11 - ----  -----  4 - ----  ----- 11 - ----
11 Disp_     -----  5 - ----  ----- 12 - ----  -----  5 - ----  ----- 12 - ----
12 Next      -----  6 - ----  ----- 13 - ----  -----  6 - ----  ----- 13 - ----
13 Select_  CEM 0  7 A ISTb  ----- 14 - ----  -----  7 - ----  ----- 14 - ----
14 QueryPM
15 ListAlm
16
17 SPERFORM
18 Upgrade_
  BHARSH
Time  13:12  >
```

6 Determine which of the modules is system-busy and select the modules by typing

>SELECT <module_type> <module_no>

and pressing the Enter key.

where

module_type
is the type of module (CEM, OC3, DSP, VSP, or DLC).

module_no
is the number of the module (0 to 27)

Example of a MAP screen:

```
SPM 3    OC3 1    InAct  OffL

Loc : Row E  FrPos  8 ShPos 24 ShId 0 Slot 10   Prot Grp : 1
Default Load: SPMLOAD                           Prot Role: Spare
```

7 Test the module by typing

>TST

and pressing the Enter key.

8 Determine the test condition of the module.

If the module test is	Do
OK	Step 9
not OK	Step 11

9 Return the module to service by typing

```
>RTS
```

and pressing the Enter key.

10 Determine the state of the module.

If the module is	Do
InSv	Step 15
any other state	Step 14

11 Replace the module identified in Step 6. For detailed instructions, see the SPM section of the *Card Replacement Procedures*. When you complete the card replacement procedure, go to Step 12 of this procedure.

12 List the alarms on the module by typing

```
>LISTALM
```

and pressing the Enter key.

13 Determine whether the alarm has cleared.

If the alarm list indicates	Do
SYSB	Step 14
None	Step 15

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

15 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

and pressing the Enter key.

Clearing a SYSBNA alarm

At the MAP terminal

1 Access the PM level of the MAP screen by typing

>MAPCI;MTC;PM

and pressing the Enter key.

Example of a MAP screen:

```
     SysB     ManB     OffL     CBsy     ISTb     InSv
PM    1        1        1        3        2        12
```

2 Display all the system-busy SPMs by typing

>DISP STATE SYSB SPM

and pressing the Enter key.

3 Record the number of the SPMs.

4 Post each system-busy-not-available SPM by typing

>POST SPM <spm_no>

and pressing the Enter key.

where

spm_no
is the number of the SPM (0 to 85)

Example of a MAP screen:

```
 XAC      MS     IOD     Net      PM     CCS     Lns     Trks    Ext     APPL
  .       .     NO AMA   Istb    1 DPT  2   RS    .      81C..   1 Maj  SBS D+
                 *C*             *C*    *C*             *C*     M      *C*
SPM                              SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit          PM                0       0       0       0      11      12
 2 Post_         SPM               0       0       0       0       3       0
 3 ListSet
 4 ListRes    SPM    0  ISTb  Class: IW        BRG_Only
 5 Trnsl
 6            Shlf0 SL A Stat  Shlf0 SL A Stat  Shlf1 SL A Stat  Shlf1 SL A Stat
 7 ATMConn    -----  1 - ----  CEM 1  8 I ISTb  -----  1 - ----  -----  8 - ----
 8            -----  2 - ----  GEM 0  9 A ISTb  -----  2 - ----  -----  9 - ----
 9            -----  3 - ----  GEM 1 10 I ManB  -----  3 - ----  ----- 10 - ----
10            -----  4 - ----  ----- 11 - ----  -----  4 - ----  ----- 11 - ----
11 Disp_      -----  5 - ----  ----- 12 - ----  -----  5 - ----  ----- 12 - ----
12 Next       -----  6 - ----  ----- 13 - ----  -----  6 - ----  ----- 13 - ----
13 Select_    CEM 0  7 A ISTb  ----- 14 - ----  -----  7 - ----  ----- 14 - ----
14 QueryPM
15 ListAlm
16
17 SPERFORM
18 Upgrade_
  BHARSH
Time  13:12  >
```

5 List the status of the ENET links by typing

>TRNSL

and pressing the Enter key.

Example of a MAP screen:

```
SPM   11 CEM   0  Act    SysB (NA)

Loc : Row F  FrPos 64 ShPos  6 ShId 0 Slot  7
Default Load: SPMLOAD
Clock:
Input Ref:            Source:            Current Mode:
Trnsl
Link 1: ENET 0  0  30  0; Status: OK
Link 2: ENET 1  0  30  1; Status: NA
Link 3: ENET 0  0  30  2; Status: OK
Link 4: ENET 1  0  30  3; Status: OK
```

6 Determine whether the ENET links are in service.

If the status of the ENET links is	Do
OK	Step 9b
NA or UR	Step 7

7 Return the ENET links to service. When you have completed the procedure, return to this point.

Note: Contact your next level of support if you are not familiar with the procedures required to restore ENET links to service.

8 List the alarms on the SPM unit by typing

>LISTALM

and pressing the Enter key.

If the alarm list shows	Do
None	Step 10
SYSBNA	Step 9

9 Perform the following substeps to record ENET information:

a List the status of the ENET links by typing

>TRNSL

and pressing the Enter key.

Example of a MAP screen:

```
SPM   11 CEM   0  Act    SysB (NA)

Loc : Row F  FrPos 64 ShPos  6 ShId 0 Slot  7
Default Load: SPMLOAD
Clock:
Input Ref:             Source:            Current Mode:
Trnsl
Link 1: ENET 0  0  30  0; Status: OK
Link 2: ENET 1  0  30  1; Status: NA
Link 3: ENET 0  0  30  2; Status: OK
Link 4: ENET 1  0  30  3; Status: OK
```

b Record the ENET shelf number (`30` in the example above).

10 Do the following substeps to determine the MS card numbers:

a At the CI level of MAP screen, locate the MS card that the ENET is connected to by typing

>TABLE ENINV

and pressing the Enter key.

b Create a heading for the tuple by typing

>HEADING

and pressing the Enter key.

c Position on the tuple for the ENET shelf by typing

>POS <enet_shelf_no>

and pressing the Enter key.

where

enet_shelf_no
is the number of the ENET shelf

Example of a MAP screen:

```
CI:
>table eninv
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: ENINV
>heading
ENKEY ENCLASS FRTYPE FRNO    FRPEC    SHPEC MSCARD0 MSLINK0 MSPORT0 FLOOR0
ROW0 FRPOS0 SHELF0                              LOAD0 MSCARD1 MSLINK1 MSPORT1
FLOOR1 ROW1 FRPOS1 SHELF1                             LOAD1
------------------------------------------------------------------------------
>pos 0
    0     PRI    ENC    0 NT9X05AB NT9X0801       6        0        0       1
   F      2     39                           ENX08AX      10        0        0
     1    F      1     39                           ENX08AX
```

d Record the MS card numbers under `MSCARD0` and `MSCARD1` (`6` and `10` in the previous example).

11 Locate the MS cards by typing

>MAPCI;MTC;MS;SHELF 0;CARD <ms_card_no>

and pressing the Enter key.

where

ms_card_no
is the number of the MS card

Example of a MAP screen:

```
Message Switch   Clock   Shelf  0       Inter-MS Link 0 1
MS 0      .         Master         F                    R R
MS 1      S          Slave          C                    C C

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

Card 06 Protocol Port  0_____3  4_____7  8____11  12___15
MS 0  .  DS512   64   . . . . . . . . . . P P  . . . .
MS 1  C   DS512   64   C P P P  P P P P  P P P P  P P P P
```

12 Do the following substeps to check the status of both ports (0 and 1) on both MS cards (MSCARD0 and MSCARD1).

a Determine the state of each MS card port that connects to the SPM with the SYSBNA alarm, by typing

>TRNSL <ms_card_port>

and pressing the Enter key.

where

ms_card_port
is the number of the MS card port (0 or 1)

Example of a MAP screen:

```
PORT  20=SPM  10 (OK  ,P:NA SYST ACC NP MSRR ^PSRR)
PORT  21=SPM  10 (OK  ,P:NA SYST ACC NP MSRR ^PSRR)
PORT  22=SPM  11 (OK  :UR SYST ACC NP MSRR PSRR)
PORT  23=SPM  11 (OK  :UR SYST ACC NP MSRR PSRR)
PORT  24=SPM  12 (OK  :AV SYST ACC NCP MSRR PSRR)
```

b Repeat Step 12a for the second MS port.

c Repeat Step 11 for the other MS card and repeat steps 12a and 12b to check the MS ports on that card.

If the status of the MS ports shows	Do
OK for all four ports	Step 15
NA or UR for any port	Step 13

13 Return the MS ports to service. When you have completed the procedure, return to this point.

Note: Contact your next level of support if you are not familiar with the procedures required to restore MS ports to service.

14 List the alarms on the SPM unit by typing

```
>LISTALM
```

and pressing the Enter key.

If the alarm list shows	Do
None	Step 16
SYSBNA	Step 15

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

16 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

and pressing the Enter key.

Clearing an SRM HLDOVR alarm

Use the following procedure to clear a Sync Resource Module (SRM) HLDOVR alarm.

The following variables are used in this procedure.

Variable	Description
spm_no	the number of the SPM
link_no	the BITS link number (0 to 2)

This procedure requires pressing the Enter key for each command typed on the MAP display.

Clearing an SRM HLDOVR alarm

At the MAP terminal

1 Post the SPM by typing

>MAPCI;MTC;PM;POST SPM spm_no

2 Query the faults on the SPM by typing

>QUERYPM FLT

Example of a MAP screen:

```
SPM 11 InSv       No Node alarms found.
SRM  0 ISTb Act   Alarm: HLDOVR   Severity: Major  Action: RPT
                 Alarm: ISTB     Severity: Minor  Action: RPT
```

3 Select the SRM by typing

>SELECT SRM 0

Example of a MAP screen:

```
SPM   11 SRM   0  Act    ISTb
Interface :
Loc : Row A  FrPos  4 ShPos  6 ShId 0 Slot  6   Prot Grp : 1
Default Load: SYN16BF                           Prot Role: Working
```

4 List alarms on the selected SRM by typing

>LISTALM

Example of a MAP screen:

```
SEVERITY    ALARM       ACTION
-----------------------------
Critical    None
Major       HLDOVR        RPT
Minor       None
No_Alarm    None
```

5 Post the BITS MAP level of the selected SRM by typing

>BITS

Example of a MAP screen:

```
         SysB    ManB    OffL    CBsy    ISTb    InSv
PM          0       0       7       0       5       2
SPM         0       0       0       0       4       0
   SRM      0       0       0       0       1       0

SPM   11  SRM   0
LinkNo   BitsName    Status    State    SSM    AlmSev
    0    BITSA       Act       SYSB     DUS       C
    1    BITSB       InAct     SYSB     DUS       C
    2    BITSOUT               Uneq     NIL
```

6 List alarms on the BITS links by typing

>QRYALARM ALL

Example of a MAP screen:

```
QryAlm all
QueryAlm: SPM 11   SRM 0
Link   : BITSA
SEVERITY    ALARM       ACTION
-----------------------------
Critical     LOS          RPT
Major        None
Minor        None
No_Alarm     None
Alarm Reason(s): FREQ

Link   : BITSB
SEVERITY    ALARM       ACTION
-----------------------------
Critical    LOS           RPT
Major       None
Minor       None
No_Alarm    None
Alarm Reason(s): FREQ

Link   : BITSOUT
SEVERITY    ALARM      ACTION
-----------------------------
Critical    None
Major       None
Minor       None
No_Alarm    None
Alarm Reason(s): None
```

7 Determine the state of the BITS link causing the alarm by looking in the State column from step 5.

If the BITS link state is	Do
OFFL, SYSB, or CBSY	step 8
Any other state	step 12

8 Busy the alarmed BITS link by typing

>BSY link_no

9 Wait until the BITS link status is MANB. Then return the link to service by typing

>RTS link_no

10 Return to the SRM level by typing

>QUIT

11 List alarms on the SRM by typing

```
>LISTALM
```

If the HLDOVR alarm	Do
is not cleared	step 12
is cleared	step 13

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

13 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

Clearing an SRM HLDOVR24 alarm

Use the following procedure to clear a Sync Resource Module (SRM) HLDOVR24 alarm.

The following variables are used in this procedure.

Variable	Description
spm_no	the number of the SPM (0 through 85)
link_no	the BITS link number (0 through 2)

This procedure requires pressing the Enter key for each command typed on the MAP display.

Clearing an SRM HLDOVR24 alarm

At the MAP terminal

1 Post the SPM by typing

>MAPCI;MTC;PM;POST SPM spm_no

2 Query the faults on the SPM by typing

>QUERYPM FLT

Example of a MAP screen:

```
SPM 11 InSv       No Node alarms found.
SRM  0 ISTb Act   Alarm: HLDOVR24   Severity:  Major  Action: RPT
                 Alarm: ISTB      Severity:  Minor  Action: RPT
```

3 Select the SRM by typing

>SELECT SRM 0

Example of a MAP screen:

```
SPM   11 SRM   0  Act    ISTb
Interface :
Loc : Row A  FrPos  4 ShPos  6 ShId 0 Slot  6   Prot Grp : 1
Default Load: SYN16BF                           Prot Role: Working
```

4 List alarms on the selected SRM by typing

>LISTALM

Example of a MAP screen:

```
SEVERITY    ALARM       ACTION
-----------------------------
Critical    None
Major       HLDOVR24         RPT
Minor       None
No_Alarm    None
```

5 Post the BITS MAP level of the selected SRM by typing

>BITS

Example of a MAP screen:

```
         SysB     ManB     OffL     CBsy     ISTb     InSv
PM          0        0        7        0        5        2
SPM         0        0        0        0        4        0
   SRM      0        0        0        0        1        0

SPM   11  SRM   0
LinkNo    BitsName     Status     State     SSM     AlmSev
    0     BITSA        Act        SYSB      DUS        C
    1     BITSB        InAct      SYSB      DIS        C
    2     BITSOUT                 Uneq      NIL
```

6 List alarms on the BITS links by typing

>QRYALARM ALL

Example of a MAP screen:

```
QryAlm all
QueryAlm: SPM 11   SRM 0
Link   : BITSA
SEVERITY    ALARM       ACTION
-----------------------------
Critical     LOS          RPT
Major        None
Minor        None
No_Alarm     None
Alarm Reason(s): FREQ

Link   : BITSB
SEVERITY    ALARM       ACTION
-----------------------------
Critical    LOS           RPT
Major       None
Minor       None
No_Alarm    None
Alarm Reason(s): FREQ

Link   : BITSOUT
SEVERITY    ALARM      ACTION
-----------------------------
Critical    None
Major       None
Minor       None
No_Alarm    None
Alarm Reason(s): None
```

7 Determine the state of the BITS link causing the alarm by looking in the State column from step 5.

If the BITS link state is	Do
OFFL, SYSB, or CBSY	step 8
Any other state	step 15

8 Busy the alarmed BITS link by typing

`>BSY link_no`

9 Wait until the BITS link status is MANB. Then return the link to service by typing

`>RTS link_no`

10 Expect to see an SSM value on the BITS links of ST3E or better or order for the alarm to clear.

Note: The hierarchy of SSM values, from best to worst, is as follows:

- PRS
- STU
- ST2

- ST3E
- ST3
- SMC
- ST4E
- ST4
- DNU

11 Return to the SRM level by typing

```
>QUIT
```

12 List alarms on the SRM by typing

```
>LISTALM
```

If the HLDOVR24 alarm	Do
did not clear	step 13
cleared	step 16

13 Clear any faults on the Timing Signal Generator (TSG) using the appropriate procedures.

If the alarm	Do
still exists	step 14
cleared	step 16

14 Replace the SRM using the appropriate procedure.

If the alarm	Do
did not clear	step 15
cleared	step 16

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

16 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

Clearing a BITS Level Alarm

Use the following procedure to clear a BITS level alarm.

The following variables are used in this procedure.

Variable	Description
severity	the alarm severity from step 3 (minor, major, or crit)
link_no	the BITS link number (0 to 2)

This procedure requires pressing the Enter key for each command typed on the MAP display.

At the MAP level

1 Use this procedure to clear any of the following SRM BITS level alarms:

- AIS
- BPV
- CRC
- LOS
- MTIE
- OOF
- TLD

2 Access the Maintenance level of the MAP by typing

```
>MAPCI;MTC
```

3 Note the number of SPMs with alarms and their severity by looking under the PM column in the top alarm banner generated in step 2.

4 Based on the severity of the alarmed SPMs, post all SPMs with that severity by typing

```
>PM;POST SPM <severity>
```

Example

```
>PM;POST SPM minor
```

5 Query the faults on the posted SPM by typing

```
>QUERYPM FLT
```

Example of a MAP screen:

```
SPM 11 ISTB          ALARM:ISTB    Severity:Minor   Sction:RPT
SRM  0 ISTb   Act    ALARM:ISTB    Severity:Minor   Sction:RPT
```

6 Use the result of step 5 to trace the fault to the SRM.

If the alarm is	Do
not being generated by the SRM	step 7
being generated by the SRM	step 8

7 Post the next SPM by typing

>NEXT

then return to step 5.

8 Select the SRM by typing

>SELECT SRM 0

Example of a MAP screen:

```
SPM   11 SRM   0  Act    ISTb
Interface :
Loc : Row A  FrPos  4 ShPos  6 ShId 0 Slot  6   Prot Grp : 1
Default Load: SYN16BF                           Prot Role: Working
```

9 List alarms on the selected SRM by typing

>LISTALM

Example of a MAP screen:

```
SEVERITY    ALARM       ACTION
-----------------------------
Critical    None
Major        None
Minor       ISTB       RPT
No_Alarm    None
```

10 Post the BITS MAP level of the selected SRM by typing

>BITS

Example of a MAP screen:

```
         SysB     ManB     OffL     CBsy     ISTb     InSv
PM          0        0        7        0        5        2
SPM         0        0        0        0        4        0
   SRM      0        0        0        0        1        0

SPM   30  SRM   0
LinkNo    BitsName     Status     State     SSM     Alarm
    0     BITSA        InAct      ISTB      ST2       m
    1     BITSB        Act        InSv      PRS       .
    2     BITSOUT                 Uneq      NIL
```

11 List alarms on the BITS links by typing

>QRYALM all

Example of a MAP screen:

```
QryAlm all
QueryAlm: SPM 11   SRM 0
Link   : BITSA
SEVERITY    ALARM       ACTION
-----------------------------
Critical     None
Major        None
Minor        BPV         RPT
No_Alarm     None
Alarm Reason(s): None

Link   : BITSB
SEVERITY    ALARM       ACTION
-----------------------------
Critical    None
Major       None
Minor       None
No_Alarm    None
Alarm Reason(s): None

Link   : BITSOUT
SEVERITY    ALARM      ACTION
-----------------------------
Critical    None
Major       None
Minor       None
No_Alarm    None
Alarm Reason(s): None
```

12 Busy the alarmed BITS link by typing

>BSY link_no

13 Wait until the BITS link status is MANB. Return the link to service by typing

>RTS link_no

14 Return to the SRM level by typing

>QUIT

15 List alarms on the SRM by typing

>LISTALM

If the alarm	Do
is not cleared	step 16
is cleared	step 22

At the MAP level

16 Access the Clock level of the MS by typing

>MAPCI;MTC;MS;CLOCK

Example of a MAP screen

```
   CM      MS     IOD     Net      PM     CCS     Lns     Trks    Ext     APPL
   .       .      .       .        .      .       .       .
 .

SPM                 Message Switch   Clock   Shelf  0       Inter-MS Link 0 1
 0 Quit           MS 0       .      Master         F                     . .
 2                MS 1       .      Slave          F                     . .
 3
 4 SwCarr        Shelf 0                1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2
 5               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
 6 Tst_          Chain           |     |
 7               MS 0  . . . . . I - - I - - - - - - - - . - - . . . . . .
 8               MS 1  . . . . . I - - I - - - - - - - - F - - . . . . . .
 9
10 Sync          Card 02 Alm Stat %Adj Src | Car Stat Sp PM     RMTyp SSM
11 DpSync        MS 0  .  .  Syn +08.6 Lk0 | Lk0 Lck   - SPM 031 SRM  PRS
12 SwMast        MS 1  .  .  Syn -00.8 Ms0 | Lk1 Smp   - SPM 030 SRM  ST2
13 Card_         Links Slipping:  NA   out of  NA
14 QueryMS       MTC:
15               MS:
16               SHELF:
17               CLOCK:
18 Adjust_

   14:12 >
```

17 Determine if the SPM with the alarmed SRM is providing timing for the MS by looking at the SPM number under the PM column.

Note: A status of “Lck” on the Clock screen identifies the active node reference. A status of “Smp” identifies the standby node reference.

If the SPM	Do
is providing timing	step 18
is not providing timing	step 19

18 Perform a node reference switch by typing

```
>SWCARR
```

At the SRM level

19 Clear any faults on the Timing Signal Generator (TSG) using the appropriate procedures.

If the BITS link alarm	Do
still exists	step 20
clears	step 22

20 Replace the SRM using the appropriate procedure.

If the BITS link alarm	Do
still exists on the link	step 21
clears	step 22

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

22 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

Clearing an LOR Level Alarm

Use the following procedure to clear a loss of redundancy (LOR) alarm for the synch resource module (SYNCRM).

The following variables are used in this procedure.

Variable	Description
spm_no	the number of the SPM
link_no	the BITS link number (0 to 2)

This procedure requires pressing the Enter key for each command typed on the MAP display.

At the MAP level

1 Post the SPM by typing

>MAPCI;MTC;PM;POST SPM spm_no

2 Select the SRM by typing

>SELECT SRM 0

Example of a MAP screen:

```
SPM   11 SRM   0  Act    ISTb
Interface :
Loc : Row A  FrPos  4 ShPos  6 ShId 0 Slot  6   Prot Grp : 1
Default Load: SYN16BF                           Prot Role: Working
```

3 List alarms on the selected SRM by typing

>LISTALM

Example of a MAP screen:

```
SEVERITY    ALARM       ACTION
-----------------------------
Critical    None
Major       LOR         RPT
Minor       ISTB        RPT
No_Alarm    None
```

4 Post the BITS MAP level of the selected SRM by typing

>BITS

Example of a MAP screen:

```
LinkNo    BitsName    Status    State    SSM    Alarm
    0     BITSA       InAct     SYSB     DUS      C
    1     BITSB         Act     InSv     PRS      .
    2     BITSOUT               Uneq     NIL
```

5 List alarms on the BITS links by typing

>QRYALM all

Example of a MAP screen:

```
QryAlm all
QueryAlm: SPM 11   SRM 0
Link   : BITSA
SEVERITY    ALARM       ACTION
-----------------------------
Critical     LOS        RPT
Major        None
Minor        None
No_Alarm     None
Alarm Reason(s): FREQ

Link   : BITSB
SEVERITY    ALARM       ACTION
-----------------------------
Critical    None
Major       None
Minor       None
No_Alarm    None
Alarm Reason(s): None

Link   : BITSOUT
SEVERITY    ALARM      ACTION
-----------------------------
Critical    None
Major       None
Minor       None
No_Alarm    None
Alarm Reason(s): None
```

6 Determine that state of the BITS link causing the alarm by looking in the State column from step 4.

If the BITS link state is	Do
OFFL, SYSB, or CBSY	step 7
Any other state	step 12

7 Busy the alarmed BITS link by typing

>BSY link_no

8 Wait until the BITS link status is MANB. Then return the link to service by typing

```
>RTS link_no
```

9 Return to the SRM level by typing

```
>QUIT
```

10 List alarms on the SRM by typing

```
>LISTALM
```

If the LOR alarm	Do
is not cleared	step 11
is cleared	step 13

11 Clear any faults on the Timing Signal Generator (TSG) using the appropriate procedures.

If the alarm	Do
still exists	step 12
cleared	step 13

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

13 You have completed this procedure. Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

Datafilling the ALRMCTRL field in the MNNODE table with a “RPT” option causes an alarm to generate a report when the alarm occurs. The “NRPT” option inhibits alarm reporting. The following procedure shows an example of adding an alarm (MANBNA) to the MNNODE table.

This procedure requires pressing the Enter key after each command.

Adding an alarm

At the MAP level

1 Access the MNNODE table by typing

```
>TABLE MNNODE
```

2 Position on the IW SPM IP selected for adding the alarm by typing

```
>POS spm_no
```

Example

```
>POS SPM 14
```

3 Select to change the datafill by typing

```
>CHA
```

4 Continue by typing

```
>Y
```

5 Accept previous datafill by pressing the Enter key for existing field settings until reaching an empty “ALRMCTRL” prompt.

Note: When a field appears without a value, enter $ to indicate no additional entries are required for that field. In the following example, a dollar sign ($) indicates no input was required for the RSRUTLIM field.

Example

```
ALIAS:SPM_14
>
CLASS:IW
>
FLOOR:1
>
```

```
CLKMODE:SYNC
>
CLKREF:LOOP
>
LEDTIMER:15
>
RSRUTLIM:
>$
ALRMCTRL:SYS CR RPT
>
ALRMCTRL:MANB MJ RPT
>
ALRMCTRL:ISTB MN RPT
>
ALARMCTRL:SYSBNA CR RPT
>
ALARMCTRL:
>
```

6 Add the MANBNA alarm by typing

```
>MANBNA MJ RPT
```

7 Until reaching the prompt to accept changes, press the $ key for empty prompts and continue to press the Enter key to accept existing field values.

Example

```
ALARMCTRL:
>$
CONN_TYP:BRDG_ONLY
>
BRDGCLLI:ENET_TO_IP
>
BRDGCLLI:
>$
OPT_ATTR:
```

```
> $

TUPLE TO BE ADDED:

SPM 14 SPM_14 IW 1 SYNC LOOP 15 $ (SYS CR RPT)
              (MANB MJ RPT) $ (ISTB MN RPT)
              (SYSBNA CR RPT) (MANBNA MN RPT) $
              BRDG_ONLY ENET_TO_IP $ $

ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
```

8 Accept the changes by typing

```
>Y
```

Response

```
TUPLE ADDED
```

9 Exit the MNNODE by typing

```
>QUIT
```

Alarm severity is configured during datafill. There are four alarm severities that can be datafilled:

- No action (NA)
- Minor (MN)
- Major (MJ)
- Critical (CR)

The procedure that follows datafills a DLC RM in table MNCKTPAK. The procedure shows how to datafill each possible alarm severity.

Example alarm severity datafill

At the MAP level

1 Access table MNCKTPAK by typing

```
>TABLE MNCKTPAK
```

and pressing the Enter key.

2 Begin the table addition by typing

```
>ADD
```

and pressing the Enter key.

3 Answer each of the prompts with the required datafill provided by the table range.

Example

This is an example of datafilling table MNCKTPAK.

```
>ADD
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>Y
CPKKEY:
>SPM 1 1 1
CPKTYPE:
>DLC
UNITNO:
>0
DSPGRPID:
```

```
>1
WRKSPR:
>WORKING
ALRMCTRL:
>SYSB CR RPT
ALRMCTRL:
>MANB MJ RPT
ALRMCTRL:
>ISTB MN RPT
ALRMCTRL:
>PROTFAIL NA NRPT
PEC:
>NTLX72BA
RELEASE:
>01
LOAD:
>DLC16AC
TUPLE TO BE ADDED:
SPM 1 1 1 DLC 0 1 WORKING (SYSB CR RPT) (MANB
MJ RPT) (ISTB MN RPT) (PROTFAIL NA NRPT)
NTLX72BA 01 DLC16AC
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>Y
TUPLE ADDED
```

4 Exit table MNCKTPAK by typing

>QUIT

and pressing the Enter key.

Correlating Logs with alarms to further isolate faults

Alarms and logs are often related to each other when a particular fault condition exists. The following table correlates alarms and logs together to help isolate faults.

SPM alarm to log correlation

Alarm	Related logs	Probable cause
CLKOOS	CLOCK500	No synchronization source available. The MS has lost its synchronization reference or no SONET synchronization reference of sufficient quality is available.
HLDOVR	SPM341, SPM501, SPM641	Two possible causes: 1. The CEM clocks have lost network synchronization 2. The SRM has gone into the holdover mode as a result of loss of reference signals. The alarm clears when holdover is exited.
HLDOVR24	SPM342, SPM501, SPM642	Two possible causes: 1. The CEM clocks have not be synchronized with the network for 24 hours or more 2. The SRM has gone into the holdover mode as a result of loss of reference signals for 24 hours or more. The alarm clears when holdover is exited.
ISTB	SPM300, SPM331, SPM500, SPM630	The SPM is in service, but is experiencing non-service-affecting faults. Indicates RM has gone into trouble state due to the failure of internal diagnostics or BITS carrier related problems.
LOR (Loss of BITS Link Redundancy)	SPM311, SPM344, SPM644	Two possible causes: 1. One of the BITS links for the SRM is out of service, causing the SRM to lost BITS link redundancy. 2. A software exception report (SWER) has occurred.

SPM alarm to log correlation

Alarm	Related logs	Probable cause
MANB	SPM300, SPM331, SPM500, SPM630	A device on the SPM is in a manual busy state. Indicates RM has gone into MANB state due to manual maintenance from the MAP interface.
MANBNA	SPM600	The SPM is in ManB state and is isolated from the ENET links or the MS ports.
NOSPARE	SPM300, SPM331	The last spare module in a protection group is not available for service.
PROTFAIL	SPM300, SPM331, SPM500	Protection switching failed for an RM.
SYSB	NODE500, SPM300, SPM331, SPM500, SPM630	A device on the SPM is in a system busy state. Indicates RM has gone into SYSB state due to loss of communications or hardware fault.
SYSBNA	ENET311	The SPM node is system busy and not accessible, and a network error has caused it to be isolated from the ENET links or the MS ports.

Viewing logs

At the MAP level

1 Access the logutil level by typing

```
>LOGUTIL
```

and pressing the Enter key.

2 Display logs on your MAP screen by typing

```
>START
```

and pressing the Enter key.

Stop logs

At the MAP level

1 Access the logutil level by typing

```
>LOGUTIL
```

and pressing the Enter key.

2 Stop the display of logs on your MAP screen by typing

```
>STOP
```

and pressing the Enter key.

Retrieving the most recent log

At the MAP terminal

1 Access the log utility level of the MAP screen by typing

```
>LOGUTIL
```

and pressing the Enter key.

2 Display the log by typing

```
>OPEN <logname> <lognumber>
```

and pressing the Enter key.

logname
is the name of the log

lognumber
is the number of the log

Example

```
>OPEN SPM 311
```

Note: Omitting a log number displays the most recent entry for all of the log numbers associated with a log name.

3 You have completed this procedure.

Add log to display

At the MAP level

1 Access the logutil level by typing

>LOGUTIL

and pressing the Enter key.

2 Ensure the log utility on the current device is stopped by typing

>STOP

and pressing the Enter key.

Examples of a MAP screen output:

```
Device <device> not found
This device stopped.
<device> is already stopped.
```

where

device
is the device on which the logs are running

3 Delete the log from displaying by typing

>DELREP <device> <rep name>

and pressing the Enter key.

where

device
is the device on which the logs are running

rep name
is the name of the report (log), for example, PM, CM, IOD, etc.

If the log had been added previously, delrep allows a clean startup when adding the log.

4 Add report of logs to display by typing

>ADDREP <device> <rep name>

and pressing the Enter key.

where

device
is the device on which the logs are running

rep name
is the name of the report (log) you wish to display (for example, PM, CM, IOD, etc.)

Delete log from display

Delete log from display

At the MAP level

1 Access the logutil level by typing

```
>LOGUTIL
```

and pressing the Enter key.

2 Delete selected reports from displaying by typing

```
>DELREP <device> <rep name>
```

and pressing the Enter key.

where

device
is the device logs are running on

rep name
is the name of the report (log) you wish to suppress (for example, PM, CM, IOD, etc.)

Replacing a GEM circuit pack

The procedure describes the process to replace a GEM circuit pack in an IW SPM IP card cage.

The Variable Abbreviations table defines the variables used in this procedure.

Variable Abbreviations

Abbreviation	Definition
spm_no	the SPM number assigned to the IW SPM IP (0 to 85)
gem_no	the number of the GEM card (0 or 1)
from_unit_no	the number of the active unit (0 or 1)
to_unit_no	the number of the inactive unit (0 or 1)

This procedure requires pressing the Enter key after typing a command.

At the MAP terminal

1 Access the PM screen level of the MAP display by typing

```
>MAPCI;MTC;PM
```

2 Access the SPM screen by typing

```
>POST   SPM   spm_no
```

Example of a MAP screen:

```
Shlf0  SL  A Stat   Shlf0   SL  A   Stat   Shlf0 SL  A  Stat   Shlf0  SL  A  Stat
----   1  -- ---    CEM 1   8  I   InSv   ----  1   --  ---   ----   8  --  ---
----   2  -- ---    GEM 0   9  A   InSv   ----  2   --  ---   ----   9  --  ---
----   3  -- ---    GEM 1  10  I   InSv   ----  3   --  ---   ----  10  --  ---
----   4  -- ---    ----   11  --  -----  ----  4   --  ---   ----  11  --  ---
----   5  -- ---    ----   12  --  -----  ----  5   --  ---   ----  12  --  ---
----   6  -- ---    ----   13  --  -----  ----  6   --  ---   ----  13  --  ---
CEM 0  7   A InSv   ----   14  --  -----  ----  7   --  ---   ----  14  --   ---
```

3 Access the appropriate card by typing

```
>SELECT   GEM   gem_no
```

Example of an GEM MAP screen:

```
SPM 7 GEM 0  Act    InSv

Loc : Row D  FrPos 32 ShPos 6 ShId 0 Slot 9 Prot Grp : 1
Default Load: GEM20BW                        Prot Role: Working
```

4 From the GEM screen, type

>PROT

Example of an GEM MAP protection screen:

```
SPM  7  InSv
 Prot Grp: GEM_GRP 1    Mode: Non-revertive    Schema: one_plus_one
 Sh0 U R A Stat  Sh0 U  R A  Stat   Sh1 U  R  A Stat  Sh1 U  R A  Stat
  1 -- - - ----    8 -- - -  ----    1  -- -  -  ----   8 -- - -  ----
  2 -- - - ----    9 0  W A  InSv    2  -- -  -  ----   9 -- - -  ----
  3 -- - - ----   10 1  S I  InSv    3  -- -  -  ----  10 -- - -  ----
  4 -- - - ----   11 -- - -  ----    4  -- -  -  ----  11 -- - -  ----
  5 -- - - ----   12 -- - -  ----    5  -- -  -  ----  12 -- - -  ----
  6 -- - - ----   13 -- - -  ----    6  -- -  -  ----  13 -- - -  ----
  7 -- - - ----   14 -- - -  ----    7  -- -  -  ----  14 -- - -  ----
```

5 At the Protection (PROT) screen, determine if the GEM being replaced is active (A) or inactive (I). If the card is active, set it to the inactive state by typing

>MANUAL from_unit_no to_unit_no

At the GEM RM card level

6 Take the card to be replaced out-of-service by typing

>BSY

7 Set the card offline (OffL) by typing

>OFFL

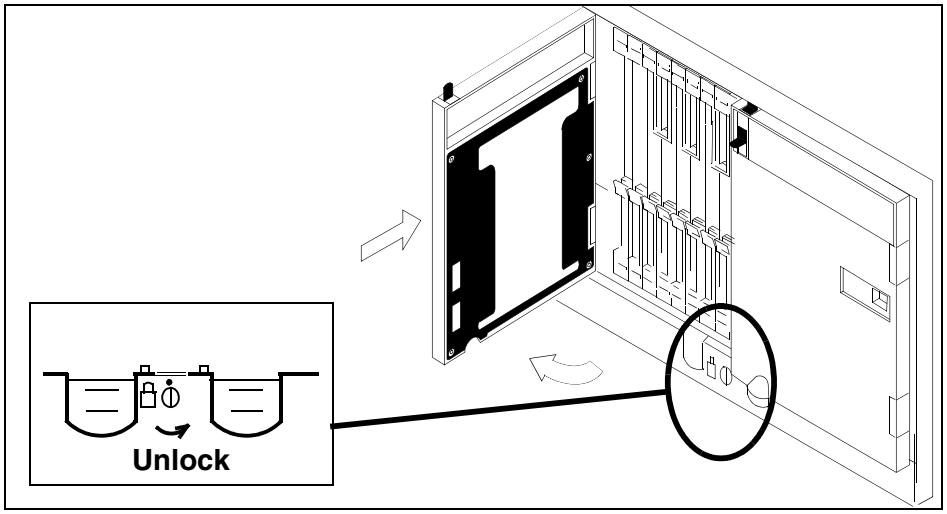
8 Wait for the circuit pack to change state and then return to the SPM screen.

Note: The state change from ManB to OffL (offline) can take up to one minute to complete. After the state change completes, remove the card.

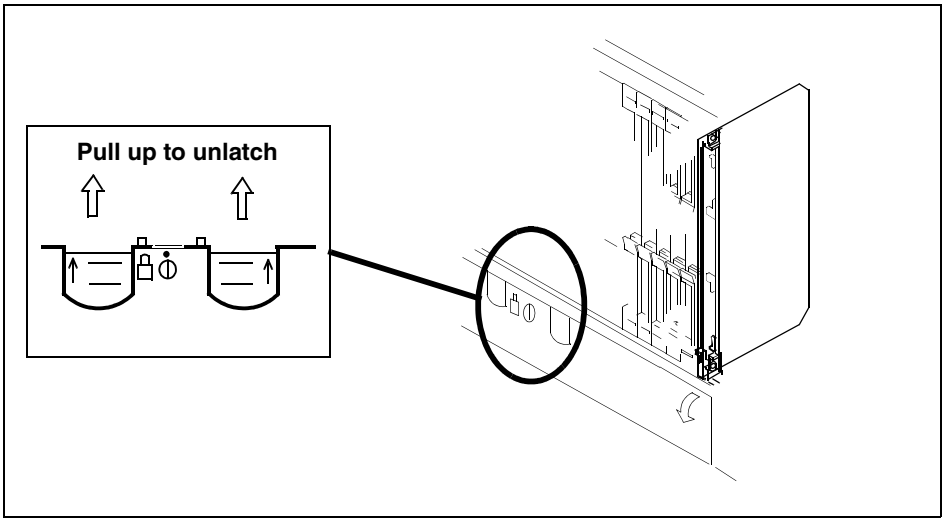
9

CAUTION
Static electricity damage
While handling circuit cards or cables, wear a wrist strap connected to the wrist-strap grounding point on the frame. This protects the cards against damage caused by static electricity.

As shown in the following figure, unlock the access doors to shelf 0 by turning the locking screw one quarter turn counter clockwise. The doors are unlocked when the slot in the locking screw is in the vertical position. Open the access doors by carefully pulling down on the spring lock at the top of each door. At the same time, carefully pull each door toward you using the finger grip at the bottom of the door. Slide the doors back into the retracted position.



10 As shown in the following figure, unlatch the cable-trough door by grasping the thumb grips and pulling up. Rotate the cable-trough door to the open position.



11

DANGER

Laser radiation exposure

The exposed ends of fiber optic cables can emit harmful laser radiation. Do not look at the ends of fiber optic cables unless protector caps are in place. Disconnect all laser sources when personnel are working with fiber-optic cables.

CAUTION

Damage to fiber cables

Take care when handling fiber cables. Do not crimp or bend fiber cables to a radius of less than 1 in. (25 mm).

The NTLZ20BA GEM card uses a NT0X97CJ 1000bSX short haul, multi-mode cable with an MT-RJ connector.

The NTLZ20CA GEM card uses a NT0X97CY 1000bLX short haul, single-mode cable with an LC connector.

Disconnect the fiber cable from the faceplate of the card.

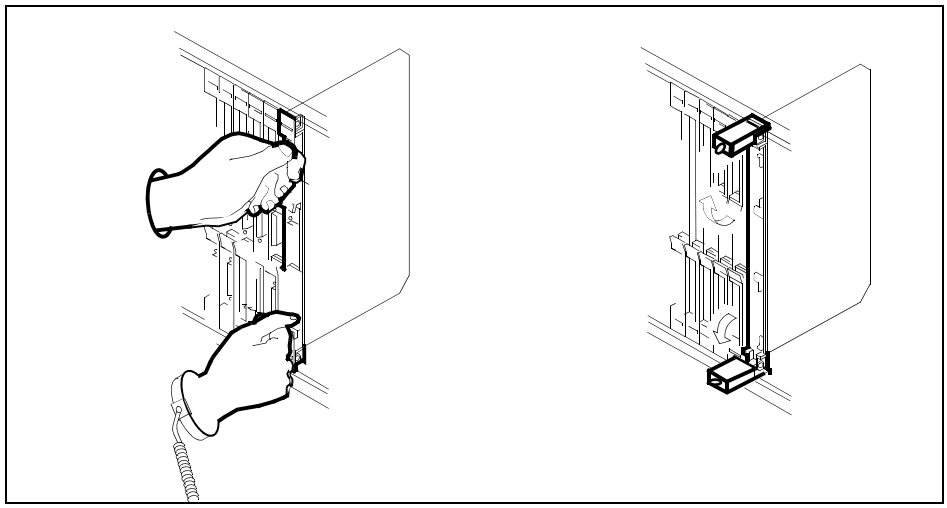
12 After the cable has been removed, cap the connectors on the circuit pack and the fiber cable. Store the cable in the cable trough.

Note: Before removing the card, ensure that the fiber cables are stored below the bottom level of the card shelf to avoid cable damage when the card is removed.

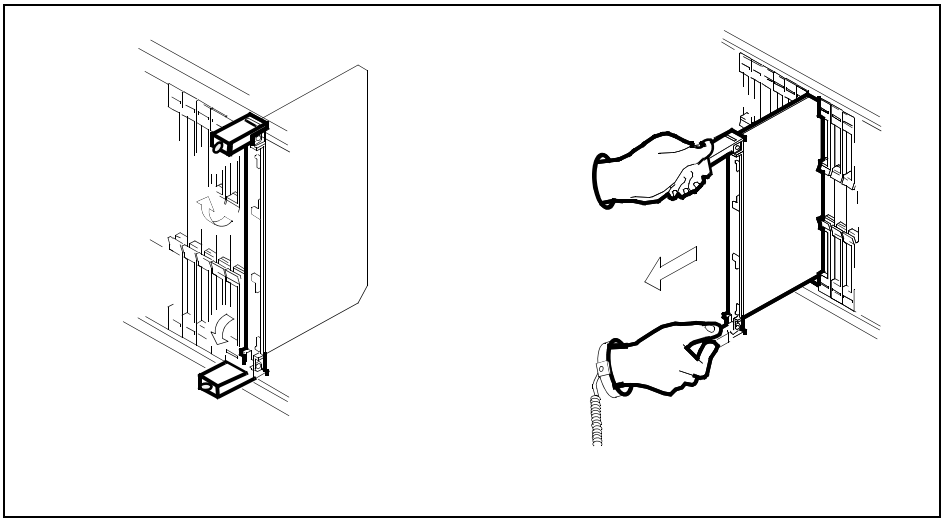
13

CAUTION
Card lever breakage
Holding a card by the levers only can result in lever breakage. Once the card has been pulled halfway out of the shelf, carefully grasp the card underneath for more secure support and continue to remove the card from the shelf. Avoid touching any wires or internal parts on the card.

As shown in the following figure, open the locking levers on the card to be replaced.



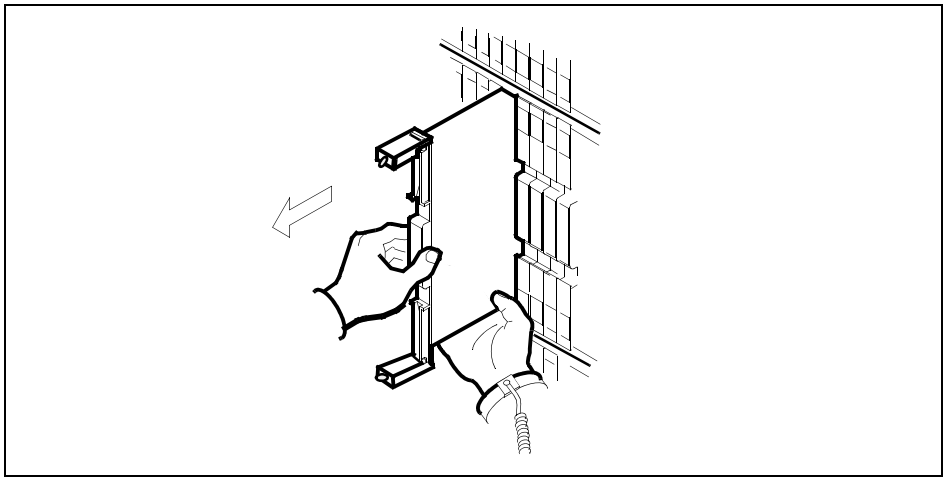
14 As shown in the following figure, while grasping the locking levers, gently pull the card towards you until it protrudes about 2 in. (5.1 cm) from the equipment shelf.



15

ATTENTION
Cards can weigh up to 9 lbs (4 kg).

As shown in the following figure, hold the card by the face plate with one hand while supporting the bottom edge with the other hand. Gently pull the card toward you until it clears the shelf.



16 Place the card you have removed in an electrostatic discharge (ESD) protective container.

17

DANGER

Equipment malfunction

Use a replacement card with the same PEC and release to avoid equipment malfunction. If the replacement card has a different PEC or release, change the datafill in Table MNCKTPAK to match the replacement card before inserting it in the slot.

Use a replacement card with the same PEC and the same release.

18

ATTENTION

Examine the fiber connector on the replacement GEM card and connectors on the fiber cable. To prevent eye damage, do not look directly into the end of the fiber cables. If the fiber connectors and the cable connectors do not mate, replace the fiber connectors on the replacement card. Each replacement card is shipped with two pairs of spare fiber connectors. To select the correct fiber connector, compare the spare fiber connector with the fiber connector on the card you removed. Also check the spare fiber connector against the connector on the fiber cable. Do not connect the fiber cable until instructed to do so.

CAUTION

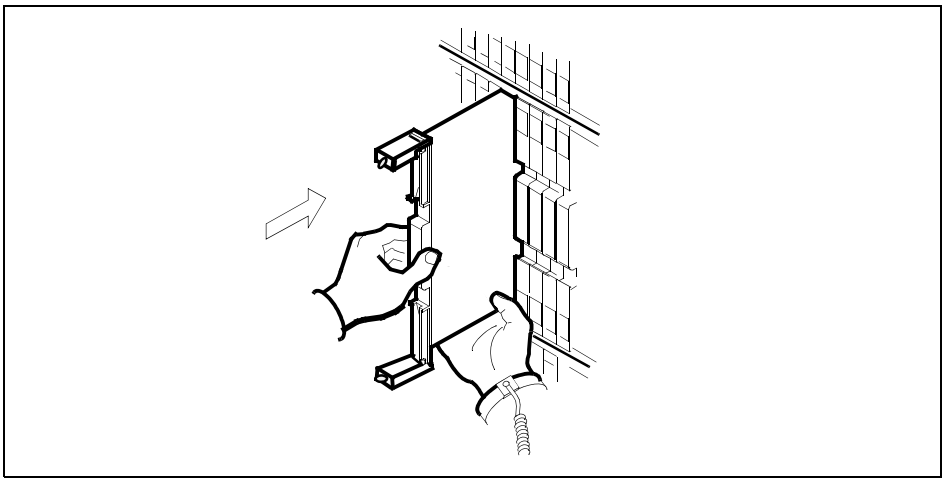
Equipment damage due to empty slots

Equip all unused slots on a powered shelf with NTLX60AA filler modules. Filler modules maintain electromagnetic interference (EMI) integrity, and they maintain shelf airflow patterns to ensure proper cooling.

Insert the replacement card into the shelf. If a replacement card is not available, insert an NTLX60AA filler circuit pack in the slot until a replacement card is available.

19 Open the locking levers on the card.

20 As shown in the following figure, hold the card by the face plate with one hand while supporting the bottom edge with the other hand. Gently slide the card into the shelf.

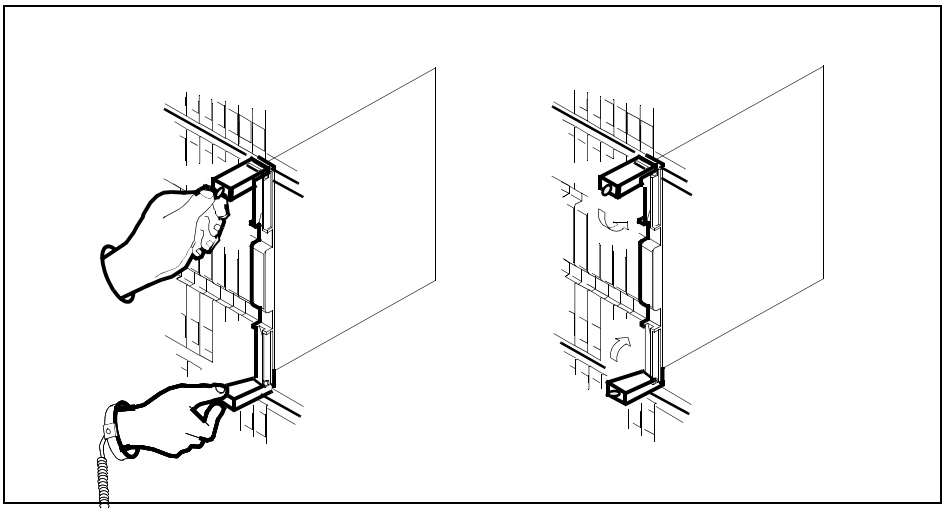


21

CAUTION
Damage to fiber cables
Take care when handling fiber cables. Do not crimp or bend fiber cables to a radius of less than 1 in. (25 mm).

Using your fingers or thumbs, push on the upper and lower edges of the faceplate to ensure that the card is fully seated in the shelf.

22 As shown in the following figure, close the locking levers to secure the card.



23 Wait until the card performs a self-test (less than one minute). The self test is complete when the green LED remains on and the red LED remains off. If both LEDs stay on for an extended period of time, it means the replacement card is defective; remove the card and replace it with another replacement card. If both LEDs remain on with the second replacement card, contact your next level of support.

24 Reconnect the cable from the faceplate of the card.

25 Close the cable trough door. Close and lock the card-access door.

At the MAP terminal

26 Return to the GEM screen and take the card from the OffL state to ManB state by typing

```
>BSY
```

27 Load the new card with the default software load by typing

```
>LOADMOD
```

Monitor the progress of the loading activity on the SPM line of the screen.

28 Return the new card to Insv state by typing

```
>RTS
```

Note: The state change from ManB to Insv can take up to seven minutes to complete.

29 Apply available patches to the replacement card through the PRSM tool by typing

```
>PRSM;ISTBAUDIT SPM spm_no GEM gem_no
```

Example

```
>PRSM;ISTBAUDIT SPM 7 GEM 0
```

30 To ensure sparing capability of the new RM, set the new card to active (A). To do this, access the Protection (PROT) screen from the GEM screen and type

```
>MANUAL from_unit_no  to_unit_no
```

Note 1: Protection switching the card normally requires protection switching of the network devices connected to the card on the external network. Refer to the appropriate manufacturer's documentation for the connected equipment.

Note 2: The MANUAL command without options and the FORCE command can be used only with a CEM card.

31 To ensure that the new RM can release activity, repeat step 30.

32 You have completed this procedure. Return to the CI level of the MAP screen by typing

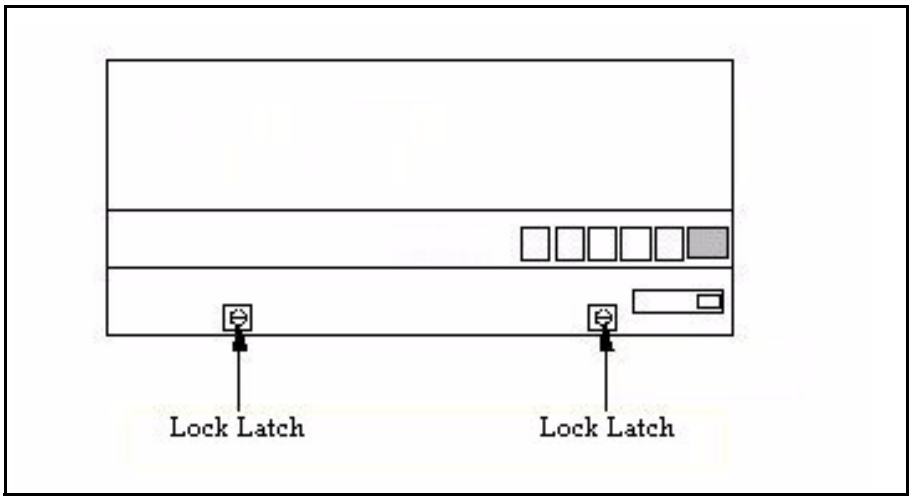
```
>QUIT ALL
```

Replacing an alarm card assembly (ALM)

At the front of the equipment frame

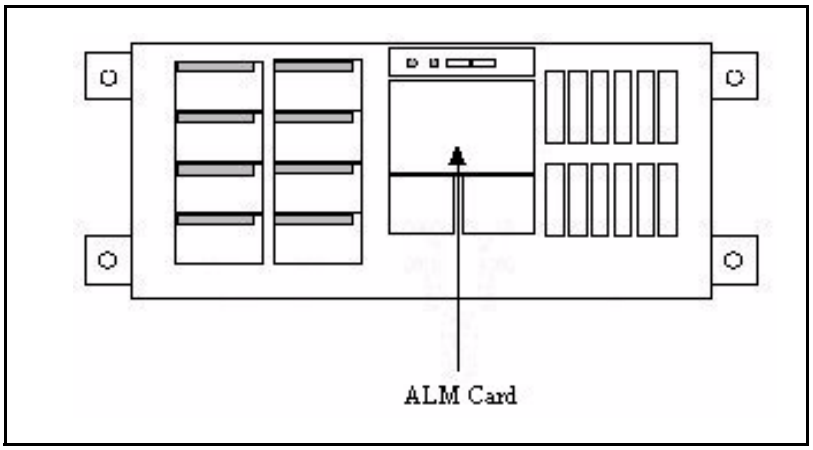
1 Move the lock latches of the power cabling interface unit (PCIU) to the unlocked position as indicated on the cover.

Lock latches of the PCIU



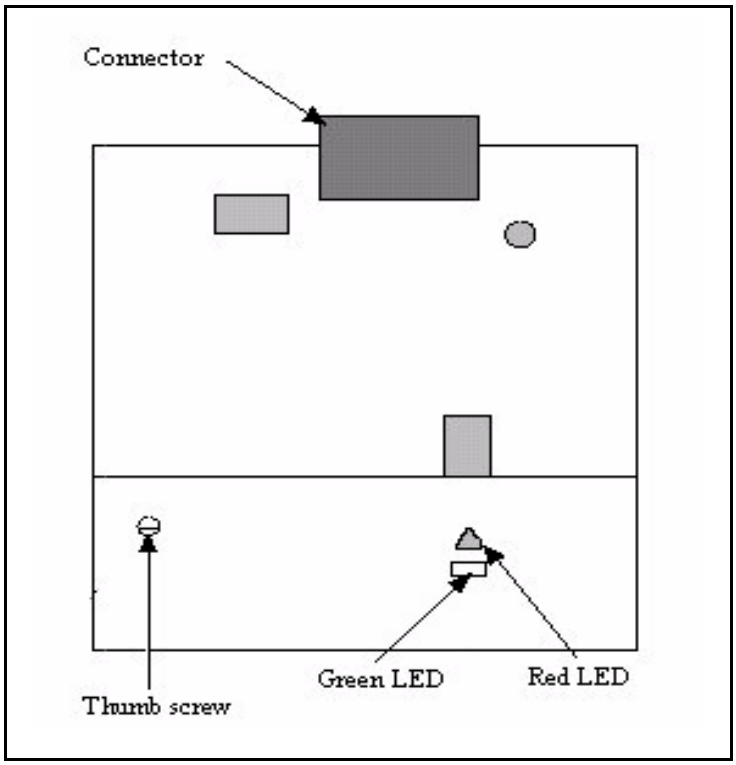
2 Lift the cover of the PCIU to gain access to the NTLX58 ALM.

Front view of PCIU



3 Unscrew the thumbscrew on the front of the ALM.

ALM with thumbscrew



4 Remove the card from the shelf.

5 Using the right and left edges of the ALM faceplate, remove the card from the shelf. This may require rocking the card slightly from side to side.

Note: When pack is removed the green LEDs on all the fan units will go out, but does not impact the operation of the fans.

6 Make a clean, direct insertion, and be sure to fully seat the card.

Once the pack is inserted the green LEDs on the fan units will light up and the amber SPME frame alarm indicator on the cover of the PCIU will light up temporarily and go out.

Note: Do not rely on the thumb screw to seat the card.

7 TIghten the thumb screw.

8 Lower the cover of the PCIU shelf and move the latches to the locked position, as indicated on the cover.

9 You have completed this procedure.

Replacing a CEM circuit pack

Use the following procedure to replace a CEM circuit pack.

The Variable Abbreviations table defines the variables used in this procedure.

Variable Abbreviations

Abbreviation	Definition
spm_no	the number of the SPM (0 through 85)
cem_no	the CEM number (0 or 1)
shelf_no	the ENET shelf number (0 through 3)
slot_no	the ENET slot number (1 through 38)
plane_no	the ENET plane number (0 or 1)
link_no	the ENET link number (0 through 4)

This procedures requires you to press the Enter key after each command.

Replacing a CEM circuit pack

At the MAP terminal

1 Access the SPM screen at the PM screen level of the MAP display:

```
>MAPCI;MTC;PM:POST SPM spm_no
```

2 Access the CEM card targeted for replacement:

```
>SELECT CEM cem_no
```

At the CEM screen

3 The CEM targeted for replacement must be inactive.

If the CEM is	Do
active	step 4
inactive or SysB	step 8
ManB	step 10

4 Go to the MAP protection (PROT) level:

```
>PROT
```

5 Perform a manual switch of activity:

```
>MANUAL
```

6 When prompted, confirm the switch of activity:

```
>Y
```

7 Exit the PROT screen:

```
>QUIT
```

8 Take the CEM card out of service:

```
>BSY
```

9 Wait for the CEM to change to the manual busy (ManB) state.

10 Write down the CEM location (SPM number, shelf ID, slot number) for later reference.

The following example highlights the required information in bold type.

Example
SPM 31 CEM 0 InAct Manb

Loc : Row D FrPos 57 ShPos 43 **ShId 0 Slot 7**

11 Begin the process to erase the flash memory::

```
>ERASEFL
```

Note: This command requires that the CEM be in a ManB state.

The command produces the following message:

```
This command erases the flash memory of the CEM
Execution of this command is recommended only
when the card is being relocated or
decommissioned. Execution of this command in
other instances may result in service
degradation. Do you wish to continue?

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

12 Execute the command:

```
>Y
```

EraseFl: Request has been submitted

EraseFl: Command completed

Note: An SPM684 log is generated every time the ERASEFL command is initiated or completed, or if it fails.

13 List the ENET links:

>TRNSL

Example of a MAP screen:

```
SPM   31 CEM   0  InAct    ManB          /

Loc : Row D  FrPos  57 ShPos  43 ShId 0 Slot  7
Default Load: CEM17BQ
Clock:
Input Ref:            Source:            Current Mode:
Trnsl
Link 1: ENET 0  0  11  0; Status: OK
Link 2: ENET 0  0  11  1; Status: OK
Link 3: ENET 0  0  11  2; Status: OK
Link 4: ENET 0  0  11  3; Status: OK
```

14 Record the ENET plane, shelf, and slot number.

Example
0, 0, 11

15 Go to the ENET level of the MAP:

>MTC;NET

At the ENET level

16 Go to the ENET-shelf level of the MAP:

>SHELF shelf_no

Example of a MAP screen:

```
SHELF 00  Slot        1111111 11122222 22222333 333333
           123456 78 90123456 78901234 56789012 345678
 Plane 0    .  .   .F ..OO.F-- -------- ..OO.F.. .  .
 Plane 1    .  .   .F ..OO..-- -------- ..OO.F.. .  .

SHELF:
```

17 Go to the card level of the ENET:

>CARD slot_no

Example of a MAP screen:

```
SHELF 00  Slot          1111111 11122222 22222333 333333
            123456 78 90123456 78901234 56789012 345678
 Plane 0     .  .   .F ......F. -------- ...S.... .  .
 Plane 1     .  .   .F ......F. -------- ..FS.... .  .

CARD 11   Front:     Back:   DS-512 Links
           Xpt        I/F     0 1 2 3
 Plane 0     .          .     . . . .
 Plane 1     .          .     . . . .
CARD:
```

18 For that shelf and card, translate an ENET peripheral-side link assigned to the CEM being replaced:

>TRNSL P plane_no link_no

Example

>TRNSL P 0 0

Example of a MAP screen:

```
Request to TRNSL ENET Plane:0 Shelf:00 Slot:11 Link:00 submitted.
Request to TRNSL ENET Plane:0 Shelf:00 Slot:11 Link:00 passed.
ENET Plane:0 Shelf:00 Slot:11 Link:00 :
  SPM 31 CEM 0 Lnk 1
```

19

CAUTION

Loss of service

A temporary interruption of service occurs when ENET links are busied. The interruption can affect data calls.

Only busy the links to the CEM being replaced. Do not busy links to the active CEM, in service.

Busy the ENET P-side link translated in step 18:

>BSY plane_no LINK link_no

Example

>BSY 0 LINK 0

20 All of the ENET P-side links on the selected shelf and card that are assigned to the CEM scheduled for replacement must be busied.

If all links to the CEM are	Do
not busied	step 18
busied	step 21

21 Although rare, some configurations may choose to split the CEM connected DS-512 links across ENET shelves or cards. The most common configuration is a single ENET shelf and a single card for each CEM.

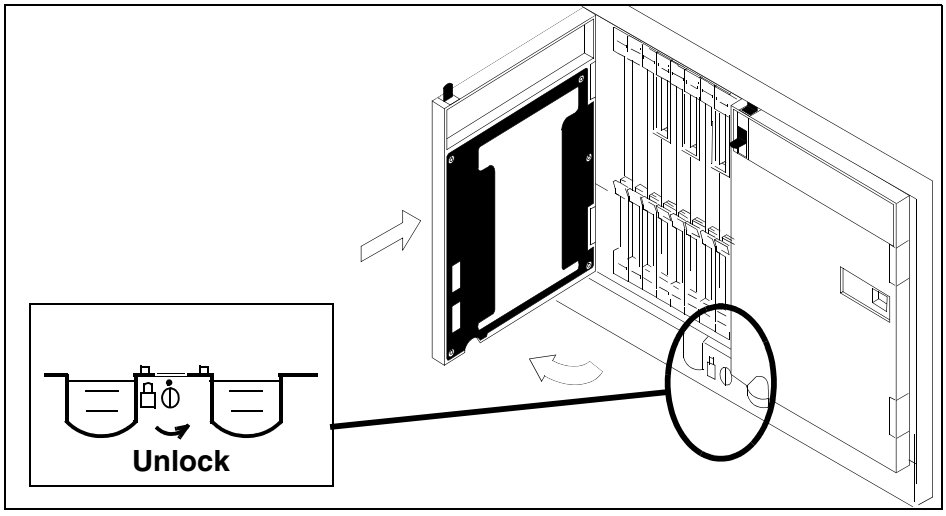
If the configuration is	Do
split shelf and split card	step 16 through step 19
single shelf, split card	step 17 through step 19
single shelf, single card	step 22

At the equipment frame

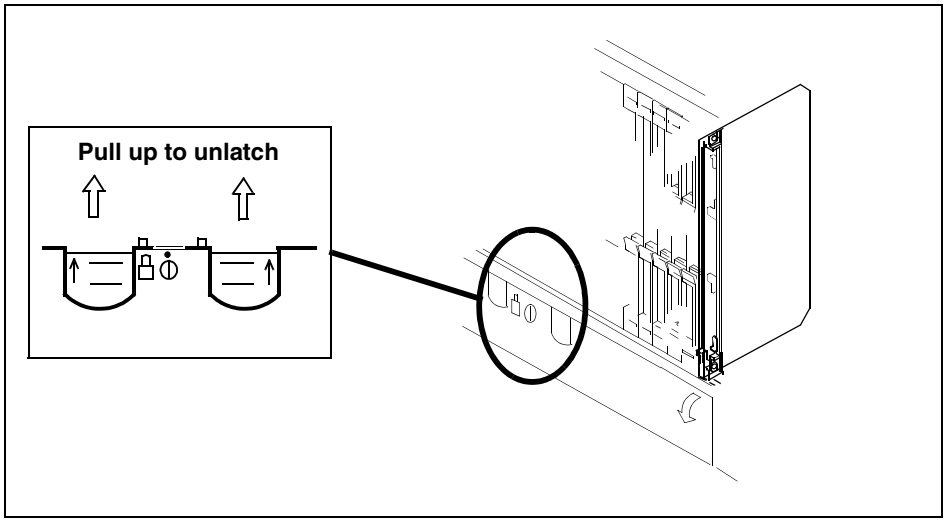
22

CAUTION
Static electricity damage
While handling circuit cards or cables, wear a wrist strap connected to the wrist-strap grounding point on the frame. This protects the cards against damage caused by static electricity.

As shown in the following figure, unlock the access doors to shelf 0 by turning the locking screw one quarter-turn counter-clockwise. The doors are unlocked when the slot in the locking screw is in the vertical position. Open the access doors by carefully pulling down on the spring lock at the top of each door. At the same time, carefully pull each door toward you using the finger grip at the bottom of the door. Slide the doors back into the retracted position.



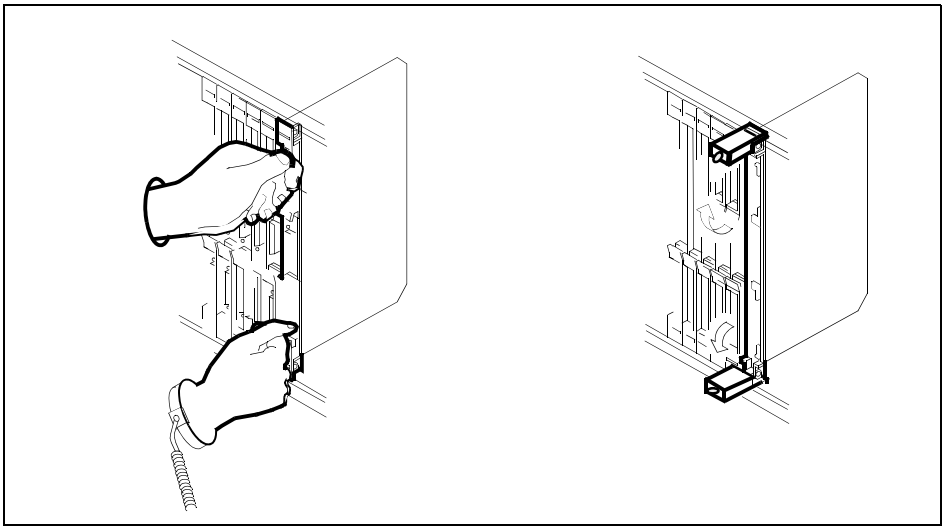
23 As shown in the following figure, unlatch the cable-trough door by grasping the thumb grips and pulling up. Rotate the cable-trough door to the open position.



24

CAUTION
Card lever breakage
Holding a card by the levers only may result in lever breakage. Once the card has been pulled halfway out of the shelf, carefully grasp the card underneath for more secure support and continue to remove the card from the shelf. Avoid touching any wires or internal parts on the card.

As shown in the following figure, open the locking levers on the card to be replaced.



25

CAUTION
Damage to fiber cables
Take care when handling fiber cables. Do not crimp or bend fiber cables to a radius of less than 1 in. (25 mm).

Label the DS-512 fiber cables to ensure that they are reconnected in the original order.

26

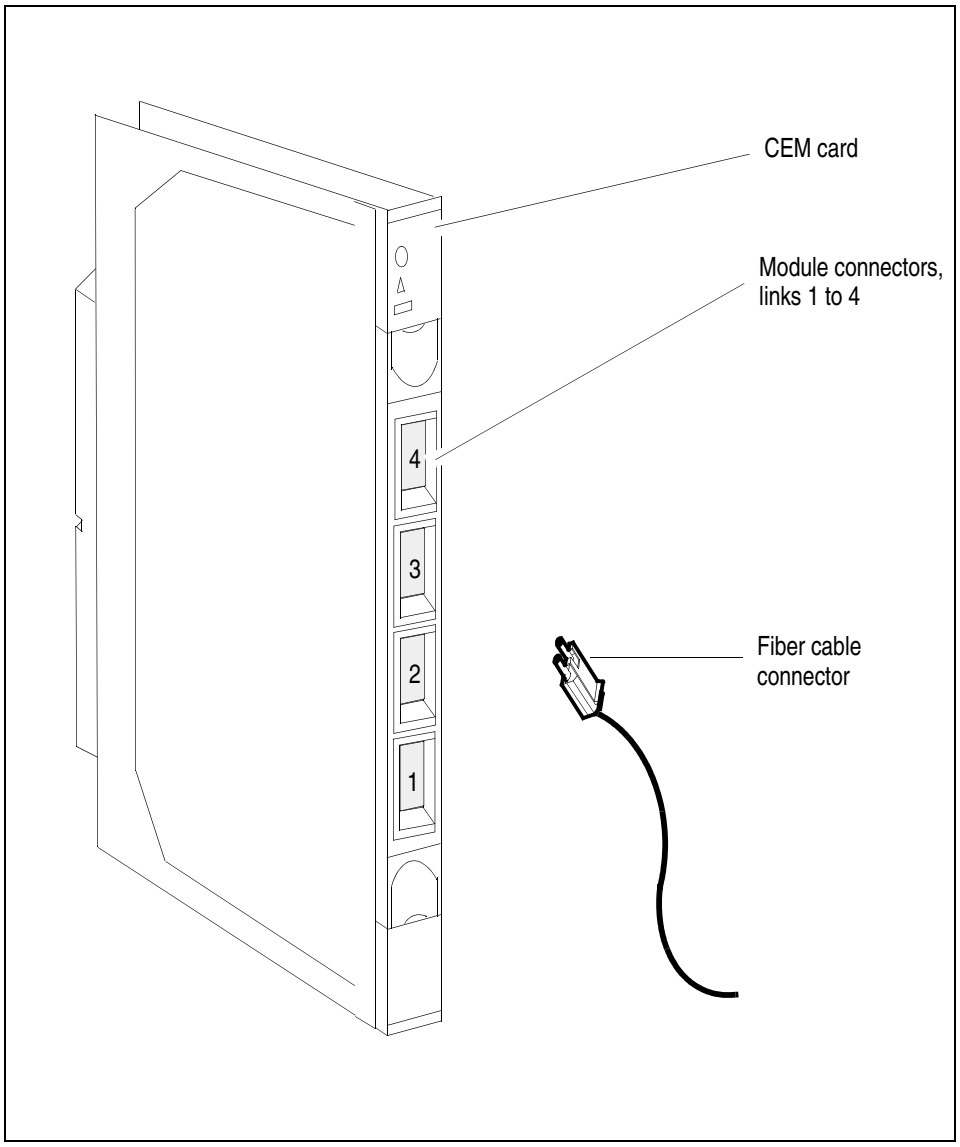
DANGER

Laser radiation exposure

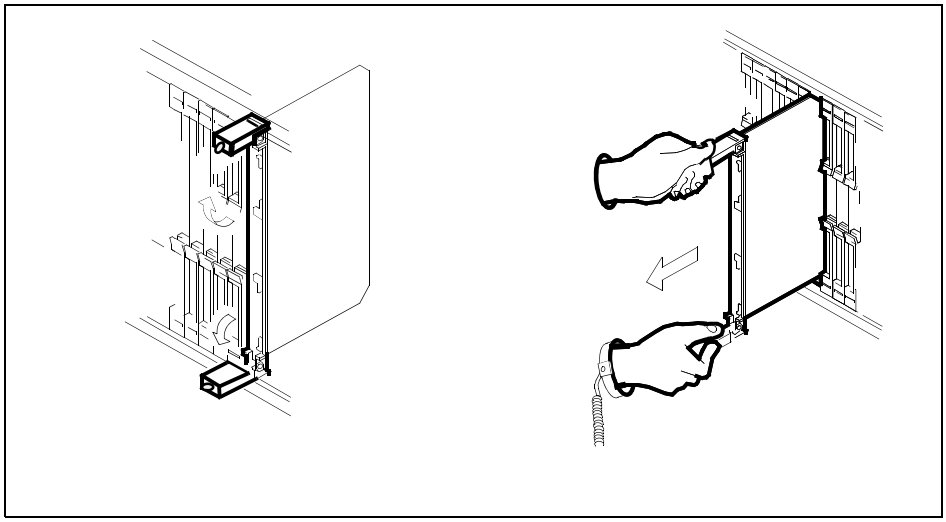
The exposed ends of fiber optic cables can emit harmful laser radiation. Do not look at the ends of fiber optic cables unless protector caps are in place. Disconnect all laser sources when personnel are working with fiber-optic cables.

Refer to the following figure. Disconnect the fiber cables from the faceplate of the card as follows:

- Gently squeeze the locking clips on the connector.
- Pull the connector out of the receptacle.
- After the cables have been removed, cap the connectors on the module and on the fiber cable.
- Store the cables in the cable trough.
- Before removing the CEM card, ensure that the fiber cables are stored below the bottom level of the card shelf to avoid cable damage when the card is removed.



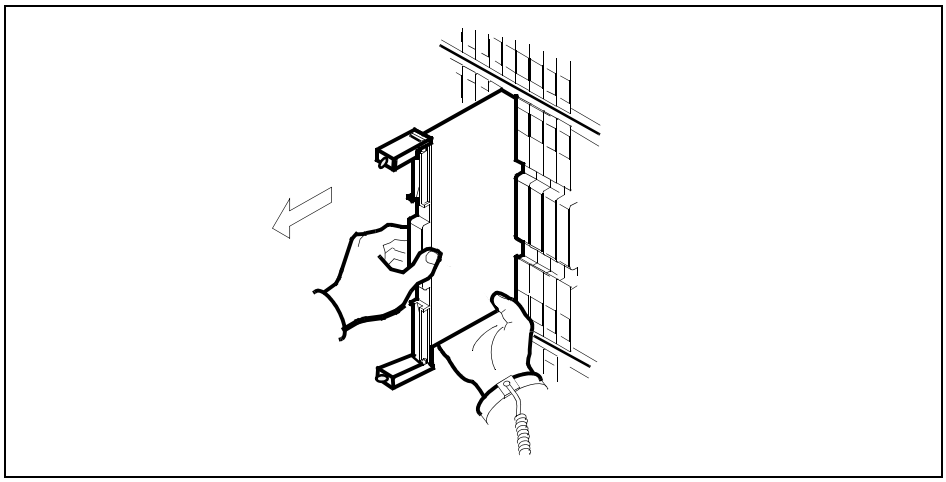
27 As shown in the following figure, while grasping the locking levers, gently pull the card towards you until it protrudes about 2 in. (5 cm) from the equipment shelf.



28

ATTENTION
Cards can weigh up to 9 lbs (4 kg).

As shown in the following figure, hold the card by the face plate with one hand while supporting the bottom edge with the other hand. Gently pull the card toward you until it clears the shelf.



29 Place the card you have removed in an electrostatic discharge (ESD) protective container.

30

DANGER

Equipment malfunction

Use a replacement card with the same PEC and release to avoid equipment malfunction. If the replacement card has a different PEC, contact the next level of support.

If the PEC is the same, but the release code is different, update the release code in the MNCKTPAK table before securing the replacement card in the shelf as instructed in step 32.

The release number is a 2-character code following the PEC (NTLX82BA) printed on the replacement CEM faceplate.

Insert the replacement CEM card into the shelf.

31 Open the locking levers on the card.

32 Before securing the card into the slot, proceed as follows:

If the release number is	Do
different from the original release number	step 33
the same as the original release number	step 41

At the MAP terminal:

33 From a second window, access the MNCKTPAK table:

```
>TABLE MNCKTPAK
```

34 Position on the tuple that defines the location of the CEM card that was selected in step 10:

```
>POS SPM spm_no shelf_no slot_no
```

Example
pos spm 31 0 7

35 Initiate the tuple change command:

```
>CHA
```

CPKTYPE: CEM

36 Continue to press the Enter key until reaching the RELEASE prompt.

Note: If the CEM is not configured for the maximum number of alarms, end the ALRMCTRL prompt: a dollar sign ($).

37 At the RELEASE prompt, type in the release number of the replacement card and press the Enter key.

38 Respond to all remaining field change prompts by pressing the Enter key.

After the last field change prompt, the modified tuple appears on the screen with the following message

```
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
```

39 Accept the release change:

```
>Y
```

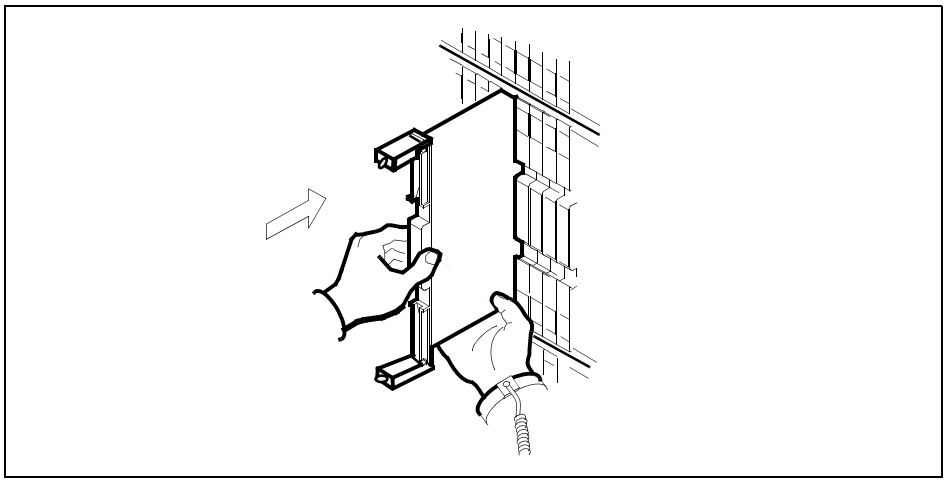
TUPLE CHANGED

40 Exit the MNCKTPAK table:

```
>QUIT
```

At the equipment frame

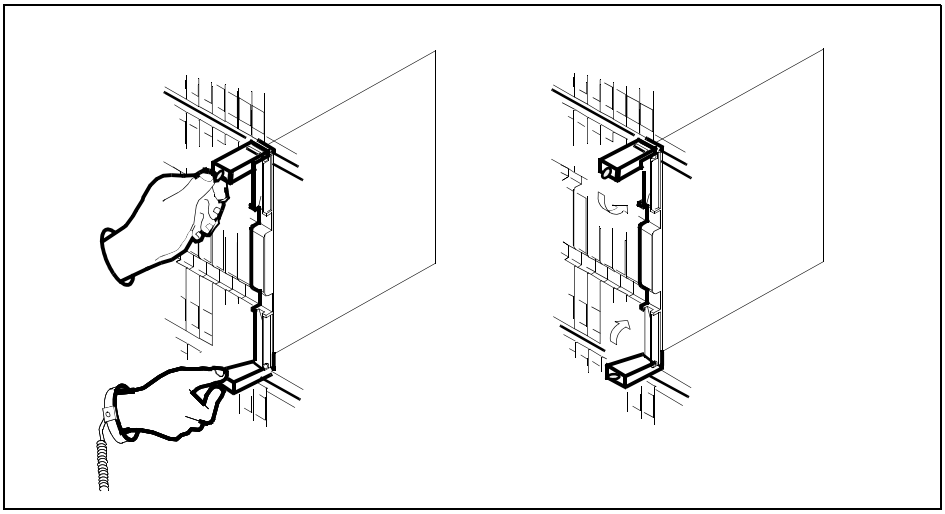
41 As shown in the following figure, hold the card by the face plate with one hand while supporting the bottom edge with the other hand. Gently slide the card into the shelf.



42

CAUTION
Damage to fiber cables
Take care when handling fiber cables. Do not crimp or bend fiber cables to a radius of less than 1 in. (25 mm).

As shown in the following figure, using your fingers or thumbs, push on the upper and lower edges of the faceplate to ensure that the card is fully seated in the shelf.



43 Close the locking levers to secure the card.

44 Wait until the card performs a self-test. The self-test is complete when the green LED remains on and the red LED remains off. If both LEDs stay on for an extended period of time, the replacement CEM card may be defective; remove the card and replace it with another replacement card. If both LEDs remain on with the second replacement card, contact your next level of support.

45

DANGER

Laser radiation exposure

The exposed ends of fiber optic cables can emit harmful laser radiation. Do not look at the ends of fiber optic cables unless protector caps are in place. Disconnect all laser sources when personnel are working with fiber-optic cables.

Reconnect the DS-512 fiber cables as follows:

- Remove the caps on the module and cable connectors.
- Gently guide the cable connector into its receptacle notches.
- Squeeze the locking clip and gently push the connector into the receptacle until it clicks into place.

46 Close the cable-trough door. Close and lock the card-access door.

At the MAP terminal

47 From the first window, return-to-service (RTS) the all ENET links assigned to the replacement CEM:

```
>RTS plane_no LINK link_no
```

Repeat the RTS command for each link assigned to the replacement CEM.

Note: If split configurations, do so for appropriate shelves and cards.

Wait until the MS ports clear and the maintenance activity is complete.

48 Post the SPM and select the CEM:

```
>MAPCI;MTC;PM;POST SPM spm_no;SELECT cem_no
```

49 At the CEM screen, reset the replacement CEM card:

```
>RESETMOD FW
```

50 Load the replacement CEM card software:

```
>LOADMOD
```

Note: The LOADMOD process can take up to 15 minutes to complete. Monitor the progress at the `/Load:` indicator at the end of the SPM line on the CEM MAP display.

51 Return the replacement CEM card to service:

```
>RTS
```

Note 1: The state change from ManB to InSv may take several minutes to complete.

Note 2: Allow the automatic SPM Patching after RTS (SPARTS) program to complete the patching process. To ensure that the process has successfully completed, wait 5 minutes after the patch application messages have completed before proceeding.

If patching was	Do
not successful	contact the next level of support
successful	step 52

52 If the replacement CEM card must be the active CEM, go to the protection (PROT) screen and type

```
>MANUAL
```

53 When prompted, confirm the switch of activity:

```
>Y
```

Monitor the MAP screen to ensure the change of status occurs.

54 You have completed this procedure. Return to the CI level of the MAP screen:

```
>QUIT ALL
```

Replacing an SRM

Use the following procedure to replace a Sync RM resource module (SRM).

The following variables are used in this procedure.

Variable	Description
spm_no	the number of the SPM
link_no	the BITS link number (0 to 2)

This procedure requires pressing the Enter key for each command typed on the MAP display.

At the MAP terminal

1 Access the clock level of the message switch MS by typing

`>MAPCI;MTC;MS;CLOCK`

Example of a MAP screen:

```
   CM      MS     IOD     Net      PM     CCS     Lns     Trks    Ext     APPL
   .       .      .       .        .      .       .       .
 .

SPM                    Message Switch   Clock   Shelf  0       Inter-MS Link 0 1
 0 Quit          MS 0        .         Master          F                     . .
 2               MS 1        .         Slave           F                     . .
 3
 4 SwCarr    Shelf 0                   1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2
 5           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
 6 Tst_      Chain         | | | | | | | |   |
 7           MS 0  . . - . . . . . . . - - - . . . . . . . . . . . . . .
 8           MS 1  . . - . . . . . . . - - - . . . . . . . . . . . . . .
 9
10 Sync      Card 02 Alm Stat %Adj Src | Car Stat Sp PM     RMTyp SSM
11 DpSync    MS 0  .  .  Syn +08.6 Ms1 | Lk0 Lck   - SPM 002 SRM  PRS
12 SwMast    MS 1  .  .  Syn -02.6 Lk0 | Lk1 Smp   - SPM 003 SRM  PRS
13 Card_     Links Slipping:  NA   out of  NA
14 QueryMS   MTC:
15           MS:
16           SHELF:
17           CLOCK:
18 Adjust_

   14:12 >
```

2 If the SRM to replace is the Active node reference for the Message Switch (MS), a Node Reference Switch needs to occur before it is replaced.

Note: A status of “Lck” on the Clock screen identifies the active node reference. A status of “Smp” identifies the standby node reference.

If the SRM is	Do
ACTIVE	step 3
STANDBY	step 5

3 Switch the SRM from ACTIVE to STANDBY by typing

>SWCARR

If the command	Do
failed	step 4
succeeded	step 5

4 Clear the SRM alarm by following the appropriate procedure

If the alarm is	Do
BITS	Clearing a BITS Level Alarm on page 72
HLDOVR	Clearing an SRM HLDOVR alarm on page 64
HLDOVR24	Clearing an SRM HLDOVR24 alarm on page 68
LOR	Clearing an LOR Level Alarm on page 78

5 Access the PM screen level of the MAP display by typing

>MAPCI;MTC;PM

6 Access the SPM screen by typing

>POST SPM spm_no

7 Access the SRM card by typing

>SELECT SRM 0

Example of a MAP screen:

```
 CM      MS     IOD     Net      PM     CCS     Lns     Trks     Ext     APPL
  .       .      .       .       .       .       .       .        .
.

OC3                              SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit     PM                    0       0       0       0       0       1
 2          SPM                   0       0       0       0       0       1
 3 ListSet  SRM                   0       0       0       0       0       1
 4
 5        SPM 11    SRM 0  Act  InSv
 6 Tst    Interface:
 7 Bsy    Loc : Row A FrPos 4 ShPos 6 ShId 0 Slot 6  Prot Grp : 1
 8 RTS    Default Load: SPMLOAD                     Prot Role: Working
 9 OffL
10 LoadMod
11
12 Next
13 Select_
14 QueryMod
15 ListAlm
16
17
18 Bits
    14:12 >
```

8 Access the BITS link level by typing

>BITS

Example of a MAP screen:

```
   CM      MS     IOD     Net      PM     CCS     Lns     Trks     Ext     APPL
   .       .      .       .        .      .       .       .
.

OC3                                  SysB    ManB    OffL    CBsy    ISTb    InSv
 0 Quit          PM                    0       0       0       0       0       1
 2               SPM                   0       0       0       0       0       1
 3               SRM                   0       0       0       0       0       2
 4
 5             SPM 11    SRM 0
 6 Tst_           LinkNo   BitsName   Status  State   SSM   AlmSev
 7 Bsy_             0      BITSA       Act    InSv    PRS
 8 RTS_             1      BITSB       InAct  InSv    PRS
 9 OffL_            2      BITSOUT            Uneq    NIL
10 Swbits      BITS:
11
12
13
14
15 QryALM_
16
17
18 Bits

    14:12 >
```

9 Record the BITS link numbers associated with the SRM and the state of each link.

10 Manual busy (ManB) the BITS links by typing

For the standby link:

>BSY link_no

For the active link:

>BSY FORCE link_no

At the SRM card level of the SPM

11 Take the SRM card to be replaced out-of-service by typing

>BSY FORCE

12 Set the SRM card offline (OffL) by typing

>OFFL

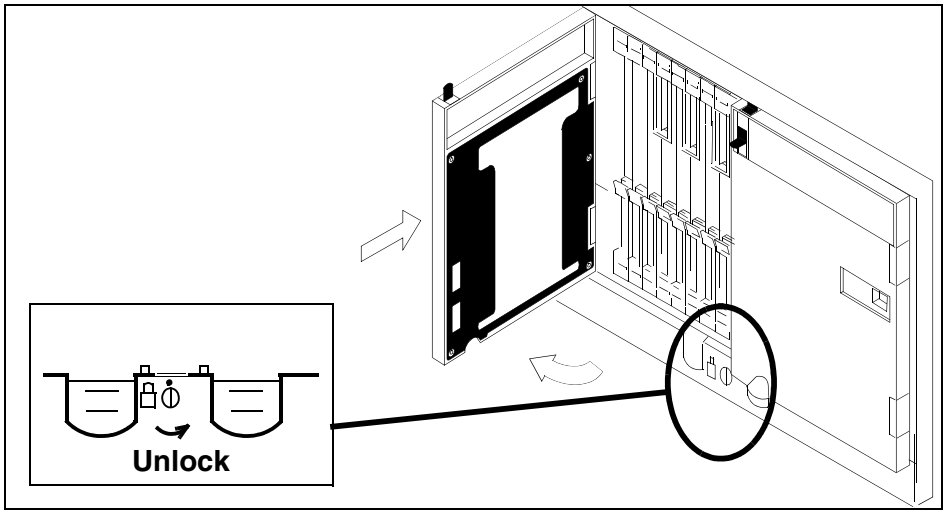
13 Return to the SPM screen and wait for the module to change state.

Note: The state change from ManB to OffL (offline) can take up to one minute to complete. After the state change completes, remove the SRM card.

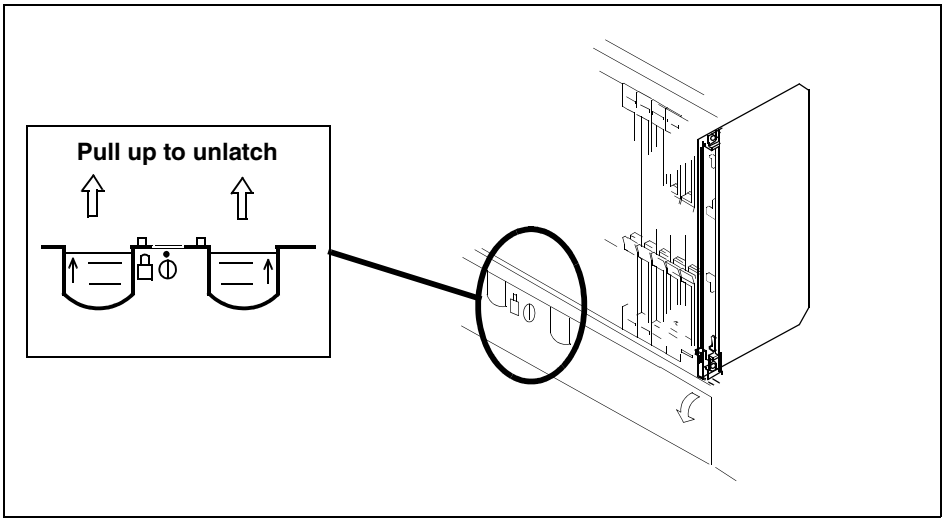
14

CAUTION
Static electricity damage
While handling circuit cards or cables, wear a wrist strap connected to the wrist-strap grounding point on the frame. This protects the cards against damage caused by static electricity.

As shown in the following figure, unlock the access doors to shelf 0 by turning the locking screw one quarter turn counter clockwise. The doors are unlocked when the slot in the locking screw is in the vertical position. Open the access doors by carefully pulling down on the spring lock at the top of each door. At the same time, carefully pull each door toward you using the finger grip at the bottom of the door. Slide the doors back into the retracted position.



15 As shown in the following figure, unlatch the cable-trough door by grasping the thumb grips and pulling up. Rotate the cable-trough door to the open position.

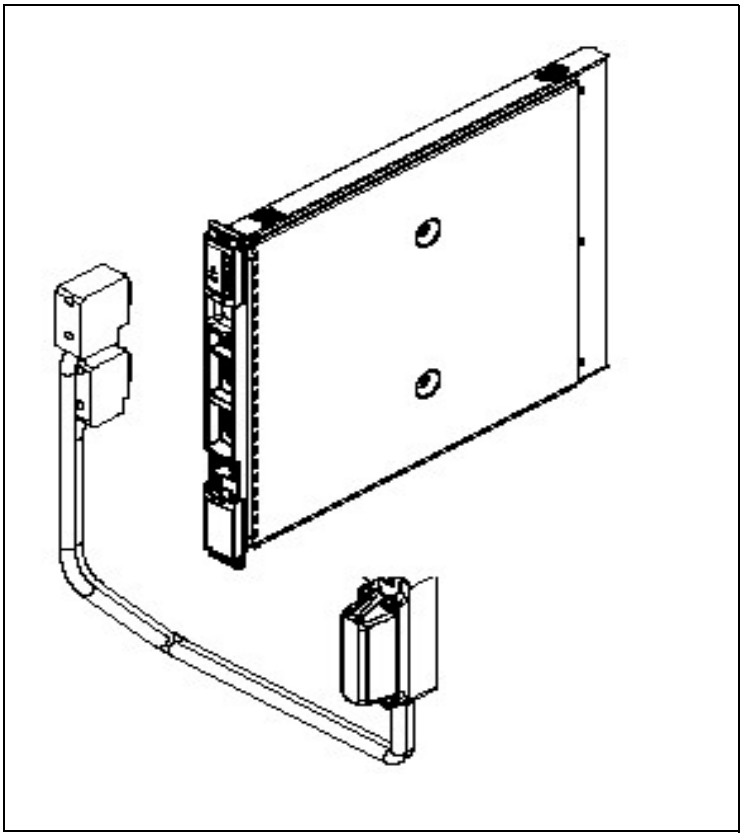


16 Disconnect the cable and 15-pin connector from the faceplate of the card.

17 After the cable has been removed, cap the connectors on the module and the cable. Store the cables in the cable trough.

Note: Before removing the SRM card, ensure that the cables are stored below the bottom level of the card shelf to avoid cable damage when the card is removed.

SRM with cable



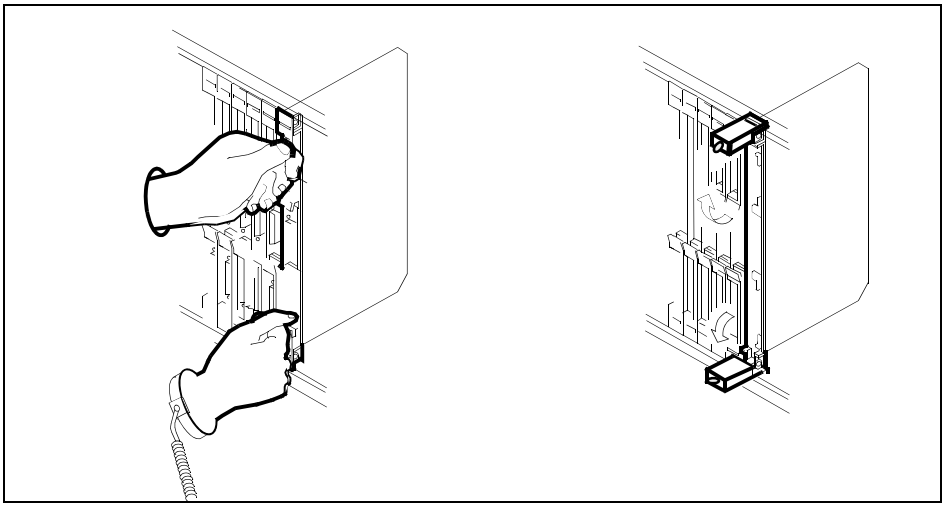
18

CAUTION

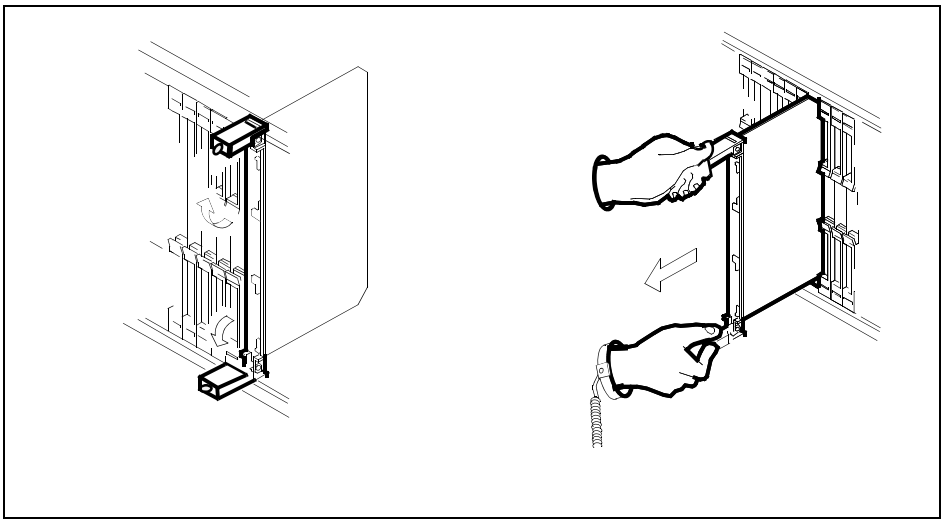
Card lever breakage

Holding a card by the levers only can result in lever breakage. Once the card has been pulled halfway out of the shelf, carefully grasp the card underneath for more secure support and continue to remove the card from the shelf. Avoid touching any wires or internal parts on the card.

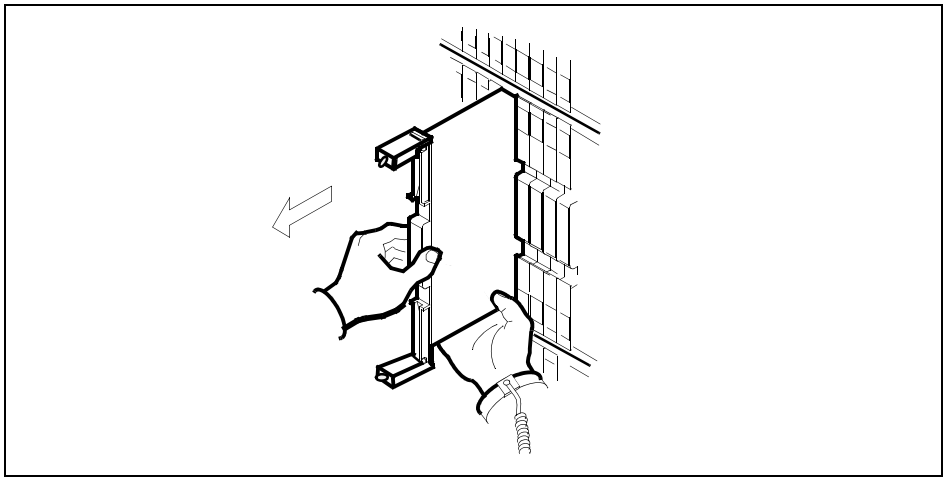
As shown in the following figure, open the locking levers on the card to be replaced.



19 As shown in the following figure, while grasping the locking levers, gently pull the card towards you until it protrudes about 2 in. (5.1 cm) from the equipment shelf.



20 As shown in the following figure, hold the card by the face plate with one hand while supporting the bottom edge with the other hand. Gently pull the card toward you until it clears the shelf.



21 Place the card you have removed in an electrostatic discharge (ESD) protective container.

22

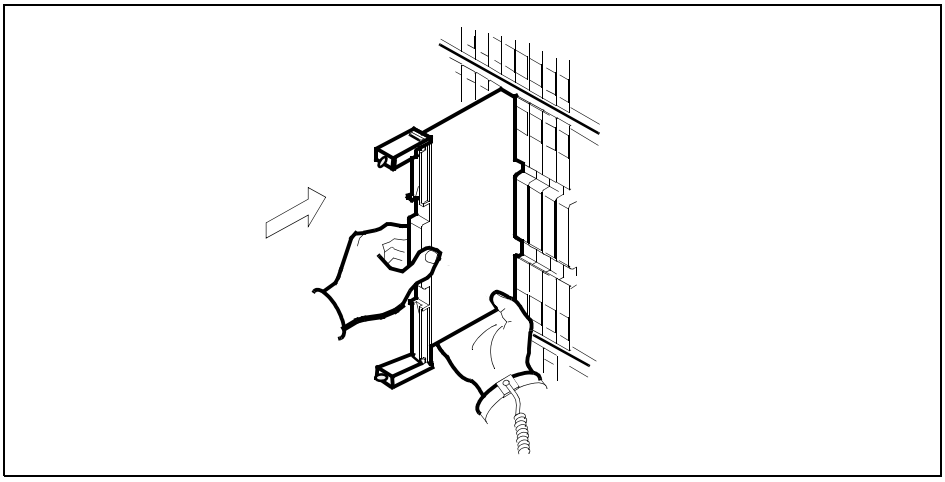
CAUTION
Equipment damage due to empty slots
Equip all unused slots on a powered shelf with NTLX60AA filler modules. Filler modules maintain electromagnetic interference (EMI) integrity, and they maintain shelf airflow patterns to ensure proper cooling.

Insert the replacement SRM card into the shelf. If a replacement card is not available, insert an NTLX60AA filler module in the slot until a replacement card is available.

Use a replacement card with the same PEC and release to avoid equipment malfunction. If the replacement card has a different PEC or release, change the datafill in Table MNCKTPAK to match the replacement card before inserting it in the slot.

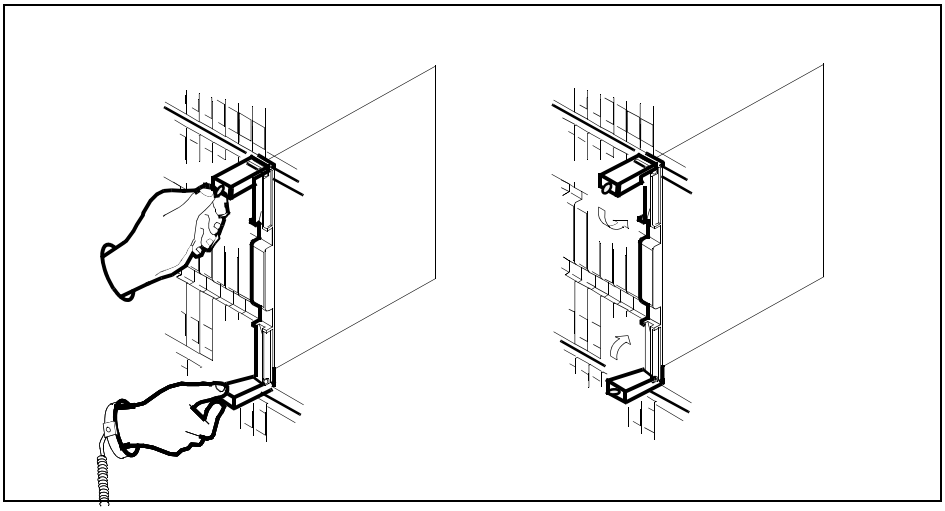
23 Open the locking levers on the card.

24 As shown in the following figure, hold the card by the face plate with one hand while supporting the bottom edge with the other hand. Gently slide the card into the shelf.



25 Using your fingers or thumbs, push on the upper and lower edges of the faceplate to ensure that the card is fully seated in the shelf.

26 As shown in the following figure, close the locking levers to secure the card.



27 Wait until the card performs a self-test (less than one minute). The self test is complete when the green LED remains on and the red LED remains off. If both LEDs stay on for an extended period of time, it means the replacement SRM card is defective; remove the card and replace it with another SRM replacement card. If both LEDs remain on with the second replacement card, contact your next level of support.

28 Reconnect the cable to the faceplate of the card.

29 Close the cable trough door. Close and lock the card-access door.

At the MAP terminal

30 Return to the SRM screen and take the SRM card from the OffL state to ManB state by typing

```
>BSY
```

31 Load the new SRM card with the default software load by typing

```
>LOADMOD
```

Monitor the progress of the loading activity on the SPM line of the SRM screen.

32 Return the new SRM card to service by typing

```
>RTS
```

Note: The state change from ManB to in service can require up to seven minutes to complete.

33 Access the BITS level by typing

```
>BITS
```

34 At the BITS screen, restore the BITS links to their original state as recorded in step 9 for each link by typing

```
>RTS  link_no
```

35 If the SRM was originally the Active node reference, return it to an ACTIVE status.

If the SRM was originally	Do
ACTIVE	step 36
STANDBY	step 38

36 Switch the SRM from ACTIVE to STANDBY by typing

```
>SwCarr
```

37 Return to the CI level of the MAP screen by typing

```
>QUIT ALL
```

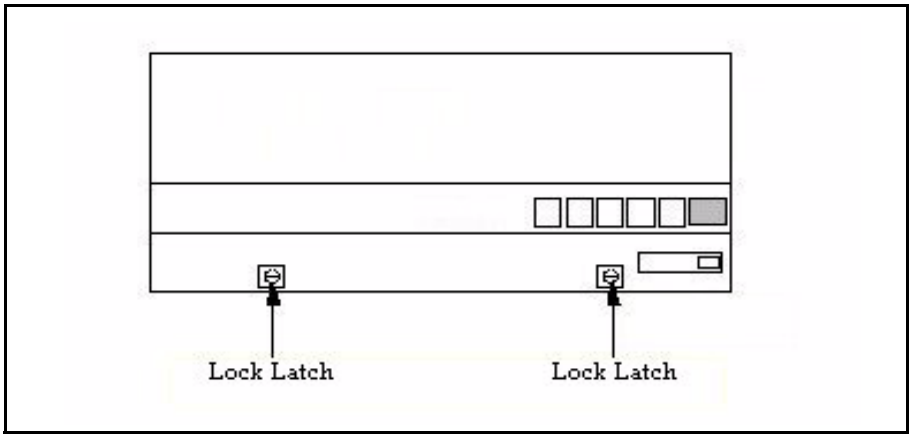
38 You have completed this procedure.

Replacing a fan management unit (FMU)

At the front of the equipment frame

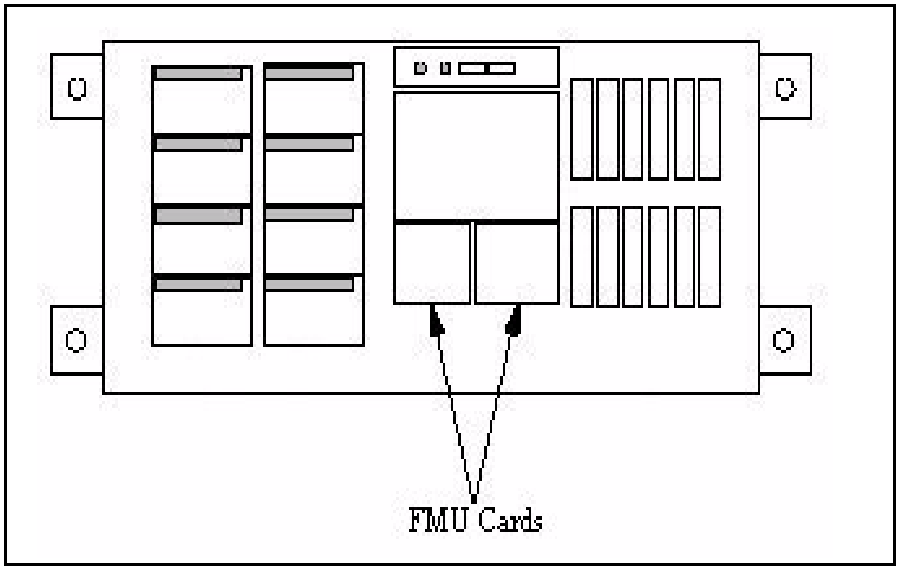
1 Move the lock latches of the power cabling interface unit (PCIU) to the unlocked position as indicated on the cover.

Lock latches of the PCIU



2 Raise the cover on the PCIU shelf.

Top view of PCIU



3

DANGER

If the fans are not powered down, they will try to conduct current when the new card is inserted, resulting in possible sparks and damage to the new card.

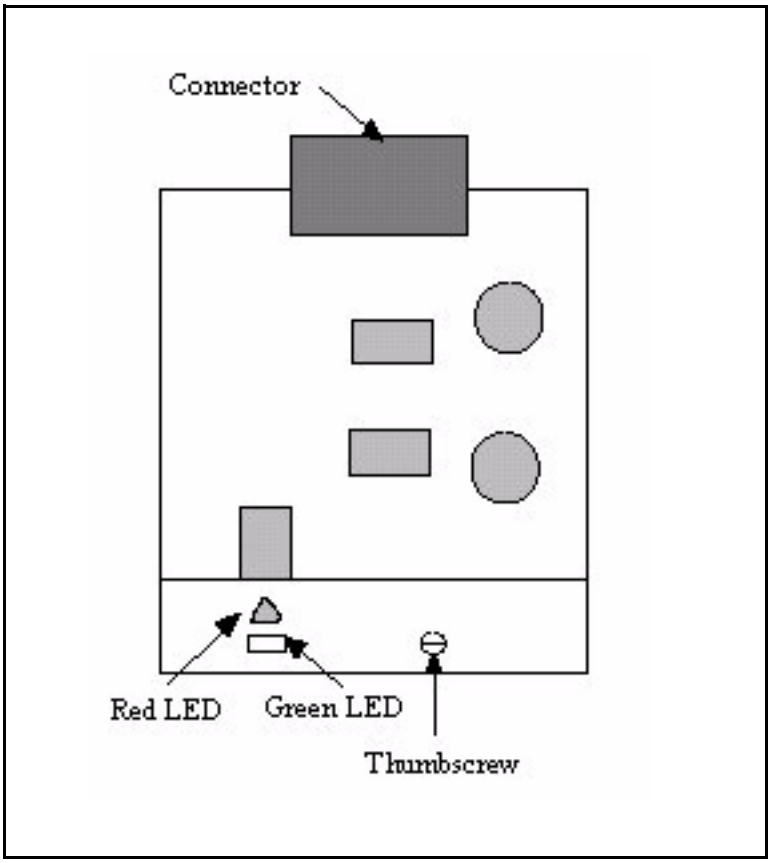
Move the lock latches on each of the eight fan units to the unlocked position as indicated on the faceplate of the fans.

4 Reaching inside the faceplate of the fans depress the latch and slide fan unit out a few inches to unseat them from the NTLX55 cooling units in shelf positions XX and YY.

5 Wait two to three minutes to allow the fan blades to come to a complete stop. Then completely remove the two fan units, in the upper cooling unit, directly below the FMUs.

6 Unscrew the thumb screw on the front of the FMU.

FMU with thumb screw



7 Using the right and left edges of the FMU faceplate, remove the appropriate card from the PCIU.

8 Align the new card with the card guides.

9 Make a clean, direct insertion, and be sure to fully seat the card.

Note: Do not rely on the thumb screw to seat the card.

10 TIghten the thumb screw.

11 Re-insert the two fan units removed by holding onto the faceplate of the fan in one hand and folding the fan assembly flat (align with the bar on the fan unit), then inserting it into the slot of the cooling unit. Once fan starts sliding into the slot of the cooling unit, release the fan and allow it to return to its upright position.

12 Pushing on the faceplate of the fan units, carefully re-seat them into the NTLX55 cooling units in shelf positions XX and YY.

13 Ensure that the green LEDs on the faceplate of the fan units are lit and the fan are running.

14 Move the lock latches on the fan units to the locked position as indicated on the faceplate of the fans.

15 Lower the cover of the PCIU shelf and move the latches to the locked position, as indicated on the cover.

16 You have completed this procedure.

Testing a circuit pack

At the MAP level

1 Post the SPM containing the circuit pack to test by typing

```
>MAPCI;MTC;PM;POST SPM <spm_no>
```

and pressing the Enter key.

where

spm_no
is the SPM number (0 to 85)

2 Select the circuit pack to test by typing

```
>SELECT <rm> <rm_no>
```

and pressing the Enter key.

where

rm
is the type of circuit pack

rm_no
is the RM number

3 Test the circuit pack by typing

```
>TST
```

and pressing the Enter key.

Retrieve test results

At the MAP level

1 Perform the “Testing a circuit pack” section of this document

2 The test results will be output to the MAP screen.

Example of test results for passing test

```
SPM 3 CEM  0 Test: Request has been submitted.
SPM 3 Test: Command passed.
```

Example of test results for failed test

```
Command rejected. The CEM is offline.
```

Managing the SPM 625 log

The two Common Equipment Module (CEM) planes of DMSCP and IW SPM nodes connect to the Enhanced Network (ENET) shelf through DS-512 fiber links. Crossover message configuration allows each CEM to communicate through both ENET planes. If a major failure occurs on one ENET shelf, the CEM in the same plane is able to send messages through the other ENET plane.

An audit automatically runs every day at 0900 to check DS-512 connected SPM nodes for crossover message channel configuration. An SPM 625 log is generated if the audit detects a node that is not configured for cross over.

This procedure requires you to press the Enter key after typing a command.

Managing the SPM 625 log

At the MAP terminal

1 Access the SPM Message Channel Crossover tool:

```
>SPMXMSG
```

2 Display SPM 625 log generation status:

```
>XAUDIT_LOG STATUS
```

MAP Response

```
Generation of SPM625 log is on
```

or

```
Generation of SPM625 log is off
```

If turning the SPM 625 log	Do
off	step 3
on	step 4

3 Display SPM 625 log generation status:

```
>XAUDIT_LOG OFF
```

MAP Response

```
Generation of SPM625 log is stopped
```

4 Display SPM 625 log generation status:

```
>XAUDIT_LOG ON
```

MAP Response

```
Generation of SPM625 log is started
```

5 Exit the SPM Message Channel Crossover tool:

```
>QUIT
```

6 You have completed this procedure.