

Critical Release Notice

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The content of this customer NTP supports the
SN07 (DMS) software release.

Bookmarks used in this NTP highlight the changes between the NA015 baseline and the current release. The bookmarks provided are color-coded to identify release-specific content changes. NTP volumes that do not contain bookmarks indicate that the NA015 baseline remains unchanged and is valid for the current release.

Bookmark Color Legend

Black: Applies to content for the NA015 baseline that is valid through the current release.

Red: Applies to new or modified content for NA017 that is valid through the current release.

Blue: Applies to new or modified content for NA018 (SN05 DMS) that is valid through the current release.

Green: Applies to new or modified content for SN06 (DMS) that is valid through the current release.

Purple: Applies to new or modified content for SN07 (DMS) that is valid through the current release.

Attention!

Adobe® Acrobat® Reader™ 5.0 or higher is required to view bookmarks in color.

Publication History

September 2004

Standard release 17.04 for software release SN07 (DMS). This release is current for the SN07 (DMS) software release, although no changes have been made for SN07 (DMS) features.

Volume 2

Modified procedure - Bus interface cards in an LCD

Modified procedure - NTB71 in an LCME

Modified procedure - NT9X30 in an LPP LIS

Volume 3

Modified procedure - NT2X70 in an XPM

Volumes 5

All of the changes below are due to CR Q00855532:

Modified procedure - NT6X40 in an SMA

Modified procedure - NT6X40 in an SMA-MVI-20

Modified procedure - NT6X40 in an SMA2

Modified procedure - NT6X40 in an SMS

Modified procedure - NT6X40 in an SMU

March 2004

Standard release 17.03 for software release SN06 (DMS). Updates made for this release are shown below:

Volume 1

Modified card replacement procedure: Power converter cards in a SuperNode SE 16k ENET - Card NT9X30AB is Manufacture Discontinued and is replaced by new card NT9X30AC (Note - there is a bookmark for each changed reference).

Volume 2

No changes

Volume 3

Modified card replacement procedure: Power converter cards in trunk and service modules.

Volumes 4 - 7

No changes

September 2003

Standard release 17.02 for software release SN06 (DMS). Updates made for this release are shown below:

Volume 1

Modified card replacement procedure: Power converter cards in a Supernode SE CM/SLM.

Volume 2

Modified card replacement procedure: NT6X30 in LCE-type frames.

Volumes 3 - 7

No changes

June 2003

Preliminary release 17.01 for software release SN06 (DMS). Updates for this release are shown below:

Volume 1

No changes

Volume 2

No changes

Volume 3

Added new card replacement procedure: SPM NTLX99BA STM-1 for DMS Spectrum Peripheral Module.

Volumes 4 - 7

No changes

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297-8021-547

DMS-100 Family

North American DMS-100

Card Replacement Procedures

Volume 2 of 7

LET0015 and up Standard 14.02 May 2001

DMS-100 Family

North American DMS-100

Card Replacement Procedures

Volume 2 of 7

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1 Line concentrating module card replacement procedures

Introduction

This chapter contains card replacement procedures for the line concentrating module (LCM) and line concentrating equipment (LCE) frame. The first section in the chapter provides illustrations of LCM and LCE shelf layouts.

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

Each procedure contains the following sections:

- Application
- Common procedures
- Action

Application

This section identifies the LCM or LCE card(s) included in the replacement procedure.

Common procedures

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

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

Action

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

Recording card replacement activities

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

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

LCM shelf layouts

Application

This procedure provides frame layouts for the following line concentrating equipment (LCE) frames:

- Line concentrating equipment (LCE) frame
- ISDN-line concentrating equipment (LCEI) frame

This procedure provides shelf and drawer layouts for the following shelves:

- Line concentrating module (LCM)
- LCM line drawer
- Enhanced LCM (LCME)
- LCME line drawer

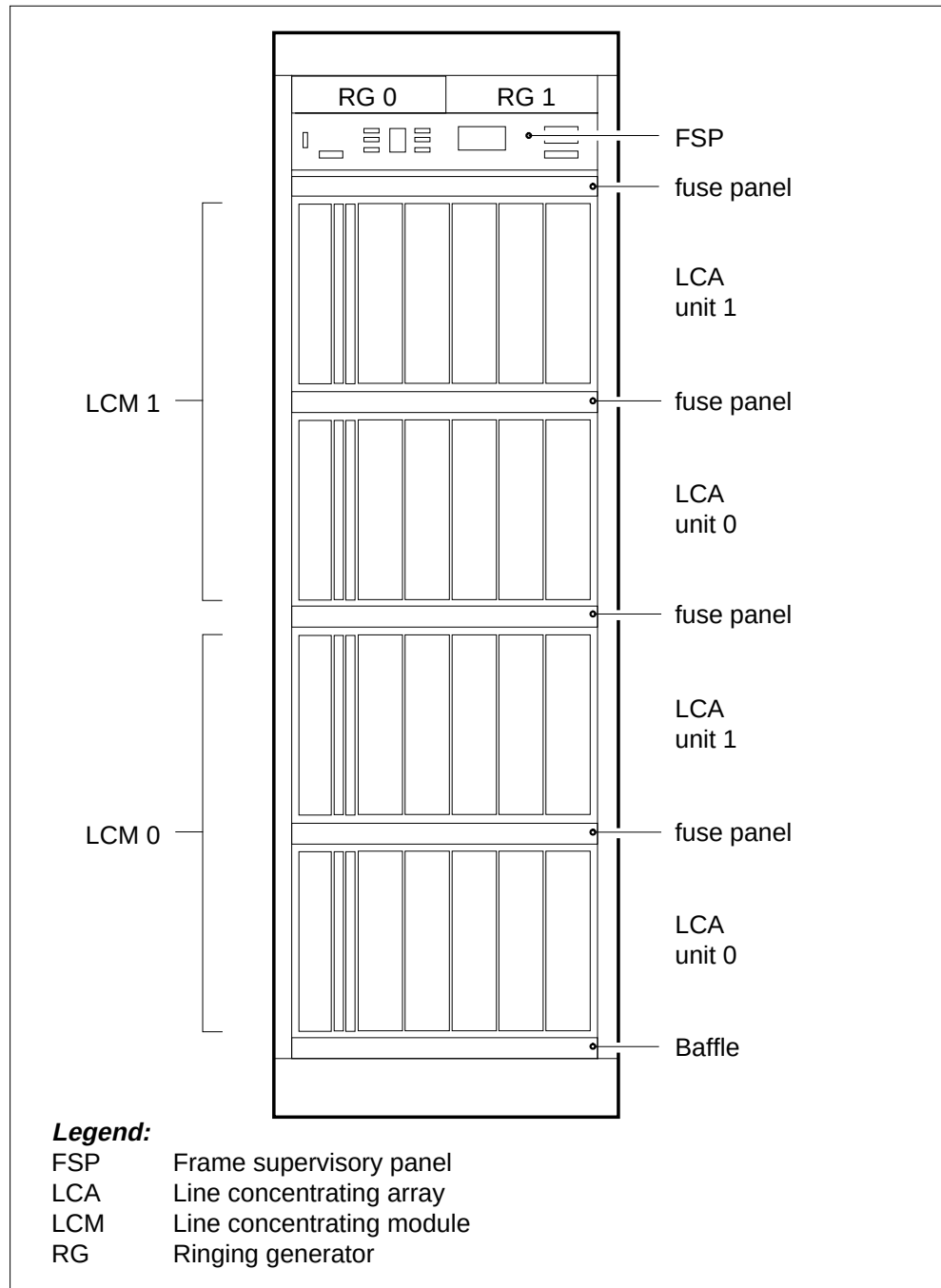
Note 1: The frame and shelf layouts on the following pages are standard. The shelves in your office can have differences.

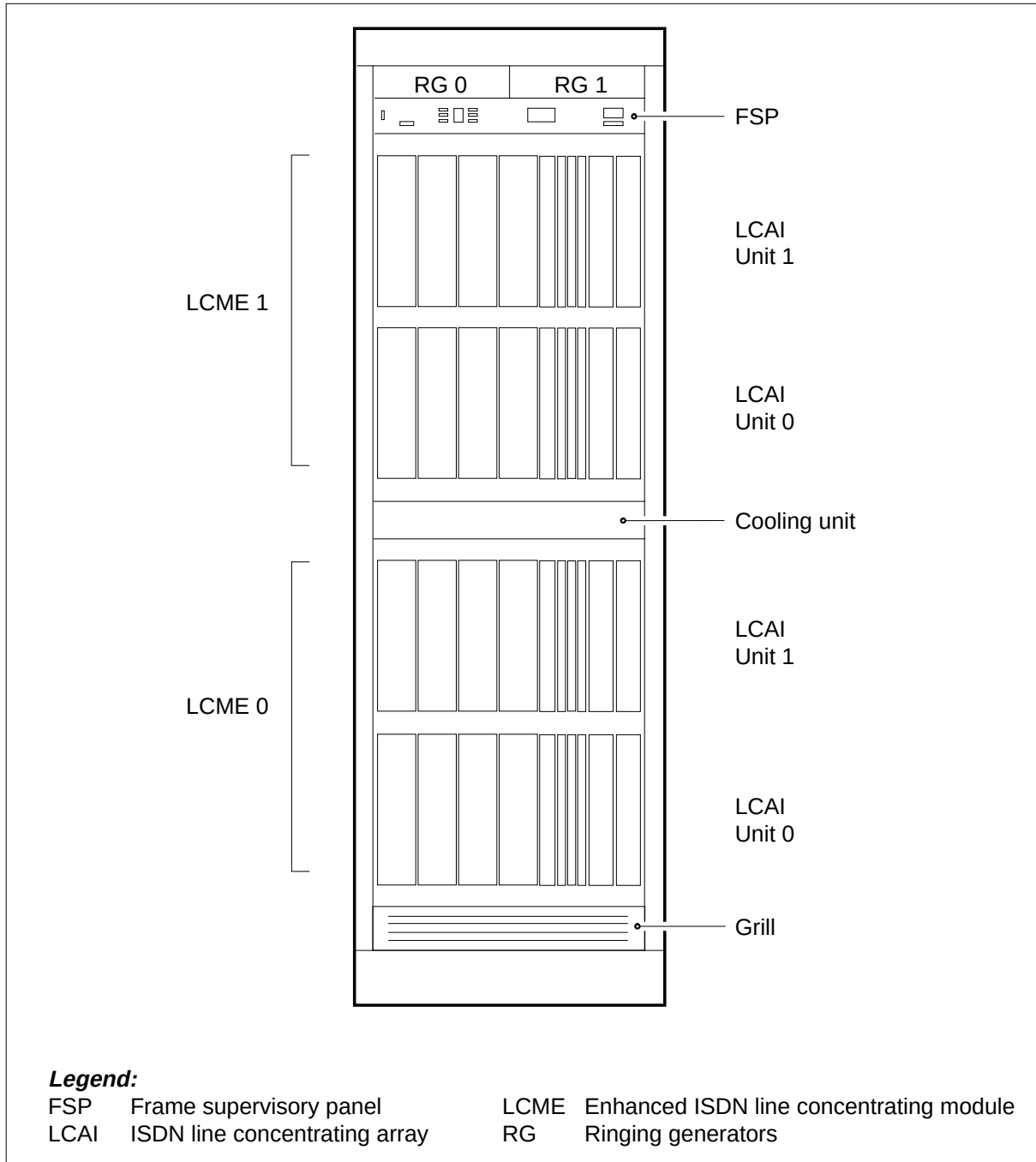
Note 2: The LCEI is another name for the enhanced LCE.

Note 3: The 1-Meg Modem Service has unique requirements for the capacity and fill of the LCM line drawer. Refer to the *1-Meg Modem Service Network Implementation Manual* (297-8063-200) for these guidelines.

LCM shelf layouts (continued)

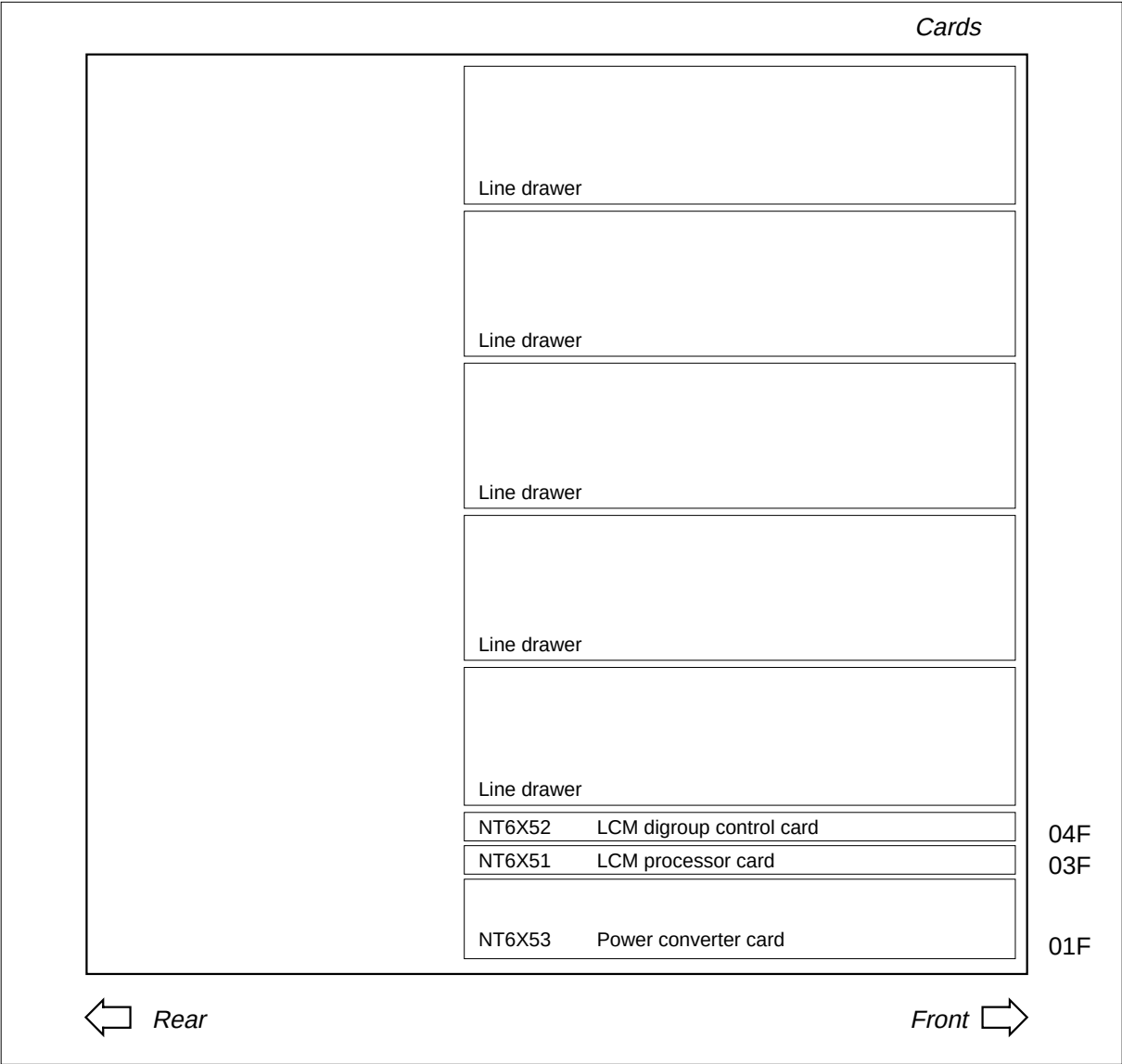
Frame layout of the LCE frame



LCM shelf layouts (continued)**Frame layout of the ISDN LCE frame**

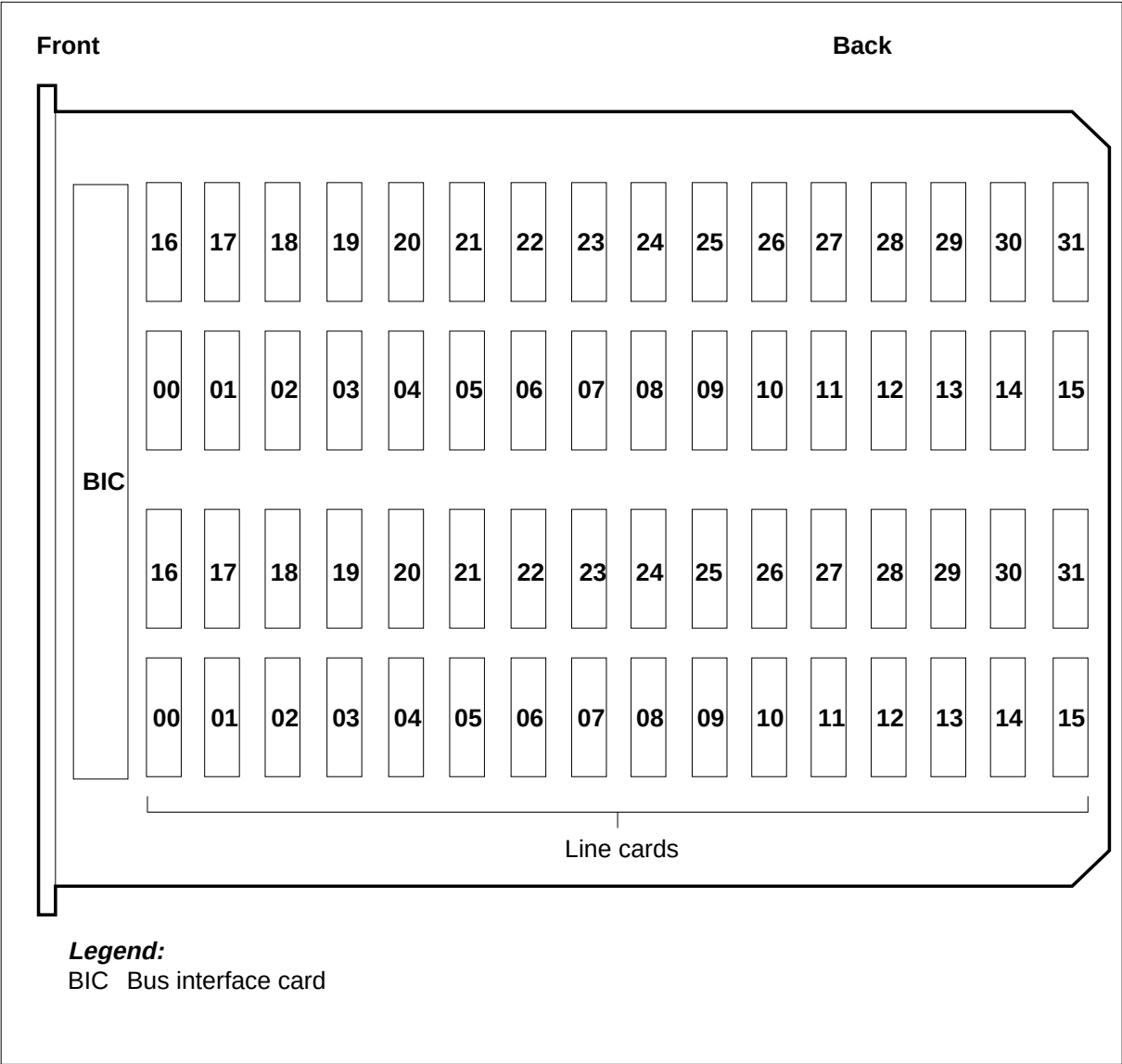
LCM shelf layouts (continued)

Shelf layout of the LCM



LCM shelf layouts (continued)

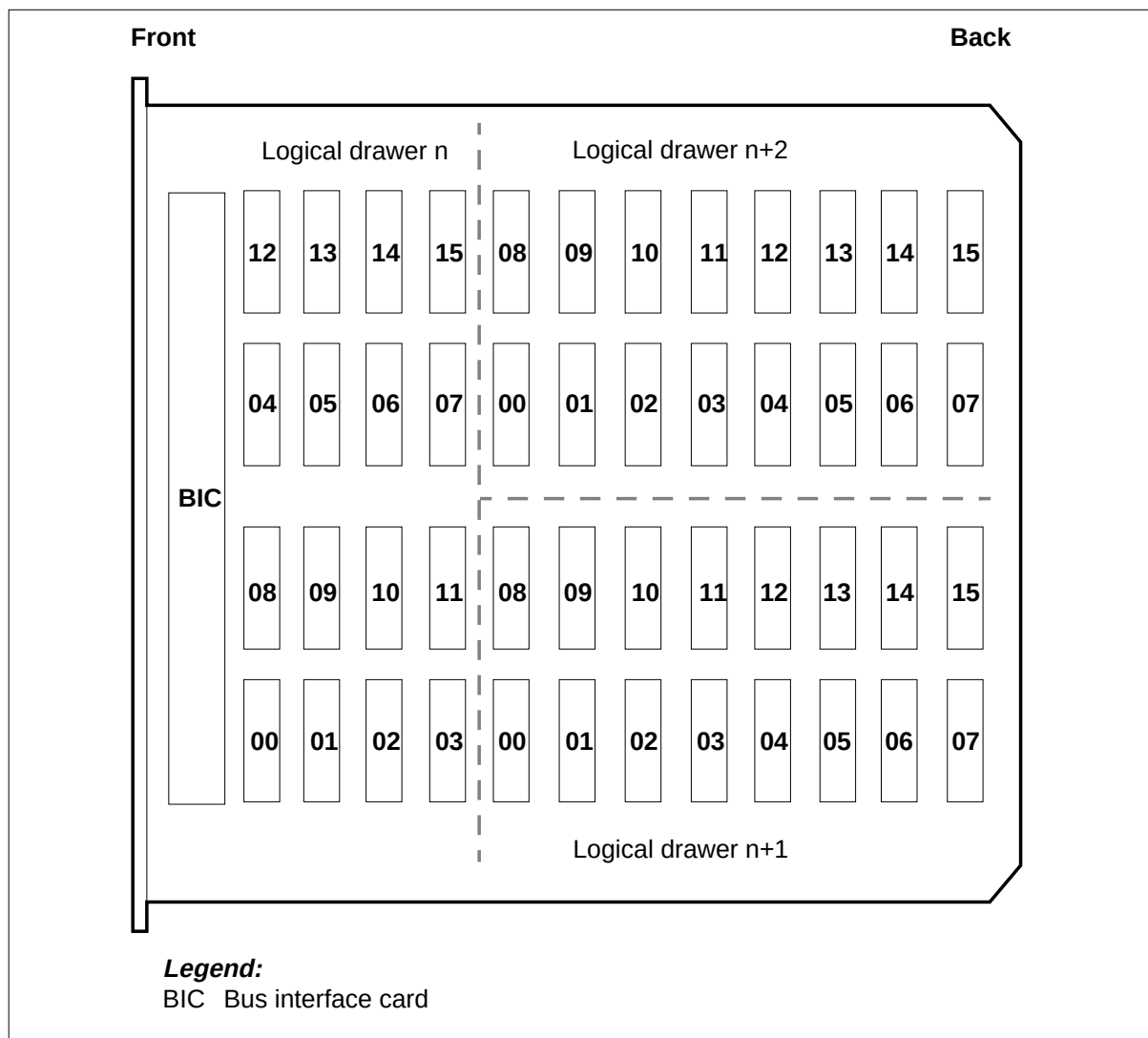
Drawer layout of the LCM line drawer



Note: Refer to the “Line cards for LCM and LCME line drawers” table for a list of line cards in this line drawer.

LCM shelf layouts (continued)

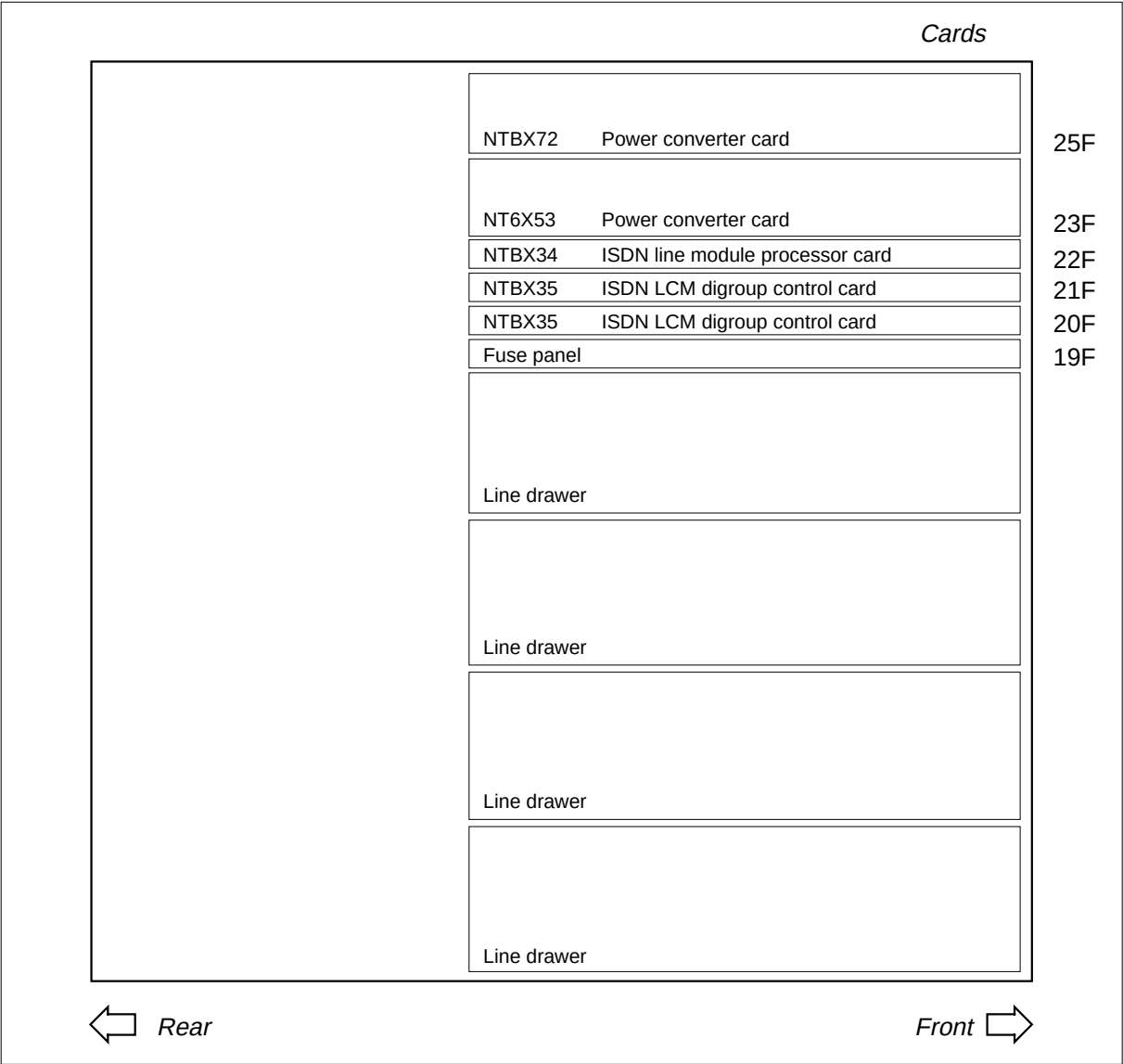
Drawer layout of the LCMI line drawer



Note: Refer to the “Line cards for LCM and LCME line drawers” table for a list of line cards in this line drawer.

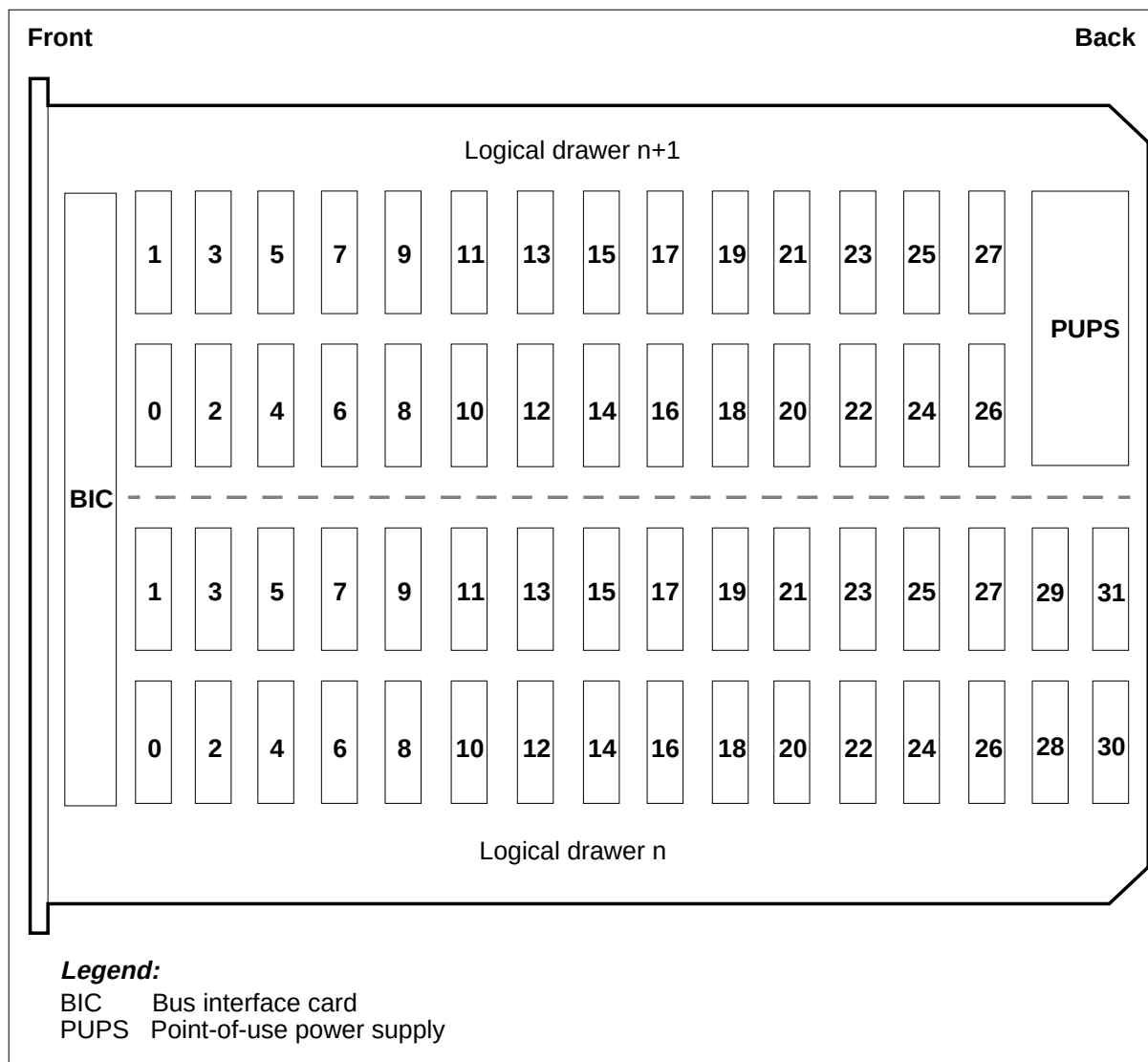
LCM shelf layouts (continued)

Shelf layout of the LCME



LCM shelf layouts (continued)

Drawer layout of the LCME line drawer



Note: Refer to the “Line cards for LCM and LCME line drawers” table for a list of line cards for this line drawer.

Line cards for LCM and LCME line drawers

PEC	Card name		LCM	LCME	ILCM
NT6X17	AA	Type A standard line card	X	X	X
	AB	Type A standard line card	X	X	X

LCM shelf layouts (continued)**Line cards for LCM and LCME line drawers**

PEC	Card name	LCM	LCME	ILCM
	AC Type A standard line card	X	X	X
	AD Type A standard line card	X	X	X
	BA Type A world line card	X	X	X
NT6X18	AA Type B line card	X	X	
NT6X18	AB Type B line card with +48 V	X	X	
NT6X18	BA Type B world line card	X	X	
NT6X19	AA Message waiting line card	X	X	
NT6X21	AA Type C standard line card	X	X	
	AB Type C standard line card	X	X	
	AC Type C standard line card	X	X	
	BC Type C line card (A-law)	X	X	
NT6X33	AA Type A world line card	X	X	X
NT6X71	AA Data line card (DLC) DMS-100/SL-100	X	X	
	AB Data line card (DLC) DMS-100/SL-100	X	X	
	BA Single slot data line card (DLC) DMS-100/SL-100	X	X	
NT6X76	AA Asynchronous interface line card	X	X	
	AD Asynchronous interface line card	X	X	
	AC Enhanced asynchronous interface line card	X	X	
NT6X93	AA Type A international line card	X		X
	BA Type A international line card	X		X
	CA Type A international line card	X		X
	DA Type A international line card	X		X
	EA Type A international line card	X		X
	FA Type A international line card	X		X

LCM shelf layouts (end)

Line cards for LCM and LCME line drawers

PEC	Card name	LCM	LCME	ILCM
NT6X94	AA International coin, PBX, SPM line card			X
	AB International coin, PBX, SPM line card			X
	BA International coin, PBX, SPM line card			X
	BB International coin, PBX, SPM line card			X
	CA International coin, PBX, SPM line card			X
	DA International coin, PBX, SPM line card			X
NT6X98	AA SCOPEDIAL line card	X	X	X
NT6X99	AA IBERT datapath line card	X	X	
NTBX25	AB ISDN U-line card		X	
NTBX26	AA ISDN S/T interface line card		X	
NTBX27	AA 2B1Q U-interface ISDN line card		X	
NTEX17	AA 1-Meg Modem xDSL two-slot line card	X		X
	BA 1-Meg Modem xDSL two-slot line card	X		X
	CA 1-Meg Modem xDSL two-slot line card	X		X
	DA 1-Meg Modem xDSL two-slot line card	X		X

Bus interface cards in an LCD

Application

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

PEC	Suffix	Card name	Shelf or frame name
NT6X54	AA	Bus interface card (BIC)	Line concentrating module (LCM)
NT6X54	AB	International bus interface card	International LCM (ILCM)
NT6X54	BA	International bus interface card	ILCM, LCM
NT6X54	CA	PCM-30 bus interface card	ILCM
NT6X54	DA	ISDN remote (ILDR) bus interface card	LCM
NTBX36	AA	Bus interface card	Enhanced LCM (LCME)
NTBX36	BA	ISDN LCM enhanced line drawer bus interface card	LCME
NTEX54	AA	Data enhanced bus interface card (DBIC)	Line concentrating module (LCM)
NTEX54	AB	Data enhanced bus interface card (DBIC)	Line concentrating module (LCM)
NTEX54	BA	Data enhanced bus interface card (DBIC)	Line concentrating module (LCM)

Refer to the Index, if you cannot identify one of the following features for the card that you want to replace;

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

Bus interface cards in an LCD (continued)

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

Common procedures

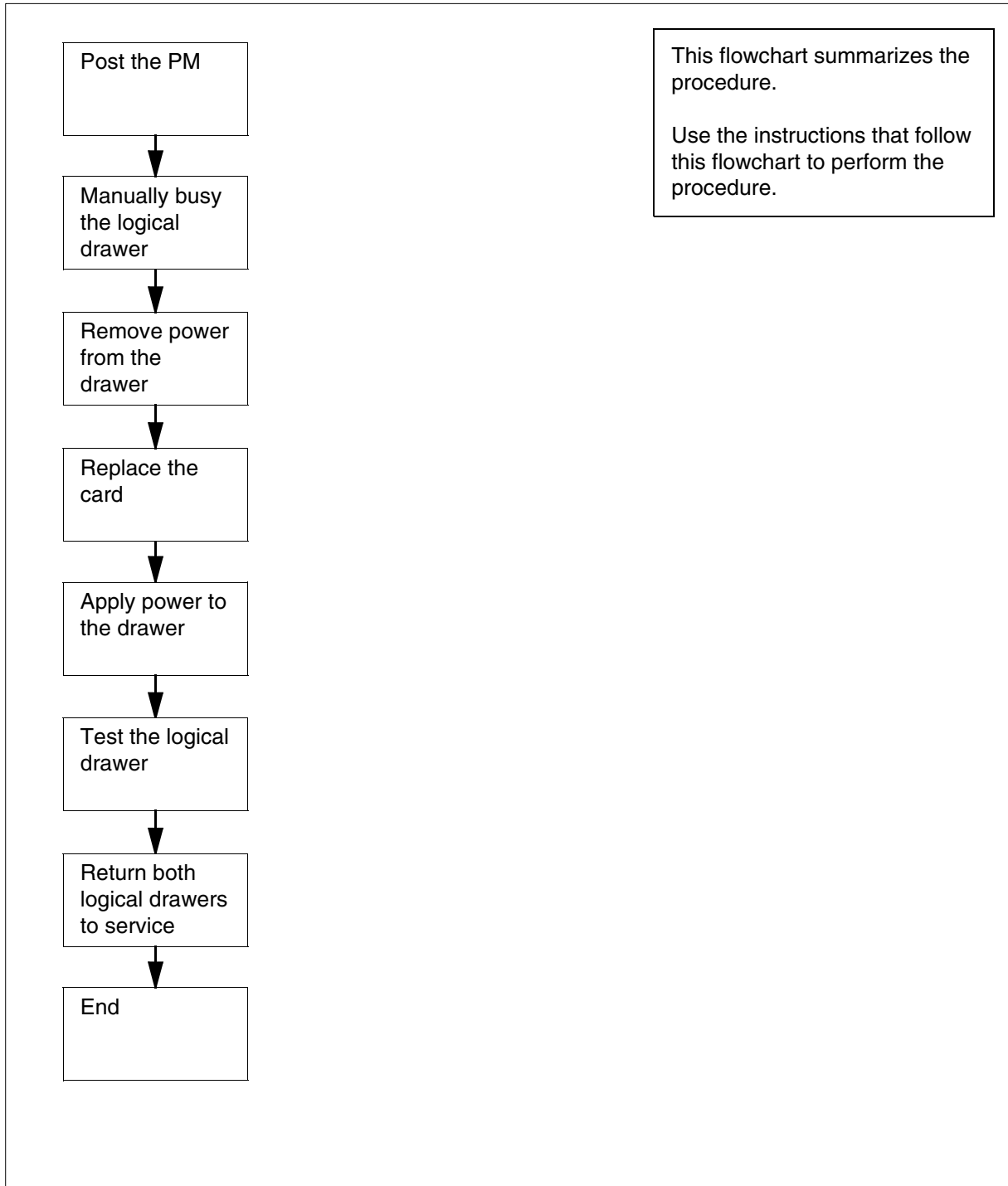
There are no common procedures.

Action

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

Bus interface cards in an LCD (continued)

Summary of Replacing Bus interface cards in an LCD



Bus interface cards in an LCD (continued)

Replacing Bus interface cards in an LCD

At your current location

1



WARNING

Loss of service

This procedure directs you to manually busy a minimum of one line drawer. Removal of a line drawer from service can cause the system to drop calls in progress. Perform this procedure only if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.

2 Note the PEC for the replacement card.

If	Do
the PEC is NTEX54AA, NTEX54AB, or NTEX54BA	step 3
the PEC is not NTEX54AA, NTEX54AB, or NTEX54BA	step 7

3 Write down the 12-digit number stamped on the replacement card. This number is the media access control (MAC) layer address used later in this procedure.

At the xEMS workstation

4 Go to the submap of the LCM line drawer with the DBIC that you will replace.

5 Select the card.

6 To busy the card, select
Maintenance -> DBIC -> ManB
from the pop-up menu.

At the MAP terminal

7 To access the PM level of the MAP display, type
>MAPCI;MTC;PM
and press the Enter key.

Example of a MAP display:

Bus interface cards in an LCD (continued)

PM	SysB	ManB	OffL	CBsy	ISTb	InSv
	0	0	2	0	1	71

- 8** To post the LCM that contains the bus interface card (BIC) to be replaced, type

```
>POST pm_type site frame_no pm_no
```

and press the Enter key.

where

pm_type

is the type of PM (LCM, ILCM, LCME)

site

is the PM location (alphanumeric)

frame_no

is the equipment frame number (00 to 511)

pm_no

is the number of the PM (0 or 1) in the frame

Example of a MAP display:

```
LCM  HOST 01 1  ISTb  Links OOS: Cside 0 Pside 0
Unit0: ISTb      /RG: 0
Unit1: ISTb Mtce  /RG: 1 Ring gen Test
      11 11 11 11 11 RG: Pref 1 InSv
Drwr: 01 23 45 67 89 01 23 45 67 89 Stby 0 InSv
      .. .. .. .. MM .. .. .. ..
```

- 9** Record the numbers of the logical drawers that are associated with the BIC.
- Note:** Logical drawers configure in pairs for the physical drawer. The BIC services the physical drawer. Both logical drawers become manually busy during this card replacement procedure.
- 10** Check the state of the affected logical drawers.

If the state for	Do
one or both logical drawers is I, S, or . (dot)	step 11
both logical drawers is M	step 14
one or both logical drawers is 0 or -	To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

Bus interface cards in an LCD (continued)

- 11 To manually busy the logical drawer, type

>BSY DRWR drwr_no

and press the Enter key.

where

drwr_no

is the logical drawer number (0 to 23)

Example of a MAP response:

```
LCM HOST 01 1 Drwr 0 will be taken out of service
Please confirm ("YES", "Y", "NO", or "N"):
```

- 12 To confirm the command, type

>YES

and press the Enter key.

Example of a MAP response:

```
LCM HOST 01 1 Drwr 0 Bsy Passed
```

Note: For LCMEs, this action manually busies both logical drawers that are associated with the physical drawer.

If	Do
you must busy the other logical drawer of the pair	step 13
both logical drawers are now M	step 14

- 13 Busy the other logical drawer of the pair.

>BSY DRWR drwr_no

and press the Enter key.

where

drwr_no

is the logical drawer number (0 to 23)

Example of a MAP response:

```
LCM HOST 01 1 Drwr 0 Bsy Passed
```

Bus interface cards in an LCD (continued)

At the shelf

14



WARNING

Static electricity damage

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



DANGER

Potential equipment damage

Note the fuses that you remove from the fuse panel. If you do not insert fuses in the correct location on the fuse panel, equipment damage occurs.

The next action depends on the LCM version.

If the LCM version	Do
is ILCM or LCM	step 15
is LCME	step 16

- 15** Remove fuses for the LCM/ILCM line drawer. Refer to figure at the end of this procedure for fuse panel layout. See figure 2 for the ILCM fuse panel layout.

Note: Fuse markings do not always identify voltage. Make sure that you note the fuses and the location of the fuses in the fuse panel.

- a** Remove the -48V fuse for the line drawer that contains the BIC you replace. Refer to the figure of the fuse panel for fuse location.
- b** Remove the +15V fuse for the line drawer that contains the BIC you replace. Refer to the figure of the fuse panel for fuse location.
- c** Remove the +5V fuse for the line drawer that contains the BIC you replace. Refer to the figure of the fuse panel for fuse location.

Go to step 17 .

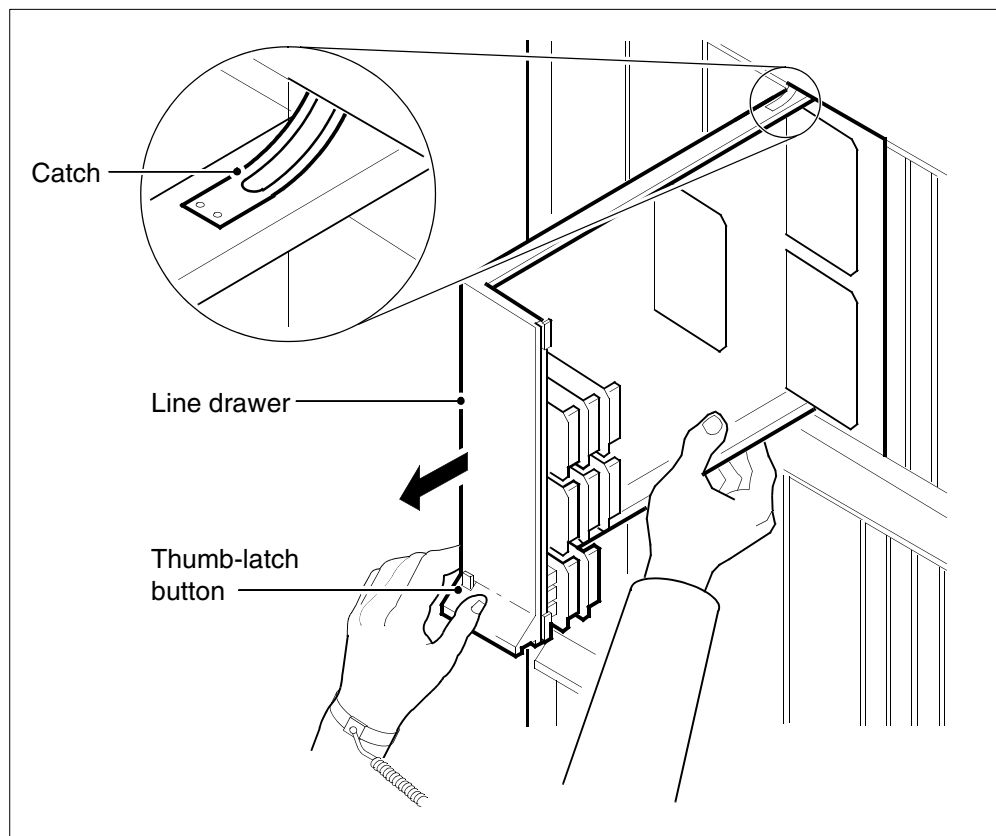
- 16** Remove fuses for the LCME line drawer.

Note: Fuse markings do not always identify voltage. Make sure that you note the fuses and the location of the fuses in the fuse panel.

- a** Remove the -48 V Talk Battery fuse for the line drawer that contains the BIC you replace. Refer to the figure "LCME fuse panel" for fuse location.

Bus interface cards in an LCD (continued)

- b Remove the +15 V fuse for the line drawer that contains the BIC you replace. Refer to the figure “LCME fuse panel” for fuse location.
 - c Remove the -48 V Battery fuse for the line drawer that contains the BIC you replace. Refer to the figure “LCME fuse panel” for fuse location.
 - d Remove the -48 V Return fuse for the line drawer that contains the BIC you replace. Refer to the figure “LCME fuse panel” for fuse location.
- 17 Identify the drawer. Press the small thumb-latch button on the lower left edge of the drawer. Pull the drawer out. To secure the drawer in a steady horizontal position, tip the drawer until the catch rests on the line drawer track.



- 18 The next action depends on the line drawer version.

If the line drawer version is	Do
NT6X05AA/BA/CA/DA	step 20
NTBX32BA	step 20
NT6X05EA	step 19

Bus interface cards in an LCD (continued)

- 19 Remove the data cable from the RJ-45 connector on the DBIC. The RJ-45 connector is located at slot location 16 of the odd LSG (connector slot). Refer to figure at the end of this procedure for drawer and cable assembly layout.
- 20

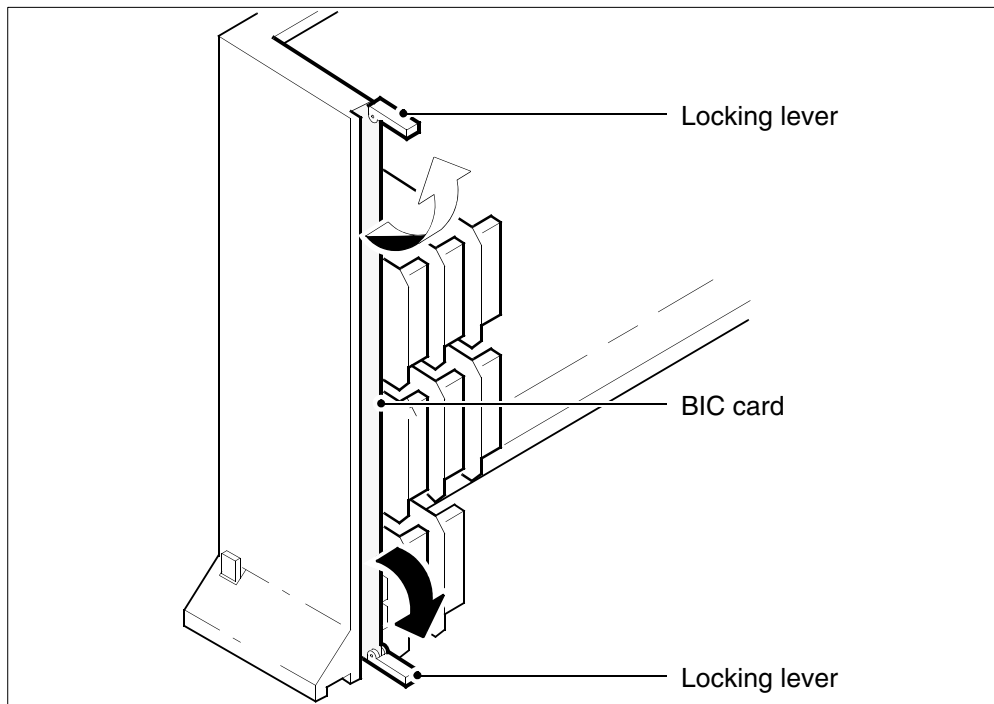


DANGER

Do not hold the card by the levers only

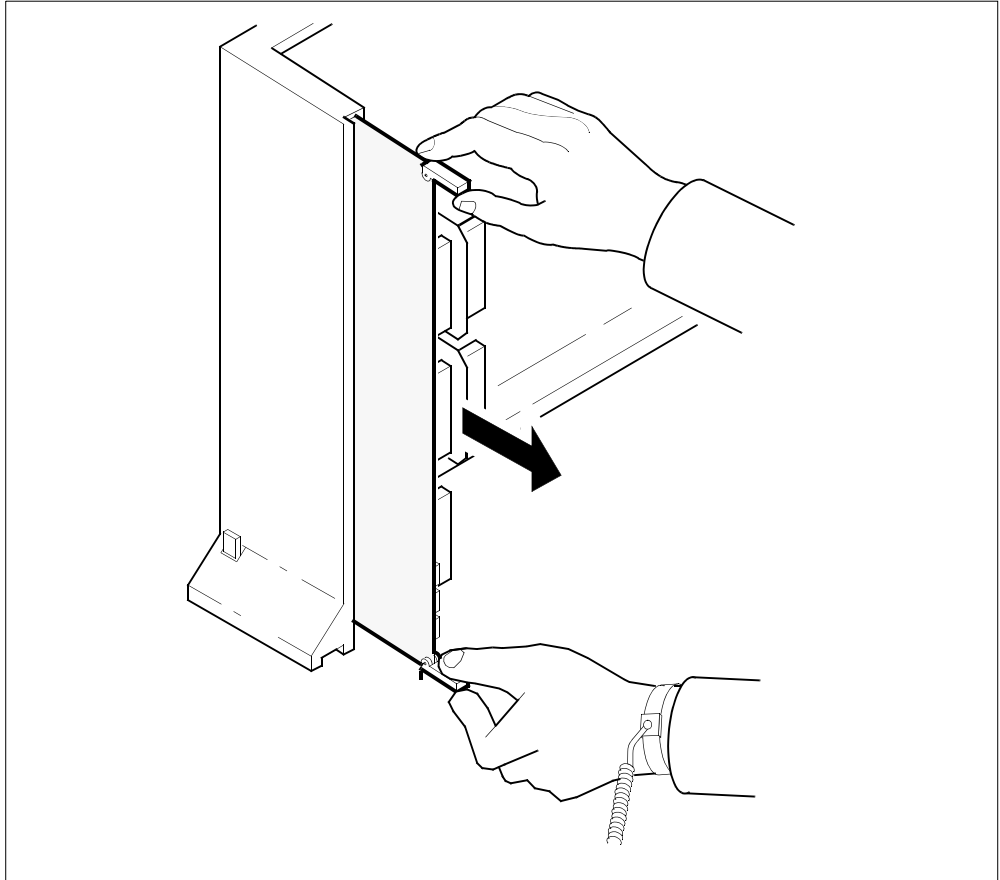
If you hold a card by the locking levers only, the levers can break. Pull the card half way out of the slot. Carefully grasp the card from below for more support. Continue to remove the card from the drawer. Make sure that you do not touch any wires or internal parts on the card.

Open the locking levers on the face of the card.



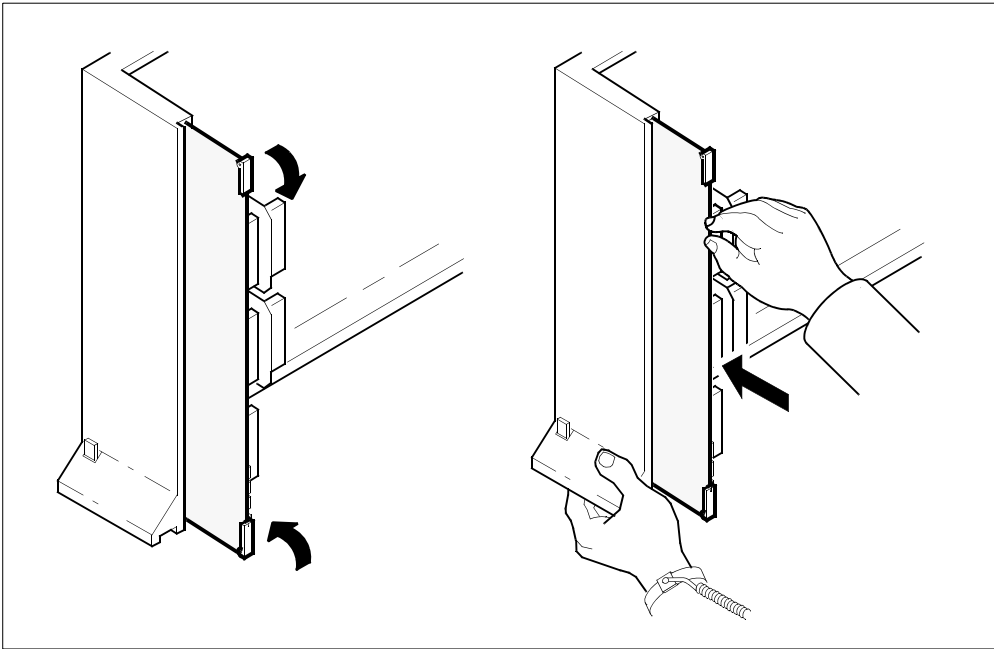
- 21 Grasp the locking levers. Carefully pull the card toward you until the card clears the drawer.

Bus interface cards in an LCD (continued)



- 22** Place the card that you removed in an electrostatic discharge (ESD) protective container.
- 23** Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.
- 24** Close the locking levers on the replacement card. Align the card with the pin slots in the drawer. Carefully slide the card into the drawer.
- 25** Support the drawer with your left hand. Use your right hand to push on the upper and lower edges of the card. Make sure that the card sits completely in the drawer.

**Bus interface cards
in an LCD (continued)**



26 The next action depends on the line drawer version.

If the line drawer version is	Do
NT6X05AA/BA/CA/DA	step 28
NTBX32BA	step 28
NT6X05EA	step 27

27 Replace the data cable RJ-45 connector that you removed in step 19. Refer to figure 4 at the end of this procedure for drawer and cable assembly layout.

28 Close the line drawer.

29



DANGER

Potential equipment damage

Note the fuses that you remove from the frame. If you do not insert fuses in the correct location on the fuse panel, equipment damage occurs.

Bus interface cards in an LCD (continued)

The next action depends on the LCM version.

If the LCM version	Do
is ILCM or LCM	step 30
is LCME	step 31

- 30** Insert the fuses that you removed in step 15, as follows.
- Note:** Fuses are coded for position. The colored square on the face of the fuse identifies the top edge.
- a** Insert the +5V fuse again.
 - b** Insert the +15V fuse again.
 - c** Insert the -48V fuse again.
- Go to step 32.
- 31** Insert the fuses that you removed in step 16.
- Note:** Fuses are coded for position. The colored square on the face of the fuse identifies the top edge.
- a** Insert the -48V Battery Return fuse.
 - b** Insert the -48V Battery fuse.
 - c** Insert the +15V fuse.
 - d** Insert the -48V Talk Battery fuse.
- 32** The next action depends on the reason that you perform this procedure.
- | If a maintenance procedure | Do |
|--------------------------------------|---------|
| directed you to this procedure | step 33 |
| did not direct you to this procedure | step 34 |
- 33** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

At the MAP terminal

- 34** A maintenance flag (Mtce) can appear. This flag indicates that system-initiated maintenance tasks are in progress. To stop the system-initiated maintenance tasks, type
- ```
>ABTK
```
- and press the Enter key.
- 35** To return the logical drawer to service, type
- ```
>RTS DRWR drwr_no
```
- and press the Enter key.

Bus interface cards in an LCD (continued)

where

drwr_no

is the logical drawer number (0 to 19)

Example of a MAP response:

```
OSvce Tests Initiated
LCM HOST 00 0 Drwr 0 Tst Passed
LCM HOST 00 0 Drwr 0 Rts Passed
```

	If the RTS command	Do
	passed, and you must return the other logical drawer to service	step 36
	passed, and the other logical drawer is in service	step 37
	failed	Contact the next level of support.
36	Repeat step 35 for the other logical drawer in the pair.	
37	Note the PEC for the card replaced.	
	If	Do
	the PEC is NTEX54AA, NTEX54AB, or NTEX54BA	step 38
	the PEC is not NTEX54AA, NTEX54AB, or NTEX54BA	step 48
38	Update table LCMDRINV.	
	a To open table LCMDRINV, type >TABLE LCMDRINV and press the Enter key.	
	b To position on the tuple for the LCM, type >POS site_name frame_no lcm_no and press the Enter key.	
	where site_name is the name of the site frame_no is the number of the frame	

Bus interface cards in an LCD (continued)

- lcm_no**
is the number of the LCM
- c** To begin changing the tuple, type
>CHA
and press the Enter key.
- d** To continue processing, type
>Y
and press the Enter key.
- e** Press the Enter key to scroll through the fields until you reach the field with the MAC address.
- f** Enter the new MAC address. Type
>drwr_id card_pec drwr_pec mac_address
and press the Enter key.
- where*
- drwr_id**
is the physical number of the drawer
- card_pec**
is NTEX54AA, NTEX54AB, or NTEX54BA
- drwr_pec**
is the PEC of the drawer
- mac_address**
is the MAC address of the new DBIC
- g** Press the Enter key to scroll through remaining fields.
- h** Confirm the change. Type
>Y
and press the Enter key.
- i** Exit the table. Type
>QUIT
and press the Enter key.

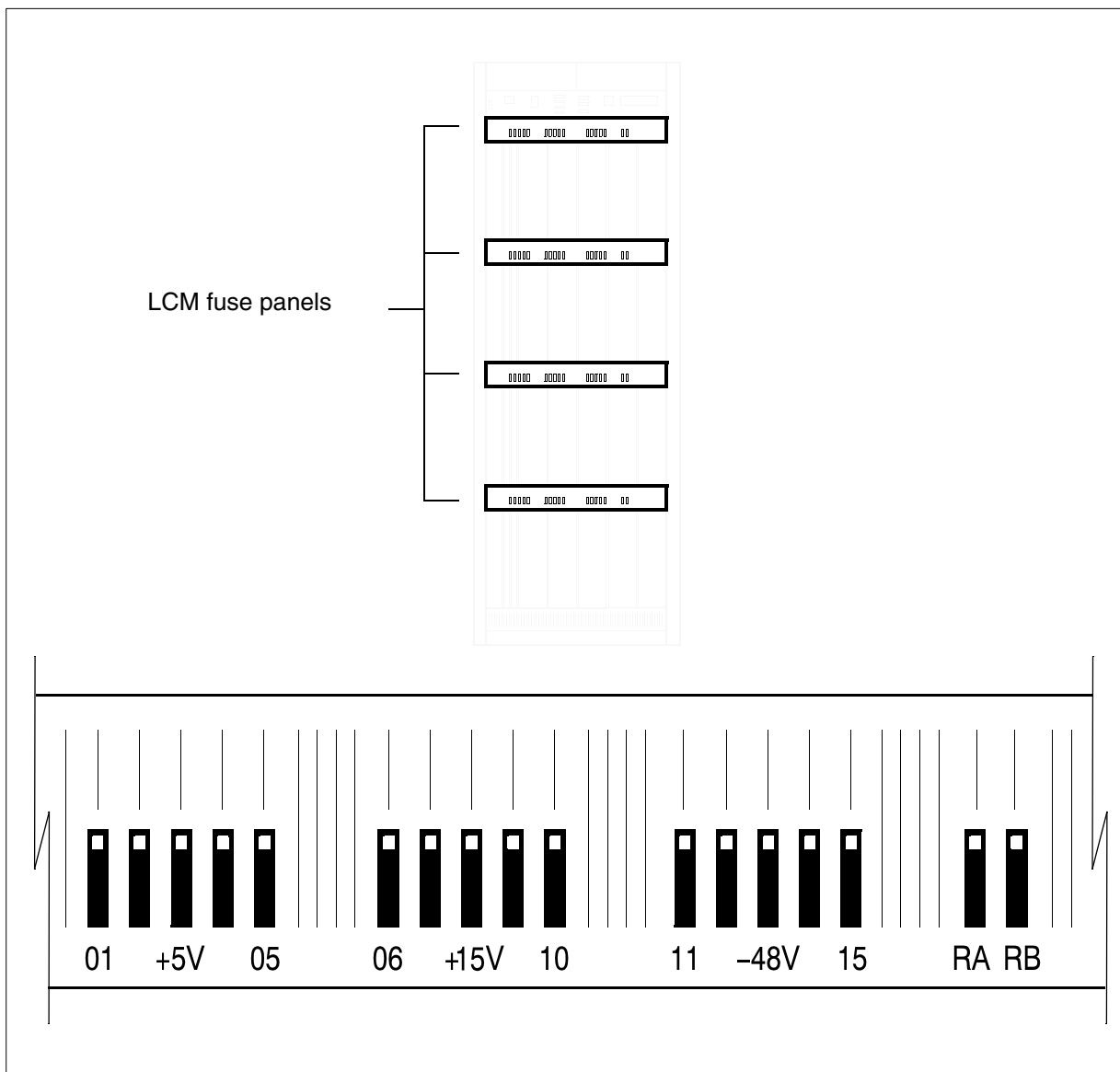
At the xEMS workstation

- 39** Go to the submap of the LCM line drawer with the new DBIC.
- 40** Select the card.
- 41** From the pop-up menu select Describe/Modify Object. The Object Description dialog box appears.
- 42** From the Object Description dialog box, select HSTP Application from the fields under Object Attributes.
- 43** Select View/Modify Object Attributes.
- 44** Enter the new MAC address in the MAC Address field.

Bus interface cards in an LCD (continued)

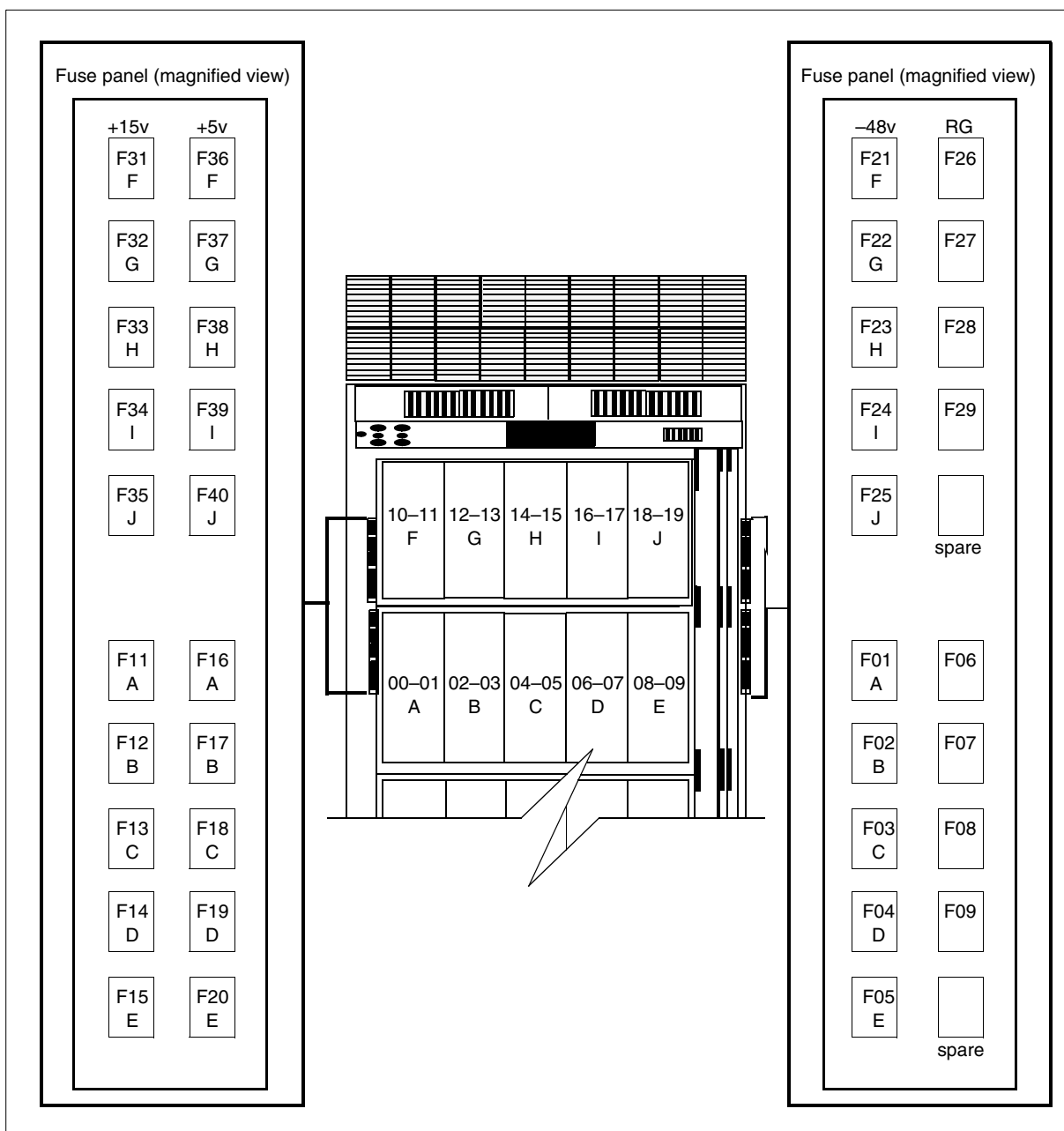
- 45 Clock OK to close the Attributes dialog box.
- 46 Click OK to close the Object Description dialog box.
- 47 To return the card to service, select
Maintenance -> DBIC -> Rts
from the pop-up menu.
- 48 You have successfully completed this card replacement procedure.

LCM fuse panel



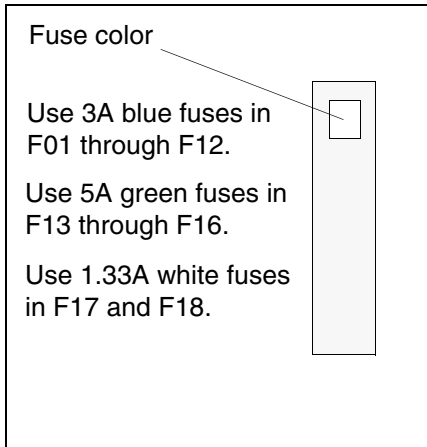
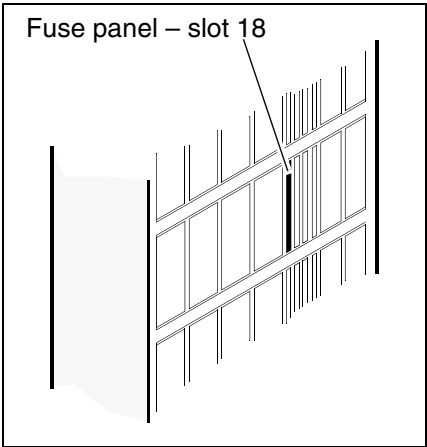
Bus interface cards in an LCD (continued)

ILCM fuse panel



**Bus interface cards
in an LCD (continued)**

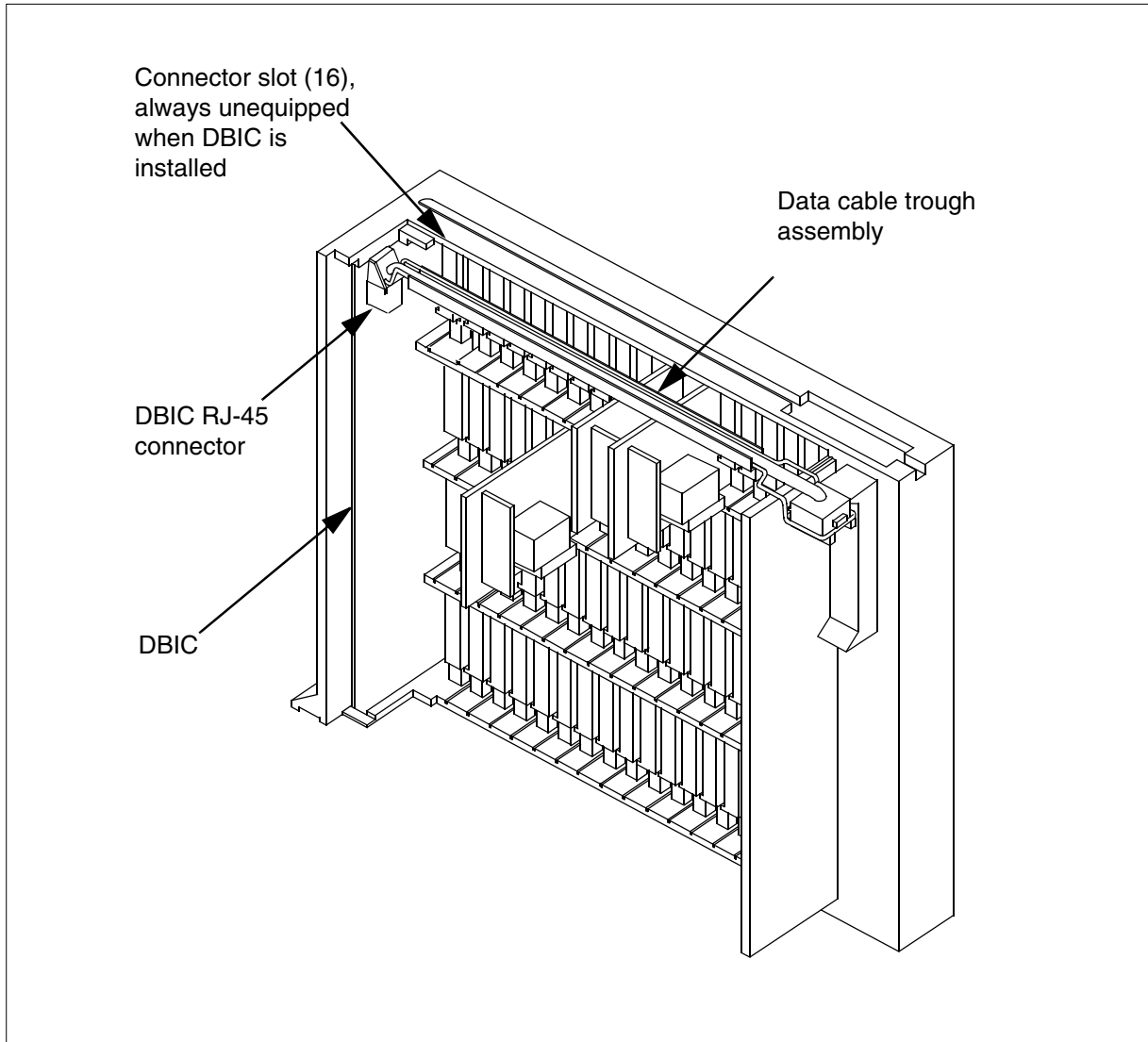
LCME fuse panel



Fuse location		Fuse location
–48V BR drawer 1 3A blue fuse	F01	–48V BR drawer 2 3A blue fuse
	F02	
–48V BR drawer 3 3A blue fuse	F03	–48V BR drawer 4 3A blue fuse
	F04	
–48V B drawer 1 3A blue fuse	F05	–48V B drawer 2 3A blue fuse
	F06	
–48V B drawer 3 3A blue fuse	F07	–48V B drawer 4 3A blue fuse
	F08	
+15 V drawer 1 3A blue fuse	F09	+15V drawer 2 3A blue fuse
	F10	
+15V drawer 3 3A blue fuse	F11	+15V drawer 4 3A blue fuse
	F12	
–48V Talk Batt drawer 1 5A green fuse	F13	–48V Talk Batt drawer 2 5A green fuse
	F14	
–48V Talk Batt drawer 3 5A green fuse	F15	–48V Talk Batt drawer 4 5A green fuse
	F16	
RING 0 1.33A white fuse	F17	Spare
	F18	1.33A white fuse

Bus interface cards in an LCD (end)

NT6X05AE line drawer with DBIC installed



Procedure history SN07 (DMS)

Procedure corrected according to CR Q00886580.

Procedure history section added.

Control complex cards in LCM-type PMs

Application

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

PEC	Suffix	Card name	Shelf or frame name
NT6X51	AA	LCM processor card	line concentrating module (LCM)
NT6X51	AB, AC	Extended LCM processor card	international LCM (ILCM), LCM
NT6X52	AA	LCM digroup control card	LCM
NT6X52	AB	International LCM digroup control card	ILCM
NTBX34	BA	ISDN LCME processor card	Enhanced LCM (LCME)
NTBX35	AA	ISDN LCME digroup control card	LCME

Refer to the Index, if you cannot identify one of the following features for the card that you want to replace;

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

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

Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Loading a PM*

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

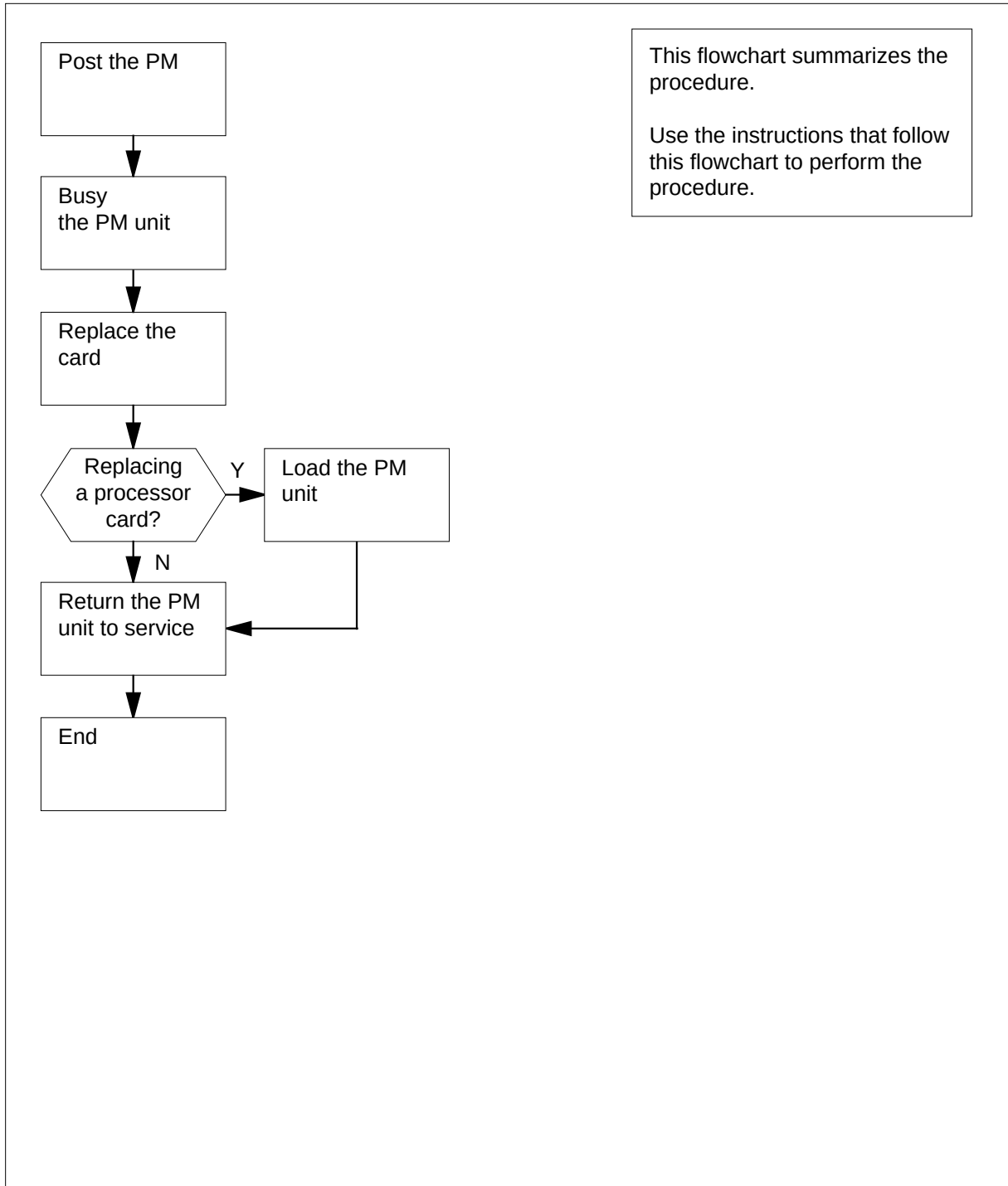
Control complex cards in LCM-type PMs (continued)

Action

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

Control complex cards in LCM-type PMs (continued)

Summary of replacing Control complex cards in LCM-type PMs



Control complex cards in LCM-type PMs (continued)

Replacing Control complex cards in LCM-type PMs

At your current location

1



WARNING

Loss of service

This procedure directs you to manually busy peripheral module (PM) units, which can cause service degradation. Perform this procedure if you need to restore out-of-service components. If you do not need to restore out-of-service components, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure the replacement card and the card to replace have the same PEC and PEC suffix.

At the MAP terminal

2 Access the PM level of the MAP display, type

>MAPCI;MTC;PM

and press the Enter key.

Example of a MAP display:

PM	SysB	ManB	OffL	CBsy	ISTb	InSv
	0	0	2	0	1	71

3 Post the LCM that contains the card to replace, type

>POST pm_type site frame_no pm_no

and press the Enter key.

where

pm_type

is the PM type (ILCM, LCM, LCME)

site

is the PM location (host or remote)

frame_no

is the frame number (00 to 99)

pm_no

is the number of the PM (0 or 1) in the frame

Control complex cards
in LCM-type PMs (continued)

Example of a MAP display:

```
LCM HOST 00 0 InSv Links 00S: Cside 0 Pside 0
Unit 0: InSv /RG:0
Unit 1: InSv /RG:1
Drwr: 01 23 45 67 89 11 11 11 11 11 RG: Pref 0 InSv
      .. .. .. .. .. 01 23 45 67 89 Stby 1 InSv
      .. .. .. .. .. .. .. .. .. ..
```

4 Determine the state of the PM unit associated with the card to replace.

If the state of the PM unit	Do
is SysB, CBSy, ISTb, or InSv	step 5
is ManB	step 6
is Offl	step 21

5 Busy the PM unit, type
>BSY UNIT unit_no
and press the Enter key.
where
unit_no
is the PM unit number (0 or 1)

Example of a MAP display:

```
LCM HOST 00 0 ISTb Links 00S: Cside 0 Pside 0
Unit0: ManB /RG: 0
Unit1: InSv Takeover /RG: 0
Drwr: 01 23 45 67 89 11 11 11 11 11 RG: Pref 0 InSv
      .. .. .. .. .. 01 23 45 67 89 Stby 1 InSv
      .. .. .. .. .. .. .. .. .. ..
```

```
bsy unit 0
LCM HOST 00 0 Unit 0 Bsy Passed
```

If the BSY command	Do
passed	step 6
failed	step 22

Control complex cards in LCM-type PMs (continued)

6	The next action depends on the type of card to replace.
	Do
	The card to replace is a step 8 NT6X52AA in a NTMX89FA.
	The card to replace is not a step 7 NT6X52AA in a NTMX89FA.
7	The next action depends on the card being replaced and the release of the NT6X53AA card.
	Do
	The card to replace is a step 8 NT6X52AA and the NT6X53AA in the same unit is release 50–58, 5C–5Z or AA–AU.
	The card to replace is a step 11 NT6X52AA and the NT6X53AA in the same unit is not release 50–58, 5C–5Z or AA–AU.
	If the card replaced is not a step 11 NT6X52AA.
8	Measure the +5VDC faceplate voltages on each of the two NT6X53AA power converter cards in the LCM. Determine if the NT6X53AA cards are within 200 millivolts of each other.
	Do
	The NT6X53AA +5VDC face- step 10 plate voltages are within 200 millivolts of each other.
	The NT6X53AA +5VDC face- step 9 plate voltages are not within 200 millivolts of each other.
9	Using the procedure entitled "Power cards in LCM-types PMs" replace the NT6X53AA that has the lower +5VDC faceplate voltage and return to step 8.
10	Power down the NT6X53 Power Converter Card in the PM unit containing the NT6X52AA card being replaced.

**Control complex cards
in LCM-type PMs** (continued)

At the shelf

11



WARNING

Static electricity damage

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

To replace the card, perform the procedure “Replacing a card” in this document. Complete the procedure and return to this point.

Note: If the card being replaced has switches, make sure the switches on the replacement card have the same settings.

12

The next action depends on the card replaced and the cabinet assembly.

If	Do
The card replaced is a step 14 NT6X52AA in a NTMX89FA.	
The card replaced is not a step 13 NT6X52AA in a NTMX89FA.	

13

The next action depends on the card replaced and the release of the NT6X53AA card.

If	Do
The card replaced is a step 14 NT6X52AA and the NT6X53AA in the same unit is release 50–58, 5C–5Z or AA–AU.	
The card replaced is a step 15 NT6X52AA and the NT6X53AA in the same unit is not release 50–58, 5C–5Z or AA–AU.	
If the card replaced is not a step 15 NT6X52AA.	

Control complex cards in LCM-type PMs (continued)

- 14** Restore power to the NT6X53 Power Converter Card in the PM unit containing the NT6X52AA card replaced.
- 15** The next action depends on the reason this procedure was performed.
- | If a maintenance procedure | Do |
|--------------------------------------|---------|
| directed you to this procedure | step 16 |
| did not direct you to this procedure | step 17 |
- 16** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.
- 17** Determine if the PM requires loading.
- | If the card replaced is | Do |
|-------------------------|---------|
| a NT6X51 or a NTBX34 | step 18 |
| a NT6X52 or a NTBX35 | step 20 |

At the MAP terminal

- 18** Load the PM, type
>LOADPM UNIT unit_no
and press the Enter key.
where
unit_no
is the PM unit number (0 or 1)

Example of a MAP response:

LCM HOST 00 0 Unit 0 LoadPM Passed

If the LOADPM command	Do
failed	step 19
passed	step 20
- 19** To load the PM unit, perform the procedure “Loading a PM” in this document. Complete the procedure and return to this point.

**Control complex cards
in LCM-type PMs (end)**

- 20** Return the PM to service, type

>RTS UNIT unit_no

and press the Enter key.

where

unit_no

is the PM unit number (0 or 1)

Example of a MAP response:

LCM HOST 00 0 Unit 0 OSvce Tests Initiated

LCM HOST 00 0 Unit 0 Tst Passed

LCM HOST 00 0 Unit 0 Rts Passed

LCM HOST 00 0 Unit 0 InSvce Tests Initiated

LCM HOST 00 0 Unit 0 Tst Passed

If the RTS command	Do
failed	step 22
passed	step 23

- 21** To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.
- 22** For additional help, contact the next level of support.
- 23** The procedure is complete.

Line cards in an LCE line drawer

Application

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

PEC	Suffix	Card name	Shelf or frame name
NT6X17	AA, AB, AC, AD	Type A standard line card	Line concentrating module (LCM), Enhanced LCM (LCME), International LCM (ILCM)
NT6X17	BA	Type A world line card	ILCM, LCM, LCME
NT6X18	AA	Type B line card	LCM, LCME
NT6X18	AB	Type B line card with +48 V	LCM, LCME
NT6X18	BA	Type B world line card	LCM, LCME
NT6X19	AA	Message waiting line card	LCM, LCME
NT6X21	AA, AB, AC	Type C standard line card	LCM, LCME
NT6X21	BC	Type C line card (A-law)	LCM, LCME
NT6X33	AA	Type A world line card	ILCM, LCM, LCME
NT6X71	AA, AB	Data line card (DLC) DMS-100/SL-100	LCM, LCME
NT6X71	BA	Single slot data line card (DLC) DMS-100/SL-100	LCM, LCME
NT6X76	AA, AD	Asynchronous interface line card	LCM, LCME
NT6X76	AC	Enhanced asynchronous interface line card	LCM, LCME
NT6X93	AA, BA, CA, DA, EA, FA	Type A international line card	ILCM, LCM

Line cards in an LCE line drawer (continued)

PEC	Suffix	Card name	Shelf or frame name
NT6X94	AA, AB, BA, BB, CA, DA	International coin, PBX, SPM line card	ILCM
NT6X98	AA	SCOPEDIAL line card	ILCM, LCM, LCME
NT6X99	AA	IBERT datapath line card	LCM, LCME
NTBX25	AB	ISDN U-line card	LCME
NTBX26	AA	ISDN S/T interface line card	LCME
NTBX27	AA	2B1Q U-interface ISDN line card	LCME
NTEX17	AA, BA, CA, DA	1-Meg Modem xDSL line card (xLC)	LCM, ILCM

Refer to the Index, if you cannot identify one of the following features for the card that you want to replace;

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

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

Common procedures

This procedure refers to *Replacing a line card*.

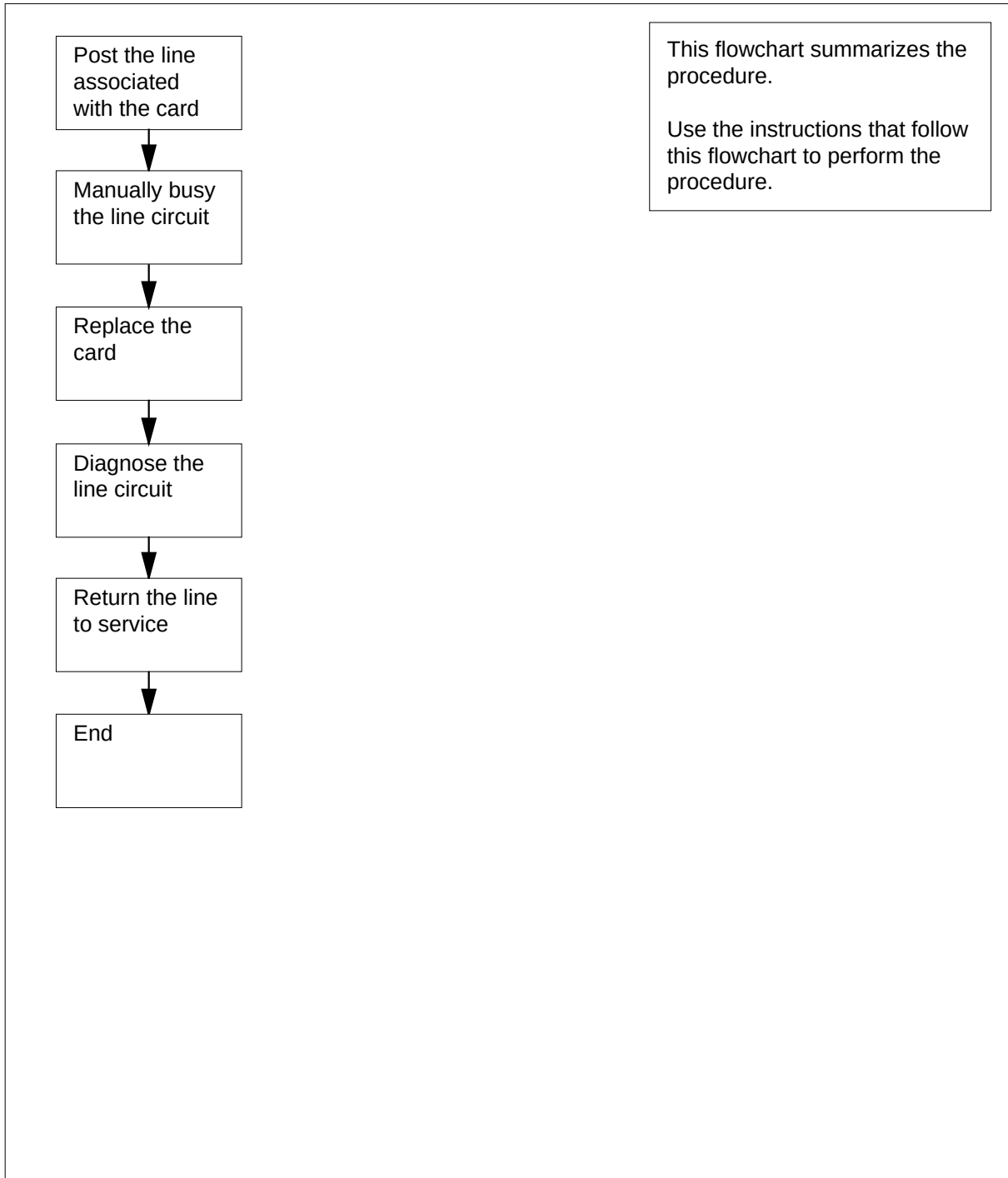
Do not go to the common procedure unless the step-action procedure directs you to go.

Action

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

Line cards in an LCE line drawer (continued)

Summary of replacing Line cards in an LCE line drawer



Line cards in an LCE line drawer (continued)

Replacing Line cards in an LCE line drawer

At your current location

1



CAUTION

Loss of service

This procedure directs you to manually busy a minimum of one line. Removal of a line from service can cause the system to drop calls in progress. Perform this procedure only if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card that you remove have the same PEC and PEC suffix.

If the card is	Do
a NTEX17AA, NTEX17BA, NTEX17CA, or NTEX17DA	step 2
any other card	step 4

At the xEMS workstation

2 Go to the submap of the LCM line drawer with the xLC that you will replace.

3 To busy the card, select
Maintenance : XLC -> MB
and press the Enter key.

At the MAP terminal

4 To access the LTP level of the MAP display, type
>MAPCI;MTC;LNS;LTP
and press the Enter key.

Example of a MAP display:

Line cards in an LCE line drawer (continued)

POST DELQ BUSYQ PREFIX

LCC PTY RNG LEN.....DN STA F S LTA TE RESULT

Note: If you worked at the LTP level of the MAP display, a posted line can be present. A posted line does not interfere with this maintenance procedure.

- 5 To post the line that associates with the card you replace, type
>POST L site frame_no unit_no drawer_no slot_no
 and press the Enter key.

where

site

is the PM location (alphanumeric)

frame_no

is the frame number (0 to 511)

unit_no

is the PM unit number (0 or 1)

drawer_no

is the logical drawer number (0 to 19)

slot_no

is the card slot number (0 to 31)

Example of a MAP display:

LCC PTY RNG LEN..... DN STA F S LTA TE RESULT
 1FR HOST 01 0 01 01 621 1134 IDL

- 6 Determine the state of the posted line.

If the state of the line	Do
is CPB, CPD	step 7
is CUT, HAZ, IDL, LO, PLO, SB	step 8
is MB	step 9
is NEQ	step 14
is DEL, DMB, INB, LMB	step 15

- 7 Wait until the line state changes. Go to step 6.

- 8 To manually busy the line circuit, type

>BSY

Line cards in an LCE line drawer (continued)

and press the Enter key.

Example of a MAP display:

```
LCC PTY RNG .....LEN.....  DN  STA F S LTA  TE  RESULT
1FR          HOST 01 0 01 01  621 1134 MB
```

Note: Observe that the state that appears under the STA header changed to MB.

If BSY command	Do
passed	step 9
failed	step 15

At the shelf

9



WARNING

Static electricity damage

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

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

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

At the MAP terminal

10 To perform a diagnostic test on the line, type

>DIAG

and press the Enter key.

Example of a MAP response:

Line cards in an LCE line drawer (continued)

```
ECOME004AH ***+LINE100 DEC17 10:04:26 0200 PASS LN_DIAG
      LENHOST 01 0 11 02      NO DIRN
      DIAGNOSTIC RESULT Card Diagnostic      OK
      ACTION REQUIRED None
      CARD TYPE 6X17AA
```

	If the DIAG command	Do
	passed	step 11
	failed	step 15
11	To return the line to service, type >RTS and press the Enter key.	
	If RTS command	Do
	passed	step 16
	failed	step 15
12	The next action depends on the reason that you perform this procedure.	
	If a maintenance procedure	Do
	directed you to this procedure	step 13
	did not direct you to this procedure	step 10
13	Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.	
14	To determine why the component is offline or not equipped, consult operating company personnel. Continue as directed by operating company personnel.	
15	For additional help, contact the next level of support.	
16	The next step depends on the PEC of the line card.	
	If the card is	Do
	a NTEX17AA, NTEX17BA, NTEX17CA, or NTEX17DA	step 17
	any other card	step 19

Line cards in an LCE line drawer (end)

At the xEMS workstation

- 17 Go to the submap of the LCM line drawer with the xLC that you replaced
- 18 To return the card to service, select
Maintenance : XLC -> IDL
and press the Enter key.
- 19 The procedure is complete.

NT6X30 in LCE-type frames

Application

Use this procedure to replace an NT6X30 in the shelves or frames listed in the following table.

PEC	Suffix	Card name	Shelf or frame name
NT6X30	AA, AE, BA, BB, CA, DA, DB, FA, GB	Ringing generator card	LCE, ISDN LCE (LCEI) frame
NT6X30	EA, GA, HA, JA, GB	Ringing generator card	Cabinetized LCE (CLCE) frame, Cabinetized Remote Switching Center (CRSC)

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

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

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

Common procedures

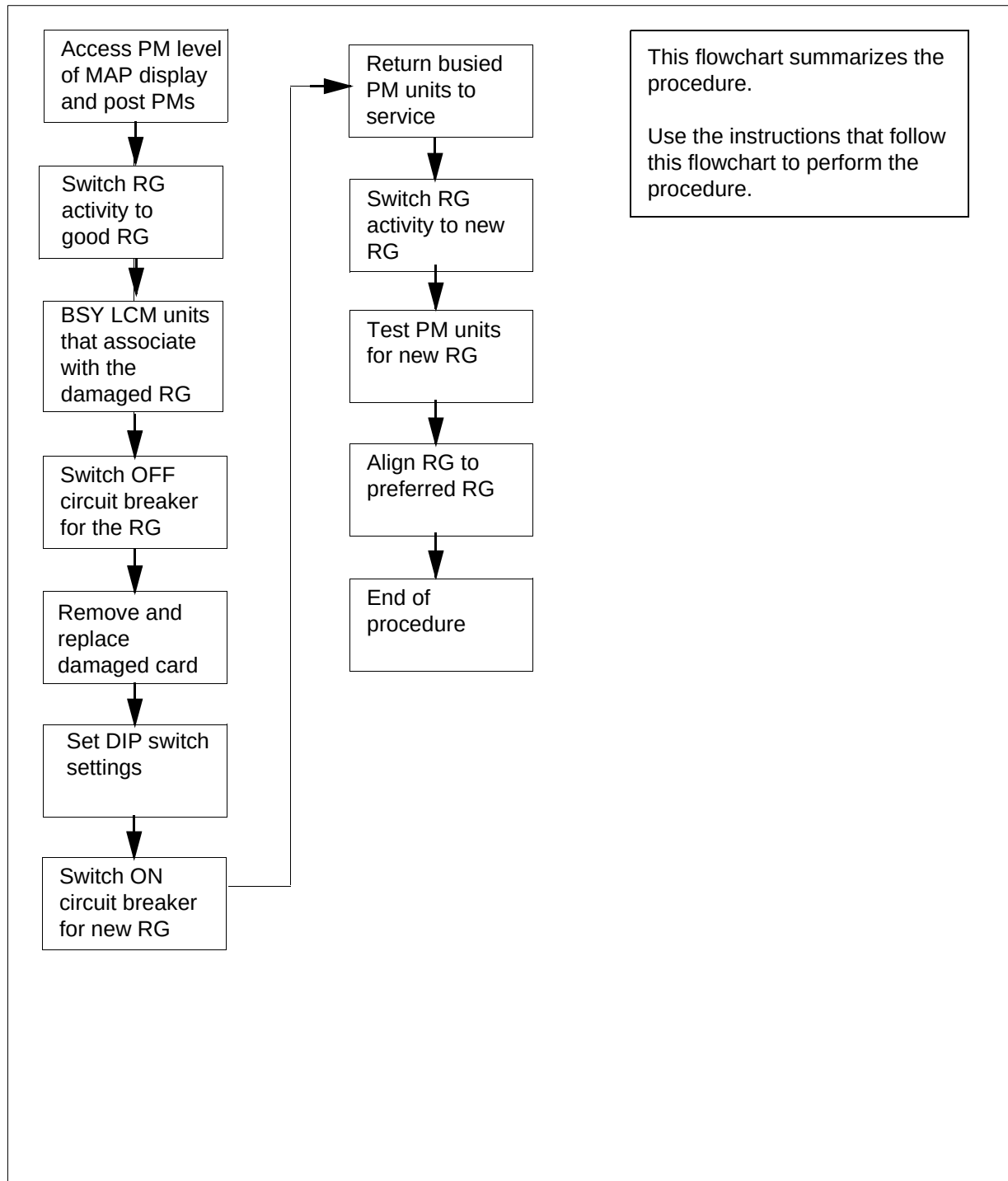
There are no common procedures.

Action

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

NT6X30 in LCE-type frames (continued)

Summary of replacing a NT6X30 in LCE-type frames



NT6X30 in LCE-type frames (continued)

Replacing a NT6X30 in LCE-type frames

At your current location

1



WARNING

Loss of service

This procedure manually busies peripheral module (PM) units and can cause service degradation. Perform this procedure only if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain an approved replacement card.

At the MAP terminal

2 To access the PM level of the MAP display, type

>MAPCI;MTC;PM

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	2	0	1	71

3 To post a peripheral module (PM) in the frame that associates with the ringing generator (RG) that you replace, type

>POST pm_type site frame_no pm_no

and press the Enter key.

where

pm_type

is the PM type (LCM, LCME, LCMI)

site

is the PM location (alphanumeric)

frame_no

is the frame number (00 to 511)

pm_no

is the number of the PM (0 or 1) in the frame

Example of a MAP display:

NT6X30

in LCE-type frames (continued)

```

LCM HOST 00 0 ISTb Links 00S: Cside 0 Pside 0
Unit 0: ISTb /RG:0
Unit 1: InSv /RG:0

Drwr: 01 23 45 67 89 11 11 11 11 11 RG: Pref 0 ISTb
      .. .. .. .. .. 01 23 45 67 89 Stby 1 InSv

```

Note: Two PMs can be present in the equipment frame. If two PMs are present in the frame, repeat steps 4 through 9 for both PMs.

- 4** Check the state of the PM units.

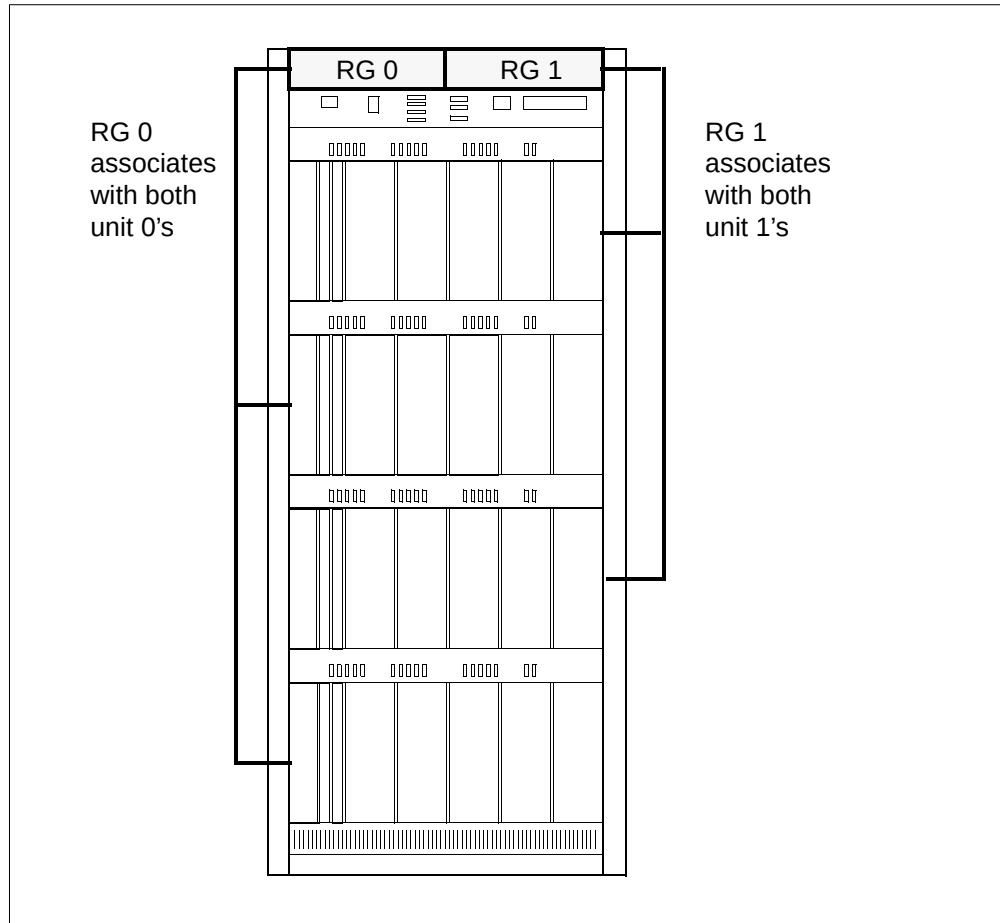
If	Do
the PM or PM units are Offl or SysB	step 5
one unit is InSv or ISTb and the other unit is SysB	step 6

- 5** Check the state of the other PM in the frame.

If the other PM	Do
is Offl or SysB	step 37
is InSv or ISTb	step 6

- 6** Record the numbers of the PM units that the defective RG services.

NT6X30 in LCE-type frames (continued)



- 7 To switch RG activity for the PM unit assigned to the damaged RG, type
>SWRG UNIT unit_no
 and press the Enter key.

where

unit_no

is the PM unit number (0 or 1)

Example of a MAP response:

LCM HOST 00 0 Unit 0 SWRG Passed

Note: Repeat this command for the other PM units that associate with the defective RG.

- 8 To manually-busy (ManB) the PM unit that associates with the defective RG, type
>BSY UNIT unit_no

NT6X30 in LCE-type frames (continued)

and press the Enter key.

where

unit_no

is the PM unit number (0 or 1) that associates with the damaged RG

Example of a MAP response:

```
LCM HOST 00 0 Unit 0 Bsy Passed
```

Note: Repeat this command for the other PM in the frame.

	If the BSY command	Do
	passed	step 9
	failed	step 36
9	The next action depends on the number of PMs in the equipment frame.	
	If	Do
	one PM is present in the frame	step 11
	two PMs are present in the frame, and you did not switch RG activity for both PMs	step 10
	two PMs are present in the frame, and you switched RG activity for both PMs	step 11
10	Repeat steps 4 to 9 for the other PM in the equipment frame.	
11	To post both PMs in the frame, and make sure that all units are now on the good RG, type	
	>POST pm_type site frame_no pm_no site frame_no pm_no	
	and press the Enter key.	
	where	
	pm_type	is the PM type (LCM, LCME, LCMI) of the first PM
	site	is the PM location (alphanumeric) of the first PM
	frame_no	is the frame number (00 to 511) of the first PM
	pm_no	is the number of the first PM (0 or 1) in the frame,

NT6X30
in LCE-type frames (continued)

site
is the PM location (alphanumeric) of the second PM

frame_no
is the frame number (00 to 511) of the second PM

pm_no
is the number of the second PM (0 or 1) in the frame,

Example of command

>POST LCM HOST 00 0 HOST 00 1

Example of a MAP display:

```
LCM HOST 00 0 ISTb Links 00S: Cside 0 Pside 0
Unit 0: ISTb      /RG:1
Unit 1: InSv      /RG:1
Drwr:  01  23  45  67  89  01  23  45  67  89  RG: Pref 0 ISTb
      ..  ..  ..  ..  ..  ..  ..  ..  ..  ..  Stby 1 InSv
      ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
```

To examine the other PM in the frame, type

>NEXT

and press the Enter key.

Example of a MAP display:

```
LCM HOST 00 1 ISTb Links 00S: Cside 0 Pside 0
Unit 0: ISTb      /RG:1
Unit 1: InSv      /RG:1
11  11  11  11  11  RG: Pref 0 ISTb
Drwr:  01  23  45  67  89  01  23  45  67  89  Stby 1 InSv
      ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
```

If both PMs	Do
are on the good RG	step 13
are not on the good RG	step 12

12 Repeat steps 4 to 9 for the other PM in the equipment frame.

NT6X30 in LCE-type frames (continued)

At the shelf

13



WARNING

Static electricity damage

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

Put on a wrist strap.

14



DANGER

Risk of personal injury

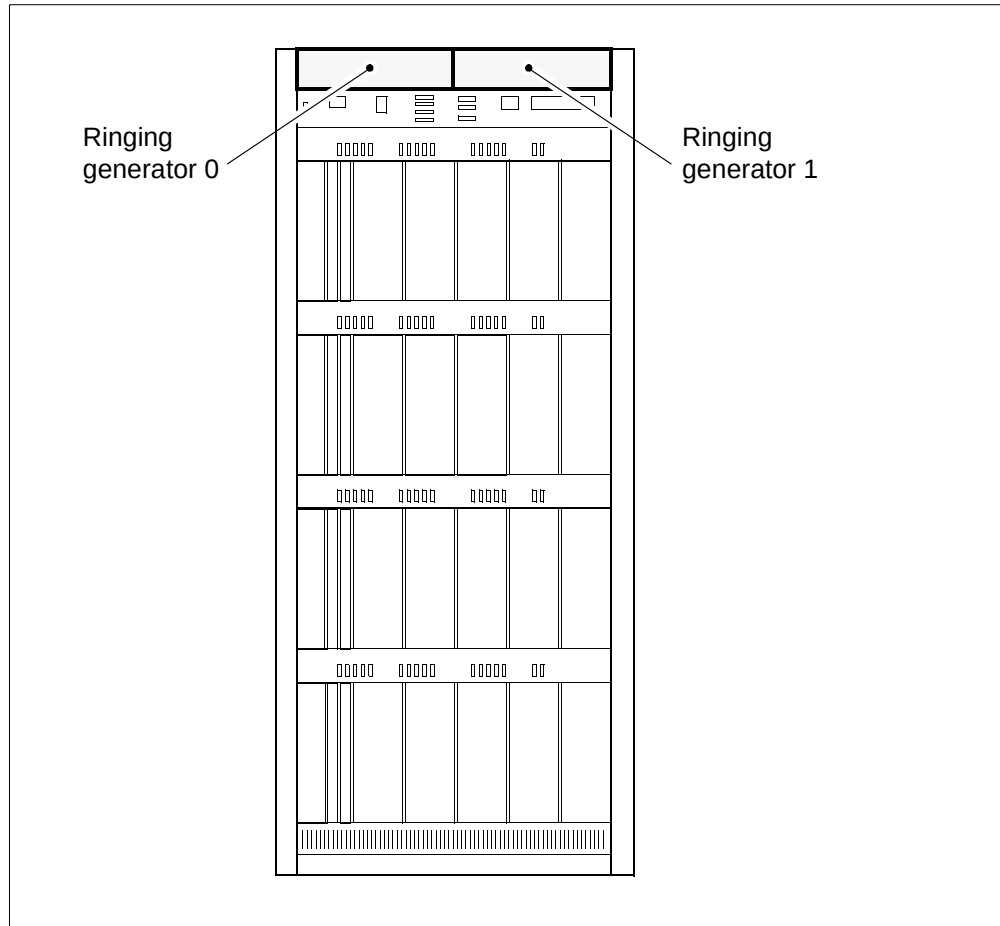
Make sure that you switch off the correct circuit breaker on the FSP as the following steps describe. Do not proceed until you locate and switch off the correct circuit breaker for the RG you replace.

Switch off the circuit breaker on the FSP that powers the defective RG card you want to replace.

15 Locate the RG you want to replace.

Note: At the front of the equipment frame, RG 0 is on the left side of the frame, RG 1 is on the right side of the frame.

NT6X30 in LCE-type frames (continued)



16



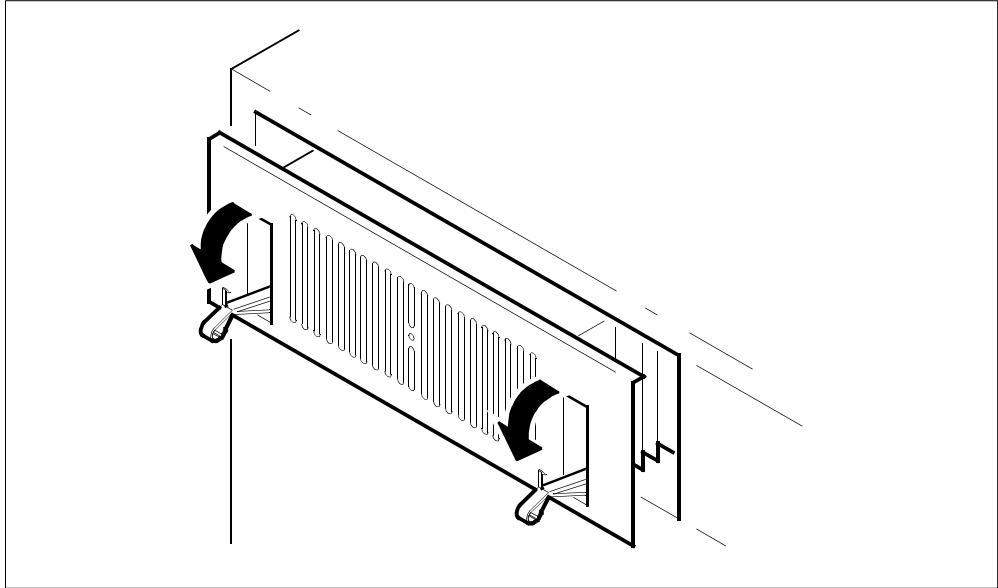
DANGER

Do not hold the card by the levers only

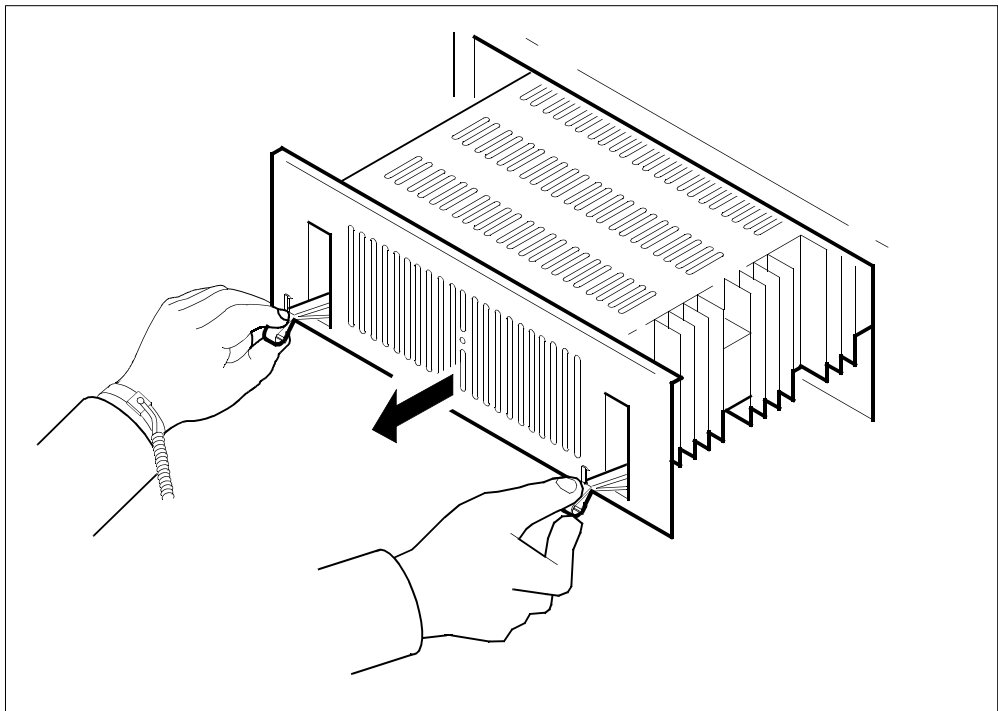
If you hold a card by the locking levers only, the locking levers can break. Pull the card half way out of the shelf and carefully grasp the card from below for more support. Continue to remove the card from the shelf. Do not touch any wires or internal parts on the card.

Open the locking levers on the face of the card.

NT6X30
in LCE-type frames (continued)



- 17** Grasp the locking levers and carefully pull the card toward you until the card protrudes halfway out of the shelf.



NT6X30
in LCE-type frames (continued)

- 18** Grasp the card by the face plate with one hand and support the card from the bottom with the other hand. Carefully pull the card toward you until the card clears the shelf.
- 19** Place the removed card in an electrostatic discharge (ESD) protective container.
- 20**



CAUTION

Loss of service

Incorrect DIP switch setting can result in a service outage. Check the DIP switch layout for the switch numbering and for the ON and OFF position.



DANGER

Potential equipment damage

The newer versions of the ringing generator (versions with suffixes BB, CA, DB, GB, HA, or JA) use switch 8. Make sure that switch 8 is in the ON position on the replacement card.

Set the DIP switch settings on the replacement card.

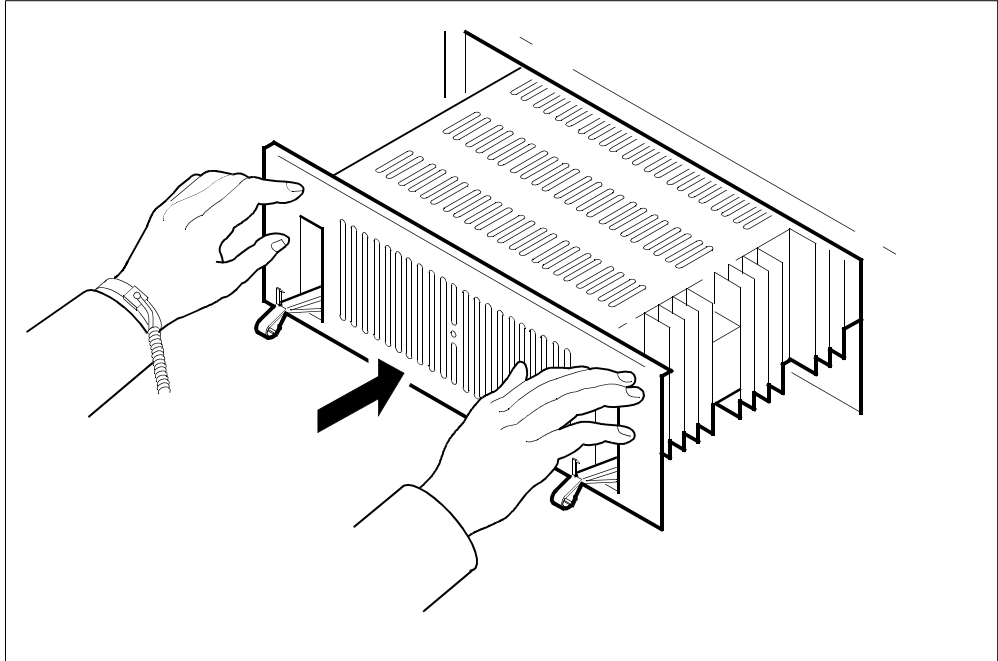
Note 1: Set the dip switches on the replacement card using the switch settings from the card being replaced.

Note 2: The layout/order of the dip switches on the two packs may be different. Ensure that the switch settings of the pack being replaced are transferred accurately to the correct switch on the replacement pack.

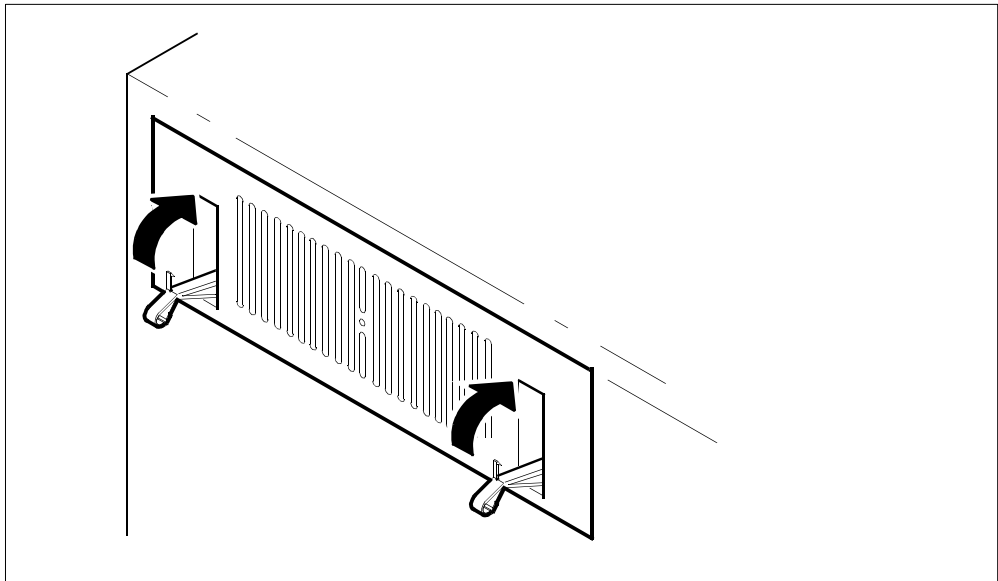
Note 3: If you replace an older version NT6X30 with a newer version, switch 8 on the replacement card must be in the ON position. Newer versions of the NT6X30 have suffixes BB, CA, DB, GB, HA, or JA. If you are not sure, contact the next level of support.

- 21** Open the locking levers on the replacement card. Align the card with the right slot in the shelf and carefully slide the card into the shelf.

NT6X30 in LCE-type frames (continued)



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



NT6X30 in LCE-type frames (continued)

- 23** Switch ON the circuit breaker that you switched to the OFF position on the FSP at step 13.

If	Do
the circuit breaker remains switched and the LED light on the FSP turns off	step 24
the circuit breaker trips or the LED light on the FSP does not turn off	step 37

- 24** Remove the wrist strap.

- 25** The next action depends on the reason you perform this procedure.

If	Do
a maintenance procedure directed you to this procedure	step 26
a maintenance procedure did not direct you to this procedure	step 27

- 26** Return to the maintenance procedure that sent you to this procedure and continue as directed.

At the MAP terminal

- 27** To post a PM in the frame, type
>POST pm_type site frame_no pm_no
 and press the Enter key.
where
 pm_type
 is the PM type (LCM, LCME, LCMI)
 site
 is the PM location (alphanumeric)
 frame_no
 is the frame number (00 to 511)
 pm_no
 is the number of the PM (0 or 1) in the frame
- 28** Wait until system-initiated maintenance on the unit stops.
- 29** To return the ManB unit to service, type
>RTS UNIT unit_no
 and press the Enter key.

NT6X30

in LCE-type frames (continued)

where

unit_no

is the number (0 or 1) of the PM unit

- 30** To switch RG activity to the new RG, type

>SWRG UNIT unit_no

and press the Enter key.

where

unit_no

is the PM unit number (0 or 1)

Example of a MAP display:

```
LCM HOST 00 0 InSv Links 00S: Cside 0 Pside 0
Unit 0: InSv /RG:1
Unit 1: InSv /RG:1
Drwr: 01 23 45 67 89 11 11 11 11 11 RG: Pref 0 InSv
      .. .. .. .. .. 01 23 45 67 89 Stby 1 InSv
```

If the SWRG command

Do

passed, and you must switch RG activity for the other PM unit step 31

passed, and RG activity is acceptable for both PM units step 32

failed step 36

- 31** Repeat step 30 for the other PM unit.

- 32** To test the new RG, type

>TST PM

and press the Enter key.

Example of a MAP display:

```
tst pm
LCM HOST 00 1 Unit 1 InSvce Tests Initiated
LCM HOST 00 1 Unit 0 InSvce Tests Initiated
LCM HOST 00 1 Unit 1 Tst Passed
LCM HOST 00 1 Unit 0 Tst Passed
```

Note: Repeat this command for the other PM in the frame.

- 33** To align RG activity to the preferred RG, type

>SWRG UNIT unit_no

and press the Enter key.

where

NT6X30
in LCE-type frames (end)

unit_no
is the PM unit number (0 or 1)

Example of a MAP display:

```
LCM HOST 00 0 InSv Links 00S: Cside 0 Pside 0
Unit 0: InSv /RG:0
Unit 1: InSv /RG:0
Drwr: 01 23 45 67 89 11 11 11 11 11 RG: Pref 0 InSv
      .. .. .. .. .. 11 11 11 11 11 Stby 1 InSv
      .. .. .. .. .. .. .. .. .. ..
```

34 The next action depends on the number of PMs present in the equipment frame.

If	Do
one PM is present in the frame	step 38
two PMs are present in the frame, and you did not switch RG activity for both PMs	step 35
two PMs are present in the frame, and you switched RG activity for both PMs	step 38

- 35** Repeat steps 27 to 33 for the other PM in the equipment frame.
- 36** Consult operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.
- 37** For additional help, contact the next level of support.
- 38** The procedure is complete.

**NTBX71
in an LCME**

Application

Use this procedure to replace a NTBX71 in an enhanced line concentrating module (LCME), as listed in the following table.

PEC	Suffix	Card name	Shelf or frame name
NTBX71	AA	ISDN enhanced line drawer point-of-use power supply (PUPS) card	LCME

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

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

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

Common procedures

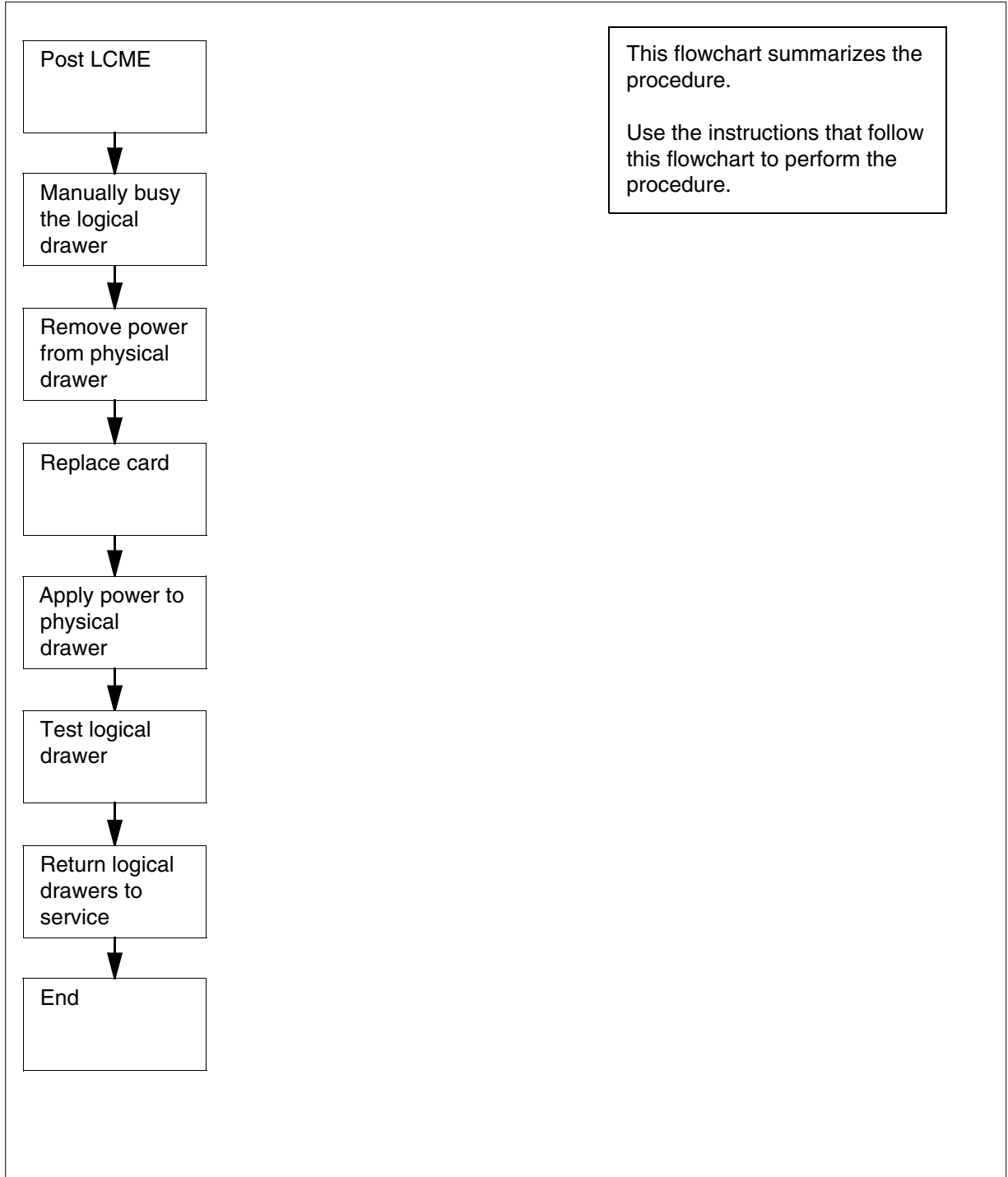
There are no common procedures

Action

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

NTBX71 in an LCME (continued)

Summary of replacing an NTBX71 in an LCME



NTBX71 in an LCME (continued)

Replacing an NTBX71 in an LCME

At your current location

1



WARNING

Loss of service

This procedure manually busies line drawers and can cause the system to drop calls in progress. Perform this procedure only if you need to restore out-of-service components. If you do not need this procedure for a return to service, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

At the MAP terminal

2 To access the PM level of the MAP display, type

>MAPCI ; MTC ; PM

and press the Enter key.

Example of a MAP display:

PM	SysB	ManB	OffL	CBsy	ISTb	InSv
	0	0	2	0	1	71

3 To post the PM that contains the card you replace, type

>POST LCME site frame_no pm_no

and press the Enter key.

where

site

is the PM location (alphanumeric)

frame_no

is the frame number (00 to 99)

pm_no

is the number of the PM (0 or 1) in the frame

Example of a MAP display:

```

LCME HOST 55 0   InSv   Links OOS: Cside 0 PSide 0
Unit0: InSv                               /RG: 0
Unit1: InSv                               /RG: 0
                                11 11 11  RG: Pref 0 InSv
Drwr:  01 23 45 67 89 01 23 45          Stby 1 InSv
      .. .. -- -- -- -- .. ..

```

NTBX71 in an LCME (continued)

- 4 Check the state of the logical drawers that associate with the PUPS card you replace.

If the state of	Do
one or both logical drawers is I, (dot) . , or S	step 5
both logical drawers is M	step 7
one or both logical drawers is O or -	step 24

- 5 To manually busy one of the logical drawers, type

```
>BSY DRWR drwr_no
```

and press the Enter key.

where

drwr_no

is the logical drawer number (0 to 15)

Example of a MAP response:

```
WARNING ... this action will affect both drwrs 0 and 1
LCME HOST 55 0 Drwr 0 will be taken out of service
Please confirm ("YES", "Y", "NO", or "N"):
```

- 6 To confirm the command, type

```
>YES
```

and press the Enter key.

Example of a MAP display:

```
LCME HOST 55 0    InSv    Links OOS: Cside  0 PSide  0
Unit0: InSv                      /RG: 0
Unit1: InSv                      /RG: 0
                                11  11  11  RG: Pref 0 InSv
Drwr:  01  23  45  67  89  01  23  45      Stby 1 InSv
      MM  ..  --  --  --  --  ..  ..
yes
LCME HOST 55 0 Drwr 0 Bsy Passed
```

Note: Both logical drawers that associate with the physical drawer are made manually busy through this action.

NTBX71 in an LCME (continued)

At the shelf

7



WARNING

Static electricity damage

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



DANGER

Potential equipment damage

Note fuses that you remove from the fuse panel. If you do not insert fuses again in the correct location, equipment damage results.

Remove fuses for the line drawer.

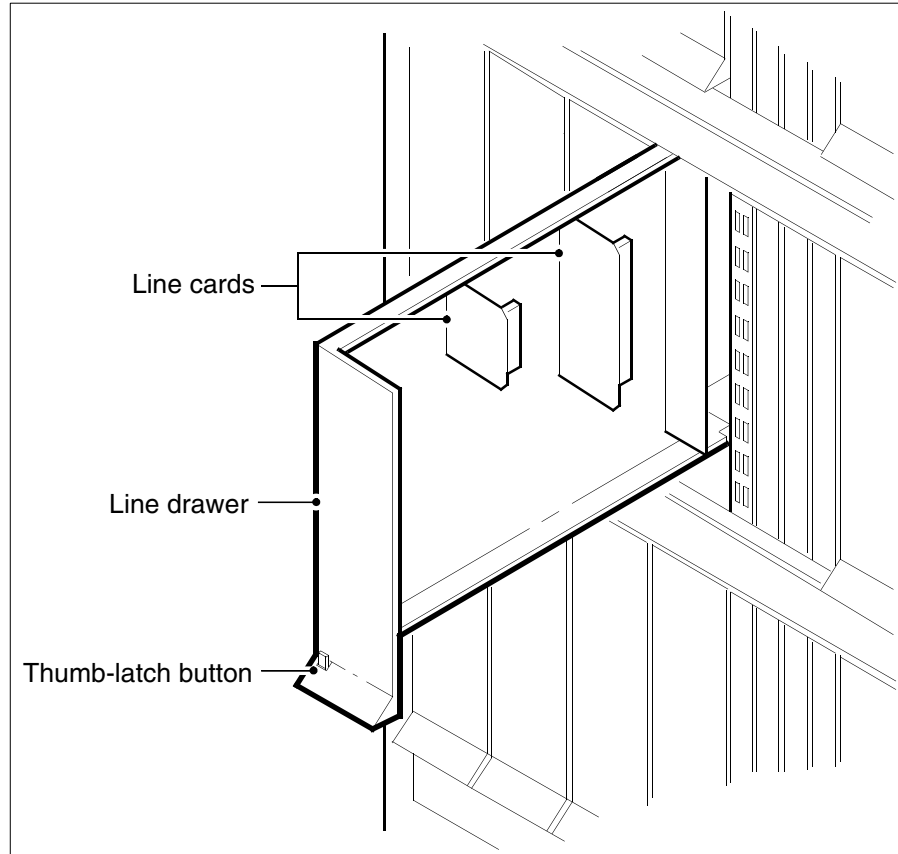
Note: Fuse markings do not always identify voltage. Make sure that you note fuses and the location of the fuses in the fuse panel.

- a Remove the -48 V Talk Battery fuse for the line drawer that contains the BIC you replace. Refer to the figure , (LCME fuse panel) for fuse location.
- b Remove the +15 V fuse for the line drawer that contains the BIC you replace. Refer to the figure , (LCME fuse panel) for fuse location.
- c Remove the -48 V Battery fuse for the line drawer that contains the BIC you replace. Refer to the figure , (LCME fuse panel) for fuse location.
- d Remove the -48 V Return fuse for the line drawer that contains the BIC you replace. Refer to the figure , (LCME fuse panel) for fuse location.

8 Locate the drawer that contains the card.

9 Locate the drawer. Press in the small thumb-latch button on the lower left edge of the drawer and pull the drawer out. To secure the drawer in a steady horizontal position, tip the drawer until the catch rests on the line drawer track.

NTBX71 in an LCME (continued)



Note: Use the insertion/removal tools to change a point-of-use power supply (PUPS) card in a line drawer. The insertion/removal tools are the small circuit pack puller (A9975), and the double slot line card insertion/removal tool (A8795).

- 10 Place double slot line card removal/insertion tool A8795 over the PUPS card and the cards in the line card slots. The line card slots are located next to the PUPS card. Refer to the figure "Removing the PUPS card" for the removal of the PUPS card.
- 11 Grasp the top of the line drawer with the left hand. Place your left thumb on the handle of the insertion/removal tool and your fingers on the rear of the line drawer. For line drawers 6/7 and 14/15, apply slight pressure with your left hand. Use your left hand to push the drawer away to clear the fuses in the next circuit pack position. Refer to the figure "Removing the PUPS card" for the removal of the PUPS card.
- 12 Grasp the PUPS card with the circuit pack puller A9975 in the center of the card. At the same time, apply pressure to the insertion/removal tool. To remove the card, pull the card straight out from the line drawer slot. Refer to the figure "Removing the PUPS card" for the removal of the PUPS card..
- 13 Place the removed card in an electrostatic discharge (ESD) protective container.

NTBX71 in an LCME (continued)

- 14 Make sure that the replacement card and the card you removed have the same PEC and PEC suffix.
- Note:** If the card you replace has switches, make sure that the switches on the replacement card have the same settings.
- 15 To insert the replacement card in the slot, use the insertion/removal tool A8795 and puller A9975. Seat the card completely in the slot.
- 16 Unlatch the catch from the line drawer track and slide the drawer back into place. Refer to the figure “Removing the PUPS card” for the removal of the PUPS card.

17

**DANGER****Potential equipment damage**

Note fuses that you remove from the frame. If you do not insert the fuses again in the correct location on the fuse panel, equipment damage results.

Insert the fuses that that you removed in step 7.

Note: Fuses are coded for position. The colored square on the face of the fuse identifies the top edge.

- a Insert the -48V Battery Return fuse.
 - b Insert the -48V Battery fuse.
 - c Insert the +15V fuse.
 - d Insert the -48V Talk Battery fuse.
- 18 The next action depends on the reason you perform this procedure.

If	Do
a maintenance procedure directed you to this procedure	step 19
a maintenance procedure did not direct you to this procedure	step 20

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

At the MAP terminal

- 20 A maintenance flag (Mtce) can appear. This flag indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears before you proceed to the next step.
- 21 To perform a diagnostic test on the first logical drawer of the pair, type
- ```
>TST DRWR drwr_no
```

## NTBX71

### in an LCME (continued)

---

and press the Enter key.

where

**drwr\_no**

is the logical drawer number (0 to 15)

*Example of a MAP response:*

```
OSvce Tests Initiated
LCME HOST 55 1 Drwr 0 Tst Passed
LCME HOST 55 1 Drwr 0 Rts Passed
```

---

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 22 |
| failed             | step 25 |

---

- 22** To perform a diagnostic test on the second logical drawer of the pair, type

>TST DRWR drwr\_no

and press the Enter key.

where

**drwr\_no**

is the logical drawer number (0 to 15)

---

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 23 |
| failed             | step 25 |

---

- 23** To return the logical drawer to service, type

>RTS DRWR drwr\_no

and press the Enter key.

where

**drwr\_no**

is the logical drawer number (0 to 15)

**Note:** The RTS command returns both logical drawers to service.

*Example of a MAP response:*

---

**NTBX71**  
**in an LCME** (continued)

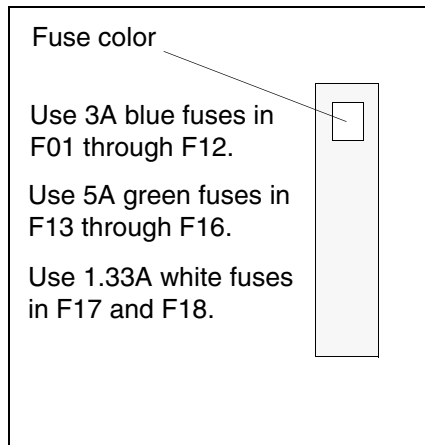
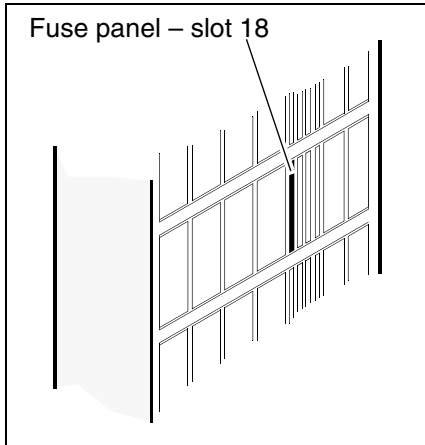
---

```
WARNING ... this action will affect both drwrs 0 and 1
OSvce Tests Initiated
LCME HOST 55 0 Drwr 0 Tst Passed
LCME HOST 55 0 Drwr 0 Rts Passed
```

|           | <b>If the RTS command</b>                                                                                                                           | <b>Do</b> |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed                                                                                                                                              | step 26   |
|           | failed                                                                                                                                              | step 25   |
| <b>24</b> | Consult operating company personnel to determine why the component is offline or not provided. Continue as directed by operating company personnel. |           |
| <b>25</b> | For additional help, contact the next level of support.                                                                                             |           |
| <b>26</b> | The procedure is complete.                                                                                                                          |           |

## NTBX71 in an LCME (continued)

### LCME fuse panel



#### Fuse location

–48V BR drawer 1  
3A blue fuse

–48V BR drawer 3  
3A blue fuse

–48V B drawer 1  
3A blue fuse

–48V B drawer 3  
3A blue fuse

+15 V  
drawer 1  
3A blue fuse

+15V  
drawer 3  
3A blue fuse

–48V Talk Batt  
drawer 1  
5A green fuse

–48V Talk Batt  
drawer 3  
5A green fuse

RING 0  
1.33A white fuse

#### Fuse location

–48V BR drawer 2  
3A blue fuse

–48V BR drawer 4  
3A blue fuse

–48V B drawer 2  
3A blue fuse

–48V B drawer 4  
3A blue fuse

+15V  
drawer 2  
3A blue fuse

+15V  
drawer 4  
3A blue fuse

–48V Talk Batt  
drawer 2  
5A green fuse

–48V Talk Batt  
drawer 4  
5A green fuse

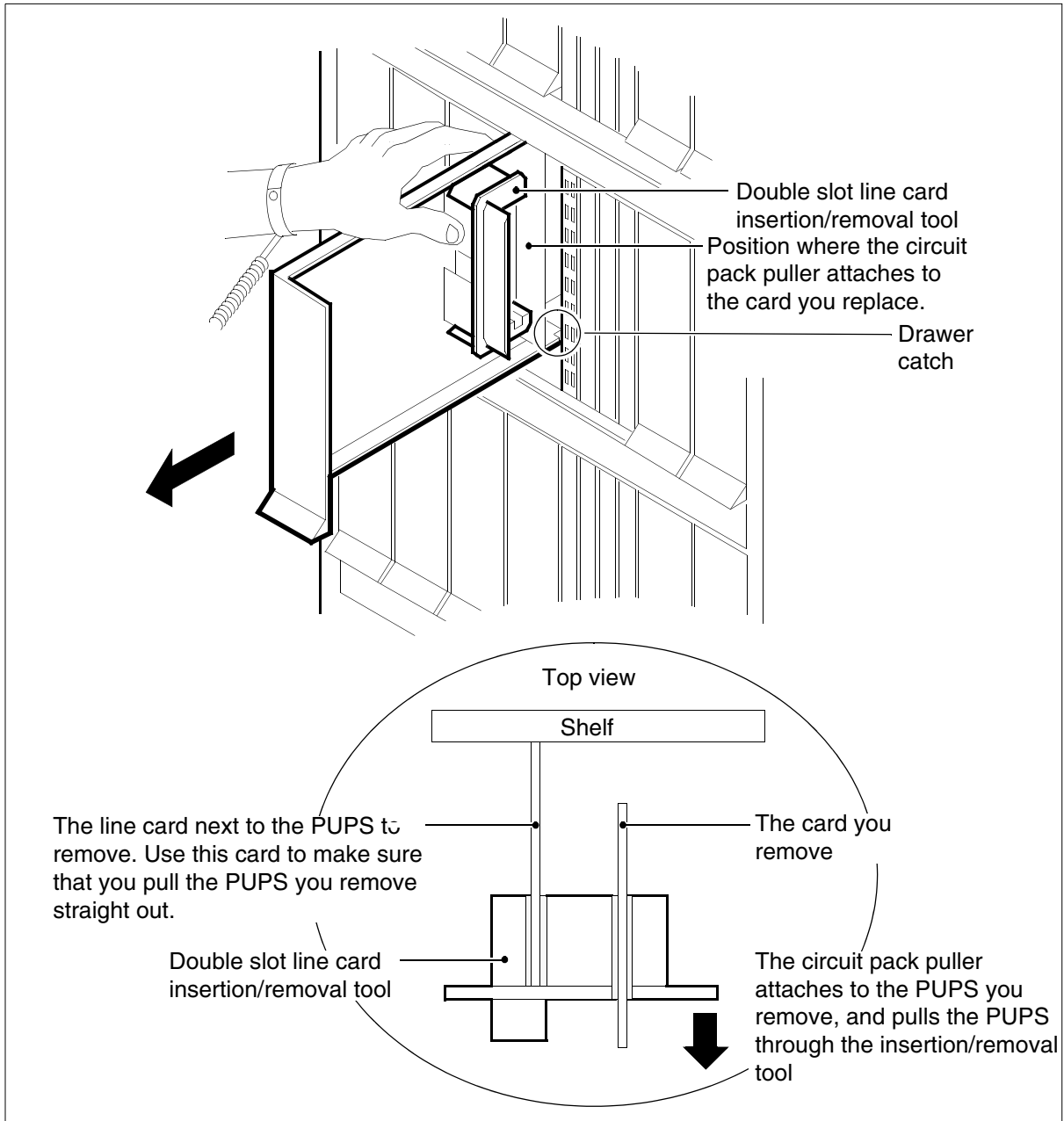
Spare  
1.33A white fuse

|     |     |
|-----|-----|
| F01 | F02 |
| F03 | F04 |
| F05 | F06 |
| F07 | F08 |
| F09 | F10 |
| F11 | F12 |
| F13 | F14 |
| F15 | F16 |
| F17 | F18 |



## NTBX71 in an LCME (continued)

### Removing the PUPS card



### Procedure history SN07 (DMS)

Procedure corrected according to CR Q00886580.

**NTBX71**  
**in an LCME** (end)

---

Procedure history section added.

## Power cards in an LCE line drawer

---

### Application

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

| PEC    | Suffix | Card name                              | Shelf or frame name             |
|--------|--------|----------------------------------------|---------------------------------|
| NT6X20 | AA     | Message waiting converter card         | line concentrating module (LCM) |
| NT6X23 | AA     | Line drawer power converter +48 V card | LCM                             |
| NT6X95 | AA, AB | Metering tone generator card           | enhanced LCM (LCME)             |

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

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

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

### Common procedures

This procedure refers to *Replacing a line card*.

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

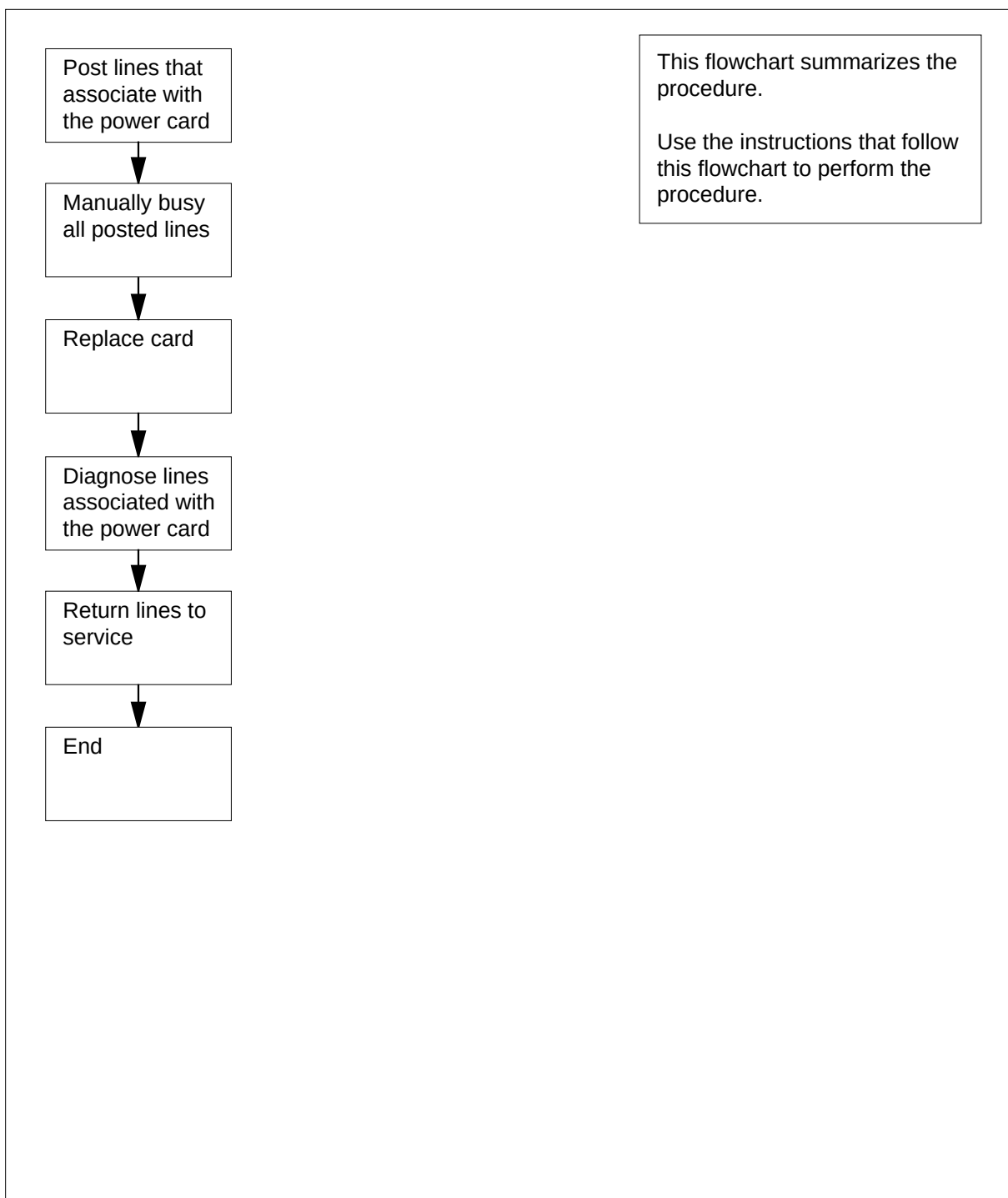
### Action

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

## Power cards in an LCE line drawer (continued)

---

### Summary of replacing Power cards in an LCE line drawer



## Power cards in an LCE line drawer (continued)

### Replacing Power cards in an LCE line drawer

#### At your current location

1



#### WARNING

##### Loss of service

This procedure manually busies lines and can cause the system to drop calls in progress. Perform this procedure only if you need to restore out-of-service components. If you do not need this procedure for a return to service, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

#### At the shelf

2

Identify the slot location for each line circuit card that associates with the line drawer power card you replace. Use the following table to identify the cards to look for in the physical line drawer.

| If the power card | DoLook for these line circuit cards |
|-------------------|-------------------------------------|
| is NT6X20         | NT6X19AA, Type E standard line card |
| is NT6X23         | NT6X18AB, Type B world line card    |
| is NT6X95         | NT6X94AA, Type B line card          |

#### At the MAP terminal

3

To access the LTP level of the MAP display, type

**>MAPCI;MTC;LNS;LTP**

and press the Enter key.

*Example of a MAP display:*

```

POST DELQ BUSYQ PREFIX
LCC PTY RNG LEN..... DN STA F S LTA TE RESULT

```

**Note:** If you did past work at the LTP level of the MAP display, a line can already be posted. A posted line does not interfere with this maintenance procedure.

4

To post the line for the circuit card that associates with the power card you replace, type

**>POST L site frame\_no unit\_no drawer\_no slot\_no**

## Power cards in an LCE line drawer (continued)

and press the Enter key.

where

**site**

is the PM location (alphanumeric)

**frame\_no**

is the frame number (0 to 511)

**unit\_no**

is the PM unit number (0 or 1)

**drawer\_no**

is the logical drawer number (0 to 19)

**slot\_no**

is the card slot number (0 to 31)

*Example of a MAP display:*

```
LCC PTY RNG LEN..... DN STA F S LTA TE RESULT
1FR HOST 00 0 00 02 621 1134 IDL
```

- 5** Determine the state of the posted line.

| If the state of the line      | Do      |
|-------------------------------|---------|
| is CPB, CPD                   | step 6  |
| is CUT, HAZ, IDL, LO, PLO, SB | step 7  |
| is MB                         | step 8  |
| is NEQ                        | step 16 |
| is DEL, DMB, INB, LMB         | step 17 |

- 6** Wait until the line state changes. Go to step 5.

- 7** To manually-busy the line circuit, type

**>BSY**

and press the Enter key.

*Example of a MAP display:*

```
LCC PTY RNG LEN..... DN STA F S LTA TE RESULT
1FR HOST 00 0 00 02 621 1134 MB
```

**Note:** Observe that the state shown under the STA header changed to MB.

| If BSY command | Do      |
|----------------|---------|
| passed         | step 8  |
| failed         | step 17 |

## Power cards in an LCE line drawer (continued)

- 8 Repeat steps 4 to 7 for all circuit cards supported by the power card you replace.

### *At the shelf*

9



#### **WARNING**

##### **Static electricity damage**

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

To replace the power card, use the procedure *Replacing a line card* in this document. Complete the procedure and return to this point.

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

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

| If                                                           | Do      |
|--------------------------------------------------------------|---------|
| a maintenance procedure directed you to this procedure       | step 11 |
| a maintenance procedure did not direct you to this procedure | step 12 |

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

### *At the MAP terminal*

- 12 To post the line for the circuit card that associates with the power card you replaced, type

```
>POST L site frame_no unit_no drawer_no slot_no
```

and press the Enter key.

where

#### **site**

is the PM location (alphanumeric)

#### **frame\_no**

is the frame number (0 to 511)

#### **unit\_no**

is the PM unit number (0 or 1)

## Power cards in an LCE line drawer (end)

**drawer\_no**

is the logical drawer number (0 to 19)

**slot\_no**

is the card slot number (0 to 31)

*Example of a MAP display:*

```

LCC PTY RNG LEN..... DN STA F S LTA TE RESULT
1FR HOST 00 0 00 02 621 1134 IDL

```

- 13** To perform a diagnostic test on the line, type

**>DIAG**

and press the Enter key.

*Example of a MAP display:*

```

ECOME004AH ***+LINE100 DEC17 10:04:26 0200 PASS LN_DIAG
LEN HOST 00 0 00 02 NO DIRN
DIAGNOSTIC RESULT Card Diagnostic OK
ACTION REQUIRED None
CARD TYPE 6X17AA

```

**If the DIAG command****Do**

passed

step 14

failed

step 17

- 14** To return the line to service, type

**>RTS**

and press the Enter key.

**If RTS command****Do**

passed

step 18

failed

step 17

- 15** Repeat steps 12 to 14 for all line circuit cards that the power card you replaced supports.

- 16** Consult operating company personnel to determine why the component is offline or unequipped. Continue as directed by office personnel.

- 17** For additional help, contact the next level of support.

- 18** The procedure is complete.



## Power cards in LCM-type PMs

### Application

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

| PEC                                                                                                                                                                                                                                                                                   | Suffix        | Card name                                 | Shelf or frame name             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------|---------------------------------|
| NT6X53                                                                                                                                                                                                                                                                                | AA (see note) | Power converter 5 V/15 V card             | line concentrating module (LCM) |
| NT6X53                                                                                                                                                                                                                                                                                | BA            | ISDN power converter 5.25 V/15 V card     | enhanced LCM (LCME)             |
| NT6X53                                                                                                                                                                                                                                                                                | CA            | ISDN LCME power converter +5 V/+15 V card | LCME                            |
| NT6X53                                                                                                                                                                                                                                                                                | EA            | ISDN LCME power converter +5V/-15 V card  | LCME                            |
| NT8X99                                                                                                                                                                                                                                                                                | AB            | Power converter card                      | LCM                             |
| NTBX72                                                                                                                                                                                                                                                                                | AA            | ISDN LCME battery and ringing router card | LCME                            |
| <b>Note:</b> Additional steps for NT6X53AA card replacement appear in the NT6X53AA Power Down and Replacement section and the Pre-Check Voltage Measurements section. Two steps are annotated in the Action section. If you do not perform the procedures, a power failure can occur. |               |                                           |                                 |

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

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

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

### NT6X53AA power down and replacement

The NT6X53AA power converters in LCM-type units share the +5VDC and +15VDC loads through diodes in the output of the converters. The LCM-type

## Power cards in LCM-type PMs (continued)

---

units include LCM, RLDM, OPM, and OPAC. In order for the converters to share the load evenly, the output voltages of the converters must match closely. Age can decrease the ability of a single NT6X53AA to maintain minimum voltage levels. This condition can occur even if both converters are in the regulated specifications.

In LCM-type redundant configurations, the NT6X53AA in the mate unit can compensate for the loss of ability to maintain voltage. Under normal operation of the LCM, the loss of ability to maintain voltage is not a problem. Complete failure of a NT6X53AA or manual maintenance actions that remove power from a converter is a risk to LCM redundancy. Failures or manual maintenance actions like this require special procedures, because of the reasons that follow.

The higher voltage converter can assume most of the load for both LCM units. This condition occurs if the NT6X53AA output voltages in each unit do not match closely. If the converter that supplies most of the load trips or powers down, the other converter assumes the load. This second converter can assume the load slowly, which can cause a temporary drop in the output voltage. This condition can result in both units of the LCM dropping SysB.

As a precaution, you can use the faceplate test jacks on the NT6X53AA to obtain the status of the power sharing. Compare the test jack voltages of the two power converters.

Check the faceplate readings. If the two LCM power converters have a difference of more than 0.20V (200 millivolts-DC), replace one of the converters. Replace the converter with the *lower* test jack value. Replace the converter with another converter to obtain a near match of the output of the converters. A near match is a difference of less than or equal to 0.20V.

## Pre-Check voltage measurements (NT6X53AA)

Perform the following voltage pre-check before you replace an NT6X53AA card:

---

## Power cards in LCM-type PMs (continued)

---

1



### WARNING

#### Static electricity hazard

Wear a wrist strap that connects to the wrist-strap grounding point of a frame supervisory panel (FSP) when you take voltage measurements.

Obtain a digital voltmeter with an accuracy of 0.01 volts.

- 2 Set the digital voltmeter to measure DC voltage. Set the range to measure to 0.01 volts. Measure and record the voltage between the +5V and the common faceplate test jacks of both LCM-type module NT6X53AA power converters. Perform this procedure on the converters that you will perform maintenance on.
- 3 If the difference between the voltage of the power converters +5V to common is more than 0.20V (200 millivolts), replace the NT6X53AA of the unit with the lower faceplate reading. To replace the NT6X53AA, use the procedure in the section Post-Check Analysis NT6X53AA Change Out Procedure. If the voltage difference is less than 0.20V, proceed with the maintenance procedure that sent you to this procedure.
- 4 After you replace the NT6X53AA with the lower faceplate reading, repeat the Pre-Check Voltage Measurements steps. If the two NT6X53AA power converters are not within 0.20V (200 millivolts), proceed with the maintenance procedure that directed you here. If the readings are higher than 0.20V (200 millivolts), contact the next level of support.

## Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Loading a PM*

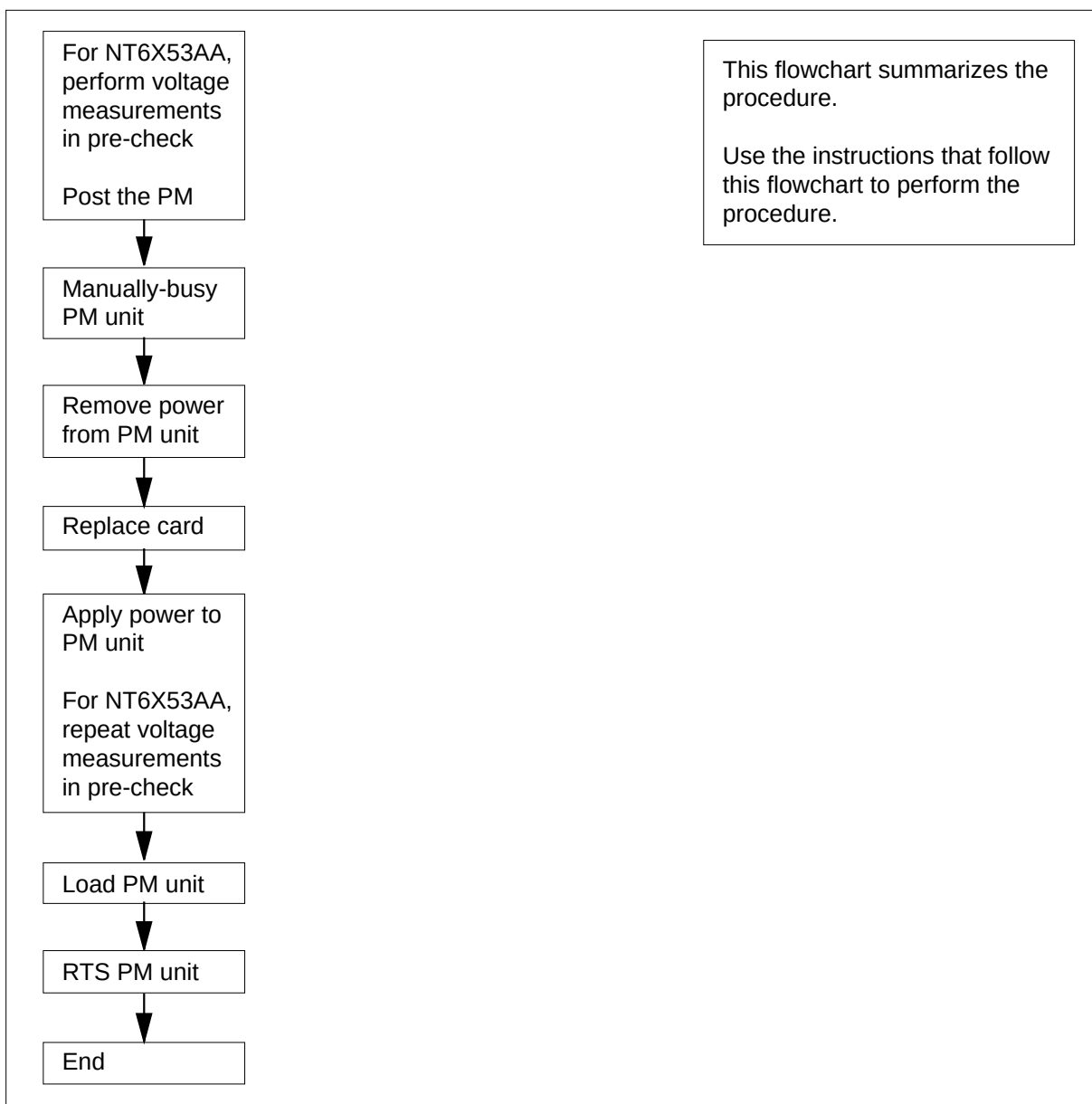
Do not proceed to the common procedure unless the step-action procedure directs you.

## Action

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

## Power cards in LCM-type PMs (continued)

### Summary of replacing Power cards in LCM-type PMs



## Power cards in LCM-type PMs (continued)

### Replacing power cards in LCM-type PMs

#### At your current location

1



#### WARNING

##### Loss of service

This procedure manually busies peripheral module (PM) units and can cause service degradation. Perform this procedure only if you need to restore out-of-service components. If you do not need this procedure for a return to service, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

#### At the MAP terminal

2 To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
|----|------|------|------|------|------|------|
| PM | 0    | 0    | 2    | 0    | 1    | 71   |

3 To post the PM that contains the card you replace, type

**>POST pm\_type site frame\_no pm\_no**

and press the Enter key.

*where*

#### **pm\_type**

is the PM type (LCM, LCME)

#### **site**

is the PM location (host or remote)

#### **frame\_no**

is the frame number (00 to 99)

#### **pm\_no**

is the number of the PM (0 or 1) in the frame

*Example of a MAP display:*

Power cards  
in LCM-type PMs (continued)

```
LCM HOST 00 0 InSv Links OOS: Cside 0 Pside 0
Unit 0: InSv /RG:0
Unit 1: InSv /RG:1

 11 11 11 11 11 RG: Pref 0 InSv
Drwr: 01 23 45 67 89 01 23 45 67 89 Stby 1 InSv
 .. -- -- -- -- -- -- ..
```

4



**DANGER**  
**Risk of service interruption**  
*When you replace an NT6X53AA card, do not proceed if the mate unit is not InSv or ISTb state. The mate unit is the unit you are not working on. Contact the next level of support.*

Determine the state of the PM unit that contains the power converter you replace.

| If the state of the PM unit  | Do      |
|------------------------------|---------|
| is InSv, ISTb, SysB, or CBSy | step 5  |
| is ManB                      | step 6  |
| is Offl                      | step 15 |

- 5 To manually-busy the PM unit that associates with the card you replace, type **>BSY UNIT unit\_no** and press the Enter key.  
where  
    **unit\_no**  
        is the PM unit number (0 or 1)  
*Example of a MAP display:*

## Power cards in LCM-type PMs (continued)

```
LCM HOST 00 0 ISTb Links OOS: Cside 0 Pside 0
Unit0: ManB /RG: 0
Unit1: InSv Takeover /RG: 0
11 11 11 11 11 RG: Pref 0 InSv
Drwr: 01 23 45 67 89 01 23 45 67 89 Stby 1 InSv
.. -- -- -- -- ..
bsy unit 0
LCM HOST 00 0 Unit 0 Bsy Passed
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 6  |
| failed             | step 16 |

### At the shelf

6



#### WARNING

##### Static electricity damage

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



#### DANGER

##### Risk of personal injury

Handle the power converter card carefully to avoid electrical shock. Make sure the power is not connected to the power converters.

At the FSP or MSP, switch off the circuit breaker that associates with the power converter for the *unit* of the PM you are working on. (Switch off only one power converter, not both converters.) The red diode on the faceplate of the power converter will be lit to indicate that power is off.

**Note:** Different FSPs and MSPs have different circuit breaker designs. If necessary, consult office records or operating company personnel for the location of the correct circuit breakers.

## Power cards in LCM-type PMs (continued)

7

**DANGER****Risk of personal injury**

Do not proceed if the red diode is not lit on the face plate of the power converter you are replacing.

If you replace an NT6X53AA card, unseat and remove the 6X53AA power converter that you powered down in step 6. Replace the 6X53AA with a spare.

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

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

**Note 2:** If the card you replace has switches, make sure that the switches on the replacement card have the same settings.

8 At the FSP or MSP, switch on the circuit breakers that you turned off in step 6.

| If the circuit breaker                                                       | Do      |
|------------------------------------------------------------------------------|---------|
| trips or the red diode on the power converter face plate is lit              | step 16 |
| does not trip and the red diode on the power converter face plate is not lit | step 9  |

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

| If                                                           | Do      |
|--------------------------------------------------------------|---------|
| you replace an NT6X53AA card                                 | step 10 |
| a maintenance procedure directed you to this procedure       | step 11 |
| a maintenance procedure did not direct you to this procedure | step 12 |

10 Perform pre-check voltage measurements again. Follow the steps in the Pre-Check Voltage Measurement section. Perform step 12.

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



## Power cards in LCM-type PMs (continued)

### At the MAP terminal

- 12** To load the PM, type  
**>LOADPM UNIT unit\_no**  
 and press the Enter key.  
 where  
**unit\_no**  
 is the PM unit number (0 or 1)

*Example of a MAP response:*

```
LCM HOST 00 0 Unit 0 LoadPM Passed
```

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 14 |
| failed                | step 13 |
| failed a second time  | step 15 |

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

- 14** To return the PM unit to service, type  
**>RTS UNIT unit\_no**  
 and press the Enter key.  
 where  
**unit\_no**  
 is the PM unit number (0 or 1)

*Example of a MAP response:*

```
LCM HOST 00 0 Unit 0 OSvce Tests Initiated
LCM HOST 00 0 Unit 0 Tst Passed
LCM HOST 00 0 Unit 0 Rts Passed
LCM HOST 00 0 Unit 0 InSvce Tests Initiated
LCM HOST 00 0 Unit 0 Tst Passed
```

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 17 |
| failed             | step 16 |

- 15** Consult operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.

**Power cards**  
**in LCM-type PMs (end)**

---

- 16 For additional help, contact the next level of support.
- 17 The procedure is complete.

---

## 2 Line module card replacement procedures

---

### Introduction

This chapter contains card replacement procedures for the line module (LM). The first section in the chapter provides layouts of LM shelves.

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

Each procedure contains the following sections:

- Application
- Common procedures
- Action

### Application

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

### Common procedures

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

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

### Action

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

## **Recording card replacement activities**

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

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

## LM shelf layouts

---

### Application

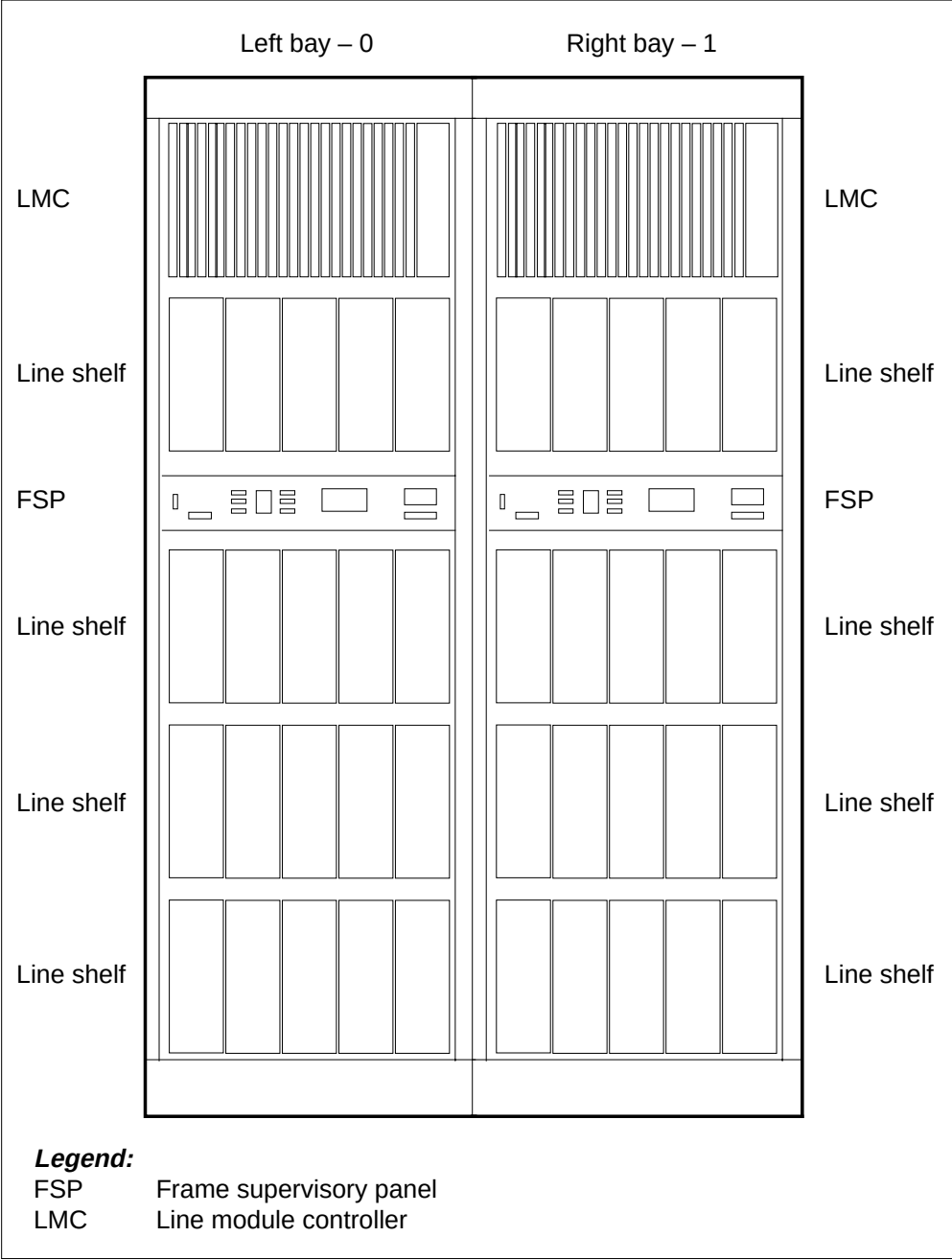
This procedure provides a frame layout diagram for the line module equipment (LME) frame. The LME frame contains line drawers and the line module controller (LMC). The procedure provides shelf diagrams for the following:

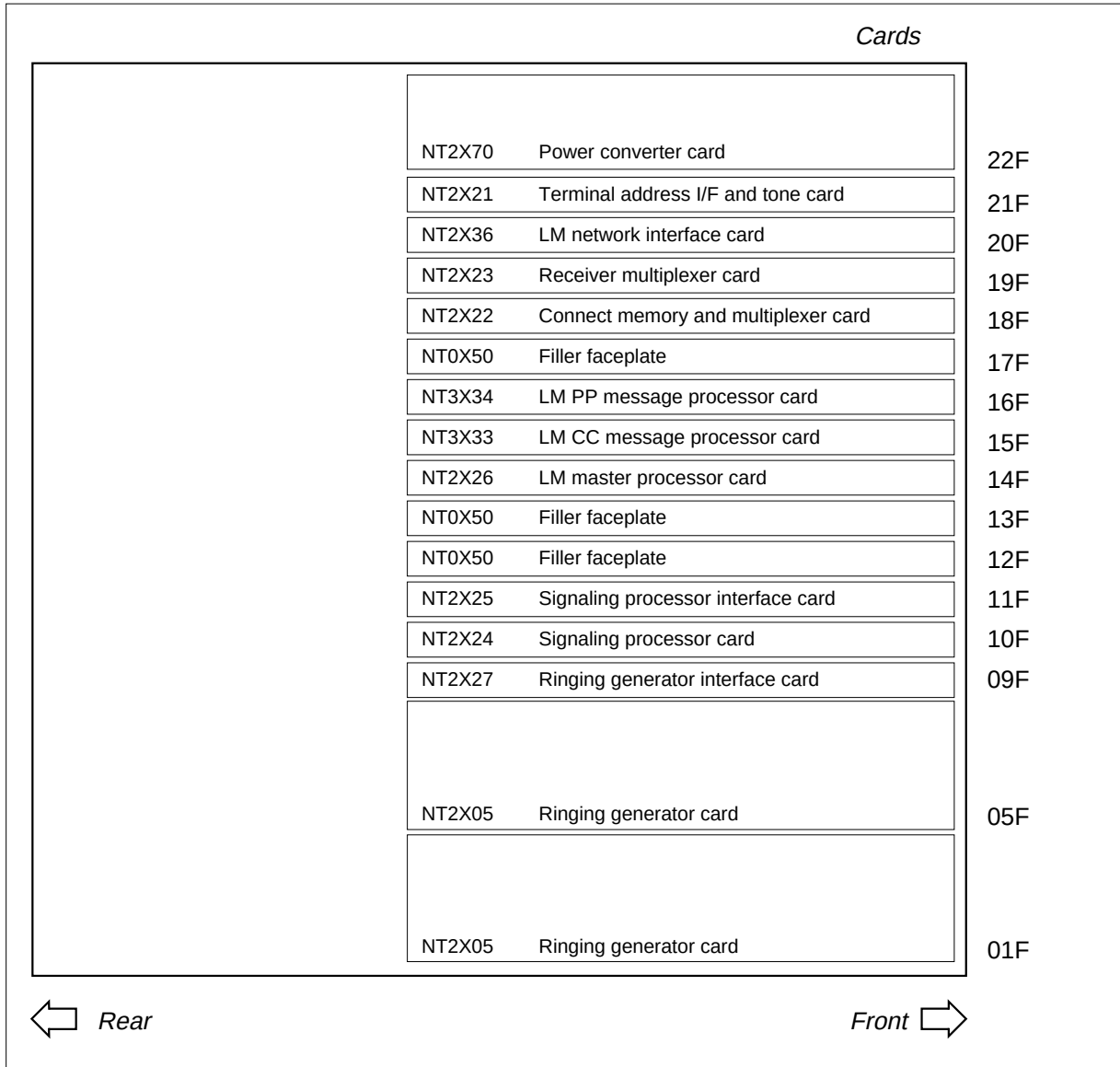
- LMC
- line drawer shelf
- line drawer layout

**Note:** The frame and shelf layouts on the following pages are standard. The layout of the shelves in your office can differ from the standard layout.

LM shelf layouts (continued)

Line module equipment frame (double bay)

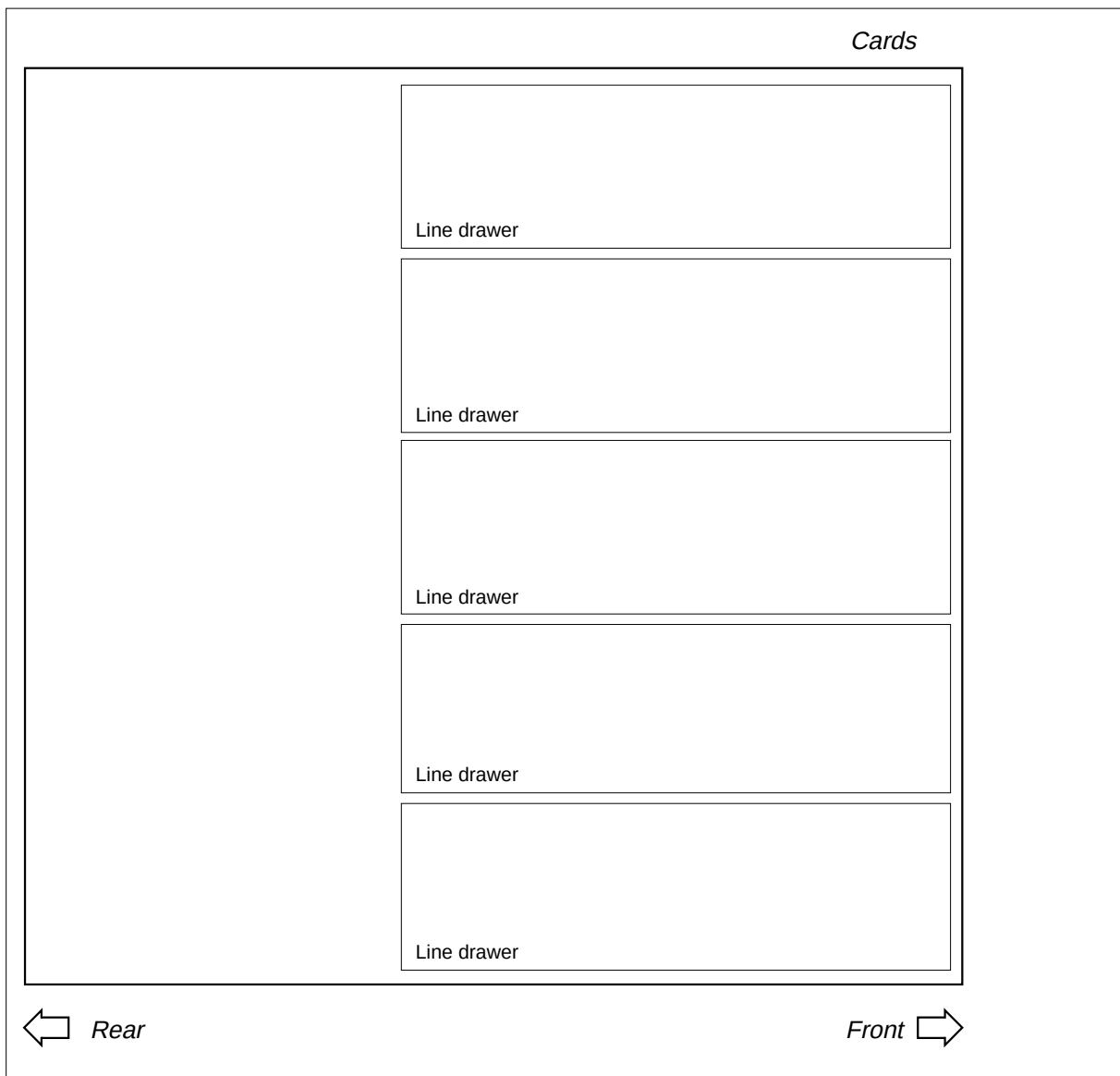


**LM shelf layouts** (continued)**Line module controller**

## LM shelf layouts (continued)

---

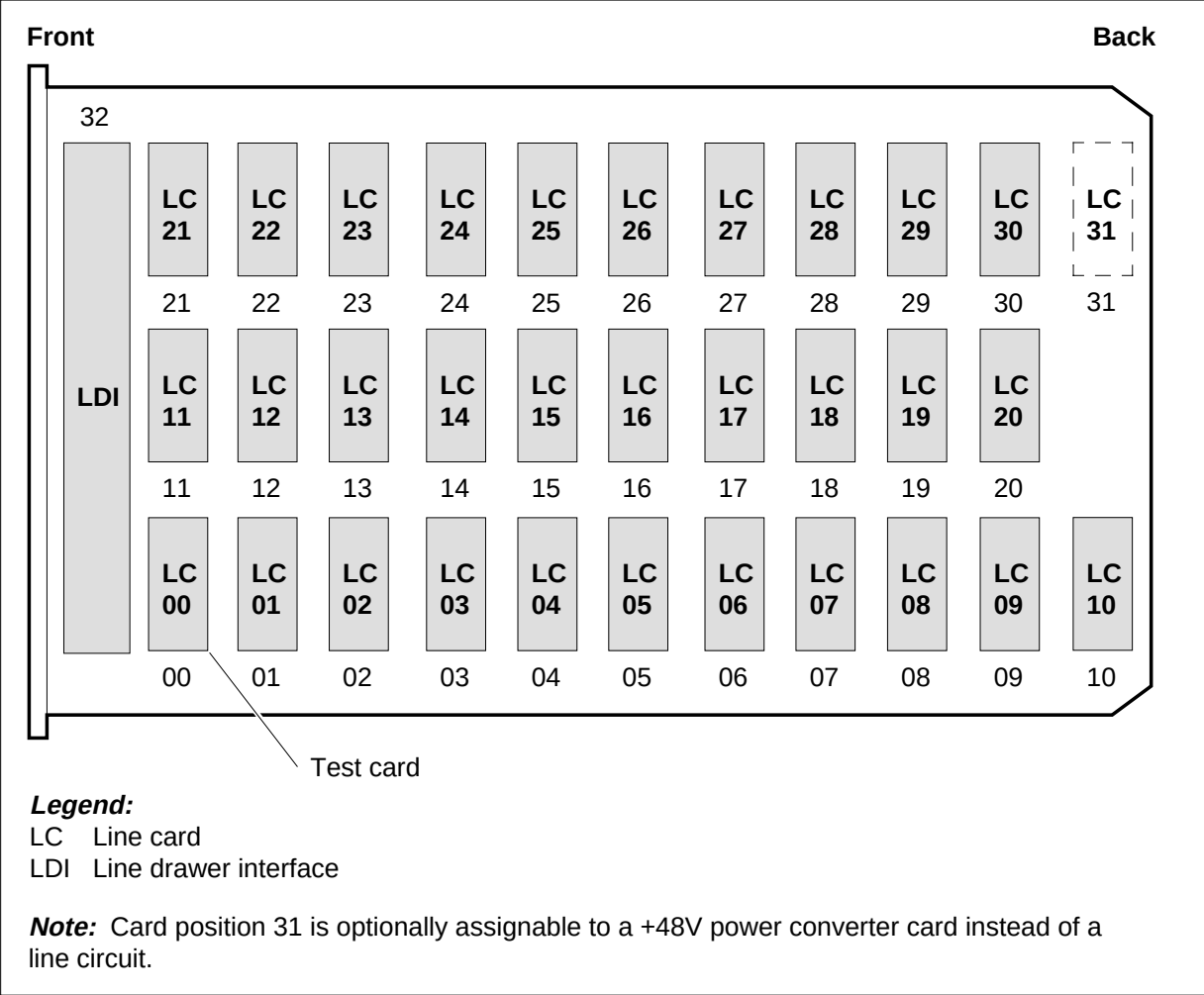
### Line drawer shelf





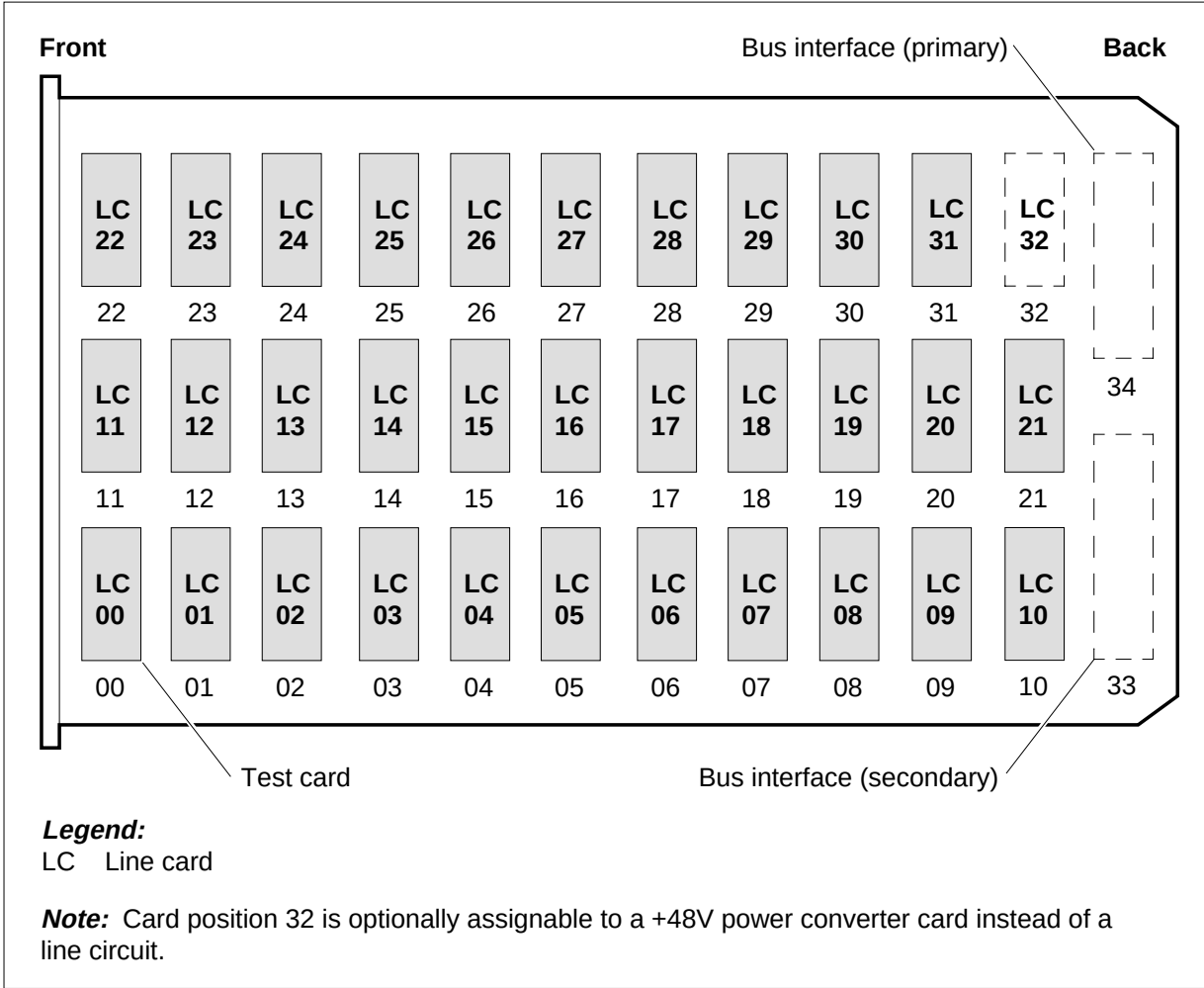
LM shelf layouts (continued)

Line drawer layout (plastic)



LM shelf layouts (end)

Line drawer layout (metal)



## Control complex cards in a line module controller

### Application

Use this procedure to replace the following cards in a line module controller (LMC).

| PEC    | Suffix | Card name                                                              | Shelf or frame name |
|--------|--------|------------------------------------------------------------------------|---------------------|
| NT2X21 | AA, AC | Terminal address interface and tone generator card                     | LMC                 |
| NT2X22 | AA     | Connection memory and transmit MUX card                                | LMC                 |
| NT2X23 | AA     | Receive MUX card                                                       | LMC                 |
| NT2X24 | AB     | Signaling processor card                                               | LMC                 |
| NT2X25 | AA     | Signaling processor interface card                                     | LMC                 |
| NT2X26 | AA     | Main processor card                                                    | LMC                 |
| NT2X27 | AA     | Ring generator interface - 20Hz Bell system card                       | LMC                 |
| NT2X27 | AB     | Ring generator interface decimonic multifrequency ringing card         | LMC                 |
| NT2X27 | AC     | Ring generator interface harmonic multifrequency ringing card          | LMC                 |
| NT2X27 | AD     | Ring generator interface syndronomic 16KHz multifrequency ringing card | LMC                 |
| NT2X27 | AE     | Ring generator interface SYNC multifrequency ringing card              | LMC                 |
| NT2X27 | AF     | Ring generator interface 20Hz 105V coded ringing card                  | LMC                 |
| NT2X33 | AB     | Control card                                                           | LMC                 |
| NT2X34 | AA     | Peripheral processor message processor card                            | LMC                 |
| NT2X36 | AA     | Network interface card                                                 | LMC                 |

## Control complex cards in a line module controller (continued)

---

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

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

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

## Common procedures

This procedure refers to the following common procedures:

- How to *Replacing a card*
- How to *Loading a PM*

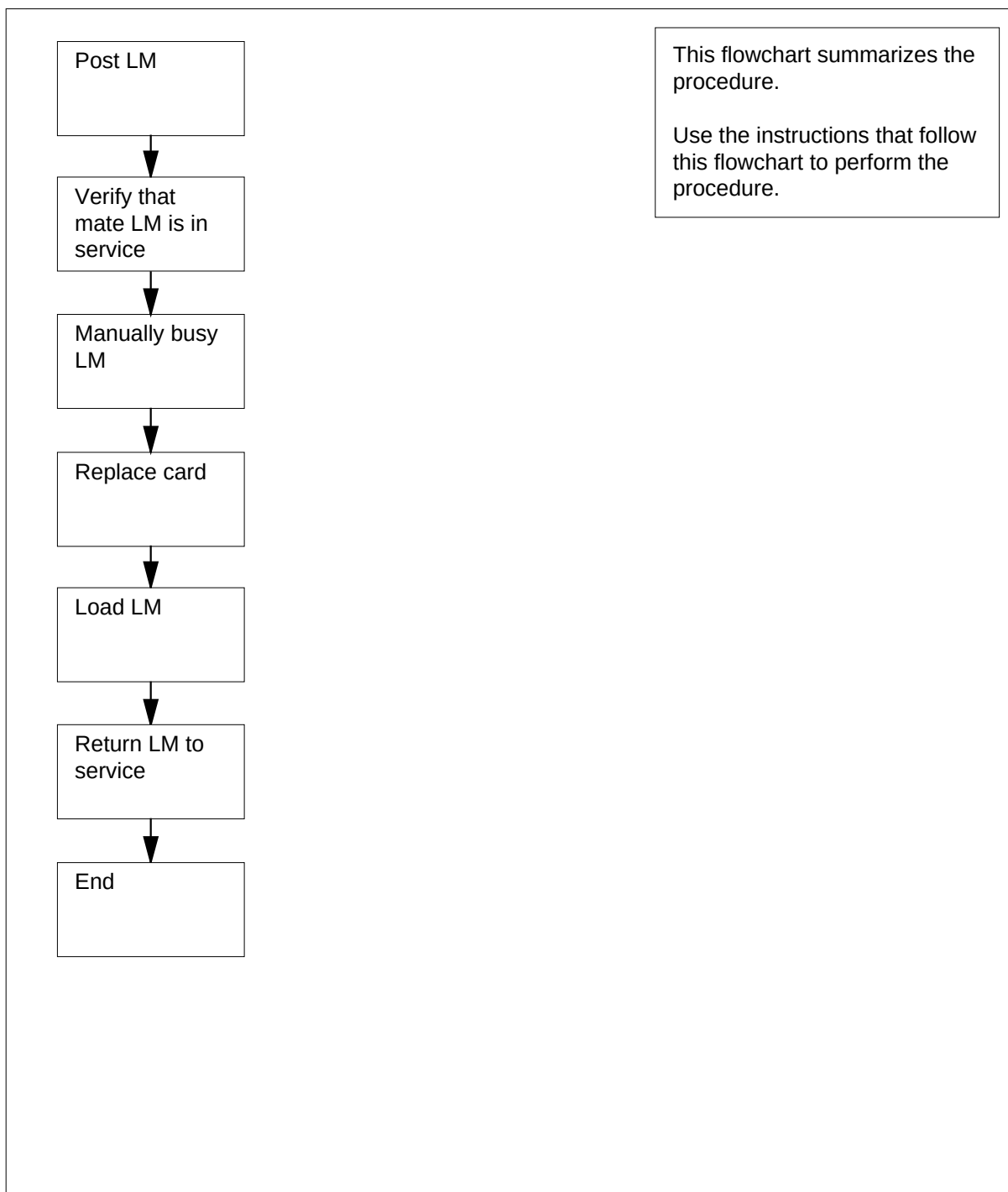
Do not proceed to the common procedure unless the step-action procedure directs you to go.

## Action

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

## Control complex cards in a line module controller (continued)

### Summary of Replacing Control complex cards in a line module controller



## Control complex cards in a line module controller (continued)

---

### Replacing Control complex cards in a line module controller

#### *At the MAP terminal*

1



#### **CAUTION**

##### **Potential loss of service**

This procedure manually busies a minimum of one LMC which can cause service degradation. Perform this procedure only if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.

2

To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 3    | 0    | 0    | 0    | 1    | 71   |

3

To post the LM, type

**>POST LM site frame\_no unit\_no**

and press the Enter key.

*where*

#### **site**

is the PM location (alphanumeric)

#### **frame\_no**

is the frame number (0 to 511)

#### **unit\_no**

is the PM unit number (0 or 1)

*Example of a MAP display:*

## Control complex cards in a line module controller (continued)

|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
|----|------|------|------|------|------|------|
| PM | 3    | 0    | 0    | 0    | 1    | 71   |
| LM | 0    | 0    | 0    | 0    | 1    | 1    |

```
LM HOST 00 0 ISTb
RGen : 0 InSv 1 InSv
```

- 4 Determine the state of the LM.

| If the state of the LM | Do      |
|------------------------|---------|
| is InSv or ISTb        | step 5  |
| is SysB or CBSy        | step 8  |
| is ManB                | step 9  |
| is Offl                | step 15 |

- 5 To post the mate LM, type

```
>POST LM site frame_no unit_no
```

and press the Enter key.

where

**site**  
is the PM location (alphanumeric)

**frame\_no**  
is the frame number (0 to 511)

**unit\_no**  
is the PM unit number (0 or 1)

- 6 Determine the state of the mate LM and the ringing generators (RG) of the mate LM.

| If                                                             | Do      |
|----------------------------------------------------------------|---------|
| the state of the mate LM is InSv or ISTb and both RGs are InSv | step 7  |
| the mate LM and RG states are other than listed here           | step 16 |

- 7 To post the LM on which you want to replace a card, type

```
>POST LM site frame_no unit_no
```

and press the Enter key.

where

**site**  
is the PM location (alphanumeric)

## Control complex cards in a line module controller (continued)

**frame\_no**  
is the frame number (0 to 511)

**unit\_no**  
is the PM unit number (0 or 1)

- 8 To manually busy the LM, type

**>BSY**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 3    | 1    | 0    | 0    | 0    | 71   |
| LM | 0    | 1    | 0    | 0    | 0    | 1    |

```
LM HOST 01 0 ManB.
RGen : 0 Standby 1 InSvb
sy
OK
```

### At the shelf

9



#### WARNING

##### Static electricity damage

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

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

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

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

#### If you were

#### Do

directed to this procedure from a maintenance procedure      step 11

not directed to this procedure from a maintenance procedure      step 12



## Control complex cards in a line module controller (end)

---

- 11** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

***At the MAP terminal***

- 12** To load the LM, type  
**>LOADPM**  
and press the Enter key.

*Example of a MAP response:*

```
LM HOST 01 0 LoadPM PASSED
```

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

- 14** To return the LM to service, type  
**>RTS**  
and press the Enter key.

*Example of a MAP response:*

```
rts
OK.
InSvce Tests Initiated
OK.
```

- 15** To determine why the component is offline, contact operating company personnel. Continue as directed by operating company personnel.
- 16** Do not manually busy the LM. If you manually busy the LM, a loss of calls in progress occurs. To determine how to proceed, contact operating company personnel or the next level of support. Continue as directed by operating company personnel or the next level of support.
- 17** For additional help, contact the next level of support.
- 18** The procedure is complete.

## Interface and power converter cards in an LM line drawer

---

### Application

Use this procedure to replace the following cards in the line module (LM) line drawer.

| PEC    | Suffix | Card name                                   | Shelf or frame name |
|--------|--------|---------------------------------------------|---------------------|
| NT2X02 | AA     | Line drawer interface card                  | LM line drawer      |
| NT2X03 | AA     | +48V line drawer power converter card       | LM line drawer      |
| NT2X16 | AB     | Line drawer input/output bus interface card | LM line drawer      |

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

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

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

### Common procedures

*This procedure refers to Replacing a line card.*

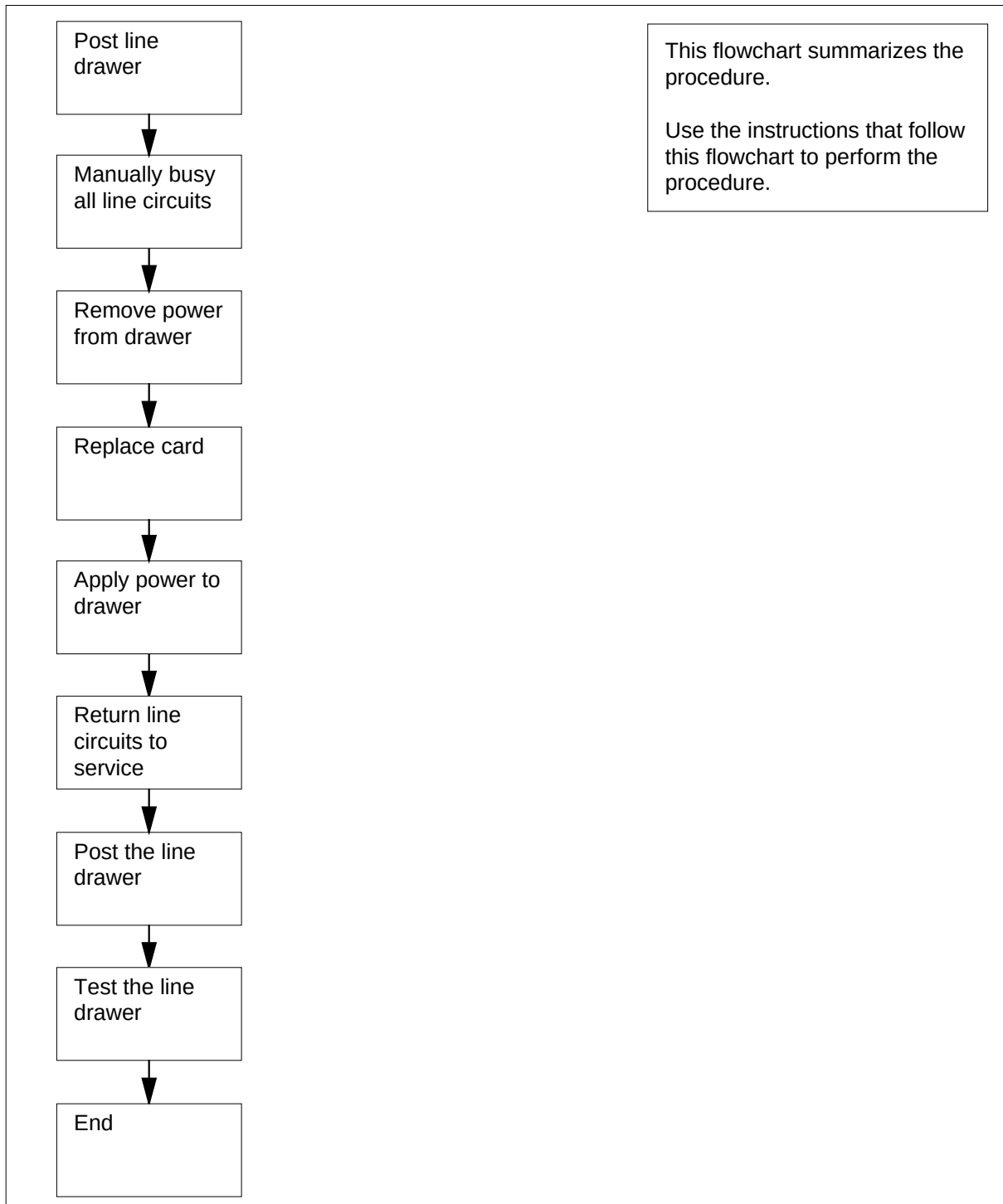
Do not proceed to the common procedure unless the step-action procedure directs you there.

### Action

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

## Interface and power converter cards in an LM line drawer (continued)

### Summary of Replacing Interface and power converter cards in an LM line drawer



## Interface and power converter cards in an LM line drawer (continued)

### Replacing Interface and power converter cards in an LM line drawer

#### At the MAP terminal

1



#### CAUTION

##### Loss of service

This procedure manually busies a minimum of one line. If you remove a line from service, a loss of calls in progress occurs. Perform this procedure only if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure the replacement card and the card you replace have the same PEC and PEC suffix.

2

To access the LTP level of the MAP display, type

**>MAPCI;MTC;LNS;LTP**

and press the Enter key.

*Example of a MAP display:*

|         |                   |       |                       |
|---------|-------------------|-------|-----------------------|
| POST    | DELQ              | BUSYQ | PREFIX                |
| LCC PTY | RNG PTY..LEN..... | DN    | STA F S LTA TE RESULT |

3

To post the line drawer that associates with the card, type

**>POST L site frame\_no unit\_no drawer\_no**

and press the Enter key.

*where*

#### site

is the PM location (alphanumeric)

#### frame\_no

is the frame number (0 to 511)

#### unit\_no

is the PM unit number (0 or 1)

#### drawer\_no

is the logical drawer number (0 to 19)

*Example of a MAP display:*

## Interface and power converter cards in an LM line drawer (continued)

```

POST DELQ BUSYQ PREFIX
LCC PTY RNG LEN..... DN STA F S LTA TE RESULT
1FR HOST 01 0 01 00 621 1134 IDL

```

- 4** To manually busy all circuits in the line drawer, type

**>BSY ALL PROMPT**

and press the Enter key.

*Example of a MAP response:*

Number of fully data filled lines in posted set:30

Number of call processing lines in posted set:0

Do you still wish to busy all?

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

---

**If call processing lines**

**Do**

are posted

step 19

are not posted

step 5

---

- 5** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Number of fully data filled lines in posted set: 30Number of lines Busied:

30

**Note:** Wait for all circuits to go busy.

## Interface and power converter cards in an LM line drawer (continued)

### *At the frame*

6



#### **DANGER**

##### **Static electricity damage**

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while handling circuit cards. This protects the cards against damage caused by static electricity.



#### **CAUTION**

##### **Service interruption**

Do not power down the NT2X05 card.

Determine the product engineering code of the FSP.

| <b>If the PEC is</b> | <b>Do</b> |
|----------------------|-----------|
| NT0X29AA             | step 7    |
| NT0X29AB             | step 8    |

7

Remove the talk battery and 24V fuses for the drawers busied in step 4. The talk battery and 24V fuses for the different line drawer combinations are shown below.

| Drawers | Talk battery fuse | 24V fuse |
|---------|-------------------|----------|
| 00/01   | f14               | f04      |
| 02/03   | f16               | f06      |
| 04/05   | f18               | f08      |
| 06/07   | f20               | f10      |
| 08/09   | f22               | f12      |
| 10/11   | f15               | f05      |
| 12/13   | f17               | f07      |
| 14/15   | f19               | f09      |

## Interface and power converter cards in an LM line drawer (continued)

| Drawers | Talk battery fuse | 24V fuse |
|---------|-------------------|----------|
| 16/17   | f21               | f11      |
| 18/19   | f23               | f13      |

Go to step 8.

### At the shelf

8



#### WARNING

##### Static electricity damage

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

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

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

Remove the NT2X02 card and use the procedure *Replacing a card* in this document.

9 Insert the replacement card and use the procedure *Replacing a card* in this document.

10 Install the removed fuses from step 6 or 7.

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

#### If a maintenance procedure

#### Do

directed you to this procedure step 12

did not direct you to this procedure step 13

12 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

*Example of a MAP display:*

[illegible]

| If RTS command | Do      |
|----------------|---------|
| passed         | step 23 |
| failed         | step 18 |

- is the line drawer containing the NT2X02 you replaced

| If     | Do      |
|--------|---------|
| passed | step 23 |
| failed | step 18 |



## Interface and power converter cards in an LM line drawer (end)

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

| If you were                                             | Do      |
|---------------------------------------------------------|---------|
| directed to this procedure from a maintenance procedure | step 21 |
| directed to this procedure from a Common procedure      | step 22 |

- 18** Perform the procedure *MAP commands for PM-level card replacement in an OAU or LM shelf* in this document. When you have completed the procedure, return to step 23.
- 19** Make sure that you do not manually busy lines in the call processing busy state. Contact other operating company personnel or the next level of support. Continue as directed by operating company personnel or the next level of support.
- 20** For additional help, contact the next level of support.
- 21** Return to the maintenance procedure that sent you to this procedure and continue as directed.
- 22** Return to the procedure in "Common procedures" that sent you here and continue as directed.
- 23** The procedure is complete.

## Line cards in an LM line drawer

---

### Application

Use this procedure to replace the following cards in the line module (LM) line drawer.

| PEC    | Suffix            | Card name                   | Shelf or frame name |
|--------|-------------------|-----------------------------|---------------------|
| NT2X20 | AA                | Ring multiplexer card       | LM line drawer      |
| NT6X17 | AA, AB,<br>AC, AD | Type-A standard line card   | LM line drawer      |
| NT6X17 | BA                | Type-A world line card      | LM line drawer      |
| NT6X18 | AA                | Type-B line card            | LM line drawer      |
| NT6X18 | AB                | Type-B line card with +48 V | LM line drawer      |
| NT6X18 | BA                | Type B world line card      | LM line drawer      |

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

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

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

### Common procedures

This procedure refers to *Replacing a line card*.

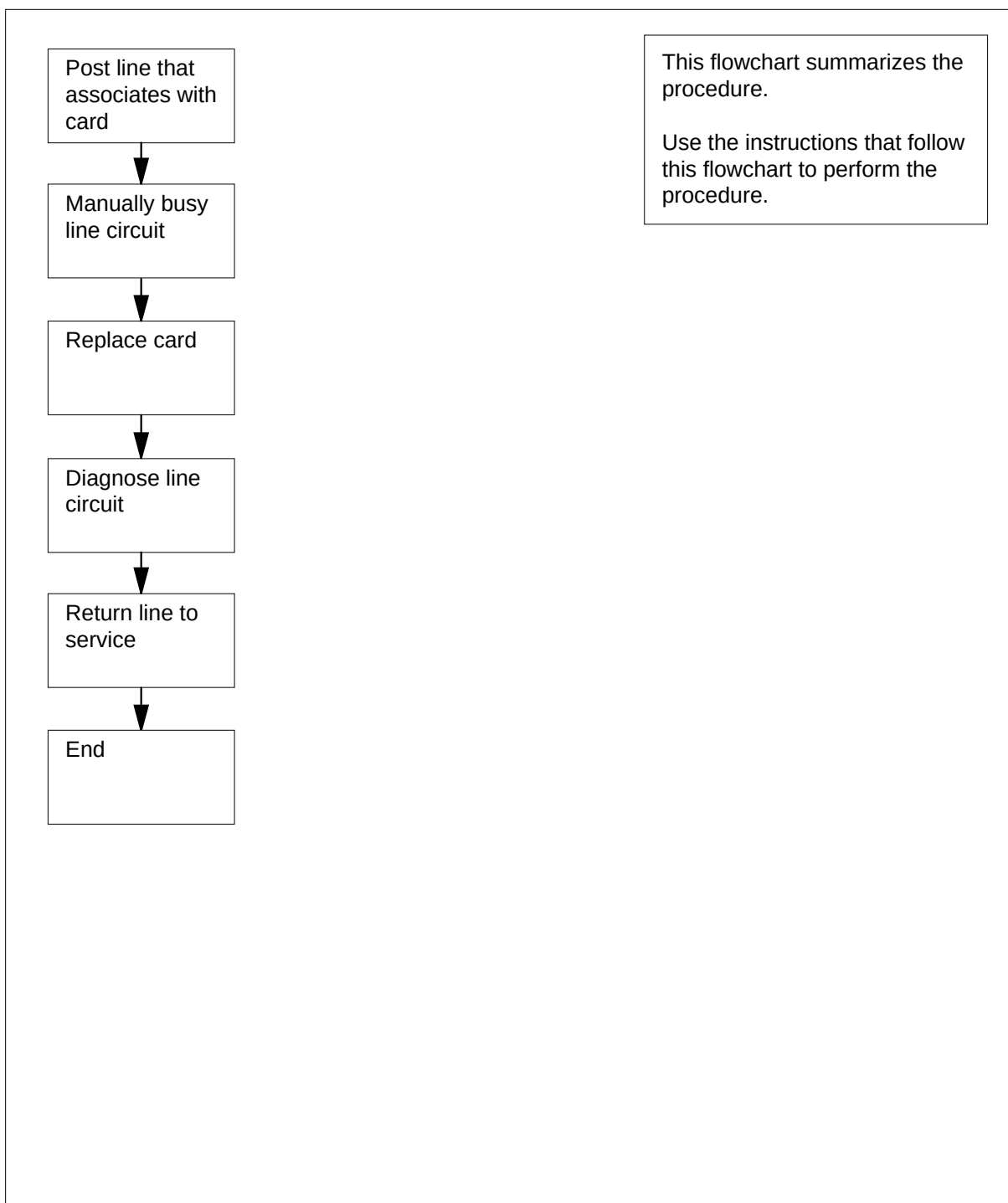
Do not proceed to the common procedure unless the step-action procedure directs you to go.

### Action

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

## Line cards in an LM line drawer (continued)

### Summary of Replacing Line cards in an LM line drawer



## Line cards in an LM line drawer (continued)

---

### Replacing Line cards in an LM line drawer

#### *At the MAP terminal*

1



#### **WARNING**

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

This procedure manually busies a minimum of one line. If you remove a line from service, a loss of calls in progress occurs. Perform this procedure only if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.

2

To access the LTP level of the MAP display, type

**>MAPCI;MTC;LNS;LTP**

and press the Enter key.

*Example of a MAP display:*

| POST        | DELQ          | BUSYQ | PREFIX                |
|-------------|---------------|-------|-----------------------|
| LCC PTY RNG | .....LEN..... | DN    | STA F S LTA TE RESULT |

3

To post the line that associates with the card you will replace, type

**>POST L site frame\_no unit\_no drawer\_no slot\_no**

and press the Enter key.

*where*

#### **site**

is the PM location (alphanumeric)

#### **frame\_no**

is the frame number (0 to 511)

#### **unit\_no**

is the PM unit number (0 or 1)

#### **drawer\_no**

is the logical drawer number (0 to 19)

#### **slot\_no**

is the card slot number (0 to 31)

*Example of a MAP display:*

## Line cards in an LM line drawer (continued)

```

POST DELQ BUSYQ PREFIX
LCC PTY RNG LEN..... DN STA F S LTA TE RESULT
1FR HOST 01 0 01 00 621 1134 SB

```

- 4** Determine the state of the posted line.

| If the state of the line      | Do      |
|-------------------------------|---------|
| is CPB, CPD                   | step 5  |
| is CUT, HAZ, IDL, LO, PLO, SB | step 6  |
| is MB                         | step 7  |
| is NEQ                        | step 12 |
| is DEL, DMB, INB, LMB         | step 13 |

- 5** Wait until the line state changes. Go to step 4.

- 6** To manually busy the line circuit, type

**>BSY**

and press the Enter key.

*Example of a MAP display:*

```

POST 30 DELQ BUSYQ PREFIX
LCC PTY RNG LEN..... DN STA F S LTA TE RESULT
IBN HOST 01 0 00 01 722 3211 MB

```

**Note:** When the BSY command is successful, the line status reads MB.

| If BSY command | Do      |
|----------------|---------|
| passed         | step 7  |
| failed         | step 13 |

## Line cards in an LM line drawer (continued)

---

### *At the shelf*

7



#### **WARNING**

##### **Static electricity damage**

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

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

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

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

| <b>If a maintenance procedure</b> | <b>Do</b> |
|-----------------------------------|-----------|
| directed you to this procedure    | step 9    |
| did not direct to this procedure  | step 10   |

- 9 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

### *At the MAP terminal*

- 10 To perform a diagnostic test on the line, type

**>DIAG**

and press the Enter key.

*Example of a MAP response:*

```
COMRUS031BL ***+LINE100 DEC01 17:25:31 8800 PASS LN_DIAG
LEN HOST 01 0 00 02 DN 7223212
DIAGNOSTIC RESULT Card Diagnostic OK
ACTION REQUIRED None
CARD TYPE 2X17AB
```

| <b>If the DIAG command</b> | <b>Do</b> |
|----------------------------|-----------|
| passed                     | step 11   |
| failed                     | step 13   |

## Line cards in an LM line drawer (end)

**11** To return the line to service, type

**>RTS**

and press the Enter key.

*Example of a MAP display:*

|      |     |      |               |          |                       |
|------|-----|------|---------------|----------|-----------------------|
| POST | 30  | DELQ | BUSYQ         | PREFIX   |                       |
| LCC  | PTY | RNG  | .....LEN..... | DN       | STA F S LTA TE RESULT |
| IBN  |     | HOST | 01 0 00 01    | 722 3211 | IDL                   |

**If RTS command**

**Do**

passed

step 14

failed

step 13

**12** To determine why the component is unequipped, contact operating company personnel . Continue as directed by operating company personnel.

**13** For additional help, contact the next level of support.

**14** The procedure is complete.

## NT2X05 in a line module controller

---

### Application

Use this procedure to replace an NT2X05 in a line module controller (LMC).

| PEC    | Suffix | Card name                                               | Shelf or frame name |
|--------|--------|---------------------------------------------------------|---------------------|
| NT2X05 | AA, AB | Line module converter<br>+24V card                      | LMC                 |
| NT2X05 | AC     | Line power pack card<br>with improved<br>grounding      | LMC                 |
| NT2X05 | CA     | Line power pack card<br>with closing ringing<br>feature | LMC                 |

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

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

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

**Note:** The NT2X05 is a ringing generator (RG).

### Common procedures

This procedure refers to *Replacing a card*.

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

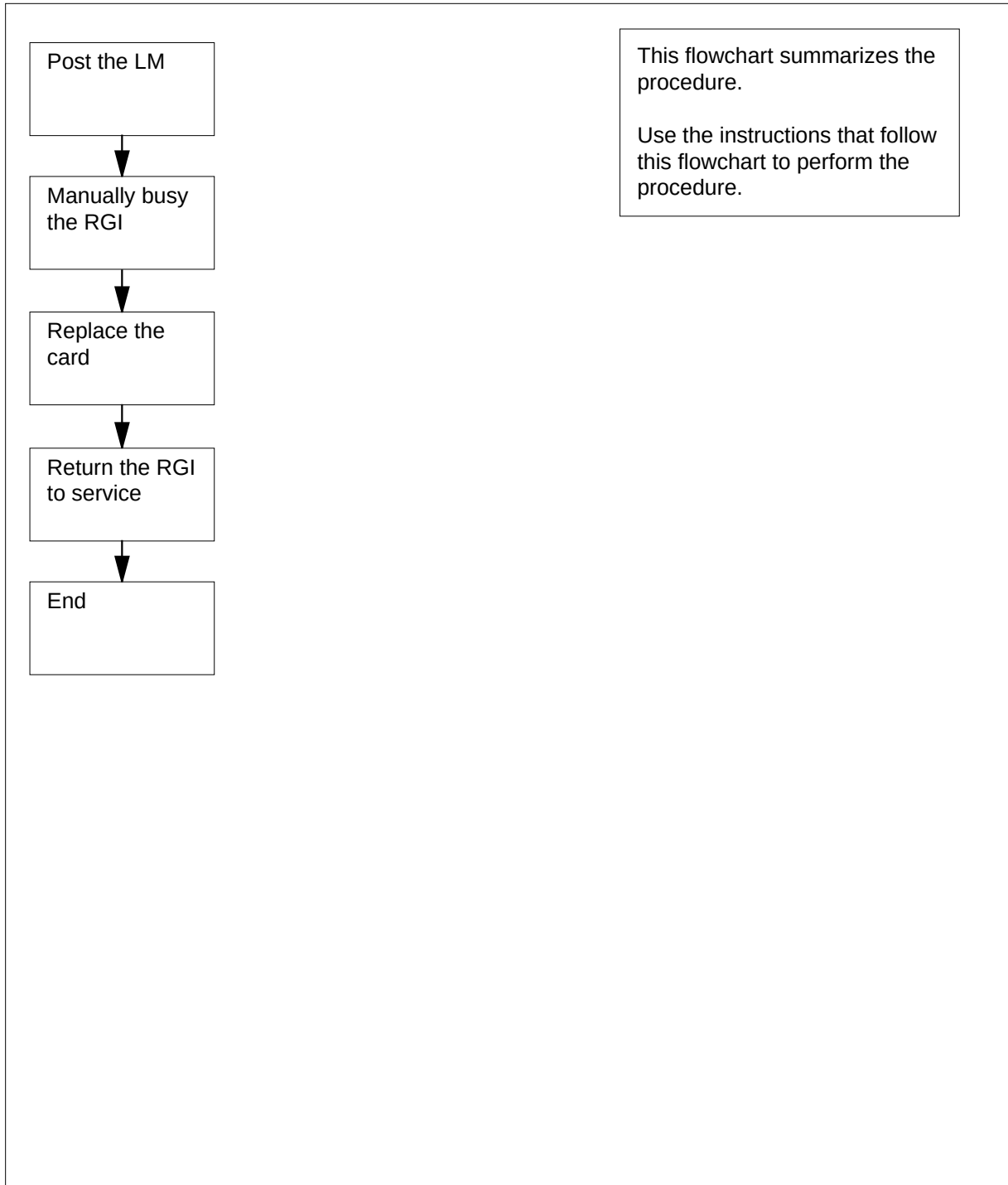
### Action

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



## NT2X05 in a line module controller (continued)

### Summary of replacing an NT2X05 in a line module controller



## NT2X05

### in a line module controller (continued)

#### Replacing an NT2X05 in a line module controller

##### At the MAP terminal

1



#### CAUTION

##### Potential loss of service

This procedure directs you to manually busy a RG in an LMC. If you manually busy an RG, you remove RG redundancy from the bay. Perform this procedure only if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

2

To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 3    | 0    | 0    | 0    | 0    | 71   |

3

To post the LM, type

**>POST LM site frame\_no unit\_no**

and press the Enter key.

*where*

#### site

is the PM location (alphanumeric)

#### frame\_no

is the frame number (0 to 511)

#### unit\_no

is the PM unit number (0 or 1)

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 3    | 0    | 0    | 0    | 1    | 71   |
| LM | 0    | 0    | 0    | 0    | 1    | 6    |

|      |      |    |      |        |
|------|------|----|------|--------|
| LM   | HOST | 00 | 0    | InSv   |
| RGen | :    | 0  | InSv | 1 InSv |

## NT2X05

### in a line module controller (continued)

- 4 Determine the state of the RGs.

| If                                                                 | Do      |
|--------------------------------------------------------------------|---------|
| either RG is Standby                                               | step 13 |
| the RG you want to replace is InSv and the mate RG is InSv or ISTb | step 5  |
| the RG you want to replace is InSv and the mate RG is ManB or SysB | step 13 |
| the RG you want to replace is ManB                                 | step 7  |
| the RG you want to replace is SysB                                 | step 5  |

- 5 To manually busy the RG, type

**>BSY RGI rgi\_no**

and press the Enter key.

where

**rgi\_no**

is the number (0 or 1) of the ringing generator interface (RGI)

*Example of a MAP response:*

```
WARNING:CALLS IN RINGING STATE USING THIS RGI WILL BE LOST
DO YOU WANT TO CONTINUE ?
Please confirm ("YES", "Y", "NO", or "N"):
```

- 6 To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

OK

## NT2X05

### in a line module controller (continued)

---

#### *At the shelf*

7



#### **WARNING**

##### **Static electricity damage**

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

Pull down and set the handle of the RG POWER switch to the OFF position.

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

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

**Note 2:** Determine if the card you will replace has switches. Make sure the switches on the replacement card and the card you will replace have the same settings.

- 9 Power up the RG as follows:
- a Pull up and set the handle of the POWER switch to the ON position.
  - b Press and hold the RESET button on the ringing generator.
  - c Pull up and set the handle of the converter circuit breaker on the FSP or MSP until the handle clicks into place.
  - d Release the RESET button.
- 10 The next action depends on why you perform the procedure.

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 11 |
| did not direct you to this procedure | step 12 |

- 11 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

#### *At the MAP terminal*

- 12 To return the RGI to service, type
- ```
>RTS RGI rgi_no
```
- and press the Enter key.
- where*

NT2X05
in a line module controller (end)

rgi_no

is the number (0 or 1) of the RGI

Example of a MAP response:

OK.

- 13** If you manually busy the RG, you disable all RGs in the LM bay. To determine how to proceed, Contact operating company personnel responsible for your next level of support. Continue as directed by the operating company personnel.
- 14** For additional help, contact the next level of support.
- 15** The procedure is complete.

NT2X70 in a line module controller

Application

Use this procedure to replace the following cards in a line module controller (LMC).

PEC	Suffix	Card name	Shelf or frame name
NT2X70	AA, AB, AC, AD	Power converter card	LMC

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

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

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

Common procedures

This procedure contains the following common procedures:

- *Replacing a card*
- *Loading a PM*

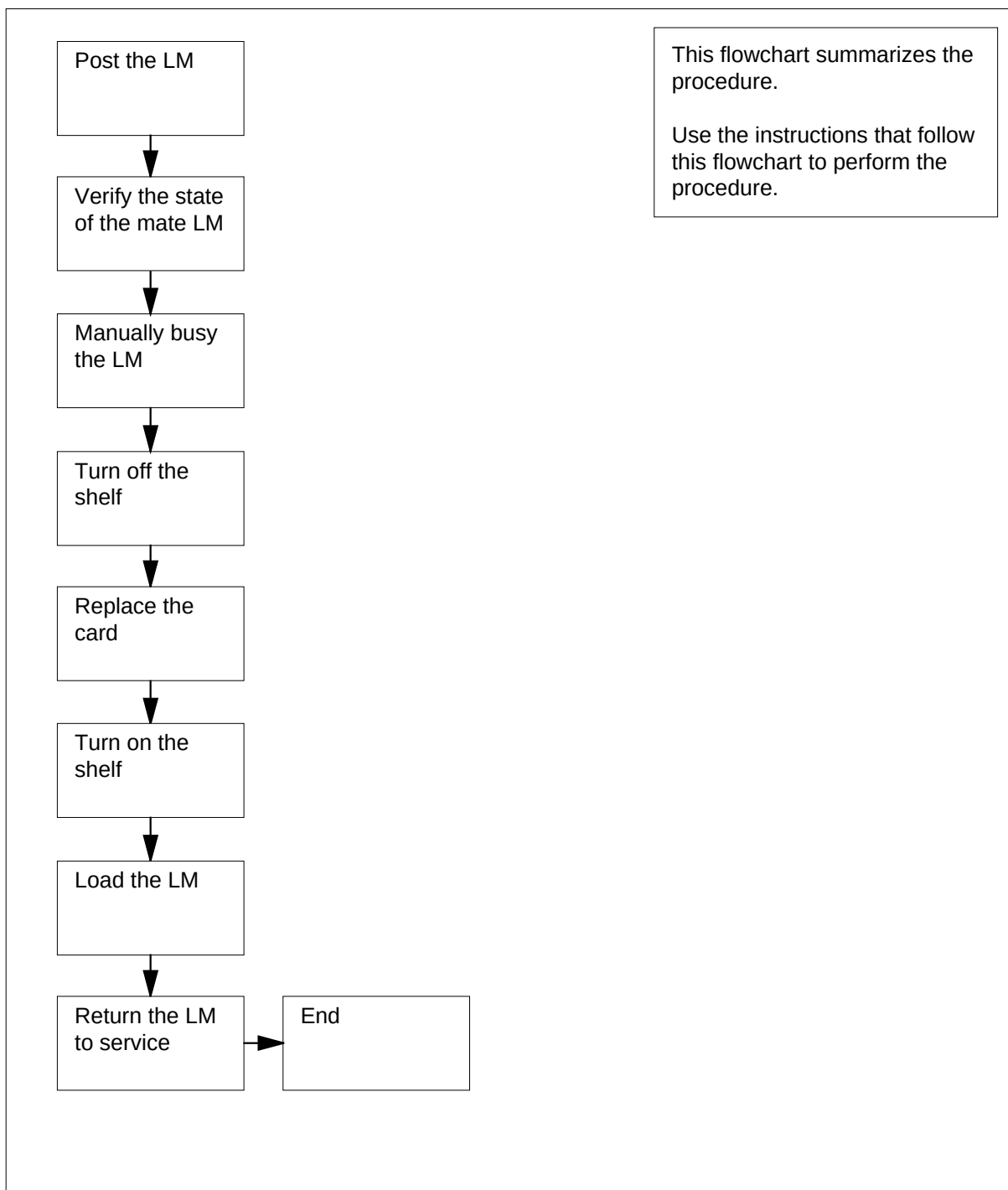
Do not go to the common procedure unless the step-action procedure directs you to go.

Action

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

NT2X70 in a line module controller (continued)

Summary of replacing an NT2X70 in a line module controller



NT2X70 in a line module controller (continued)

Replacing an NT2X70 in a line module controller

At the MAP terminal

1



WARNING

Potential loss of service

This procedure directs you to manually busy a minimum of one LMC. If you manually busy an LMC, service degradation can occur. Perform this procedure only if you need to restore out-of-service components. Unless it is urgent, perform the procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.

2

To access the PM level of the MAP display, type

>MAPCI;MTC;PM

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	3	0	0	0	1	71

3

To post the LM, type

>POST LM site frame_no unit_no

and press the Enter key.

where

site

is the PM location (alphanumeric)

frame_no

is the frame number (0 to 511)

unit_no

is the PM unit number (0 or 1)

Example of a MAP display:

NT2X70

in a line module controller (continued)

	SysB	ManB	OffL	CBSy	ISTb	InSv
PM	3	0	0	0	1	71
LM	0	0	0	0	1	1

LM HOST 00 0 ISTb
RGen : 0 InSv 1 InSv

- 4 Determine the state of the LM.

If the state of the LM	Do
is InSv or ISTb	step 5
is SysB or CBSy	step 8
is ManB	step 9
is Offl	step 18

- 5 To post the mate LM, type
>POST LM site frame_no unit_no
 and press the Enter key.
where

site
 is the PM location (alphanumeric)

frame_no
 is the frame number (0 to 511)

unit_no
 is the PM unit number (0 or 1)

- 6 Determine the state of the mate LM and the ringing generators (RG) of the mate LM.

If the state of the mate LM	Do
is InSv or ISTb and both RGs are InSv	step 7
and the state of the RG are other than listed here	step 19

- 7 To post the LM on which you want to replace a card, type
>POST LM site frame_no unit_no
 and press the Enter key.
where

site
 is the PM location (alphanumeric)

NT2X70 in a line module controller (continued)

frame_no

is the frame number (0 to 511)

unit_no

is the PM unit number (0 or 1)

- 8 To manually busy the LM, type

>BSY

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	3	1	0	0	0	71
LM	0	1	0	0	0	1

LM HOST 01 0 ManB
RGen : 0 Standby 1 InSv
bsy
OK.

At the shelf

- 9

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

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

Pull down and set the handle of the power converter POWER switch to the OFF position.

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

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

Note 2: Determine if the card you will replace has switches. Make sure the switches on the replacement card and the card you will replace have the same settings.

- 11 The next action depends on the power converter version and the type of supervisory panel.

- 12 Power up the converter as follows:

- a Pull up and set the handle of the POWER switch to the ON position.
- b Press and hold the RESET button on the power converter.

NT2X70 in a line module controller (end)

- c** Pull up and set the handle of the converter circuit breaker on the FSP or MSP until the handle clicks into place.
- d** Release the RESET button.
- 13** The next action depends on why you perform this procedure.

If a maintenance procedure	Do
directed you to this procedure	step 14
did not direct you to this procedure	step 15

- 14** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

At the MAP terminal

- 15** To load the LM, type
>LOADPM
and press the Enter key.

Example of a MAP response:

```
LM HOST 01 0 LoadPM PASSED
```

- 16** To load the PM unit perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 17** To return the LM to service, type
>RTS
and press the Enter key.

Example of a MAP response:

```
rts
OK.
InSvce Tests Initiated
OK.
```

- 18** To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.
- 19** Do not manually busy the LMC. If you manually busy the LCM, a loss of calls in progress occurs. To proceed, contact the operating company personnel responsible for the next level of support. Continue as directed by the operating company personnel.
- 20** For additional help, contact the next level of support.
- 21** The procedure is complete.

3 Link peripheral processor card replacement procedures

Introduction

This chapter contains card replacement procedures for the link peripheral processor (LPP). The first section in the chapter provides diagrams that show LPP shelf designs.

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

Each procedure contains the following sections:

- Application
- Common procedures
- Action

Application

This section identifies the LPP cards that this procedure covers.

Common procedures

This section lists common procedures that you use during the LPP card replacement procedure. A common procedure is a series of steps that repeat in maintenance procedures. An example of a common procedure is the removal and replacement of a card. Common procedures appear in the common procedures chapter in this NTP.

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

Action

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

Recording card replacement activities

Record the following information in office records when you replace a card.

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

LPP shelf layouts

Application

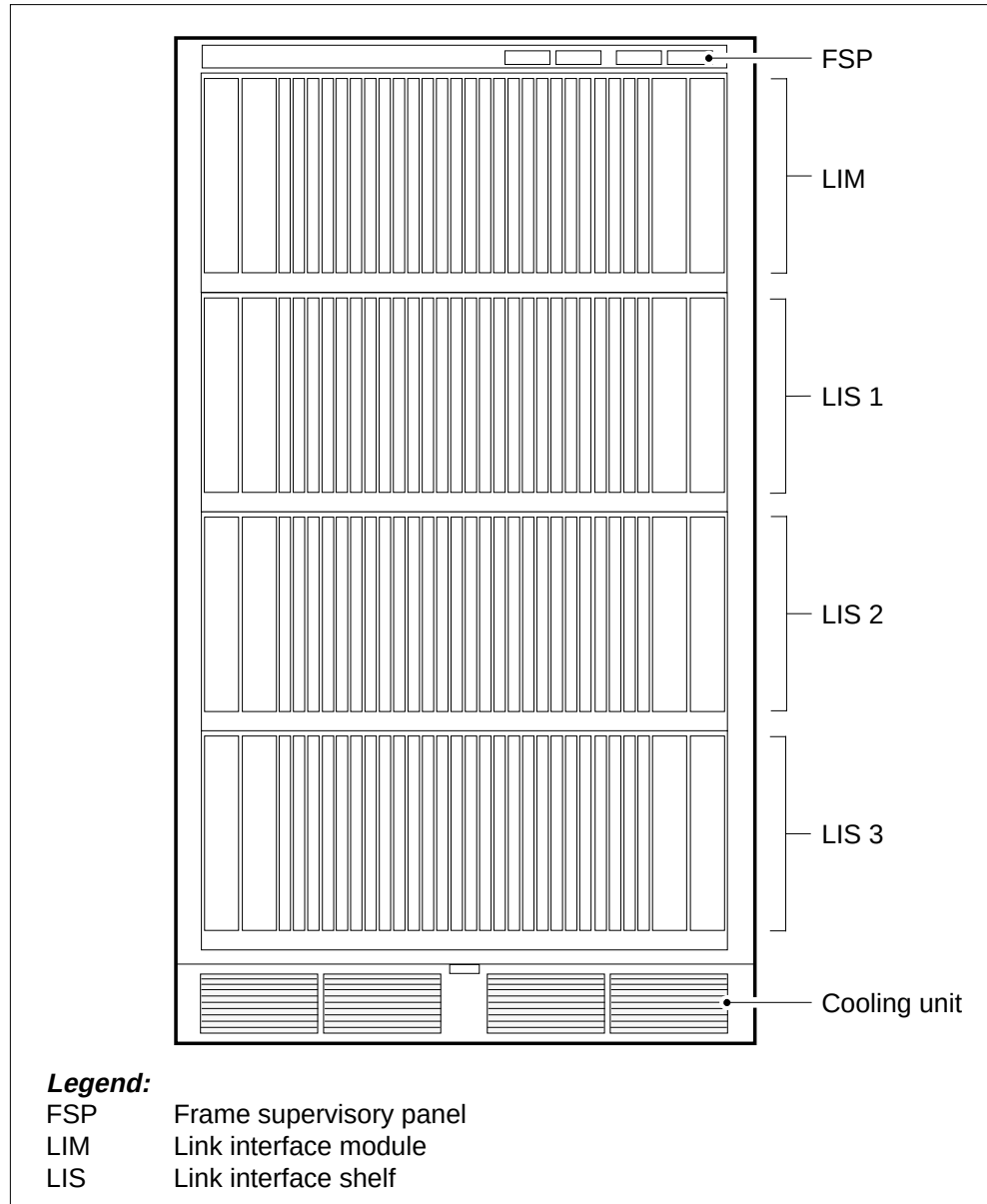
This section shows frame layouts for the link peripheral processor (LPP), as follows:

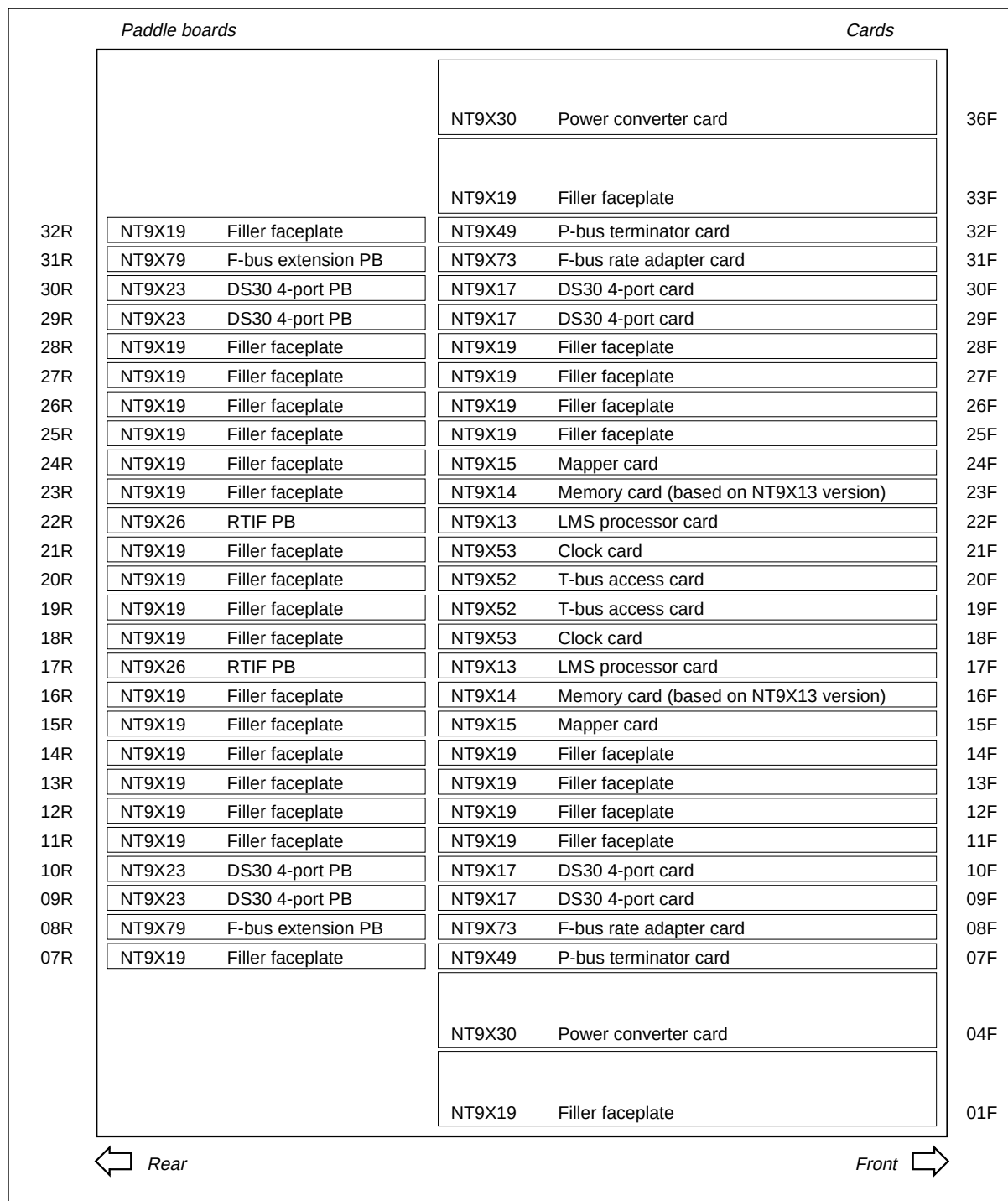
- link interface module (LIM), that shows LMS units 0 and 1
- link interface module (LIM), that shows LMS units 0 and 1 (fiber LPP)
- link interface shelf (LIS), that shows common card fill
- LIS application specific units (ASU), that includes the following:
 - network interface unit (NIU)
 - application processor units (APU)
 - ethernet interface unit (EIU)
 - CCS7 link interface unit (LIU7)
 - X.25/X.75 interface units (XLIU)
 - frame relay interface units (FRIU)
 - voice processor units (VPU)

Note: The diagrams that follow show standard frame and shelf layouts. The shelf in your office can have minor differences.

LPP shelf layouts (continued)

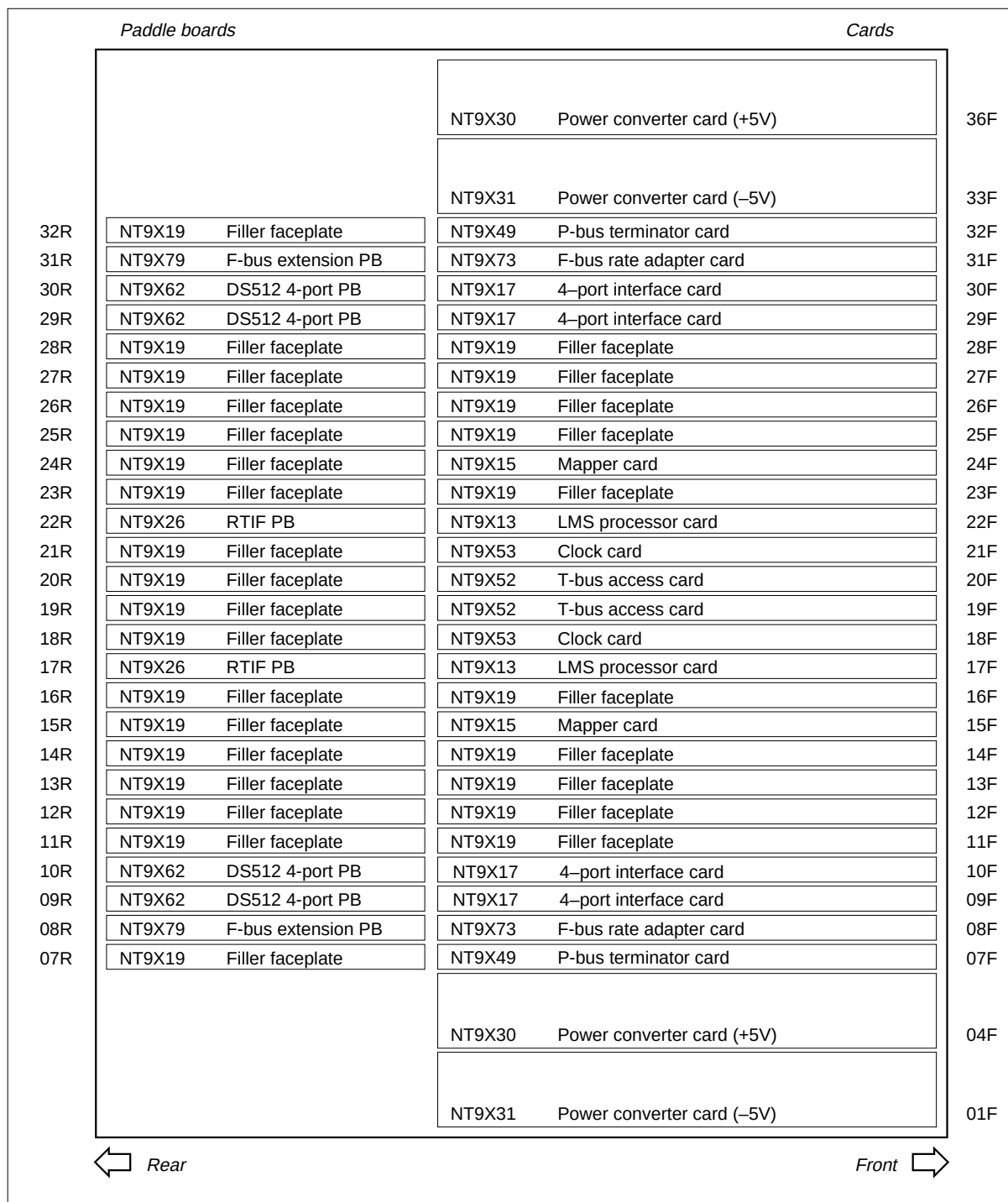
Figure Link peripheral processor

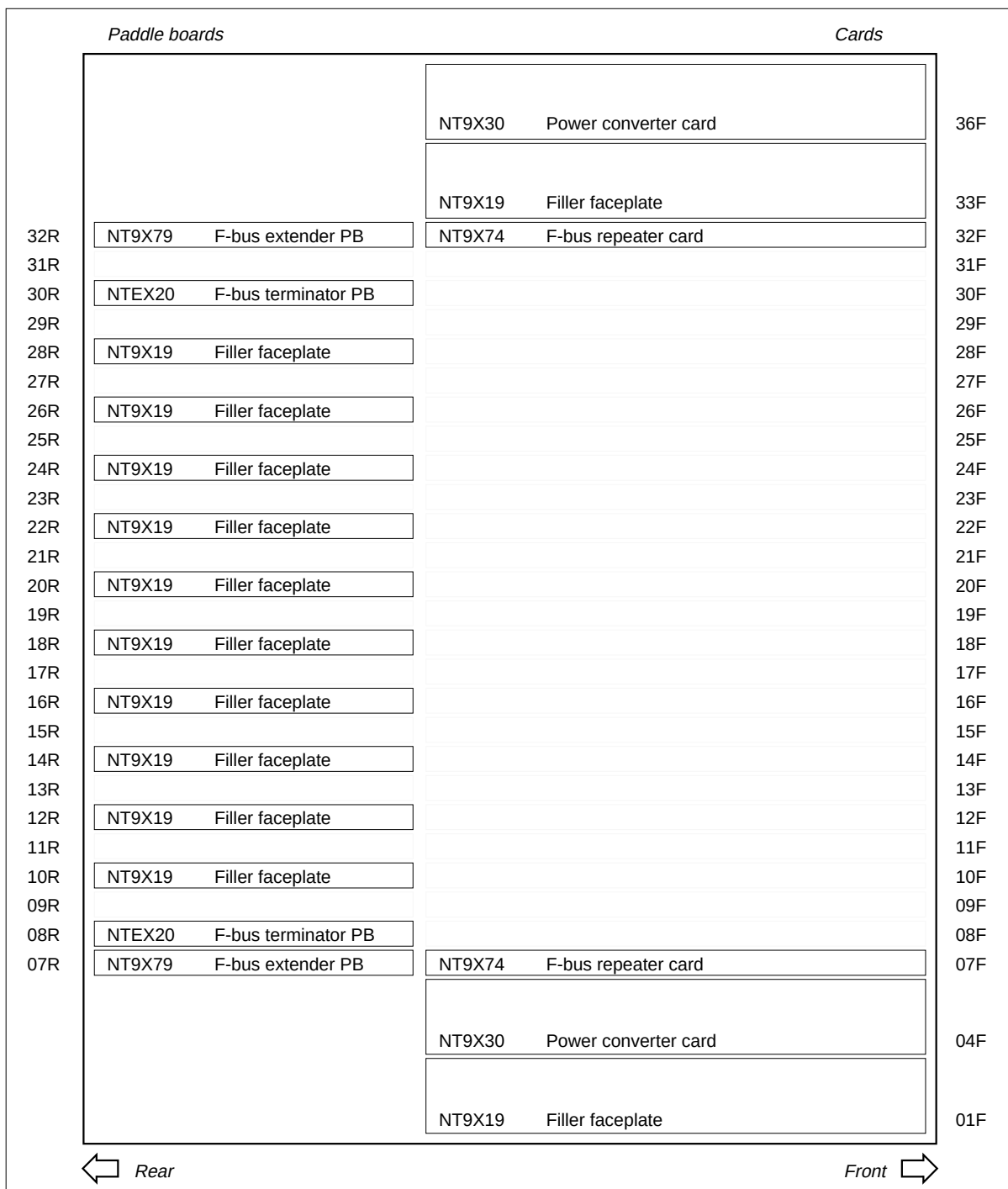


LPP shelf layouts (continued)**Figure Link interface module, that shows LMS 0 and LMS 1**

LPP shelf layouts (continued)

Figure Link interface module, showing LMS 0 and LMS 1 (fiber LPP)

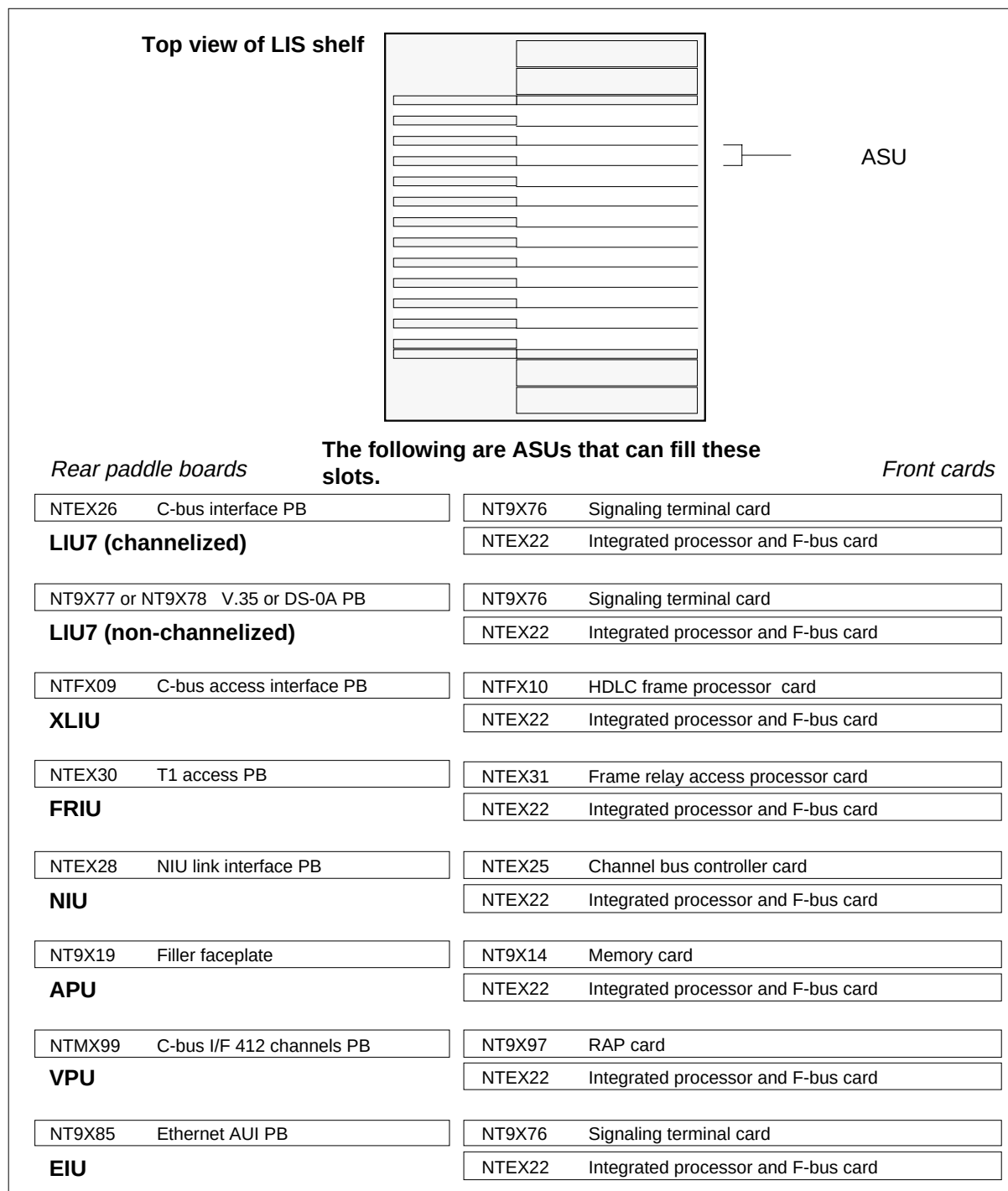


LPP shelf layouts (continued)**Figure Link interface shelf, that shows common fill ASUs**

Note: Slots for ASUs have gray outlines.

LPP shelf layouts (end)

Figure Link interface shelf, that shows ASU location



APU cards in an LPP LIS

Application

Use this procedure to replace the following cards in a application processor unit (APU) in a link peripheral processor (LPP) link interface shelf (LIS).

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

PEC	Suffix	Card name	Shelf or frame name
NT9X14	DB	24-byte memory card	APU in an LPP LIS
NTEX22	BB	Integrated processor and F-bus interface card	APU in an LPP LIS

Note 1: Some documentation refers to a link interface module (LIM) unit as a local message switch (LMS). LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit indicates an LMS.

Note 2: The term LIM also refers to the LPP, when it indicates the entire LPP cabinet. This reference parallels how the LISs in the LPP closely associate with the LIM. MAP displays and data schema tables also refer to the LPP as a LIM.

Common procedures

This procedure contains the following common procedures:

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

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

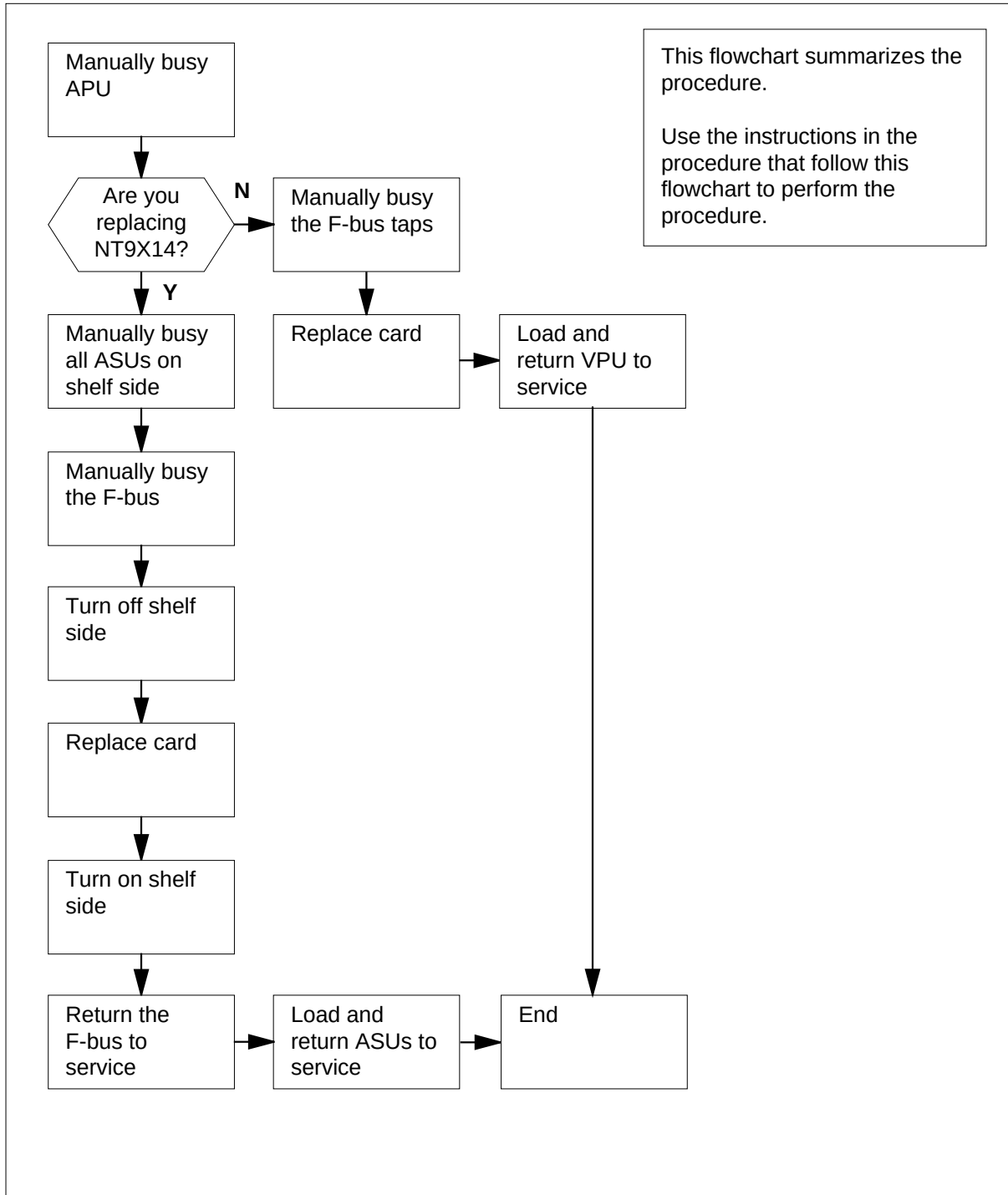
APU cards
in an LPP LIS (continued)

Action

This procedure contains a summary flowchart and a list of specific steps. Use the flowchart as an overview of the procedure. Follow the specific steps to perform the procedure.

APU cards in an LPP LIS (continued)

Summary of Replacing APU cards in a LPP LIS



APU cards in an LPP LIS (continued)

How to Replace APU cards in an LPP LIS

At you current location

1

**WARNING****Loss of service**

When you remove an APU from service, you reduce service capacity.

**WARNING****Loss of service**

This procedure removes from service all application specific units (ASU) for an entire shelf side if your office procedures do not support hot insertion. Perform this procedure only if you need to return the APU to service. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.

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

At the MAP terminal

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

>MAPCI;MTC;PM

and press the Enter key.

Example of a MAP display:

PM	SysB	ManB	OffL	CBsy	ISTb	InSv
	11	0	11	4	16	38

- 4 To post the APU that contains the card you want to replace, type

>POST APU apu_no

and press the Enter key.

where

apu_no

is the number of the APU (0 to 511)

Example of a MAP display:

APU cards in an LPP LIS (continued)

		SysB	ManB	Offl	CBSy	ISTb	InSv
PM		11	0	11	4	16	38
APU		3	0	0	0	0	4

APU 1 InSv Rsvd

- 5 To display information about the APU, type

>QUERYPM

and press the Enter key.

Example of a MAP response:

```
PM type: APU PM No.: 1 Status: ISTb
LIM: 0 Shelf: 1 Slot: 14 APU FTA: 424B 1000
Default Load: ULC02A0
Running Load: ULC02A0
LMS States : InSv InSv
Auditing : Yes Yes
Msg Channels: Acc Acc
TAP 3 : . .
```

- 6 Record the number of the link interface module (LIM) and the taps that associate with the APU.

Note: The LIM number follows the word LIM on the second line of the display. In the example, the LIM number is 0. The tap number follows the word TAP on the last line of the display. In the example, the TAP number is 3.

- 7 Determine the state of the APU that contains the card you want to replace.

If the state of the APU	Do
is SysB, SysB (NA), ISTb, or InSv	step 8
is ManB or ManB (NA)	step 10
is Offl	step 94

- 8 To manually busy the APU that contains the card you want to replace, type

>BSY FORCE

and press the Enter key.

Example of a MAP response:

```
BSYing APU 1 may reduce ADAS capacity.
Please confirm ("YES", "Y", "NO", or "N"):
```

If	Do
the command passed	step 10

APU cards in an LPP LIS (continued)

	If	Do
	you need to confirm the command	step 9
9	To confirm the busy command, type >YES and press the Enter key. <i>Example of a MAP response:</i> APU 1 BSY Passed	
10	The next action depends on the card you are replace. Note: Procedures in your office may permit hot insertion techniques in some circumstances. Consult with operating company personnel or your next level of support and continue as directed.	
	If you	Do
	replace an NTEX22	step 72
	replace an NT9X14, and you are permitted to do hot insertion	step 72
	replace an NT9X14, and you are not permitted to do hot insertion	step 11

11



WARNING

Loss of service

This procedure removes from service all application specific units (ASU) for an entire shelf side. If you remove an ASU from service, you will degrade or stop service for several hours. After you replace the APU card, all ASUs on the shelf side require peripheral module (PM) reloads. Perform this procedure only if you need to return APU components to service. Unless it is urgent, perform this procedure during periods of low traffic only.

APU cards in an LPP LIS (continued)

The next step depends on the information you have on the LIM and the ASUs on the side of the shelf that associates with the APU NT9X14 card that you replace.

If you	Do
know the PM number and slot location of each ASU on the shelf side	step 18
do not know the PM number and slot location of each ASU on the shelf side	step 12

Note: ASUs include: network interface units (NIU), APUs, ethernet interface units (EIU), CCS7 link interface units (LIU7), and voice processor units (VPU). X.25/X.75 link interface units (XLIU) and frame relay interface units (FRIU) are also ASUs but are never provisioned in an LIS that supports APUs.

- 12** To access table NIUINV, type

>TABLE NIUINV;FORMAT PACK

and press the Enter key.

Example of a MAP response:

JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED

TABLE: NIUINV

<line length>: 76 columns can be output per line.

<pack mode>: Pack mode is ON.

<indent column>: Indented lines will begin in column 1.

<first column>: The first column of output is column 1.

- 13** To list the NIUs provisioned, type

>LIST ALL

and press the Enter key.

Example of a MAP response:

APU cards in an LPP LIS (continued)

```

TOP
NUMBER LOCATION LOAD U0INFO U1INFO NETLINKS
-----
1 LIM 0 1 NRS03BG NTEX22BB NTEX25AA NTEX28AA NTEX22BB
NTEX25BA NTEX28AA
(0 11) (0 41) $

2 LIM 0 2 NRS03BG NTEX22BB NTEX25AA NTEX28AA NTEX22BB
NTEX25BA NTEX28AA
(2 52) (2 60) $

BOTTOM

```

If	Do
an NIU is on the LIM shelf that associates with the APU	step 14
an NIU is not on the LIM shelf that associates with the APU you	step 15

Note: The NIU number appears in column 1. The LIM number is in columns 2 and 3. The LIM shelf number is in column 4. In the example listing, NIU 1 (line 1 in the example) is in LIM 0 on shelf 1.

14 Record the number of the NIU that associates with the shelf in use.

15 To access table LIUINV, type
>TABLE LIUINV;FORMAT PACK
and press the Enter key.

16 To list all ASUs for the office, type
>LIST ALL
and press the Enter key.

Example of a MAP response:

```

TOP
LIUNAME LOCATION LOAD PROCINFO CARDINFO
-----
EIU 200 LIM 2 1 9 ERS03BF NTEX22BA NT9X84AA NT9X85AA YES 000075F00020
LIU7 101 LIM 1 1 8 ARS03BG NTEX22BB NT9X76AA NTEX26AA $ 56000 ABI
LIU7 208 LIM 2 2 8 LCC03BF NT9X13CA NT9X75AA NT9X76AA NT9X78AA FBUS
APU 135 LIM 1 3 28 ULX03AU NTEX22BB NT9X14DB SOSNIX
BOTTOM

```

If	Do
a minimum of one ASU is on the LIM shelf side that associates with the APU	step 17

APU cards in an LPP LIS (continued)

If	Do
ASUs are not on the LIM shelf side that associates with the APU	step 18

Note: The ASU number is in columns 1 and 2. The LIM number is in columns 3 and 4. The LIM shelf number is in column 5 and the ASU slot location is in column 6. In the example listing, LIU7 101 (line 2) is in LIM 1, shelf 1, and slot 8. When you face the LPP, the ASU slot number corresponds to the far-left ASU slot.

- 17 Record the number and slot location for each ASU on the shelf side that associates with the APU.

18

ATTENTION

The following routines provide instructions to remove ASUs from service in this order: NIU, LIU7, APU, EIU, and VPU. The priority of services that the ASUs support can require you to remove ASUs from service in a different order. The configuration of the shelf side can require you to remove ASUs from service in a different order. Contact operating company personnel or the next level of support to verify service priorities.

The next action depends on whether NIUs are in the shelf you are working on.

If an NIU	Do
is in the shelf	step 19
is not in the shelf	step 30

19



WARNING

Potential loss of channelized access

This procedure removes an NIU unit from service, which eliminates NIU redundancy for the associated LIS. If the in-service NIU unit becomes out of service at any time during this maintenance procedure, this condition affects channelized access for all ASUs on the LIS.

To post the NIU, type

>POST NIU niu_no

and press the Enter key.

APU cards in an LPP LIS (continued)

where

niu_no

is the number of the NIU (0 to 29)

Example of a MAP display:

	SysB	ManB	OffL	CBSy	ISTb	InSv
PM	0	0	1	0	2	48
NIU	0	0	0	0	0	1

```

NIU 1: InSv
Unit 0: InAct InSv
Unit 1: Act   InSv

```

- 20** Determine the state of the NIU unit that associates with the shelf side. To identify the NIU unit, refer to table "LIS and associated LIM components".

If the state of the NIU unit	Do
is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA), and active	step 21
is ISTb, InSv, SysB, SysB (NA), or ISTb (NA), and inactive	step 24
is ManB or ManB (NA)	step 30
is OffL	step 94

- 21** Determine the state of the mate NIU unit.

If the state of the mate NIU unit	Do
is ISTb or InSv	step 23
is other than listed here	step 22

- 22** The mate unit is not in service. If you switch activity, a loss of service occurs. Contact the next level of support and continue as directed.

- 23** To switch activity, type
>SWACT
 and press the Enter key.

Example of a MAP response:

```

NIU 1 SwAct PM: Request has been submitted.
NIU 1 SwAct PM: Command completed. The node has switched activity.

```

APU cards in an LPP LIS (continued)

	If the SWACT command	Do
	passed	step 24
	failed	step 95
24	To manually busy the NIU unit, type >BSY INACTIVE and press the Enter key. <i>Example 1 of a MAP response:</i> NIU 1 Busy Inactive Unit: Request has been submitted. NIU 1 Busy Inactive Unit: Command completed. The Unit is manually busy. <i>Example 2 of MAP display:</i> Imaging is currently in progress on NIU x Unit Y. Busying the NIU will cause imaging on this NIU to be aborted. Do you wish to continue? Please conform ("YES", "Y", "NO" or "N").	
	If the response is	Do
	as shown in example 2	step 25
	anything else	step 30
25	Imaging is being performed on the NIU unit you are working on. Contact the next level of support to determine if it is safe to proceed. Continue as directed.	
	If the response is	Do
	yes, proceed with busy	step 26
	no, abort busy	step 96
26	To confirm Busy, type >YES and press the Enter key. <i>Example of a MAP response:</i> Imaging will be aborted on NIU x, Unit y.	
27	To access the DEVICES level of the MAP display, type >DEVICES and press the Enter key. <i>Example of a MAP display:</i>	

APU cards in an LPP LIS (continued)

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	1	0	5	45
NIU	0	0	0	0	1	0

NIU 1: ISTb
Unit 0: InAct ManB
Unit 1: Act InSv

	Net Links	CBUS ports	00S
	0 1 2 3		
PB 0		2	
PB 1		.	

- 28** To manually busy all the links for the NIU you are working on, type
>BSYLNKS INACTIVE
and press the Enter key.

Example of a MAP display:

	Net Links	CBUS ports	00S
	0 1 2 3		
PB 0	P P P P	2	
PB 1		.	

BSYLNKS INACTIVE
Command completed.

Note: Paddle board 0 is associated with NIU unit 0; paddle board 1 is associated with NIU unit 1.

	If the BSYLNKS command	Do
	passed	step 29
	failed	step 95

29 To access the CI level of the MAP display, type
>QUIT ALL
and press the Enter key.

30 The next step depends on if LIU7s are in the shelf side that associate with the APU.

	If LIU7s	Do
	are on the shelf side	step 31
	are not on the shelf side	step 37

APU cards
in an LPP LIS (continued)

31



WARNING
Loss of service
The following routine removes an LIU7 from service and temporarily interrupts messaging on the associated CCS7 link.

To post the LIU7, type
>POST LIU7 liu_no
and press the Enter key.
where

liu_no
is the number of the LIU7 (0 to 511)

Example of a MAP display:

			SysB	ManB	OffL	CBsy	ISTb	InSv
PM			1	0	2	0	3	6
LIU7			1	0	0	0	0	3
LIU7	208	InSv		Rsvd				

- 32** To deactivate the CCS7 link that associates with the LIU7, perform the procedure *Deactivating CCS7 links* in this document. Complete the procedure and return to this point.
- 33** Determine the state of the LIU7.

If the state of the LIU7	Do
is SysB, SysB (NA), ISTb, or InSv	step 34
is ManB or ManB (NA)	step 36
is OffL	step 94
34 To manually busy the LIU7, type >BSY FORCE and press the Enter key.	
If	Do
you need to confirm the command	step 35

APU cards in an LPP LIS (continued)

	If	Do
	the command passed	step 36
35	To confirm the command, type >YES and press the Enter key.	
36	Repeat steps 31 to 35 for all LIU7s on the shelf side.	
37	The next step depends on if APUs, EIUs, or VPUs are on the shelf side that associates with the APU.	
	If shelf side	Do
	has APUs, EIUs, or VPU	step 38
	does not have APUs, EIUs, or VPU	step 43
38		

**WARNING****Loss of service capacity**

The following routine can remove an APU from service. Service capacity will reduce. The following routine can remove an EIU from service. The Ethernet address will be inaccessible to the LAN. If other EIUs that provide alternative addresses to the LAN are not present, you will isolate ASUs on the shelf. The following routine removes a VPU from service. As a result, service capacity reduces.

To post the APU, EIU, or VPU by type

>POST asu_type asu_no

and press the Enter key.

where

asu_type

is the ASU type (APU, EIU, VPU)

asu_no

is the number of the ASU (0 to 511 for APU and EIU, 0 to 179 for VPU)

Example of a MAP display:

APU cards in an LPP LIS (continued)

		SysB	ManB	OffL	CBsy	ISTb	InSv
PM		2	0	7	0	14	63
VPU		0	0	1	0	0	5
VPU	1	InSv	Rsvd				
39	Determine the state of the APUs, EIUs, or VPU.						
	If the state of the PM			Do			
	is SysB, SysB (NA), ISTb, or InSv			step 40			
	is ManB or ManB (NA)			step 42			
	is OffL			step 94			
40	To manually busy the APUs, EIUs, or VPU, type >BSY and press the Enter key. <i>Example of a MAP response:</i> BSYing VPU 1 may reduce ADAS capacity. Please confirm ("YES", "Y", "NO", or "N"):						
	If			Do			
	the command passed			step 42			
	you need to confirm the command			step 41			
41	To confirm the busy command, type >YES and press the Enter key. <i>Example of a MAP response:</i> VPU 1 BSY Passed.						
	If the BSY command			Do			
	passed			step 42			
	failed			step 95			
42	Repeat steps 38 to 41 for all APUs, EIUs, or VPUs on the shelf side.						

APU cards
in an LPP LIS (continued)

- 43 To post the LIM, type
>POST LIM lim_no
and press the Enter key.
where
lim_no
is the number of the LIM you must post (0 to 16)
Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	2	0	3	6
LIM	0	0	0	0	1	0
LIM 0 InSv	Links_00S Taps_00S					
Unit0: InSv	.	.				
Unit1: InSv	.	.				

- 44 To access the F-bus level of the MAP display, type
>FBUS
and press the Enter key.
Example of a MAP display:

	Tap: 0	4	8	12	16	20	24	28	32
FBus0: InSv	...	----	----	....	----	----	.....	----	....
FBus1: InSv	...	----	----	....	----	----	.....	----	....

- 45 To manually busy the F-bus that associates with the shelf side you replace, type
>BSY FBUS fbus_no
and press the Enter key.
where
fbus_no
is the number of an fbus (0 or 1)
Note: Refer to table “LIS and associated LIM components”to identify the F-bus associated with the card you must replace.

APU cards in an LPP LIS (continued)

At the shelf

46

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

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

To power down the NT9X30 card for the shelf side, press down and release the power switch. The power switch is on the faceplate of the card. The CONVERTER OFF LED illuminates when the converter powers down.

If the CONVERTER OFF LED**Do**

is lit

step 47

is not lit

step 93

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

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

- 48** Lift and release the power switch on the faceplate of the card to power up the NT9X30 card.

Note: The CONVERTER OFF LED goes out when the power converter powers up.

At the MAP terminal

- 49** To return the F-bus to service, type

```
>RTS FBUS 0 tap_no
```

and press the Enter key.

where

fbus_no

is the number of a fbus (0 or 1)

APU cards in an LPP LIS (continued)

50

ATTENTION

The routines that follow return ASUs to service in this order: NIU, LIU7, APU, EIU, and VPU.

It can be necessary to return to service the ASUs in a different order. The order depends on the priority of the services the ASUs support or the shelf side configuration. Consult operating company personnel or the next level of support if you need to verify service priorities.

Determine if the shelf contains NIUs.

If the shelf	Do
contains NIUs	step 51
does not contain NIUs	step 57

- 51** To post the NIU, type
>POST NIU niu_no
 and press the Enter key.
where
niu_no
 is the number of the NIU (0 to 29)

- 52** To load the inactive NIU unit, type
>LOADPM INACTIVE
 and press the Enter key.

Example of a MAP response:

NIU 1 Load Inactive Unit: Request has been submitted.
 NIU 1 Load Unit 0: Command completed. The Unit contains
 the "NRS0 123BA" load.

If the LOADPM command	Do
passed	step 54
failed	step 53

- 53** To load the PM unit perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.
- 54** To return to service the inactive NIU unit, type
>RTS INACTIVE

APU cards in an LPP LIS (continued)

and press the Enter key.

Example of a MAP response:

```
NIU 1 RTS Inactive Unit: Request has been submitted.
NIU 1 RTS Inactive Unit: Command completed. The Unit is in service.
```

	If the RTS command	Do
	passed	step 57
	failed	step 95
55	To access the DEVICES level of the MAP display, type >DEVICES and press the Enter key.	
56	To return the links to service, type >RTSLNKS INACTIVE and press the Enter key. <i>Example of a MAP display:</i>	
	<pre> Net Links 0 1 2 3 PB 0 PB 1 RTSLNKS INACTIVE Command completed.</pre> CBUS ports 00S 2 .	
	If the RTSLNKS command	Do
	passed	step 55
	failed	step 95
57	Determine if the shelf side contains CCS7 link interface units (LIU7).	
	If shelf side	Do
	contains with LIU7s	step 58
	does not contain with LIU7s	step 64
58	To post the LIU7 , type >POST LIU7 liu_no and press the Enter key. <i>where</i>	

APU cards in an LPP LIS (continued)

- liu_no**
is the number of the LIU7 (0 to 511)
- 59** To load the LIU7, type
>LOADPM
and press the Enter key.
Example of a MAP response:
LIU7 208 LOADPM Passed
- | If the LOADPM command | Do |
|-----------------------|---------|
| passed | step 61 |
| failed | step 60 |
- 60** To load the PM perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.
- 61** To return the LIU7 to service, type
>RTS
and press the Enter key.
Example of a MAP response:
LIU7 100 RTS Passed
- | If the RTS command | Do |
|--------------------|---------|
| passed | step 62 |
| failed | step 95 |
- 62** To activate the CCS7 link associated with the LIU7 perform the procedure *Activating CCS7 links* in this document. Complete the procedure and return to this point.
- 63** Repeat steps 58 to 62 for all LIU7s on the shelf side you work on.
- 64** Determine if the shelf side contains APUs, EIUs, or VPUs.
- | If shelf side | Do |
|--------------------------------------|---------|
| contains APUs, EIUs, or VPUs | step 65 |
| does not contain APUs, EIUs, or VPUs | step 70 |
- 65** To post the APUs, EIUs, or VPUs, type
>POST asu_type asu_no
and press the Enter key.

APU cards in an LPP LIS (continued)

where

asu_type

is the ASU type (APU, EIU, VPU)

asu_no

is the number of the ASU (0 to 511 for APU and EIU, 0 to 179 for VPU)

66 To load the APU, EIU, or VPU, type

>LOADPM

and press the Enter key.

APU 1 LOADPM Passed

If the LOADPM command	Do
passed	step 68
failed	step 67

67 To load the PM perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

68 To return to service the APU, EIU, or VPU to service, type

>RTS

and press the Enter key.

APU 1 RTS Passed

If the RTS command	Do
passed	step 70
failed	step 95

69 Repeat steps 65 to 68 for all APUs, EIUs, and VPUs on the shelf side.

70 Determine if another maintenance procedure directed you to this procedure.

If another maintenance procedure	Do
directed you to this procedure	step 71
did not direct you to this procedure	step 97

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

72 To post the LIM, type

>POST LIM lim_no

APU cards
in an LPP LIS (continued)

and press the Enter key.
where
lim_no
is the number of the LIM that you recorded in step 6
Example of a MAP display:

PM	SysB	ManB	OffL	CBsy	ISTb	InSv
LIM	1	0	2	0	3	6
	0	0	0	0	1	0
LIM 0 InSv	Links_00S Taps_00S					
Unit0: InSv	:					
Unit1: InSv	:					

73 To access the F-bus level of the MAP display, type
>FBUS
and press the Enter key.
Example of a MAP display:

	Tap: 0	4	8	12	16	20	24	28	32
FBus0: InSv	....	----	----	----	----	----	----	----	----
FBus1: InSv	....	----	----	----	----	----	----	----	----

74 To manually busy the APU tap on F-bus 0, type
>BSY FBUS 0 tap_no
and press the Enter key.
where
tap_no
is the number of the APU tap that you recorded in step 6

If	Do
you need to confirm the command	step 75
you do not need to confirm the command	step 76

75 To confirm the command, type
>YES
and press the Enter key.
Example of a MAP response:

APU cards in an LPP LIS (continued)

```
Confirmed ...  
LIM 0 FBus 0 Tap 3 Busy initiated.  
LIM 0 FBus 0 Tap 3 Busy passed.
```

- 76** To manually busy the APU tap on F-bus 1, type

```
>BSY FBUS 1 tap_no
```

and press the Enter key.

where

tap_no

is the number of the APU tap that you recorded in step 6

Example of a MAP response:

```
LIM 0 FBus 1 Tap 3 Busy requires confirmation because a  
SEVERE system OUTAGE may occur if the following node is  
isolated:
```

```
APU 1
```

```
Do you wish to proceed with this operation?
```

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

- 77** To confirm the command, type

```
>YES
```

and press the Enter key.

Example of a MAP response:

```
Confirmed ...  
LIM 0 FBus 1 Tap 3 Busy initiated.  
LIM 0 FBus 1 Tap 3 Busy passed.
```

APU cards in an LPP LIS (continued)

At the shelf

78



WARNING

Static electricity damage

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

Determine the type of card you must replace.

	If you	Do
	must replace NT9X14	step 79
	must replace NTEX22	step 82
79	Unseat the NTEX22 card that associates with the APU. To unseat the card, perform the procedure <i>Unseating cards in equipment shelves</i> in this document. Complete the procedure and return to this point.	
80	To replace the NT9X14 card, perform the procedure <i>Replacing a card</i> in this document. Complete the procedure and return to this point.	
	Note: If the card you must replace has switches, make sure that the switches on the replacement card have the same settings.	
81	Reseat the NTEX22 card that associates with the APU. To reseat the card perform the procedure <i>Reseating cards in equipment shelves</i> in this document. Complete the procedure and return to this point.	
	Go to step 83.	
82	To replace the card perform the procedure <i>Replacing a card</i> in this document. Complete the procedure and return to this point.	
	Note: If the card you must replace has switches, make sure that the switches on the replacement card have the same settings.	
83	Determine if a maintenance procedure directed you to this procedure.	
	If you were	Do
	directed here from a maintenance procedure	step 84
	not directed here from a maintenance procedure	step 85
84	Return to the maintenance procedure that directed you to this procedure and continue as directed.	

APU cards in an LPP LIS (continued)

At the MAP terminal

85 To return to service the APU tap on F-bus 0, type

>RTS FBUS 0 tap_no

and press the Enter key.

where

tap_no

is the number of the APU tap that you recorded in step 6

Example of a MAP response:

```
LIM 0 FBus 0 Tap 3 Return to Service passed
- local maintenance not accessible.
```

If the RTS command	Do
passed	step 86
failed	step 95

86 To return to service the APU tap on F-bus 1 to service, type

>RTS FBUS 1 tap_no

and press the Enter key.

where

tap_no

is the number of the APU tap that you recorded in step 6

Example of a MAP response:

```
LIM 0 FBus 1 Tap 3 Return to Service initiated.
LIM 0 FBus 1 Tap 3 Return to Service passed.
```

If the RTS command	Do
passed	step 87
failed	step 95

87 To quit from the F-bus level of the MAP display, type

>QUIT

and press the Enter key.

88 To post the APU, type

>POST APU apu_no

and press the Enter key.

where

APU cards in an LPP LIS (continued)

apu_no

is the number of the APU (0 to 179)

- 89** To load the APU, type
>LOADPM
and press the Enter key.

APU 1 LOADPM Passed

If the LOADPM command	Do
passed	step 91
failed	step 90

- 90** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 91** To return to service the APU, type
>RTS
and press the Enter key.

APU 1 RTS Passed

If the RTS command	Do
passed	step 97
failed	step 95

- 92** You must clear all faults on the inactive NIU unit before you complete the activity switch, or loss of service can result. For direction on how to proceed, consult the next level of support and continue as directed.

- 93** It is not safe to proceed if you do not correctly power down the power converter. Consult operating company personnel or the next level of support on how to proceed without a spare XLIU. Continue as directed.

- 94** Consult operating company personnel to determine why the component is offline and continue as directed by operating company personnel.

- 95** For additional help, contact the next level of support.

- 96** To abort Busy, type

>NO

and press the Enter key. Busy request has been aborted, node imaging is continuing.

Example of a MAP response:

Aborted.

APU cards in an LPP LIS (end)

97 The procedure is complete.

LIS and associated LIM components

LIM unit	Associated LIM hardware and F-buses	
0 (left side)	F-bus number:	0
	Mate F-bus number:	1
	Shelf side:	slots 0 to 19
	NIU unit number	:unit 0
	Location of NT9X13:	slot 17F
	Location of NT9X30:	slot 4F
1 (right side)	F-bus number:	1
	Mate F-bus number:	0
	Shelf side:	slots 39 to 20
	NIU unit number:	unit 1
	Location of NT9X13:	slot 22F
	Location of NT9X30:	36F
Note: Some documentation refers to a LIM unit as an LMS. LIM unit 0 corresponds to LMS 0. LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM refers to an LMS. The term LIM can also refer to an entire LPP cabinet.		

Common fill paddle boards in an LPP LIS

Application

Use this procedure to replace the following cards in a link interface shelf (LIS) in a link peripheral processor (LPP).

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

PEC	Suffix	Card name	Shelf or frame name
NT9X79	AA	F-bus extension paddle board	LIS in an LPP
NT9X79	BA	F-bus termination paddle board	LIS in an LPP
NTEX20	AA, BA	Intrashelf termination paddle board	LIS in an LPP

Note 1: Some documentation refers to a link interface module (LIM) unit as a local message switch (LMS). LIM unit 0 corresponds to LMS 0. LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit refers to an LMS.

Note 2: The system refers to an LPP as a link interface module (LIM) when it indicates the entire LPP. This reference system parallels how the LISs in the LPP associate with the LIM. MAP displays and data schema tables also refer to the LPP as a LIM.

Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*
- *Loading a PM*

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

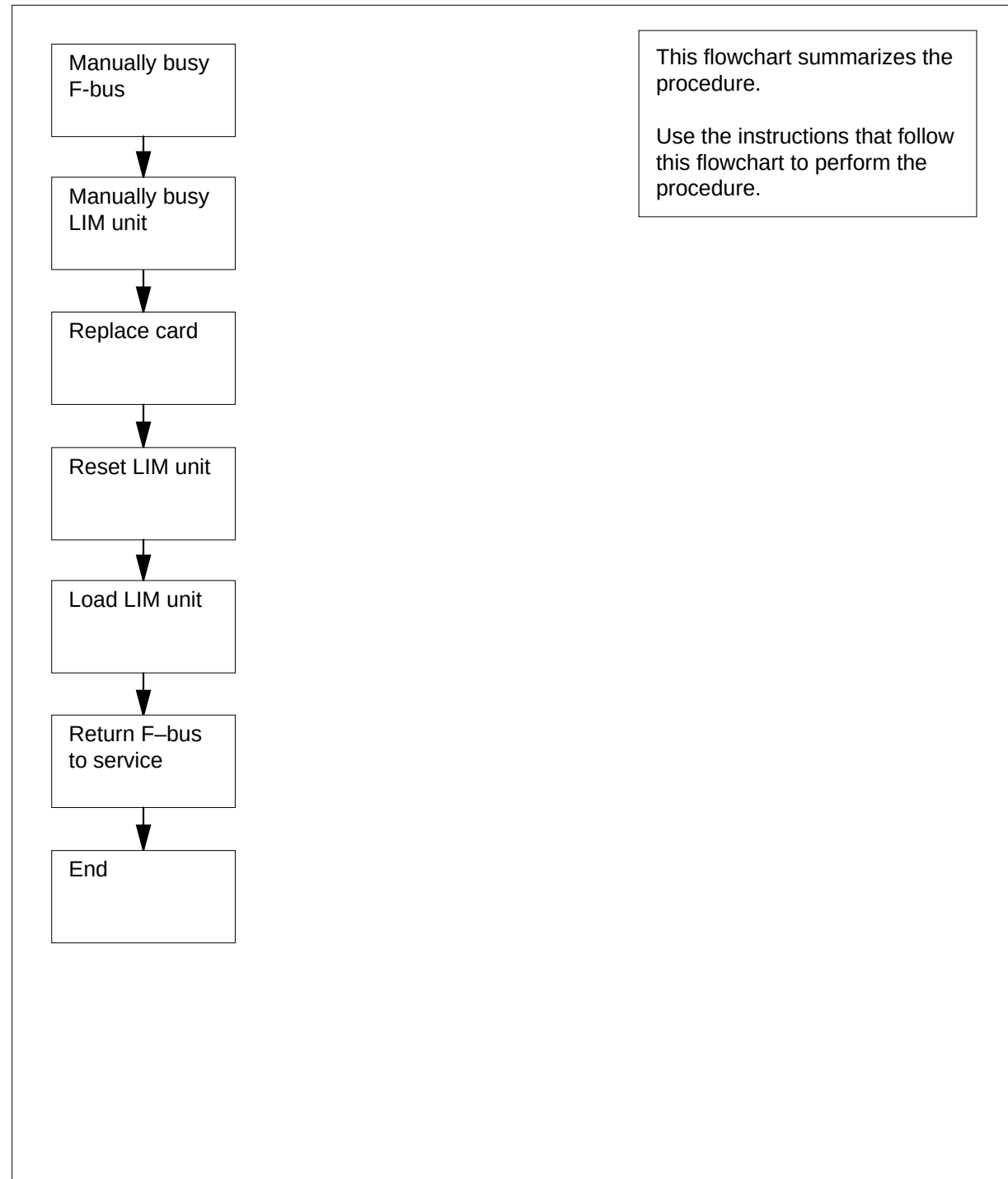
Common fill paddle boards in an LPP LIS (continued)

Action

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

Common fill paddle boards in an LPP LIS (continued)

Summary of Replacing Common fill paddel boards in an LPP LIS



Common fill paddle boards in an LPP LIS (continued)

Replacing Common fill paddle boards in an LPP LIS

At your current location

1



WARNING

Loss of service

During this procedure you remove a LIM and an F-bus from service. When you remove a LIM and an F-bus from service, you disable redundancy for the LPP. Perform this procedure only if you need to return to service the F-bus. Unless it is urgent, perform this procedure during periods of low traffic only.

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

- 2 Make sure that the replacement card is compatible with the software load. To make sure the card is compatible, perform the procedure *Verifying load compatibility of SuperNode cards* in this document. Complete the procedure and return to this point.

At the MAP terminal

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

>MAPCI ; MTC ; PM

and press the Enter key.

Example of a MAP display:

PM	SysB	ManB	OffL	CBsy	ISTb	InSv
	0	0	28	0	0	18

- 4 To post the link interface module (LIM) associated with the cad, type

>POST LIM lim_no

and press the Enter key.

where

lim_no

is the number of the LIM (0 to 16)

Note: To identify the LIM unit associated with the card you replace, refer to table "Common fill paddle boards and associated LIM components".

Example of a MAP display:

Common fill paddle boards in an LPP LIS (continued)

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	28	0	0	18
LIM	0	0	1	0	0	1

```
LIM 0 InSv
Unit0: InSv
Unit1: InSv
Links_00S Taps_00S
      .
      .
```

- 5 Determine the state of the LIM.

Note: The state of the LIM appears on the right of the LIM number on the MAP display.

If the state of the LIM	Do
is Offl	step 26
is any other in-service or out-of-service state	step 6

- 6 Determine the state of the mate LIM unit. To identify the LIM unit that associates with the card you replace, refer to table "Common fill paddle boards and associated LIM components".

Note: The state of the LIM unit appears on the right of the LIM unit number on the MAP display.

If the state of the mate LIM unit	Do
is InSv	step 7
is any other state	step 24

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

>FBUS

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	28	0	0	18
LIM	0	0	1	0	0	1

```
LIM 0 InSv
Unit0: InSv
Unit1: InSv
Links_00S Taps_00S
      .
      .
```

	Tap: 0	4	8	12	16	20	24	28	32
FBus0: InSv	.-.-	----	----	----	----	----	----	----	----
FBus1: InSv	.-.-	----	----	----	----	----	----	----	----

Common fill paddle boards in an LPP LIS (continued)

8

**WARNING****Potential loss of service**

Make sure that the mate LIM unit, the mate F-bus, and the F-bus taps on the mate are in service. When the units and taps are in service, you can manually busy the LIM unit and F-bus that associates with the card. If you manually busy the F-bus and LIM unit with the mates out of service, you isolate nodes on the link interface shelves (LIS).

Determine the states the F-bus and the F-bus taps for the mate LIM unit.

Note: The state of the F-buses appears on the right of the F-bus numbers on the MAP display. To identify the LIM and F-bus components that associate with the card in use, refer to table "Common fill paddle boards and associated LIM components".

If the state of the F-bus	Do
is InSv and all F-bus taps are . (dot)	step 9
is not InSv and one or more F-bus taps are not . (dot)	step 25

9

To manually busy the F-bus associated with the card in use, type

>BSY FBUS fbus_no

and press the Enter key.

where

fbus_no

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

Note: To identify the F-bus components associated with the card you must replace, refer to table "Common fill paddle boards and associated LIM components".

Example of a MAP response:

```
LIM 0 FBus 0 Busy requires confirmation because the
following NIUS may be active on this bus...
NIU 0 unit 0
NIU 0 unit 1
Please confirm ("YES", "Y", "NO", or "N"):
```

If the command	Do
passes	step 11

Common fill paddle boards in an LPP LIS (continued)

	If the command	Do																					
	needs confirmation	step 10																					
10	To confirm the command, type >YES and press the Enter key. <i>Example of a MAP response:</i> <pre>LIM 0 FBus 0 Busy initiated. LIM 0 FBus 0 Busy passed.</pre>																						
11	To quit the F-bus level of the MAP display, type >QUIT and press the Enter key.																						
12	To manually busy the LIM unit that associates with the card you must replace, type >BSY UNIT unit_no and press the Enter key. <i>where</i> unit_no is the number of the LIM unit (0 or 1) <i>Example of a MAP display:</i> <table><tr><td></td><td>SysB</td><td>ManB</td><td>OffL</td><td>CBsy</td><td>ISTb</td><td>InSv</td></tr><tr><td>PM</td><td>0</td><td>0</td><td>28</td><td>0</td><td>17</td><td>13</td></tr><tr><td>LIM</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td></tr></table> <pre>LIM 0 ISTb Links_00S Taps_00S Unit0: ManB 4 10 Unit1: ISTb 4 . bsy unit 0 LIM 0 UNIT 0 Busy initiated. LIM 0 UNIT 0 Busy passed.</pre>		SysB	ManB	OffL	CBsy	ISTb	InSv	PM	0	0	28	0	17	13	LIM	0	0	1	0	1	0	
	SysB	ManB	OffL	CBsy	ISTb	InSv																	
PM	0	0	28	0	17	13																	
LIM	0	0	1	0	1	0																	
	If the response is	Do																					
	Imaging is currently in progress on LIM x UNIT y. Busy Action aborted. Use the force option if you wish to override the imaging of this unit.	step 13																					

Common fill paddle boards in an LPP LIS (continued)

	If the response is	Do
	Imaging is currently in progress on LIM x UNIT y and UNIT z. Busy Action aborted. Use the force option if you wish to override the imaging of this unit.	step 14
	anything else	step 15
13	Imaging is being performed on the LIM unit you are working on. Contact the next level of support to determine if it is safe to proceed. Continue as directed.	
14	Imaging is being performed on the LIM unit you are working on and the mate LIM unit. Contact the next level of support to determine if it is safe to proceed. Continue as directed.	

At the shelf

15



WARNING

Static electricity damage

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

To replace the card perform the procedure *Replacing a card* in this document. Completed the procedure and return to this point.

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

16 Determine if a maintenance procedure directed you to this procedure.

	If a maintenance procedure	Do
	directed you to this procedure	step 17
	did not directed you to this procedure	step 18
17	Return to the maintenance procedure that sent you to this procedure and continue as directed.	

Common fill paddle boards in an LPP LIS (continued)

At the MAP terminal

- 18** To reset the LIM unit that you manually busied in step 12, type

>PMRESET UNIT unit_no

and press the Enter key.

where

unit_no

is the number of the LIM unit (0 or 1)

Example of a MAP response:

```
LIM 0 UNIT 0 Reset initiated.  
LIM 0 UNIT 0 Reset passed.
```

If the PMRESET command	Do
passed	step 21
failed	step 19

- 19** To load the LIM unit, type

>LOADPM UNIT unit_no

and press the Enter key.

where

unit_no

is the number of the LIM unit (0 or 1)

Example of a MAP response:

```
LIM 0 UNIT 0 Load initiated.  
LIM 0 UNIT 0 Load passed.
```

If the LOADPM command	Do
passed	step 21
failed	step 20

- 20** To load the PM perform the procedure *Loading a PM* in this document. Completed the procedure and return to this point.

- 21** To return to service the LIM unit to service, type

>RTS UNIT unit_no

and press the Enter key.

where

unit_no

is the number of the LIM unit (0 or 1)

Example of a MAP response:

Common fill paddle boards in an LPP LIS (continued)

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

If the RTS command	Do
passed	step 22
failed	step 27

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

>FBUS

and press the Enter key.

- 23** To return to service the F-bus, type

>RTS FBUS fbus_no

and press the Enter key.

where

fbus_no

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

Example of a MAP response:

```
LIM 0 FBus 0 Return to Service initiated.
LIM 0 FBus 0 Return to Service passed.
```

If the RTS command	Do
passed	step 28
failed	step 27

- 24** If you continue this procedure you remove the entire LIM from service. When you remove the LIM from service, you isolate application specific units (ASU) on the link interface shelves (LIS). To determine if you can continue with this procedure, contact operating company personnel or the next level of support.

- 25** If you continue this procedure, you isolate a minimum of one application specific unit (ASU) on the link interface shelves (LIS). To determine if you can continue, this procedure, contact operating company personnel or the next level of support.

- 26** Consult operating company personnel to determine why the component is offline. Continue as directed.

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

Common fill paddle boards in an LPP LIS (end)

28 The procedure is complete.

Common fill paddle boards and associated LIM components

PEC	Slot	Associated LIM and F-buses	
NT9X79	07R	LIM unit number:	0
		Mate LIM unit number:	1
NTEX20	30R	F-bus number:	0
		Mate F-bus number:	1
NT9X79	32R	LIM unit number:	1
		Mate LIM unit number:	0
NTEX20	08R	F-bus number:Mate	1
		F-bus number:	0
Note: Some documentation refers to an LIM unit as an LMS. LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit refers to an LMS. The term LIM also refers to the LPP and indicates the entire LPP cabinet.			

EIU cards in an LPP LIS

Application

Use this procedure to replace the following cards in an ethernet interface unit (EIU) in a link peripheral processor (LPP) link interface shelf (LIS).

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

PEC	Suffixes	Card name	Shelf/frame name
NT9X76	AA, BA, CA	STP signaling terminal card	EIU in an LPP LIS
NT9X84	AA	Ethernet interface card	EIU in an LPP LIS
NT9X85	AA	Ethernet attachment unit interface paddle board	EIU in an LPP LIS

Note: Use this procedure to replace all cards in two-slot EIUs.

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

Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Unseating cards in equipment shelves*
- *Replacing a card*
- *Loading a PM*
- *Reseating cards in equipment shelves*

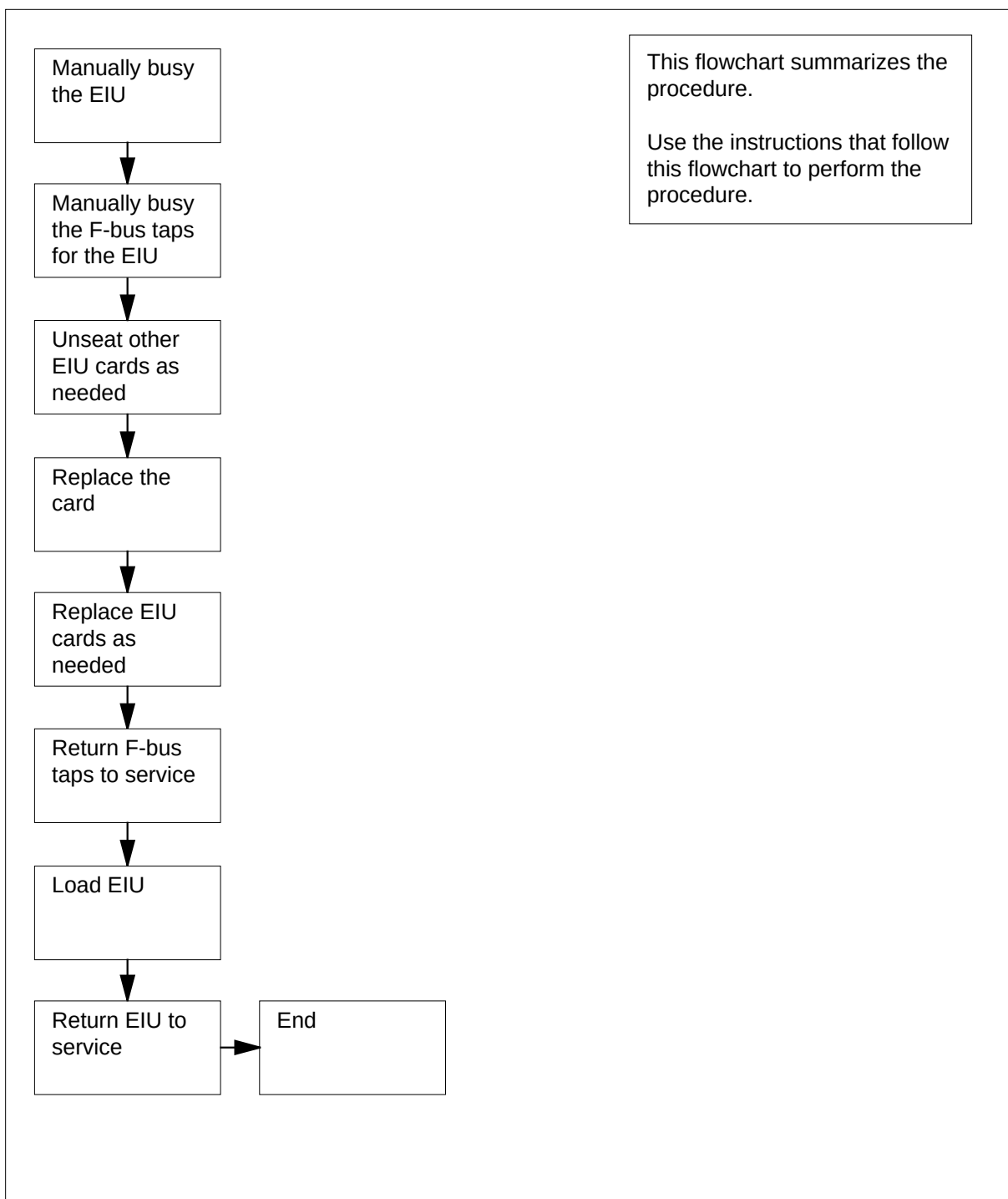
Do not proceed to the common procedure unless the step-action procedure directs you to go.

Action

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

EIU cards in an LPP LIS (continued)

Summary of replacing EIU cards in an LPP LIS



EIU cards in an LPP LIS (continued)

Replacing EIU cards in an LPP LIS



WARNING

Loss of Ethernet connection

This procedure removes an EIU from service, so the Ethernet address is not accessible. If other EIUs do not provide alternative addresses to the LAN, ASUs on the LIS are isolated. Perform this procedure only if you must to return the EIU to service. Unless it is urgent, perform this procedure during periods of low traffic only.

At your current location

- 1 Obtain a replacement card. Make sure that the replacement card and the card you remove has the same PEC and PEC suffix.
- 2 Use the procedure *Verifying load compatibility of SuperNode cards* in this document. Make sure the replacement card is compatible with the software load. Complete the procedure and return to this point.

At the MAP terminal

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

>MAPCI ; MTC ; PM

and press the Enter key

Example of a MAP display:

PM	SysB	ManB	OffL	CBsy	ISTb	InSv
	0	0	1	0	2	48

- 4 To post the EIU that contains the card you want to replace, type

>POST EIU eiu_no

and press the Enter key

where

eiu_no

is the number of the EIU (0 to 511)

Example of a MAP display:

PM	SysB	ManB	OffL	CBsy	ISTb	InSv
	0	0	1	0	2	48
EIU	0	InSv		Rsvd		

EIU cards in an LPP LIS (continued)

- 5 Determine the state of the EIU.

If the state of the EIU	Do
is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA)	step 6
is ManB	step 10
is OffL	step 35

- 6 To manually busy the EIU, type

>BSY

and press the Enter key

Example of a MAP response:

If the response is	Do
Bsy EIU 0 requires confirmation because the action may isolate the SuperNode from the nodes on the LAN. Please confirm ("YES", "Y", "NO", or "N"):	Step 9
Warning: EIU 0 is currently being imaged. The BSY command will be aborted unless the FORCE option is used.	step 7

- 7 To manually force bsy the EIU, type

>BSY FORCE

and press the Enter key.

Example of a MAP response:

WARNING: The EIU 0 is currently being imaged.
Do you wish to abort imaging to proceed with the BSY request?
Please confirm ("YES", "Y", "NO", or "N"):

If	Do
proceed with BSY FORCE request	step 8
abort BSY FORCE request	step 37

EIU cards in an LPP LIS (continued)

- 8 To force bsy the EIU, type
 >YES
 and press the Enter key. Go to step10
 Example of a MAP response:

 Imaging will be aborted on EIU 0.
- 9 To confirm the command, type
 >YES
 and press the Enter key
 Example of a MAP response:

 Confirmed...
 EIU 0 BSY Passed
- 10 To display information about the EIU, type
 >QUERYPM
 and press the Enter key
 Example of a MAP response:

 PM type: EIU PM No.: 0 Status: ManB
 LIM: 0 Shelf: 1 Slot: 24 EIU FTA: 424F 1000
 Default Load: LRS02A0
 Running Load: LRS02A0
 LMS States: InSv InSv
 Auditing?: Yes Yes
 Msg Channels: Acc Acc
 TAPs: . .
- 11 Record the LIM number associated with the EIU you are working on.
 Note: The LIM number follows the word LIM on the second line of the display. In the example, the LIM number is 1.
- 12 To post the LIM, type
 >POST LIM lim_no
 and press the Enter key
 where
 lim_no
 is the number of the LIM that you recorded in step 11
 Example of a MAP display:

EIU cards in an LPP LIS (continued)

PM	SysB 0	ManB 0	OffL 1	CBsy 0	ISTb 2	InSv 48
LIM	0	0	0	0	1	0

```
LIM 0 InSv
Unit0: InSv
Unit1: InSv
```

Links_00S Taps_00S

- 13** To access the F-bus level of the MAP display, type
>FBUS
and press the Enter key
Example of a MAP display:

```

Tap: 0      4      8      12     16     20     24     28     32
FBus0: InSv  ..--  ----  .---  .---  ----  ----  .-----  ----
FBus1: InSv  ..--  ----  .---  .---  ----  ----  .-----  ----

FBUS:
```

- 14** To determine which tap numbers associate with the EIU, type
>TRNSL 0
and press the Enter key
Example of a MAP response:

```

LIM 0 FBus 0 Tap 0 is on LIU7 1.
LIM 0 FBus 0 Tap 1 is on LIU7 2.
LIM 0 FBus 0 Tap 2 is unequipped.
LIM 0 FBus 0 Tap 3 is unequipped.
LIM 0 FBus 0 Tap 4 is unequipped.
LIM 0 FBus 0 Tap 6 is unequipped.
LIM 0 FBus 0 Tap 7 is unequipped.
LIM 0 FBus 0 Tap 8 is on EIU 0.
.
.
.
LIM 0 FBus 0 Tap 35 is unequipped.
```

- 15** Record the tap number for the EIU.
- 16** To manually busy the EIU tap on F-bus 0, type
>BSY FBUS 0 tap_no
and press the Enter key
where
tap_no
is the number of the EIU tap that you recorded in step 15
Example of a MAP response:

EIU cards in an LPP LIS (continued)

```
LIM 0 FBus 0 Tap 8 Busy initiated.
LIM 0 FBus 0 Tap 8 Busy passed.
```

- 17 To manually busy the EIU tap on F-bus 1, type

>BSY FBUS 1 tap_no

and press the Enter key

where

tap_no

is the number of the EIU tap that you recorded in step 15

Example of a MAP response:

```
LIM 0 FBus 1 Tap 8 Busy requires confirmation because a
SEVERE system OUTAGE may occur if the following node is
isolated:
```

```
EIU 0
```

```
Do you wish to proceed with this operation?
```

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

- 18 To confirm the command, type

>YES

and press the Enter key

Example of a MAP response:

```
Confirmed ...
```

```
LIM 0 FBus 1 Tap 8 Busy initiated.
```

```
LIM 0 FBus 1 Tap 8 Busy passed.
```

At the shelf

19



WARNING

Static electricity damage

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

Based on the card you want to replace, determine your next step.

If you want to replace

Do

the NTEX22

step 20

EIU cards in an LPP LIS (continued)

	If you want to replace	Do
	an EIU card other than listed here	step 23
20	To unseat the NT9X84 for the EIU, use the procedure <i>Unseating cards in equipment shelves</i> in this document. Complete the procedure and return to this point.	
21	Use the procedure <i>Replacing a card</i> in this document to replace the NTEX22 card in use. Complete the procedure and return to this point. Note: If the card you want to replace has switches, make sure that the switches on the replacement card have the same settings.	
22	To reseat the NT9X84 for the EIU use the procedure <i>Reseating cards in equipment shelves</i> in this document. Complete the procedure and return to this point. Go to step 26.	
23	To unseat the NTEX22 for the EIU use the procedure <i>Unseating cards in equipment shelves</i> in this document. Complete the procedure and return to this point.	
24	To replace the card use the procedure <i>Replacing a card</i> in this document. Complete the procedure and return to this point. Note: If the card you want to replace has switches, make sure that the switches on the replacement card have the same settings.	
25	To reseat the NTEX22 for the EIU use the procedure <i>Reseating cards in equipment shelves</i> in this document. Complete the procedure and return to this point.	
26	The next action depends on the reason you perform this procedure.	
	If a maintenance procedure	Do
	directed you to this procedure	step 27
	did not direct you to this procedure	step 28
27	Return to the maintenance procedure that sent you to this procedure.	
At the MAP terminal		
28	To return the EIU tap on F-bus 0 to service, type >RTS FBUS 0 tap_no and press the Enter key where tap_no is the number of the EIU tap that you recorded in step 15 <i>Example of a MAP response:</i>	

EIU cards in an LPP LIS (continued)

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

If the RTS command	Do
passed	step 29
failed	step 36

- 29** To return the EIU tap on F-bus 1 to service, type
>RTS FBUS 1 tap_no
 and press the Enter key
where
 tap_no
 is the number of the EIU tap that you recorded in step 15
Example of a MAP response:

LIM 0 FBus 1 Tap 8 Return to Service initiated.
 LIM 0 FBus 1 Tap 8 Return to Service passed.

If the RTS command	Do
passed	step 30
failed	step 36

- 30** To quit from the F-bus level of the MAP display, type
>QUIT
 and press the Enter key

- 31** To post the EIU, type
>POST EIU eiu_no
 and press the Enter key
where
 eiu_no
 is the number of the EIU (0 to 511)

- 32** To load the EIU, type
>LOADPM
 and press the Enter key
Example of a MAP response:

EIU cards in an LPP LIS (end)

EIU 0 LOADPM passed

If the LOADPM command	Do
passed	step 34
failed	step 33

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

- 34** To return the EIU to service, type

>RTS

and press the Enter key

Example of a MAP response:

EIU 0 RTS Passed

If the RTS command	Do
passed	step 38
failed	step 36

- 35** Consult operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.

- 36** For additional help, contact the next level of support.

- 37** Abort the BSY FORCE request by typing

>NO

and pressing the Enter key

Example of a MAP response:

BSY command aborted due to imaging in progress.

- 38** The procedure is complete.

LIU7 cards in an LPP LIS

Application

Use this procedure to replace the following cards in a CCS7 link interface unit (LIU7) in a link peripheral processor (LPP) link interface shelf (LIS).

If you cannot identify the product engineering code (PEC), suffix, or provisioned shelf or frame for the card you want to replace, refer to the “Index” for a list of the cards, shelves, and frames documented in this card replacement NTP.

PEC	Suffix	Card name	Shelf or frame name
NT9X76	AA, BA, CA	STP signaling terminal card	LIU7 in an LPP LIS
NT9X77	AA, AB	DMS-100 V.35 interface paddle board	LIU7 in an LPP LIS
NT9X78	AA	DS-0A interface paddle board	LIU7 in an LPP LIS
NT9X78	BA, CA, DA	Enhanced DS-0A interface paddle board	LIU7 in an LPP LIS
NTEX22	BA, BB, CA	Integrated processor and F-bus interface card	LIU7 in an LPP LIS
NTEX26	AA	LIU channel-bus interface card	LIU7 in an LPP LIS

Common procedures

The following common procedures are referenced:

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

LIU7 cards in an LPP LIS (continued)

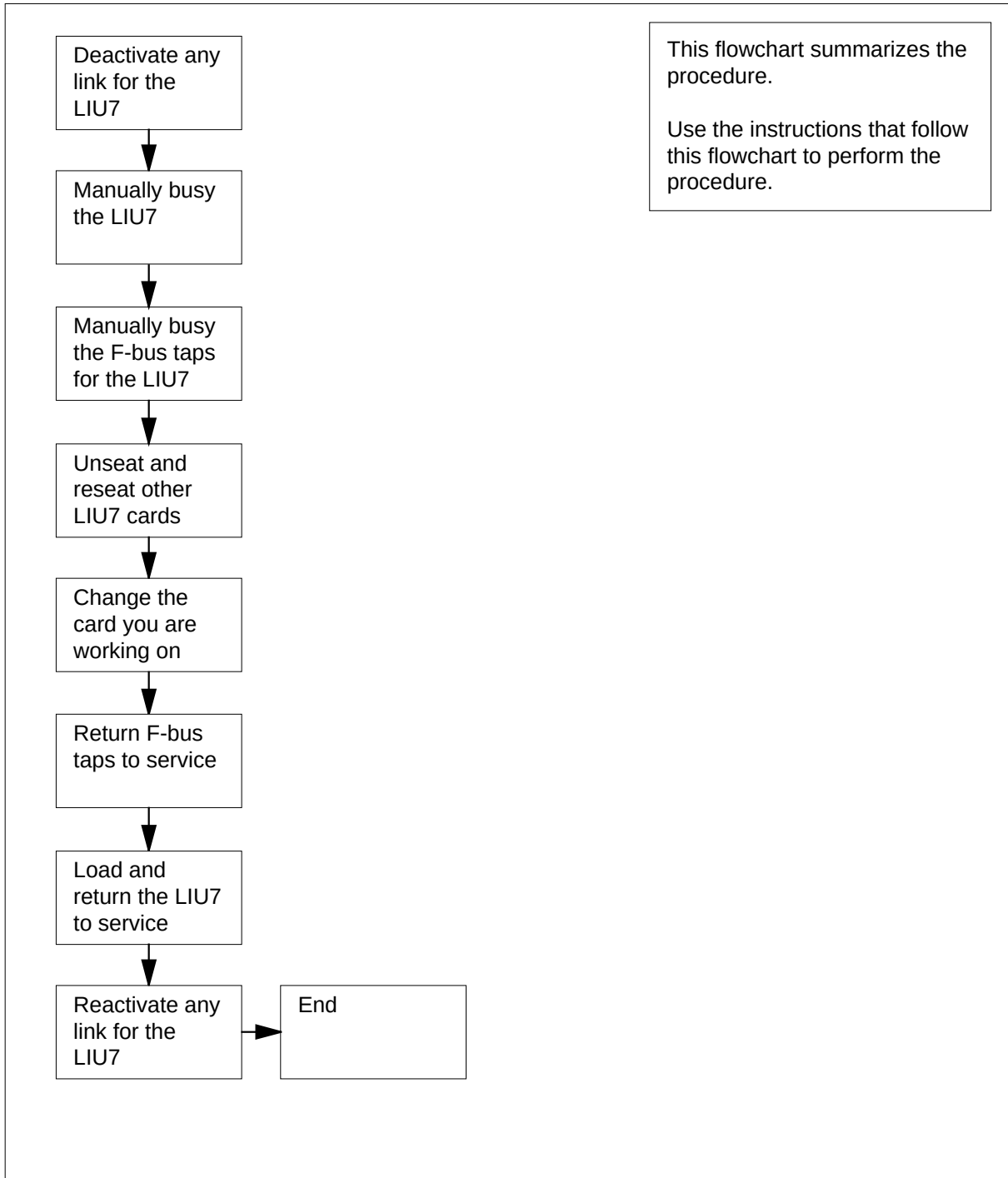
Do not go to the common procedure unless directed to do so in the step-action procedure.

Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

LIU7 cards in an LPP LIS (continued)

Summary of Replacing LIU7 cards in an LPP LIS



LIU7 cards in an LPP LIS (continued)

Replacing LIU7 cards in an LPP LIS



CAUTION

Loss of service

This procedure removes an LIU7 from service and temporarily interrupts messaging on the associated CCS7 link. Perform this procedure only if necessary to return the LIU7 to service. Otherwise, perform this procedure only during periods of low traffic.

At your current location

- 1 Obtain a replacement card. Ensure that the replacement card has the same PEC, including suffix, as the card being removed.
- 2 Ensure that the replacement card is compatible with the software load by using the procedure *Verifying load compatibility of SuperNode cards* in this document. When you have completed the procedure, return to this point.

At the MAP terminal

- 3 Access the PM level of the MAP display by typing
>MAPCI;MTC;PM
and pressing the Enter key.

Example of a MAP display:

SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	2	0	3 6

- 4 Post the LIU7 that contains the card to be replaced by typing
>POST LIU7 liu_no
and pressing the Enter key.

where

liu_no

is the number of the LIU7 (0 to 511)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	2		0	3 6
LIU7	1	0	0	0	0	3
LIU7 208	InSv		Rsvd			

LIU7 cards in an LPP LIS (continued)

- 5 Determine the state of the LIU7.

If the state of the LIU7 is	Do
SysB, SysB (NA), ISTb, or InSv	step 6
ManB or ManB (NA)	step 19
OffL	step 37
- 6 Deactivate the CCS7 link (if there is one) associated with the LIU7 using the procedure *Deactivating CCS7 links* in this document. When you have completed the procedure, return to this point.
- 7 Manually force bsy the LIU7 by typing
>BSY FORCE
 and pressing the Enter key.

If	Do
you need to confirm the command	step 10
the command passed	step 11
MAP response is WARNING: LIU7 208 is currently being imaged. Do you wish to abort imaging to proceed with the BSY request? Please confirm ("YES", "Y", "NO", or "N");	step 8
- 8 Determine if it is safe to continue with this procedure.

If it is	Do
proceed with BSY FORCE request	step 9
abort BSY FORCE request	step 39
- 9 Force bsy the LIU7 by typing
>YES
 and pressing the Enter key. Go to step 11
Example of a MAP response:

 Imaging will be aborted on LIU7 208.
- 10 Confirm the command by typing
>YES

LIU7 cards in an LPP LIS (continued)

- and pressing the Enter key.
- 11** Display information about the LIU7 by typing
>QUERYPM
and pressing the Enter key.
Example of a MAP response:
- ```

PM type: LIU7 PM No.: 208 Status: InSv
LIM: 2 Shelf: 2 Slot: 8 LIU FTA: 4247 1000
Default Load: LCC03BD
Running Load: LCC03BD
LMS States : ISTb ISTb
Auditing : Yes Yes
Msg Channels: Acc Acc
TAP 8 : . .
Reserved LIU7 forms part of CCS7 Linkset: SSP208_LS SLC: 0
LIU is not allocated

```
- 12** Record the number of the link interface module (LIM) and the taps that are associated with the LIU7 you are working on.
- Note:** The LIM number follows the word LIM on the second line of the display. In the example, the LIM number is 0. The tap number follows the word TAP on the line below Msg Channels. In the example, the TAP number is 8.
- 13** Post the LIM by typing  
**>POST LIM lim\_no**  
and pressing the Enter key.  
*where*  
**lim\_no**  
is the number of the LIM you recorded in step 12  
*Example of a MAP display:*
- ```

          SysB  ManB  OffL  CBsy  ISTb  InSv
PM        1      0      2      0      3      6
LIM       0      0      0      0      1      0

LIM 2 ISTb
Unit0: ISTb      Links_OOS Taps_OOS
Unit1: InSv      .         .

```
- 14** Access the F-bus level of the MAP display by typing
>FBUS
and pressing the Enter key.
Example of a MAP display:

LIU7 cards in an LPP LIS (continued)

```

                                Tap: 0  4  8  12  16  20  24  28  32
FBus0: InSv      ...- - - - - - - - - - - - - - - - - - - -
FBus1: InSv      ...- - - - - - - - - - - - - - - - - - - -

```

- 15** Manually busy the LIU7 tap on F-bus 0 by typing

>BSY FBUS 0 tap_no

and pressing the Enter key.

where

tap_no

is the number of the LIU7 tap recorded in step 12

If	Do
you need to confirm the command	step 16
you do not need to confirm the command	step 17

- 16** Confirm the command by typing

>YES

and pressing the Enter key.

Example of a MAP response:

```

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

```

- 17** Manually busy the LIU7 tap on F-bus 1 by typing

>BSY FBUS 1 tap_no

and pressing the Enter key.

where

tap_no

is the number of the LIU7 tap recorded in step 12

Example of a MAP response:

```

LIM 2 FBus 1 Tap 8 Busy requires confirmation because
a SEVERE system OUTAGE may occur if the following
node is isolated:
LIU7 208
Do you wish to proceed with this operation?
Please confirm ("YES", "Y", "NO", or "N"):

```

LIU7 cards in an LPP LIS (continued)

- 18 Confirm the command by typing

>YES

and pressing the Enter key.

Example of a MAP response:

Confirmed ...

LIM 2 FBus 1 Tap 8 Busy initiated.

LIM 2 FBus 1 Tap 8 Busy passed.

At the shelf

- 19



DANGER

Static electricity damage

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while handling circuit cards. This protects the cards against damage caused by static electricity.

Determine your next step based on the card you are replacing.

If you are replacing an	Do
NT9X76	step 21
NTEX22	step 23
any back plane card	step 26

- 20 Go to step 27.

- 21 To begin changing an NT9X76 card in a 2-slot LIU7, unseat and reseat cards in the LIU7 using the following sub-steps. To unseat a card, use the procedure *Unseating cards in equipment shelves* in this document. To reseat a card, use the procedure *Reseating cards in equipment shelves* in this document.

- a Unseat the NT9X76 STP signaling terminal card.
- b Unseat the NTEX22 link general processor card.
- c Reseat the NTEX22 link general processor card.

- 22 Replace the NT9X76 card using the procedure *Replacing a card* in this document. When you have completed the procedure, return to this point.

Note: If the card to be replaced has switches, ensure that the switches on the replacement card have the same settings.

Go to step 27.

LIU7 cards in an LPP LIS (continued)

- 23** To begin changing an NTEX22 card, unseat the NT9X76 STP signaling terminal card using the procedure *Unseating cards in equipment shelves* in this document. When you have finished the procedure, return to this point.
- 24** Replace the NTEX22 card using the procedure *Replacing a card* in this document. When you have completed the procedure, return to this point.
- Note:** If the card to be replaced has switches, ensure that the switches on the replacement card have the same settings.
- 25** Reseat the NT9X76 STP signaling terminal card using the procedure *Reseating cards in equipment shelves* in this document. When you have finished the procedure, return to this point.
- Go to step 27.
- 26** Replace the card using the procedure *Replacing a card* in this document. When you have completed the procedure, return to this point.
- Note:** If the card to be replaced has switches, ensure that the switches on the replacement card have the same settings.
- 27** The next action depends on your reason for performing this procedure.

If you were	Do
directed to this procedure from another maintenance procedure	step 28
not directed to this procedure from another maintenance procedure	step 29

- 28** Return to the maintenance procedure that sent you to this procedure and continue as directed.

At the MAP terminal

- 29** Return the LIU7 tap on F-bus 0 to service by typing
>RTS FBUS 0 tap_no
 and pressing the Enter key.
where
 tap_no
 is the number of the LIU7 tap you recorded in step 12

Example of a MAP response:

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

If the RTS command	Do
passed	step 30
failed	step 38

LIU7 cards in an LPP LIS (continued)

- 30** Return the LIU7 tap on F-bus 1 to service by typing
>RTS FBUS 1 tap_no
and pressing the Enter key.
where
tap_no
is the number of the LIU7 tap you recorded in step 12
Example of a MAP response:

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

If the RTS command	Do
passed	step 31
failed	step 38

- 31** Quit from the F-bus level of the MAP display by typing
>QUIT
and pressing the Enter key.

- 32** Post the LIU7 you are working on by typing
>POST LIU7 liu_no
and pressing the Enter key.
where

liu_no
is the number of the LIU7 (0 to 511)

- 33** Load the LIU7 by typing
>LOADPM
and pressing the Enter key.
Example of a MAP response:

LIU7 208 LOADPM Passed

If the LOADPM command	Do
passed	step 35
failed	step 34

- 34** Load the PM using the procedure *Loading a PM* in this document. When you have completed the procedure, return to this point.

**LIU7 cards
in an LPP LIS (end)**

- 35** Return the LIU7 to service by typing

>RTS

and pressing the Enter key.

Example of a MAP response:

LIU7 100 RTS Passed

If the RTS command	Do
passed	step 36
failed	step 38

- 36** Activate the CCS7 link (if there is one) associated with the LIU7 using the procedure *Activating CCS7 links* in this document. When you have completed the procedure, return to this point.
Go to step 40.
- 37** Consult office personnel to determine why the component is offline. Continue as directed by office personnel.
- 38** For further assistance, contact the personnel responsible for the next level of support.
- 39** Abort the BSY FORCE request by typing
>NO
and pressing the Enter key. BSY request has been aborted, node imaging is continuing.
- 40** You have completed this procedure.

FRIU cards in an LPP LIS

Application

Use this procedure to replace the following cards in a frame-relay interface unit (FRIU) in a link peripheral processor (LPP) link interface shelf (LIS).

PEC	Suffix	Card name	Shelf or frame name
NTEX22	BB, CA	Integrated processor and F-bus interface card	FRIU in an LPP LIS
NTEX30	AA	T1 analog paddle board	FRIU in an LPP LIS
NTEX31	AA	Frame relay access processor card	FRIU in an LPP LIS
NTEX31	BA	Enhanced frame relay access processor card	FRIU in an LPP LIS

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

Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*
- *Loading a PM*

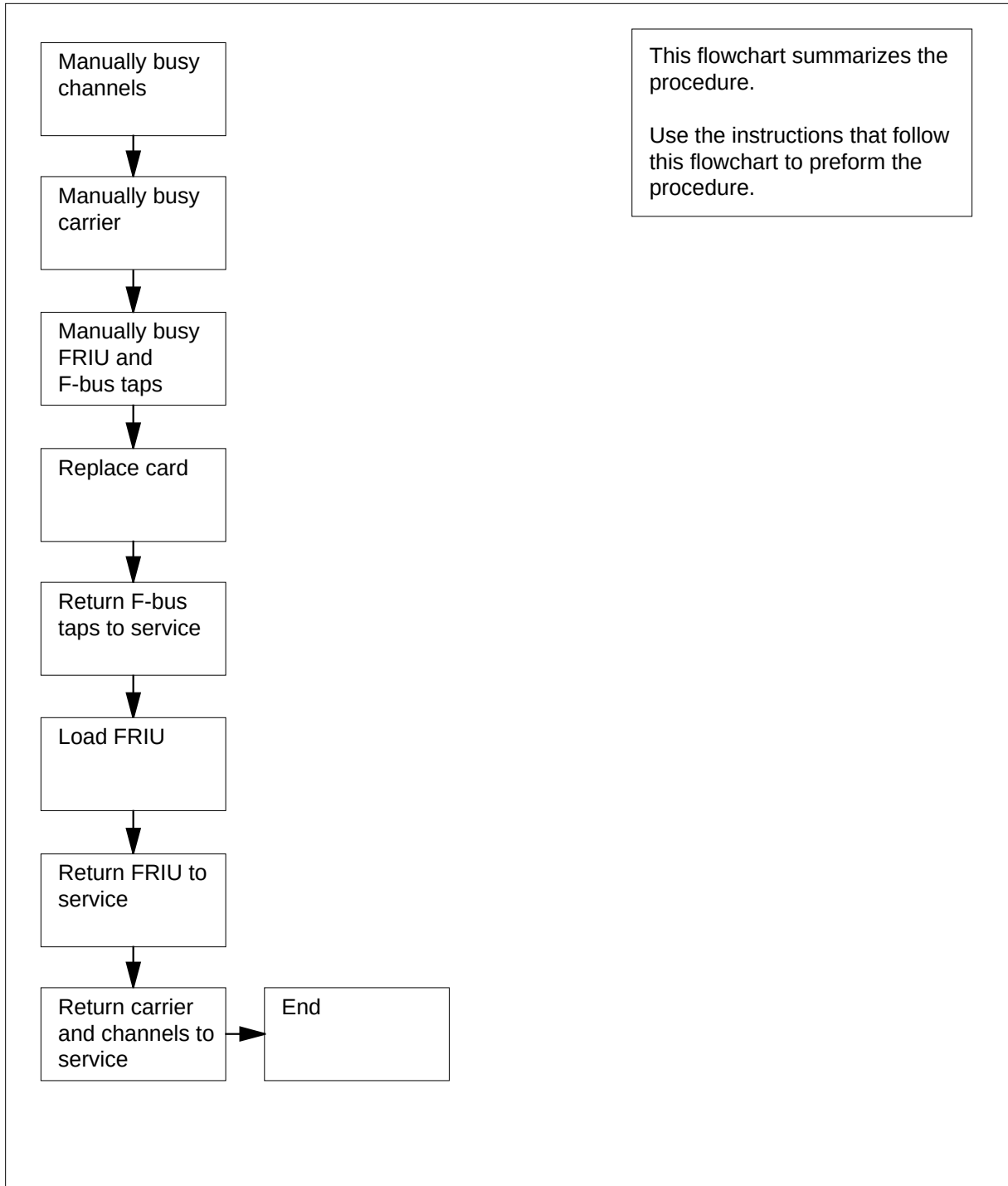
Do not go to the common procedure unless the step-action procedure directs you to go.

Action

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

FRIU cards in an LPP LIS (continued)

Summary of replacing FRIU cards in a LPP LIS



FRIU cards in an LPP LIS (continued)

Replacing FRIU cards in an LPP LIS

At your current location

1



WARNING

Loss of service

This procedure removes an FRIU from service and temporarily interrupts traffic on the associated access or trunking DS-1 channels. Perform this procedure only if you must return the FRIU to service. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card you remove has the same PEC and PEC suffix.

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

At the MAP terminal

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

>MAPCI;MTC;PM

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	27	0	8	29

- 4 To post the FRIU that contains the NTEX22 card you want to replace, type

>POST FRIU friu_no

and press the Enter key.

where

friu_no

is the number of the FRIU (0 to 500)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	27	0	8	29
FRIU	1	0	19	0	6	28
FRIU	8 InSv	Rsvd				

FRIU cards in an LPP LIS (continued)

- 5 Determine the state of the FRIU.

Note: The state of the FRIU appears on the right of the FRIU number, as in the example MAP display in step 4.

If the state of the FRIU	Do
is SysB, ISTb (NA), InSv, or ISTb	step 6
is ManB	step 16
is OffL	step 42

- 6 To access the CHAN level of the MAP display, type

>CARR;CHAN

and press the Enter key.

Example of a MAP display:

		SysB	ManB	OffL	CBsy	ISTb	InSv
		1	0	27	0	8	29
PM		1	0	19	0	6	28
FRIU	8 InSv	Rsvd					
CARRIER				Alarm	BER	ES	SES
InSv					-8.3	0	0
CHANNEL	1						
	.						
CHANNEL	1	(24 x DS0)					
InSv							
CHAN:							

- 7 To manually busy all channels, type

>BSY ALL

and press the Enter key.

- 8 To confirm the command, type

>YES

and press the Enter key.

Note: If all channels are out of service, the system does not request confirmation.

- 9 To access the CARR level of the MAP display, type

>QUIT

and press the Enter key.

Example of a MAP display:

FRIU cards in an LPP LIS (continued)

		SysB	ManB	OffL	CBsy	ISTb	InSv
		1	0	27	0	8	29
PM		1	0	19	0	6	28
FRIU							

FRIU	8	InSv	Rsvd

CARRIER			Alarm	BER	ES	SES	UAS
InSv				-8.3	0	0	0

CHANNEL	1
	.

- 10** To manually busy the carrier, type

>BSY

and press the Enter key.

- 11** To confirm the command, type

>YES

and press the Enter key.

Example of a MAP response:

Confirmed...
BSY passed.

Note: If the carrier is out of service, the system does not request confirmation.

- 12** To quit the CARR level, type

>QUIT

and press the Enter key.

- 13** To manually busy the FRIU, type

>BSY FORCE

and press the Enter key.

If MAP response is	Do

Billing data is stored in the	step 16
FRIU.Uploading billing data	
..Uploaded FRS Billing data	
successfully ...FRIU 8 BSY	
Passed	

FRIU cards in an LPP LIS (continued)

	If MAP response is	Do
	WARNING: FRIU 8 is currently being imaged. Do you wish to abort imaging to proceed with the busy request. Please confirm ("YES", "Y", "NO" or "N")	step 14
14	Determine if you should proceed with the BYS and proceed as shown below.	
	If proceed with	Do
	BUSY and abort imaging	step 15
	abort BSY request	step 44
15	To continue with BSY FORCE the FRIU, type >BSY FORCE and press the Enter key. <i>Example of a MAP response:</i> Imaging will be aborted on FRIU 8.	
16	To query the FRIU, type >QUERYPM and press the Enter key. <i>Example of a MAP response:</i> FRIU FTA: 4251 1000 LIM: 0 Shelf: 1 Slot: 22 Default Load: F8X03AU Running Load: F8X03AU Carrier is currently ManB. Carrier Alarm: -----. LMS States: InSv InSv Auditing?: Yes Yes Msg Channels: Acc Acc TAPs: . .	
17	Record the number of the link interface module (LIM) associated with the FRIU. Note: The LIM number appears on the right of the word LIM on the second line of the response. In the example in step 16, the LIM number is 0.	
18	To post the LIM associated with the FRIU in use, type >POST LIM lim_no and press the Enter key.	

FRIU cards in an LPP LIS (continued)

where

lim_no

is the number of the LIM that you recorded in step 17

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	2	1	27	0	8	27
LIM	0	0	1	0	0	1

LIM 0 InSv

	Links_00S	Taps_00S
Unit0: InSv	.	.
Unit1: InSv	.	.

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

>FBUS

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	1	27	0	8	28
LIM	0	0	1	0	0	1

LIM 0 InSv

	Links_00S	Taps_00S
Unit0: InSv	.	.
Unit1: InSv	.	.

	Tap: 0	4	8	12	16	20	24	28	32
FBus0: InSv								IIIII	...I
FBus1: InSv								IIIII	...I

20 To determine which F-bus tap that associates with the FRIU, type

>TRNSL fbus_no

and press the Enter key.

where

fbus_no

is the number of one of the F-buses (0 or 1)

Note: The number of the F-bus tap associated with the FRIU appears in the third column of the MAP response.

Example of a MAP response:

FRIU cards in an LPP LIS (continued)

```
LIM 0 FBus 0 Tap 6 is on FRIU 7.
LIM 0 FBus 0 Tap 7 is on FRIU 8.
LIM 0 FBus 0 Tap 8 is on FRIU 9.
LIM 0 FBus 0 Tap 9 is on FRIU 10.
LIM 0 FBus 0 Tap 10 is on FRIU 11.
LIM 0 FBus 0 Tap 11 is on FRIU 12.MORE...
```

- 21** To manually busy the FRIU tap on F-bus 0, type

```
>BSY FBUS 0 tap_no FORCE
```

and press the Enter key.

where

tap_no

is the number of the tap that you recorded in step 20

Note: The state of the tap changes to M when you issue this command.

Example of a MAP response:

```
LIM 0 FBus 0 Tap 7 Busy initiated.
LIM 0 FBus 0 Tap 7 Busy passed.
```

- 22** To manually busy the FRIU tap on F-bus 1, type

```
>BSY FBUS 1 tap_no FORCE
```

and press the Enter key.

where

tap_no

is the number of the tap that you recorded in step 20

Example of a MAP response:

```
LIM 0 FBus 1 Tap 7 Busy requires confirmation because a
SEVERE system OUTAGE may occur if the following node is
isolated:
```

```
FRIU 8
```

```
Do you wish to proceed with this operation?
```

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

- 23** To confirm the command, type

```
>YES
```

and press the Enter key.

Example of a MAP response:

```
Confirmed ...
```

```
LIM 0 FBus 1 Tap 7 Busy initiated.
```

```
LIM 0 FBus 1 Tap 7 Busy passed.
```

FRIU cards in an LPP LIS (continued)

At the shelf

24



WARNING

Static electricity damage

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

To replace the card use the procedure *Replacing a card* in this document to replace the card. Complete the procedure and return to this point.

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

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

If a maintenance procedure	Do
directed you to this procedure	step 26
did not direct you to this procedure	step 27

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

At the MAP terminal

27 To return the first tap to service for the FRIU, type

>RTS FBUS 0 tap_no

and press the Enter key.

where

tap_no

is the number of the FRIU tap that you recorded in step 20

Example of a MAP response:

FRIU cards in an LPP LIS (continued)

LIM 0 FBus 0 Tap 7 Return to Service passed
- local maintenance not accessible.

If the RTS command	Do
passed	step 29
failed, and you did not test the tap	step 28
failed, and you tested the tap	step 43

Note: Occasionally, you must perform a test to manually return the tap to service.

- 28** To test the F-bus tap, type
>TST FBUS 0 tap_no
and press the Enter key.
where

tap_no

is the number of the FRIU tap that you recorded in step 20

Example of a MAP response:

LIM 1 FBus 0 Tap 0 Test initiated.
LIM 1 FBus 0 Tap 0 Test passed.

If the TST command	Do
passed	step 27
failed	step 43

- 29** To return the second tap to service for the FRIU, type
>RTS FBUS 1 tap_no
and press the Enter key.
where

tap_no

is the number of the FRIU tap that you recorded in step 20

Example of a MAP response:

FRIU cards
in an LPP LIS (continued)

LIM 0 FBus 1 Tap 7 Return to Service initiated.
LIM 0 FBus 1 Tap 7 Return to Service passed.

If the RTS command	Do
passed	step 31
failed, and you did not test the tap	step 30
failed, and you tested the tap	step 43

- 30** To test the F-bus tap, type
>TST FBUS 1 tap_no
and press the Enter key.
where
tap_no
is the number of the FRIU tap that you recorded in step 20

If the TST command	Do
passed	step 29
failed	step 43

- 31** To quit from the F-bus level of the MAP display, type
>QUIT
and press the Enter key.

- 32** To post the FRIU, type
>POST FRIU friu_no
and press the Enter key.
where
friu_no
is the number of the FRIU (0 to 500)

- 33** To load the FRIU, type
>LOADPM
and press the Enter key.
Example of a MAP response:

FRIU cards in an LPP LIS (continued)

FRIU 8 LOADPM Passed

If the LOADPM command	Do
passed	step 35
failed	step 34

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

35 To return the FRIU to service, type

>RTS

and press the Enter key.

Example of a MAP response:

FRIU 8 RTS Passed

If the RTS command	Do
passed	step 36
failed	step 43

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

>CARR

and press the Enter key.

37 To return the carrier to service, type

>RTS

and press the Enter key.

Example of a MAP display:

		SysB	ManB	OffL	CBsy	ISTb	InSv
PM		1	0	27	0	9	28
FRIU		1	0	19	0	7	27
FRIU	8	ISTb	Rsvd				
CARRIER	Mtce	/T1	proving	Alarm	BER	ES	SES
ManB					-8.3	0	0
CHANNEL	1						
	C						
rts							
RTS	passed.						

FRIU cards in an LPP LIS (continued)

38 Wait until the Mtce flag on the right of the CARRIER header leaves the display. The carrier will go ISTb at this point.

39 Wait 1 min for the carrier to go in service.

If after 1 min the state of the carrier	Do

is InSv	step 40

is other than listed here	step 43

40 To access the CHAN level of the MAP display, type
>CHAN
and press the Enter key.

41 To return the channels to service, type
>RTS ALL
and press the Enter key.

Example of a MAP display:

		SysB	ManB	OffL	CBsy	ISTb	InSv
		1	0	27	0	9	28
PM		1	0	19	0	7	27
FRIU							
FRIU	8	ISTb	Rsvd				
CARRIER	Mtce	/T1	proving	Alarm	BER	ES	SES
ManB					-8.3	0	0
							UAS
							0
CHANNEL	1						
	C						
rts							
RTS	passed.						

If the RTS command	Do
passed	step 45
failed	step 43

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

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

44 To abort the BSY FORCE, type
>NO
and press the Enter key

Example of a MAP response:

**FRIU cards
in an LPP LIS (end)**

BSY command aborted due to imaging in progress.

45 The procedure is complete.

NIU processor and controller cards in an LPP LIS

Application

Use this procedure to replace the following cards in a network interface unit (NIU) in a link peripheral processor (LPP) link interface shelf (LIS).

PEC	Suffixes	Card name	Shelf/frame name
NTEX22	BB, CA	Integrated processor and F-bus interface card	NIU in an LPP LIS
NTEX25	AA, BA	NIU channel bus controller card	NIU in an LPP LIS

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

Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*
- *Loading a PM*

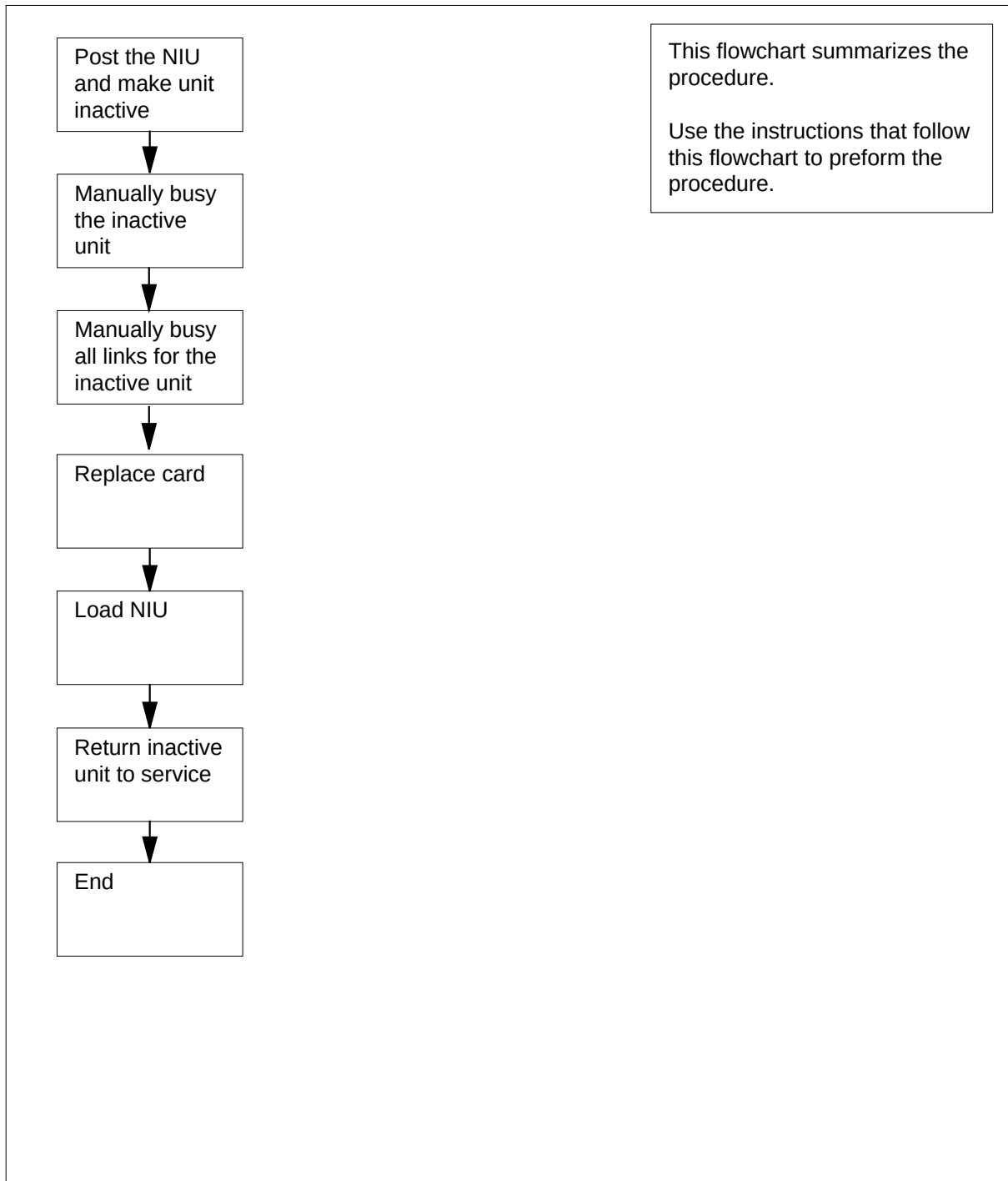
Do not go to the common procedure unless the step-action procedure directs you to go.

Action

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

NIU processor and controller cards in an LPP LIS (continued)

Summary of Replacing NIU processor and controller cards in an LPP LIS



NIU processor and controller cards in an LPP LIS (continued)

Replacing NIU processor and controller cards in an LPP LIS

At your current location

1



WARNING

Service degradation

If you remove an NIU unit from service, you will eliminate NIU redundancy for the associated LIS. If the in-service unit goes out of service, it affects channelized access for all ASUs on the LIS. Perform this procedure only if you must return the NIU to service. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card you removed have the same PEC and PEC suffix.

2

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

At the MAP terminal

3

To access the PM level of the MAP display, type

>MAPCI ; MTC ; PM

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	1	0	2	48

4

To post the NIU that contains the card you want to replace, type

>POST NIU niu_no

and press the Enter key.

where

niu_no

is the number of the NIU (0 to 29)

Example of a MAP display:

NIU processor and controller cards in an LPP LIS (continued)

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	1	0	2	48
NIU	0	0	0	0	0	1

```

NIU 1:  InSv
Unit 0:  InAct InSv
Unit 1:  Act   InSv

```

- 5 Determine the state of the NIU unit that contains the card you want to replace.

If the state of the NIU unit	Do
is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA), and active	step 6
is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA), and inactive	step 9
is ManB	step 12
is OffL	step 18

- 6 Determine the state of the mate NIU unit.

If the state of the mate NIU unit	Do
is ISTb or InSv	step 8
is other than listed here	step 7

- 7 The mate unit is not in service. If you busy the unit on which you are working, loss of service will occur. Contact your next level of support.

- 8 To switch activity, type

>SWACT

and press the Enter key.

Example of a MAP response:

```

NIU 1 SwAct PM: Request has been submitted.
NIU 1 SwAct PM:Command completed.
The node has switched activity

```

If the SWACT command	Do
passed	step 9
failed	step 19

NIU processor and controller cards in an LPP LIS (continued)

- 9 To manually busy the inactive NIU unit, type

>BSY INACTIVE

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	1	0	4	46
NIU	0	0	0	0	1	0

NIU 1: ISTb

Unit 0: InAct ManB

Unit 1: Act InSv

bsy inactive

NIU 1 Busy Inactive Unit:

Request has been submitted.

NIU 1 Busy Inactive Unit: Command completed.

The Unit is manually busy.

Example 2 of MAP display:

Imaging is currently in progress on NIU x Unit Y.
 Busying the NIU will cause imaging on this NIU to be aborted.
 Do you wish to continue?
 Please conform ("YES", "Y", "NO" or "N").

If the response is	Do
as shown in example 2	step 10
anything else	step 12

- 10 Imaging is being performed on the NIU unit you are working on. Contact the next level of support to determine if it is safe to proceed. Continue as directed.

If the response is	Do
yes, proceed with busy	step 11
no, abort busy	step 20

- 11 To confirm Busy, type

>YES

and press the Enter key.

Example of a MAP response:

Imaging will be aborted on NIU x, Unit y.

NIU processor and controller cards in an LPP LIS (continued)

At the shelf

12



WARNING

Static electricity damage

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

To replace the card use the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

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

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

If a maintenance procedure

Do

directed you here

step 14

did not direct you here.

step 15

14 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

At the MAP terminal

15 To load the inactive NIU unit, type

>LOADPM INACTIVE

and press the Enter key.

Example 1

Examples of MAP responses:

NIU 1 Load Inactive Unit: Request has been submitted.
NIU 1 Load Unit 0: Command completed.
The Unit contains the "NRS0 123BA" load.

Example 2

NIU processor and controller cards in an LPP LIS (end)

Warning: Loadfile NRS09BA is meant for an EX22BB.
Warning: NIU 2 Unit 1 has been datafilled with an EX22CA.
Warning: Load/Processor mismatch.
Warning: Valid only for EX22 upgrades.
NIU 2 load Inactive Unit: Request has been submitted.
NIU 2 Load Unit 1: Command completed.
The Unit contains the "NRS09BA" load.

If the LOADPM command	Do
passed	step 17
failed	step 16

- 16** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 17** To return the inactive NIU unit to service, type

>RTS INACTIVE

and press the Enter key.

Example of a MAP response:

NIU 1 RTS Inactive Unit: Request has been submitted.
NIU 1 RTS Inactive Unit: Command completed.
The Unit is in service

If the RTS command	Do
passed	step 21
failed	step 19

- 18** Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.

- 19** For additional help, contact the next level of support.

- 20** To abort Busy, type

>NO

and press the Enter key. Busy request has been aborted, node imaging is continuing.

Example of a MAP response:

Aborted.

- 21** The procedure is complete.

NT9X13 in an LPP LIM unit

Application

Use this procedure to replace an NT9X13 in a link interface module (LIM) unit of a link peripheral processor (LPP).

PEC	Suffixes	Card name	Shelf/frame name
NT9X13	DA, DB, DD, DE	CPU 20-MHz card	LIM unit of an LPP

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

Note 1: Some documentation refers to a LIM unit as a local message switch (LMS). LIM unit 0 corresponds to LMS 0; LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit designates an LMS.

Note 2: Also, the LPP is referred to as a link interface module (LIM) where the entire LPP is indicated. This parallels how the LISs in the LPP are closely associated with the LIM. MAP displays and data schema tables refer to the LPP as a LIM.

Common procedures

The following common procedures are referenced:

- *Verifying load compatibility of SuperNode cards*
- *Unseating cards in equipment shelves*
- *Replacing a card*
- *Loading a PM*

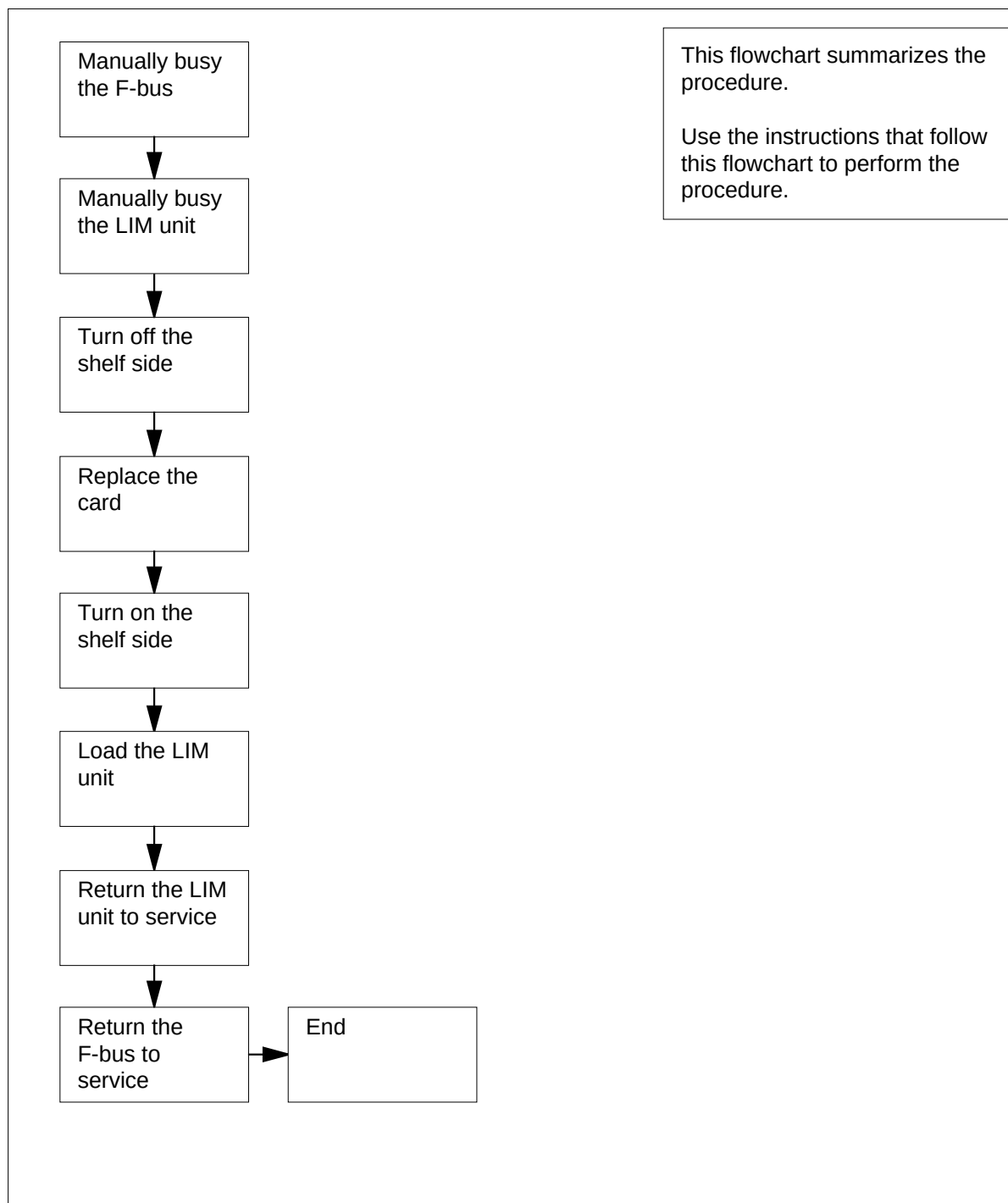
Do not go to the common procedure unless the step-action procedure directs you to go.

Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

NT9X13 in an LPP LIM unit (continued)

Replacing NT9X13 in an LPP LIM unit



NT9X13 in an LPP LIM unit (continued)

Replacing NT9X13 in an LPP LIM unit

At your current location

1



CAUTION

Loss of service

This procedure provides instructions to remove a LIM unit from service. If you remove a LIM from service, you remove redundancy from the LPP. Perform this procedure only when necessary to return the LIM unit to service. Otherwise, perform this procedure only during periods of low traffic.

Obtain a replacement card. Make sure the replacement card and the card you you replace have the same PEC and PEC suffix.

2

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

At the MAP terminal

3

To access the PM level of the MAP display, type

>MAPCI ; MTC ; PM

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	28		0	0 18

4

To post the LIM that contains the card you will replace, type

>POST LIM lim_no

and press the Enter key.

where

lim_no

is the number of the LIM you want to post (0 to 16)

Example of a MAP display:

NT9X13

in an LPP LIM unit (continued)

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	28		0	0
LIM	0	0	1	0	0	1

LIM 0 InSv
 Links_OOS Taps_OOS
 Unit0: InSv
 .Unit1: InSv . .

- 5 Determine the state of the LIM.

Note: The state of the LIM is on the right of the LIM number on the MAP display.

If the state of the LIM is	Do
Offl	step 29
any other in-service or out-of-service state	step 6

- 6 Determine the state of the LIM units. To identify the LIM unit, the F-bus, and the mates that associate with the card you replace, refer to the table at the end of this document.

Note: The state of the LIM units is on the right of the LIM unit number on the MAP display.

If the state of the mate LIM unit is	Do
InSv	step 7
ISTb, and the state of the LIM unit associated with the card is InSv or ISTb	step 27
ISTb, and the LIM unit associated with the card is out of service	step 7
any out-of-service state, and the state of the LIM unit associated with the card is InSv or ISTb	step 27
any out-of-service state, and the LIM unit associated with the card you are replacing is out of service	step 7

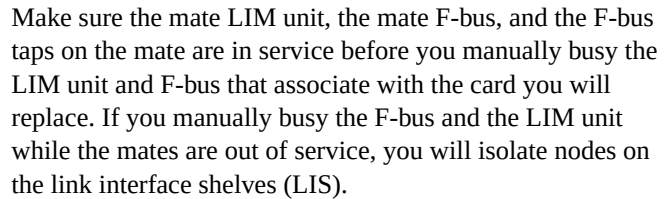
- 7 To access the F-bus level of the MAP display, type

>FBUS

and press the Enter key.

Example of a MAP display:

8



Note: The state of the F-buses is on the right of the F-bus numbers on the MAP display. To identify the LIM unit that associates with the card you replace, refer to the table at the end of this document.

If the states are	Do
in-service (state of the F-bus is InSv and all F-bus taps are . (dot))	step 9
any other state (state of the F-bus is not InSv and one or more F-bus taps are not . (dot))	step 28

Note: To identify the LIM unit associated with the card you replace, refer to the table at the end of this document.

NT9X13
in an LPP LIM unit (continued)

Example of a MAP response:

LIM 0 FBus 0 Busy requires confirmation because
the following NIUs may be active on this bus...
NIU 0 unit 0
NIU 0 unit 1
Please confirm ("YES", "Y", "NO", or "N"):

If	Do
the command passes	step 11
you must confirm the command	step 10

- 10 To confirm the command, type
>YES
and press the Enter key.
Example of a MAP response:

LIM 0 FBus 0 Busy initiated.
LIM 0 FBus 0 Busy passed.
- 11 To quit the F-bus level of the MAP display, type
>QUIT
and press the Enter key.
- 12 To manually busy the LIM unit associated with the card you will replace, type
>BSY UNIT unit_no
and press the Enter key.
where
 unit_no
 is the number of the LIM unit (0 or 1)

Example of a MAP display:

NT9X13

in an LPP LIM unit (continued)

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	28		0	17 13
LIM	0	0	1	0	1	0

LIM 0 ISTb

	Links_OOS	Taps_OOS
Unit0: ManB	2	10
Unit1: ISTb	2	.

bsy unit 0
 LIM 0 UNIT 0 Busy initiated.
 LIM 0 UNIT 0 Busy passed.

If the response is		Do
Imaging is currently in progress on LIM x UNIT y. Busy Action aborted. Use the force option if you wish to override the imaging of this unit.		step 13
Imaging is currently in progress on LIM x UNIT y and UNIT z. Busy Action aborted. Use the force option if you wish to override the imaging of this unit.		step 14
Anything else		step 15
13	Imaging is being performed on the LIM unit you are working on. Contact the next level of support to determine if it is safe to proceed. Continue as directed.	
14	Imaging is being performed on the LIM unit you are working on and the mate LIM unit. Contact the next level of support to determine if it is safe to proceed. Continue as directed.	

NT9X13 in an LPP LIM unit (continued)

At the shelf

15



WARNING

Static electricity damage

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while you handle circuit cards. The wrist strap protects the cards against static electricity damage.

Press down and release the power switch on the faceplate of the NT9X30 and NT9X31 (if present) power converters associated with the card you are replacing. To identify the power converter associated with the LIM unit you are working on, refer to the table at the end of this document.

Note: The CONVERTER OFF LED is lit when the NT9X30 power converter is powered down. If the NT9X31 power converter is present, ensure that it is powered down.

If the CONVERTER OFF LED is	Do
lit	step 18
not lit	step 16

16



WARNING

Possible loss of service

If you unseat the NT9X13 card, you bypass the safety interlock. Make sure the card you want to remove is in the manual-busy LIM unit.

To unseat the NT9X13, perform the procedure *Unseating cards in equipment shelves* in this document. Complete the procedure and return to this point.

17 Press down and release the power switch on the faceplate of the NT9X30 and NT9X31 (if present) power converters associated with the card you want to replace. To identify the power converter that associates with the LIM unit you are working on, refer to the table at the end of this document

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

Note: Determine if the card you will replace has switches. Make sure the switches on the replacement card and the card you will replace have the same settings.

NT9X13

in an LPP LIM unit (continued)

- 19** Release the power switch on the faceplate of the NT9X30 and NT9X31 (if present) power converters associated with the card you replaced.
- Note:** The CONVERTER OFF LED is not lit when the NT9X30 power converter is powered up. If the NT9X31 power converter is present, make sure that it is powered up.

- 20** The next action depends on why you are performing this procedure.

If another maintenance procedure	Do
directed you to this procedure	step 21
did not direct you to this procedure	step 22

- 21** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

At the MAP terminal

- 22** To load the LIM unit, type
- >LOADPM UNIT unit_no**
- and press the Enter key.
- where
- unit_no**
- is the number of the LIM unit (0 or 1)

Example of a MAP response:

LIM 0 UNIT 0 Load initiated.
LIM 0 UNIT 0 Load passed.

If the LOADPM command	Do
passed	step 24
failed	step 23

- 23** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 24** To return the LIM unit to service, type
- >RTS UNIT unit_no**
- and press the Enter key.
- where
- unit_no**
- is the number of the LIM unit (0 or 1)

Example of a MAP response:

NT9X13
in an LPP LIM unit (continued)

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

If the RTS command	Do
passed	step 25
failed	step 30

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

>FBUS

and press the Enter key.

- 26** To return the F-bus to service, type

>RTS FBUS fbus_no

and press the Enter key.

where

fbus_no

is the number of the F-bus you busied (0 or 1)

Example of a MAP response:

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

If the RTS command	Do
passed	step 31
failed	step 30

- 27** If you continue with this procedure, you will remove both LIM units from service and isolate application specific units (ASU) on the link interface shelf (LIS). To determine if you must continue, contact operating company personnel or your next level of support. Continue as advised.
- 28** If you continue with this procedure, you will isolate a minimum of one ASU on the LIS. To determine if you must continue, contact operating company personnel or your next level of support. Continue as advised.
- 29** To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.
- 30** For additional help, contact the next level of support.

NT9X13 in an LPP LIM unit (end)

31 The procedure is complete.

NT9X13 card and associated LIM components

PEC	Slot	Associated LIM hardware and F-buses	
NT9X13	17F	LIM unit number:	0
		Mate LIM unit number:	1
		F-bus number:	0
		Mate F-bus number:	1
		Location of NT9X30 powerconverter:	slot 0 1F
NT9X13	22F	Location of NT9X31 powerconverter:	slot 0 1F
		LIM unit number:	1
		Mate LIM unit number:	0
		F-bus number:	1
		Mate F-bus number:	0
		Location of NT9X30 powerconverter:	slot 36F
		Location of NT9X31 powerconverter:	slot 33F
Note: Some documentation refers to a LIM unit as an LMS. The LIM unit 0 corresponds to LMS 0 and LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit indicates an LMS. The term LIM also refers to the LPP, when it indicates the entire LPP cabinet.			

NT9X30 in an LPP LIS

Application

Use this procedure to replace an NT9X30 in a link interface shelf (LIS) of a link peripheral processor (LPP).

PEC	Suffix	Card name	Shelf or frame name
NT9X30	AA	+5V 86-A power converter	LPP LIS
NT9X30	AC	Global +5V 86-A power converter	LPP LIS

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

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

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

Note: This document refers to an entire LPP unit as a link interface module (LIM). The MAP displays and data schema tables also refer to the LPP as a LIM.

The following table contains details about the locations of NT9X30 and related cards. Refer also to the ELPP shelf layout diagram.

NT9X30 (in a LIS) and associated LIM components

PEC	Slot	Component	LIM/F-bus number
NT9X30	04F	LIM unit number	0
		Mate LIM unit number	1
		F-bus number	0
		Mate F-bus number	1
		Shelf side	Slots 0 to 19
		NIU unit number	0

NT9X30 in an LPP LIS (continued)

NT9X30 (in a LIS) and associated LIM components

PEC	Slot	Component	LIM/F-bus number
Location of corresponding NT9X13 card			Slot 17F
NT9X30	36F	LIM unit number	1
		Mate LIM unit number	0
		F-bus number	1
		Mate F-bus number	0
		Shelf side	Slots 20 to 36
		NIU unit number	1
		Location of corresponding NT9X13 card	Slot 22F

Note: Some documentation refers to an LIM unit as an LMS. LIM unit 0 corresponds to LMS 0. LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit designates an LMS. The LIM also refers to the whole LPP cabinet.

Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Deactivating CCS7 links and C7ROUTERS*
- *Moving an XSG to a spare XLIU*
- *Replacing a card*
- *Activating CCS7 links and C7ROUTERS*

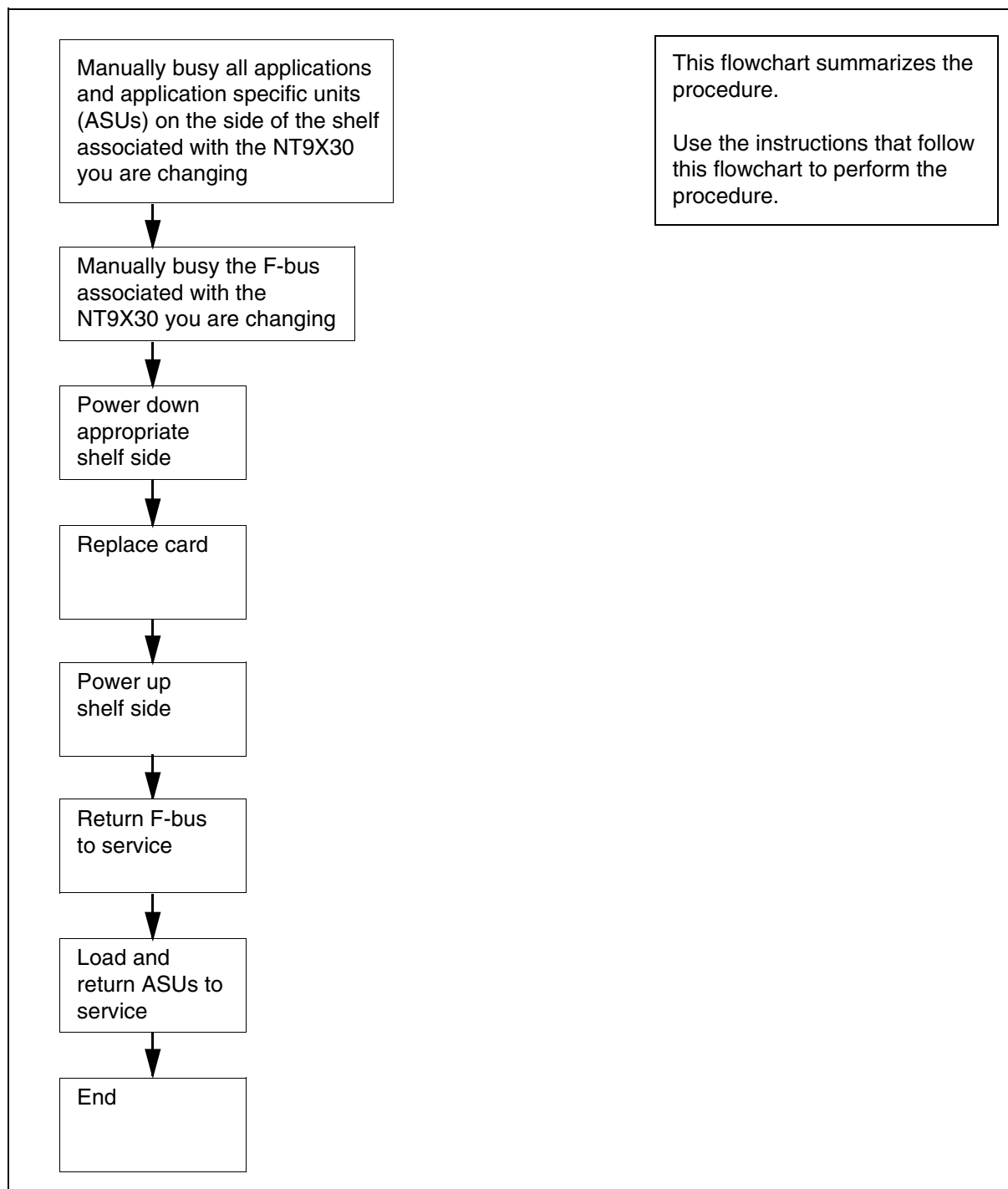
Do not proceed to the common procedure unless the step-action procedure directs you to do so.

Action

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

NT9X30 in an LPP LIS (continued)

Summary of replacing NT9X30 in an LPP LIS



NT9X30 in an LPP LIS (continued)

Replacing NT9X30 in an LPP LIS

At your current location

1



WARNING

Loss of service

This procedure removes all ASUs from service for the whole shelf side. The service the ASUs provide can degrade or stop for several hours. After you replace the power card, you must reload peripheral modules (PM) for all ASUs on the shelf side.

Obtain a replacement card. Make sure that the replacement card and the card you remove have the same product engineering code (PEC) and PEC suffix.

- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. Make sure that the replacement card is compatible with the software load. Complete the procedure and return to this point.
- 3 From office records or operating company personnel, determine the location and the number of the LIS that contains the NT9X30 card.

At the MAP terminal

- 4 To access the PM level of the MAP display, type
>MAPCI ; MTC ; PM
and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	11	0	11	4	16	38

- 5 The next step depends on the information you have on the LIM and the ASU on the side of the shelf that associates with the NT9X30 card you are replacing.

	If you	Do
know the PM number and slot location of each ASU on the same shelf side	step 12

NT9X30 in an LPP LIS (continued)

	If you	Do
	do not know the PM number and slot location of each ASU on the same shelf side	step 6
	Note 1: The NT9X30 in slot 4F powers slots 7 through 19. The NT9X30 in slot 36F powers slots 20 through 32. Note 2: ASUs can include: • network interface units (NIU) • C7ROUTERS • application processor units (APU) • ethernet interface units (EIU) • CCS7 link interface units (LIU7) • X.25/X.75 interface units (XLIU) • frame relay interface units (FRIU) • voice processor units (VPU)	
6	To access table NIUINV, type >TABLE NIUINV;FORMAT PACK and press the Enter key. <i>Example of a MAP response:</i> <pre>TABLE: NIUINV <line length>: 76 columns can be output per line. <pack mode>: Pack mode is ON. <indent column>: Indented lines will begin in column 1. <first column>: The first column of output is column 1.</pre>	
7	To list the NIUs, type >LIST ALL and press the Enter key. <i>Example of a MAP response:</i>	

NT9X30 in an LPP LIS (continued)

```

TOP
NUMBER LOCATION LOAD U0INFO U1INFO NETLINKS
-----
0 LIM 0 1 NRS15BC NTEX22BB NTEX25AA NTEX28AA NTEX22BB
NTEX25BA NTEX28AA
(0 32 11 0) (0 32 12 0) (0 32 13 0) (0 32 14 0) $

1 LIM 0 2 NRS15BC NTEX22BB NTEX25AA NTEX28AA NTEX22BB
NTEX25BA NTEX28AA
(2 52) (2 60) $

```

BOTTOM

If	Do
an NIU is present on the LIM shelf that associates with the NT9X30 card you are replacing	step 8
an NIU is not present on the LIM shelf that associates with the NT9X30 card you are replacing	step 9

Note: In the MAP response, the first column contains the NIU number. The third column contains the LIM number. The fourth column contains the LIM shelf number. In the previous example, NIU 0 is in LIM 0, shelf 1 and NIU 1 is in LIM 0, shelf 2.

- 8 Record the number of the NIU that associates with the shelf containing the NT9X30 you are replacing.
- 9 To access table LIUINV, type
>TABLE LIUINV;FORMAT PACK
and press the Enter key.
- 10 To list all LIM-based peripherals for the office, type
>LIST ALL
and press the Enter key.

Example of a MAP response:

```

TOP
LIUNAME LOCATION LOAD PROCINFO CARDINFO
-----
EIU 200 LIM 2 1 9 ETC15BC NTEX22BA NT9X84AA NT9X85AA YES0075F00020
LIU7 101 LIM 1 1 8 LRS15BH NTEX22BB NT9X76AANT9X78BA $ 56000 ABI
LIU7 208 LIM 2 2 8 LCC03BF NT9X13CANT9X75AA NT9X76AA NT9X78AA FBUS
XLIU 132 LIM 3 3 22 XRX031BF NTEX22BB NTFX10AA NTFX09AA
FRIU 134 LIM 1 3 26 F8C031BG NTEX22BB NTEX31BA NTEX30AA FBUS UNCHAN
DS1 LLEQ 125 DEFAULT Y B8ZS
APU 135 LIM 1 3 28 ULX03AUNTEX22BB NT9X14DB SOSNIX
BOTTOM

```

NT9X30 in an LPP LIS (continued)

If	Do
at least one ASU is present on the LIS shelf that associates with the NT9X30 card you are replacing	step 11
no ASUs are present on the LIS shelf that associates with the NT9X30 card you are replacing	step 12

Note: In the MAP response for table LIUINV, the first two columns contain the ASU identifier. The fourth column contains the LIM number. The fifth column contains the LIM shelf number. The sixth column contains the ASU slot location. In the example, EIU 200 is in LIM 2, shelf 1, slot 9. The ASU slot number corresponds to the ASU slot on the left half of the shelf as you face the LPP.

- 11 Record the number and slot location for each ASU on the shelf side that associates with the NT9X30 you are replacing. The NT9X30 in slot 4F associates with ASUs in slots 7 to 19; the NT9X30 in slot 36F associates with ASUs in slots 20 to 32.

12

ATTENTION

The following routines provide instructions to remove ASUs from service in this order: NIU, C7ROUTER, LIU7, XLIU, FRIU, APU, EIU, and VPU. The priority of services that ASUs support can require you to remove ASUs from service in a different order. The configuration of the shelf side containing the NT9X30 you are replacing can also require you to remove ASUs from service in a different order. Contact operating company personnel or the next level of support to verify service priorities.

The next step depends on whether NIUs are present on the shelf.

If shelf	Do
has NIUs	step 13
does not have NIUs	step 20

13



WARNING

Potential loss of channelized access

The following routine removes an NIU unit from service, which eliminates NIU redundancy for the associated LIS. If the in-service NIU goes out of service at any time during this maintenance procedure, it affects channelized access for all ASUs on both sides of the LIS.

NT9X30 in an LPP LIS (continued)

To post the NIU, type

```
>POST NIU niu_no
```

and press the Enter key.

where

niu_no

is the number of the NIU (0 to 29)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	0	1	0	2	48
NIU	0	0	0	0	0	1

```
NIU 1: InSv
Unit 0: InAct InSv
Unit 1: Act InSv
```

- 14** Determine the state of the NIU unit that associates with the shelf side. To identify the NIU unit, refer to the table at the start of this document.

If the state of the NIU unit	Do
is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA), and active	step 15
is ISTb, InSv, SysB, SysB (NA), or ISTb (NA), and inactive	step 17
is ManB or ManB (NA)	step 20
is OffL	step 112

- 15** Determine the state of the mate NIU unit.

If the state of the mate NIU unit	Do
is ISTb or InSv	step 16
is other than listed here	step 109

- 16** To switch activity, type

```
>SWACT
```

and press the Enter key.

Example of a MAP response:

NT9X30 in an LPP LIS (continued)

NIU 1 SwAct PM: Request has been submitted.
NIU 1 SwAct PM: Command completed.
The node has switched activity

If the SWACT command	Do
passed	step 17
failed	step 114

- 17** To manually busy the NIU unit, type

>BSY INACTIVE

and press the Enter key.

Example 1 of a MAP response:

NIU 1 Busy Inactive Unit: Request has been submitted.
NIU 1 Busy Inactive Unit: Command completed.

The Unit is manually busy.

Example 2 of MAP display:

Imaging is currently in progress on NIU x Unit Y.
Busying the NIU will cause imaging on this NIU to be aborted.
Do you wish to continue?
Please conform ("YES", "Y", "NO" or "N").

If the response is	Do
as shown in example 2	step 18
anything else	step 20

- 18** Imaging is being performed on the NIU unit you are working on. Contact the next level of support to determine if it is safe to proceed. Continue as directed.

If the response is	Do
yes, proceed with busy	step 19
no, abort busy	step 113

- 19** To confirm Busy, type

>YES

and press the Enter key.

Example of a MAP response:

NT9X30 in an LPP LIS (continued)

Imaging will be aborted on NIU x, Unit y.

- 20** Determine whether C7ROUTERS are on the shelf side that associates with the NT9X30 you are replacing. The office must have either no C7ROUTERS configured, or more than one C7ROUTER. If the office has only one C7ROUTER configured and it is on the same shelf side as the NT9X30 you are replacing, contact the next level of support. If all of the C7ROUTERS are on the same shelf side, contact the next level of support. Removing C7ROUTERS from service can cause outages to occur.

- 21** To access table C7ROUTER, type
>TABLE C7ROUTER;FORMAT PACK
and press the Enter key.

- 22** To list all C7ROUTERS for the office, type
>LIST ALL
and press the Enter key.

Example of a MAP response:

```
TOP
RTRNUM RESOURCE
-----
1 LIU7 1
2 LIU7 7
BOTTOM
```

If C7ROUTERS		Do
are provisioned in table C7ROUTER		step 23
are not provisioned in table C7ROUTER		step 30

23 Identify the LIU7 number assigned to the C7ROUTER. The number in column 3 in table C7ROUTER indicates the LIU7 number assigned to the router. Compare this number to the entry in table LIUINV you listed in step 10. Determine whether any of the C7ROUTERS are on the same side of the shelf as the NT9X30 you are replacing.

If C7ROUTERS		Do
are on the same side of the shelf as the NT9X30		step 24
are not on the same side of the shelf as the NT9X30		step 30

NT9X30 in an LPP LIS (continued)

24

**CAUTION****Possible SS7 node isolation**

The following routine removes an LIU7 from service, which temporarily interrupts messaging on the associated CCS7 link. Do not attempt to busy the LIU7 if no other routers are in service. If this LIU7 is the only in-service router, contact the next level of support before proceeding.

ATTENTION

Perform this procedure on one LIU7 and its associated router at a time.

To access the C7ROUTER level and post the router instance, type

>MAPCI;MTC;CCS;CCS7;C7ROUTER;POST router_number

and press the Enter key.

where

router_number

is the router number (instance) of the LIU7 in table C7ROUTER (field RTRNUM)

- 25** To busy the router instance for the LIU7, type

>BSY

and press the Enter key.

The router changes state from InSv to MANB.

- 26** To access the PM level of the MAP display, type

>PM

and press the Enter key.

- 27** To post the LIU7, type

>POST LIU7 liu_no

and press the Enter key.

where

liu_no

is the number of the LIU7 (0 to 511)

Example of a MAP display:

NT9X30 in an LPP LIS (continued)

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	2	0	3	6
LIU7	1	0	0	0	0	3

LIU7 208 InSv Rsvd

28

**CAUTION****Loss of service**

The following routine removes an LIU7 from service, which temporarily interrupts messaging on the associated CCS7 link.

To busy the LIU7, type

>BSY

and press the Enter key.

- 29 Repeat steps 24 to 28 for all C7ROUTERS on the same shelf side as the NT9X30 you are replacing.
- 30 Determine whether CCS7 LIU7s associated with signaling links are on the shelf side that associates with the NT9X30.

If the shelf side	Do
has LIU7s	step 31
does not have LIU7s	step 46

31

**CAUTION****Loss of service**

The following routine removes an LIU7 from service, which temporarily interrupts messaging on the associated CCS7 link.

To post the LIU7, type

>POST LIU7 liu_no

and press the Enter key.

where

liu_no

is the number of the LIU7 (0 to 511)

NT9X30 in an LPP LIS (continued)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	2	0	3	6
LIU7	1	0	0	0	0	3

LIU7 208 InSv Rsvd

- 32** To deactivate the CCS7 link that associates with the LIU7, perform the procedure *Deactivating CCS7 links* in this document. Complete the procedure and return to this point.

- 33** Determine the state of the LIU7.

If the state of the LIU7	Do
is SysB, SysB (NA), ISTb, or InSv	step 34
is ManB or ManB (NA)	step 37
is OffL	step 112

- 34** To manually busy the LIU7, type

>BSY FORCE

and press the Enter key.

If	Do
you need to confirm the command	step 36
the command passed	step 38
Warning: LIU7 27 is currently being imaged. Do you want to abort imaging to proceed with the BSY request? Please confirm ("YES", "Y", "NO" or "N");	step 35

- 35** Contact the next level of support to determine if it is safe to continue this procedure.

If the response is	Do
proceed with BSY FORCE request	step 36
abort BSY FORCE request	step 113

- 36** To confirm the command, type

>YES

and press the Enter key.

- 37** Repeat steps 27 to 36 for all LIU7s on the shelf side.

NT9X30 in an LPP LIS (continued)

- 38** Determine whether XLIUs are on the shelf side that associates with the NT9X30.

If the shelf side	Do
has XLIUs	step 39
does not have XLIUs	step 46

- 39**



CAUTION

Loss of packet handler service

The following routine removes an XLIU from service and interrupts traffic on associated X.25/X.75 channels.

To post the XLIU, type

```
>POST XLIU xliu_no
```

and press the Enter key.

where

xliu_no

is the number of the XLIU (0 to 511)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	0	2	23	0	10	30
XLIU	0	0	0	0	0	3

XLIU 27 InSv Rsvd

- 40** Determine the state of the XLIU.

Note: The state of the XLIU appears on the right side of the XLIU number. This state appears in the example MAP display in step 39.

If the state of the XLIU	Do
is SysB, ISTb (NA) , ManB, ISTb, or InSv	step 41
is OffL	step 112

NT9X30 in an LPP LIS (continued)

- 41** Determine whether the XLIU is a spare.
- Note:** The code “Spre” on the right side of the service condition identifies a spare XLIU. This code appears in the display in step 39. The code “Rsvd” identifies an XLIU with an assigned X.25/X.75 service group (XSG).

If the XLIU	Do
is a spare, and the state is ManB	step 45
is a spare, and the state is other than listed here	step 44
is not a spare	step 42

- 42** Determine from office records or from operating company personnel the number of a spare XLIU.
- Note:** The spare XLIU must be on the same shelf as the out-of-service XLIU.

If a spare XLIU	Do
is available	step 43
is not available and the reserved XLIU is out of service	step 44
is not available and the reserved XLIU is in service	step 110

- 43** Perform the procedure *Moving an XSG to a spare XLIU* in this document. Move the XSG from the reserved XLIU to the spare XLIU. Complete the procedure and return to this point.

Note: The XLIU for which you change cards is now the spare. In the following steps, the spare refers to this XLIU.

Go to step 46.

- 44** To manually busy the XLIU, type

>BSY

and press the Enter key.

Example of a MAP response

XLIU 27 BSY Passed

- 45** Repeat steps 39 to 44 for all XLIUs on the shelf side you are working on.

- 46** Determine whether FRIUs are on the shelf side that associates with the NT9X30.

If the shelf side	Do
has FRIUs	step 47
does not have FRIUs	step 64

NT9X30 in an LPP LIS (continued)

47

**CAUTION****Loss of frame relay service**

The following routine removes an FRIU from service and temporarily interrupts traffic on the associated access or trunking DS-1 channels.

To post the FRIU, type

```
>POST FRIU friu_no
```

and press the Enter key.

where

friu_no

is the number of the FRIU (0 to 500)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	27	0	8	29
FRIU	1	0	19	0	6	28

FRIU	8	InSv	Rsvd

48 Determine the state of the FRIU.

Note: The state of the FRIU appears on the right side of the FRIU number. This state appears in the example MAP display in step 47.

If the state of the FRIU is	Do
SysB, ISTb (NA), InSv, or ISTb	step 49
ManB	step 63
OffL	step 112

49 To access the CHAN level of the MAP display, type

```
>CARR;CHAN
```

and press the Enter key.

Example of a MAP display:

NT9X30 in an LPP LIS (continued)

```

          SysB   ManB   OffL   CBsy   ISTb   InSv
PM          1       0       27       0       8       29
FRIU        1       0       19       0       6       28

FRIU   8 InSv      Rsvd

CARRIER
InSv                               Alarm   BER   ES   SES   UAS
                               -8.3    0    0    0    0

CHANNEL  1
.
CHANNEL  1      ( 24 x DS0)
InSv
CHAN:

```

- 50** Determine if the FRIU has channelized access.

Note: A non-channelized FRIU has one channel assigned. A channelized FRIU has 4 or 24 channels assigned.

If the FRIU is	Do
non-channelized	step 51
channelized	step 53

- 51** To manually busy the channel, type

>BSY

and press the Enter key.

- 52** To confirm the command, type

>YES

and press the Enter key.

Note: If the channel is out of service, the system does not request confirmation.

Go to step 56.

- 53** To manually busy all channels, type

>BSY ALL

and press the Enter key.

- 54** To manually busy all channels, type

>BSY ALL

and pressing the Enter key.

- 55** To confirm the command, type

>YES

NT9X30 in an LPP LIS (continued)

and press the Enter key.

Note: If all channels are out of service, the system does not request confirmation.

- 56 To access the CARR level of the MAP display, type

>QUIT

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	27	0	8	29
FRIU	1	0	19	0	6	28

FRIU 8 InSv Rsvd

CARRIER	Alarm	BER	ES	SES	UAS
InSv		-8.3	0	0	0

CHANNEL 1

.

- 57 To manually busy the carrier, type

>BSY

and press the Enter key.

Example of a MAP response:

Busying this carrier will affect 1 channels.
Please confirm ("YES", "Y", "NO", or "N"):

- 58 To confirm the command, type

>YES

and press the Enter key.

Example of a MAP response:

Confirmed...BSY passed.

Note: If the carrier is out of service, the system does not request confirmation.

- 59 To quit the CARR level, type

>QUIT

and press the Enter key.

- 60 To manually busy the FRIU, type

>BSY FORCE

NT9X30 in an LPP LIS (continued)

and press the Enter key.

	If MAP response is	Do
	Billing data is stored in the FRIU. Uploading billing data..Uploaded FRS Billing data successfully ...FRIU 8 BSY Passed	step 63
	WARNING: FRIU 8 is currently being imaged. Do you wish to abort imaging to proceed with the busy request. Please confirm ("YES", "Y", "NO" or "N")	step 61
61	Determine if you should proceed with the BSY and proceed as shown below.	
	If you want to proceed with	Do
	BUSY and abort imaging	step 62
	abort BSY request	step 113
62	Continue with BSY FORCE by typing >BSY FORCE and pressing the Enter key. <i>Example of a MAP response:</i> Imaging will be aborted on FRIU 8.	
63	Repeat steps 47 to 60 for all FRIUs on the shelf side.	
64	Determine whether APUs, EIUs, or VPUs are on the shelf side that associates with the NT9X30 in use.	
	If the shelf side	Do
	has APUs, EIUs, or VPU	step 65
	does not have APUs, EIUs, or VPU	step 70

NT9X30 in an LPP LIS (continued)

65



CAUTION

Loss of service capacity

The following routine can remove an APU or VPU from service. Service capacity reduces.

The following routine can remove an EIU from service so that the LAN cannot access the Ethernet address. If other EIUs do not provide alternative addresses to the LAN, ASUs on the shelf are isolated.

To post the APU, EIU, or VPU, type

```
>POST asu_type asu_no
```

and press the Enter key.

where

asu_type

is the ASU type (APU, EIU, VPU)

asu_no

is the number of the ASU (0 to 511 for APU and EIU; 0 to 179 for VPU)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	2	0	7	0	14	63
VPU	0	0	1	0	0	5

VPU 1 InSv Rsvd

66 Determine the state of the APUs, EIUs, or VPU.

If the state of the PM is	Do
SysB, SysB (NA), ISTb, or InSv	step 67
ManB or ManB (NA)	step 69
Offl	step 112

67 To manually busy the APUs, EIUs, or VPU, type

```
>BSY
```

and press the Enter key.

Example of a MAP response:

NT9X30 in an LPP LIS (continued)

BSYing VPU 1 may reduce ADAS capacity.
Please confirm ("YES", "Y", "NO", or "N"):

If	Do
the command passed	step 69
you need to confirm the command	step 68

68 To confirm the busy command, type

>YES

and press the Enter key.

If the BSY command	Do
passed	step 69
failed	step 114

69 Repeat steps 65 to 68 for all APUs, EIUs, or VPUs on the shelf side.

70 To post the LIM, type

>POST LIM lim_no

and press the Enter key.

where

lim_no

is the number of the LIM to post (0 to 16)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	1	0	2	0	3	6
LIM	0	0	0	0	1	0

LIM 0 InSv

Links_OOS Taps_OOS

Unit0: InSv

.

Unit1: InSv

.

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

>FBUS

and press the Enter key.

Example of a MAP display:

NT9X30 in an LPP LIS (continued)

	Tap:	0	4	8	12	16	20	24	28	32
FBus0:	InSv	...	---	---	---	---	---	---	---	---
FBus1:	InSv	...	---	---	---	---	---	---	---	---

- 72** To manually busy the F-bus that associates with the power converter you replace, type

```
>BSY FBUS fbus_no
```

and press the Enter key.

where

fbus_no

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

Note: Refer to the table at the start of this document to identify the F-bus that associates with the card you replace.

At the shelf

73



WARNING

Static electricity damage

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

To power down the NT9X30 card, press and release the power switch on the faceplate of the card. The CONVERTER OFF LED lights when the converter powers down.

If the CONVERTER OFF LED	Do
is lit	step 74
is not lit	step 111

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

Note: Determine if the card you will replace has switches. Make sure the switches on the replacement card have the same settings.

NT9X30 in an LPP LIS (continued)

- 75** To power up the NT9X30 card, lift and release the POWER switch on the faceplate of the card. The CONVERTER OFF LED will go out when the converter powers up.

If the CONVERTER OFF LED	Do
is not lit	step 76
is lit	step 111

At the MAP terminal

- 76** To return the F-bus to service, type

```
>RTS FBUS 0 tap_no
```

and press the Enter key.

where

fbus_no

is the number of a fbus (0 or 1)

77

ATTENTION

The following routines provide instructions to return ASUs to service in this order: NIU, LIU7, FRIU, XLIU, APU, EIU, and VPU.

The priority of services that the ASUs support can require you to return ASUs to service in a different order. The configuration of the shelf side can require you to return ASUs to service in a different order. Contact operating company personnel or the next level of support to verify service priorities.

Determine whether NIUs are present on the shelf.

If the shelf	Do
has NIUs	step 78
does not have NIUs	step 82

- 78** To post the NIU, type
- ```
>POST NIU niu_no
```
- and press the Enter key.

where

**niu\_no**

is the number of the NIU (0 to 29)

- 79** To load the inactive NIU unit, type

```
>LOADPM INACTIVE
```

**NT9X30**  
**in an LPP LIS** (continued)

---

and press the Enter key.

*Example of a MAP response:*

```
NIU 1 Load Inactive Unit: Request has been submitted.
NIU1 Load Unit 0: Command completed.
The Unit contains the "NRS0 12 3BA" load.
```

---

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 81 |
| failed                | step 80 |

---

- 80** To load the PM, perform the procedure *How to load a PM* in this document. Complete the procedure and return to this point.

- 81** To return the inactive NIU unit to service, type

```
>RTS INACTIVE
```

and press the Enter key.

*Example of a MAP response:*

```
NIU 1 RTS Inactive Unit: Request has been submitted.
NIU 1RTS Inactive Unit: Command completed.
The Unit is in service
```

---

| If the RTS command | Do       |
|--------------------|----------|
| passed             | step 82  |
| failed             | step 114 |

---

- 82** Determine if CCS7 link interface units (LIU7) are in the shelf side that associates with the NT9X30.

---

| If the shelf side   | Do      |
|---------------------|---------|
| has LIU7s           | step 83 |
| does not have LIU7s | step 89 |

---

- 83** To post the LIU7, type

```
>POST LIU7 liu_no
```

and press the Enter key.

*where*

**liu\_no**  
is the number of the LIU7 (0 to 511)



## NT9X30 in an LPP LIS (continued)

- 84** To load the LIU7, type  
>LOADPM  
and press the Enter key.

*Example of a MAP response:*

LIU7 208 LOADPM Passed

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 86 |
| failed                | step 85 |

- 85** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 86** To return the LIU7 to service, type  
>RTS  
and press the Enter key.

*Example of a MAP response:*

LIU7 100 RTS Passed

| If the RTS command | Do       |
|--------------------|----------|
| passed             | step 87  |
| failed             | step 114 |

- 87** To activate the CCS7 link that associates with the LIU7, perform the procedure *Activating CCS7 links* in this document. Complete the procedure and return to this point.

- 88** Repeat steps 83 to 87 for all LIU7s on the shelf side.

- 89** Determine if FRIUs are in the shelf side that associates with the NT9X30.

| If the shelf side  | Do       |
|--------------------|----------|
| has FRIU           | step 90  |
| does not have FRIU | step 101 |

- 90** To post the FRIU, type  
>POST FRIU friu\_no  
and press the Enter key.  
*where*

**NT9X30**  
**in an LPP LIS** (continued)

---

- friu\_no**  
is the number of the FRIU (0 to 500)
- 91** To load the FRIU type  
>**LOADPM**  
and press the Enter key.  
*Example of a MAP response:*  
  
FRIU 8 LOADPM Passed
- | If the <b>LOADPM</b> command | Do      |
|------------------------------|---------|
| passed                       | step 93 |
| failed                       | step 92 |
- 92** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.
- 93** To return the FRIU to service, type  
>**RTS**  
and press the Enter key.  
*Example of a MAP response:*  
  
FRIU 8 RTS Passed
- | If the <b>RTS</b> command | Do       |
|---------------------------|----------|
| passed                    | step 94  |
| failed                    | step 114 |
- 94** To access the CARR level of the MAP display, type  
>**CARR**  
and press the Enter key.
- 95** To return the carrier to service, type  
>**RTS**  
and press the Enter key.  
*Example of a MAP response:*  
  
RTS passed.
- 96** Wait until the Mtce flag on the right side of the CARRIER header is removed from the display. The carrier will go ISTb at this point.

## NT9X30 in an LPP LIS (continued)

- 97** Wait 1 min for the carrier to go in service.
- | If after 1 min the state of the carrier | Do       |
|-----------------------------------------|----------|
| is InSv                                 | step 98  |
| is other than listed here               | step 114 |
- 98** To access the CHAN level of the MAP display, type  
>CHAN  
and press the Enter key.
- 99** To return the carrier to service, type  
>RTS  
and press the Enter key.  
*Example of a MAP response:*
- RTS passed.
- 100** Repeat steps 90 to 99 for all FRIUs on the shelf side in use.
- 101** Determine if XLIUs, APUs, EIUs, or VPUs are in the shelf side that associates with the NT9X30.
- | If the shelf side                        | Do       |
|------------------------------------------|----------|
| has XLIUs, APUs, EIUs, or VPUs           | step 102 |
| does not have XLIUs, APUs, EIUs, or VPUs | step 107 |
- 102** To post the XLIU, APU, EIU, or VPU, type  
>POST asu\_type asu\_no  
and press the Enter key.  
*where*
- asu\_type**  
is the ASU type (XLIU, APU, EIU, VPU)
- asu\_no**  
is the number of the ASU (0 to 511 for XLIU, APU, and EIU; 0 to 179 for VPU)
- 103** To load the XLIU, APU, EIU, or VPU, type  
>LOADPM  
and press the Enter key.  
*Example of a MAP response:*

## NT9X30

### in an LPP LIS (continued)

APU 1 LOADPM Passed

|            | If the LOADPM command                                                                                                          | Do       |
|------------|--------------------------------------------------------------------------------------------------------------------------------|----------|
|            | passed                                                                                                                         | step 105 |
|            | failed                                                                                                                         | step 104 |
| <b>104</b> | To load the PM, perform the procedure <i>Loading a PM</i> in this document. Complete the procedure and return to this point.   |          |
| <b>105</b> | To return the XLIU, APU, EIU, or VPU to service, type<br>>RTS<br>and press the Enter key.<br><i>Example of a MAP response:</i> |          |

APU 1 RTS Passed

|            | If the RTS command                                                                                                                                                                                                                                                                                                                                                              | Do       |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|            | passed                                                                                                                                                                                                                                                                                                                                                                          | step 106 |
|            | failed                                                                                                                                                                                                                                                                                                                                                                          | step 114 |
| <b>106</b> | Repeat steps 102 to 105 for all XLIU, APUs, EIUs, and VPUs on the shelf side.                                                                                                                                                                                                                                                                                                   |          |
| <b>107</b> | The next action depends on the reason you perform this procedure.                                                                                                                                                                                                                                                                                                               |          |
|            | If a maintenance procedure                                                                                                                                                                                                                                                                                                                                                      | Do       |
|            | directed you to this procedure                                                                                                                                                                                                                                                                                                                                                  | step 108 |
|            | did not direct you to this procedure                                                                                                                                                                                                                                                                                                                                            | step 115 |
| <b>108</b> | Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.                                                                                                                                                                                                                                                     |          |
| <b>109</b> | You must clear all faults on the inactive NIU unit before you complete the activity switch, or loss of service occurs. For direction on how to proceed, contact the next level of support.                                                                                                                                                                                      |          |
| <b>110</b> | You must move the XSG to a spare XLIU before you manually busy an XLIU with an XSG assigned to it. If you do not perform this procedure, service degrades for a long period of time. Contact operating company personnel or the next level of support on how to proceed without a spare XLIU. Continue as directed by operating company personnel or the next level of support. |          |
| <b>111</b> | Power down the power converter before you proceed. Contact operating company personnel or the next level of support on how to proceed.                                                                                                                                                                                                                                          |          |

**NT9X30**  
**in an LPP LIS (end)**

---

- 112** Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.
- 113** Abort the BSY FORCE request by typing  
>NO  
and pressing the Enter key  
*Example of a MAP response:*  
  
Aborted.
- 114** For additional help, contact the next level of support.
- 115** The procedure is complete.

**Procedure history**

**SN07 (DMS)**

Procedure corrected according to CR Q00819400.

Procedure history section added.



## NT9X74 in an LPP LIS

---

### Application

Use this procedure to replace an NT9X74 card in a link interface shelf (LIS) in a link peripheral processor (LPP).

| PEC    | Suffix         | Card name           | Shelf or frame name |
|--------|----------------|---------------------|---------------------|
| NT9X74 | AA, BA, CA, DA | F-bus repeater card | LIS in an LPP       |

**Note 1:** Some documentation refers to the link interface module (LIM) unit as a local message switch (LMS). LIM unit 0 corresponds to LMS 0. LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit designates an LMS.

**Note 2:** This document refers to the whole LPP as a link interface module (LIM). This parallels how the link interface shelf (LIS) in the LPP associates with the LIM. The MAP displays and data schema tables also refer to the LPP as a LIM.

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

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

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

### Common procedures

This procedure refers to the following common procedures.

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*
- *Loading a PM*

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

**NT9X74**  
**in an LPP LIS** (continued)

---

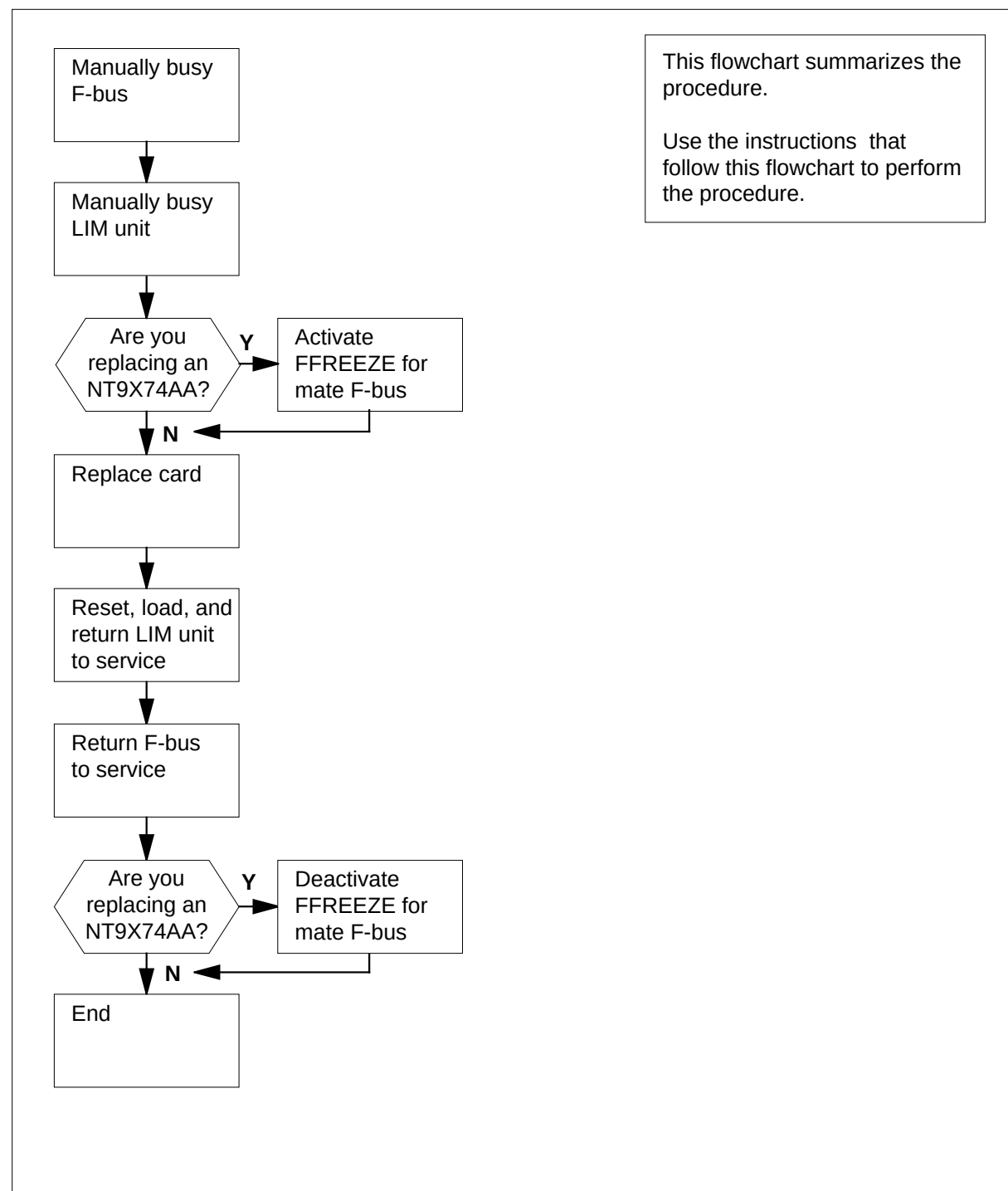
**Action**

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



## NT9X74 in an LPP LIS (continued)

### Summary of replacing an NT9X74 in an LPP LIS



## NT9X74 in an LPP LIS (continued)

### Replacing an NT9X74 in an LPP LIS

#### At your current location

1



#### WARNING

##### Loss of service

This procedure provides instructions to remove a LIM unit and an F-bus from service. This removes redundancy from the LPP. Perform this procedure if you must return the F-bus to service. Perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.

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

#### At the MAP terminal

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

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 0    | 0    | 28   | 0    | 0    | 18   |

- 4 To post the link interface module (LIM) that associate with the card you replace, type

**>POST LIM lim\_no**

and press the Enter key.

*where*

**lim\_no**

is the number of the LIM (0 to 16)

**Note:** Refer to table "NT9X74 (in an LIS) and associated LIM components" to identify the LIM unit that associates with the card you replace.

*Example of a MAP display:*

## NT9X74 in an LPP LIS (continued)

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 28   | 0    | 0    | 18   |
| LIM | 0    | 0    | 1    | 0    | 0    | 1    |

```
LIM 0 InSv
Links_00S Taps_00S
Unit0: InSv
Unit1: InSv
```

- 5 Determine the state of the LIM.

**Note:** The state of the LIM appears on the right side of the LIM number on the MAP display.

| If the state of the LIM                         | Do      |
|-------------------------------------------------|---------|
| is Offl                                         | step 34 |
| is any other in-service or out-of-service state | step 6  |

- 6 Determine the state of the mate LIM unit. Refer to table "NT9X74 (in an LIS) and associated LIM components" to identify the LIM unit that associates with the card you replace.

**Note:** The state of the LIM units appears on the right side of the LIM unit number on the MAP display.

| If the state of the mate LIM unit | Do      |
|-----------------------------------|---------|
| is InSv                           | step 7  |
| is other than listed here         | step 32 |

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

**>FBUS**

and press the Enter key.

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 28   | 0    | 0    | 18   |
| LIM | 0    | 0    | 1    | 0    | 0    | 1    |

```
LIM 0 InSv
Links_00S Taps_00S
Unit0: InSv
Unit1: InSv
Tap: 0 4 8 12 16 20 24 28 32
FBus0: InSv
FBus1: InS
```

## NT9X74 in an LPP LIS (continued)

- 8 Determine the state of the F-bus and the F-bus taps for the mate LIM unit.

**Note:** The state of the F-buses appears on the right side of the F-bus numbers on the MAP display. To identify the LIM and F-bus components that associate with the card you replace, refer to table “NT9X74 (in an LIS) and associate LIM components”.

| If the states                                                                                            | Do      |
|----------------------------------------------------------------------------------------------------------|---------|
| are in-service (state of the F-bus is InSv and all F-bus taps are dot ( . ))                             | step 9  |
| are other than listed here (state of the F-bus is not InSv and one or more F-bus taps are not dot ( . )) | step 33 |

- 9



### WARNING

#### Potential loss of service

Make sure that the mate LIM unit, the mate F-bus, and the F-bus taps on the mate are in service. Complete this action before you manually busy the LIM unit and F-bus that associates with the card you replace. Do not manually busy the F-bus and the LIM unit while the mates are out of service. This can isolate nodes on the link interface shelves (LIS).

To manually busy the F-bus that associates with the card you replace, type

**>BSY FBUS fbus\_no**

and press the Enter key.

where

**fbus\_no**

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

**Note:** To identify the F-bus components that associate with the card you replace, refer to table “NT9X74 (in an LIS) and associate LIM components”.

*Example of a MAP response:*

**NT9X74**  
**in an LPP LIS** (continued)

---

LIM 0 FBus 0 Busy requires confirmation because the following NIUs may be active on this bus...  
NIU 0 unit 0  
NIU 0 unit 1  
Please confirm ("YES", "Y", "NO", or "N"):

---

| If                           | Do      |
|------------------------------|---------|
| the command passes           | step 11 |
| you must confirm the command | step 10 |

---

- 10** To confirm the command, type  
**>YES**  
and press the Enter key.  
*Example of a MAP response:*
- LIM 0 FBus 0 Busy initiated.  
LIM 0 FBus 0 Busy passed.
- 11** To quit the F-bus level of the MAP display, type  
**>QUIT**  
and press the Enter key.
- 12** To manually busy the LIM unit that associates with the card you replace, type  
**>BSY UNIT unit\_no**  
and press the Enter key.  
*where*  
**unit\_no**  
is the number of the LIM unit (0 or 1)  
*Example of a MAP display:*

## NT9X74 in an LPP LIS (continued)

|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
|-----|------|------|------|------|------|------|
| PM  | 0    | 0    | 28   | 0    | 17   | 13   |
| LIM | 0    | 0    | 1    | 0    | 1    | 0    |

```
LIM 0 ISTb
Links_00S Taps_00S
```

```
Unit0: ManB 4 10
Unit1: ISTb 4 .
```

```
bsy unit 0
LIM 0 UNIT 0 Busy initiated.
LIM 0 UNIT 0 Busy passed.
```

| If the response is                                                                                                                                       | Do      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Imaging is currently in progress on LIM x UNIT y. Busy Action aborted. Use the force option if you wish to override the imaging of this unit.            | step 13 |
| Imaging is currently in progress on LIM x UNIT y and UNIT z. Busy Action aborted. Use the force option if you wish to override the imaging of this unit. | step 14 |
| anything else                                                                                                                                            | step 15 |

- 13** Imaging is being performed on the LIM unit you are working on. Contact the next level of support to determine if it is safe to proceed. Continue as directed.
- 14** Imaging is being performed on the LIM unit you are working on and the mate LIM unit. Contact the next level of support to determine if it is safe to proceed. Continue as directed.
- 15**



### CAUTION

#### Possible loss of service

If you replace an NT9X74AA card, remote login to the mate LIM unit. Use the FFREEZE command to keep the mate in service. If you do not keep the mate in service, you can cause the mate unit to go system busy.

## NT9X74 in an LPP LIS (continued)



### WARNING

#### Possible loss of service

If you replace an NT9X74AA card, remote login to the mate LIM unit. Use the FFREEZE command to keep the mate in service. If you do not keep the mate in service, you can cause the mate unit to go system busy.

Determine the suffix of the NT9X74 card you will replace.

| If the suffix of the NT9X74 card | Do      |
|----------------------------------|---------|
| is AA                            | step 16 |
| is BA, CA, or DA                 | step 19 |

- 16** To access the mate LIM unit, type  
**>REMLOGIN LIM lim\_no unit\_no**  
 and press the Enter key.  
*where*  
**lim\_no**  
 is the number of the LIM (0 to 16)  
**unit\_no**  
 is the number of the mate LIM unit (0 or 1)

*Example of a MAP response:*

```
Remote Login complete
IPL *** lpx02ao --- SER. III LOAD ***
LIM0U0>
```

| If the REMLOGIN command | Do      |
|-------------------------|---------|
| passed                  | step 17 |
| failed                  | step 35 |

---

**NT9X74**  
**in an LPP LIS (continued)**

---

17

**WARNING****Possible loss of service**

The FFREEZE command shuts off automatically after 3 h. The F-bus becomes system busy, which isolates all LISs from the message switch. If you require more than 3 h to complete this maintenance procedure, repeat steps 16 to 18 before period expires. This action will extend mate F-bus integrity. Perform these steps from any level of the MAP display.

To keep the F-bus of the mate LIM unit in service, type

**>FFREEZE START**

and press the Enter key.

*Example of a MAP response:*

```
FFREEZE active. FBus will not go SysB for 3 hours
LIM0U0>
```

**Note:** The system prints logs if the log printer for the remote unit is on.

18

To close the remote CI session on the mate LIM unit, type

**>REMLOGOUT**

and press the Enter key.

*Example of a MAP response:*

```
Logged out of node LIM0U0.
```



## NT9X74 in an LPP LIS (continued)

---

### *At the shelf*

19



#### **WARNING**

##### **Static electricity damage**

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

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

**Note:** Determine if the card you will replace has switches. Make sure that the switches on the replacement card have the same settings.

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

| <b>If maintenance procedure</b>      | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 21   |
| did not direct you to this procedure | step 22   |

21 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

### *At the MAP terminal*

22 To reset the LIM unit that you manually busied in step 12, type

**>PMRESET UNIT unit\_no**

and press the Enter key.

where

**unit\_no**

is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
LIM 0 UNIT 0 Reset initiated.
LIM 0 UNIT 0 Reset passed.
```

| <b>If the PMRESET command</b> | <b>Do</b> |
|-------------------------------|-----------|
| passed                        | step 25   |
| failed                        | step 23   |

## NT9X74 in an LPP LIS (continued)

- 23** To load the LIM unit, type  
**>LOADPM UNIT unit\_no**  
 and press the Enter key.  
*where*  
**unit\_no**  
 is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
LIM 0 UNIT 0 Load initiated.
LIM 0 UNIT 0 Load passed.
```

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 25 |
| failed                | step 24 |

- 24** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 25** To return the LIM unit to service, type  
**>RTS UNIT unit\_no**  
 and press the Enter key.  
*where*  
**unit\_no**  
 is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

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

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 26 |
| failed             | step 35 |

- 26** To access the F-bus level of the MAP display, type  
**>FBUS**  
 and press the Enter key.

- 27** To return the F-bus to service, type  
**>RTS FBUS fbus\_no**  
 and press the Enter key.  
*where*

**NT9X74**  
**in an LPP LIS** (continued)

---

**fbus\_no**

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

*Example of a MAP response:*LIM 0 FBus 0 Return to Service initiated.  
LIM 0 FBus 0 Return to Service passed.

|           | <b>If the RTS command</b>                                                                                                                                                                                                                       | <b>Do</b> |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed                                                                                                                                                                                                                                          | step 28   |
|           | failed                                                                                                                                                                                                                                          | step 35   |
| <b>28</b> | Determine the suffix of the replaced NT9X74 card.                                                                                                                                                                                               |           |
|           | <b>If the suffix of the NT9X74 card</b>                                                                                                                                                                                                         | <b>Do</b> |
|           | is AA                                                                                                                                                                                                                                           | step 29   |
|           | is BA, CA, or DA                                                                                                                                                                                                                                | step 36   |
| <b>29</b> | To access the mate LIM unit, type<br><b>&gt;REMLOGIN LIM lim_no unit_no</b><br>and press the Enter key.<br><i>where</i><br><b>lim_no</b><br>is the number of the LIM (0 to 16)<br><b>unit_no</b><br>is the number of the mate LIM unit (0 or 1) |           |
|           | <b>If the REMLOGIN command</b>                                                                                                                                                                                                                  | <b>Do</b> |
|           | passed                                                                                                                                                                                                                                          | step 30   |
|           | failed                                                                                                                                                                                                                                          | step 35   |
| <b>30</b> | To deactivate the FFREEZE command, type<br><b>&gt;FFREEZE STOP</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>FFREEZE now deactivated.<br>LIM0U0>                                                                  |           |
| <b>31</b> | To cancel the remote CI session on the mate LIM unit, type<br><b>&gt;REMLOGOUT</b><br>and press the Enter key.                                                                                                                                  |           |

## NT9X74 in an LPP LIS (end)

Logged out of node LIM0U0.

Go to step 36.

- 32** If you continue with this procedure, you will remove the whole LIM from service. You will isolate application specific units (ASU) on the link interface shelves (LIS). Contact the next level of support to determine if you must continue. Continue as directed by the next level of support.
- 33** If you continue with this procedure, you can isolate one or more application specific units (ASU) on the link interface shelves (LIS). Contact the next level of support to determine if you must continue this procedure. Continue as directed by the next level of support.
- 34** Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.
- 35** For additional help, contact the next level of support.
- 36** The procedure is complete.

### NT9X74 (in an LIS) and associated LIM components

| PEC                                                                                                                                                                                                                                                                          | Slot | LIM and F-bus associations |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------|---|
| NT9X74                                                                                                                                                                                                                                                                       | 07F  | LIM unit number:           | 0 |
|                                                                                                                                                                                                                                                                              |      | Mate LIM unit number:      | 1 |
|                                                                                                                                                                                                                                                                              |      | F-bus number:              | 0 |
|                                                                                                                                                                                                                                                                              |      | Mate F-bus number:         | 1 |
| NT9X74                                                                                                                                                                                                                                                                       | 32F  | LIM unit number:           | 1 |
|                                                                                                                                                                                                                                                                              |      | Mate LIM unit number:      | 0 |
|                                                                                                                                                                                                                                                                              |      | F-bus number:              | 1 |
|                                                                                                                                                                                                                                                                              |      | Mate F-bus number:         | 0 |
| <b>Note:</b> Some documentation refers to a LIM unit as an LMS. LIM unit 0 corresponds to LMS 0. LIM unit 1 corresponds to LMS 1. The term LIM in MAP commands, responses, and displays designates an LMS. The term LIM is also refers to the LPP and the whole LPP cabinet. |      |                            |   |

## NTDX16 in an LPP LIS

---

### Application

Use this procedure to replace an NTDX16 card in link interface shelf (LIS) of a link peripheral processor (LPP).

| PEC    | Suffix | Card name                 | Shelf or frame name |
|--------|--------|---------------------------|---------------------|
| NTDX16 | AA     | +/-5V 86A power converter | in an LPP LIS       |

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

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

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

### Common procedures

This procedure refers to the following common procedures:

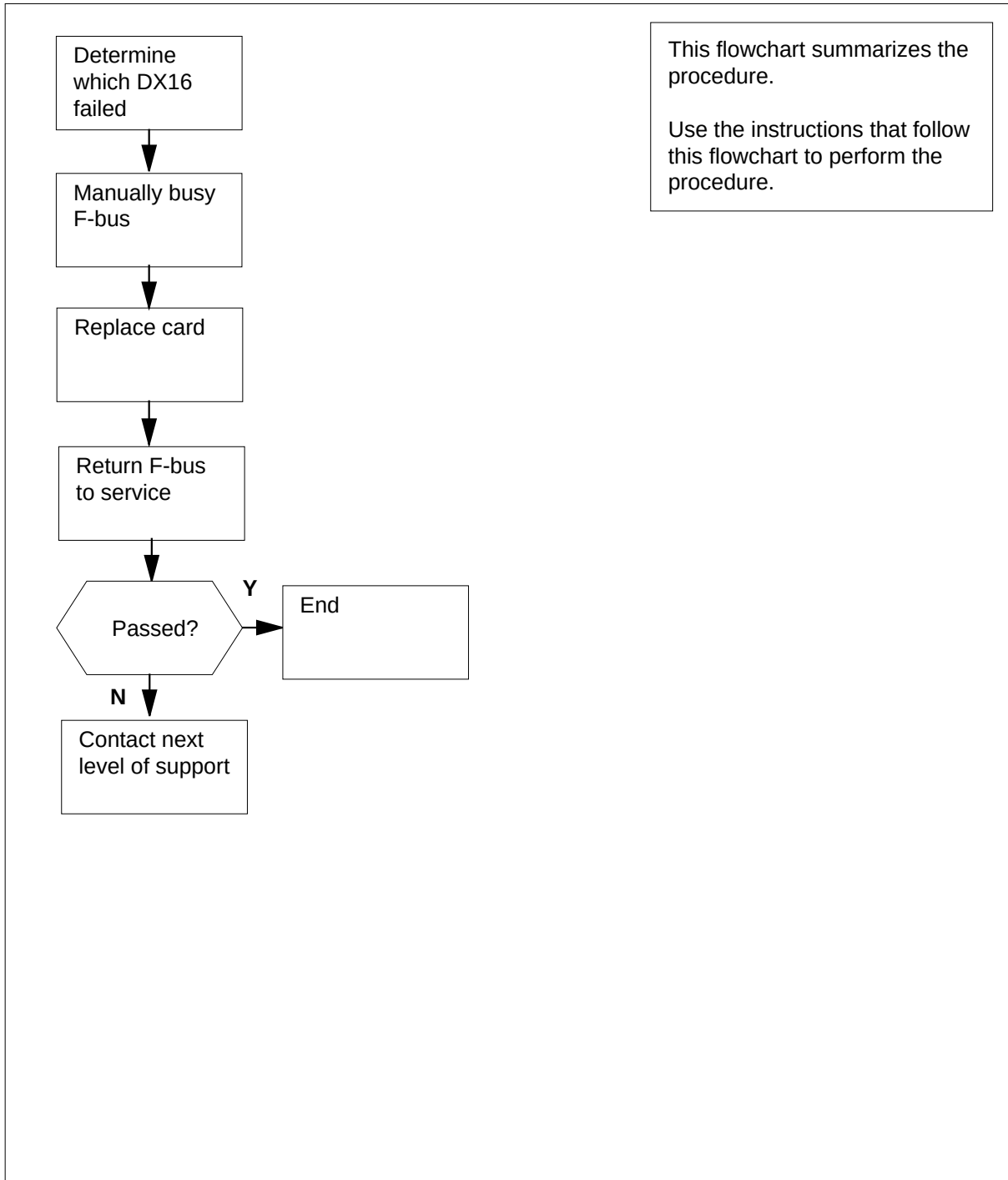
- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*

### Action

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

## NTDX16 in an LPP LIS (continued)

### Summary of NTDX16 in an LPP LIS



## NTDX16 in an LPP LIS (continued)

---

### NTDX16 in an LPP LIS

#### *At your current location*

- 1 Obtain a replacement card. Make sure that the replacement card and the card you remove have the same product engineering code (PEC) and PEC suffix.
- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. Make sure the replacement card is compatible with the software load. Complete the procedure and return to this point.
- 3 Determine the location and the number of the link interface module (LIM) that contains the NTDX16 card. Refer to office records or operating company personnel.

#### *At the MAP terminal*

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

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 11   | 0    | 11   | 4    | 16   | 38   |

- 5 To post the LIM, type  
**>POST LIM lim\_no**  
and press the Enter key.  
*where*  
**lim\_no**  
is the number of the LIM you will post (0 to 16)

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 1    | 0    | 2    | 0    | 3    | 6    |
| LIM | 0    | 0    | 0    | 0    | 1    | 0    |

LIM 0 InSv

Links\_00S Taps\_00S

Unit0: InSv

Unit1: InSv

- 6 To access the F-bus level of the MAP display, type  
**>FBUS**

## NTDX16 in an LPP LIS (continued)

and press the Enter key.

*Example of a MAP display:*

```

 Tap: 0 4 8 12 16 20 24 28 32
FBus0: InSv ...- --- --- --- --- --- --- --- ---
FBus1: InSv ...- --- --- --- --- --- --- --- ---

```

- 7 To manually busy the F-bus that associates with the power converter you replace, type

**>BSY FBUS fbus\_no**

and press the Enter key.

*where*

**fbus\_no**

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

**At the LPP**

8



### WARNING

#### Static electricity damage

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

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

**At the MAP**

- 9 To return the F-bus to service, type

**>RTS FBUS fbus\_no**

and press the Enter key.

*where*

**fbus\_no**

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

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 10 |
| failed             | step 12 |



## NTDX16

### in an LPP LIS (end)

---

- 10** The next action depends on the reason you perform this procedure.

---

| <b>If a maintenance procedure</b>    | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 11   |
| did not direct you to this procedure | step 13   |

---

- 11** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.
- 12** For additional help, contact the next level of support.
- 13** The procedure is complete.

## NTEX28 in an NIU in an LPP LIS

---

### Application

Use this procedure to replace an NTEX28 in a network interface unit (NIU) in a link peripheral processor (LPP) link interface shelf (LIS). The following table identifies this card.

| PEC    | Suffixes | Card name                               | Shelf/frame name  |
|--------|----------|-----------------------------------------|-------------------|
| NTEX28 | AA       | NIU DS30 link interface<br>paddle board | NIU in an LPP LIS |

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

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

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

### Common procedures

This procedure refers to the following common procedures.

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*
- *Loading a PM*

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

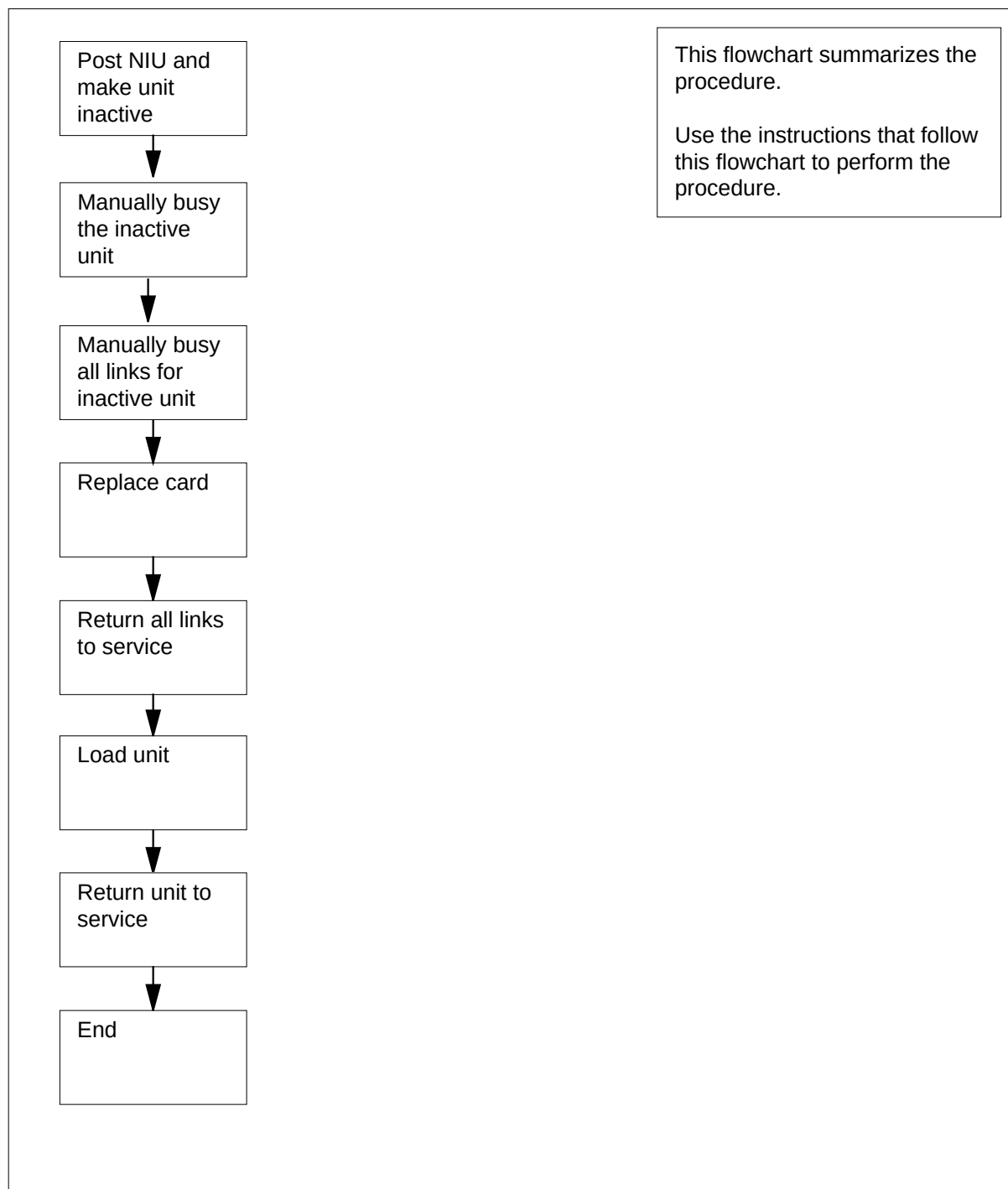
### Action

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

## NTEX28 in an NIU in an LPP LIS (continued)

---

### Summary of Replacing NTEX28 in an NIU in an LPP LIS



## NTEX28 in an NIU in an LPP LIS (continued)

---

### NTEX28 in an NIU in an LPP LIS

#### *At your current location*

1



#### **WARNING**

##### **Service degradation**

If you remove an NIU unit from service, you will eliminate NIU redundancy for the associated LIS. If the in-service NIU unit goes out of service during this maintenance procedure, it affects channelized access for all ASUs on the LIS. Perform this procedure when you need to return the NIU to service. Unless it is urgent, perform this procedure during periods of low traffic only.



#### **WARNING**

##### **Loss of packet handler service**

When you remove the NTEX28 paddle board, a loss of service on associated X.25/X.75 link interface units (XLIU) can occur. The loss of service can last up to 15 min longer than the time period the NTEX28 is out of service. Perform this procedure when you need to return the NIU to service. Unless it is urgent, perform the procedure during periods of low traffic only.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

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

#### *At the MAP terminal*

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

**>MAPCI ; MTC ; PM**

and press the Enter key

*Example of a MAP display:*

## NTEX28

### in an NIU in an LPP LIS (continued)

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 1    | 0    | 2    | 48   |
| NIU | 0    | 0    | 0    | 0    | 0    | 1    |

- 4 To post the NIU that contains the NTEX28 card you replace, type

**>POST NIU niu\_no**

and press the Enter key

where

**niu\_no**

is the number of the NIU (0 to 29)

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 1    | 0    | 2    | 48   |
| NIU | 0    | 0    | 0    | 0    | 0    | 1    |

NIU 1: InSv  
Unit 0: InAct InSv  
Unit 1: Act InSv

- 5 Determine the state of the NIU unit that contains the NTEX28 card you want to replace.

| If the state of the NIU unit                                          | Do      |
|-----------------------------------------------------------------------|---------|
| is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA), and active   | step 6  |
| is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA), and inactive | step 9  |
| is ManB                                                               | step 12 |
| is OffL                                                               | step 21 |

- 6 Determine the state of the mate NIU unit.

| If the state of the mate NIU unit | Do     |
|-----------------------------------|--------|
| is ISTb or InSv                   | step 8 |
| is other than listed here         | step 7 |

- 7 The mate unit is not in service. Switching activity will cause a loss of service. Contact the next level of support. Continue as directed by the next level of support.

## NTEX28

### in an NIU in an LPP LIS (continued)

- 8 To switch activity, type

**>SWACT**

and press the Enter key.

*Example of a MAP response:*

```
NIU 1 SwAct PM: Request has been submitted.
NIU 1 SwAct PM:Command completed.
The node has switched activity
```

| If the SWACT command | Do      |
|----------------------|---------|
| passed               | step 9  |
| failed               | step 22 |

- 9 To manually busy the inactive NIU unit, type

**>BSY INACTIVE**

and press the Enter key.

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 1    | 0    | 4    | 46   |
| NIU | 0    | 0    | 0    | 0    | 1    | 0    |

```
NIU 1: ISTb
Unit 0: InAct ManB
Unit 1: Act InSv
```

```
BSY INACTIVE
NIU 1 Busy Inactive Unit: Request has been submitted.
NIU 1 Busy Inactive Unit: Command completed.
The Unit is manually busy.
```

*Example 2 of MAP display:*

```
Imaging is currently in progress on NIU x Unit Y.
Busying the NIU will cause imaging on this NIU to be aborted.
Do you wish to continue?
Please conform ("YES", "Y", "NO" or "N").
```

| If the response is    | Do      |
|-----------------------|---------|
| as shown in example 2 | step 10 |
| anything else         | step 12 |

**NTEX28****in an NIU in an LPP LIS** (continued)

- 10** Imaging is being performed on the NIU unit you are working on. Contact the next level of support to determine if it is safe to proceed. Continue as directed.

| If the response is     | Do      |
|------------------------|---------|
| yes, proceed with busy | step 11 |
| no, abort busy         | step 23 |

- 11** To confirm Busy, type  
**>YES**  
 and press the Enter key.  
*Example of a MAP response:*

Imaging will be aborted on NIU x, Unit y.

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

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 1    | 0    | 5    | 45   |
| NIU | 0    | 0    | 0    | 0    | 1    | 0    |

NIU 1: ISTb  
 Unit 0: InAct ManB  
 Unit 1: Act InSv

|      |           |   |   |   |                |
|------|-----------|---|---|---|----------------|
|      | Net Links |   |   |   |                |
|      | 0         | 1 | 2 | 3 | CBUS ports 00S |
| PB 0 | .         | . | . | . | 2              |
| PB 1 | .         | . | . | . | .              |

- 13** To manually busy all the links for the NIU, type  
**>BSYLNKS INACTIVE**  
 and press the Enter key.  
*Example of a MAP display:*

|      |           |   |   |   |                |
|------|-----------|---|---|---|----------------|
|      | Net Links |   |   |   |                |
|      | 0         | 1 | 2 | 3 | CBUS ports 00S |
| PB 0 | P         | P | P | P | 2              |
| PB 1 | .         | . | . | . | .              |

BSYLNKS INACTIVE  
 Command completed.

## NTEX28

### in an NIU in an LPP LIS (continued)

**Note:** NIU unit 0 associates with paddleboard 0. NIU unit 1 associates with paddleboard 1.

| If the BSYLNKS command | Do      |
|------------------------|---------|
| passed                 | step 14 |
| failed                 | step 22 |

#### At the shelf

14



#### WARNING

##### Static electricity damage

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



#### WARNING

##### Possible loss of service

You must not cross-connect the cables when you connect the cables to the new NTEX28 paddleboard. If you cross-connect the cables, you can cause a loss of service when you return the NIU to service.

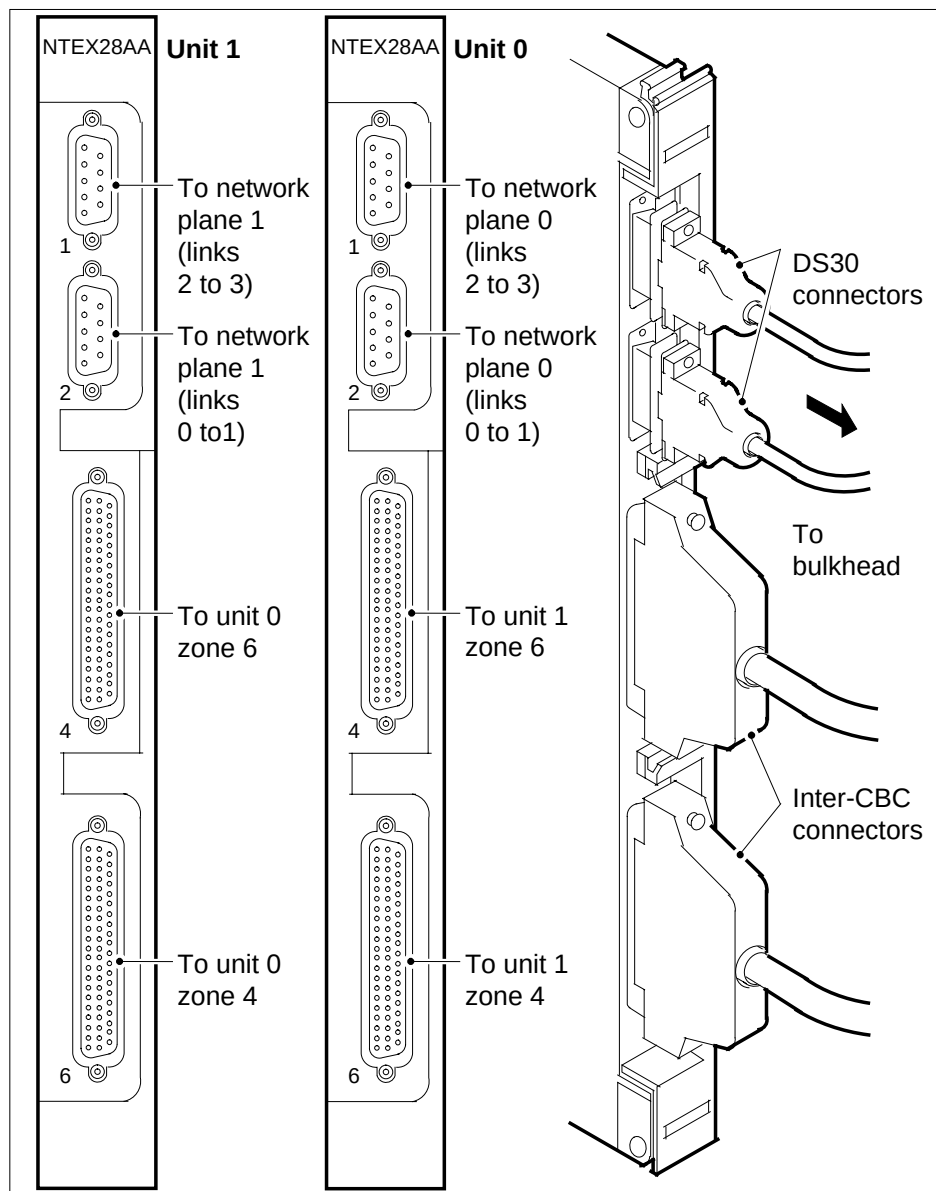
To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

**Note 1:** Determine if the card you replace has switches. Make sure that the switches on the replacement card have the same settings.

**Note 2:** When you remove the old NTEX28 card and insert the replacement card, use the following diagram. The diagram enables you to identify and label connectors.



## NTEX28 in an NIU in an LPP LIS (continued)



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

- 15** To return the links to service, type  
**>RTSLNKS INACTIVE**  
 and press the Enter key

*Example of a MAP display:*

## NTEX28

### in an NIU in an LPP LIS (continued)

```

 Net Links
 0 1 2 3
PB 0
PB 1
RTSLNKS INACTIVE
Command completed.

```

```

CBUS ports 00S
2
.

```

|           | <b>If the RTSLNKS command</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Do</b> |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | step 16   |
|           | failed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | step 22   |
| <b>16</b> | The next action depends on the reason you perform this procedure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |
|           | <b>If a maintenance procedure</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Do</b> |
|           | directed you here                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | step 17   |
|           | did not direct you here                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | step 18   |
| <b>17</b> | Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |
| <b>18</b> | To load the NIU, type<br><b>&gt;LOADPM INACTIVE</b><br>and press the Enter key<br><i>Examples of MAP responses:</i><br><i>Example 1</i><br><br>NIU 1 Load Inactive Unit: Request has been submitted.<br>NIU 1 Load Unit 0: Command completed.<br><br>The Unit contains the "NRS0 123BA" load.<br><br><i>Example 2</i><br><br>Warning: Loadfile NRS09BA is meant for an EX22BB.<br>Warning: NIU 2 Unit 1 has been datafilled with an EX22CA.<br>Warning: Load/Processor mismatch.<br>Warning: Valid only for EX22 upgrades.<br>NIU 2 load Inactive Unit: Request has been submitted.<br>NIU 2 Load Unit 1: Command completed.<br>The Unit contains the "NRS09BA" load. |           |
|           | <b>If the LOADPM command</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Do</b> |
|           | passed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | step 20   |

**NTEX28****in an NIU in an LPP LIS (end)**

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|           | <b>If the LOADPM command</b>                                                                                                                                                                                                                                      | <b>Do</b> |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | failed                                                                                                                                                                                                                                                            | step 19   |
| <b>19</b> | To load the PM, perform the procedure <i>Loading a PM</i> in this document. Complete the procedure and return to this point.                                                                                                                                      |           |
| <b>20</b> | To return the NIU to service, type<br><b>&gt;RTS INACTIVE</b><br>and press the Enter key<br><i>Example of a MAP response:</i><br><br>NIU 1 RTS Inactive Unit: Request has been submitted.<br>NIU 1RTS Inactive Unit: Command completed.<br>The Unit is in service |           |
|           | <b>If the RTS command</b>                                                                                                                                                                                                                                         | <b>Do</b> |
|           | passed                                                                                                                                                                                                                                                            | step 24   |
|           | failed                                                                                                                                                                                                                                                            | step 22   |
| <b>21</b> | Contact the operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.                                                                                                                           |           |
| <b>22</b> | For additional help, contact the next level of support.                                                                                                                                                                                                           |           |
| <b>23</b> | To abort Busy, type<br><b>&gt;NO</b><br>and press the Enter key. Busy request has been aborted, node imaging is continuing.<br><i>Example of a MAP response:</i><br><br>Aborted.                                                                                  |           |
| <b>24</b> | The procedure is complete.                                                                                                                                                                                                                                        |           |

## System and power cards in an LPP LIM unit

### Application

Use this procedure to replace the following cards in a link interface module (LIM) unit of a link peripheral processor (LPP).

| PEC    | Suffix         | Card name                                             | Shelf or frame name |
|--------|----------------|-------------------------------------------------------|---------------------|
| NT9X14 | BB             | 6-Mbyte memory card                                   | LIM unit of an LPP  |
| NT9X15 | AA             | Mapper card                                           | LIM unit of an LPP  |
| NT9X17 | AA, AB, AC, AD | Message switch four-port card                         | LIM unit of an LPP  |
| NT9X23 | BA             | Four-port DS30 paddle board                           | LIM unit of an LPP  |
| NT9X26 | AA, BA, CA     | Remote terminal interface paddle board                | LIM unit of an LPP  |
| NT9X30 | AA             | +5 V 86-A power converter card                        | LIM unit of an LPP  |
| NT9X30 | AB             | Global +5 V 86-A power converter card                 | LIM unit of an LPP  |
| NT9X31 | BA             | -5 V power converter card                             | LIM unit of an FLPP |
| NT9X49 | CA             | Message switch P-bus terminator card                  | LIM unit of an LPP  |
| NT9X52 | AA             | Message switch T-bus access card                      | LIM unit of an LPP  |
| NT9X53 | AA             | Message switch system clock card                      | LIM unit of an LPP  |
|        | AD             | Message switch system clock card (not for STP office) | LIM unit of an LPP  |
| NT9X62 | BB             | Four-port sub-rate DS512 paddle board                 | LIM unit of an FLPP |
| NT9X73 | AA, BA         | LMS F-bus rate adapter card                           | LIM unit of an LPP  |
| NT9X79 | BA             | F-bus termination paddle board                        | LIM unit of an LPP  |

## System and power cards in an LPP LIM unit (continued)

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

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

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

**Note 1:** Some documentation refers to a link interface module (LIM) unit as a local message switch (LMS). LIM unit 0 corresponds to LMS 0. LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit designates an LMS.

**Note 2:** This document refers to the whole LPP as a link interface module (LIM). This parallels how the link interface shelf (LIS) in the LPP associates with the LIM. The MAP displays and data schema tables also refer to the LPP as a LIM.

## Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Manually busying LIM-to-MS DS30 links*
- *Removing cards in equipment shelves*
- *Replacing a card*
- *Replacing cards in equipment shelves*
- *Returning LIM-to-MS DS30 links to service*
- *Loading a PM*

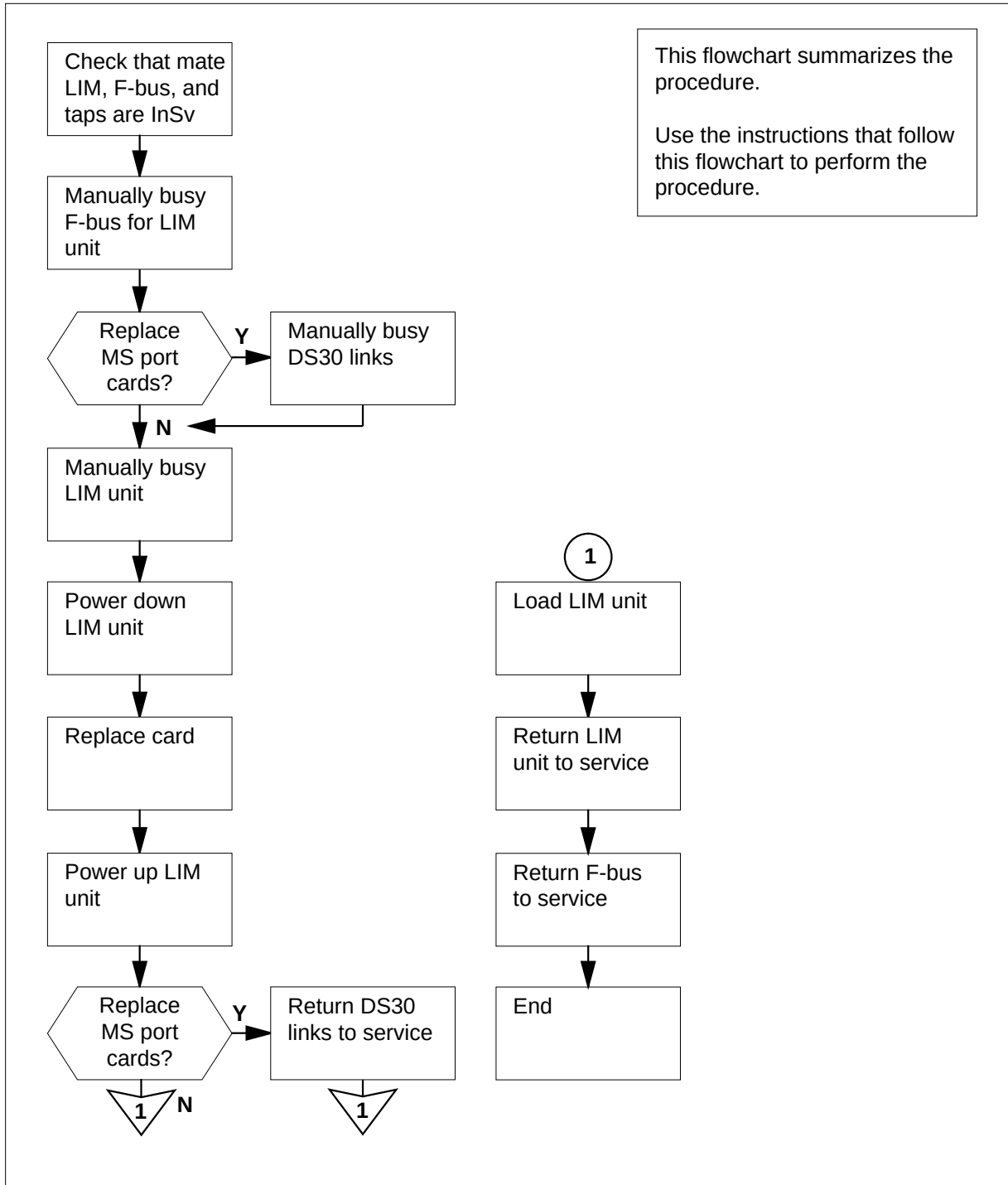
Do not go to the common procedure unless the step-action procedure directs you to go.

## Action

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

## System and power cards in an LPP LIM unit (continued)

### Summary of Replacing System and power cards in an LPP LIM unit



## System and power cards in an LPP LIM unit (continued)

### Replacing System and power cards in an LPP LIM unit

#### At your current location

1



#### WARNING

##### Loss of service

This procedure provides instructions to remove an LIM unit from service. When you remove a LIM from service, you remove redundancy from the LPP. Perform this procedure when you need to return the LIM unit to service. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

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

#### At the MAP terminal

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

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 0    | 0    | 28   | 0    | 0    | 18   |

- 4 To post the LIM unit that contains the card you will replace, type

**>POST LIM lim\_no**

and press the Enter key.

*where*

**lim\_no**

is the number of the LIM you will post (0 to 16)

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 28   | 0    | 0    | 18   |
| LIM | 0    | 0    | 1    | 0    | 0    | 1    |

LIM 0 InSv Links\_00S Taps\_00S

Unit0: InSv : :

Unit1: InSv : :

## System and power cards in an LPP LIM unit (continued)

- 5 Determine the state of the LIM.

**Note:** The state of the LIM appears on the right side of the LIM number on the MAP display.

| If the state of the LIM                         | Do      |
|-------------------------------------------------|---------|
| is Offl                                         | step 35 |
| is any other in-service or out-of-service state | step 6  |

- 6 Determine the state of the mate LIM unit. Refer to table "System cards and associated LIM hardware" to identify the LIM unit that associates with the card you replace.

**Note:** The state of the LIM units appears on the right side of the LIM unit number on the MAP display.

| If the state of the mate LIM unit                                                                                    | Do      |
|----------------------------------------------------------------------------------------------------------------------|---------|
| is InSv                                                                                                              | step 7  |
| is ISTb, and the state of the LIM unit that associates with the card you replace is InSv or ISTb                     | step 33 |
| is ISTb, and the LIM unit that associates with the card you replace is out of service                                | step 33 |
| is any out-of-service state, and the state of the LIM unit that associates with the card you replace is InSv or ISTb | step 33 |
| is any out-of-service state, and the LIM unit that associates with the card you replace is out of service            | step 7  |

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

**>FBUS**

and press the Enter key.

*Example of a MAP display:*



System and power cards  
in an LPP LIM unit (continued)

|             |                    |      |      |      |      |      |      |      |      |
|-------------|--------------------|------|------|------|------|------|------|------|------|
|             | SysB               | ManB | OffL | CBsy | ISTb | InSv |      |      |      |
| PM          | 0                  | 0    | 28   | 0    | 0    | 18   |      |      |      |
| LIM         | 0                  | 0    | 1    | 0    | 0    | 1    |      |      |      |
| LIM 0 InSv  | Links_00S Taps_00S |      |      |      |      |      |      |      |      |
| Unit0: InSv | :                  |      |      |      |      |      |      |      |      |
| Unit1: InSv | :                  |      |      |      |      |      |      |      |      |
|             | Tap: 0             | 4    | 8    | 12   | 16   | 20   | 24   | 28   | 32   |
| FBus0: InSv | .-.-               | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| FBus1: InSv | .-.-               | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |

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**WARNING**  
**Potential loss of service**  
Make sure the mate LIM unit, the mate F-bus, and the F-bus taps on the mate are in service. Complete this action before you manually busy the LIM unit and F-bus that associates with the card you replace. Do not manually busy the F-bus and the LIM unit while the mates are out of service. This can isolate nodes on the link interface shelves (LIS).

Determine the states of the F-bus and the F-bus taps for the mate LIM unit.

**Note:** The state of the F-buses appears on the right side of the F-bus numbers on the MAP display. Refer to table “System cards and associated LIM hardware” to identify the LIM and F-bus components that associate with the card you replace.

| If the state                                                                                        | Do      |
|-----------------------------------------------------------------------------------------------------|---------|
| is in-service (state of the F-bus is InSv and all F-bus taps are dot( . )                           | step 9  |
| is any other state (state of the F-bus is not InSv and a minimum of one F-bus taps is not dot ( . ) | step 34 |

- 9 To manually busy the F-bus that corresponds to the LIM unit associated with the card you want to replace, type
- >BSY FBUS fbus\_no
- and press the Enter key.
- where

## System and power cards in an LPP LIM unit (continued)

**fbus\_no**

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

**Note:** To identify the components of this F-bus, refer to table "System cards and associated LIM hardware" .

*Example of a MAP response:*

LIM 0 FBus 0 Busy requires confirmation because the following NIUs may be active on this bus...

NIU 0 unit 0

NIU 0 unit 1

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

| If                           | Do      |
|------------------------------|---------|
| the command passes           | step 11 |
| you must confirm the command | step 10 |

- 10** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

LIM 0 FBus 0 Busy initiated.

LIM 0 FBus 0 Busy passed.

- 11** To quit the F-bus level of the MAP display, type

**>QUIT**

and press the Enter key.

- 12** The next step depends on the card you replace.

| If the card you replace                   | Do      |
|-------------------------------------------|---------|
| is an NT9X17 or an NT9X23 (MS port cards) | step 13 |
| is other than listed here                 | step 14 |

- 13** To manually busy the DS30 links, perform the procedure *Manually busying LIM-to-MS DS30 links* in this document. Complete the procedure and return to this point.

- 14** To manually busy the LIM unit that corresponds to the F-bus, that associates with the card you replace, type

**>BSY UNIT unit\_no**

and press the Enter key.

*where*

## System and power cards in an LPP LIM unit (continued)

### unit\_no

is the number of the LIM unit (0 or 1)

*Example of a MAP display:*

|     | SysB | ManB | OffL | CBSy | ISTb | InSv |
|-----|------|------|------|------|------|------|
| PM  | 0    | 0    | 28   | 0    | 17   | 13   |
| LIM | 0    | 0    | 1    | 0    | 1    | 0    |

LIM 0 ISTb                      Links\_00S Taps\_00S

Unit0: ManB                      4                      10

Unit1: ISTb                      4                      .

bsy unit 0

LIM 0 UNIT 0 Busy initiated.

LIM 0 UNIT 0 Busy passed.

|           | If the response is                                                                                                                                                                  | Do      |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|           | Imaging is currently in progress on LIM x UNIT y. Busy Action aborted. Use the force option if you wish to override the imaging of this unit.                                       | step 15 |
|           | Imaging is currently in progress on LIM x UNIT y and UNIT z. Busy Action aborted. Use the force option if you wish to override the imaging of this unit.                            | step 16 |
|           | anything else                                                                                                                                                                       | step 17 |
| <b>15</b> | Imaging is being performed on the LIM unit you are working on. Contact the next level of support to determine if it is safe to proceed. Continue as directed.                       |         |
| <b>16</b> | Imaging is being performed on the LIM unit you are working on and the mate LIM unit. Contact the next level of support to determine if it is safe to proceed. Continue as directed. |         |

## System and power cards in an LPP LIM unit (continued)

### At the shelf

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

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

Press down and release the power switch on the faceplate of the NT9X30 power converter that associates with the card you replace. To identify the power converter that associates with the LIM unit, refer to table "System cards and associated LIM hardware".

**Note:** The CONVERTER OFF LED is lit when you power down the NT9X30 power converter.

| If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is lit                   | step 20 |
| is not lit               | step 18 |

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**WARNING****Possible loss of service**

Make sure that the card you remove is in the manual-busy LIM unit. If you unseat the NT9X13 card, you will bypass the safety interlock.

Perform the procedure *Unseating cards in equipment shelves* in this document. Unseat the NT9X13 that associates with the LIM unit on which you work. Complete the procedure and return to this point.

**Note:** To identify the NT9X13 that associates with the LIM unit, refer to table "System cards and associated LIM hardware".

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Press down and release the power switch on the faceplate of the NT9X30 power converter that associates with the card you replace. To identify the power converter that associates with the LIM unit, refer to table "System cards and associated LIM hardware".

## System and power cards in an LPP LIM unit (continued)

- 20 To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- Note 1:** Make sure the handle of the power switch on the replacement power converter is in the OFF position.
- Note 2:** If the card you will replace has switches, make sure the switches on the replacement card have the same settings.
- 21 The next step depends on the condition of the NT9X13 card that associates with the card you replaced.
- | If the NT9X13 | Do      |
|---------------|---------|
| is seated     | step 23 |
| is removed    | step 22 |
- 22 Perform the procedure *Reseating cards in equipment shelves* in this document. Reseat the NT9X13 that associates with the card you replace. Complete this procedure and return to this point.
- 23 Release the power switch on the faceplate of the NT9X30 power converter that associates with the card you replaced.
- Note:** The CONVERTER OFF LED is not lit when you power up the NT9X30 power converter.
- 24 The next action depends on the reason you perform this procedure
- | If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed to this procedure           | step 25 |
| did not direct you to this procedure | step 26 |
- 25 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

### At the MAP terminal

- 26 The next step depends on the card you replace.
- | If you                                         | Do      |
|------------------------------------------------|---------|
| replace an NT9X17 or an NT9X23 (MS port cards) | step 27 |
| replace any card other than listed here        | step 28 |
- 27 Perform the procedure *Returning LIM-to-MS DS30 links to service* in this document. Return the DS30 links to service. Complete the procedure and return to this point.

## System and power cards in an LPP LIM unit (continued)

- 28** To load the LIM unit, type  
**>LOADPM UNIT unit\_no**  
 and press the Enter key.  
*where*  
**unit\_no**  
 is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
LIM 0 UNIT 0 Load initiated.
LIM 0 UNIT 0 Load passed.
```

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 30 |
| failed                | step 29 |

- 29** Perform the procedure *How to load a PM* in this document to load the PM. Complete the procedure and return to this point.

- 30** To return the LIM unit to service, type  
**>RTS UNIT unit\_no**  
 and press the Enter key.  
*where*  
**unit\_no**  
 is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

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

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 31 |
| failed             | step 36 |

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

**>FBUS**

and press the Enter key.

- 32** To return the F-bus to service, type

**>RTS FBUS fbus\_no**

and press the Enter key.

*where*

## System and power cards in an LPP LIM unit (continued)

---

**fbus\_no**

is the number of the F-bus that you busied (0 or 1)

*Example of a MAP response:*

```
LIM 0 FBus 0 Return to Service initiated.
LIM 0 FBus 0 Return to Service passed.
```

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 37 |
| failed             | step 36 |

---

- 33** If you continue this procedure, you will remove the whole LIM from service. You will isolate application specific units (ASU) on the link interface shelves (LIS). Contact operating company personnel or the next level of support to determine if you must continue this procedure. Continue as directed by operating company personnel or the next level of support.
- 34** If you continue this procedure, you will isolate a minimum of one application specific unit (ASU) on the link interface shelves (LIS). Contact operating company personnel or the next level of support to determine if you must continue this procedure. Continue as directed by operating company personnel or the next level of support.
- 35** Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.
- 36** For additional help, contact the next level of support.

## System and power cards in an LPP LIM unit (end)

37 The procedure is complete.

### System cards and associated LIM hardware

| PEC                                                                                                                                                                                                                                                            | Slot | Associated LIM hardware and F-buses |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------|----------|
| NT9X14                                                                                                                                                                                                                                                         | 16F  | LIM unit number:                    | 0        |
|                                                                                                                                                                                                                                                                |      | Mate LIM unit number:               | 1        |
| NT9X15                                                                                                                                                                                                                                                         | 15F  |                                     |          |
|                                                                                                                                                                                                                                                                |      | F-bus number:                       | 0        |
| NT9X26                                                                                                                                                                                                                                                         | 17R  | Mate F-bus number:                  | 1        |
| NT9X30                                                                                                                                                                                                                                                         | 04F  | Location of NT9X13:                 | slot 17F |
| NT9X49                                                                                                                                                                                                                                                         | 07F  | Location of NT9X30 power converter: | slot 04F |
| NT9X52                                                                                                                                                                                                                                                         | 19F  |                                     |          |
| NT9X53                                                                                                                                                                                                                                                         | 18F  |                                     |          |
| NT9X73                                                                                                                                                                                                                                                         | 08F  |                                     |          |
| NT9X79                                                                                                                                                                                                                                                         | 08R  |                                     |          |
| NT9X14                                                                                                                                                                                                                                                         | 23F  | LIM unit number:                    | 0        |
|                                                                                                                                                                                                                                                                |      | Mate LIM unit number:               | 1        |
| NT9X15                                                                                                                                                                                                                                                         | 24F  |                                     |          |
|                                                                                                                                                                                                                                                                |      | F-bus number:                       | 0        |
| NT9X26                                                                                                                                                                                                                                                         | 22R  | Mate F-bus number:                  | 1        |
| NT9X30                                                                                                                                                                                                                                                         | 36F  | Location of NT9X13:                 | slot 22F |
| NT9X49                                                                                                                                                                                                                                                         | 32F  | Location of NT9X30 power converter: | slot 36F |
| NT9X52                                                                                                                                                                                                                                                         | 20F  |                                     |          |
| NT9X53                                                                                                                                                                                                                                                         | 21F  |                                     |          |
| NT9X73                                                                                                                                                                                                                                                         | 31F  |                                     |          |
| NT9X79                                                                                                                                                                                                                                                         | 31R  |                                     |          |
| <b>Note:</b> Some documentation refers to a LIM unit as an LMS. LIM unit 0 corresponds to LMS 0. LIM unit 1 corresponds to LMS 1. In MAP commands, responses, and displays, the term LIM unit designates an LMS. The term LIM refers to the whole LPP cabinet. |      |                                     |          |



## VPU cards in an LPP LIS

---

### Application

Use this procedure to replace the following cards in a voice processor unit (VPU) in a link peripheral processor (LPP) link interface shelf (LIS).

| PEC    | Suffix | Card name                                        | Shelf or frame name |
|--------|--------|--------------------------------------------------|---------------------|
| NTEX22 | BB     | Integrated processor and F-bus interface card    | VPU in an LPP LIS   |
| NTMX97 | AA     | Recording - announcement processor card          | VPU in an LPP LIS   |
| NTMX99 | AA     | Channel bus interface - 512-channel paddle board | VPU in an LPP LIS   |

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

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

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

### Common procedures

This procedure refers to the following common procedures.

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*
- *Loading a PM*

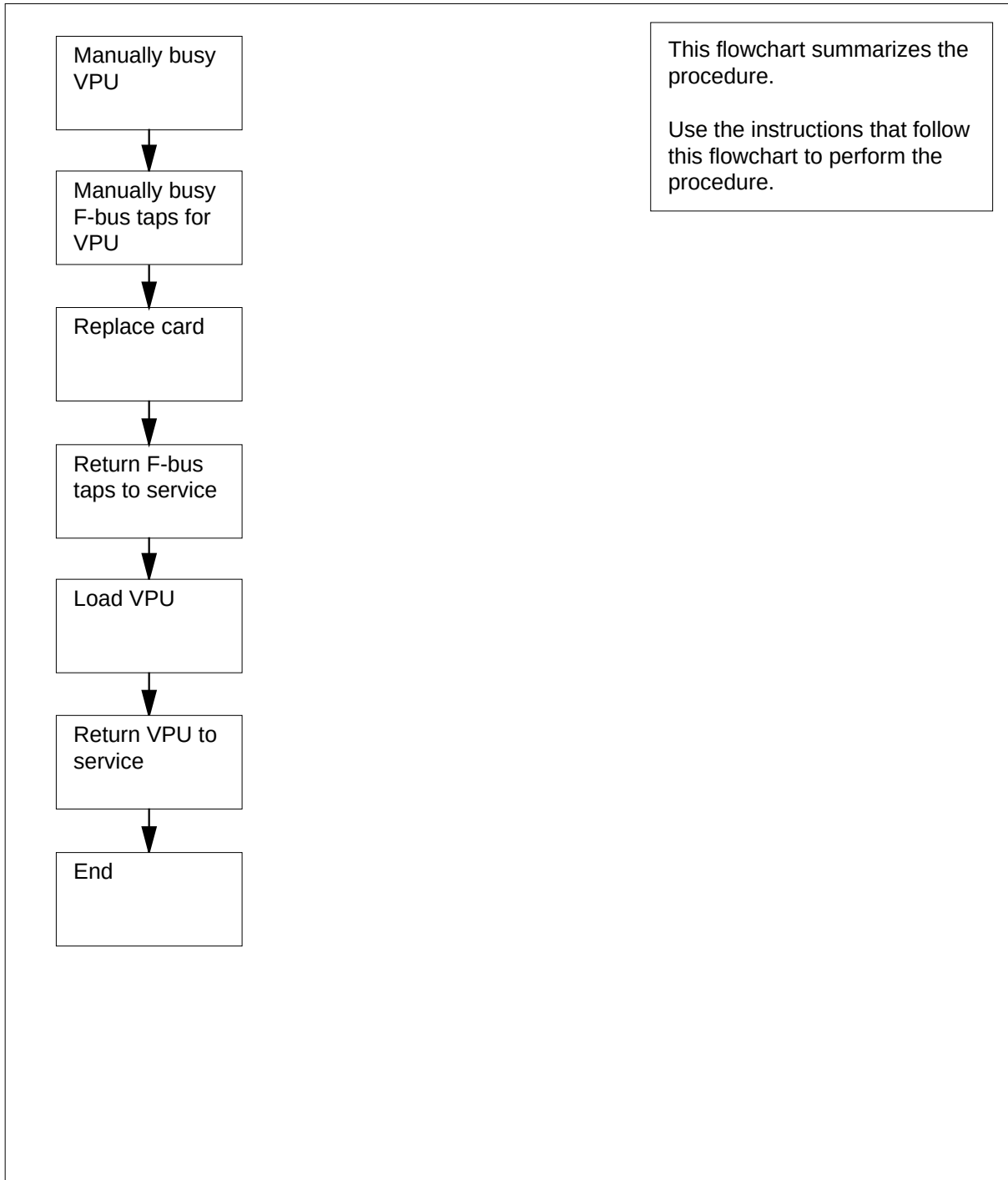
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## VPU cards in an LPP LIS (continued)

### Summary of VPU cards in an LPP LIS



## VPU cards in an LPP LIS (continued)

---

### VPU cards in an LPP LIS

#### *At your current location*

1



#### **WARNING**

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

This procedure provides instructions to remove a VPU from service and reduce service capacity. Perform this procedure if you must return the VPU to service. Perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

2

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

**Note:** Do not use this common procedure for VPU cards with PECs NTMX97 and NTMX99.

#### *At the MAP terminal*

3

To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |           |           |           |           |            |            |
|----|-----------|-----------|-----------|-----------|------------|------------|
| PM | SysB<br>2 | ManB<br>0 | OffL<br>7 | CBsy<br>0 | ISTb<br>14 | InSv<br>63 |
|----|-----------|-----------|-----------|-----------|------------|------------|

4

To post the VPU that contains the card you replace, type

**>POST VPU vpu\_no**

and press the Enter key.

*where*

**vpu\_no**

is the number of the VPU (0 to 179)

*Example of a MAP display:*

## VPU cards in an LPP LIS (continued)

|     |        |      |      |      |      |      |
|-----|--------|------|------|------|------|------|
|     | SysB   | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 2      | 0    | 7    | 0    | 14   | 63   |
| VPU | 0      | 0    | 1    | 0    | 0    | 5    |
| VPU | 1 InSv |      | Rsvd |      |      |      |

- 5 Determine the state of the VPU.

| If the state of the VPU           | Do      |
|-----------------------------------|---------|
| is SysB, SysB (NA), ISTb, or InSv | step 6  |
| is ManB or ManB (NA)              | step 8  |
| is Offl                           | step 26 |

- 6 To manually busy the VPU, type

**>BSY**

and press the Enter key.

*MAP response:*

BSYing VPU 1 may reduce ADAS capacity.  
Please confirm ("YES", "Y", "NO", or "N"):

| If                              | Do     |
|---------------------------------|--------|
| the command passed              | step 8 |
| you need to confirm the command | step 7 |

- 7 To confirm the busy command, type

**>YES**

and press the Enter key.

*MAP response:*

## VPU cards in an LPP LIS (continued)

VPU 1 BSY Passed.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 8  |
| failed             | step 27 |

- 8 To display information about the VPU, type

**>QUERYPM**

and press the Enter key.

*Example of a MAP response:*

```

Location : LIM 0 Shelf: 1 Slot: 12 FTA: 4259 1000
PM Load : Default: VPC03BK Running: VPC03BK
Card Info : Processor: NTX22BB Other: NTMX97AA NTMX99AA
Reserved : Service: ADAS Options: AUDIO: PROALF

```

```

 LIM 0 FBus Message Audits NIU 0 CBus
 Tap Tap Channel
Unit 0 : InSv . Open ON InSv InSv
Unit 1 : InSv . Open ON InSv InSv

```

- 9 Record the number of the link interface module (LIM) and the taps that associate with the VPU.

**Note:** The LIM number follows the word LIM on the second line of the display. In the example, the LIM number is 0. The tap number follows the word TAP. In the example, the TAP number is 2.

- 10 To post the LIM, type

**>POST LIM lim\_no**

and press the Enter key.

*where*

**lim\_no**

is the number of the LIM that you recorded in step 9

*Example of a MAP display:*

VPU cards  
in an LPP LIS (continued)

|        |           |          |      |      |      |      |
|--------|-----------|----------|------|------|------|------|
|        | SysB      | ManB     | OffL | CBsy | ISTb | InSv |
| PM     | 1         | 0        | 2    | 0    | 3    | 6    |
| LIM    | 0         | 0        | 0    | 0    | 1    | 0    |
| LIM    | 0         | InSv     |      |      |      |      |
|        | Links_00S | Taps_00S |      |      |      |      |
| Unit0: | InSv      | :        | :    |      |      |      |
| Unit1: | InSv      | :        | :    |      |      |      |

- 11 To access the F-bus level of the MAP display, type  
**>FBUS**  
and press the Enter key.  
*Example of a MAP display:*

|        |        |     |     |     |     |     |     |     |     |
|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|
|        | Tap: 0 | 4   | 8   | 12  | 16  | 20  | 24  | 28  | 32  |
| FBus0: | InSv   | ... | --- | --- | ... | --- | --- | ... | --- |
| FBus1: | InSv   | ... | --- | --- | ... | --- | --- | ... | --- |

- 12 To manually busy the VPU tap on F-bus 0, type  
**>BSY FBUS 0 tap\_no**  
and press the Enter key.  
*where*  
**tap\_no**  
is the number of the VPU tap that you recorded in step 9

| If                                     | Do      |
|----------------------------------------|---------|
| you need to confirm the command        | step 13 |
| you do not need to confirm the command | step 14 |

- 13 To confirm the command, type  
**>YES**  
and press the Enter key.  
*Example of a MAP response:*

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

- 14 To manually busy the VPU tap on F-bus 1, type  
**>BSY FBUS 1 tap\_no**  
and press the Enter key.

## VPU cards in an LPP LIS (continued)

---

where

**tap\_no**

is the number of the VPU tap that you recorded in step 9

*Example of a MAP response:*

```
LIM 0 FBus 1 Tap 2 Busy requires confirmation because
a SEVERE system OUTAGE may occur if the following
node is isolated:
VPU 1
Do you wish to proceed with this operation?
Please confirm ("YES", "Y", "NO", or "N"):
```

- 15 To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

```
Confirmed ...
LIM 0 FBus 1 Tap 2 Busy initiated.
LIM 0 FBus1 Tap 2 Busy passed.
```

### *At the shelf*

16



#### **WARNING**

##### **Static electricity damage**

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

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

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

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

---

| <b>If a maintenance procedure</b> | <b>Do</b> |
|-----------------------------------|-----------|
| directed you here                 | step 18   |
| did not direct you here           | step 19   |

---

## VPU cards in an LPP LIS (continued)

- 18** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

**At the MAP terminal**

- 19** To return the VPU tap on F-bus 0 to service, type

**>RTS FBUS 0 tap\_no**

and press the Enter key.

where

**tap\_no**

is the number of the VPU tap that you recorded in step 9

*Example of a MAP response:*

```
LIM 0 FBus 0 Tap 2 Return to Service passed
- localmaintenance not accessible.
```

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 20 |
| failed             | step 27 |

- 20** To return the VPU tap on F-bus 1 to service, type

**>RTS FBUS 1 tap\_no**

and press the Enter key.

where

**tap\_no**

is the number of the VPU tap that you recorded in step 9

*Example of a MAP response:*

```
LIM 0 FBus 1 Tap 2 Return to Service initiated.
LIM 0 FBus1 Tap 2 Return to Service passed.
```

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 21 |
| failed             | step 27 |

- 21** To quit from the F-bus level of the MAP display, type

**>QUIT**

and press the Enter key.



## VPU cards in an LPP LIS (end)

---

- 22** To post the VPU, type  
**>POST VPU vpu\_no**  
and press the Enter key.  
*where*  
**vpu\_no**  
is the number of the VPU (0 to 179)

- 23** To load the VPU, type  
**>LOADPM**  
and press the Enter key.  
*Example of a MAP response:*  
  
VPU 1 LOADPM Passed .

---

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 25 |
| failed                | step 24 |

---

- 24** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 25** To return the VPU to service, type  
**>RTS**  
and press the Enter key.  
*Example of a MAP response:*  
  
VPU 1 RTS Passed .

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 28 |
| failed             | step 27 |

---

- 26** Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.
- 27** For additional help, contact the next level of support.
- 28** The procedure is complete.

---

## XLIU cards in an LPP LIS

---

### Application

Use this procedure to replace the following cards in an X.25/X.75 link interface unit (XLIU) in a link peripheral processor (LPP) link interface shelf (LIS).

| PEC    | Suffix     | Card name                                         | Shelf or frame name |
|--------|------------|---------------------------------------------------|---------------------|
| NTEX22 | BA, BB, CA | Integrated processor and F-bus interface card     | XLIU in an LPP LIS  |
| NTFX09 | AA         | Channelized bus interface paddle board            | XLIU in an LPP LIS  |
| NTFX10 | AA         | High-density line controller frame processor card | XLIU in an LPP LIS  |

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

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

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

### Common procedures

This procedure refers to the following common procedures:

- *How to verify load compatibility of SuperNode cards*
- *How to move an XSG to a spare XLIU*
- *How to replace a card*
- *How to load a PM*

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

**XLIU cards**  
**in an LPP LIS** (continued)

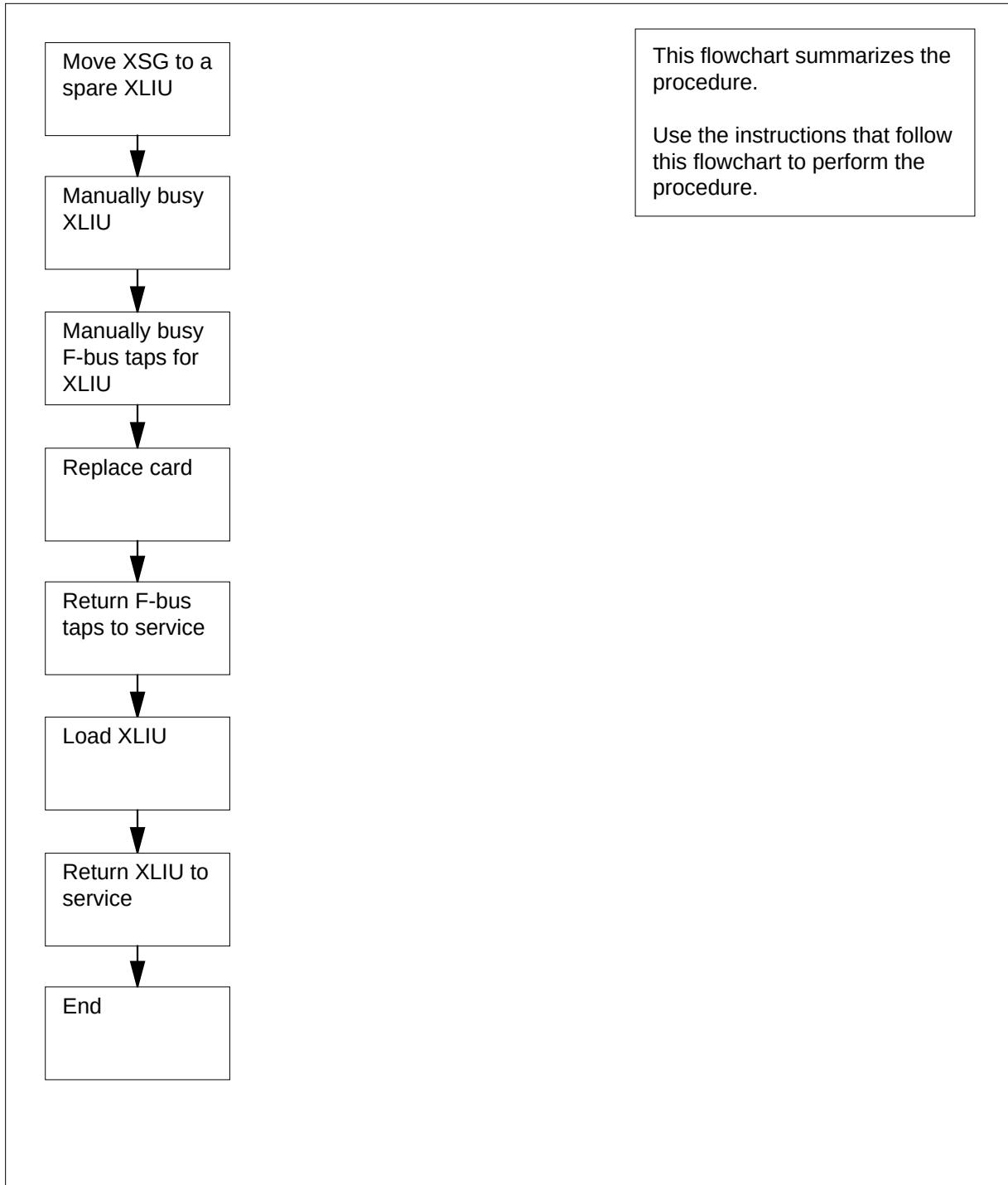
---

**Action**

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

## XLIU cards in an LPP LIS (continued)

### Summary of replacing XLIU cards in an LPP LIS



## XLIU cards in an LPP LIS (continued)

### Replacing XLIU cards in an LPP LIS

#### *At your current location*

1



#### **WARNING**

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

This procedure removes an XLIU from service and temporarily interrupts traffic on associated X.25/X.75 channels. Perform this procedure when you need to return the XLIU to service. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

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

**Note:** Do not use this common procedure for XLIU cards with PECs NTFX09 and NTFX10.

#### *At the MAP terminal*

3 To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 0    | 1    | 23   | 0    | 10   | 30   |

4 To post the XLIU that associates with the card you will replace, type

**>POST XLIU xliu\_no**

and press the Enter key.

*where*

**xliu\_no**

is the number of the XLIU (0 to 511)

*Example of a MAP display:*

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
|      | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM   | 0    | 2    | 23   | 0    | 10   | 30   |
| XLIU | 0    | 0    | 0    | 0    | 0    | 3    |
| XLIU | 27   | InSv | Rsvd |      |      |      |

## XLIU cards in an LPP LIS (continued)

- 5 Determine the state of the XLIU.
- Note:** The state of the XLIU appears on the right side of the XLIU number. The state appears in the example MAP display in step 4.
- | If the state of the XLIU                | Do      |
|-----------------------------------------|---------|
| is SysB, ISTb (NA), ManB, ISTb, or InSv | step 6  |
| is OffL                                 | step 33 |
- 6 Determine if the XLIU is a spare.
- Note:** The code Spre on the right side of the service condition identifies a spare XLIU. The code Rsvd identifies an XLIU with an assigned X.25/X.75 service group (XSG).
- | If the XLIU                                                         | Do      |
|---------------------------------------------------------------------|---------|
| is not a spare                                                      | step 7  |
| is a spare, and the service state is SysB, ISTb (NA), ISTb, or InSv | step 9  |
| is a spare, and the service state is ManB                           | step 12 |
- 7 Determine from office records or from operating company personnel the number of a spare XLIU.
- Note:** The spare XLIU must be on the same shelf as the out-of-service XLIU.
- | If a spare XLIU                                          | Do      |
|----------------------------------------------------------|---------|
| is available                                             | step 8  |
| is not available and the reserved XLIU is out of service | step 9  |
| is not available and the reserved XLIU is in service     | step 32 |
- 8 Perform the procedure *Moving an XSG to a spare XLIU* in this document. Move the XSG from the reserved XLIU to the spare XLIU. Complete the procedure and return to this point.
- Note:** The XLIU for which you change cards is now the spare. In the following steps, the XLIU is the spare.
- Go to step 12.

---

## XLIU cards in an LPP LIS (continued)

---

- 9 To manually busy the XLIU 27, type

**>BSY**

and press the Enter key.

---

| If the response is | Do |
|--------------------|----|
|--------------------|----|

---

|                    |         |
|--------------------|---------|
| XLIU 27 BSY Passed | step 12 |
|--------------------|---------|

Warning: XLIU 27 is currently being imaged. The BSY command will be aborted unless the FORCE option is used.

step 10

- 
- 10 To manually force bsy the XLIU 27, type

**>BSY FORCE**

and press the Enter key.

*Example of a MAP response:*

WARNING: XLIU 27 is currently being imaged.  
Do you wish to abort imaging to proceed with the BSY request?  
Please confirm ("YES", "Y", "NO", or "N"):

---

| If | Do |
|----|----|
|----|----|

---

|                                |         |
|--------------------------------|---------|
| proceed with BSY FORCE request | step 11 |
|--------------------------------|---------|

|                         |         |
|-------------------------|---------|
| abort BSY FORCE request | step 35 |
|-------------------------|---------|

- 
- 11 To force bsy XLIU 27, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Imaging will be aborted on XLIU 27.

- 12 To query the XLIU, type

**>QUERYPM**

and press the Enter key.

*Example of a MAP response:*

## XLIU cards in an LPP LIS (continued)

```

PM type: XLIU PM No.: 27 Status: ManB
Node Number 20 spare
LIM: 0 Shelf: 3 Slot: 14 XLIU FTA: 4265 1000
Default load: XRC02AW
Running load: XRC02AW
Potential service affecting conditions:
CBUS PORT for NIU Unit 0 is not inservice
CBUS PORT for NIU Unit 1 is not inservice
 Unit 0 Unit 1
LMS States : InSv InSv
Auditing : Yes Yes
Msg Channels : Acc Acc
TAP 27 : . .
NIU 3 : InSv InSv

```

- 13** Record the numbers of the link interface module (LIM) and the F-bus taps that associate with the XLIU.

**Note:** The LIM number appears on the right side of the word LIM on the third line of the display. The F-bus tap number appears on the right side of the word TAP on the second last line of the display. In the example in step 12, the LIM number is 0; the F-bus tap is 27.

- 14** To post the LIM that associates with the XLIU, type

**>POST LIM lim\_no**

and press the Enter key.

where

**lim\_no**

is the number of the LIM that you recorded in step 13

*Example of a MAP display:*

|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
|-----|------|------|------|------|------|------|
| PM  | 0    | 2    | 23   | 0    | 10   | 30   |
| LIM | 0    | 0    | 1    | 0    | 0    | 1    |

```

LIM 0 InSv
Links_00S Taps_00S
Unit0: InSv
Unit1: InSv

```

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

**>FBUS**

and press the Enter key.

*Example of a MAP display:*



**XLIU cards**  
**in an LPP LIS** (continued)

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 2    | 23   | 0    | 10   | 30   |
| LIM | 0    | 0    | 1    | 0    | 0    | 1    |

|        |      |      |           |          |      |      |      |      |      |      |
|--------|------|------|-----------|----------|------|------|------|------|------|------|
| LIM    | 0    | InSv | Links_00S | Taps_00S |      |      |      |      |      |      |
| Unit0: | InSv | .    | .         | .        |      |      |      |      |      |      |
| Unit1: | InSv | .    | .         | .        |      |      |      |      |      |      |
|        | Tap: | 0    | 4         | 8        | 12   | 16   | 20   | 24   | 28   | 32   |
| FBus0: | InSv | .... | ....      | ....     | .... | .... | .... | .... | .... | ...I |
| FBus1: | InSv | .... | ....      | ....     | .... | .... | .... | .... | .... | ...I |

- 16** To manually busy the XLIU tap on F-bus 0, type  
**>BSY FBUS 0 tap\_no**  
and press the Enter key.  
*where*  
**tap\_no**  
is the number of the tap that you recorded in step 21

| If                                     | Do      |
|----------------------------------------|---------|
| you need to confirm the command        | step 17 |
| you do not need to confirm the command | step 19 |

- 17** To confirm the command, type  
**>YES**  
and press the Enter key.  
*Example of a MAP response:*  
  
Confirmed ...  
LIM 0 FBus 0 Tap 27 Busy initiated.  
LIM 0 FBus 0 Tap 27 Busy passed.
- 18** Wait until all system-initiated local maintenance processes complete.  
**Note:** A maintenance flag (Mtce) on the right of the LIM unit status lines indicates the progress of local maintenance. A maintenance flag (Mt) on the F-bus status lines also indicates the progress of local maintenance.
- 19** To manually busy the XLIU tap on F-bus 1, type  
**>BSY FBUS 1 tap\_no**  
and press the Enter key.  
*where*

## XLIU cards in an LPP LIS (continued)

**tap\_no**

is the number of the tap that you recorded in step 12

*Example of a MAP response:*

```
LIM 0 FBus 1 Tap 27 Busy requires confirmation because a
SEVERE system OUTAGE may occur if the following node is
isolated:
```

```
XLIU 27
```

```
Do you wish to proceed with this operation?
```

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

- 20 To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

```
Confirmed ...
```

```
LIM 0 FBus 1 Tap 9 Busy initiated.
```

```
LIM 0 FBus 1 Tap 9 Busy passed.
```

**At the shelf****21****WARNING****Static electricity damage**

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

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

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

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

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 23 |
| did not direct you to this procedure | step 24 |

## XLIU cards in an LPP LIS (continued)

---

- 23 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

***At the MAP terminal***

- 24 To return the first tap to service for the XLIU, type  
**>RTS FBUS 0 tap\_no**  
and press the Enter key.  
*where*  
**tap\_no**  
is the number of the tap that you recorded in step 13

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 26 |
| failed             | step 25 |

---

- 25 Record the number of the tap. Give this information to the next level of support.

- 26 To return the second tap to service for the XLIU, type  
**>RTS FBUS 1 tap\_no**  
and press the Enter key.  
*where*  
**tap\_no**  
is the number of the tap that you recorded in step 13

---

| If the RTS command                                  | Do      |
|-----------------------------------------------------|---------|
| passed                                              | step 27 |
| failed, and the first tap returned to service       | step 27 |
| failed, and the first tap did not return to service | step 34 |

---

- 27 To quit from the F-bus level of the MAP display, type  
**>QUIT**  
and press the Enter key.

- 28 To post the XLIU, type  
**>POST XLIU xliu\_no**  
and press the Enter key.  
*where*

## XLIU cards in an LPP LIS (end)

**xliu\_no**

is the number of the XLIU (0 to 511)

- 29** To load the XLIU, type

**>LOADPM**

and press the Enter key.

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 31 |
| failed                | step 30 |

- 30** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 31** To return the XLIU to service, type

**>RTS**

and press the Enter key.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 36 |
| failed             | step 34 |

- 32** Make sure you move the XSG to a spare XLIU before you manually busy an XLIU with an assigned XSG. If you do not perform this action, service degrades for a long period of time. Contact operating company personnel or the next level of support on how to proceed without a spare XLIU.

- 33** Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.

- 34** For additional help, contact the next level of support.

- 35** To abort the BSY FORCE request, type

**>NO**

and press the Enter key.

*Example of a MAP response:*

BSY command aborted due to imaging in progress.

- 36** The procedure is complete.



---

## 4 SuperNode SE LIS or ENI card replacement procedures

---

### Introduction

This chapter contains card replacement procedures for the SuperNode SE link interface shelf (LIS). The first section in the chapter contains illustrations of LIS shelf layouts.

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

Each procedure contains the following sections:

- Application
- Common procedures
- Action

### Application

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

### Common procedures

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

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

### Action

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

## **Recording card replacement activities**

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

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

---

## SuperNode SE link interface shelf layouts

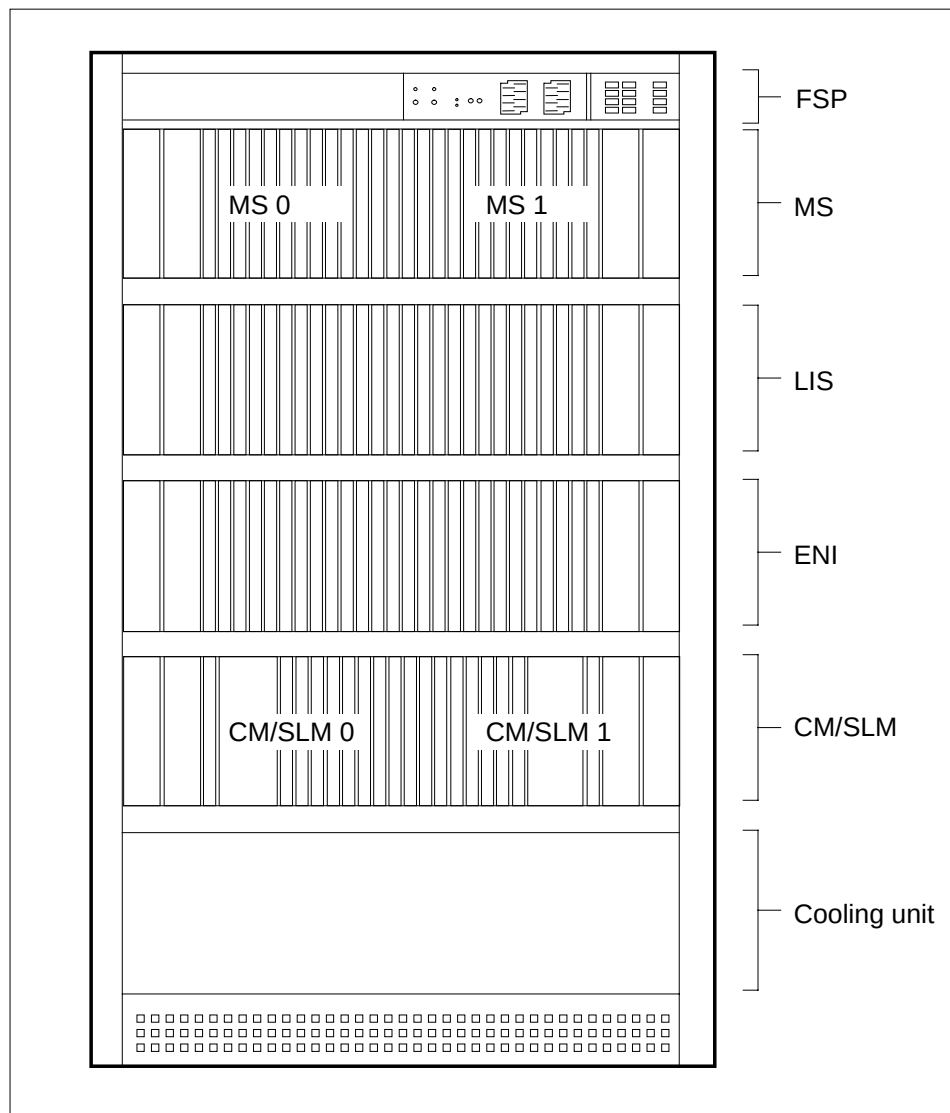
---

### Application

This procedure provides layout diagrams for the following:

- single core cabinet (SCC) with a link interface shelf (LIS)
- LIS, that shows common fill cards and paddle boards for 2-slot application specific units (ASU)
- LIS 2-slot ASU, that includes ethernet interface units (EIU), frame relay interface units (FRIU), CCS7 link interface units (LIU7), network interface units (NIU), and X.25/X.75 interface units (XLIU)

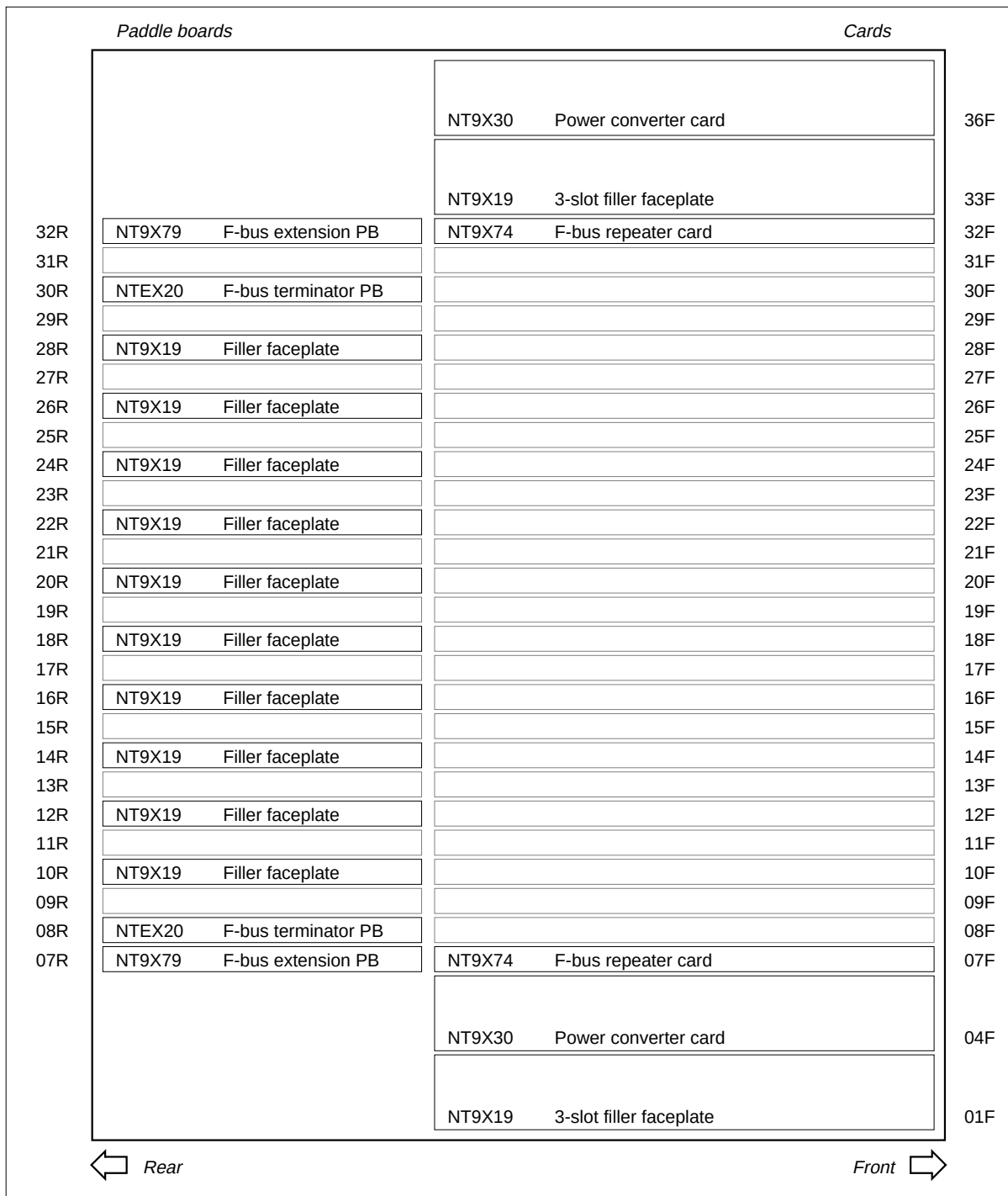
**Figure Single core cabinet**





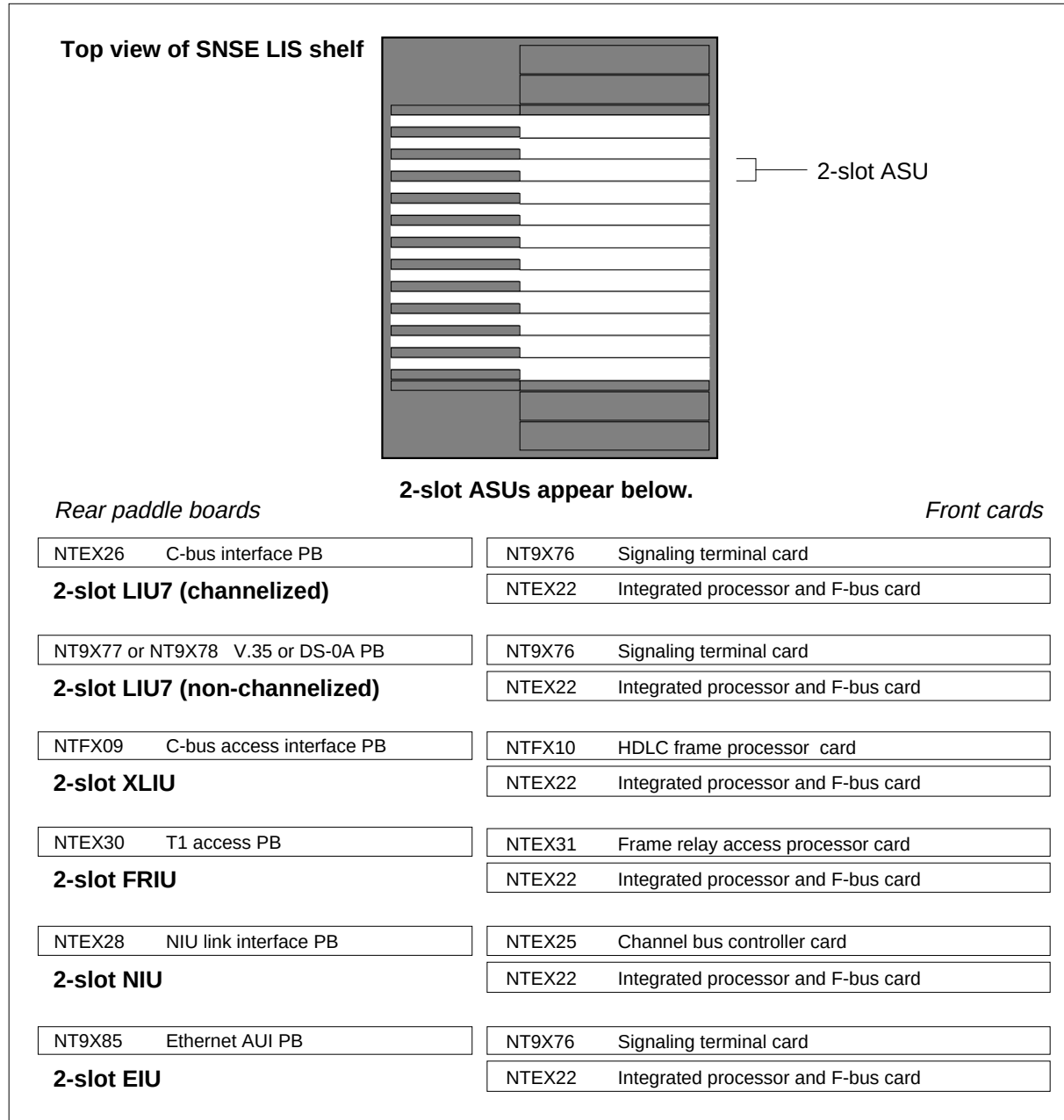
## SuperNode SE link interface shelf layouts (continued)

Figure SuperNode SE link interface shelf



## SuperNode SE link interface shelf layouts (end)

Figure SuperNode SE link interface shelf



## Common fill cards in a SuperNode SE LIS or ENI shelf

---

### Application

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

| PEC    | Suffix            | Card name                                       | Shelf or frame name                                                    |
|--------|-------------------|-------------------------------------------------|------------------------------------------------------------------------|
| NT9X74 | AA, BA,<br>CA, DA | F-bus repeater card                             | link interface shelf (LIS),<br>enhanced network and<br>interface (ENI) |
| NT9X79 | AA, BA            | F-bus extension paddle<br>board                 | LIS, ENI                                                               |
| NTEX20 | AA, BA            | Within the shelf<br>termination paddle<br>board | LIS, ENI                                                               |

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

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

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

### Common procedures

The procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*

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

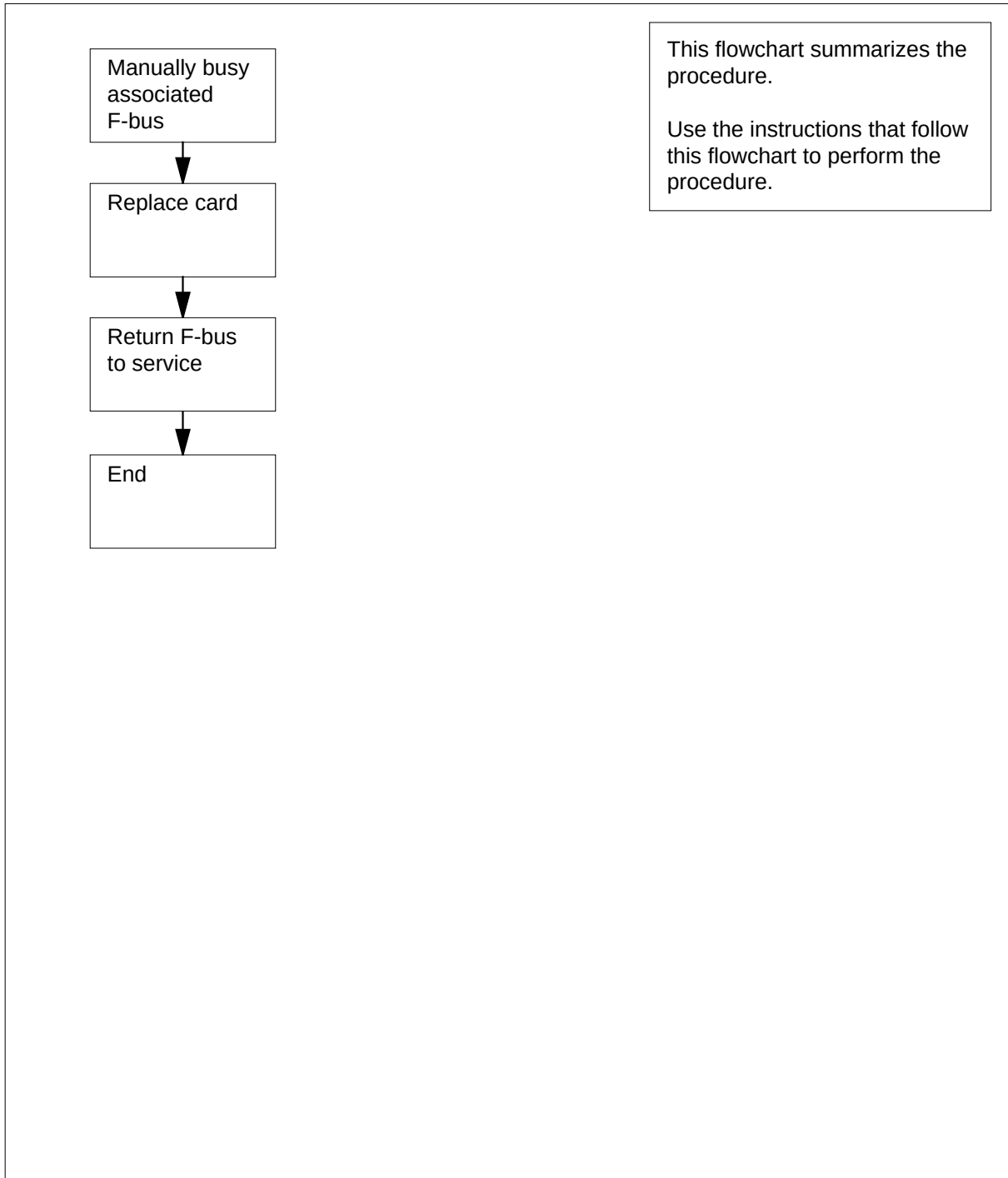
### Action

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

## Common fill cards in a SuperNode SE LIS or ENI shelf (continued)

---

### Summary of replacing Common fill cards in a SuperNode SE LIS or ENI shelf



## Common fill cards in a SuperNode SE LIS or ENI shelf (continued)

---

### Replacing Common fill cards in a SuperNode SE LIS or ENI shelf

#### *At your current location*

- 1 Obtain a replacement card. Make sure the replacement and the card you remove have the same PEC and PEC suffix.
- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. You must perform this procedure to make sure the replacement card is compatible with the software load. Complete the procedure and return to this point.

#### *At the MAP terminal*

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

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

- 4 Determine the state of the MS that controls the mate F-bus.  
**Note:** The MS 0 controls F-bus 0. The F-bus 0 is the mate F-bus for a card in slot 32F, 32R, or 30R. The MS 1 controls F-bus 1. The F-bus 1 is the mate F-bus for a card in slot 7F, 7R, or 8R.

| If the MS controlling the mate F-bus | Do |
|--------------------------------------|----|
|--------------------------------------|----|

|                                     |        |
|-------------------------------------|--------|
| is in service or in-service trouble | step 6 |
| is other than listed here           | step 5 |

- 5 To return the MS to service, perform the correct MS alarm clearing procedure in *Alarm and Performance Monitoring Procedures*. Complete the procedure and return to this point.
- 6 To access the F-bus level of the MAP display, type  
**>SHELF 0;CARD 12**  
 and press the Enter key.

*Example of a MAP display:*

**Common fill cards  
in a SuperNode SE LIS or ENI shelf** (continued)

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

|      |    |  |  |  |  |   |  |   |  |  |  |  |  |  |
|------|----|--|--|--|--|---|--|---|--|--|--|--|--|--|
| Card | 12 |  |  |  |  |   |  |   |  |  |  |  |  |  |
| MS 0 | .  |  |  |  |  | . |  | . |  |  |  |  |  |  |
| MS 1 | .  |  |  |  |  | . |  | . |  |  |  |  |  |  |

CARD:

**Note 1:** A dot under the F-bus header indicates the F-bus is in service. The letter S indicates the F-bus is system busy. The letter M indicates the F-bus is manually busy. The letter I indicates the F-bus is in-service trouble. The letter O indicates the F-bus is offline.

**Note 2:** The letter C appears under the F-bus tap number and indicates the F-bus is manually busy. The letter C can also indicate that the controlling MS or MS port is system busy or manually busy. The letter S indicates the F-bus tap is system busy. A dot indicates the F-bus tap is in service. The letter M indicates the F-bus tap is manually busy. The letter I indicates the F-bus tap is in-service trouble. A dash (-) indicates the F-bus tap is offline .

7 Determine the state of the mate F-bus and the provisioned mate F-bus taps.

**Note:** The MS 0 controls F-bus 0. The F-bus 0 is the mate F-bus that associates with a card in slot 30R, 32R, or 32F. The MS 1 controls F-bus 1. The F-bus 1 is the mate that associates with a card in slot 7R, 8R, or 7F.

| If the states                                                                                                  | Do      |
|----------------------------------------------------------------------------------------------------------------|---------|
| are in-service, that means, the state of the F-bus is InSv and all F-bus taps are dot ( . )                    | step 8  |
| are any other state, that means, the state of the F-bus is not InSv and one or more F-bus taps are not dot (.) | step 14 |

8



**CAUTION**  
**Potential loss of service**  
Make sure that the mate F-bus and the F-bus taps on the mate are in service. Perform this procedure before you manually busy the F-bus that associates with the replacement card. If you manually busy the F-bus while the mates are out of service, you will isolate nodes on the LIS.

## Common fill cards in a SuperNode SE LIS or ENI shelf (continued)

---

To manually busy the F-bus that associates with the replacement card, type

**>BSY ms\_no FBUS**

and press the Enter key.

where

**ms\_no**

is the number of the MS (0 or 1) that controls the F-bus

**Note:** The MS 0 controls F-bus 0. The F-bus 0 associates with a card in slot 7R, 8R or 7F. The MS 1 controls F-bus 1. The F-bus 1 associates with a card in slot 30R, 32R, or 32F.

*Example of a MAP response:*

Request MAN BSY MS: 0 shelf 0 card:12 port 0 FBus requires confirmation because the following NIUs may be active on this bus...

NIU 001 unit 0

NIU 001 unit 1

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

| If the response                  | Do      |
|----------------------------------|---------|
| indicates the BSY command passed | step 10 |
| requests confirmation            | step 9  |

**9** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Request MAN BSY MS: 0 shelf 0 card:12 port 0  
FBus submitted

Request MAN BSY MS: 0 shelf 0 card:12 port 0  
FBus passed

## Common fill cards in a SuperNode SE LIS or ENI shelf (continued)

### At the LIS or ENI shelf

10

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

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

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

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

### At the MAP terminal

**11** To return the F-bus to service, type

**>RTS ms\_no FBUS**

and press the Enter key.

where

**ms\_no**

is the number of MS (0 or 1) that controls the F-bus

*Example of a MAP response:*

```
Request return to Service MS: 0 shelf 0 card:12 port 0
FBUS submitted
Request return to Service MS: 0 shelf 0 card:12 port 0
FBUS passed
```

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 12 |
| failed             | step 15 |

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

| If another maintenance procedure | Do      |
|----------------------------------|---------|
| directed you to this procedure   | step 13 |



## Common fill cards in a SuperNode SE LIS or ENI shelf (end)

---

|    | If another maintenance procedure                                                                                                                                                                                                                   | Do      |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | did not direct you to this procedure                                                                                                                                                                                                               | step 16 |
| 13 | Return to the maintenance procedure that sent you to this procedure and continue as directed.                                                                                                                                                      |         |
| 14 | If you continue with this procedure, you can isolate one or more application specific units (ASU). To determine if you should continue with this procedure, consult operating company personnel or the next level of support. Proceed as directed. |         |
| 15 | For additional help, contact the next level of support.                                                                                                                                                                                            |         |
| 16 | The procedure is complete.                                                                                                                                                                                                                         |         |

---

## EIU cards in a SuperNode SE LIS

---

### Application

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

| PEC    | Suffix     | Card name                                     | Shelf or frame name                                              |
|--------|------------|-----------------------------------------------|------------------------------------------------------------------|
| NT9X76 | AA, BA, CA | STP signalling terminal card                  | link interface shelf (LIS), enhanced network and interface (ENI) |
| NT9X85 | AA         | Ethernet AUI interface paddle board           | LIS, ENI                                                         |
| NTEX22 | BA, BB, CA | Integrated processor and F-bus interface card | LIS, ENI                                                         |

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

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

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

### Common procedures

This procedure refers to the following common procedures:

- *Loading a PM*
- *Replacing a card*
- *Replacing cards in equipment shelves*
- *Removing cards in equipment shelves*
- *Verifying load compatibility of SuperNode cards*

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

**EIU cards**  
**in a SuperNode SE LIS** (continued)

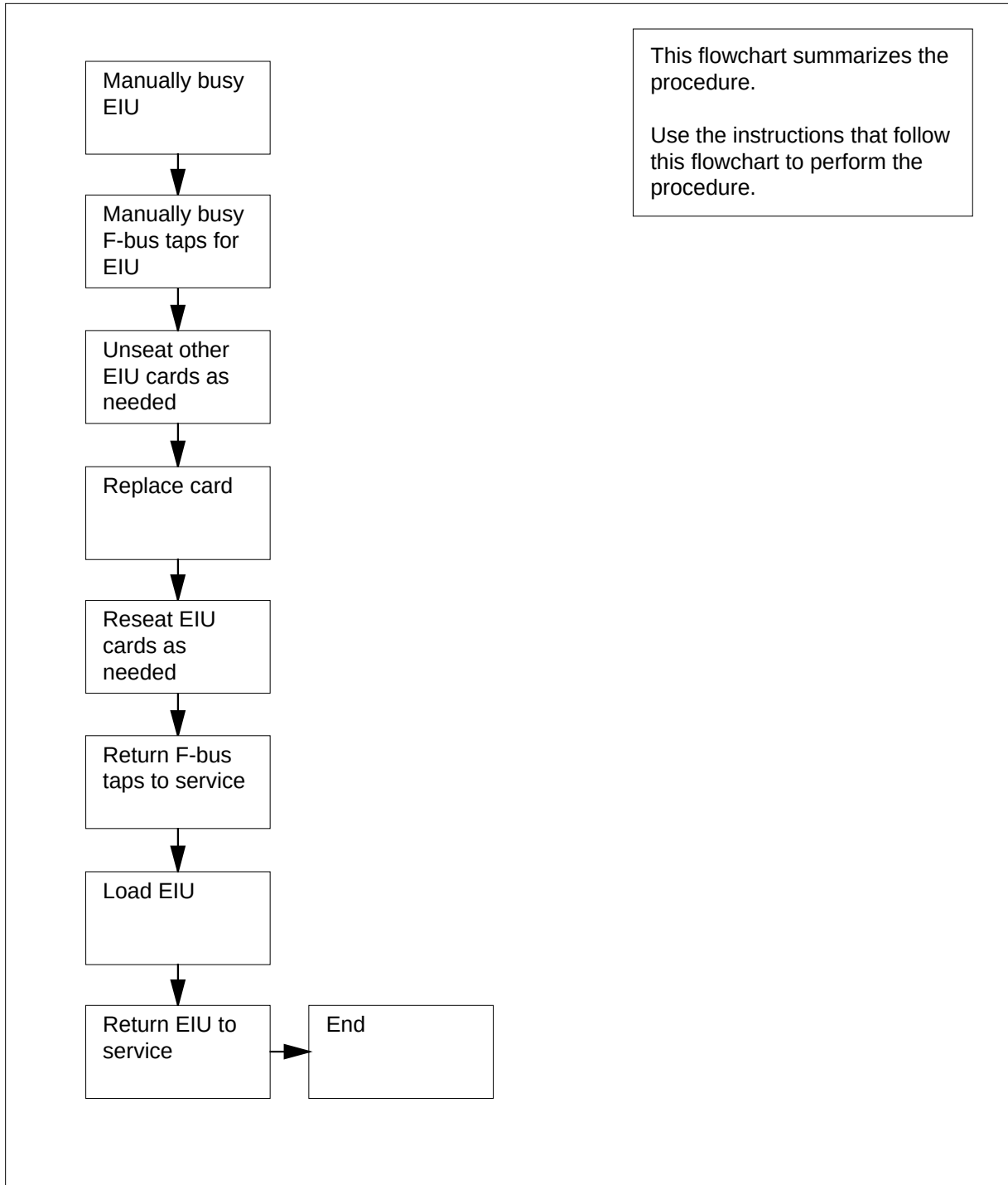
---

**Action**

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

## EIU cards in a SuperNode SE LIS (continued)

### Summary of Replacing EIU cards in a SuperNode SE LIS



## EIU cards in a SuperNode SE LIS (continued)

### Replacing EIU cards in Supernode SE LIS

#### *At your current location*

1



#### **WARNING**

##### **Loss of Ethernet connection**

This procedure removes an EIU from service so that the Ethernet address is not accessible. If other EIUs do not provide alternative addresses to the LAN, ASUs on the LIS will be isolated. Perform this procedure during high traffic periods only if you must return the EIU to service. Unless it is urgent, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card and the card you remove have the same PEC and PEC suffix.

- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. Perform this procedure to make sure the replacement card is compatible with the software load. Complete the procedure and return to this point.

#### *At the MAP terminal*

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

**>MAPCI ; MTC ; PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 0    | 0    | 1    | 0    | 2    | 48   |

- 4 To post the EIU that contains the replacement card, type

**>POST EIU eiu\_no**

and press the Enter key

*where*

**eiu\_no**

is the number of the EIU (0 to 511)

*Example of a MAP display:*

|     |        |      |      |      |      |      |
|-----|--------|------|------|------|------|------|
|     | SysB   | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0      | 0    | 1    | 0    | 2    | 48   |
| EIU | 0 InSv | Rsvd |      |      |      |      |

## EIU cards in a SuperNode SE LIS (continued)

- |          |                                                                                                                                                                                                                                                                                              |           |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>5</b> | Determine the state of the EIU.                                                                                                                                                                                                                                                              |           |
|          | <b>If the state of the EIU</b>                                                                                                                                                                                                                                                               | <b>Do</b> |
|          | is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA)                                                                                                                                                                                                                                      | step 6    |
|          | is ManB                                                                                                                                                                                                                                                                                      | step 11   |
|          | is OffL                                                                                                                                                                                                                                                                                      | step 33   |
| <b>6</b> | To manually busy the EIU, type<br><b>&gt;BSY</b><br>and press the Enter key.                                                                                                                                                                                                                 |           |
|          | <b>If the response is</b>                                                                                                                                                                                                                                                                    | <b>Do</b> |
|          | Bsy EIU 0 requires confirmation because the action may isolate the SuperNode from the nodes on the LAN. Please confirm ("YES", "Y", "NO", or "N"):                                                                                                                                           | Step 10   |
|          | Warning: EIU 0 is currently being imaged. The BSY command will be aborted unless the FORCE option is used.                                                                                                                                                                                   | step 7    |
| <b>7</b> | To manually force bsy the EIU, type<br><b>&gt;BSY FORCE</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>WARNING: EIU 0 is currently being imaged.<br>Do you wish to abort imaging to proceed with the BSY request?<br>Please confirm ("YES", "Y", "NO", or "N"): |           |
| <b>8</b> | Determine if it is safe to continue with this procedure.                                                                                                                                                                                                                                     |           |
|          | <b>If it is</b>                                                                                                                                                                                                                                                                              | <b>Do</b> |
|          | proceed with BSY FORCE request                                                                                                                                                                                                                                                               | step 9    |
|          | abort BSY FORCE request                                                                                                                                                                                                                                                                      | step 36   |
| <b>9</b> | To force bsy the EIU, type<br><b>&gt;YES</b>                                                                                                                                                                                                                                                 |           |

**Note 2:** The letter C appears under the F-bus tap numbers and indicates the F-bus is manually busy. The letter C can also indicate that the controlling MS or MS port is system busy. The letter S indicates the F-bus tap is system busy. A dot ( . ) indicates the F-bus tap is in service. The

## EIU cards in a SuperNode SE LIS (continued)

letter M indicates the F-bus tap is manually busy. The letter I indicates the F-bus tap is in-service trouble. A dash (-) indicates the F-bus tap is offline .

- 13** To determine which F-bus taps associate with the replacement card, type

**>TRNSL 0**

and press the Enter key.

*Example of a MAP response:*

| Site                             | Flr | RPos | Bay_id | Shf | Description  | Slot | EqPEC          |
|----------------------------------|-----|------|--------|-----|--------------|------|----------------|
| HOST                             | 01  | F02  | SCC    | 0   | 39 MS 0:0:12 | 08   | 9X73BA FRNT 17 |
| HOST                             | 01  | F02  | SCC    | 0   | 39 MS 0:0:12 | 08   | 9X79BA BACK 18 |
| FBus 0 Tap 0 is on LIU7 100      |     |      |        |     |              |      |                |
| FBus 0 Tap 11 is on LIU7 111     |     |      |        |     |              |      |                |
| FBus 0 Tap 12 is on LIU7 200     |     |      |        |     |              |      |                |
| FBus 0 Tap 13 is on LIU7 201     |     |      |        |     |              |      |                |
| FBus 0 Tap 14 is on LIU7 202     |     |      |        |     |              |      |                |
| FBus 0 Tap 15 is on LIU7 203     |     |      |        |     |              |      |                |
| FBus 0 Tap 16 is on LIU7 204     |     |      |        |     |              |      |                |
| FBus 0 Tap 17 is on NIU 1 unit 0 |     |      |        |     |              |      |                |
| FBus 0 Tap 18 is on NIU 1 unit 1 |     |      |        |     |              |      |                |
| FBus 0 Tap 19 is on FRIU 222     |     |      |        |     |              |      |                |
| FBus 0 Tap 20 is on EIU 224      |     |      |        |     |              |      |                |
| FBus 0 Tap 21 is on LIU7 209     |     |      |        |     |              |      |                |
| FBus 0 Tap 22 is on LIU7 210     |     |      |        |     |              |      |                |
| FBus 0 Tap 23 is on LIU7 211     |     |      |        |     |              |      |                |

**Note:** The tap numbers that appear in the example are for the F-buses controlled by both MSs. The example MAP response indicates tap 17 on F-bus 0 and tap 17 on F-bus 1 associate with unit 0 of NIU 1.

- 14** Record the tap number that associates with EIU.

- 15** To manually busy the EIU tap on F-bus 0, type

**>BSY 0 TAP tap\_no**

and press the Enter key.

*where*

**tap\_no**

is the number of the F-bus tap that you recorded in step 14

*Example of a MAP display:*

Warning, P-side nodes may be isolated.  
Please confirm ("YES", "Y", "NO", or "N"):

- 16** To confirm the command, type

**>YES**

and press the Enter key.



## EIU cards in a SuperNode SE LIS (continued)

---

- 17 To manually busy the EIU tap on F-bus 1, type  
**>BSY 1 TAP tap\_no**  
and press the Enter key.  
*where*  
**tap\_no**  
is the number of the F-bus tap that you recorded in step 14  
*Example of a MAP display:*
- Warning, P-side nodes may be isolated.  
Please confirm ("YES", "Y", "NO", or "N"):
- 18 To confirm the command, type  
**>YES**  
and press the Enter key.

### *At the LIS shelf*

19



#### **WARNING**

##### **Static electricity damage**

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

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

|    | <b>If you replace</b>                                                                                                                                                                                                                                                                | <b>Do</b> |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|    | the NTEX22                                                                                                                                                                                                                                                                           | step 20   |
|    | another card                                                                                                                                                                                                                                                                         | step 21   |
| 20 | To replace the NTEX22 card, perform the procedure <i>Replacing a card</i> in this document. Complete the procedure and return to this point.<br><b>Note:</b> If the card you replace has switches, make sure the replacement card switches have the same settings.<br>Go to step 24. |           |
| 21 | To unseat the NTEX22 card for the EIU, perform the procedure <i>Unseating cards in equipment shelves</i> in this document. Complete the procedure and return to this point.                                                                                                          |           |

## EIU cards in a SuperNode SE LIS (continued)

- 22** To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- Note:** If the replacement card has switches, make sure that the switches on the replacement card have the same settings.
- 23** To reseal the NTEX22 card for the EIU, perform the procedure *Reseating cards in equipment shelves* in this document. Complete the procedure and return to this point.

### **At the MAP terminal**

- 24** To return to service the F-bus 0 tap you busied in step 15, type.

**>RTS 0 TAP tap\_no**

and press the Enter key.

where

**tap\_no**

is the number of the F-bus tap that you recorded in step 14

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 25 |
| failed             | step 34 |

- 25** To return to service the F-bus tap that you busied in step 17, type

**>RTS 1 TAP tap\_no**

and press the Enter key.

where

**tap\_no**

is the number of the F-bus tap that you recorded in step 14

*Example of a MAP display:*

Warning, P-side nodes may be isolated.  
Please confirm ("YES", "Y", "NO", or "N"):

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 26 |
| failed             | step 34 |

- 26** The next action depends on the reason you perform this procedure.

| If another maintenance procedure | Do      |
|----------------------------------|---------|
| directed you to this procedure   | step 27 |

## EIU cards in a SuperNode SE LIS (continued)

|    | If another maintenance procedure                                                                                                                        | Do      |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | did not direct you to this procedure                                                                                                                    | step 28 |
| 27 | Return to the maintenance procedure that sent you to this procedure and continue as directed.                                                           |         |
| 28 | To access the PM level of the MAP display, type<br><b>&gt;PM</b><br>and press the Enter key.                                                            |         |
| 29 | To post the EIU, type<br><b>&gt;POST EIU eiu_no</b><br>and press the Enter key<br><i>where</i><br><b>ei_u_no</b><br>is the number of the EIU (0 to 511) |         |
| 30 | To load the EIU, type<br><b>&gt;LOADPM</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>EIU 0 LOADPM passed                  |         |
|    | If the LOADPM command                                                                                                                                   | Do      |
|    | passed                                                                                                                                                  | step 32 |
|    | failed                                                                                                                                                  | step 31 |
| 31 | To load the PM, perform the procedure <i>Loading a PM</i> in this document. Complete the procedure and return to this point.                            |         |
| 32 | [To return the EIU to service, type<br><b>&gt;RTS</b><br>and press the Enter key<br><i>Example of a MAP response:</i><br><br>EIU 0 RTS Passed           |         |
|    | If the RTS command                                                                                                                                      | Do      |
|    | passed                                                                                                                                                  | step 36 |

---

**EIU cards  
in a SuperNode SE LIS (end)**

---

|           | <b>If the RTS command</b>                                                                                                                                                    | <b>Do</b> |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | failed                                                                                                                                                                       | step 34   |
| <b>33</b> | Consult operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.                                          |           |
| <b>34</b> | For additional help, contact the next level of support.                                                                                                                      |           |
| <b>35</b> | To abort the BSY FORCE request, type<br><b>&gt;NO</b><br>and press the Enter key<br><i>Example of a MAP response:</i><br><br>BSY command aborted due to imaging in progress. |           |
| <b>36</b> | The procedure is complete.                                                                                                                                                   |           |

## FRIU cards in a SuperNode SE LIS

---

### Application

Use this procedure to replace the following cards in the SuperNode SE (SNSE) shelves or frames listed.

| PEC    | Suffix | Card name                                     | Shelf or frame name                                              |
|--------|--------|-----------------------------------------------|------------------------------------------------------------------|
| NTEX22 | BB, CA | Integrated processor and F-bus interface card | link interface shelf (LIS), enhanced network and interface (ENI) |
| NTEX30 | AA     | T1 analog paddle board                        | LIS, ENI                                                         |
| NTEX31 | AA     | Frame relay access processor card             | LIS, ENI                                                         |
| NTEX31 | BA     | Enhanced frame relay access processor card    | LIS, ENI                                                         |

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

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

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

### Common procedures

This procedure refers to the following common procedures:

- *Loading a PM*
- *Replacing a card*
- *Verifying the load compatibility of SuperNode cards*

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

**FRIU cards**  
**in a SuperNode SE LIS** (continued)

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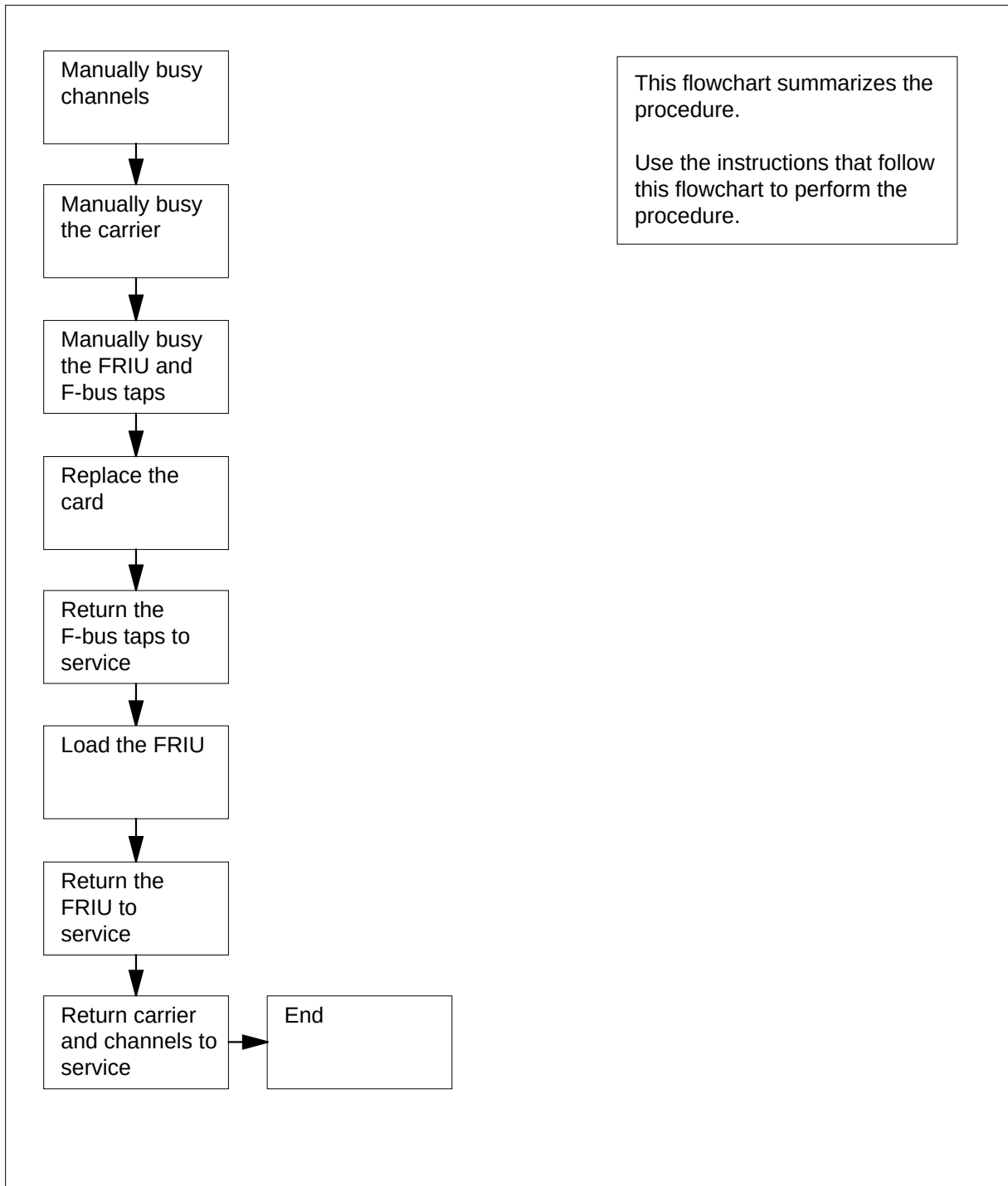
**Action**

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

## FRIU cards in a SuperNode SE LIS (continued)

---

### Summary of Replacing FRIU cards in a SuperNode SE LIS



## FRIU cards in a SuperNode SE LIS (continued)

### Replacing FRIU cards in a SuperNode SE LIS

#### *At your current location*

1



#### **WARNING**

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

This procedure removes an FRIU from service and temporarily interrupts traffic on the associated access or trunking DS-1 channels. Perform this procedure only if you need to return the FRIU to service. Unless it is urgent, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure the replacement card and the card you remove have the same PEC and PEC suffix.

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

#### *At the MAP terminal*

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

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 1    | 0    | 27   | 0    | 8    | 29   |

- 4 To post the FRIU that contains the NTEX22 card you will replace, type

**>POST FRIU friu\_no**

and press the Enter key.

*where*

**friu\_no**

is the number of the FRIU (0 to 500)

*Example of a MAP display:*

|      |        |      |      |      |      |      |
|------|--------|------|------|------|------|------|
|      | SysB   | ManB | OffL | CBsy | ISTb | InSv |
| xPM  | 1      | 0    | 27   | 0    | 8    | 29   |
| FRIU | 1      | 0    | 19   | 0    | 6    | 28   |
| FRIU | 8 InSv | Rsvd |      |      |      |      |



## FRIU cards in a SuperNode SE LIS (continued)

- 5 Determine the state of the FRIU.

**Note:** The state of the FRIU appears on the right side of the FRIU number.  
The state of the FRIU appears in the example MAP display in step 4.

| If the state of the FRIU          | Do      |
|-----------------------------------|---------|
| is SysB, ISTb (NA), InSv, or ISTb | step 6  |
| is ManB                           | step 16 |
| is OffL                           | step 41 |

- 6 To access the CHAN level of the MAP display, type

**>CARR;CHAN**

and press the Enter key.

*Example of a MAP display:*

|         |   |      |      |             |      |      |      |
|---------|---|------|------|-------------|------|------|------|
|         |   | SysB | ManB | OffL        | CBsy | ISTb | InSv |
| PM      |   | 1    | 0    | 27          | 0    | 8    | 29   |
| FRIU    |   | 1    | 0    | 19          | 0    | 6    | 28   |
| FRIU    | 8 | InSv | Rsvd |             |      |      |      |
| CARRIER |   |      |      | Alarm       | BER  | ES   | SES  |
| InSv    |   |      |      |             | -8.3 | 0    | 0    |
| CHANNEL | 1 |      |      |             |      |      |      |
|         | . |      |      |             |      |      |      |
| CHANNEL | 1 |      |      | ( 24 x DS0) |      |      |      |
| InSv    |   |      |      |             |      |      |      |
| CHAN:   |   |      |      |             |      |      |      |

- 7 To manually busy all channels, type

**>BSY ALL**

and press the Enter key.

- 8 To confirm the command, type

**>YES**

and press the Enter key.

**Note:** If all channels are out of service, the system does not request confirmation.

- 9 To access the CARR level of the MAP display, type

**>QUIT**

and press the Enter key.

*Example of a MAP display:*

## FRIU cards in a SuperNode SE LIS (continued)

|      |  |      |      |      |      |      |      |
|------|--|------|------|------|------|------|------|
|      |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM   |  | 1    | 0    | 27   | 0    | 8    | 29   |
| FRIU |  | 1    | 0    | 19   | 0    | 6    | 28   |

FRIU 8 InSv Rsvd

|         |  |  |       |      |    |     |     |
|---------|--|--|-------|------|----|-----|-----|
| CARRIER |  |  | Alarm | BER  | ES | SES | UAS |
| InSv    |  |  |       | -8.3 | 0  | 0   | 0   |

CHANNEL 1  
.

- 10** To manually busy the carrier, type  
**>BSY**  
and press the Enter key.

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

*Example of a MAP response*

Confirmed...  
BSY passed.

**Note:** If the carrier is out of service, the system does not request confirmation.

- 12** To quit the CARR level, type  
**>QUIT**  
and press the Enter key.

- 13** To manually busy the FRIU, type  
**>BSY FORCE**  
and press the Enter key.

| If MAP response is                                                                                                                                 | Do      |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Billing data is stored in the FRIU. Uploading billing data ..Uploaded FRS Billing data successfully ...FRIU 8 BSY Passed                           | step 16 |
| WARNING: FRIU 8 is currently being imaged. Do you wish to abort imaging to proceed with the busy request. Please confirm ("YES", "Y", "NO" or "N") | step 14 |

## FRIU cards in a SuperNode SE LIS (continued)

- 14** Determine if you should proceed with the BYS and proceed as shown below.

| If proceed with        | Do      |
|------------------------|---------|
| BUSY and abort imaging | step 15 |
| abort BSY request      | step 44 |

- 15** To continue with BSY FORCE, type

**>BSY FORCE**

and press the Enter key.

*Example of a MAP response:*

Imaging will be aborted on FRIU 8.

- 16** To access the MS level of the MAP display, type

**> MAPCI;MTC;MS**

and press the Enter key.

*Example of a MAP display:*

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

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

**>SHELF 0;CARD 12**

and press the Enter key.

*Example of a MAP display:*

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

|         |   |  |  |  |  |  |  |  |  |  |  |  |  |
|---------|---|--|--|--|--|--|--|--|--|--|--|--|--|
| Card 12 |   |  |  |  |  |  |  |  |  |  |  |  |  |
| MS 0    | . |  |  |  |  |  |  |  |  |  |  |  |  |
| MS 1    | . |  |  |  |  |  |  |  |  |  |  |  |  |

CARD:

**Note 1:** A dot (.) under the F-bus header indicates the F-bus is in service. The letter S indicates the F-bus is system busy. The letter M indicates the F-bus is manual busy. The letter I indicates the F-bus is in-service trouble. The letter O indicates the F-bus is offline.

**Note 2:** Letter codes can appear under the F-bus tap numbers. The letter C indicates the F-bus is manually busy or the controlling MS or MS port is

## FRIU cards in a SuperNode SE LIS (continued)

system busy or manually busy. The letter S indicates the F-bus tap is system busy. A dot (.) indicates the F-bus tap is in service. The letter M indicates the F-bus tap is manually busy. The letter I indicates the F-bus tap is in-service trouble, and a dash (-) indicates the F-bus tap is offline .

- 18** To determine the F-bus taps associated with the card you replace, type

**>TRNSL 0**

and press the Enter key.

*Example of a MAP response:*

| Site                             | Flr | RPos | Bay_id | Shf | Description | Slot | EqPEC          |
|----------------------------------|-----|------|--------|-----|-------------|------|----------------|
| HOST                             | 01  | F02  | SCC 0  | 39  | MS 0:0:12   | 08   | 9X73BA FRNT 17 |
| HOST                             | 01  | F02  | SCC 0  | 39  | MS 0:0:12   | 08   | 9X79BA BACK 18 |
| FBus 0 Tap 0 is on LIU7 100      |     |      |        |     |             |      |                |
| FBus 0 Tap 11 is on LIU7 111     |     |      |        |     |             |      |                |
| FBus 0 Tap 12 is on LIU7 200     |     |      |        |     |             |      |                |
| FBus 0 Tap 13 is on LIU7 201     |     |      |        |     |             |      |                |
| FBus 0 Tap 14 is on LIU7 202     |     |      |        |     |             |      |                |
| FBus 0 Tap 15 is on LIU7 203     |     |      |        |     |             |      |                |
| FBus 0 Tap 16 is on LIU7 204     |     |      |        |     |             |      |                |
| FBus 0 Tap 17 is on NIU 1 unit 0 |     |      |        |     |             |      |                |
| FBus 0 Tap 18 is on NIU 1 unit 1 |     |      |        |     |             |      |                |
| FBus 0 Tap 19 is on FRIU 222     |     |      |        |     |             |      |                |
| FBus 0 Tap 20 is on FRIU 224     |     |      |        |     |             |      |                |
| FBus 0 Tap 21 is on LIU7 209     |     |      |        |     |             |      |                |
| FBus 0 Tap 22 is on LIU7 210     |     |      |        |     |             |      |                |
| FBus 0 Tap 23 is on LIU7 211     |     |      |        |     |             |      |                |

**Note:** The tap numbers that appear in the example are for the F-buses controlled by both MSs. The example MAP response indicates tap 19 on F-bus 0 and tap 19 on F-bus 1 associate with FRIU number 222.

- 19** Record the tap number associated with the FRIU.

- 20** To Manually busy the FRIU tap on F-bus 0, type

**>BSY 0 TAP tap\_no**

and press the Enter key.

*where*

**tap\_no**

is the number of the F-bus tap you recorded in step 19

*Example of a MAP response:*

Request to MAN BUSY MS: 0 shelf: 0 card: 12 port: 0 Tap: 19 submitted.  
Request to MAN BUSY MS: 0 shelf: 0 card: 12 port: 0 Tap: 19 passed.

- 21** To manually busy the FRIU tap on F-bus 1, type

**>BSY 1 TAP tap\_no FORCE**

and press the Enter key.

## FRIU cards in a SuperNode SE LIS (continued)

---

where

**tap\_no**

is the number of the F-bus tap you recorded in step 19

*Example of a MAP response:*

Warning, P-side nodes may be isolated.  
Please confirm ("YES", "Y", "NO", or "N"):

**22** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Request to MAN BUSY MS: 1 shelf: 0 card: 12 port: 0 Tap: 19 submitted.  
Request to MAN BUSY MS: 1 shelf: 0 card: 12 port: 0 Tap: 19 passed.

### ***At the LIS shelf***

**23**



#### **WARNING**

##### **Static electricity damage**

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

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

**Note:** Determine if the card you replace has switches. Make sure the switches on the replacement card and the card you replace have the same settings.

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

**24** To return the F-bus tap you busied in step 20 to service, type

**>RTS 0 TAP tap\_no**

and press the Enter key.

where

**tap\_no**

is the number of the FRIU tap you recorded in step 19

*Example of a MAP response:*

## FRIU cards in a SuperNode SE LIS (continued)

Request to RTS MS: 0 shelf: 0 card: 12 port: 0 Tap: 19 submitted.  
Request to RTS MS: 0 shelf: 0 card: 12 port: 0 Tap: 19 passed.

| If the RTS command                      | Do      |
|-----------------------------------------|---------|
| passed                                  | step 26 |
| failed, and you have not tested the tap | step 25 |
| failed, and you tested the tap          | step 42 |

**Note:** You can perform a test to manually return the tap to service.

- 25** To test the F-bus tap, type  
**>TST 0 TAP tap\_no**  
and press the Enter key.  
*where*

**tap\_no**  
is the number of the F-bus tap you recorded in step 19

*Example of a MAP response:*

Request to TEST INSV MS: 0 shelf: 0 card: 12 port: 0 Tap: 19 submitted.  
Request to TEST INSV MS: 0 shelf: 0 card: 12 port: 0 Tap: 19 passed.

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 24 |
| failed             | step 42 |

- 26** To return the F-bus tap you busied in step 21 to service, type  
**>RTS 1 TAP tap\_no**  
and press the Enter key.  
*where*

**tap\_no**  
is the number of the F-bus tap you recorded in step 19

| If the RTS command                      | Do      |
|-----------------------------------------|---------|
| passed                                  | step 28 |
| failed, and you have not tested the tap | step 27 |
| failed, and you tested the tap          | step 42 |

## FRIU cards in a SuperNode SE LIS (continued)

| 27                                                                                                                                                                                                                                                                                                                               | <p>To test the F-bus tap, type<br/> <b>&gt;TST 1 TAP tap_no</b><br/> and press the Enter key.<br/> <i>where</i><br/> <b>tap_no</b><br/> is the number of the FRIU tap you recorded in step 19</p>                                                                                                                                                                                                                                                                   |                              |    |                                |         |                                      |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----|--------------------------------|---------|--------------------------------------|---------|
|                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |    |                                |         |                                      |         |
| <table> <tr> <th>If the RTS command</th><th>Do</th></tr> <tr> <td>passed</td><td>step 28</td></tr> <tr> <td>failed</td><td>step 42</td></tr> </table> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | If the RTS command           | Do | passed                         | step 28 | failed                               | step 42 |
| If the RTS command                                                                                                                                                                                                                                                                                                               | Do                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              |    |                                |         |                                      |         |
| passed                                                                                                                                                                                                                                                                                                                           | step 28                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |    |                                |         |                                      |         |
| failed                                                                                                                                                                                                                                                                                                                           | step 42                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |    |                                |         |                                      |         |
| 28                                                                                                                                                                                                                                                                                                                               | <p>The next action depends on why you perform this procedure.</p> <table> <tr> <th>If the maintenance procedure</th><th>Do</th></tr> <tr> <td>directed you to this procedure</td><td>step 29</td></tr> <tr> <td>did not direct you to this procedure</td><td>step 30</td></tr> </table> | If the maintenance procedure | Do | directed you to this procedure | step 29 | did not direct you to this procedure | step 30 |
| If the maintenance procedure                                                                                                                                                                                                                                                                                                     | Do                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              |    |                                |         |                                      |         |
| directed you to this procedure                                                                                                                                                                                                                                                                                                   | step 29                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |    |                                |         |                                      |         |
| did not direct you to this procedure                                                                                                                                                                                                                                                                                             | step 30                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |    |                                |         |                                      |         |
| 29                                                                                                                                                                                                                                                                                                                               | <p>Return to the maintenance procedure that sent you to this procedure. Continue as directed by the maintenance procedure.</p>                                                                                                                                                                                                                                                                                                                                      |                              |    |                                |         |                                      |         |
| 30                                                                                                                                                                                                                                                                                                                               | <p>To access the PM level of the MAP display, type<br/> <b>&gt;PM</b><br/> and press the Enter key.</p>                                                                                                                                                                                                                                                                                                                                                             |                              |    |                                |         |                                      |         |
| 31                                                                                                                                                                                                                                                                                                                               | <p>To post the FRIU, type<br/> <b>&gt;POST FRIU friu_no</b><br/> and press the Enter key.<br/> <i>where</i><br/> <b>friu_no</b><br/> is the number of the FRIU (0 to 500)</p>                                                                                                                                                                                                                                                                                       |                              |    |                                |         |                                      |         |
| 32                                                                                                                                                                                                                                                                                                                               | <p>To load the FRIU, type<br/> <b>&gt;LOADPM</b><br/> and press the Enter key.<br/> <i>Example of a MAP response:</i></p> <p>FRIU 8 LOADPM Passed</p>                                                                                                                                                                                                                                                                                                               |                              |    |                                |         |                                      |         |
|                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |    |                                |         |                                      |         |
| <table> <tr> <th>If the LOADPM command</th><th>Do</th></tr> <tr> <td>passed</td><td>step 34</td></tr> </table>                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | If the LOADPM command        | Do | passed                         | step 34 |                                      |         |
| If the LOADPM command                                                                                                                                                                                                                                                                                                            | Do                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              |    |                                |         |                                      |         |
| passed                                                                                                                                                                                                                                                                                                                           | step 34                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |    |                                |         |                                      |         |

## FRIU cards in a SuperNode SE LIS (continued)

|           | If the LOADPM command                                                                                                                           | Do                                               |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
|           | failed                                                                                                                                          | step 33                                          |
| <b>33</b> | To load the FRIU, use the procedure <i>Loading a PM</i> in this document. Complete the procedure and return to this point.                      |                                                  |
| <b>34</b> | To return the FRIU to service, type<br><b>&gt;RTS</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>FRIU 8 RTS Passed |                                                  |
|           | If the RTS command                                                                                                                              | Do                                               |
|           | passed                                                                                                                                          | step 35                                          |
|           | failed                                                                                                                                          | step 42                                          |
| <b>35</b> | To access the CARR level of the MAP display, type<br><b>&gt;CARR</b><br>and press the Enter key.                                                |                                                  |
| <b>36</b> | To return the carrier to service, type<br><b>&gt;RTS</b><br>and press the Enter key.<br><i>Example of a MAP display:</i>                        |                                                  |
|           | PM                                                                                                                                              | SysB 1 ManB 0 OffL 27 CBsy 0 ISTb 9 InSv 28      |
|           | FRIU                                                                                                                                            | 1 0 19 0 7 27                                    |
|           | FRIU 8                                                                                                                                          | ISTb Rsvd                                        |
|           | CARRIER                                                                                                                                         | Mtce /T1 proving Alarm BER -8.3 ES 0 SES 0 UAS 0 |
|           | ManB                                                                                                                                            |                                                  |
|           | CHANNEL                                                                                                                                         | 1                                                |
|           |                                                                                                                                                 | C                                                |
|           | rts                                                                                                                                             |                                                  |
|           | RTS                                                                                                                                             | passed.                                          |
| <b>37</b> | Wait until the Mtce flag on the right side of the CARRIER header does not appear in the display. The carrier goes ISTb at this point.           |                                                  |



## FRIU cards in a SuperNode SE LIS (continued)

**38** Wait 1 min for the carrier to go in service.

| If after 1 min the state of the carrier | Do      |
|-----------------------------------------|---------|
| is InSv                                 | step 39 |
| is other than listed here               | step 42 |

**39** To access the CHAN level of the MAP display, type  
**>CHAN**  
and press the Enter key.

**40** To return the channels to service, type  
**>RTS ALL**  
and press the Enter key.

*Example of a MAP display:*

|         |         |      |         |       |      |      |      |
|---------|---------|------|---------|-------|------|------|------|
| PM      |         | SysB | ManB    | OffL  | CBsy | ISTb | InSv |
| FRIU    |         | 1    | 0       | 27    | 0    | 9    | 28   |
|         |         | 1    | 0       | 19    | 0    | 7    | 27   |
| FRIU    | 8       | ISTb | Rsvd    |       |      |      |      |
| CARRIER | Mtce    | /T1  | proving | Alarm | BER  | ES   | SES  |
| ManB    |         |      |         |       | -8.3 | 0    | 0    |
|         |         |      |         |       |      |      | UAS  |
|         |         |      |         |       |      |      | 0    |
| CHANNEL | 1       |      |         |       |      |      |      |
|         | C       |      |         |       |      |      |      |
| rts     |         |      |         |       |      |      |      |
| RTS     | passed. |      |         |       |      |      |      |

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 44 |
| failed             | step 42 |

**41** Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.

**42** For additional help, contact the operating company personnel responsible for the next level of support.

**43** To abort the BSY FORCE request, type  
**>NO**  
and press the Enter key

*Example of a MAP response:*

**FRIU cards  
in a SuperNode SE LIS (end)**

---

BSY command aborted due to imaging in progress.

**44** The procedure is complete.

## LIU7 cards in a SuperNode SE LIS or ENI shelf

---

### Application

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

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

| PEC    | Suffix     | Card name                                     | Shelf or frame name                                              |
|--------|------------|-----------------------------------------------|------------------------------------------------------------------|
| NT9X76 | AA, BA, CA | STP signaling terminal card                   | link interface shelf (LIS), enhanced network and interface (ENI) |
| NT9X77 | AA, AB     | DMS-100 V.35 interface paddle board           | LIS, ENI                                                         |
| NT9X78 | AA         | DS-0A interface paddle board                  | LIS, ENI                                                         |
| NT9X78 | BA, DA, CA | Enhanced DS-0A interface paddle board         | LIS, ENI                                                         |
| NTEX22 | BA, BB, CA | Integrated processor and F-bus interface card | LIS, ENI                                                         |
| NTEX26 | AA         | LIU channel bus interface card                | LIS, ENI                                                         |

### Common procedures

The following common procedures are referenced:

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

## **LIU7 cards in a SuperNode SE LIS or ENI shelf** (continued)

---

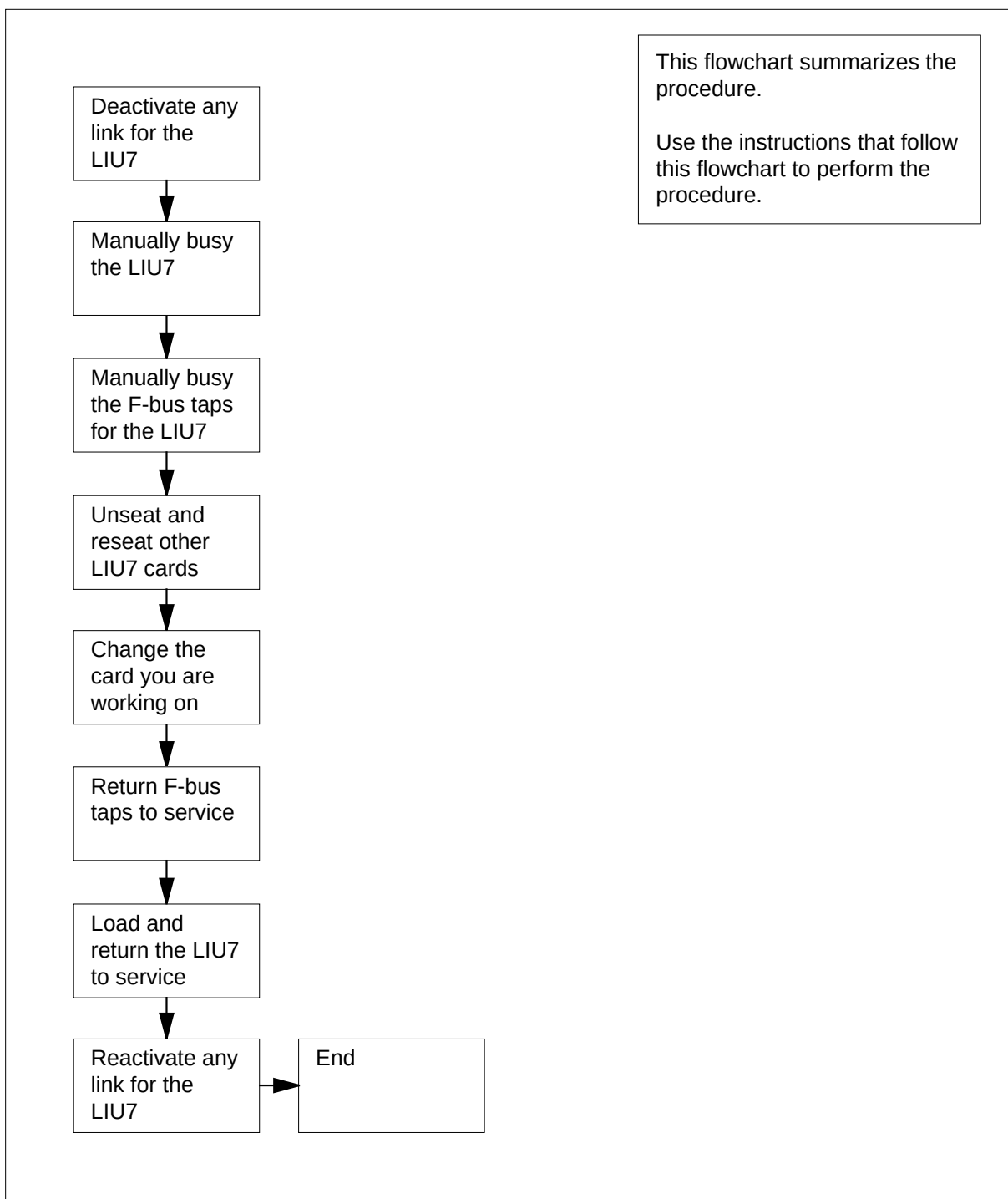
Do not go to the common procedure unless the step action procedure directs you to go.

### **Action**

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

## LIU7 cards in a SuperNode SE LIS or ENI shelf (continued)

### Summary of Replacing LIU7 cards in a SuperNode SE LIS or ENI shelf



## LIU7 cards in a SuperNode SE LIS or ENI shelf (continued)

### Replacing LIU7 cards in a SuperNode SE LIS or ENI shelf

#### *At your current location*

1



#### **WARNING**

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

This procedure removes an LIU7 from service and temporarily interrupts messaging on the associated CCS7 link. Perform this procedure only if necessary to return the LIU7 to service. Unless it is urgent, perform this procedure only during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card has the same PEC, including suffix, as the card being removed.

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

#### *At the MAP terminal*

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

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    | SysB | ManB | OffL | CBSy | ISTb | InSv |
|----|------|------|------|------|------|------|
| PM | 1    | 0    | 2    | 0    | 3    | 6    |

- 4 To post the LIU7 that contains the card to be replaced, type

**>POST LIU7 liu\_no**

and press the Enter key.

*where*

**liu\_no**

is the number of the LIU7 (0 to 511)

*Example of a MAP display:*

|      | SysB | ManB | OffL | CBSy | ISTb | InSv |
|------|------|------|------|------|------|------|
| PM   | 1    | 0    | 2    | 0    | 3    | 6    |
| LIU7 | 1    | 0    | 0    | 0    | 0    | 3    |

|      |     |      |      |
|------|-----|------|------|
| LIU7 | 208 | InSv | Rsvd |
|------|-----|------|------|

**LIU7 cards****in a SuperNode SE LIS or ENI shelf** (continued)

- | 5                                                                                                                                                       | Determine the state of the LIU7.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----|----------------------------------------|---------|-----------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                                                                                                                                                         | <table border="1"> <tr> <th>If the state of the LIU7 is</th> <th>Do</th> </tr> <tr> <td>SysB, SysB (NA), ISTb, or InSv</td> <td>step 6</td> </tr> <tr> <td>ManB or ManB (NA)</td> <td>step 11</td> </tr> <tr> <td>OffL</td> <td>step 35</td> </tr> </table>                                                                                                                                                | If the state of the LIU7 is | Do | SysB, SysB (NA), ISTb, or InSv         | step 6  | ManB or ManB (NA)                 | step 11 | OffL                                                                                                                                                    | step 35 |
| If the state of the LIU7 is                                                                                                                             | Do                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| SysB, SysB (NA), ISTb, or InSv                                                                                                                          | step 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| ManB or ManB (NA)                                                                                                                                       | step 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| OffL                                                                                                                                                    | step 35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| 6                                                                                                                                                       | Deactivate the CCS7 link (if there is one) associated with the LIU7 using the procedure <i>Deactivating CCS7 links</i> in this document. Complete the procedure and return to this point.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| 7                                                                                                                                                       | <p>To manually busy the LIU7, type</p> <p><b>&gt;BSY FORCE</b></p> <p>and press the Enter key.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
|                                                                                                                                                         | <table border="1"> <tr> <th>If</th> <th>Do</th> </tr> <tr> <td>you need to confirm the command</td> <td>step 10</td> </tr> <tr> <td>the command passed</td> <td>step 11</td> </tr> <tr> <td>WARNING: LIU7 312 is currently being imaged.Do you wish to abort imaging to proceed with the BSY request?<br/>Please confirm ("YES", "Y", "NO", or "N"):</td> <td>step 8</td> </tr> </table> | If                          | Do | you need to confirm the command        | step 10 | the command passed                | step 11 | WARNING: LIU7 312 is currently being imaged.Do you wish to abort imaging to proceed with the BSY request?<br>Please confirm ("YES", "Y", "NO", or "N"): | step 8  |
| If                                                                                                                                                      | Do                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| you need to confirm the command                                                                                                                         | step 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| the command passed                                                                                                                                      | step 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| WARNING: LIU7 312 is currently being imaged.Do you wish to abort imaging to proceed with the BSY request?<br>Please confirm ("YES", "Y", "NO", or "N"): | step 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| 8                                                                                                                                                       | Determine if it is safe to continue with this procedure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
|                                                                                                                                                         | <table border="1"> <tr> <th>If it is</th> <th>Do</th> </tr> <tr> <td>safe to proceed with BSY FORCE request</td> <td>step 9</td> </tr> <tr> <td>not safe, abort BSY FORCE request</td> <td>step 37</td> </tr> </table>                                                                                                                                                                                                                                  | If it is                    | Do | safe to proceed with BSY FORCE request | step 9  | not safe, abort BSY FORCE request | step 37 |                                                                                                                                                         |         |
| If it is                                                                                                                                                | Do                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| safe to proceed with BSY FORCE request                                                                                                                  | step 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| not safe, abort BSY FORCE request                                                                                                                       | step 37                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |
| 9                                                                                                                                                       | <p>To force bsy the LIU7, type</p> <p><b>&gt;YES</b></p> <p>and press the Enter key. Go to step 11</p> <p><i>Example of a MAP response:</i></p> <p>Imaging will be aborted on LIU7 312.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |    |                                        |         |                                   |         |                                                                                                                                                         |         |

## LIU7 cards in a SuperNode SE LIS or ENI shelf (continued)

- 10** To confirm the command, type

**>YES**

and press the Enter key.

- 11** To access the MS level of the MAP display, type

**>MAPCI;MTC;MS**

and press the Enter key.

*Example of a MAP display:*

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

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

**>SHELF 0;CARD 12**

and press the Enter key.

*Example of a MAP display:*

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

| Card 12 |   | FBus Tap: 0 |   | 11 | 12    | 16    | 20    |
|---------|---|-------------|---|----|-------|-------|-------|
| MS 0    | . | .           | . | .  | ..... | ..... | ..... |
| MS 1    | . | .           | . | .  | ..... | ..... | ..... |

CARD:

**Note 1:** A dot (.) under the F-bus header indicates the F-bus is in service. An S indicates the F-bus is system busy. An M indicates the F-bus is manual busy. An I indicates the F-bus is in-service trouble, and an O indicates the F-bus is offline.

**Note 2:** Under the F-bus tap numbers, a C indicates the F-bus is manual busy or the controlling MS or MS port is system busy or manual busy. An S indicates the F-bus tap is system busy. A dot indicates the F-bus tap is in service. An M indicates the F-bus tap is manual busy. An I indicates the F-bus tap is in-service trouble, and a dash (-) indicates the F-bus tap is offline.

- 13** To determine which F-bus taps are associated with the card you are replacing, type

**>TRNSL 0**

and press the Enter key.

*Example of a MAP response:*



## LIU7 cards

### in a SuperNode SE LIS or ENI shelf (continued)

---

| Site | Flr | RPos | Bay_id | Shf   | Description  | Slot | EqPEC          |
|------|-----|------|--------|-------|--------------|------|----------------|
| HOST | 01  | F02  | SCC    | 0     | MS 0:0:12    | 08   | 9X73BA FRNT 17 |
| HOST | 01  | F02  | SCC    | 0     | MS 0:0:12    | 08   | 9X79BA BACK 18 |
| FBus | 0   | Tap  | 0      | is on | LIU7 100     |      |                |
| FBus | 0   | Tap  | 11     | is on | LIU7 111     |      |                |
| FBus | 0   | Tap  | 12     | is on | LIU7 200     |      |                |
| FBus | 0   | Tap  | 13     | is on | LIU7 201     |      |                |
| FBus | 0   | Tap  | 14     | is on | LIU7 202     |      |                |
| FBus | 0   | Tap  | 15     | is on | LIU7 203     |      |                |
| FBus | 0   | Tap  | 16     | is on | LIU7 204     |      |                |
| FBus | 0   | Tap  | 17     | is on | NIU 1 unit 0 |      |                |
| FBus | 0   | Tap  | 18     | is on | NIU 1 unit 1 |      |                |
| FBus | 0   | Tap  | 19     | is on | FRIU 222     |      |                |
| FBus | 0   | Tap  | 20     | is on | EIU 224      |      |                |
| FBus | 0   | Tap  | 21     | is on | LIU7 209     |      |                |
| FBus | 0   | Tap  | 22     | is on | LIU7 210     |      |                |
| FBus | 0   | Tap  | 23     | is on | LIU7 211     |      |                |

**Note:** The tap numbers shown in the example are for the F-buses controlled by both MSs. The example MAP response indicates tap 12 on F-bus 0 and tap 12 on F-bus 1 are both associated with LIU7 number 200.

**14** Record the tap number associated with the LIU7 you are working on.

**15** To manually busy the LIU7 tap on F-bus 0, type

**>BSY 0 TAP tap\_no**

and press the Enter key.

where

**tap\_no**

is the number of the F-bus tap recorded in step 14

*Example of a MAP display:*

Request to MAN BUSY MS: 0 shelf: 0 card: 12 port: 0 Tap: 12 submitted.  
Request to MAN BUSY MS: 0 shelf: 0 card: 12 port: 0 Tap: 12 passed.

**16** To manually busy the LIU7 tap on F-bus 1, type

**>BSY 1 TAP tap\_no FORCE**

and press the Enter key.

where

**tap\_no**

is the number of the F-bus tap recorded in step 14

*Example of a MAP display:*

Warning, P-side nodes may be isolated.  
Please confirm ("YES", "Y", "NO", or "N"):

## LIU7 cards in a SuperNode SE LIS or ENI shelf (continued)

- 17 To confirm the command, type

>YES

and press the Enter key.

*Example of a MAP display:*

Request to MAN BUSY MS: 1 shelf: 0 card: 12 port: 0 Tap: 12 submitted.  
Request to MAN BUSY MS: 1 shelf: 0 card: 12 port: 0 Tap: 12 passed.

### *At the LIS or ENI shelf*

- 18



#### **WARNING**

##### **Static electricity damage**

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. This protects the cards against damage caused by static electricity.

The next action depends on the card you replace.

| <b>If you are replacing</b> | <b>Do</b> |
|-----------------------------|-----------|
| an NT9X76                   | step 19   |
| an NTEX22                   | step 21   |
| a back plane card           | step 24   |

- 19 To change an NT9X76 card, unseat and reseat cards in the LIU7 using the following sub-steps. To unseat a card, use the procedure *Unseating cards in equipment shelves* in this document. To reseat a card, use the procedure *Reseating cards in equipment shelves* in this document.

- a Unseat the NT9X76 card.
- b Unseat the NTEX22 card.
- c Reseat the NTEX22 card.

- 20 Replace the NT9X76 card using the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

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

Go to step 25.

- 21 To change an NTEX22 card, unseat the NT9X76 card using the procedure *Unseating cards in equipment shelves* in this document. Complete the procedure and return to this point.

## LIU7 cards

### in a SuperNode SE LIS or ENI shelf (continued)

- 22 Replace the NTEX22 card using the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- Note:** If the card being replaced has switches, make sure that the switches on the replacement card have the same settings.
- 23 Reseat the NT9X76 card using the procedure *Reseating cards in equipment shelves* in this document. Complete the procedure and return to this point. Go to step 25.
- 24 Replace the card using the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- Note:** If the card being replaced has switches, make sure that the switches on the replacement card have the same settings.

#### At the MAP terminal

- 25 To return to service the F-bus 0 tap you busied in step 15, type
- >RTS 0 TAP tap\_no**
- and press the Enter key.
- where

**tap\_no**

is the number of the F-bus tap recorded in step 14

Example of a MAP response:

Request to RTS MS: 0 shelf: 0 card: 12 port: 0 Tap: 12 submitted.  
Request to RTS MS: 0 shelf: 0 card: 12 port: 0 Tap: 12 passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 26 |
| failed             | step 36 |

- 26 To return to service the F-bus tap you busied in step 16 type
- >RTS 1 TAP tap\_no**
- and press the Enter key.
- where

**tap\_no**

is the number of the F-bus tap recorded in step 14

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 27 |
| failed             | step 36 |

## LIU7 cards

### in a SuperNode SE LIS or ENI shelf (continued)

- 27 The next action depends on your reason for performing this procedure.
- | If you were                                                       | Do      |
|-------------------------------------------------------------------|---------|
| directed to this procedure from another maintenance procedure     | step 28 |
| not directed to this procedure from another maintenance procedure | step 29 |
- 28 Return to the maintenance procedure that sent you to this procedure and continue as directed.
- 29 To access the PM level of the MAP display, type  
**>PM**  
and press the Enter key.
- 30 To post the LIU7 you are working on, type  
**>POST LIU7 liu\_no**  
and press the Enter key.  
*where*  
    **liu\_no**  
        is the number of the LIU7 (0 to 511)
- 31 To load the LIU7, type  
**>LOADPM**  
and press the Enter key.  
*Example of a MAP response:*  
  
LIU7 208 LOADPM Passed
- | If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 33 |
| failed                | step 32 |
- 32 Load the PM using the procedure *Loading a PM* in this document. Complete the procedure and return to this point.
- 33 To return the LIU7 to service, type  
**>RTS**  
and press the Enter key.  
*Example of a MAP response:*

## LIU7 cards in a SuperNode SE LIS or ENI shelf (end)

---

LIU7 100 RTS Passed

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 34 |
| failed             | step 36 |

- 34** Activate the CCS7 link (if there is one) associated with the LIU7 using the procedure *Activating CCS7 links* in this document. Complete the procedure and return to this point.  
Go to step 38.
- 35** Consult office personnel to determine why the component is offline. Continue as directed by office personnel.
- 36** For further assistance, contact the next level of support.
- 37** To abort the BSY FORCE request, type  
**>NO**  
and press the Enter key.  
*Example of a MAP response:*  
  
BSY command aborted due to imaging in progress.
- 38** The procedure is complete.

## NIU cards in a SuperNode SE LIS

---

### Application

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

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

| PEC    | Suffix | Card name                                     | Shelf or frame name                                              |
|--------|--------|-----------------------------------------------|------------------------------------------------------------------|
| NTEX22 | BB, CA | Integrated processor and F-bus interface card | link interface shelf (LIS), enhanced network and interface (ENI) |
| NTEX25 | AA, BA | NIU channel bus controller card               | LIS, ENI                                                         |
| NTEX28 | AA     | NIU DS30 link interface paddle board          | LIS, ENI                                                         |

### Common procedures

The following common procedures are referenced:

- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*
- *Loading a PM*

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

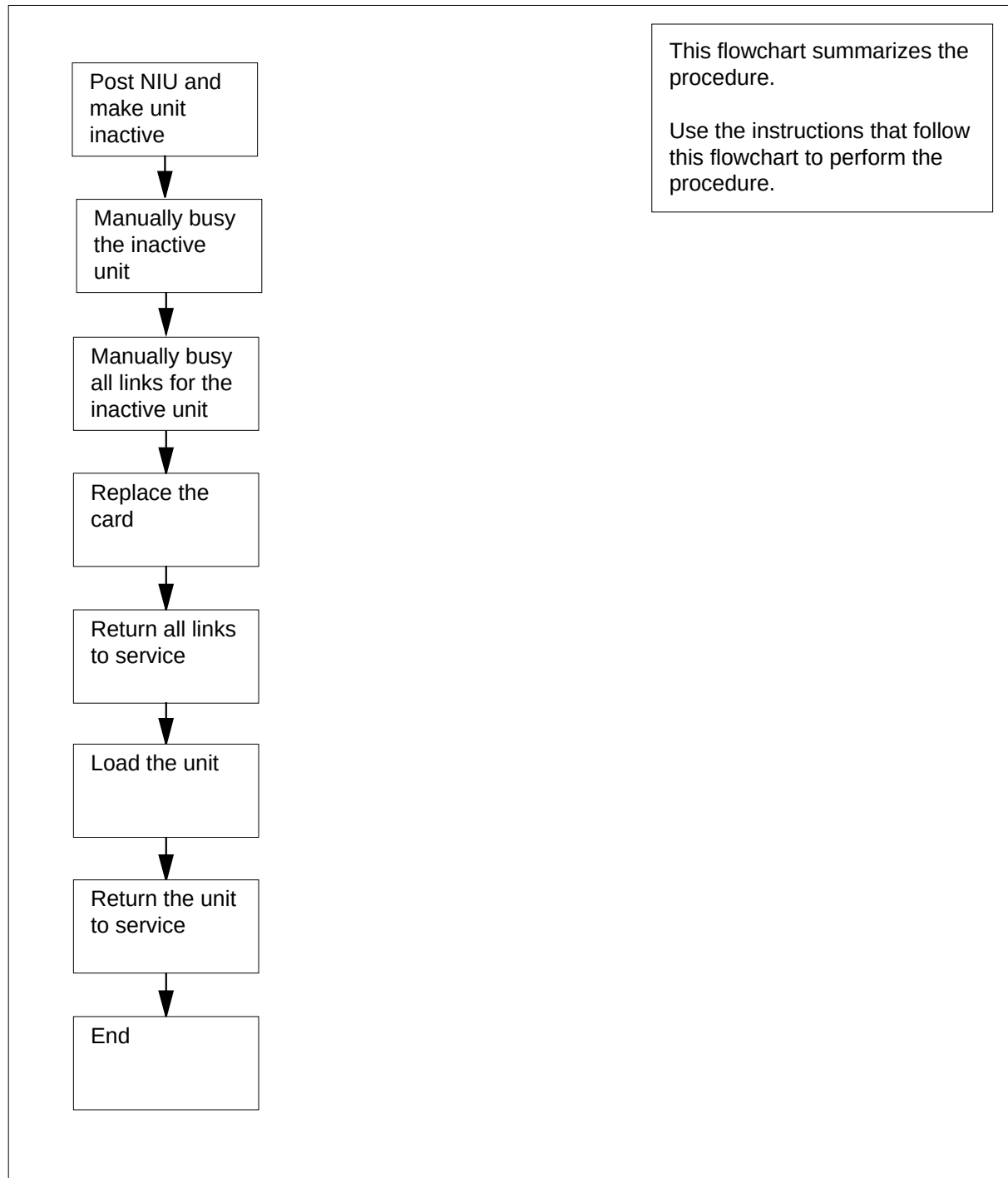
### Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

## NIU cards in a SuperNode SE LIS (continued)

---

### Summary of Replacing NIU cards in a SuperNode SE LIS



## NIU cards in a SuperNode SE LIS (continued)

### Replacing NIU cards in a SuperNode SE LIS

#### *At your current location*

1



#### **CAUTION**

##### **Service degradation**

To remove an NIU unit from service eliminates NIU redundancy for the shelf. If the in-service NIU unit goes out of service at any time during this maintenance procedure, channelized access is affected for all ASUs on the shelf. Perform this procedure during high traffic periods only if it is necessary to return the NIU to service. Unless it is urgent, only perform this procedure during periods of low traffic.



#### **CAUTION**

##### **Loss of packet handler service**

If the NTEX28 paddle board is removed, there can be a temporary loss of service on associated X.25/X.75 link interface units (XLIU). Perform this procedure during high traffic periods only if it is necessary to return the NIU to service. Unless it is urgent, perform this procedure only during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card has the same PEC, including PEC suffix, as the card being removed.

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

#### *At the MAP terminal*

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

**>MAPCI ; MTC ; PM**

and press the Enter key.

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 1    | 0    | 2    | 48   |
| NIU | 0    | 0    | 0    | 0    | 0    | 1    |



## NIU cards in a SuperNode SE LIS (continued)

- 4 To post the NIU that contains the card you replace, type

**>POST NIU niu\_no**

and press the Enter key.

where

**niu\_no**

is the NIU number (0 to 29)

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 1    | 0    | 2    | 48   |
| NIU | 0    | 0    | 0    | 0    | 0    | 1    |

NIU 1: InSv  
Unit 0: InAct InSv  
Unit 1: Act InSv

- 5 Determine the state of the NIU unit that contains the card you replace

| If the state of the NIU unit                                          | Do      |
|-----------------------------------------------------------------------|---------|
| is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA), and active   | step 6  |
| is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA), and inactive | step 8  |
| is ManB                                                               | step 9  |
| is OffL                                                               | step 37 |

- 6 Determine the state of the mate NIU unit.

| If the state of the mate NIU unit | Do      |
|-----------------------------------|---------|
| is ISTb or InSv                   | step 7  |
| is anything else                  | step 38 |

- 7 To switch activity, type

**>SWACT**

and press the Enter key.

*Example of a MAP response:*

## NIU cards in a SuperNode SE LIS (continued)

NIU 1 SwAct PM: Request has been submitted.  
NIU 1 SwAct PM: Command completed.  
The node has switched activity

| If the SWACT command | Do      |
|----------------------|---------|
| passed               | step 8  |
| failed               | step 38 |

- 8** To manually busy the inactive NIU unit, type

**>BSY INACTIVE**

and press the Enter key.

*Example 1 of a MAP display:*

NIU 1 Busy Inactive Unit: Request has been submitted.  
NIU 1 Busy Inactive Unit: Command completed.  
The Unit is manually busy.

*Example 2 of MAP display:*

Imaging is currently in progress on NIU x Unit Y.  
Busying the NIU will cause imaging on this NIU to be aborted.  
Do you wish to continue?  
Please conform ("YES", "Y", "NO" or "N").

| If the response is    | Do      |
|-----------------------|---------|
| as shown in example 2 | step 9  |
| anything else         | step 11 |

- 9** Imaging is being performed on the NIU unit you are working on. Contact the next level of support to determine if it is safe to proceed. Continue as directed.

| If the response is     | Do      |
|------------------------|---------|
| yes, proceed with busy | step 10 |
| no, abort busy         | step 41 |

- 10** To confirm Busy, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

## NIU cards in a SuperNode SE LIS (continued)

Imaging will be aborted on NIU x, Unit y.

- 11** The next action depends on the type of card you replace

| If the card               | Do      |
|---------------------------|---------|
| is an NTEX28              | step 10 |
| is other than listed here | step 12 |

- 12** To access the DEVICES level of the MAP display, type

**>DEVICES**

and press the Enter key.

*Example of a MAP display:*

```

 SysB ManB OffL CBsy ISTb InSv
 PM 0 0 1 0 5 45
 NIU 0 0 0 0 1 0

NIU 1: ISTb
Unit 0: InAct ManB
Unit 1: Act InSv

 Net Links
 0 1 2 3
PB 0
PB 1

 CBUS ports 00S
 2
 .

```

- 13** To manually busy the network links for the inactive NIU unit, type

**>BSYLNKS INACTIVE**

and press the Enter key.

*Example of a MAP display:*

```

 Net Links
 0 1 2 3
PB 0 P P P P
PB 1
BSYLNKS INACTIVE
Command completed.

 CBUS ports 00S
 2
 .

```

**Note:** Paddle board 0 is associated with NIU unit 0; paddle board 1 is associated with NIU unit 1.

| If the BSYLNKS command | Do      |
|------------------------|---------|
| passed                 | step 12 |

## NIU cards in a SuperNode SE LIS (continued)

- |  | If the BSYLNKS command | Do      |
|--|------------------------|---------|
|  | failed                 | step 38 |
- 14** To access the MS level of the MAP display, type  
**>MAPCI;MTC;MS**  
 and press the Enter key.  
*Example of a MAP display:*
- ```

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

```
- 15** To access the F-bus level of the MAP display, type
>SHELF 0;CARD 12
 and press the Enter key.
Example of a MAP display:
- ```

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

Card 12 FBus Tap: 0 11 12 16 20
MS 0
MS 1

```
- CARD:
- Note 1:** A dot under the F-bus header indicates the F-bus is in service. An S indicates the F-bus is system busy. An M indicates the F-bus is manual busy. An I indicates the F-bus is in-service trouble, and an O indicates the F-bus is offline.
- Note 2:** Under the F-bus tap numbers, a C indicates the F-bus is manual busy or the controlling MS or MS port is system busy or manual busy. An S indicates the F-bus tap is system busy. A dot indicates the F-bus tap is in service. An M indicates the F-bus tap is manual busy. An I indicates the F-bus tap is in-service trouble, and a dash (-) indicates the F-bus tap is offline.
- 16** To determine which F-bus taps are associated with the card you replace, type  
**>TRNSL 0**  
 and press the Enter key.  
*Example of a MAP response:*

## NIU cards in a SuperNode SE LIS (continued)

| Site                             | Flr | RPos | Bay_id | Shf | Description  | Slot | EqPEC          |
|----------------------------------|-----|------|--------|-----|--------------|------|----------------|
| HOST                             | 01  | F02  | SCC    | 0   | 39 MS 0:0:12 | 08   | 9X73BA FRNT 17 |
| HOST                             | 01  | F02  | SCC    | 0   | 39 MS 0:0:12 | 08   | 9X79BA BACK 18 |
| FBus 0 Tap 0 is on LIU7 100      |     |      |        |     |              |      |                |
| FBus 0 Tap 11 is on LIU7 111     |     |      |        |     |              |      |                |
| FBus 0 Tap 12 is on LIU7 200     |     |      |        |     |              |      |                |
| FBus 0 Tap 13 is on LIU7 201     |     |      |        |     |              |      |                |
| FBus 0 Tap 14 is on LIU7 202     |     |      |        |     |              |      |                |
| FBus 0 Tap 15 is on LIU7 203     |     |      |        |     |              |      |                |
| FBus 0 Tap 16 is on LIU7 204     |     |      |        |     |              |      |                |
| FBus 0 Tap 17 is on NIU 1 unit 0 |     |      |        |     |              |      |                |
| FBus 0 Tap 18 is on NIU 1 unit 1 |     |      |        |     |              |      |                |
| FBus 0 Tap 19 is on XLIU 222     |     |      |        |     |              |      |                |
| FBus 0 Tap 20 is on XLIU 224     |     |      |        |     |              |      |                |
| FBus 0 Tap 21 is on LIU7 209     |     |      |        |     |              |      |                |
| FBus 0 Tap 22 is on LIU7 210     |     |      |        |     |              |      |                |
| FBus 0 Tap 23 is on LIU7 211     |     |      |        |     |              |      |                |

**Note:** The tap numbers shown in the example are for the F-buses controlled by both MSs. The example MAP response indicates tap 17 on F-bus 0 and tap 17 on F-bus 1 are both associated with unit 0 of NIU 1.

**17** Record the tap number associated with the NIU unit you are working on.

**18** To manually busy the NIU tap on F-bus 0, type

**>BSY 0 TAP tap\_no**

and press the Enter key.

where

**tap\_no**

is the number of the F-bus tap recorded in step 17

*Example of a MAP response:*

Request to MAN BUSY MS: 0 shelf: 0 card: 12 port: 0 Tap: 5 submitted.

Request to MAN BUSY MS: 0 shelf: 0 card: 12 port: 0 Tap: 5 passed.

**19** To manually busy the NIU tap on F-bus 1, type

**>BSY 1 TAP tap\_no FORCE**

and press the Enter key.

where

**tap\_no**

is the number of the F-bus tap recorded in step 17

*Example of a MAP display:*

## NIU cards in a SuperNode SE LIS (continued)

---

Warning, P-side nodes may be isolated.  
Please confirm ("YES", "Y", "NO", or "N"):

- 20** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Request to MAN BUSY MS: 1 shelf: 0 card: 12 port: 0 Tap: 5  
submitted.

Request to MAN BUSY MS: 1 shelf: 0 card: 12 port: 0 Tap: 5  
passed.

- 21** The next action depends on the type of card you replace

| If the card               | Do      |
|---------------------------|---------|
| is an NTEX28              | step 20 |
| is other than listed here | step 27 |

## NIU cards in a SuperNode SE LIS (continued)

---

*At the LIS or ENI shelf*

22



**WARNING**

**Static electricity damage**

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. This protects the cards against damage caused by static electricity.



**WARNING**

**Possible loss of service**

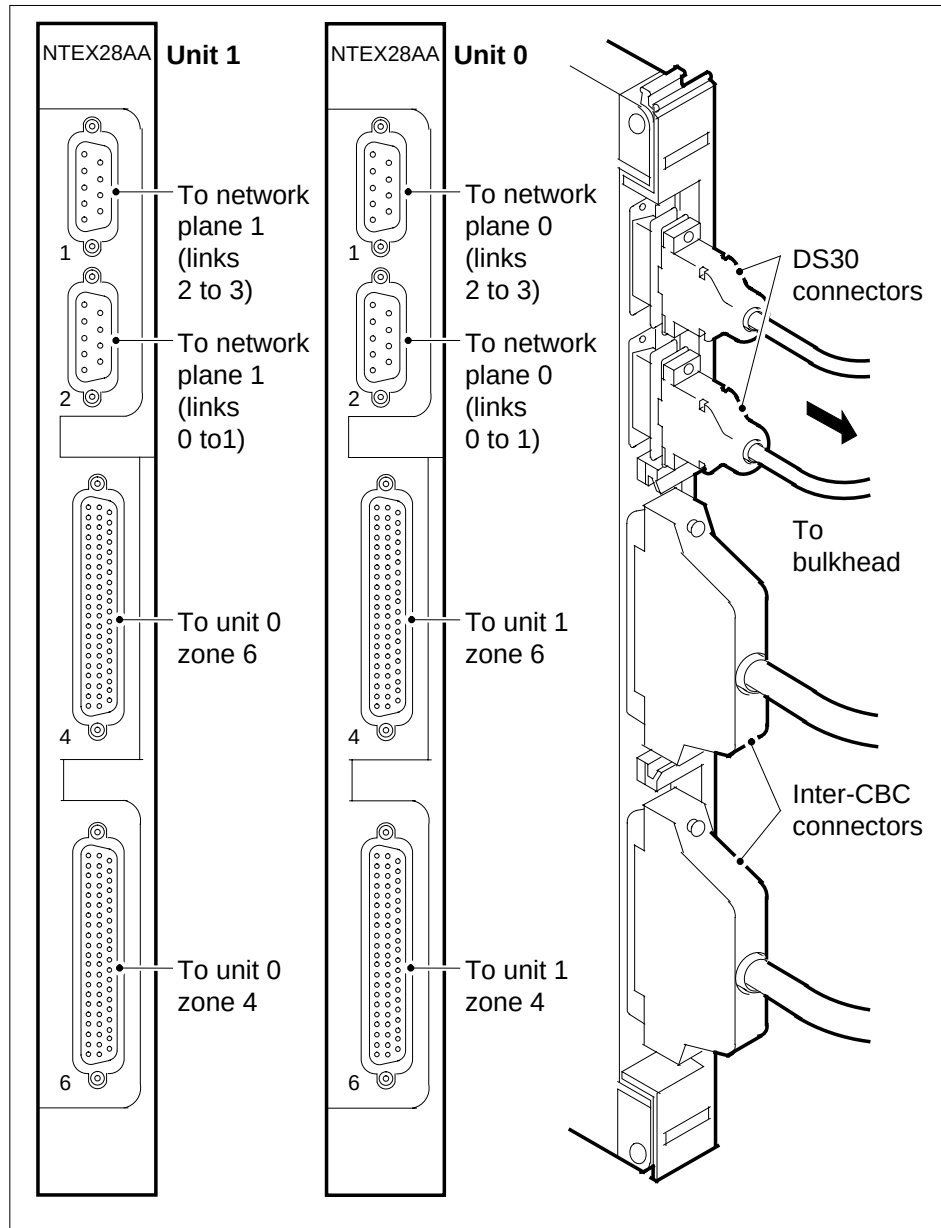
You must avoid cross-connecting the cables when they are reconnected to the new NTEX28 paddle board. Loss of service can occur if you cross-connect the cables when the NIU returns to service.

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

**Note 1:** If the card you are replacing has switches, make sure that the switches on the replacement card have the same settings.

**Note 2:** When removing the old NTEX28 card and inserting the replacement card, use the illustration on the following page to identify and label connectors.

## NIU cards in a SuperNode SE LIS (continued)



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

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



NIU cards  
in a SuperNode SE LIS (continued)

- 24
- To post the NIU that contains the card you will replace, type  
**>POST NIU niu\_no**  
and press the Enter key.  
*where*  
**niu\_no**  
is the NIU number (0 to 29)
- 25
- To access the DEVICES level of the MAP display, type  
**>DEVICES**  
and press the Enter key.
- 26
- To return the network links on the inactive NIU unit to service, type  
**>RTSLNKS INACTIVE**  
and press the Enter key.  
*Example of a MAP display:*

|                    |           |   |   |   |            |     |
|--------------------|-----------|---|---|---|------------|-----|
|                    | Net Links |   |   |   |            |     |
|                    | 0         | 1 | 2 | 3 |            |     |
| PB 0               | .         | . | . | . | CBUS ports | OOS |
| PB 1               | .         | . | . | . | 2          |     |
| RTSLNKS            | INACTIVE  |   |   |   | .          |     |
| Command completed. |           |   |   |   |            |     |

| If the RTSLNKS command | Do      |
|------------------------|---------|
| passed                 | step 25 |
| failed                 | step 38 |

- 27
- To access the MS level of the MAP display, type  
**>MAPCI;MTC;MS**  
and press the Enter key.
- 28
- To access the F-bus level of the MAP display, type  
**>SHELF 0;CARD 12**  
and press the Enter key.  
Go to step 30.

## NIU cards in a SuperNode SE LIS (continued)

### At the LIS shelf

29

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

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) to handle circuit cards. This protects the cards against damage caused by static electricity.

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

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

### At the MAP terminal

**30** To return to service the F-bus 0 tap you busied in step 18, type

**>RTS 0 TAP tap\_no**

and press the Enter key.

where

**tap\_no**

is the number of the F-bus tap recorded in step 17

*Example of a MAP response:*

Request to RTS MS: 0 shelf: 0 card: 12 port: 0 Tap:5 submitted.

Request to RTS MS: 0 shelf: 0 card: 12 port: 0 Tap: 5 passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 29 |
| failed             | step 38 |

**31** To return to service the F-bus tap you busied in step 19, type

**>RTS 1 TAP tap\_no**

and press the Enter key.

where

## NIU cards in a SuperNode SE LIS (continued)

- tap\_no**  
is the number of the F-bus tap recorded in step 18
- | If the RTS command | Do      |
|--------------------|---------|
| passed             | step 30 |
| failed             | step 38 |
- 32** The next action depends on the reason you perform this procedure.
- | If you were                                    | Do      |
|------------------------------------------------|---------|
| directed here from a maintenance procedure     | step 31 |
| not directed here from a maintenance procedure | step 32 |
- 33** Return to the maintenance procedure that sent you to this procedure and continue as directed.
- 34** To access the PM level of the MAP display, type  
**>PM**  
and press the Enter key.
- 35** To post the NIU that contains the card you replace, type  
**>POST NIU niu\_no**  
and press the Enter key.  
**niu\_no**  
is the NIU number (0 to 29)
- 36** To load the inactive NIU unit, type  
**>LOADPM INACTIVE**  
and press the Enter key.
- Examples of MAP responses:*
- Example 1*
- NIU 1 Load Inactive Unit: Request has been submitted.  
NIU 1 Load Unit 0: Command completed.  
The Unit contains the "NRS0 123BA" load.
- Example 2*

## NIU cards in a SuperNode SE LIS (end)

Warning: Loadfile NRS09BA is meant for an EX22BB.  
 Warning: NIU 2 Unit 1 has been datafilled with an EX22CA.  
 Warning: Load/Processor mismatch.  
 Warning: Valid only for EX22 upgrades.  
 NIU 2 load Inactive Unit: Request has been submitted.  
 NIU 2 Load Unit 1: Command completed.  
 The Unit contains the "NRS09BA" load.

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 36 |
| failed                | step 35 |

- 37** Load the PM using the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 38** To return the inactive NIU unit to service, type

**>RTS INACTIVE**

and press the Enter key.

*Example of a MAP response:*

NIU 1 RTS Inactive Unit: Request has been submitted.  
 NIU 1RTS Inactive Unit: Command completed.  
 The Unit is in service

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 39 |
| failed             | step 38 |

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

- 40** For further assistance, contact the next level of support.

- 41** To abort Busy, type

**>NO**

and press the Enter key. Busy request has been aborted, node imaging is continuing.

*Example of MAP response:*

Aborted.

- 42** The procedure is complete.

## NT9X30 in a SuperNode SE LIS

---

### Application

Use this procedure to replace an NT9X30 in a SuperNode SE (SNSE) link interface shelf.

The Index has a list of the cards, shelves and frames documented in this card replacement book. Refer to the Index if you cannot identify the product engineering code (PEC), PEC suffix, shelf or frame to be replaced.

| PEC    | Suffix | Card name                       | Shelf or frame name |
|--------|--------|---------------------------------|---------------------|
| NT9X30 | AA     | +5V 86-A power converter        | LIS                 |
| NT9X30 | AB     | Global +5V 86-A power converter | LIS                 |

### Common procedures

This procedure refers to the following common procedures:

- *Activating CCS7 links*
- *Deactivating CCS7 links*
- *Loading a PM*
- *Moving an XSG to a spare XLIU*
- *Replacing a card*
- *Replacing cards in equipment shelves*
- *Removing cards in equipment shelves*
- *Verifying load compatibility of SuperNode cards*

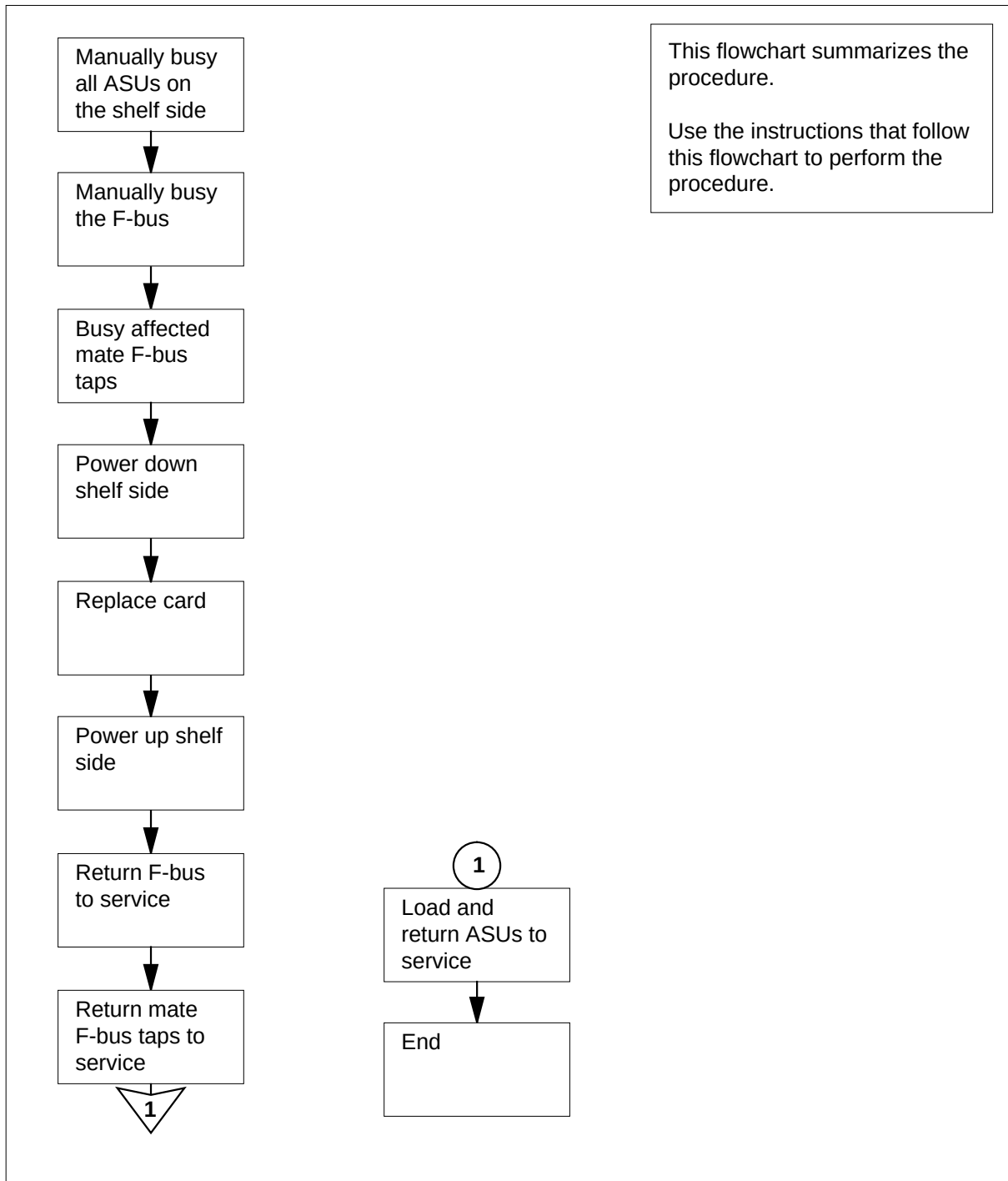
Do not go to the common procedure unless the step-action procedure directs you.

### Action

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

## NT9X30 in a SuperNode SE LIS (continued)

### Summary of Replacing a NT9X30 in a SuperNode SE LIS



## NT9X30 in a SuperNode SE LIS (continued)

---

### Replacing a NT9X30 in a SuperNode SE LIS

#### *At your current location*

1



#### **WARNING**

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

This procedure removes all application specific units (ASU), from service for an entire shelf side. Service provided by these ASUs will degrade or stop for more than one hour. After you replace the power converter card, you must reload a peripheral module (PM) for all ASUs on the shelf side. Perform this procedure during high traffic periods only if you must return power to the shelf side. Unless it is urgent, perform this procedure during periods of low traffic.

Obtain a replacement card. Make sure that the replacement card and the card you remove has the same product engineering code (PEC) and PEC suffix.

- 2 Perform the procedure *Verifying load compatibility of SuperNode cards* in this document. Complete the procedure, and return to this point.
- 3 Determine the PM number and slot location of each ASU on the shelf side. The shelf side associates with the NTX9X30 you replace.

| If                                                                            | Do      |
|-------------------------------------------------------------------------------|---------|
| you know the PM number and slot location of each ASU on the shelf side        | step 13 |
| you do not know the PM number and slot location of each ASU on the shelf side | step 4  |

**Note:** ASUs for an SNSE LIS include network interface units (NIU) and ethernet interface units (EIU). They also include CCS7 link interface units (LIU7), X.25/X.75 interface units (XLIU), and frame-relay interface units (FRIU).

#### *At the MAP terminal*

- 4 To access the CI level of the MAP display, type  
**>QUIT ALL**  
and press the Enter key.

## NT9X30 in a SuperNode SE LIS (continued)

- 5 To access table NIUINV, type

**>TABLE NIUINV;FORMAT PACK**

and press the Enter key.

*Example of a MAP response:*

```
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: NIUINV
<line length>: 76 columns can be output per line.
<pack mode>: Pack mode is ON.
<indent column>: Indented lines will begin in column 1.
<first column>: The first column of output is column 1.
```

- 6 To list the NIUs, type

**>LIST ALL**

and press the Enter key.

*Example of a MAP response:*

```
TOPNUMBER LOCATION LOAD U0INFO U1INFO NETLINKS

1 MS 12 0 2 NRS04AR NTEX22BB NTEX25AA NTEX28AA NTEX22BB
NTEX25BA NTEX28AA
(0 15 4 0) (0 15 5 0) (0 15 6 0) (0 15 7 0) $
```

BOTTOM

**Note 1:** The NIU number appears in column 1 and the controlling entity appears in column 2. The number of the MS interface card appears in column 3.

**Note 2:** An MS controls the NIU on an SNSE LIS. Twelve interface cards are present on the MS.

| If                                                                | Do     |
|-------------------------------------------------------------------|--------|
| NIU is on the LIS that contains the NT9X30 card you replace       | step 7 |
| A NIU is not on the LIS that contains the NT9X30 card you replace | step 8 |

- 7 Record the number of the NIU that associates with the LIS shelf.

**Note:** In the MAP display generated in step 6, the number of the NIU on the LIS is 1.

- 8 To quit table NIUINV, type

**>QUIT**

and press the Enter key.



## NT9X30 in a SuperNode SE LIS (continued)

- 9 To access table LIUINV, type  
**>TABLE LIUINV;FORMAT PACK**  
and press the Enter key.
- 10 To list all ASUs for the office, type  
**>LIST ALL**  
and press the Enter key.

*Example of a MAP response:*

```

TOP
LIU7 100 MS 12 0 1 8 LRS04AR NTEX22BB NT9X76AA NT9X78AA
FBUS
LIU7 111 MS 12 0 1 30 LRS04AR NTEX22BB NT9X76AA NT9X78AA
FBUS
LIU7 200 MS 12 0 2 8 LRS04AR NTEX22BB NT9X76AA NT9X78BA
FBUS 56000 NIL
LIU7 201 MS 12 0 2 10 LRS04AR NTEX22BB NT9X76AA NT9X78BA
FBUS 56000 NIL
LIU7 202 MS 12 0 2 12 LRS04AR NTEX22BB NT9X76AA NT9X78BA
FBUS 56000 NIL
LIU7 203 MS 12 0 2 14 LRS04AR NTEX22BB NT9X76AA NT9X78BA
FBUS 56000 NIL
LIU7 204 MS 12 0 2 16 LRS04AR NTEX22BB NT9X76AA NT9X78BA
FBUS 56000 NIL
LIU7 209 MS 12 0 2 26 LRS04AR NTEX22BB NT9X76AA NT9X78BA
FBUS 56000 NIL
LIU7 210 MS 12 0 2 28 LRS04AR NTEX22BB NT9X76AA NT9X78BA
FBUS 56000 NIL
LIU7 211 MS 12 0 2 30 LRS04AR NTEX22BB NT9X76AA NT9X78BA
FBUS 56000 NIL
XLIU 222 MS 12 0 2 22 XRX4AQ NTEX22BB NTFX10AA NTFX09AA
XLIU 224 MS 12 0 2 24 XRX4AQ NTEX22BB NTFX10AA NTFX09AA
BOTTOM

```

**Note 1:** The ASU number appears in columns 1 and 2. The controlling entity appears in column 3. The number of the associated MS interface card appears in column 4. The number of the associated MS port appears in column 5. The shelf number appears in column 6. The slot number of the the card on the far left appears in column 7.

**Note 2:** In the MAP response example, two LIU7 are on the ENI shelf. Eight LIU7 and two XLIU are on the LIS shelf. The numbers of the LIU7 on the ENI shelf are 100 and 111. The numbers of the LIU7 on the LIS shelf are 200, 201, 202, 203, 204, 209, 210, and 211. The XLIU numbers are 222 and 224.

- 11 Record the number and slot location for each ASU on the shelf side that associates with NT9X30.
- 12 To quit table LIUINV, type  
**>QUIT**

## NT9X30

### in a SuperNode SE LIS (continued)

and press the Enter key.

**At the MAP terminal**

**13**

#### ATTENTION

The following routines provide instructions to remove ASUs from service in this order: NIU, LIU7, XLIU, FRIU, and EIU.

You can remove ASUs from service in a different order. The priority of services supported by these ASUs and/or the configuration of the shelf side determines the order of removal. Consult operating company personnel or the next level of support to verify service priorities.

To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |            |           |            |           |            |            |
|----|------------|-----------|------------|-----------|------------|------------|
| PM | SysB<br>11 | ManB<br>0 | OffL<br>11 | CBsy<br>4 | ISTb<br>16 | InSv<br>38 |
|----|------------|-----------|------------|-----------|------------|------------|

**14** The next step depends if the LIS has NIUs.

| If LIS            | Do      |
|-------------------|---------|
| has NIU           | step 15 |
| does not have NIU | step 20 |

**15**



#### WARNING

##### Potential loss of channelized access

The following routine removes an NIU from service, which eliminates NIU redundancy for the associated LIS. The in-service NIU unit can go out of service at any time during this maintenance procedure. An out of service affects channelized access for all ASUs on both sides of the LIS.

To post the NIU, type

**>POST NIU niu\_no**

and press the Enter key.

## NT9X30 in a SuperNode SE LIS (continued)

where

**niu\_no**  
is the NIU number (0 to 29)

Example of a MAP display:

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 0    | 1    | 0    | 2    | 48   |
| NIU | 0    | 0    | 0    | 0    | 0    | 1    |

NIU 1: InSv  
Unit 0: InAct InSv  
Unit 1: Act InSv

- 16** Determine the state of the NIU unit that associates with the shelf side you are working on.

| If the state of the NIU unit                                        | Do       |
|---------------------------------------------------------------------|----------|
| is ISTb, InSv, SysB, SysB (NA), ISTb (NA), or ManB (NA), and active | step 17  |
| is ISTb, InSv, SysB, SysB (NA), or ISTb (NA), and inactive          | step 19  |
| is ManB or ManB (NA)                                                | step 20  |
| is OffL                                                             | step 114 |

- 17** Determine the state of the mate NIU unit.

| If the state of the mate NIU unit | Do       |
|-----------------------------------|----------|
| is ISTb or InSv                   | step 18  |
| is other than listed here         | step 110 |

- 18** To switch activity, type  
**>SWACT**  
and press the Enter key.

Example of a MAP response:

NIU 1 SwAct PM: Request has been submitted.  
NIU 1 SwAct PM:Command completed.  
The node has switched activity

| If the SWACT command | Do      |
|----------------------|---------|
| passed               | step 19 |

## NT9X30 in a SuperNode SE LIS (continued)

|    | If the SWACT command                                                                                                                                                                                                                                                                    | Do       |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|    | failed                                                                                                                                                                                                                                                                                  | step 115 |
| 19 | To manually busy the inactive NIU unit, type<br><b>&gt;BSY INACTIVE</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>NIU 1 Busy Inactive Unit: Request has been submitted.<br>NIU 1 Busy Inactive Unit: Command completed.<br><br>The Unit is manually busy. |          |
| 20 | The next step depends if the side of the LIS has CCS7 link interface units (LIU7). The side of the LIS contains the NT9X30 card you want to replace.                                                                                                                                    |          |
|    | If shelf side                                                                                                                                                                                                                                                                           | Do       |
|    | has LIU7s                                                                                                                                                                                                                                                                               | step 21  |
|    | does not have LIU7s                                                                                                                                                                                                                                                                     | step 27  |
| 21 |                                                                                                                                                                                                                                                                                         |          |

**WARNING****Loss of service**

The following routine removes an LIU7 from service. This routine temporarily interrupts messaging on the associated CCS7 link.

To post the LIU7, type

**>POST LIU7 liu\_no**

and press the Enter key.

where

**liu\_no**

is the LIU7 number (0 to 511)

*Example of a MAP display:*

## NT9X30

### in a SuperNode SE LIS (continued)

|      | PM  | SysB | ManB | OffL | CBsy | ISTb | InSv |
|------|-----|------|------|------|------|------|------|
| LIU7 |     | 1    | 0    | 2    | 0    | 3    | 6    |
|      |     | 1    | 0    | 0    | 0    | 0    | 3    |
| LIU7 | 208 | InSv |      | Rsvd |      |      |      |

- 22** To deactivate the CCS7 link that associates with the LIU7, perform the procedure *Deactivating CCS7 links* in this document. Complete the procedure and return to this point.

- 23** Determine the state of the LIU7.

**Note:** The state of the LIU7 appears on the right of the LIU7 number. This appears in the example MAP display in step 21.

| If the state of the LIU7          | Do       |
|-----------------------------------|----------|
| is SysB, SysB (NA), ISTb, or InSv | step 24  |
| is ManB or ManB (NA)              | step 26  |
| is OffL                           | step 114 |

- 24** To manually busy the LIU7, type  
**>BSY FORCE**  
and press the Enter key.

| If                                            | Do      |
|-----------------------------------------------|---------|
| the system prompts you to confirm the command | step 25 |
| the command passed                            | step 26 |

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

*Example of a MAP response:*

LIU7 204 BSTY passed.

- 26** Repeat steps 21 to 25 for all LIU7s on the shelf side you are working on.

## NT9X30 in a SuperNode SE LIS (continued)

- 27 The next step depends if the XLIUs are on the side of the LIS that contains the NT9X30 card you want to replace.

| If shelf side      | Do      |
|--------------------|---------|
| has XLIU           | step 28 |
| does not have XLIU | step 35 |

28



### WARNING

#### Loss of packet handler service

The following routine removes an XLIU from service. The routine temporarily interrupts traffic on associated X.25/X.75 channels.

To post the XLIU, type

**>POST XLIU xliu\_no**

and press the Enter key.

where

**xliu\_no**

is the XLIU number (0 to 511)

Example of a MAP display:

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
|      | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM   | 0    | 2    | 23   | 0    | 10   | 30   |
| XLIU | 0    | 0    | 0    | 0    | 0    | 3    |
| XLIU | 27   | InSv | Rsvd |      |      |      |

- 29 Determine the state of the XLIU.

**Note:** The state of the XLIU is on the right of the XLIU number. Refer to the example MAP display in step 28.

| If the state of the XLIU                | Do       |
|-----------------------------------------|----------|
| is SysB, ISTb (NA), ManB, ISTb, or InSv | step 30  |
| is OffL                                 | step 114 |

- 30 Determine if the XLIU is a spare XLIU.

**Note:** You can identify spare XLIUs by the code Spre on the right of the service condition. This appears in the MAP display example in step 28. An

## NT9X30 in a SuperNode SE LIS (continued)

XLIU with an X.25/X.75 service group (XSG) assigned to it is identified by the code Rsvd.

|    | If the XLIU                                                                                                                                                                                                                                                                                                                   | Do       |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|    | is a spare, and the state is ManB                                                                                                                                                                                                                                                                                             | step 34  |
|    | is a spare, and the state is other than listed here.                                                                                                                                                                                                                                                                          | step 33  |
|    | is not a spare                                                                                                                                                                                                                                                                                                                | step 31  |
| 31 | Determine from office records or from operating company personnel the number of a spare XLIU.<br><b>Note:</b> The spare XLIU must be on the same shelf as the out-of-service XLIU.                                                                                                                                            |          |
|    | If a spare XLIU                                                                                                                                                                                                                                                                                                               | Do       |
|    | is available                                                                                                                                                                                                                                                                                                                  | step 32  |
|    | is not available and the reserved XLIU is out of service                                                                                                                                                                                                                                                                      | step 33  |
|    | is not available and the reserved XLIU is in service                                                                                                                                                                                                                                                                          | step 111 |
| 32 | Move the XSG from the reserved XLIU to the spare XLIU. Consult the procedure <i>Moving an XSG to a spare XLIU</i> in this document. Complete the procedure and return to this point.<br><b>Note:</b> The XLIU for which you change cards becomes the spare. In the following steps, this XLIU is the spare.<br>Go to step 34. |          |
| 33 | To manually busy the XLIU, type<br><b>&gt;BSY</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>XLIU 27 BSY Passed                                                                                                                                                                                  |          |
| 34 | Repeat steps 28 to 33 for all XLIUs on the shelf side you are working on.                                                                                                                                                                                                                                                     |          |
| 35 | The next step depends if FRIUs are on the side of the LIS that contains the NT9X30 card you want to replace.                                                                                                                                                                                                                  |          |
|    | If shelf side                                                                                                                                                                                                                                                                                                                 | Do       |
|    | has FRIUs                                                                                                                                                                                                                                                                                                                     | step 36  |

## NT9X30

### in a SuperNode SE LIS (continued)

36

| If shelf side       | Do      |
|---------------------|---------|
| does not have FRIUs | step 50 |

**WARNING****Loss of frame relay service**

The following routine removes an FRIU from service. The routine temporarily interrupts traffic on the associated access or trunking DS-1 channels.

To post the FRIU, type

**>POST FRIU friu\_no**

and press the Enter key.

where

**friu\_no**

is the number of the FRIU (0 to 500)

*Example of a MAP display:*

|      |        |      |      |      |      |      |
|------|--------|------|------|------|------|------|
|      | SysB   | ManB | OffL | CBsy | ISTb | InSv |
| PM   | 1      | 0    | 27   | 0    | 8    | 29   |
| FRIU | 1      | 0    | 19   | 0    | 6    | 28   |
| FRIU | 8 InSv | Rsvd |      |      |      |      |

37 Determine the state of the FRIU.

**Note:** The state of the FRIU is on the right of the FRIU number. The state of the FRIU appears in the example MAP display in step 36.

| If the state of the FRIU          | Do       |
|-----------------------------------|----------|
| is SysB, ISTb (NA), InSv, or ISTb | step 38  |
| is ManB                           | step 49  |
| is OffL                           | step 114 |

38 To access the CHAN level of the MAP display, type

**>CARR; CHAN**

and press the Enter key.

*Example of a MAP display:*



## NT9X30

### in a SuperNode SE LIS (continued)

|         |        |             |      |       |      |      |      |
|---------|--------|-------------|------|-------|------|------|------|
|         | PM     | SysB        | ManB | OffL  | CBsy | ISTb | InSv |
|         | FRIU   | 1           | 0    | 27    | 0    | 8    | 29   |
|         |        | 1           | 0    | 19    | 0    | 6    | 28   |
| FRIU    | 8 InSv | Rsvd        |      | Alarm | BER  | ES   | SES  |
| CARRIER |        |             |      |       | -8.3 | 0    | 0    |
| InSv    |        |             |      |       |      |      | UAS  |
| CHANNEL | 1      |             |      |       |      |      | 0    |
|         | .      |             |      |       |      |      |      |
| CHANNEL | 1      | ( 24 x DS0) |      |       |      |      |      |
| InSv    |        |             |      |       |      |      |      |
| CHAN:   |        |             |      |       |      |      |      |

- 39** Determine if the FRIU has channelized access.

**Note:** A non-channelized FRIU has one assigned channel. A channelized FRIU has four or 24 assigned channels.

| If the FRIU        | Do      |
|--------------------|---------|
| is non-channelized | step 40 |
| is channelized     | step 42 |

- 40** To manually busy the channel, type

**>BSY**

and press the Enter key.

- 41** To confirm the command, type

**>YES**

and press the Enter key.

**Note:** If the channel is out of service, the system does not request confirmation.

Go to step 44.

- 42** To manually busy all channels, type

**>BSY ALL**

and press the Enter key.

- 43** To confirm the command type

**>YES**

and press the Enter key.

**Note:** If all channels are out of service, the system does not request confirmation.

- 44** To access the CARR level of the MAP display type

**>QUIT**

## NT9X30 in a SuperNode SE LIS (continued)

and press the Enter key.

*Example of a MAP display:*

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
|      | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM   | 1    | 0    | 27   | 0    | 8    | 29   |
| FRIU | 1    | 0    | 19   | 0    | 6    | 28   |

|         |   |      |       |      |    |     |
|---------|---|------|-------|------|----|-----|
| FRIU    | 8 | InSv | Rsvd  |      |    |     |
| CARRIER |   |      | Alarm | BER  | ES | SES |
| InSv    |   |      |       | -8.3 | 0  | 0   |
| CHANNEL | 1 |      |       |      |    | 0   |

- 45** To manually busy the carrier, type

**>BSY**

and press the Enter key.

*Example of a MAP response:*

Busying this carrier will affect 1 channels.  
Please confirm ("YES", "Y", "NO", or "N"):

- 46** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Confirmed...BSY passed.

**Note:** If the carrier is out of service, the system does not request confirmation.

- 47** To quit the CARR level type

**>QUIT**

and press the Enter key.

- 48** To manually busy the FRIU type

**>BSY FORCE**

and press the Enter key.

*Example of a MAP response:*

Billing data is stored in the FRIU.  
Uploading billing data ...  
Uploaded FRS Billing data successfully ...  
FRIU 8 BSY Passed

- 49** Repeat steps 36 to 48 for all FRIUs on the shelf side you are working on.

## NT9X30 in a SuperNode SE LIS (continued)

- 50 The next step depends if EIUs are in the shelf side that associates with the NT9X30.

| If shelf side      | Do      |
|--------------------|---------|
| has EIUs           | step 51 |
| does not have EIUs | step 56 |

51



### WARNING

#### Loss of service capacity

The following routine can remove an EIU from service, so the LAN cannot access the Ethernet address. If other EIUs do not provide alternative addresses to the LAN, ASUs on the shelf will be isolated.

To post the EIU, type

**>POST EIU eiu\_no**

and press the Enter key.

where

**eiu\_no**

is the EIU number (0 to 511)

Example of a MAP display:

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 2    | 0    | 7    | 0    | 14   | 63   |
| EIU | 0    | 0    | 0    | 0    | 0    | 1    |

|     |   |      |      |
|-----|---|------|------|
| EIU | 1 | InSv | Rsvd |
|-----|---|------|------|

- 52 Determine the state of the EIU.

| If the state of the EIU           | Do       |
|-----------------------------------|----------|
| is SysB, SysB (NA), ISTb, or InSv | step 53  |
| is ManB or ManB (NA)              | step 55  |
| is OffL                           | step 114 |

- 53 To manually busy the EIU, type

**>BSY**

## NT9X30 in a SuperNode SE LIS (continued)

and press the Enter key.

| If                              | Do      |
|---------------------------------|---------|
| the command passed              | step 55 |
| you need to confirm the command | step 54 |

**54** To confirm the busy command type

**>YES**

and press the Enter key.

| If the BSY command | Do       |
|--------------------|----------|
| passed             | step 55  |
| failed             | step 115 |

**55** Repeat steps 51 to 54 for all EIUs on the shelf side you are working on.

**56** To access the MS level of the MAP display, type

**>MAPCI;MTC;MS**

and press the Enter key.

*Example of a MAP display:*

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

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

**Note:** MS 0 controls F-bus 0, which is the mate F-bus for a card in slot 32F, 32R, or 30R. MS 1 controls F-bus 1, which is the mate F-bus for a card in slot 7F, 7R, or 8R.

| If the MS that controls the mate F-bus | Do      |
|----------------------------------------|---------|
| is in service or in-service trouble    | step 59 |
| is other than listed here              | step 58 |

**58** Return the MS to service by following the correct MS alarm clearing procedure in *Alarm and Performance Monitoring Procedures*. Complete the procedure and return to this point.

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

**>SHELF 0;CARD 12**

NT9X30  
in a SuperNode SE LIS (continued)

and press the Enter key.

Example of a MAP display:

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

Card 12 FBus Tap: 0 11 12 16 20
MS 0 . . . : : : : : : : : :
MS 1 . . . : : : : : : : : :
```

CARD:

**Note 1:** A dot (.) under the F-bus header indicates the F-bus is in service. An S indicates the F-bus is system busy. An M indicates the F-bus is manually busy. An I indicates the F-bus is in-service trouble. An O indicates that the F-bus is offline.

**Note 2:** Under the F-bus tap numbers, a C indicates the F-bus is manually busy. A C can also mean the controlling MS or MS port is system busy or manually busy. An S indicates the F-bus tap is system busy. A dot (.) indicates the F-bus tap is in service. An M indicates the F-bus tap is manually busy. An I indicates the F-bus tap is in-service trouble. A dash (-) indicates the F-bus tap is offline .

60 Determine the state of the mate F-bus and the provisioned mate F-bus taps.

**Note:** F-bus 0 (controlled by MS 0) is the mate F-bus that associates with a card in slot 30R, 32R, or 32F. F-bus 1 (controlled by MS 1) is the mate that associates with a card in slot 7R, 8R, or 7F.

| If the states                                                                                         | Do       |
|-------------------------------------------------------------------------------------------------------|----------|
| are in-service. The state of the F-bus is InSv and all F-bus taps are . (dot)                         | step 61  |
| are in any other state. The state of the F-bus is not InSv and one or more F-bus taps are not . (dot) | step 112 |

## NT9X30 in a SuperNode SE LIS (continued)

61

**WARNING****Potential loss of service**

Make sure that the mate F-bus and the F-bus taps on the mate are in service. Make sure that the buses are in service before you manually busy the F-bus that associates with the card you want to replace. If you manually busy the F-bus while the mates are out of service, you will isolate nodes on the LIS.

To manually busy the F-bus associated with the NT9X30 card you want to replace, type

**>BSY ms\_no FBUS**

and press the Enter key.

where

**ms\_no**

is the number of the MS (0 or 1) that controls the F-bus

**Note:** MS 0 controls F-bus 0. F-bus 0 associates with a NT9X30 card in slot 4F. MS 1 controls F-bus 1. F-bus 1 associates with an NT9X30 card in slot 36F.

*Example of a MAP response:*

```
Request MAN BSY MS: 0 shelf 0 card:12 port 0
FBus requires confirmation because
the following NIUs may be active on this bus...
NIU 001 unit 0
NIU 001 unit 1
Please confirm ("YES", "Y", "NO", or "N")
```

| If the response                  | Do      |
|----------------------------------|---------|
| indicates the BSY command passed | step 63 |
| requests confirmation            | step 62 |

62

To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

## NT9X30 in a SuperNode SE LIS (continued)

```
Request MAN BSY MS: 0 shelf 0 card:12 port 0FBus
submitted
Request MAN BSY MS: 0 shelf 0 card:12 port 0FBus
passed
```

- 63** To determine which taps on the mate F-bus associate with each ASU on the NT9X30 card you replace, type

**>TRNSL 0**

and press the Enter key.

*Example of a MAP response:*

| Site | Flr | RPos   | Bay_id             | Shf | Description  | Slot | EqPEC          |
|------|-----|--------|--------------------|-----|--------------|------|----------------|
| HOST | 01  | F02    | SCC                | 0   | 39 MS 0:0:12 | 08   | 9X73BA FRNT 17 |
| HOST | 01  | F02    | SCC                | 0   | 39 MS 0:0:12 | 08   | 9X79BA BACK 18 |
| FBus | 0   | Tap 0  | is on LIU7 100     |     |              |      |                |
| FBus | 0   | Tap 11 | is on LIU7 111     |     |              |      |                |
| FBus | 0   | Tap 12 | is on LIU7 200     |     |              |      |                |
| FBus | 0   | Tap 13 | is on LIU7 201     |     |              |      |                |
| FBus | 0   | Tap 14 | is on LIU7 202     |     |              |      |                |
| FBus | 0   | Tap 15 | is on LIU7 203     |     |              |      |                |
| FBus | 0   | Tap 16 | is on LIU7 204     |     |              |      |                |
| FBus | 0   | Tap 17 | is on NIU 1 unit 0 |     |              |      |                |
| FBus | 0   | Tap 18 | is on NIU 1 unit 1 |     |              |      |                |
| FBus | 0   | Tap 19 | is on XLIU 222     |     |              |      |                |
| FBus | 0   | Tap 20 | is on XLIU 224     |     |              |      |                |
| FBus | 0   | Tap 21 | is on LIU7 209     |     |              |      |                |
| FBus | 0   | Tap 22 | is on LIU7 210     |     |              |      |                |
| FBus | 0   | Tap 23 | is on LIU7 211     |     |              |      |                |

**Note:** The tap numbers that appear in the example are for the F-buses. The Two MSs control the F-buses. In the MAP response example, tap 0 on F-bus 0 and tap 0 on F-bus 1 associate with LIU7 number 100.

- 64** Record the mate F-bus tap numbers for each ASU. The NT9X30 card you replace powers each ASU.

- 65** Select a tap to work on.

- 66** To manually busy the first mate F-bus tap you recorded in step 64, type

**>BSY ms\_no TAP tap\_no**

and press the Enter key.

*where*

**ms\_no**

is the number of the MS (0 or 1) that controls the mate F-bus

**tap\_no**

is the number of a tap

## NT9X30 in a SuperNode SE LIS (continued)

**Note:** The MS 0 controls F-bus 0. The F-bus is the mate F-bus for an NT9X30 card in slot 36F. The MS 1 controls F-bus 1. The F-bus 1 is the mate F-bus for an NT9X30 card in slot 4F.

*Example of a MAP display:*

Warning, P-side nodes may be isolated.  
Please confirm ("YES", "Y", "NO", or "N"):

- 67 To confirm the command, type  
**>YES**  
and press the Enter key.
- 68 Repeat steps 66 and 67 for the mate F-bus taps that remain. You recorded the F-bus taps that remain in step 64.

**At the LIS shelf**

69



### WARNING

#### Static electricity damage

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

To power down the NT9X30 card, press down and release the power switch on the faceplate of the card. The CONVERTER OFF LED turns on when the converter powers down.

| If the CONVERTER OFF LED | Do       |
|--------------------------|----------|
| is lit                   | step 70  |
| is not lit               | step 113 |

- 70 Review the procedure *Unseating cards in equipment shelves* in this document. Unseat the NT9X74 card on the shelf side. Complete the procedure and return to this point.

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

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



---

## NT9X30 in a SuperNode SE LIS (continued)

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- 72 To power up the NT9X30 card, lift and release the power switch on the faceplate of the card . The CONVERTER OFF LED turns off when the converter powers up.

---

| If the CONVERTER OFF LED | Do       |
|--------------------------|----------|
| is not lit               | step 73  |
| is lit                   | step 113 |

---

- 73 To reseal the NT9X74 card, perform the procedure *Reseating cards in equipment shelves* in this document. Complete the procedure and return to this point.

### *At the MAP terminal*

- 74 To return to service the F-bus that you manually busied in step 61, type  
**>RTS ms\_no FBUS**  
and press the Enter key.

where

**ms\_no**

is the number of the MS (0 or 1)

*Example of a MAP response:*

Request return to Service MS: 0 shelf 0 card:12 port 0FBus  
submitted

Request return to Service MS: 0 shelf 0 card:12 port 0FBus  
passed

---

| If the RTS command | Do       |
|--------------------|----------|
| passed             | step 75  |
| failed             | step 115 |

---

- 75 To return to service one of the mate F-bus taps that you busied in steps 66 to 68, type

**>RTS ms\_no TAP tap\_no**

and press the Enter key.

where

**ms\_no**

is the number of the MS (0 or 1) that controls the mate F-bus

**tap\_no**

is the tap number

**Note:** You recorded the tap numbers in step 64.

*Example of a MAP response:*

## NT9X30

### in a SuperNode SE LIS (continued)

Request to RTS MS: 0 shelf: 0 card: 12 tap: 0 submitted.  
Request to RTS MS: 0 shelf: 0 card: 12 tap: 0 passed.

|           | <b>If the RTS command</b>                                                                    | <b>Do</b> |
|-----------|----------------------------------------------------------------------------------------------|-----------|
|           | passed                                                                                       | step 76   |
|           | failed                                                                                       | step 115  |
| <b>76</b> | Repeat step 75 for each of the mate F-bus taps that you busied in steps 66 to 68.            |           |
| <b>77</b> | To access the PM level of the MAP display, type<br><b>&gt;PM</b><br>and press the Enter key. |           |
| <b>78</b> | Determine if the NIUs are in the LIS you are working on.                                     |           |
|           | <b>If shelf</b>                                                                              | <b>Do</b> |
|           | has an NIU                                                                                   | step 79   |
|           | does not have an NIU                                                                         | step 83   |

**79**

#### ATTENTION

The following routines provide instructions to return ASUs to service in this order: NIU, LIU7, FRIU, XLIU, and EIU.

The priority of services that the ASUs support can require you to return ASUs to service in a different order. The configuration of the shelf side can also require you to return ASUs to service in a different order. Contact operating company personnel or the next level of support to verify service priorities.

To post the NIU, type

**>POST NIU niu\_no**

and press the Enter key.

where

**niu\_no**

is the number of the NIU (0 to 29)

**80** To load the inactive NIU unit, type

**>LOADPM INACTIVE**

## NT9X30 in a SuperNode SE LIS (continued)

and press the Enter key.

*Example of a MAP response:*

NIU 1 Load Inactive Unit: Request has been submitted.  
NIU 1 Load Unit 0: Command completed.  
The Unit contains the "NRS0 123BA" load.

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 82 |
| failed                | step 81 |

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

**82** To return the inactive NIU unit to service, type

**>RTS INACTIVE**

and press the Enter key.

*Example of a MAP response:*

NIU 1 RTS Inactive Unit: Request has been submitted.  
NIU 1 RTS Inactive Unit: Command completed.  
The Unit is in service

| If the RTS command | Do       |
|--------------------|----------|
| passed             | step 83  |
| failed             | step 115 |

**83** Determine if the CCS7 link interface units (LIU7) are in the shelf side that contains the NT9X30 you replaced.

| If shelf side       | Do      |
|---------------------|---------|
| has LIU7s           | step 84 |
| does not have LIU7s | step 90 |

**84** To post the LIU7, type  
**>POST LIU7 liu\_no**

and press the Enter key.

*where*

**liu\_no**

is the number of the LIU7 (0 to 511)

## NT9X30 in a SuperNode SE LIS (continued)

- 85** To load the LIU7, type  
**>LOADPM**  
 and press the Enter key.

*Example of a MAP response:*

LIU7 208 LOADPM Passed

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 87 |
| failed                | step 86 |

- 86** To load the PM, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 87** To return the LIU7 to service, type  
**>RTS**  
 and press the Enter key.

*Example of a MAP response:*

LIU7 100 RTS Passed

| If the RTS command | Do       |
|--------------------|----------|
| passed             | step 88  |
| failed             | step 115 |

- 88** To activate the CCS7 link that associates with the LIU7, perform the procedure *Activating CCS7 links* in this document. Complete the procedure and return to this point.

- 89** Repeat steps 84 to 88 for all LIU7s on the shelf side.

- 90** Determine if the FRIUs are in the shelf side that contains the NT9X30.

| If shelf side      | Do       |
|--------------------|----------|
| has FRIU           | step 91  |
| does not have FRIU | step 102 |

- 91** To post the FRIU, type  
**>POST FRIU friu\_no**  
 and press the Enter key.  
*where*

---

## NT9X30

### in a SuperNode SE LIS (continued)

---

**friu\_no**

is the number of the FRIU (0 to 500)

- 92** To load the FRIU, type

**>LOADPM**

and press the Enter key.

*Example of a MAP response:*

FRIU 8 LOADPM Passed

---

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 94 |
| failed                | step 93 |

---

- 93** To load the FRIU, perform the procedure *Loading a PM* in this document. Complete the procedure and return to this point.

- 94** To return the FRIU to service, type

**>RTS**

and press the Enter key.

*Example of a MAP response:*

FRIU 8 RTS Passed

---

| If the RTS command | Do       |
|--------------------|----------|
| passed             | step 95  |
| failed             | step 115 |

---

- 95** To access the CARR level of the MAP display, type

**>CARR**

and press the Enter key.

- 96** To return the carrier to service, type

**>RTS**

and press the Enter key.

*Example of a MAP response:*

RTS passed.

- 97** Wait until the Mtce flag on the right of the CARRIER header does not appear in the display. The carrier will go ISTb at this point.

## NT9X30 in a SuperNode SE LIS (continued)

- |            |                                                                                                                                                                                                                          |           |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>98</b>  | Wait 1 min for the carrier to go in service.                                                                                                                                                                             |           |
|            | <b>If after 1 min the state of the carrier</b>                                                                                                                                                                           | <b>Do</b> |
|            | is InSv                                                                                                                                                                                                                  | step 99   |
|            | is any other state                                                                                                                                                                                                       | step 115  |
| <b>99</b>  | To access the CHAN level of the MAP display, type<br><b>&gt;CHAN</b><br>and press the Enter key.                                                                                                                         |           |
| <b>100</b> | To return the carrier to service, type<br><b>&gt;RTS</b><br>and press the Enter key.<br><i>Example of a MAP response:</i><br><br>RTS passed.                                                                             |           |
| <b>101</b> | Repeat steps 91 to 100 for all FRIUs on the shelf side.                                                                                                                                                                  |           |
| <b>102</b> | Determine if the XLIUs or EIUs are in the shelf side that associates with the NT9X30.                                                                                                                                    |           |
|            | <b>If shelf side</b>                                                                                                                                                                                                     | <b>Do</b> |
|            | has XLIUs or EIUs                                                                                                                                                                                                        | step 103  |
|            | does not have XLIUs or EIUs                                                                                                                                                                                              | step 108  |
| <b>103</b> | To post the XLIU or EIU, type<br><b>&gt;POST asu_type asu_no</b><br>and press the Enter key.<br><i>where</i><br><b>asu_type</b><br>is the ASU type (XLIU or EIU)<br><b>asu_no</b><br>is the number of the ASU (0 to 511) |           |
| <b>104</b> | To load the XLIU or EIU, type<br><b>&gt;LOADPM</b><br>and press the Enter key.                                                                                                                                           |           |
|            | <b>If the LOADPM command</b>                                                                                                                                                                                             | <b>Do</b> |
|            | passed                                                                                                                                                                                                                   | step 106  |

## NT9X30

### in a SuperNode SE LIS (end)

|            | If the LOADPM command                                                                                                                                                                                                                                                                                   | Do       |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|            | failed                                                                                                                                                                                                                                                                                                  | step 105 |
| <b>105</b> | To load the XLIU, perform the procedure <i>Loading a PM</i> in this document. Complete the procedure and return to this point.                                                                                                                                                                          |          |
| <b>106</b> | To return the XLIU or EIU to service, type<br><b>&gt;RTS</b><br>and press the Enter key.                                                                                                                                                                                                                |          |
|            | If the RTS command                                                                                                                                                                                                                                                                                      | Do       |
|            | passed                                                                                                                                                                                                                                                                                                  | step 107 |
|            | failed                                                                                                                                                                                                                                                                                                  | step 115 |
| <b>107</b> | Repeat steps 103 to 106 for all XLIU and EIUs on the shelf side.                                                                                                                                                                                                                                        |          |
| <b>108</b> | Determine the reason that you perform this procedure.                                                                                                                                                                                                                                                   |          |
|            | If a maintenance procedure                                                                                                                                                                                                                                                                              | Do       |
|            | directed you to this procedure                                                                                                                                                                                                                                                                          | step 109 |
|            | did not direct you to this procedure                                                                                                                                                                                                                                                                    | step 116 |
| <b>109</b> | Return to the maintenance procedure that sent you to this procedure and continue as directed.                                                                                                                                                                                                           |          |
| <b>110</b> | Clear all faults on the inactive NIU unit before you complete the activity switch. If you do not clear all faults, a loss of service will occur. For direction on how to proceed, contact the next level of support. Continue as directed by the next level of support.                                 |          |
| <b>111</b> | Move the XSG to a spare XLIU before you manually busy an XLIU that has an XSG. If you do not perform this procedure, service degradation will occur for a long period of time. For direction on how to proceed, contact the next level of support. Continue as directed by the next level of support.   |          |
| <b>112</b> | If you continue this procedure, you can isolate a minimum of one application specific unit (ASU). To determine if you must continue this procedure, contact operating company personnel or the next level of support. Continue as directed by operating company personnel or the next level of support. |          |
| <b>113</b> | Do not continue this procedure if the power converter is not powered down correctly. For direction on how to proceed, contact operating company personnel or the next level of support.                                                                                                                 |          |
| <b>114</b> | To determine why the component is offline, contact operating company personnel. Continue as directed by operating company personnel.                                                                                                                                                                    |          |
| <b>115</b> | For additional help, contact the next level of support.                                                                                                                                                                                                                                                 |          |
| <b>116</b> | The procedure is complete.                                                                                                                                                                                                                                                                              |          |

---

## XLIU cards in a SuperNode SE LIS

---

### Application

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

| PEC    | Suffix     | Card name                                     | Shelf or frame name                                              |
|--------|------------|-----------------------------------------------|------------------------------------------------------------------|
| NTEX22 | BA, BB, CA | Integrated processor and F-bus interface card | link interface shelf (LIS), enhanced network and interface (ENI) |
| NTFX09 | AA         | C-bus interface paddle board                  | LIS, ENI                                                         |
| NTFX10 | AA         | HDLC frame processor card                     | LIS, ENI                                                         |

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

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

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

### Common procedures

This procedure refers to the following common procedures:

- *Loading a PM*
- *Moving an XSG to a spare XLIU*
- *Replacing a card*
- *Verifying load compatibility of SuperNode cards*

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

### Action

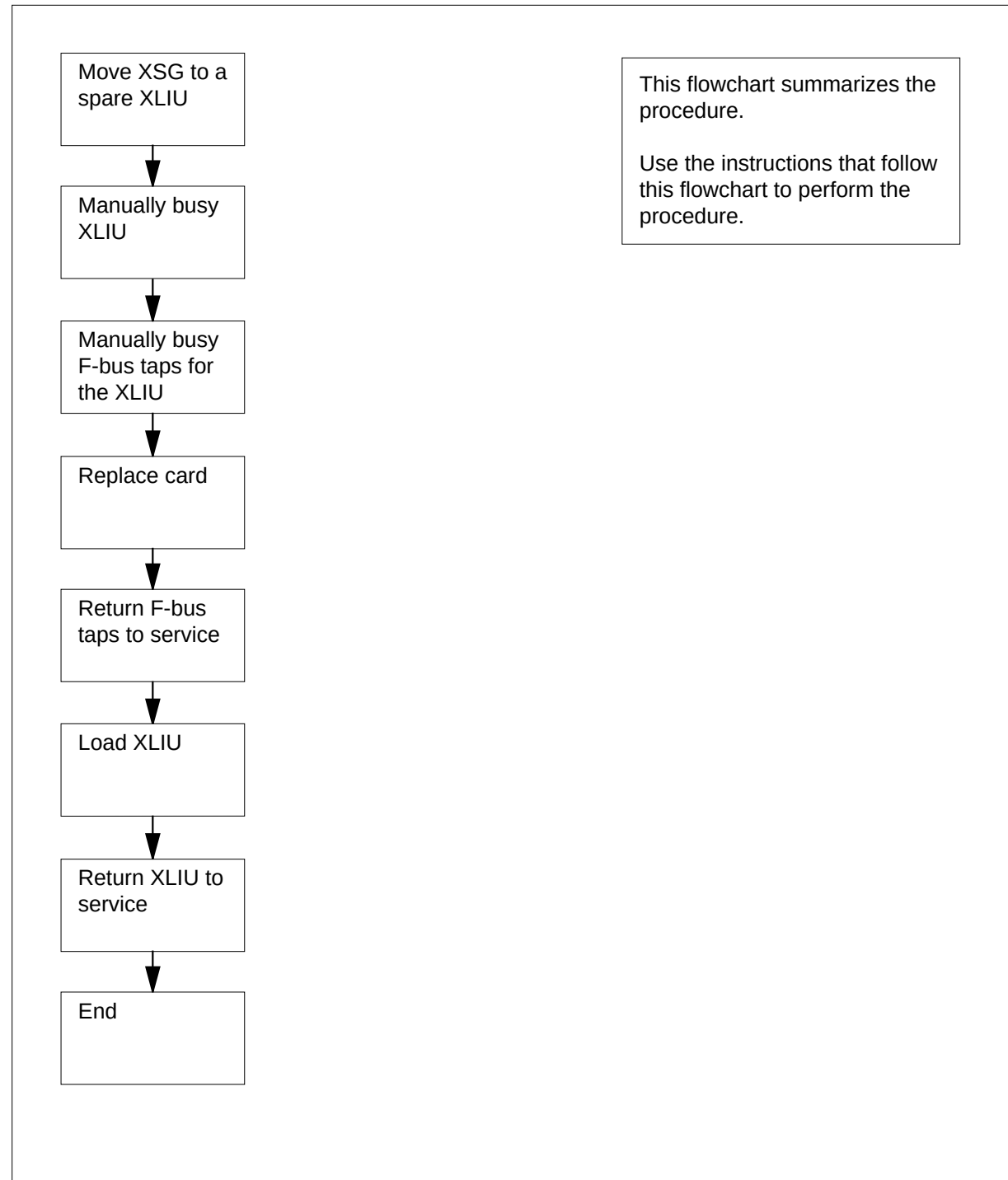
This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Follow the steps to perform the procedure.



## XLIU cards in a SuperNode SE LIS (continued)

---

### Summary of Replacing XLIU cards in a SuperNode SE LIS



## XLIU cards in a SuperNode SE LIS (continued)

### Replacing XLIU cards in a SuperNode SE LIS

#### *At your current location*

1



#### **WARNING**

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

This procedure removes an XLIU from service and temporarily interrupts traffic on associated X.25/X.75 channels. Perform this procedure only if you need to return the XLIU to service. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card you replace have the same PEC and PEC suffix.

2 Review the procedure *Verifying load compatibility of SuperNode cards* in this document. To make sure that the replacement card is compatible, perform the procedure. Complete the procedure and return to this point.

**Note:** Do not use this procedure for XLIU cards with PECs NTFX09 and NTFX10.

#### *At the MAP terminal*

3 To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

| PM | SysB | ManB | OffL | CBSy | ISTb | InSv |
|----|------|------|------|------|------|------|
|    | 0    | 1    | 23   | 0    | 10   | 30   |

4 To post the XLIU that associates with the card, type

**>POST XLIU xliu\_no**

and press the Enter key.

*where*

**xliu\_no**

is the number of the XLIU (0 to 511)

*Example of a MAP display:*

| PM   | SysB | ManB | OffL | CBSy | ISTb | InSv |
|------|------|------|------|------|------|------|
|      | 0    | 2    | 23   | 0    | 10   | 30   |
| XLIU | 0    | 0    | 0    | 0    | 0    | 3    |
| XLIU | 27   | InSv | Rsvd |      |      |      |

## XLIU cards in a SuperNode SE LIS (continued)

- 5 Determine the state of the XLIU.  
**Note:** The state of the XLIU is on the right of the XLIU number. The example MAP display in step 4 shows the state of the XLIU.
 

| If the state of the XLIU                | Do      |
|-----------------------------------------|---------|
| is SysB, ISTb (NA), ManB, ISTb, or InSv | step 6  |
| is OffL                                 | step 31 |
- 6 Determine if the XLIU is a spare.  
**Note:** The code Spre on the right of the service condition in the MAP display identifies a spare XLIU. The code Rsvd identifies an XLIU that has an X.25/X.75 service group (XSG).
 

| If the XLIU                                                         | Do      |
|---------------------------------------------------------------------|---------|
| is not a spare                                                      | step 7  |
| is a spare, and the service state is SysB, ISTb (NA), ISTb, or InSv | step 9  |
| is a spare, and the service state is ManB                           | step 12 |
- 7 Determine from office records or from operating company personnel the number of a spare XLIU.  
**Note:** The spare XLIU must be on the same shelf as the out-of-service XLIU.
 

| If a spare XLIU                                          | Do      |
|----------------------------------------------------------|---------|
| is available                                             | step 8  |
| is not available and the reserved XLIU is out of service | step 9  |
| is not available and the reserved XLIU is in service     | step 30 |
- 8 Move the XSG from the reserved XLIU to the spare XLIU. Perform the procedure *Moving an XSG to a spare XLIU* in this document. Complete the procedure and return to this point.  
**Note:** The XLIU that you change cards for is now the spare. This procedure refers to the XLIU as the spare in the following steps.  
 Go to step 12.

## XLIU cards in a SuperNode SE LIS (continued)

- 9** To manually busy the XLIU, type

**>BSY**

and press the Enter key.

*Example of a MAP response*

| If the response is                                                                                           | Do      |
|--------------------------------------------------------------------------------------------------------------|---------|
| XLIU 27 BSY Passed                                                                                           | step 11 |
| Warning: XLIU 27 is currently being imaged. The BSY command will be aborted unless the FORCE option is used. | step 10 |

- 10** To manually force bsy the XLIU, type

**>BSY FORCE**

and press the Enter key.

*Example of a MAP response:*

WARNING: XLIU 27 is currently being imaged.  
Do you wish to abort imaging to proceed with the BSY request?  
Please confirm ("YES", "Y", "NO", or "N"):

| If To                          | Do      |
|--------------------------------|---------|
| proceed with BSY FORCE request | step 11 |
| abort BSY FORCE request        | step 13 |

- 11** To force bsy the XLIU, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

Imaging will be aborted on XLIU 27.

- 12** To access the MS level of the MAP display, type

**>MAPCI;MTC;MS**

and press the Enter key.

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

- 13** To access the F-bus level of the MAP display, type  
**>SHELF 0;CARD 12**  
and press the Enter key.

*Example of a MAP display:*

```

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

Card 12 FBus Tap: 0 11 12 16 20
MS 0 . . .
MS 1 . . .

```

CARD :

**Note 1:** A dot ( . ) under the F-bus header indicates that the F-bus is in service. The letter S indicates the F-bus is system busy. The letter M indicates the F-bus is manually busy. The letter I indicates the F-bus is in-service trouble. The letter O indicates the F-bus is offline.

**Note 2:** The letter C appears under the F-bus tap numbers and indicates the F-bus is manually busy. The letter C can also indicate the controlling MS or MS port is system busy or manually busy. The letter S indicates the F-bus tap is system busy. A dot ( . ) indicates the F-bus tap is in service. The letter M indicates the F-bus tap is manually busy. The letter I indicates the F-bus tap is in-service trouble. A dash (-) indicates the F-bus tap is offline.

- 14** To determine which F-bus taps associate with the card that you replace, type  
**>TRNSL 0**  
and press the Enter key.

*Example of a MAP response:*

## XLIU cards in a SuperNode SE LIS (continued)

| Site | Flr | RPos | Bay_id | Shf        | Description | Slot | EqPEC          |
|------|-----|------|--------|------------|-------------|------|----------------|
| HOST | 01  | F02  | SCC    | 0          | MS 0:0:12   | 08   | 9X73BA FRNT 17 |
| HOST | 01  | F02  | SCC    | 0          | MS 0:0:12   | 08   | 9X79BA BACK 18 |
| FBus | 0   | Tap  | 0      | is on LIU7 | 100         |      |                |
| FBus | 0   | Tap  | 11     | is on LIU7 | 111         |      |                |
| FBus | 0   | Tap  | 12     | is on LIU7 | 200         |      |                |
| FBus | 0   | Tap  | 13     | is on LIU7 | 201         |      |                |
| FBus | 0   | Tap  | 14     | is on LIU7 | 202         |      |                |
| FBus | 0   | Tap  | 15     | is on LIU7 | 203         |      |                |
| FBus | 0   | Tap  | 16     | is on LIU7 | 204         |      |                |
| FBus | 0   | Tap  | 17     | is on NIU  | 1 unit 0    |      |                |
| FBus | 0   | Tap  | 18     | is on NIU  | 1 unit 1    |      |                |
| FBus | 0   | Tap  | 19     | is on XLIU | 222         |      |                |
| FBus | 0   | Tap  | 20     | is on XLIU | 224         |      |                |
| FBus | 0   | Tap  | 21     | is on LIU7 | 209         |      |                |
| FBus | 0   | Tap  | 22     | is on LIU7 | 210         |      |                |
| FBus | 0   | Tap  | 23     | is on LIU7 | 211         |      |                |

**Note:** The tap numbers that appear in the example are for the F-buses that both MSs control. The example MAP response indicates that tap 19 on F-bus 0 and tap 19 on F-bus 1 both associate with XLIU number 222.

**15** Record the tap number that associates with the XLIU.

**16** To manually busy the XLIU tap on F-bus 0, type

**>BSY 0 TAP tap\_no**

and press the Enter key.

where

**tap\_no**

is the number of the F-bus tap that you recorded in step 15

*Example of a MAP display:*

Warning, P-side nodes may be isolated.  
Please confirm ("YES", "Y", "NO", or "N"):

**17** To confirm the command, type

**>YES**

and press the Enter key.

**18** To manually busy the XLIU tap on F-bus 1, type

**>BSY 1 TAP tap\_no FORCE**

and press the Enter key.

where

**tap\_no**

is the number of the F-bus tap that you recorded in step 15

## XLIU cards in a SuperNode SE LIS (continued)

---

*Example of a MAP display:*

Warning, P-side nodes may be isolated.  
Please confirm ("YES", "Y", "NO", or "N"):

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

### ***At the LIS shelf***

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

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

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

- 21 To return to service the F-bus 0 tap that you busied in step 16, type  
**>RTS 0 TAP tap\_no**  
and press the Enter key.

*where*

**tap\_no**

is the number of the F-bus tap that you recorded in step 15

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 22 |
| failed             | step 32 |

- 22 To return to service the F-bus tap that you busied in step 18, type  
**>RTS 1 TAP tap\_no**  
and press the Enter key.

*where*

**tap\_no**

is the number of the F-bus tap recorded in step 15

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 23 |
| failed             | step 32 |

## XLIU cards in a SuperNode SE LIS (continued)

- 23** The next action depends on the reason that you perform this procedure.
- | If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 24 |
| did not direct you to this procedure | step 25 |
- 24** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.
- 25** To access the PM level of the MAP display, type  
**>PM**  
and press the Enter key.
- 26** To post the XLIU, type  
**>POST XLIU xliu\_no**  
and press the Enter key.  
*where*  
    **xliu\_no**  
        is the number of the XLIU (0 to 511)
- 27** To load the XLIU, type  
**>LOADPM**  
and press the Enter key.
- | If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 29 |
| failed                | step 28 |
- 28** To load the PM, perform the procedure *Loading a PM* in this document . Complete the procedure and return to this point.
- 29** To return the XLIU to service, type  
**>RTS**  
and press the Enter key.
- | If the RTS command | Do      |
|--------------------|---------|
| passed             | step 34 |
| failed             | step 32 |
- 30** Move the XSG to a spare XLIU before you manually busy an XLIU that has an assigned XSG. If you do not move the XSG to a spare XLIU, service degradation occurs for a long period of time. For directions on how to



## **XLIU cards in a SuperNode SE LIS (end)**

---

proceed without a spare XLIU, contact operating company personnel or the next level of support.

**31** Consult operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.

**32** For additional help, contact the next level of support.

**33** Abort the BSY FORCE request by typing

**>NO**

and pressing the Enter key.

*Example of a MAP response:*

BSY command aborted due to imaging in progress.

**34** The procedure is complete.

---

## 5 MTM card replacement procedures

---

This chapter provides card replacement procedures for the maintenance trunk module (MTM).

## NT1X76 in an MTM

---

### Application

Use this procedure to replace an NT1X76 card in a maintenance trunk module (MTM).

| PEC    | Suffixes | Name                  |
|--------|----------|-----------------------|
| NT1X76 | AE       | DRAM PROM memory card |

If you cannot identify the product engineering code (PEC), suffix, and shelf or frame for the card you want to replace, refer to the index. The index contains a list of cards, shelves, and frames for this card replacement Northern Telecom Publication (NTP).

### Common procedures

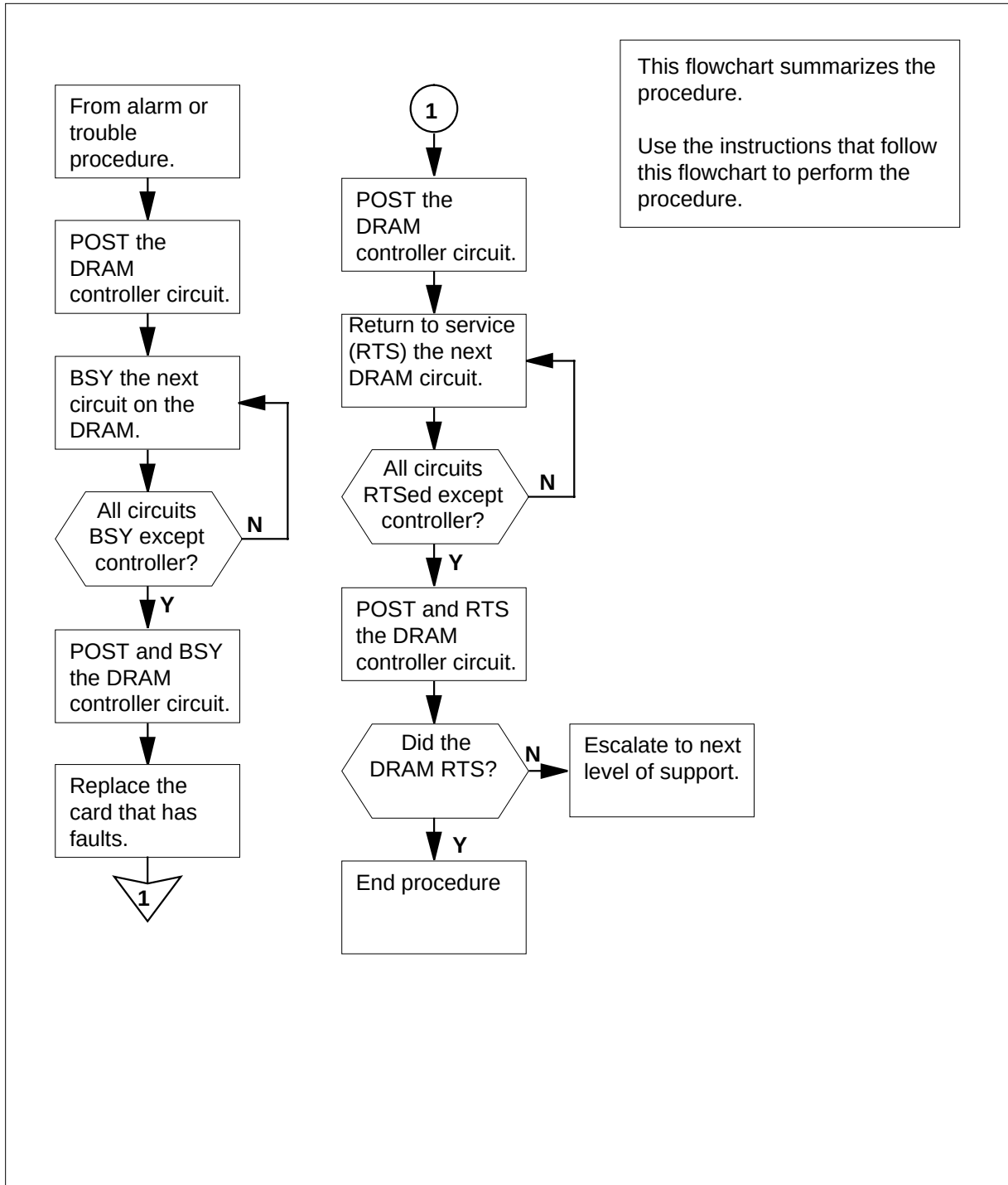
This procedure refers to the *Shelf card removal and replacement procedure*.

### Action

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

## NT1X76 in an MTM (continued)

### Summary of Replacing an NT1X76 in an MTM



## NT1X76 in an MTM (continued)

### Replacing an NT1X76 in an MTM

#### *At your current location:*

- 1 Proceed if a step in a maintenance procedure directs you to this procedure. Seperate use of this procedure can cause equipment damage or service interruption.

#### *At the MAP terminal:*

- 2 To access the trunk test position (TTP) level of the MAP and post the DRAM controller circuit (0), type

**>MAPCI;MTC;TRKS;TTP;POST TM MTM n 0**

and press the Enter key.

where

- n**  
is the MTM number and the location of the DRAM card that has faults
- 0**  
is the DRAM controller circuit

**Note:** You must busy all other DRAM circuits before you busy the DRAM controller circuit.

*Example of a MAP response:*

| CM  | MS       | IOD      | Net     | PM | CCS      | Lns | Trks | Ext        | EIO    |
|-----|----------|----------|---------|----|----------|-----|------|------------|--------|
| .   | .        | .        | .       | .  | .        | .   | .    | .          | .      |
| TTP |          |          |         |    |          |     |      |            |        |
| 0   | Quit_    | POST     | DELQ    |    | BUSYQ    |     | DIG  |            |        |
| 2   | Post_    | TTP      | 6-025   |    |          |     |      |            |        |
| 3   | Seize_   | CKT TYPE | PM NO.  |    | COM LANG |     | STA  | S R DOT TE | RESULT |
| 4   |          | ANN      | MTM 1 0 |    | DRAM0    | 0   | IDL  |            |        |
| 5   | Bsy_     |          |         |    |          |     |      |            |        |
| 6   | RTS_     |          |         |    |          |     |      |            |        |
| 7   | Tst_     |          |         |    |          |     |      |            |        |
| 8   |          |          |         |    |          |     |      |            |        |
| 9   | CktInfo  |          |         |    |          |     |      |            |        |
| 10  | CktLoc   |          |         |    |          |     |      |            |        |
| 11  | Hold     |          |         |    |          |     |      |            |        |
| 12  | Next_    |          |         |    |          |     |      |            |        |
| 13  | Rls_     |          |         |    |          |     |      |            |        |
| 14  | Ckt_     |          |         |    |          |     |      |            |        |
| 15  | TrnslVf_ |          |         |    |          |     |      |            |        |
| 16  | StkSdr_  |          |         |    |          |     |      |            |        |
| 17  | Pads_    |          |         |    |          |     |      |            |        |
| 18  | Level_   |          |         |    |          |     |      |            |        |

DRAM controller circuit

## NT1X76 in an MTM (continued)

- 3 To proceed to the next circuit on the DRAM, type  
**>NEXT**  
and press the Enter key.

4



### WARNING

#### Service interruption

Removal of a DRAM circuit from service causes service interruption.

To busy the circuit on the DRAM, type

**>BSY**

and press the Enter key.

Repeat steps 3 and 4 until all circuits on the DRAM except the DRAM controller circuit (0) are busy.

*Example of a MAP response:*

| CM  | MS       | IOD       | Net     | PM | CCS      | Lns | Trks           | Ext    | EIO |
|-----|----------|-----------|---------|----|----------|-----|----------------|--------|-----|
| .   | .        | .         | .       | .  | .        | .   | .              | .      | .   |
| TTP |          |           |         |    |          |     |                |        |     |
| 0   | Quit_    | POST      | DELQ    |    | BUSYQ    |     | DIG            |        |     |
| 2   | Post_    | TTP 6-025 |         |    |          |     |                |        |     |
| 3   | Seize_   | CKT TYPE  | PM NO.  |    | COM LANG |     | STA S R DOT TE | RESULT |     |
| 4   |          | ANN       | MTM 1 2 |    | ACTSTOPS | 0   | MB             |        |     |
| 5   | Bsy_     |           |         |    |          |     |                |        |     |
| 6   | RTS_     |           |         |    |          |     |                |        |     |
| 7   | Tst_     |           |         |    |          |     |                |        |     |
| 8   |          |           |         |    |          |     |                |        |     |
| 9   | CktInfo  |           |         |    |          |     |                |        |     |
| 10  | CktLoc   |           |         |    |          |     |                |        |     |
| 11  | Hold     |           |         |    |          |     |                |        |     |
| 12  | Next_    |           |         |    |          |     |                |        |     |
| 13  | Rls_     |           |         |    |          |     |                |        |     |
| 14  | Ckt_     |           |         |    |          |     |                |        |     |
| 15  | Trnslvf_ |           |         |    |          |     |                |        |     |
| 16  | StkSdr_  |           |         |    |          |     |                |        |     |
| 17  | Pads_    |           |         |    |          |     |                |        |     |
| 18  | Level_   |           |         |    |          |     |                |        |     |

DRAM circuit and status

- 5 To post the DRAM controller circuit (0), type  
**>POST TM MTM n 0**

NT1X76  
in an MTM (continued)

and press the Enter key.

where

- n is the MTM number and the location of the DRAM card that has faults
- 0 is the DRAM controller circuit

6



**WARNING**  
**Service interruption**  
Removal of a DRAM circuit from service causes service interruption.

To busy the DRAM controller circuit, type

>BSY

and press the Enter key.

Example of a MAP response:

| CM  | MS       | IOD       | Net     | PM    | CCS      | Lns | Trks           | Ext    | EIO |
|-----|----------|-----------|---------|-------|----------|-----|----------------|--------|-----|
| .   | .        | .         | .       | .     | .        | .   | .              | .      | .   |
| TTP |          |           |         |       |          |     |                |        |     |
| 0   | Quit_    | POST      | DELQ    |       | BUSYQ    |     | DIG            |        |     |
| 2   | Post_    | TTP 6-025 |         |       |          |     |                |        |     |
| 3   | Seize_   | CKT TYPE  | PM NO.  |       | COM LANG |     | STA S R DOT TE | RESULT |     |
| 4   |          | ANN       | MTM 1 0 | DRAM0 | 0        |     | MB             |        |     |
| 5   | Bsy_     |           |         |       |          |     |                |        |     |
| 6   | RTS_     |           |         |       |          |     |                |        |     |
| 7   | Tst_     |           |         |       |          |     |                |        |     |
| 8   |          |           |         |       |          |     |                |        |     |
| 9   | CktInfo  |           |         |       |          |     |                |        |     |
| 10  | CktLoc   |           |         |       |          |     |                |        |     |
| 11  | Hold     |           |         |       |          |     |                |        |     |
| 12  | Next_    |           |         |       |          |     |                |        |     |
| 13  | Rls_     |           |         |       |          |     |                |        |     |
| 14  | Ckt_     |           |         |       |          |     |                |        |     |
| 15  | Trnslvf_ |           |         |       |          |     |                |        |     |
| 16  | StkSdr_  |           |         |       |          |     |                |        |     |
| 17  | Pads_    |           |         |       |          |     |                |        |     |
| 18  | Level_   |           |         |       |          |     |                |        |     |

DRAM controller circuit and status

## NT1X76 in an MTM (continued)

---

**At the MTM:**

- 7** To remove and replace the NT1X76 card, see the *Common card removal and replacement* procedure in this document. Complete the removal and replacement procedure. Return to step 8.

**Note:** Make sure that the dip switches on the new card are in the same positions as the dip switches on the old card.

- 8** To post the DRAM controller circuit (0), type

**>POST TM MTM n 0**

and press the Enter key.

where

**n**

is the MTM number and the location of the DRAM card

**0**

is the DRAM controller circuit

- 9** To proceed to the next circuit on the DRAM, type

**>NEXT**

and press the Enter key.

- 10** To perform a RTS for the circuit on the DRAM, type

**>RTS**

and press the Enter key.

Repeat steps 9 and 10 until all DRAM circuits busied in step 4 RTS.

*Example of a MAP response:*



**NT1X76****in an MTM** (continued)

| CM  | MS       | IOD       | Net     | PM       | CCS      | Lns | Trks    | Ext    | EIO    |
|-----|----------|-----------|---------|----------|----------|-----|---------|--------|--------|
| .   | .        | .         | .       | .        | .        | .   | .       | .      | .      |
| TTP |          |           |         |          |          |     |         |        |        |
| 0   | Quit_    | POST      | DELQ    |          | BUSYQ    |     | DIG     |        |        |
| 2   | Post_    | TTP 6-025 |         |          |          |     |         |        |        |
| 3   | Seize_   | CKT TYPE  | PM NO.  |          | COM LANG |     | STA S R | DOT TE | RESULT |
| 4   |          | ANN       | MTM 1 2 | ACTSTOPS | 0        |     | IDL     |        |        |
| 5   | Bsy_     |           |         |          |          |     |         |        |        |
| 6   | RTS_     |           |         |          |          |     |         |        |        |
| 7   | Tst_     |           |         |          |          |     |         |        |        |
| 8   |          |           |         |          |          |     |         |        |        |
| 9   | CktInfo  |           |         |          |          |     |         |        |        |
| 10  | CktLoc   |           |         |          |          |     |         |        |        |
| 11  | Hold     |           |         |          |          |     |         |        |        |
| 12  | Next_    |           |         |          |          |     |         |        |        |
| 13  | Rls_     |           |         |          |          |     |         |        |        |
| 14  | Ckt_     |           |         |          |          |     |         |        |        |
| 15  | Trnslvf_ |           |         |          |          |     |         |        |        |
| 16  | StkSdr_  |           |         |          |          |     |         |        |        |
| 17  | Pads_    |           |         |          |          |     |         |        |        |
| 18  | Level_   |           |         |          |          |     |         |        |        |

DRAM circuit and status

- 11** To post the DRAM controller circuit (0), type

**>POST TM MTM n 0**

and press the Enter key.

*where*

**n**

is the MTM number and the location of the DRAM card

**0**

is the DRAM controller circuit

- 12** To RTS the DRAM controller circuit, type

**>RTS**

and press the Enter key.

*Example of a MAP response:*

## NT1X76 in an MTM (end)

| CM  | MS       | IOD       | Net     | PM    | CCS      | Lns | Trks           | Ext    | EIO |
|-----|----------|-----------|---------|-------|----------|-----|----------------|--------|-----|
| .   | .        | .         | .       | .     | .        | .   | .              | .      | .   |
| TTP |          |           |         |       |          |     |                |        |     |
| 0   | Quit_    | POST      | DELQ    |       | BUSYQ    |     | DIG            |        |     |
| 2   | Post_    | TTP 6-025 |         |       |          |     |                |        |     |
| 3   | Seize_   | CKT TYPE  | PM NO.  |       | COM LANG |     | STA S R DOT TE | RESULT |     |
| 4   |          | ANN       | MTM 1 0 | DRAM0 | 0        |     | IDL            |        |     |
| 5   | Bsy_     |           |         |       |          |     |                |        |     |
| 6   | RTS_     |           |         |       |          |     |                |        |     |
| 7   | Tst_     |           |         |       |          |     |                |        |     |
| 8   |          |           |         |       |          |     |                |        |     |
| 9   | CktInfo  |           |         |       |          |     |                |        |     |
| 10  | CktLoc   |           |         |       |          |     |                |        |     |
| 11  | Hold     |           |         |       |          |     |                |        |     |
| 12  | Next_    |           |         |       |          |     |                |        |     |
| 13  | Rls_     |           |         |       |          |     |                |        |     |
| 14  | Ckt_     |           |         |       |          |     |                |        |     |
| 15  | Trnslvf_ |           |         |       |          |     |                |        |     |
| 16  | StkSdr_  |           |         |       |          |     |                |        |     |
| 17  | Pads_    |           |         |       |          |     |                |        |     |
| 18  | Level_   |           |         |       |          |     |                |        |     |

DRAM controller circuit and status

**If the DRAM****Do**

RTS, the response on the MAP display is IDL

Step 13

does not RTS

Step 14

**13** For additional help, contact the next level of support.

**14** This procedure is complete. Return to the main procedure that sent you to this procedure.

## NT3X67 in an MTM

---

### Application

Use this procedure to replace an NT3X67 card in an MTM.

| PEC    | Suffixes | Name                              |
|--------|----------|-----------------------------------|
| NT3X67 | BB       | Six party conference circuit card |

If you cannot identify the PEC, suffix, and shelf or frame for the card you want to replace, refer to the Index. The index contains a list of cards, shelves, and frames in this card replacement NTP.

### Common procedures

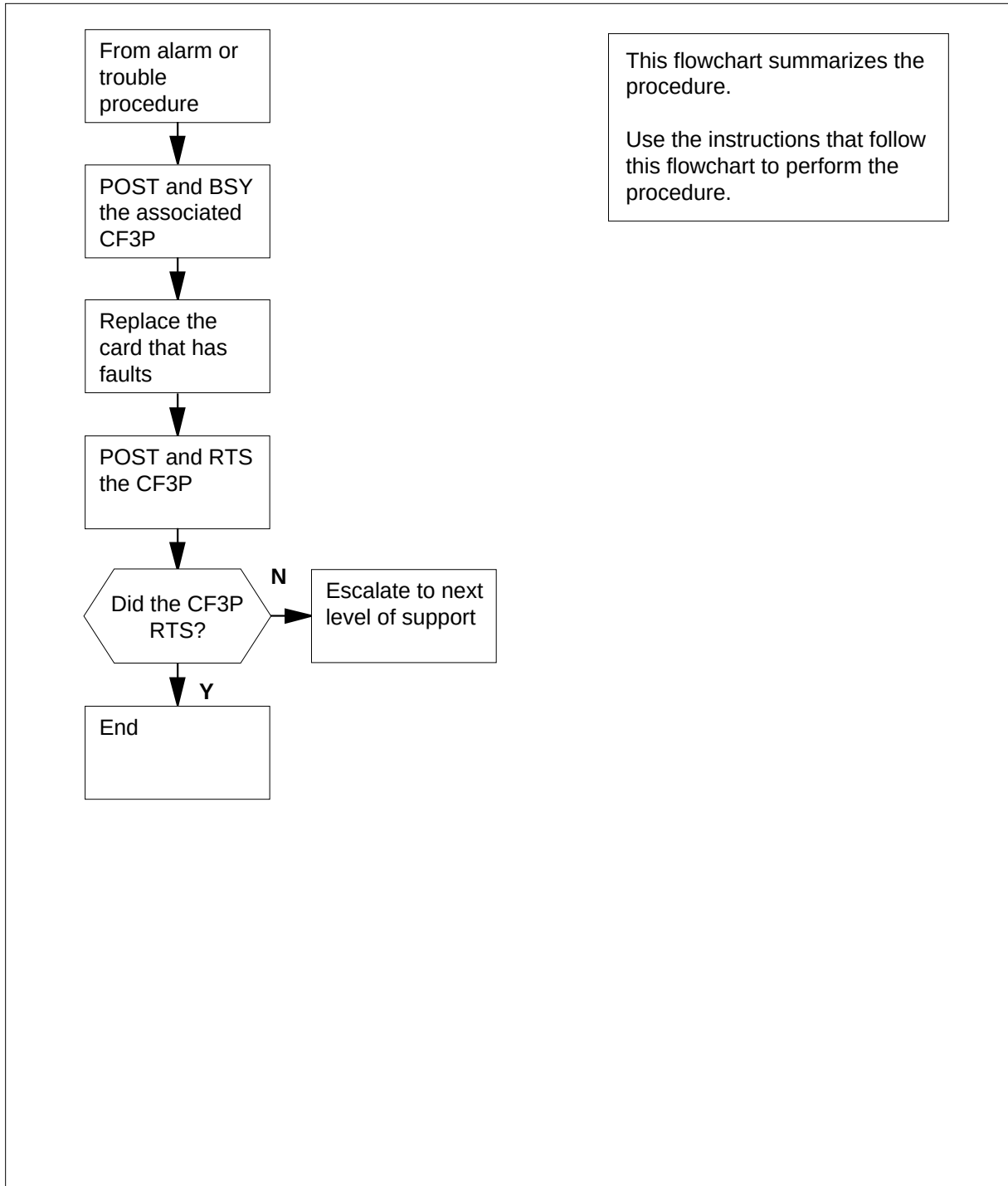
This procedure references *Shelf card removal and replacement procedure*:

### Action

This procedure contains a summary flowchart and a list of steps. Use the flowchart to review the procedure. Use the instructions that follow this flowchart to replace the card.

## NT3X67 in an MTM (continued)

### Summary of Replacing an NT3X67 in an MTM



## NT3X67 in an MTM (continued)

---

### Replacing an NT3X67 in an MTM

#### *At your current location*

- 1 Proceed only if a step in a maintenance procedure directs you to this procedure. Independent use of this procedure can cause equipment damage or service interruption.

#### *At the MAP*

- 2 To post and busy the associated circuit on the card, type

**>MAPCI;MTC;TRKS;TTP;POST G CF3P nnn**

and press the Enter key.

*where*

**nnn**

is the associated circuit on the conference circuit card

**>BSY**

and press the Enter key.

**Note:** Each NT3X67 circuit card provides two three-port conference circuits. Make sure that both circuits are busy before you replace the circuit card. One circuit is already busy in the main procedure.

#### *At the MTM*

- 3 Remove and replace the NT3X67 card. *Comon card removal and replacement* in this document contains this procedure. Return to step 4 after you complete the removal and replacement procedure.

**Note:** Make sure the dip switches on the new card are set to the same positions as the dip switches on the old card.

#### *At the MAP*

- 4 To return to service the CF3P you busied in step 2, type

**>POST CF3P nnn**

and press the Enter key.

*where*

**nnn**

is the CF3P you busied in step 2

**>RTS**

and press the Enter key.

---

**If the CF3P**

**Do**

returns to service

step 6

does not return to service

step 5

---

- 5 For additional help, contact the next level of support.

**NT3X67**  
**in an MTM (end)**

---

- 6 The procedure is complete. Return to the main procedure and continue as the procedure directs.



---

## 6 SuperNode message switch card replacement procedures

---

### Introduction

This chapter contains card replacement procedures for the SuperNode message switch (MS). The first section in the chapter provides diagrams of MS shelf layouts.

Card replacement procedures for the SuperNode SE MS are in the chapter "SuperNode SE message switch card replacement procedures".

The chapter "Frame supervisory panel and maintenance supervisory panel card replacement procedures" contains card replacement procedures for the following:

- frame supervisory panel (FSP)
- modular supervisory panel (MSP)

Each procedure contains the following sections:

- Application
- Common procedures
- Action

### Application

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

### Common procedures

This section lists common procedures required during the MS card replacement procedure. A common procedure is a series of steps that repeat within maintenance procedures. The removal and replacement of a card is an example of a common procedure. The common procedures chapter in this NTP contains common procedures.

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



**Action**

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

**Recording card replacement activities**

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

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

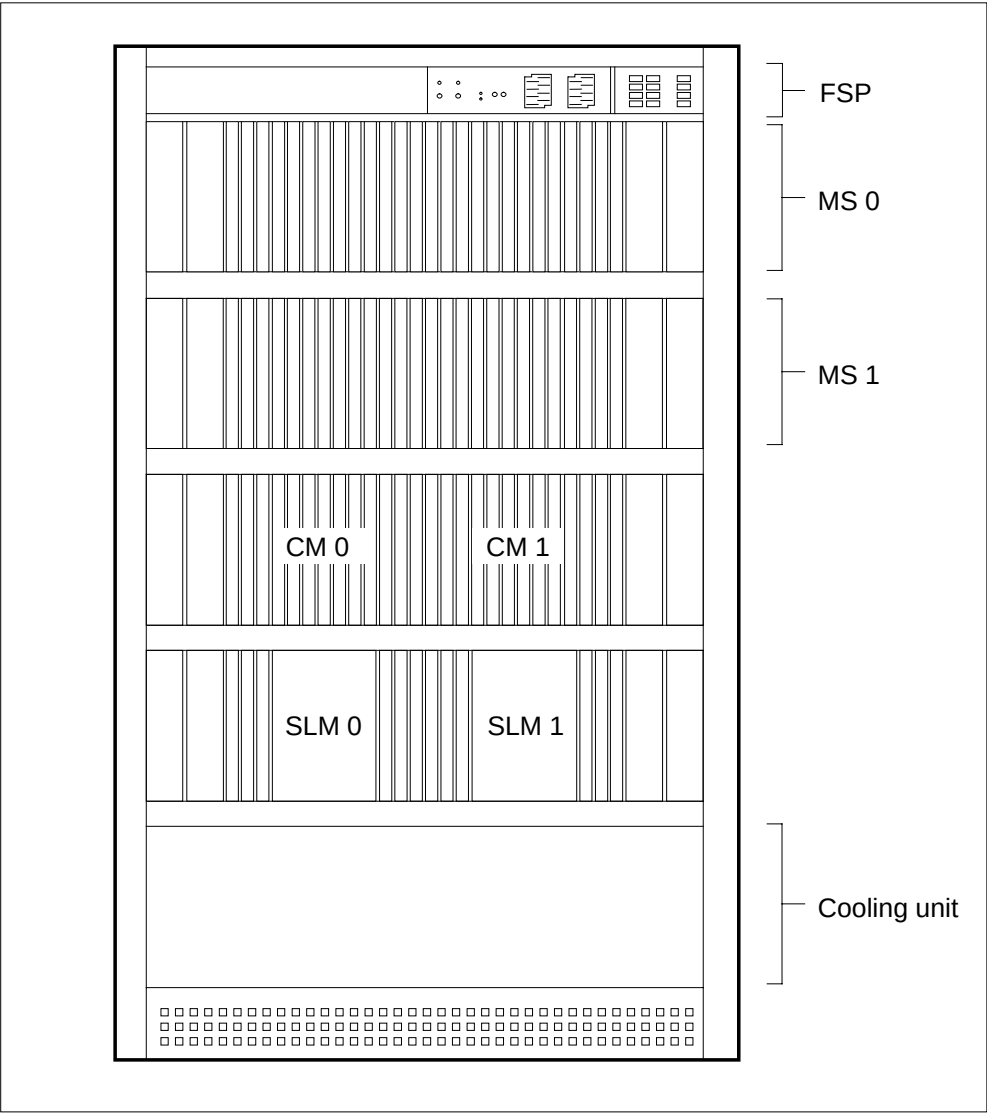
# SuperNode MS shelf layouts

## Application

This section contains the following diagrams:

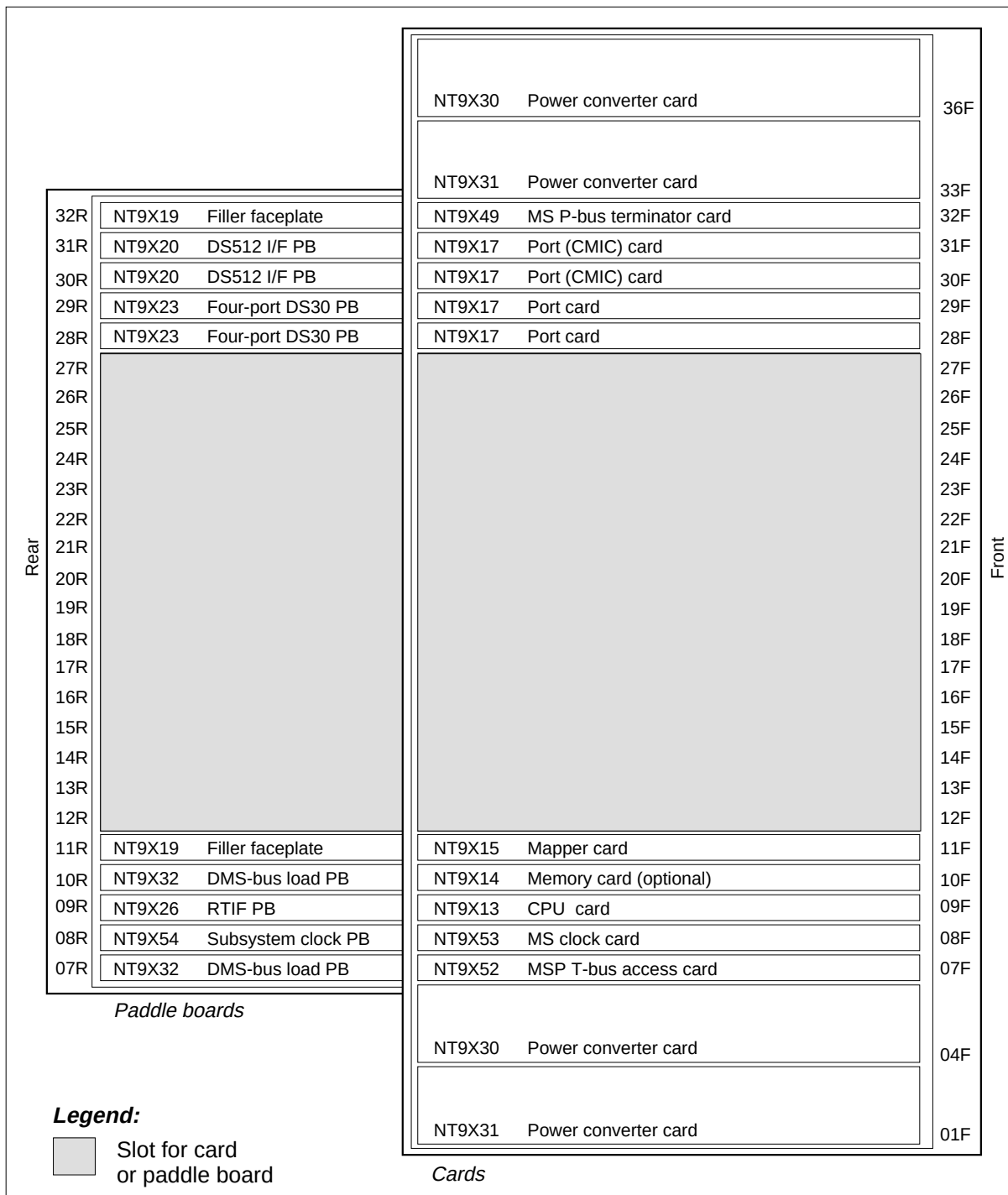
- dual-plane combined core cabinet (DPCC)
- SuperNode message switch (MS)

Figure Dual-plane combined core cabinet



## SuperNode MS shelf layouts (end)

Figure SuperNode message switch that shows common fill



## Interface cards in a SuperNode MS

### Application

Use this procedure to replace interface cards in a SuperNode message switch (MS), as listed in the following table.

| PEC    | Suffix            | Card name                                      | Shelf or frame name |
|--------|-------------------|------------------------------------------------|---------------------|
| NT9X20 | AA                | DS512 paddle board                             | MS                  |
| NT9X20 | BB                | DS512 interface<br>CM-MS EN-MS paddle<br>board | MS                  |
| NT9X23 | AA, BA            | Four-port DS30 paddle<br>board                 | MS                  |
| NT9X54 | AA, AB,<br>AC, AD | Subsystem clock<br>paddle board                | MS                  |
| NT9X62 | BA, BB,<br>CB     | Four-port subrate<br>DS512 paddle board        | MS                  |
| NT9X69 | BA                | DMS-bus 16-link DS30<br>paddle board           | MS                  |

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

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

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

### Common procedures

This procedure refers to the following common procedures:

- *Cleaning fiber optic components and assemblies*
- *Failure to switch clock mastership*

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

## **Interface cards in a SuperNode MS (continued)**

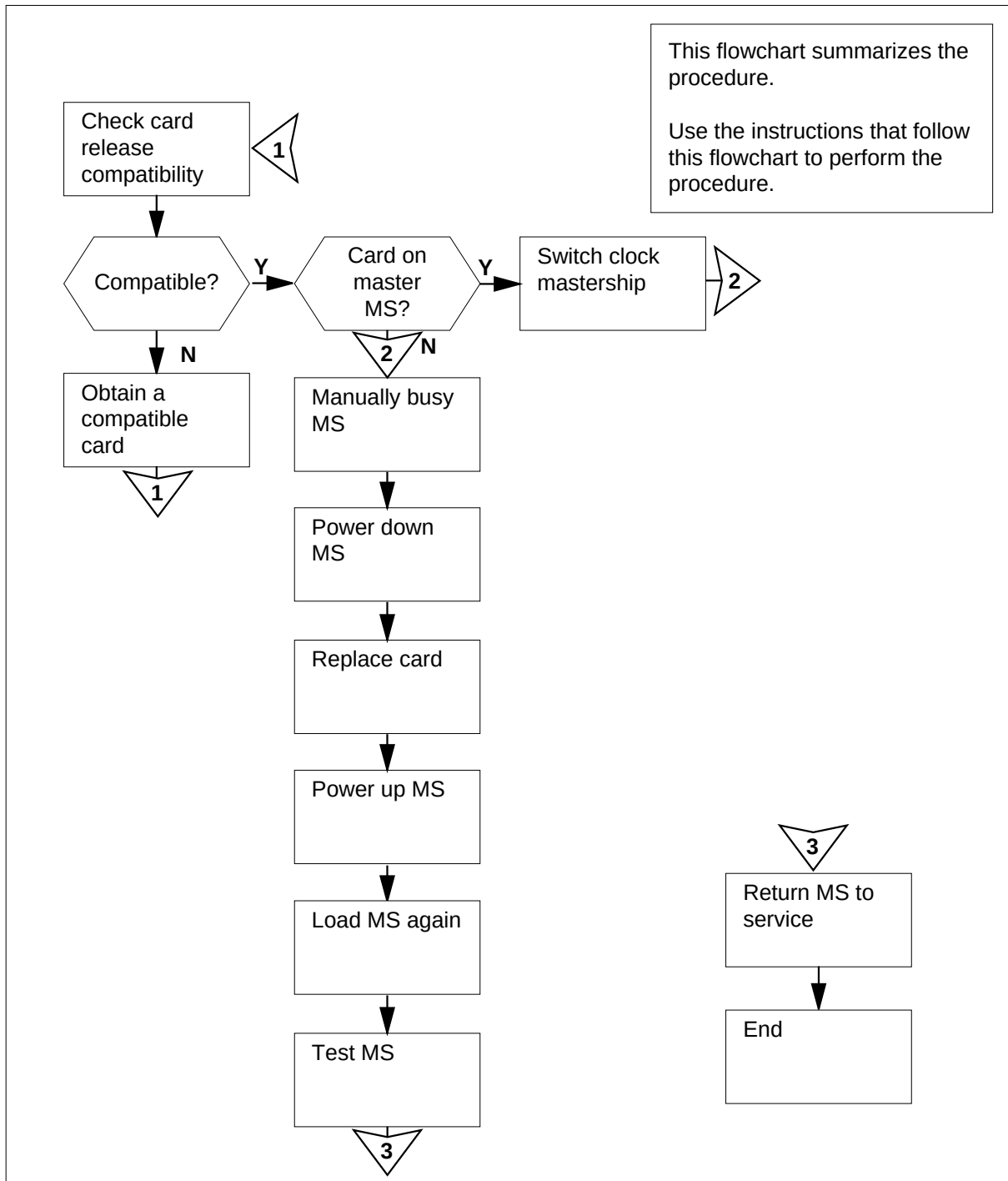
---

### **Action**

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

## Interface cards in a SuperNode MS (continued)

### Replacing Interface cards in a SuperNode MS



## Interface cards in a SuperNode MS (continued)

---

### Replacing Interface cards in a SuperNode MS

#### *At the MAP terminal*

- 1 Obtain a replacement card. Make sure that the replacement card and the card you remove have the same product engineering code (PEC) and PEC suffix.
- 2 To ensure that the replacement card is compatible with the software load, type

**>CHECKREL MS pec release**

and press the Enter key.

where

**pec**

is the PEC and suffix of the new card

**release**

is the two-character code located on the faceplate of the replacement card

*Example input:*

**>CHECKREL MS NT9X20AA 2Z**

*Example of a MAP response:*

| PEC      | BASELINE | EXCEPT | RELEASE | COMPATIBLE |
|----------|----------|--------|---------|------------|
| NT9X20AA | 50       | None   | 2Z      | *NO        |

Card release is below baseline.

Do not plug the card into the MS.

---

| If the replacement card is | Do     |
|----------------------------|--------|
| below baseline             | step 3 |
| on or above baseline       | step 6 |

---

- 3 From the MAP display, record the baseline release code (BASELINE) and any exception release codes (EXCEPT).
- 4 Determine which release codes are compatible with the software load in the switch. A compatible release code is one that is
  - greater than or equal to the baseline release code, and
  - not an exception release code

**Note:** The range of release codes in ascending order is 01 to 09, 0A to 0Z, and 10 to VZ.

## Interface cards in a SuperNode MS (continued)

- 5 Obtain a replacement card with a compatible release code.

| If you                                      | Do      |
|---------------------------------------------|---------|
| can obtain a compatible replacement card    | step 2  |
| cannot obtain a compatible replacement card | step 52 |

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

*Example of a MAP response:*

```

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

```

- 7 Determine the clocking configuration.

**Note:** The clocking configuration appears under the Clock header of the MAP display.

| If the MS that contains the card you will replace                                   | Do      |
|-------------------------------------------------------------------------------------|---------|
| is the slave MS, indicated by Slave, S Flt, S OOS, or S Free under the Clock header | step 11 |
| is the master MS, indicated by Master, M Free, or M Flt under the Clock header      | step 8  |

- 8 To switch clock mastership, type  
**>SWMAST**  
and press the Enter key.

*Example of a MAP response:*

```

Request to Switch Clock Mastership MS: 0 submitted.
Request to Switch Clock Mastership MS: 0 passed.

```

| If the SWMAST command | Do      |
|-----------------------|---------|
| passed                | step 10 |
| failed                | step 9  |

- 9 Perform the procedure *Failure to switch clock mastership* in this document. Complete the procedure and return to this point.



## Interface cards in a SuperNode MS (continued)

---

**10** Wait 10 min to make sure MS has stability. Continue this procedure.

**11** Determine if the slave MS is manual busy.

**Note:** The letter M on the right of the MS 0 or MS 1 header on the MAP display identifies a manual busy MS.

---

| If the slave MS is | Do      |
|--------------------|---------|
| not manual busy    | step 12 |
| manual busy        | step 13 |

---

**12**



### CAUTION

#### Possible service interruption

Make sure that you manually busy the slave MS. Do not busy the master MS. If you busy the master MS, you can cause service interruption.

To manually busy the slave MS, type

**>BSY ms\_number**

and press the Enter key.

where

**ms\_number**

is the number of the slave MS (0 or 1)

---

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 13 |
| aborted or failed  | step 52 |

---

### At the MS shelf

**13** Determine if the LED on the NT9X13 card in the slave MS is lit.

**Note:** Allow 5 min for the LED to light.

---

| If the LED is | Do      |
|---------------|---------|
| lit           | step 14 |
| not lit       | step 52 |

---

## Interface cards in a SuperNode MS (continued)

14

**CAUTION****Possible loss of service**

Make sure that you power down the slave MS. If you power down the master MS, the system will shut down.

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

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

Power down the slave MS, as follows:

- a Press down and release the switch on the faceplate of the NT9X30 power converter in slot 4F.
- b Press down and release the switch on the faceplate of the NT9X31 power converter in slot 1F.
- c Press down and release the switches on the faceplates of the power converters in slots 33F and 36F at the same time.

15 Locate the card on the shelf.

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

| If the card you are replacing is<br>an | Do      |
|----------------------------------------|---------|
| NT9X20                                 | step 17 |
| NT9X23                                 | step 21 |
| NT9X54                                 | step 23 |
| NT9X62                                 | step 25 |
| NT9X69                                 | step 28 |

## Interface cards in a SuperNode MS (continued)

---

17



### **DANGER**

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

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

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

18

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

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

**Note:** The NT9X20 cable connections appear in Figure at the end of this procedure.

19

Perform the procedure *Cleaning fiber optic components and assemblies* in this document. Complete the procedure and return to this point.

20

Go to step 29.

21



### **DANGER**

#### **Possible equipment damage**

If you remove the cables by first unseating the top pins and then the bottom pins, the pins in the RS-232 cable connector bend. When you insert the connector again, the pins will not align correctly. Some pins can bend more and become unseated from the connector block.

Disconnect the RS-232 cable from the card you are removing, as follows:

- a To prevent damage to the pins, remove the connector at a 90° angle to the faceplate.
- b Loosen the cable with the latch handles up.

**Note:** The RS232 cable connection appears in Figure at the end of this procedure.

22

Go to step 29.

23

Label the cables connected to the faceplate of the card you are replacing.

**Note:** The NT9X54 cable connections appear in Figure at the end of this procedure.

## Interface cards in a SuperNode MS (continued)

- 24 Disconnect the cables from the faceplate of the card you are replacing. Note the connector numbers.  
Go to step 29.
- 25 Label each fiber cable. Use Transmit for the top cable and Receive for the bottom cable.

**Note:** The NT9X62 cable connections appear in Figure at the end of this procedure.

26



### DANGER

#### Do not contaminate the fiber tip surface

Do not touch the tip of the fiber. Dirt or oil from the skin transfers to the fiber tip surface and degrades fiber performance.



### DANGER

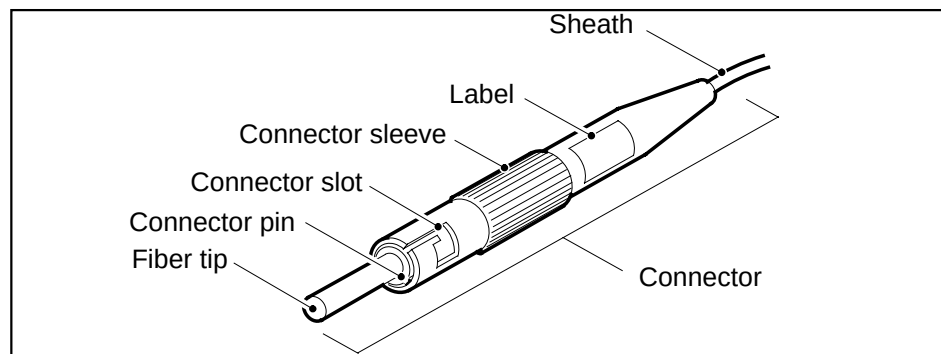
#### Fiber cable can become damaged

Handle fiber cables carefully. Do not crimp or bend fiber cables to a radius of less than 25 mm (1 in.).

Disconnect the fiber links from the card as follows:

- a Loosen the fiber connections with the latch handles up.
- b Push in and turn the fiber cable connector counter-clockwise until the connector slides out of the receptacle.
- c Place dust caps on the ends of the connectors when you disconnect the connectors.

**Note:** The fiber cable connections appear in Figure at the end of this procedure.



## Interface cards in a SuperNode MS (continued)

---

27 Go to step 29.

28



### **DANGER**

#### **Possible damage to the pins on the DS30 connector**

Do not remove the cables by first unseating the top pins and then unseating the bottom pins, or the reverse. This method bends the pins. When you insert the connector again, the pins may not align correctly. Some pins can then bend and become unseated from the connector block.

Disconnect the DS30 cables from the card as follows:

- a Remove the connectors at a 90° angle to the faceplate. This action prevents damage to the pins.

**Note:** The DS30 cable connections appear in Figure at the end of this procedure.

- b Loosen the DS30 connections.

29



### **DANGER**

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

If you hold a card by the levers only, you can cause lever breakage. When you pull the card halfway out of the shelf, carefully grasp the card from below for more secure support. Continue to remove the card from the shelf. Do not touch any wires or internal parts on the card.



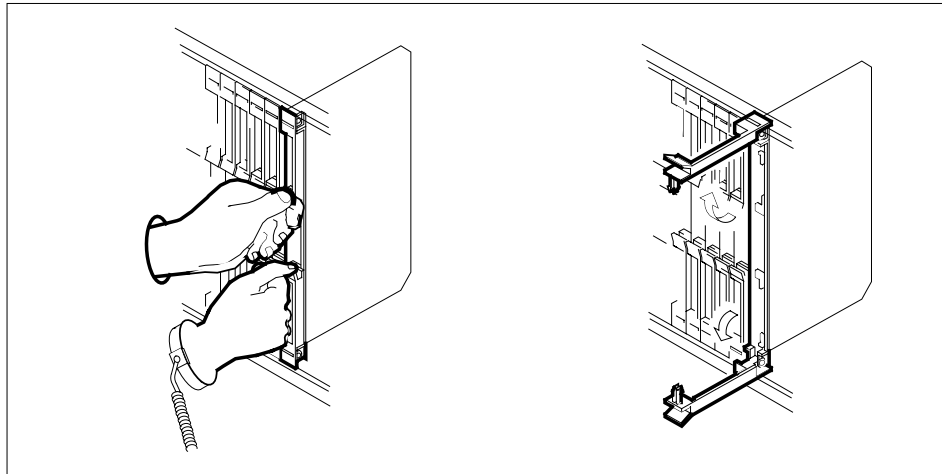
### **DANGER**

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

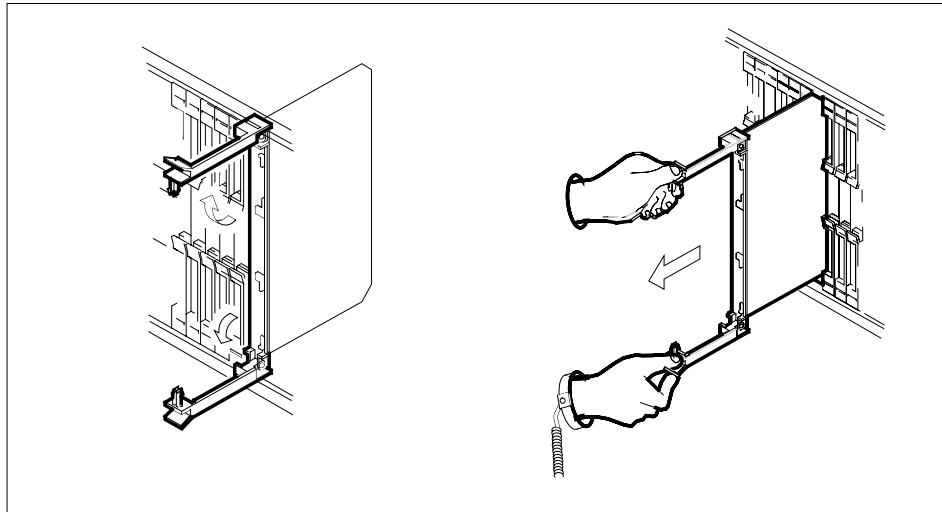
If you hold a card by the levers only, you can cause lever breakage. When you pull the card halfway out of the shelf, carefully grasp the card from below for more secure support. Continue to remove the card from the shelf. Do not touch any wires or internal parts on the card.

Open the locking levers on the card you will replace.

## Interface cards in a SuperNode MS (continued)

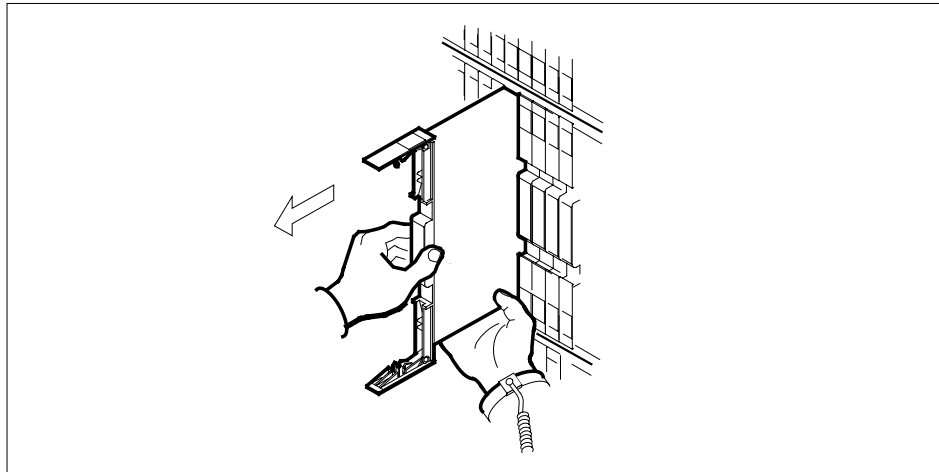


- 30** Grasp the locking levers. Carefully pull the card toward you until the card protrudes 5 cm (about 2 in.) from the equipment shelf.



- 31** Hold the card by the faceplate with one hand while you support the bottom edge with the other hand. Carefully pull the card toward you until the card clears the shelf.

## Interface cards in a SuperNode MS (continued)



- 32** Place the card you removed in an electrostatic discharge (ESD) protective container.
- 33** Make sure the replacement card and the card you removed have the same PEC and PEC suffix.
- 34** Insert the replacement card into the shelf.
- a** Open the locking levers on the card.
  - b** Hold the card by the faceplate with one hand while you support the bottom edge with the other hand. Carefully slide the card into the shelf.
- 35** The next action depends on the type of card you are replacing.

| If you are replacing an | Do      |
|-------------------------|---------|
| NT9X20 or NT9X62        | step 36 |
| NT9X23                  | step 38 |
| NT9X54                  | step 40 |
| NT9X69                  | step 42 |

**36**



### **DANGER**

#### **Do not contaminate the fiber tip surface**

Do not touch the tip of the fiber. Dirt or oil from the skin transfers to the fiber tip surface and degrades fiber performance.

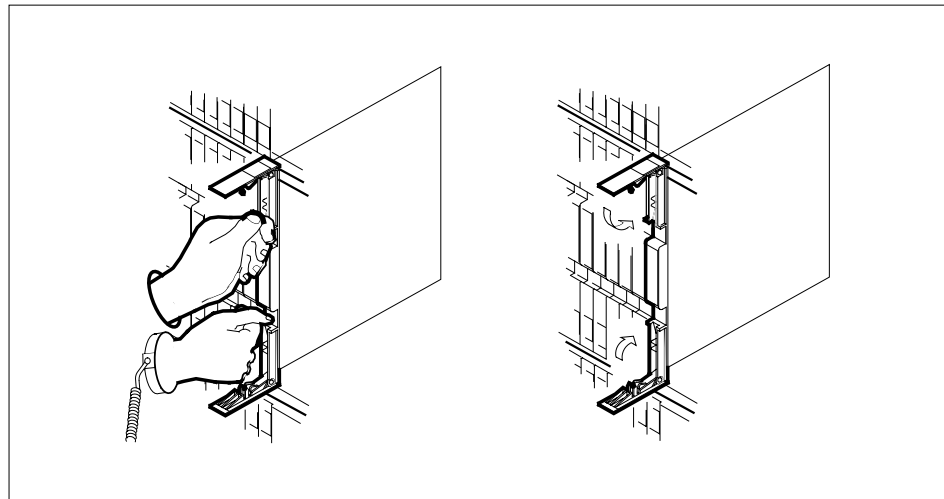
Connect the fiber cables to the replacement card, as follows:

---

## Interface cards in a SuperNode MS (continued)

---

- a Tighten the cable connections with the locking levers open.
  - b Carefully guide the cable connector into the receptacle notches.
  - c Push in and turn the cable connector clockwise halfway until the connection is tight.
- 37 Go to step 43.
- 38 Connect the RS-232 cable to the replacement card, as follows:
  - a To prevent damage to the pins, carefully insert the connector into the card with the latch handles up.
  - b Make sure the retaining screws on the RS-232 connection are tight and completely screwed in. Perform this action so that all pins make the correct contact.
- 39 Go to step 43.
- 40 Connect the cables to the replacement card.
- 41 Go to step 43.
- 42 Connect the DS30 cables again, as follows:
  - a To prevent damage to the pins, carefully insert the connectors into the card.
  - b Tighten the DS30 connections.
  - c Make sure the retaining screws on the DS30 connections are tight and completely screwed in. Perform this action so that all pins make the correct contact.
- 43 Seat and lock the card.



- a Use your fingers or thumbs to push on the upper and lower edges of the faceplate. Perform this action to make sure that you seat the card completely in the shelf.
  - b Close the locking levers to secure the card.



## Interface cards in a SuperNode MS (continued)

---

- 44** Power up the slave MS as follows:
- a** Lift and release the switches on the faceplates of the power converters in slots 33F and 36F at the same time.
  - b** Lift and release the switch on the faceplate of the NT9X31 power converter in slot 1F.
  - c** Lift and release the switch on the faceplate of the NT9X30 power converter in slot 4F.

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

- 45** To make sure that you are at the MS level of the MAP display, type  
**>MAPCI;MTC;MS**  
and press the Enter key.

- 46** To reload the slave MS, type  
**>LOADMS ms\_number**  
and press the Enter key.

*where*

**ms\_number**

is the number of the slave MS (0 or 1)

*Example of a MAP response:*

```
Active boot file CSP04AX_MS from S01DVOL1 on SLM DISK
will be loaded
Do you want to proceed with loading?
Please confirm ("YES", "Y", "NO", or "N"):
```

---

| If the response                     | Do      |
|-------------------------------------|---------|
| indicates the LOADMS command passed | step 48 |
| requests confirmation               | step 47 |

---

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

---

| If the LOADMS command | Do      |
|-----------------------|---------|
| passed                | step 48 |
| failed                | step 52 |

---

## Interface cards in a SuperNode MS (continued)

- 48** The next action depends on the reason you perform this procedure.

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 49 |
| did not direct you to this procedure | step 50 |

- 49** Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

- 50** To perform an out-of-service test on the slave MS, type

**>TST ms\_number**

and press the Enter key.

where

**ms\_number**

is the number of the slave MS (0 or 1)

*Example of a MAP response:*

Request to TEST OOS MS: 0 submitted.  
 Request to TEST OOS MS: 0 passed.  
 No node faults were found on MS 0.  
 No cards were found to be faulty on MS0.  
 Request to TEST VIA MATE MS: 0 submitted.  
 Request to TEST VIA MATE MS: 0 passed.  
 No node faults were found on MS 0.  
 No cards were found to be faulty on MS 0.

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 51 |
| failed             | step 52 |

- 51** To return the slave MS to service, type

**>RTS ms\_number**

and press the Enter key.

where

**ms\_number**

is the number of the slave MS (0 or 1)

*Example of a MAP response:*

## Interface cards in a SuperNode MS (continued)

---

Request to RTS MS: 0 submitted.  
Request to RTS MS: 0 passed.  
No node faults were found on MS 0.  
No cards were found to be faulty on MS 0.

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 53 |
| failed             | step 52 |

---

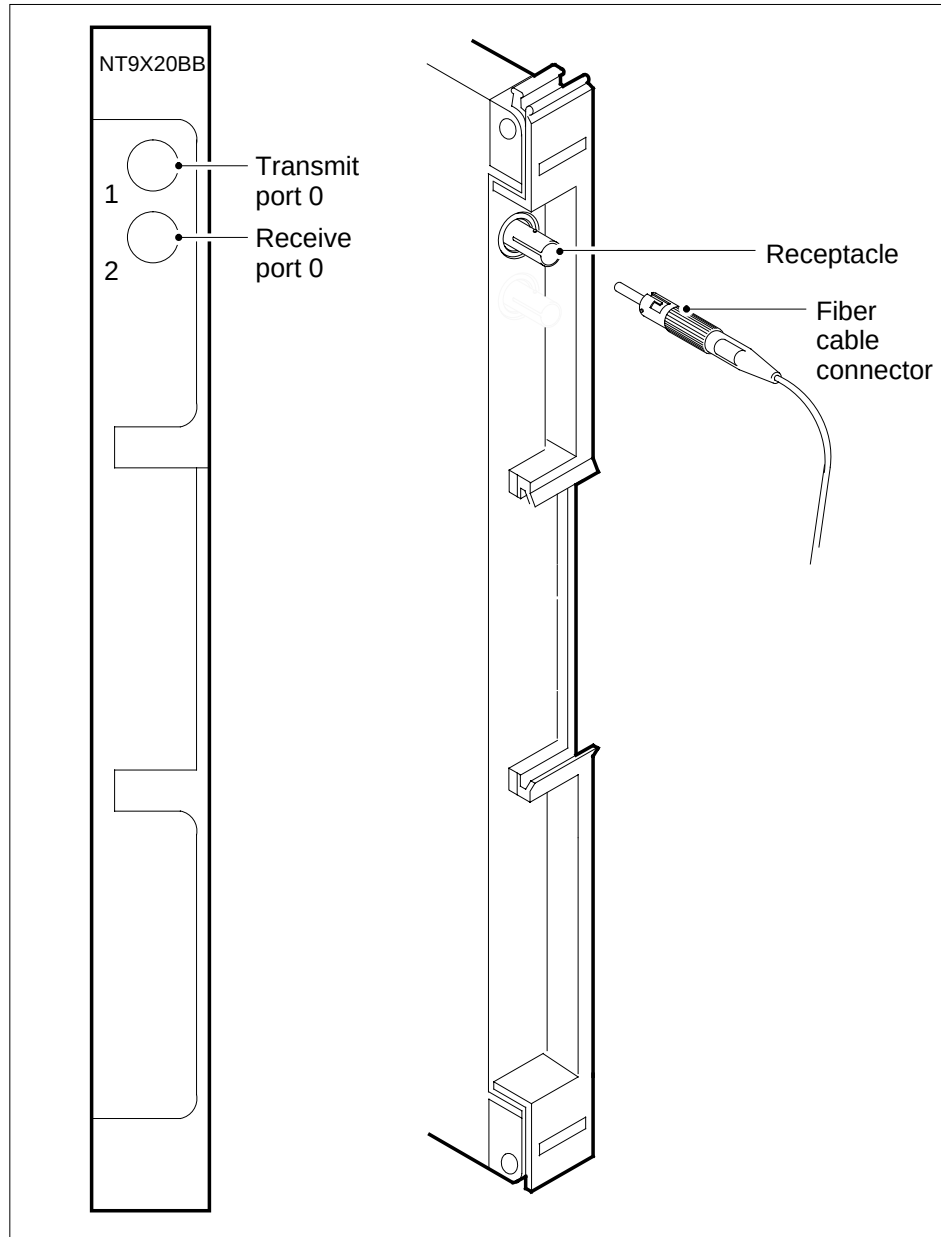
**52** For additional help, contact the next level of support.

**53** The procedure is complete.

The following diagrams show the cable connections for the cards in this procedure.

## Interface cards in a SuperNode MS (continued)

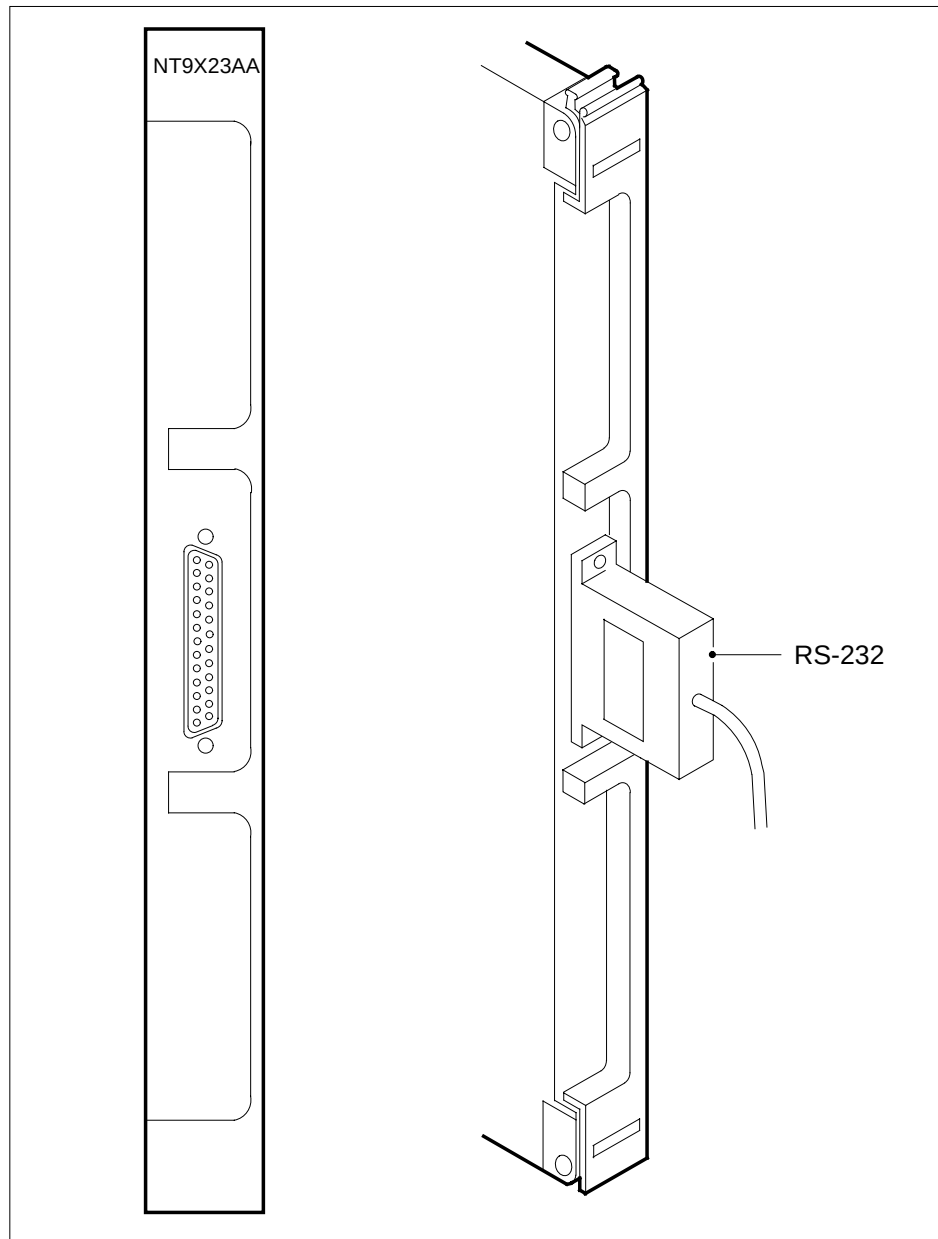
### Cable connections for an NT9X20 in a SuperNode MS



## Interface cards in a SuperNode MS (continued)

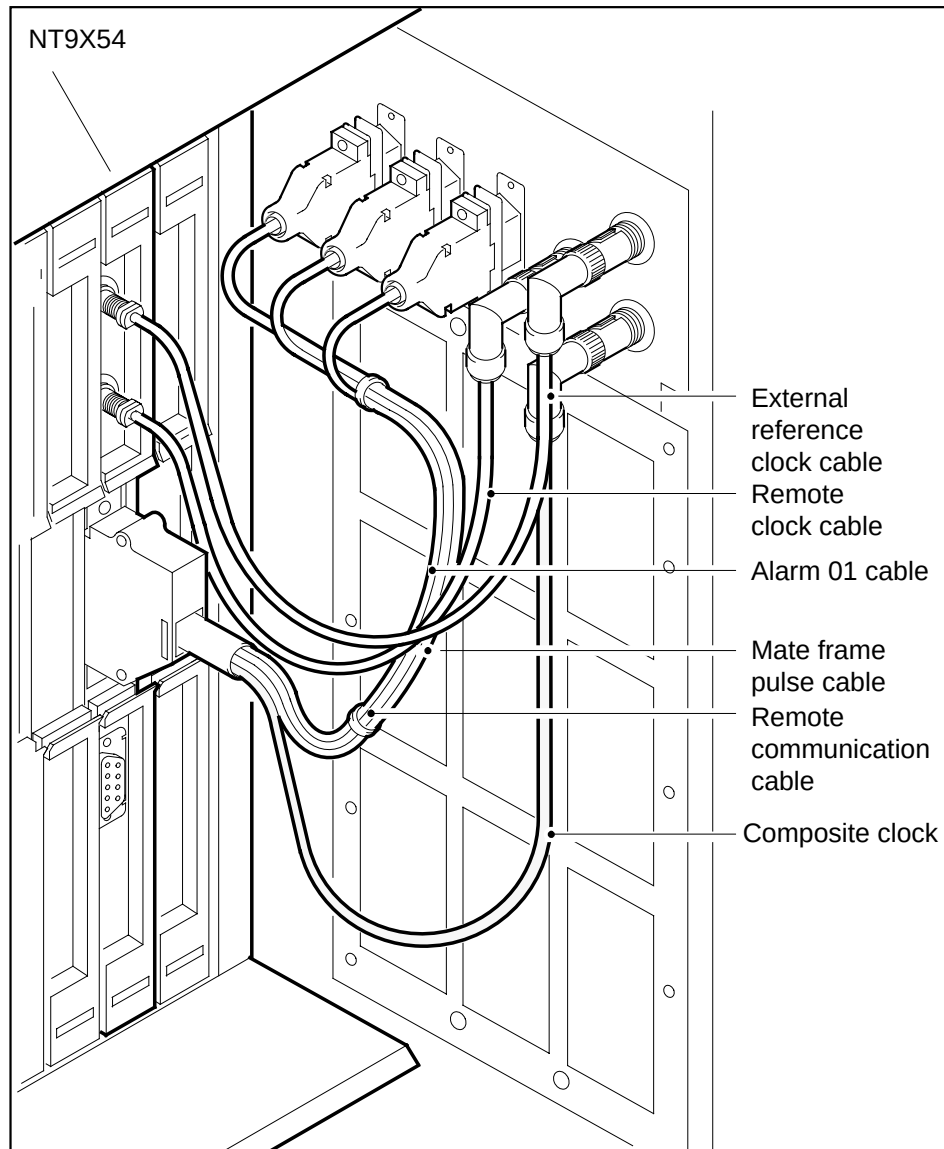
---

### Cable connections for an NT9X23 in a SuperNode MS



## Interface cards in a SuperNode MS (continued)

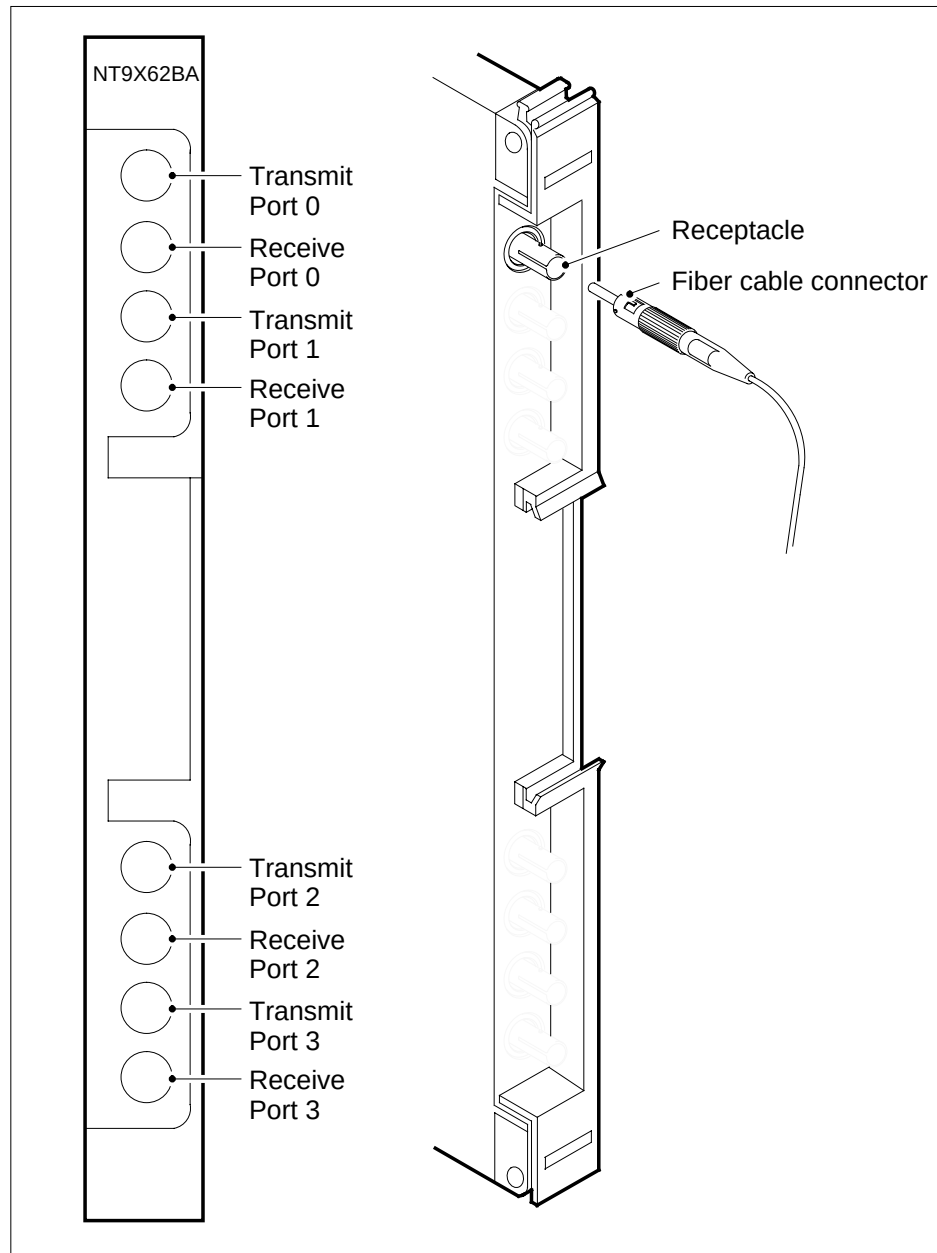
### Cable connections for an NT9X54 in a SuperNode MS



## Interface cards in a SuperNode MS (continued)

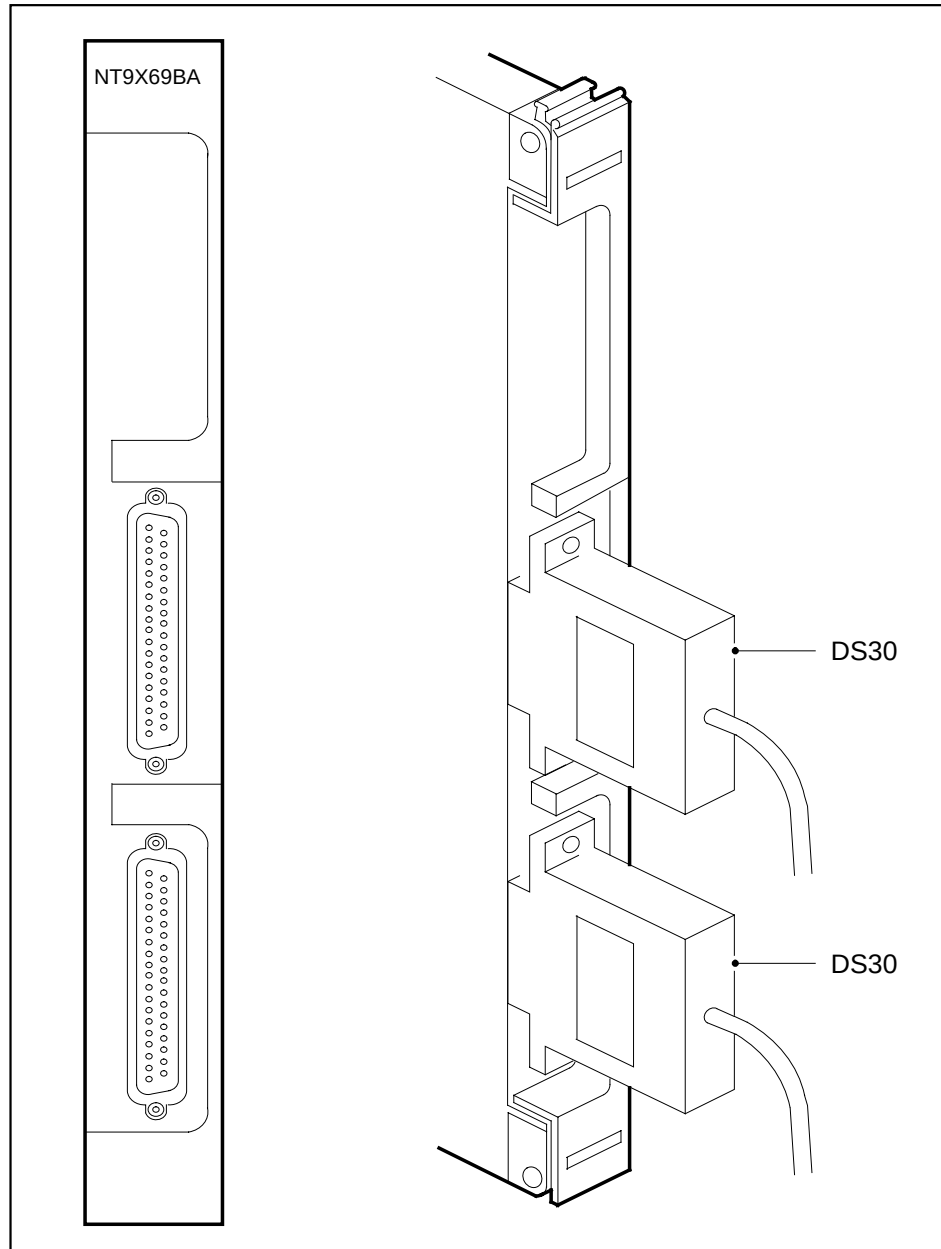
---

### Cable connections for an NT9X62 in a SuperNode MS



## Interface cards in a SuperNode MS (end)

### Cable connections for an NT9X69 in a SuperNode MS





## Manually busying LIM-to-MS SR128 links

---

### Application

Use this procedure to manually busy SR128 links between a link interface module (LIM) unit and the message switch (MS) before replacing an NT9X17 or NT9X62 card in the LIM unit. This procedure applies only to LIM units equipped with SR128 fiber links.

Before using this procedure, the LIM is posted and available for query; this procedure instructs you to again post the LIM you have been working on. This procedure also assumes a known location for the MS port card to be changed on the LIM.

### Action

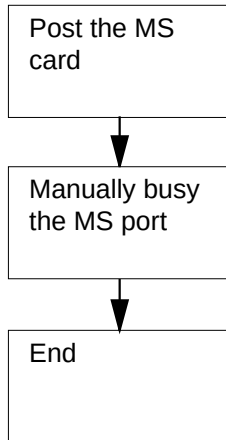
The following flowchart is only a summary of the procedure. To perform this procedure, use the instructions in the step-action procedure that follows the flowchart.

---

## Manually busying LIM-to-MS SR128 links (continued)

---

### Summary of Manually busying LIM-to-MS SR128 links



This flowchart summarizes the procedure.

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

## Manually busying LIM-to-MS SR128 links (continued)

---

### Manually busying LIM-to-MS SR128 links



#### CAUTION

##### Potential loss of service

Proceed only if you have been directed to this procedure from a step in a maintenance procedure. This procedure removes LIM-to-MS SR128 links from service. Loss of service may result.

#### At the MAP

- 1 Display information about the SR128 links between the LIM unit that contains the card to be replaced and the MS by typing

**>TRNSL unit\_no**

and pressing the Enter key.

*where*

**unit\_no**

is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
LIM 0 UNIT 0 LINK 0 (9:0 - MS 1:20:0) Open
LIM 0 UNIT 0 LINK 1 (9:1 - MS 0:20:0) Open
LIM 0 UNIT 0 LINK 2 (9:2 - LIM 0:30:2) Open
LIM 0 UNIT 0 LINK 3 is unequipped.
LIM 0 UNIT 0 LINK 4 (10:0 - MS 0:21:0) Open
LIM 0 UNIT 0 LINK 5 (10:1 - MS 1:21:0) Open
LIM 0 UNIT 0 LINK 6 (10:2 - LIM 0:29:2) Open
LIM 0 UNIT 0 LINK 7 is unequipped.
```

**Note:** In this example response, 9:0 is slot 9 and port 0 on the LIM side of the connection. MS 1:20:0 is MS 1, card 20, and port 0 that the link is connected to in the MS.

2



#### CAUTION

##### Possible service impact

Manually busy only the SR128 links associated with a specific NT9X17 or NT9X62 card in the LIM unit. The remaining SR128 links associated with the LIM unit must remain in service.

## Manually busying LIM-to-MS SR128 links (continued)

From the response obtained in step 1, record the MS number, MS card number, and MS port number for each LIM-to-MS link associated with the card to be replaced.

**Note:** Each MS port card for the LIM unit supports two LIM-to-MS links.

- 3 Access the SHELF level of the MAP display by typing

**>MS;SHELF 0**

and pressing the Enter key.

*Example of a MAP display:*

```

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

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

```

- 4 Post the MS card number of the first SR128 link you recorded in step 2 by typing

**>CARD card\_no**

and pressing the Enter key.

*where*

**card\_no**

is the card number (1 to 26) of the first link recorded in step 2

*Example of a MAP response:*

```

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

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

Card 20 Protocol Port 0____3
MS 0 . DS512 4 . - . .
MS 1 . DS512 4 . - . .

```

- 5 Manually busy the MS port for the first SR128 link recorded in step 2 by typing

**>BSY ms\_no PORT port\_no**

and pressing the Enter key.

*where*

## Manually busying LIM-to-MS SR128 links (continued)

---

**ms\_no**

is the MS number (0 or 1) of the first link recorded in step 2

**port\_no**

is the MS port number (0 to 3) of the first link recorded in step 2

*Example of a MAP response:*

Request to MAN BUSY MS: 1 shelf: 0 card:20 port: 0 submitted.

Request to MAN BUSY MS: 1 shelf: 0 card:20 port: 0 passed.

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 6  |
| failed             | step 11 |

6 Determine the card number of the second SR128 link recorded in step 2.

| If the second SR128 link is               | Do     |
|-------------------------------------------|--------|
| on the same MS card as the first link     | step 7 |
| not on the same MS card as the first link | step 8 |

7



### CAUTION

#### Possible service impact

Manually busy only the SR128 links associated with a specific NT9X17 or NT9X62 card in the LIM unit. The remaining SR128 links associated with the LIM unit must remain in service.

Manually busy the MS port for the second SR128 link by typing

**>BSY ms\_no PORT port\_no**

and pressing the Enter key.

*where*

**ms\_no**

is the MS number (0 or 1) of the second link recorded in step 2

---

## Manually busying LIM-to-MS SR128 links (continued)

---

**port\_no**

is the MS port number (0 to 3) of the second link recorded instep 2

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 10 |
| failed             | step 11 |

- 8** Post the MS card number of the second SR128 link recorded in step 2 by typing

**>CARD card\_no**

and pressing the Enter key.

where

**card\_no**

is the card number (1 to 26) of the second link recorded instep 2

- 9** Manually busy the MS port for the second SR128 link by typing

**>BSY ms\_no PORT port\_no**

and pressing the Enter key.

where

**ms\_no**

is the MS number (0 or 1) of the second link recorded in step 2

**port\_no**

is the MS port number (0 to 3) of the second link recorded instep 2

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 10 |
| failed             | step 11 |

- 10** Post the LIM that contains the card to be replaced by typing

**>PM;POST LIM lim\_no**

and pressing the Enter key.

where

**lim\_no**

is the number of the LIM (0 to 16)

*Example of a MAP display:*

```

LIM 0 ISTb
Unit0: ISTb 2
Unit1: InSv .
Links_00S Taps_00S

```

Go to step 12.

## **Manually busying LIM-to-MS SR128 links (end)**

---

- 11 For further assistance, contact the personnel responsible for the next level of support.
- 12 You have completed this procedure. Return to the main procedure that sent you to this procedure and continue as directed.

## Returning LIM-to-MS SR128 links to service

---

### Application

Use this procedure to return SR128 links between a link interface module (LIM) unit and the message switch (MS) to service after replacing an NT9X17 or NT9X62 card in a LIM unit. This procedure applies only to LIM units equipped with SR128 fiber links.

### Action

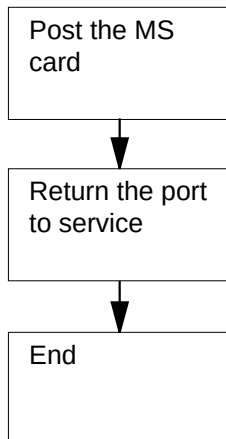
The following flowchart is only a summary of the procedure. To perform this procedure, use the instructions in the step-action procedure that follows the flowchart.



## Returning LIM-to-MS SR128 links to service (continued)

---

### Summary of Returning LIM-to-MS SR128 links to service



This flowchart summarizes the procedure.

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

---

## Returning LIM-to-MS SR128 links to service (continued)

---

### Returning LIM-to-MS SR128 links to service

**CAUTION****Potential loss of service**

Proceed only if you have been directed to this procedure from a step in a maintenance procedure. This procedure returns LIM-to-MS SR128 links from service. Loss of service may result.

**At the MAP terminal**

- 1 Display information about the SR128 links between the LIM unit that contains the card to be replaced and the MS by typing

**>TRNSL unit\_no**

and pressing the Enter key.

*where*

**unit\_no**

is the number of the LIM unit (0 or 1)

*Example of a MAP response:*

```
LIM 0 UNIT 0 LINK 0 (9:0 - MS 1:20:0) OEC
LIM 0 UNIT 0 LINK 1 (9:1 - MS 0:20:0) Open
LIM 0 UNIT 0 LINK 2 (9:2 - LIM 0:30:2) Open
LIM 0 UNIT 0 LINK 3 is unequipped.
LIM 0 UNIT 0 LINK 4 (10:0 - MS 0:21:0) Open
LIM 0 UNIT 0 LINK 5 (10:1 - MS 1:21:0) OEC
LIM 0 UNIT 0 LINK 6 (10:2 - LIM 0:29:2) Open
LIM 0 UNIT 0 LINK 7 is unequipped.
```

**Note:** In this example response, 9:0 is slot 9 and port 0 on the LIM side of the connection. MS 1:20:0 is MS 1, card 20, and port 0 that the link is connected to in the MS.

- 2 From the response obtained in step 1, record the MS number, MS card number, and MS port number for each LIM-to-MS link associated with the card to be replaced.
- 3 Access the SHELF level of the MAP display by typing

**>MS;SHELF 0**

and pressing the Enter key.

*Example of a MAP display:*

## Returning LIM-to-MS SR128 links to service (continued)

```

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

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

```

- 4 Post the MS card number of the first SR128 link you recorded in step 2 by typing

**>CARD card\_no**

and pressing the Enter key.

where

**card\_no**

is the card number (1 to 26) of the first link recorded in step 2

*Example of a MAP response:*

```

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

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

Card 20 Protocol Port 0____3
MS 0 . DS512 4 M - . .
MS 1 . DS512 4 M - . .

```

- 5 Return to service the MS port for the first SR128 link recorded in step 2 by typing

**>RTS ms\_no PORT port\_no**

and pressing the Enter key.

where

**ms\_no**

is the MS number (0 or 1) of the first link recorded in step 2

**port\_no**

is the MS port number (0 to 3) of the first link recorded in step 2

*Example of a MAP response:*

---

## Returning LIM-to-MS SR128 links to service (continued)

---

Request to RTS MS: 1 shelf: 0 card:20 port: 0  
submitted.  
Request to RTS MS: 1 shelf: 0 card:20 port: 0  
passed.

|          | <b>If the RTS command</b>                                                                                                                                                                                                                                                                                                          | <b>Do</b> |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|          | passed                                                                                                                                                                                                                                                                                                                             | step 6    |
|          | failed                                                                                                                                                                                                                                                                                                                             | step 11   |
| <b>6</b> | Determine the card number of the second SR128 link recorded in step 2.                                                                                                                                                                                                                                                             |           |
|          | <b>If the second SR128 link is</b>                                                                                                                                                                                                                                                                                                 | <b>Do</b> |
|          | on the same MS card as the first link                                                                                                                                                                                                                                                                                              | step 7    |
|          | not on the same MS card as the first link                                                                                                                                                                                                                                                                                          | step 8    |
| <b>7</b> | Return to service the MS port for the second SR128 link by typing<br><b>&gt;RTS ms_no PORT port_no</b><br>and pressing the Enter key.<br><i>where</i><br><b>ms_no</b><br>is the MS number (0 or 1) of the second link recorded in step 2<br><b>port_no</b><br>is the MS port number (0 to 3) of the second link recorded in step 2 |           |
|          | <b>If the RTS command</b>                                                                                                                                                                                                                                                                                                          | <b>Do</b> |
|          | passed                                                                                                                                                                                                                                                                                                                             | step 10   |
|          | failed                                                                                                                                                                                                                                                                                                                             | step 11   |
| <b>8</b> | Post the MS card number of the second SR128 link you recorded in step 2 by typing<br><b>&gt;CARD card_no</b><br>and pressing the Enter key.<br><i>where</i><br><b>card_no</b><br>is the card number (1 to 26) of the second link recorded in step 2                                                                                |           |
| <b>9</b> | Return to service the MS port for the second SR128 link by typing<br><b>&gt;RTS ms_no PORT port_no</b><br>and pressing the Enter key.<br><i>where</i>                                                                                                                                                                              |           |

---

**Returning LIM-to-MS SR128 links to service (end)**

---

**ms\_no**

is the MS number (0 or 1) of the second link recorded in step 2

**port\_no**

is the MS port number (0 to 3) of the second link recorded in step 2

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 10 |
| failed             | step 11 |

---

- 10** Post the LIM that you are working on by typing

**>PM;POST LIM lim\_no**

and pressing the Enter key

where

**lim\_no**

is the number of the LIM (0 to 16)

*Example of a MAP display:*

```
LIM 0 InSv
Unit0: InSv Links_00S Taps_00S
Unit1: InSv . .
```

Go to step 12.

- 11** For further assistance, contact the personnel responsible for the next level of support.
- 12** You have completed this procedure. Return to the main procedure that sent you to this procedure and continue as directed.

## System cards in a SuperNode MS

### Application

Use this procedure to replace the following cards in a SuperNode message switch (MS).

| PEC    | Suffix            | Card name                                 | Shelf or frame name |
|--------|-------------------|-------------------------------------------|---------------------|
| NT9X13 | DA, DB,<br>DC, DD | CPU 16-MHz card                           | MS                  |
| NT9X14 | AA                | 4-Mbyte memory card                       | MS                  |
| NT9X14 | BB                | 6-Mbyte memory card                       | MS                  |
| NT9X14 | DB                | 24-Mbyte memory card                      | MS                  |
| NT9X15 | AA                | Mapper card                               | MS                  |
| NT9X17 | AA, AD            | Message switch<br>four-port card          | MS                  |
| NT9X17 | BB                | DMS-bus 32-port card                      | MS                  |
| NT9X17 | CA                | DMS-bus 128-port card                     | MS                  |
| NT9X17 | DA                | Message switch 64-port<br>card            | MS                  |
| NT9X25 | AA                | MS port expander<br>paddle board          | MS                  |
| NT9X25 | BA                | MS port terminator<br>paddle board        | MS                  |
| NT9X26 | AA                | Remote terminal<br>interface card         | MS                  |
| NT9X26 | AB                | Remote terminal<br>interface paddle board | MS                  |
| NT9X30 | AA                | +5V 86-A power<br>converter               | MS                  |
| NT9X31 | AA                | -5V 20-A power<br>converter               | MS                  |
| NT9X32 | AA                | DMS-bus load paddle<br>board              | MS                  |

## System cards in a SuperNode MS (continued)

---

| PEC    | Suffix        | Card name                   | Shelf or frame name |
|--------|---------------|-----------------------------|---------------------|
| NT9X49 | CA, CB,<br>CC | MS P-bus terminator<br>card | MS                  |
| NT9X52 | AA            | MSP T-bus access card       | MS                  |
| NT9X53 | AA            | MS system clock card        | MS                  |
| NT9X53 | AB            | DMS SuperNode clock<br>card | MS                  |
| NT9X53 | AC, AD        | SuperNode clock card        | MS                  |

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

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

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

## Common procedures

This procedure refers to the following common procedures:

- *Failure to switch clock mastership*
- *Replacing a card*

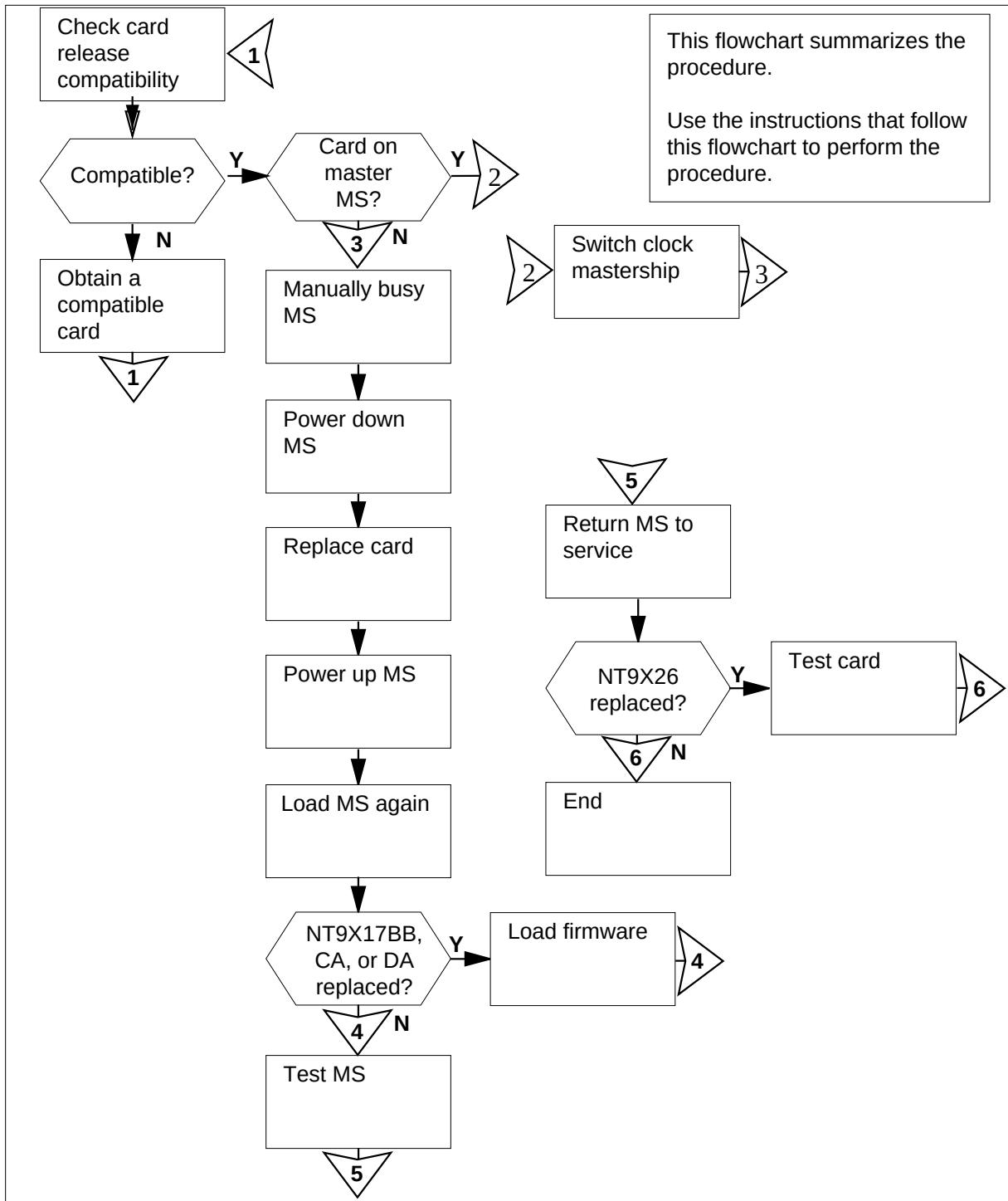
Do not go to the common procedure unless the step-action procedure directs you to go.

## Action

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

## System cards in a SuperNode MS (continued)

### Summary of System cards in a SuperNode MS





---

## System cards in a SuperNode MS (continued)

---

### System cards in a SuperNode MS

#### *At the your current location*

1

**WARNING****Loss of service**

Do not use the NT9X13DE card in the MS. The MS becomes system busy if you replace the NT9X13 card with the DE version. Service will be lost for the whole office if you attempt to use the NT9X13DE cards in both MSs.

Obtain a replacement card. Make sure that the replacement card and the card you remove have the same product engineering code (PEC) and PEC suffix.

#### *At the MAP terminal*

2

To ensure that the replacement card is compatible with the software load, type

**>CHECKREL MS pec release**

and press the Enter key.

where

**pec**

is the PEC and suffix of the new card

**release**

is the two-character code located on the faceplate of the replacement card

*Example input:*

**>CHECKREL MS NT9X13DD 2Z**

*Example of a MAP response:*

| PEC      | BASELINE | EXCEPT | RELEASE | COMPATIBLE |
|----------|----------|--------|---------|------------|
| NT9X13DD | 13       | None   | 2Z      | YES        |

OK. Card release is above baseline.

---

| If the replacement card is | Do |
|----------------------------|----|
|----------------------------|----|

---

|                |        |
|----------------|--------|
| below baseline | step 3 |
|----------------|--------|

|                      |        |
|----------------------|--------|
| on or above baseline | step 6 |
|----------------------|--------|

3

From the MAP display, record the baseline release code (BASELINE) and any exception release codes (EXCEPT).

## System cards in a SuperNode MS (continued)

- 4 Determine which release codes are compatible with the software load in the switch. A compatible release code is the code that is
- greater than or equal to the baseline release code, and
  - not an exception release code

**Note:** The range of release codes in ascending order is 01 to 09, 0A to 0Z, and 10 to VZ.

- 5 Obtain a replacement card with a compatible release code.

| If you                                      | Do      |
|---------------------------------------------|---------|
| can obtain a compatible replacement card    | step 2  |
| cannot obtain a compatible replacement card | step 35 |

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

*Example of a MAP response:*

```

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

```

- 7 Determine the clocking configuration.

**Note:** The clocking configuration appears under the Clock header of the MAP display.

| If the MS that contains the card<br>you will replace                                        | Do      |
|---------------------------------------------------------------------------------------------|---------|
| is the slave MS, indicated by<br>Slave, S Flt , S 00S , or S<br>Free under the Clock header | step 11 |
| is the master MS, indicated by<br>Master, M Free or M Flt<br>under the Clock header         | step 8  |

- 8 To switch clock mastership, type  
**>SWMAST**  
and press the Enter key.

*Example of a MAP response:*

## System cards in a SuperNode MS (continued)

Request to Switch Clock Mastership MS: 0 submitted.  
Request to Switch Clock Mastership MS: 0 passed.

|           | <b>If the SWMAST command</b>                                                                                                                                                                      | <b>Do</b> |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed                                                                                                                                                                                            | step 10   |
|           | failed                                                                                                                                                                                            | step 9    |
| <b>9</b>  | Perform the procedure <i>Failure to switch clock mastership</i> in this document. Complete the procedure and return to this point.                                                                |           |
| <b>10</b> | Wait 10 min to make sure the MS has stability. Continue this procedure.                                                                                                                           |           |
| <b>11</b> | Determine if the slave MS is manually busy.<br><br><b>Note:</b> The letter M appears on the right side of the MS 0 or MS 1 header on the MAP display. The letter M identifies a manually busy MS. |           |
|           | <b>If the slave MS</b>                                                                                                                                                                            | <b>Do</b> |
|           | is not manually busy                                                                                                                                                                              | step 12   |
|           | is manually busy                                                                                                                                                                                  | step 17   |
| <b>12</b> | To manually busy the slave MS, type<br><b>&gt;BSY ms_number</b><br>and press the Enter key.<br><i>where</i><br><b>ms_number</b><br>is the number of the slave MS (0 or 1)                         |           |
|           | <b>If the BSY command</b>                                                                                                                                                                         | <b>Do</b> |
|           | passed                                                                                                                                                                                            | step 13   |
|           | aborted or failed                                                                                                                                                                                 | step 35   |
| <b>13</b> | Determine the type of card you will replace.                                                                                                                                                      |           |
|           | <b>If the card you will replace</b>                                                                                                                                                               | <b>Do</b> |
|           | is an NT9X30 or NT9X31                                                                                                                                                                            | step 17   |
|           | is not an NT9X30 or NT9X31                                                                                                                                                                        | step 14   |
| <b>14</b> | To access the Shelf level of the MAP display, type<br><b>&gt;SHELF shelf_number</b><br>and press the Enter key.                                                                                   |           |

## System cards in a SuperNode MS (continued)

where

**shelf\_number**

is the number of the shelf (0 to 3)

Example of a MAP response:

```
Shelf 0 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2
Card 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
Chain
MS 0 F .
MS 1 .
```

- 15** To translate the location of the card, type

**>TRNSL ms\_number card\_number**

and press the Enter key.

where

**ms\_number**

is the number of the MS (0 or 1) that contains the card you will replace

**card\_number**

is the card identification number (1 to 13)

Example of a MAP response:

```
Site Flr RPos Bay_id Shf Description Slot EqPEC
HOST 01 A01 DPCC 0 39 MS 0:0: 5 11 9X15AA FRNT
HOST 01 A01 DPCC 0 39 MS 0:0: 5 11 BACK
No resources to translate on card 5.
```

- 16** Record the location, description, slot number, PEC, and PEC suffix of the card you will replace.

### At the MS shelf

- 17** Determine if the LED on the NT9X13 card in the slave MS is lit.

**Note:** Allow 5 min for the LED to light.

| If the LED | Do      |
|------------|---------|
| is lit     | step 18 |
| is not lit | step 35 |

## System cards in a SuperNode MS (continued)

---

18



**WARNING**

**Possible loss of service**

Make sure that you power down the slave MS. If you power down the master MS the system will shut down.



**WARNING**

**Static electricity damage**

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

Power down the slave MS, as follows:

- a Press down and release the switch on the faceplate of the NT9X30 power converter in slot 4F.
  - b Press down and release the switch on the faceplate of the NT9X31 power converter in slot 1F.
  - c Press down and release the switches on the faceplates of the power converters in slots 33F and 36F at the same time.
- 19** Perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- 20** Power up the slave MS, as follows:
- a Lift and release the switches on the faceplates of the power converters in slots 33F and 36F at the same time.
  - b Lift and release the switch on the faceplate of the NT9X31 power converter in slot 1F.
  - c Lift and release the switch on the faceplate of the NT9X30 power converter in slot 4F.

**At the MAP terminal**

- 21** To make sure you are at the MS level of the MAP display, type  
**>MAPCI ; MTC ; MS**  
and press the Enter key.
- 22** To load the slave MS again, type  
**>LOADMS ms\_number**  
and press the Enter key.  
*where*

## System cards in a SuperNode MS (continued)

**ms\_number**

is the number of the slave MS (0 or 1)

*Example of a MAP response:*

Active boot file CSP04AX\_MS from S01DVOL1 on SLM DISK  
will be loaded

Do you want to proceed with loading?

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

|           | <b>If the response</b>                                                                                                                                                                                                                                                                                         | <b>Do</b> |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | indicates the LOADMS command passed                                                                                                                                                                                                                                                                            | step 24   |
|           | requests confirmation                                                                                                                                                                                                                                                                                          | step 23   |
| <b>23</b> | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.                                                                                                                                                                                                                                     |           |
|           | <b>If the LOADMS command</b>                                                                                                                                                                                                                                                                                   | <b>Do</b> |
|           | passed                                                                                                                                                                                                                                                                                                         | step 24   |
|           | failed                                                                                                                                                                                                                                                                                                         | step 35   |
| <b>24</b> | Determine the type of the replaced card.                                                                                                                                                                                                                                                                       |           |
|           | <b>If the replaced card</b>                                                                                                                                                                                                                                                                                    | <b>Do</b> |
|           | is a NT9X17BB, NT9X17CA, or NT9X17DA                                                                                                                                                                                                                                                                           | step 25   |
|           | is other than listed here                                                                                                                                                                                                                                                                                      | step 27   |
| <b>25</b> | To access the Shelf level of the MAP display, type<br><b>&gt;SHELF</b><br>and press the Enter key.                                                                                                                                                                                                             |           |
| <b>26</b> | To load the firmware into the replacement card, type<br><b>&gt;LOADCD ms_number card_number1 FROMCD card_number2</b><br>and press the Enter key.<br><i>where</i><br><b>ms_number</b><br>is the number of the slave MS (0 or 1)<br><b>card_number1</b><br>is the number of the card (6 to 25) that you replaced |           |

## System cards in a SuperNode MS (continued)

**card\_number2**

is the number of the card (6 to 25) you load from

**Note:** Both cards must be in the same MS. The card you load from and the card you load must have the same PEC and PEC suffix.

*Example input*

>LOADCD 0 5 FROMCD 7

- 27 Determine if a maintenance procedure directed you to this procedure.

| If a maintenance procedure               | Do      |
|------------------------------------------|---------|
| directed you to this procedure           | step 28 |
| did not direct you to this6<br>procedure | step 29 |

- 28 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

- 29 To perform an out-of-service test on the slave MS, type

>TST ms\_number

and press the Enter key.

*where*

**ms\_number**

is the number of the slave MS (0 or 1)

*Example of a MAP response:*

Request to TEST 00S MS: 0 submitted.  
Request to TEST 00S MS: 0 passed.  
No node faults were found on MS 0.  
No cards were found to be faulty on MS0.  
Request to TEST VIA MATE MS: 0 submitted.  
Request to TEST VIA MATE MS: 0 passed.  
No node faults were found on MS 0.  
No cards were found to be faulty on MS 0.

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 30 |
| failed             | step 35 |

- 30 To return the slave MS to service, type

>RTS ms\_number

and press the Enter key.

*where*

## System cards in a SuperNode MS (continued)

**ms\_number**

is the number of the slave MS (0 or 1)

*Example of a MAP response:*

Request to RTS MS: 0 submitted.  
Request to RTS MS: 0 passed.  
No node faults were found on MS 0.  
No cards were found to be faulty on MS 0.

|           | <b>If the RTS command</b>                                                                                                                                                                                                                                                                                                                   | <b>Do</b> |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed                                                                                                                                                                                                                                                                                                                                      | step 31   |
|           | failed                                                                                                                                                                                                                                                                                                                                      | step 35   |
| <b>31</b> | Determine the type of card that you replaced.                                                                                                                                                                                                                                                                                               |           |
|           | <b>If the card</b>                                                                                                                                                                                                                                                                                                                          | <b>Do</b> |
|           | is an NT9X26                                                                                                                                                                                                                                                                                                                                | step 32   |
|           | is other than an NT9X26                                                                                                                                                                                                                                                                                                                     | step 36   |
| <b>32</b> | To access the Shelf level of the MAP display, type<br><b>&gt;SHELF</b><br>and press the Enter key.                                                                                                                                                                                                                                          |           |
| <b>33</b> | To access the Card level for the card you replaced, type<br><b>&gt;CARD 3</b><br>and press the Enter key.                                                                                                                                                                                                                                   |           |
| <b>34</b> | To test the card, type<br><b>&gt;TST ms_number BACK</b><br>and press the Enter key.<br><i>where</i><br><b>ms_number</b><br>is the number of the slave MS (0 or 1)<br><i>Example of a MAP response:</i><br><br>Request to TEST INSV MS: 0 shelf: 0 card: 3 back<br>submitted.<br>Request to TEST InSV MS: 0 shelf: 0 card: 3 back<br>passed. |           |
|           | <b>If the TST command</b>                                                                                                                                                                                                                                                                                                                   | <b>Do</b> |
|           | passed                                                                                                                                                                                                                                                                                                                                      | step 36   |



## System cards in a SuperNode MS (end)

---

|    | If the TST command                                      | Do      |
|----|---------------------------------------------------------|---------|
|    | failed                                                  | step 35 |
| 35 | For additional help, contact the next level of support. |         |
| 36 | The procedure is complete.                              |         |

---

## 7 SuperNode SE message switch card replacement procedures

---

### Introduction

This chapter contains card replacement procedures for the SuperNode SE message switch (MS). The first section in the chapter provides diagrams that show SuperNode SE MS shelf layouts.

Card replacement procedures for the SuperNode MS are in the chapter titled “SuperNode message switch card replacement procedures”.

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

Each procedure contains the following sections:

- Application
- Common procedures
- Action

### Application

This section identifies the MS card(s) the replacement procedure covers.

### Common procedures

This section lists common procedures used during the card replacement procedure. A common procedure is a series of steps that repeat within maintenance procedures. An example of a common procedure is card removal and replacement. Common procedures appear in the common procedures chapter in this NTP.

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

**Action**

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

**Recording card replacement activities**

Record the following information in office records when you replace a card:

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

---

## SuperNode SE message switch shelf layouts

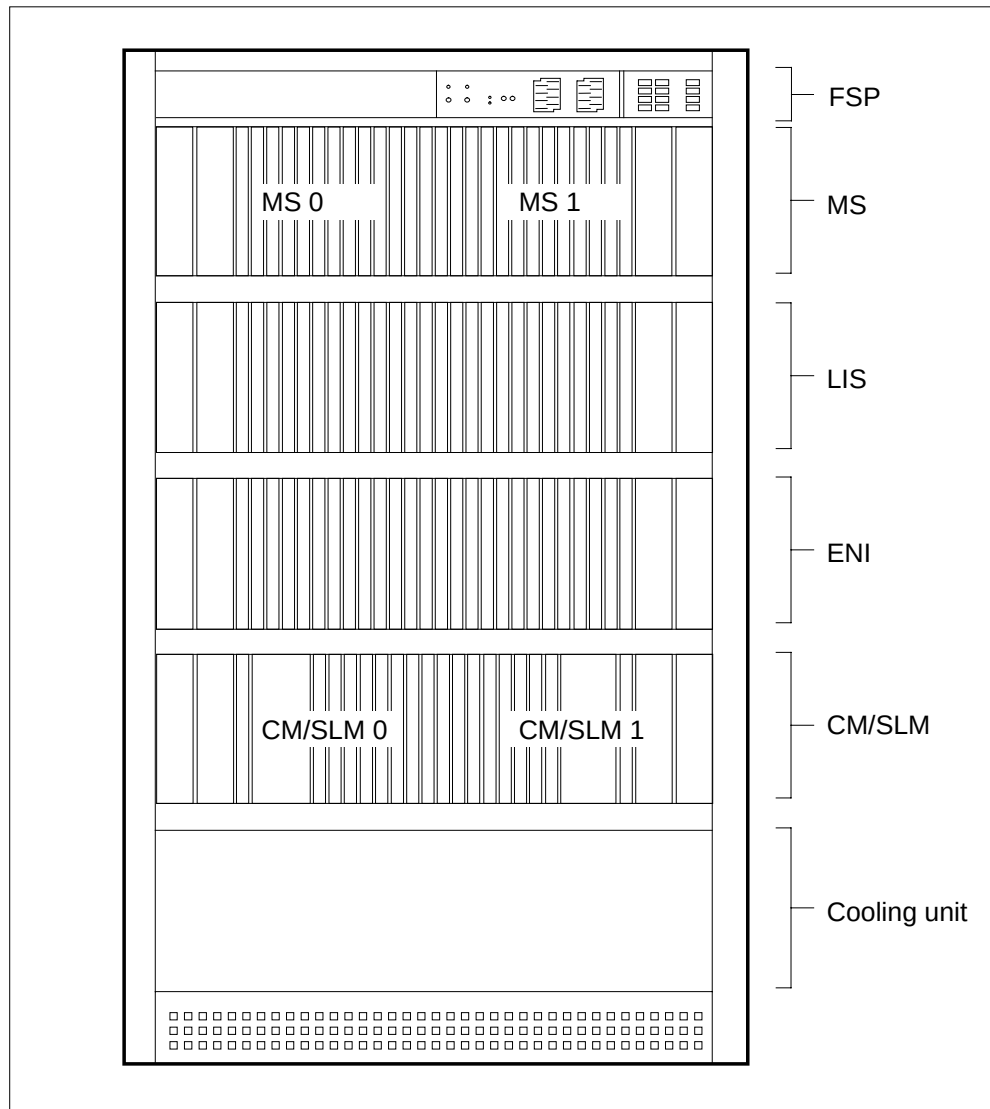
---

### Application

This procedure provides the following layout diagrams:

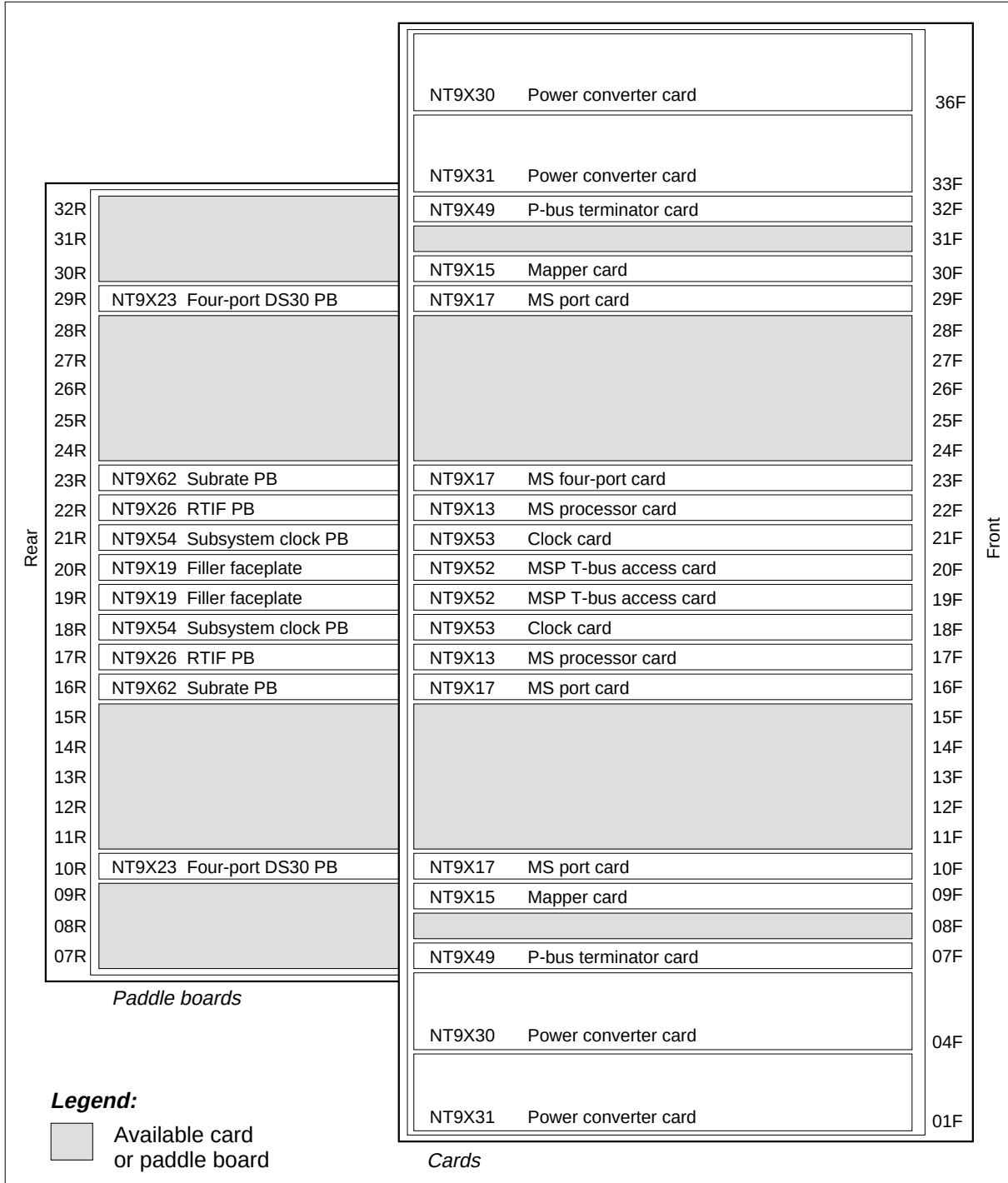
- single core cabinet
- SuperNode SE message switch (MS)

**Figure Single core cabinet**



## SuperNode SE message switch shelf layouts (end)

Figure 2 SuperNode SE message switch, that shows common fill



---

## Interface paddle boards in a SuperNode SE MS

---

### Application

Use this procedure to replace the following cards in a SuperNode SE (SNSE) message switch (MS).

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

| PEC    | Suffix | Card name                                         | Shelf or frame name |
|--------|--------|---------------------------------------------------|---------------------|
| NT9X23 | AA     | Four-port DS30 paddle board                       | MS                  |
| NT9X54 | AC, AD | Subsystem clock paddle board (external interface) | MS                  |
| NT9X62 | BA     | Four-port subrate DS512 paddle board              | MS                  |
| NT9X62 | CA     | SR-512 subrate paddle board                       | MS                  |
| NT9X69 | BA     | DMS-bus 16-link DS30 paddle board                 | MS                  |
| NT9X79 | BA     | F-bus termination paddle board                    | MS                  |

### Common procedures

This procedure refers to the following common procedures:

- *Failure to switch clock mastership*
- *Verifying load compatibility of SuperNode cards*
- *Cleaning fiber optic components and assemblies*

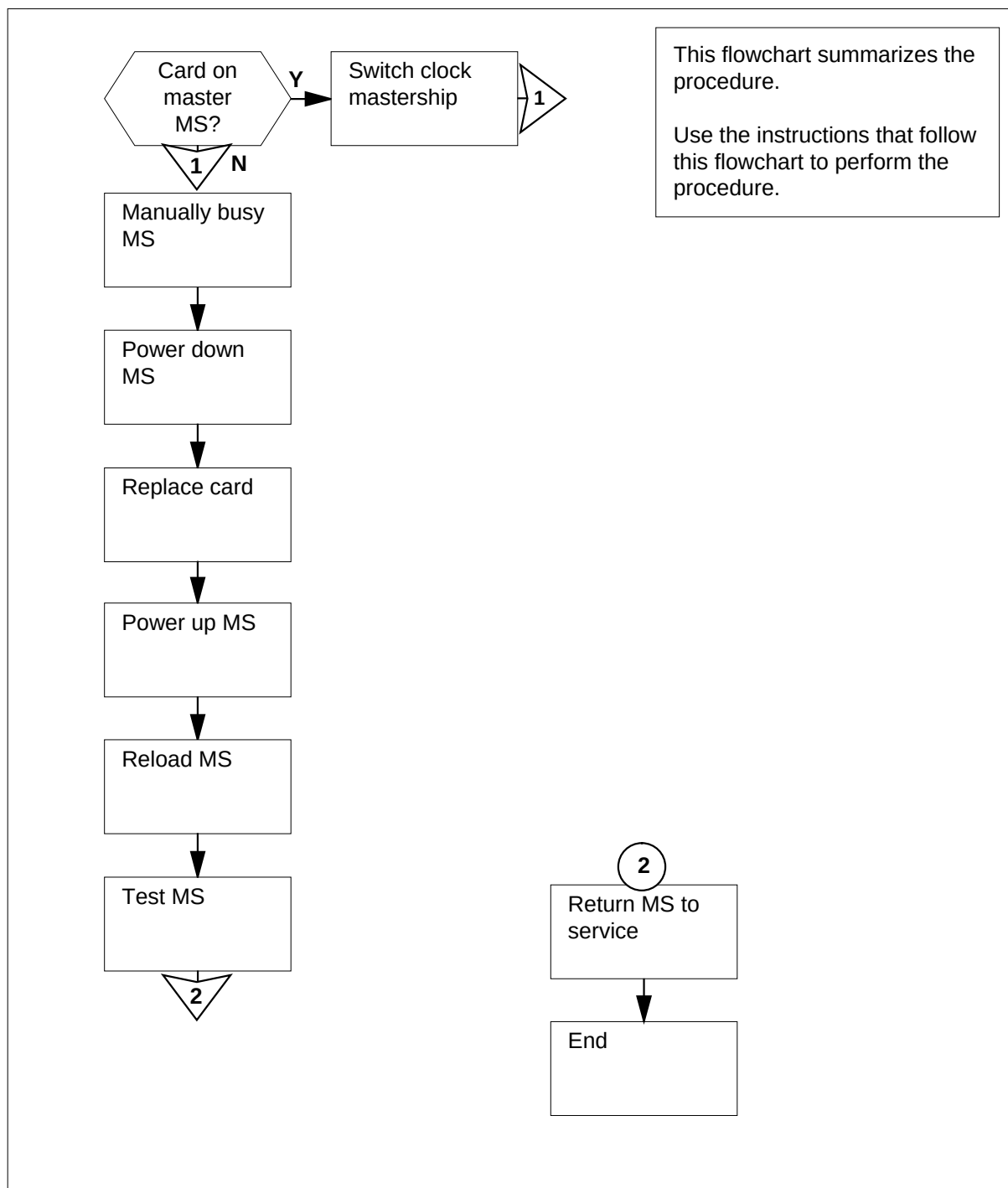
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## Interface paddle boards in a SuperNode SE MS (continued)

### Summary of Interface paddle boards in a SuperNode SE MS



## Interface paddle boards in a SuperNode SE MS (continued)

### Interface paddle boards in a SuperNode SE MS

#### *At the MAP terminal*

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

*Example of a MAP response:*

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

- 4 Determine the clocking configuration.

**Note:** The clocking configuration is under the Clock header of the MAP display.

| If the MS that contains the card you                                                                                       | Do     |
|----------------------------------------------------------------------------------------------------------------------------|--------|
| replace is the slave MS, indicated by <b>Slave</b> , <b>S Flt</b> , <b>S 00S</b> , or <b>S Free</b> under the Clock header | step 8 |
| replace is the master MS, indicated by <b>Master</b> , <b>M Free</b> or <b>M Flt</b> under the Clock header                | step 5 |

- 5 To switch clock mastership, type

**>SWMAST**

and press the Enter key.

*Example of a MAP response:*

Request to Switch Clock Mastership MS: 0 submitted.  
Request to Switch Clock Mastership MS: 0 passed.

| If the SWMAST command | Do     |
|-----------------------|--------|
| passed                | step 7 |
| failed                | step 6 |



## Interface paddle boards in a SuperNode SE MS (continued)

- 6 Perform the procedure *Failure to switch clock mastership* in this document. Complete the procedure and return to this point.
- 7 Wait 10 min to make sure the MS has stability. Continue with this procedure.
- 8 Determine if the slave MS is manual busy.  
**Note:** A letter M on the right of the MS 0 or MS 1 header on the MAP display identifies a manual-busy MS.

| If the slave MS    | Do      |
|--------------------|---------|
| is not manual busy | step 9  |
| is manual busy     | step 10 |

- 9 To manually busy the slave MS, type  
**>BSY ms\_number**  
and press the Enter key.  
*where*  
**ms\_number**  
is the number of the slave MS (0 or 1)

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 10 |
| failed or aborted  | step 56 |

- 10 To access the Shelf level of the MAP display, type  
**>SHELF shelf\_number**  
and press the Enter key.  
*where*  
**shelf\_number**  
is the number of the shelf (0 to 3)

*Example of a MAP response:*

```
Shelf 0 1 1 1 1
Card 1 2 3 4 5 6 7 8 9 0 1 2 3
Chain
MS 0 F
MS 1
```

- 11 To translate the location of the card, type  
**>TRNSL ms\_number card\_number**  
and press the Enter key.  
*where*

## Interface paddle boards in a SuperNode SE MS (continued)

**ms\_number**

is the number of the MS (0 or 1) that contains the card to replace

**card\_number**

is the card identification number (1 to 13)

*Example of a MAP response:*

```
Site Flr RPos Bay_id Shf Description Slot EqPEC
HOST 00 A00 SCC 0 39 MS 1 :0: 3 22 9X13NA FRNT
HOST 00 A00 SCC 0 39 MS 1 :0: 3 22 9X26AB BACK
No resources to translate on card 3.
```

- 12 Record the location, description, slot number, and PEC and PEC suffix of the card you replace.
- 13 Determine which MS is the slave MS.

| If the slave MS | Do      |
|-----------------|---------|
| is MS 0         | step 14 |
| is MS 1         | step 16 |

14

**WARNING****Possible loss of service**

Make sure that you power down the slave MS. If you power down the MS that contains the master clock, the system shuts down completely.

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

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

Power down the slave MS, as follows:

- a Press down and release the switch on the faceplate of the NT9X30 power converter in slot 4F.
  - b Press down and release the switch on the faceplate of the NT9X31 power converter in slot 1F.
- 15 Go to step 17.

## Interface paddle boards in a SuperNode SE MS (continued)

---

### *At the MS shelf*

16



#### **WARNING**

##### **Static electricity damage**

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

Power down the slave MS, as follows:

- a Press down and release the switch on the faceplate of the NT9X30 power converter in slot 36F.
- b Press down and release the switch on the faceplate of the NT9X31 power converter in slot 33F.

17 Locate the card on the shelf.

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

| If the card you   | Do      |
|-------------------|---------|
| replace is NT9X23 | step 19 |
| replace is NT9X54 | step 21 |
| replace is NT9X62 | step 23 |
| replace is NT9X69 | step 26 |
| replace is NT9X79 | step 28 |

19



#### **DANGER**

##### **Possible equipment damage**

Pins in the RS-232 cable connector bend if you remove the top pins and then remove the bottom pins. When you insert the connector again, the pins will be misaligned and can bend further and become unseated from the connector block.

Disconnect the RS-232 cable from the card you replace as follows:

- a To prevent damage to the pins, remove the connector at a 90° angle to the faceplate.

---

## Interface paddle boards in a SuperNode SE MS (continued)

---

- b Loosen the cable with the latch handles up.

**Note:** The RS-232 cable connection is in Figure 1 at the end of this procedure.

- 20 Go to step 29.

- 21 Label the cables connected to the faceplate of the card you replace.

**Note:** A normal cable connection configuration is in Figure 2 at the end of this procedure.

- 22 Note the connector numbers and disconnect the cables from the faceplate of the card you replace.

Go to step 29.

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

**Note:** The fiber cable connections appear in Figure 3 at the end of this procedure.

- 24



### DANGER

#### Avoid contaminating the fiber tip surface

Do not touch the tip of the fiber. Dirt or oil from the skin transferred to the fiber tip surface degrades fiber performance.



### DANGER

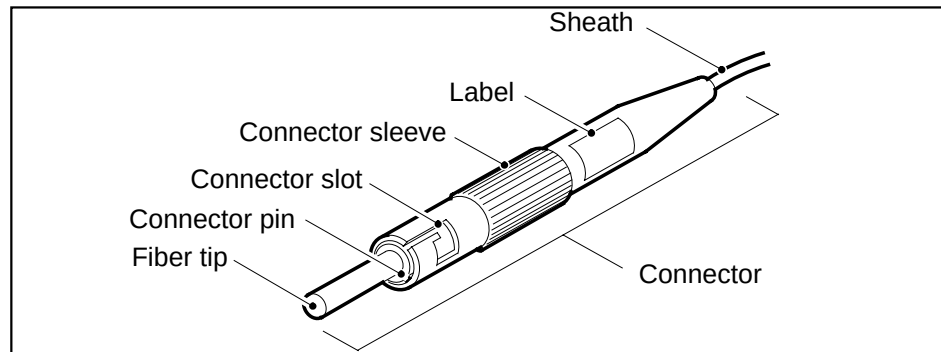
#### Fiber cable may become damaged

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

Disconnect the fiber links from the card as follows:

- a Loosen the fiber connections with the latch handles up.
- b Carefully push in and turn the fiber cable connector counterclockwise until the connector slides out of the connector receptacle.
- c Place dust caps on the ends of the connectors as you disconnect them.

## Interface paddle boards in a SuperNode SE MS (continued)



**Note 1:** Perform the procedure, *Cleaning fiber optic components and assemblies* in this NTP.

**Note 2:** The fiber cable connections are in Figure 3 at the end of this procedure.

25 Go to step 29.

26



### **DANGER**

#### **Possible equipment damage**

Pins in the RS-232 cable connector bend if you remove the top pins and then remove the bottom pins. When you insert the connector again, the pins will be misaligned and can bend further and become unseated from the connector block.

Disconnect the DS30 cables from the card as follows:

- a To prevent damage to the pins, remove the connectors at a 90° angle to the faceplate.

**Note:** The DS30 cable connections appear in Figure 4 at the end of this procedure.

- b Loosen the DS30 connections.

27 Go to step 29.

28 Disconnect the cables from the NT9X79 card, as follows:

- a Remove the composite clock cable.

**Note:** The cable connections appear in Figure 5 at the end of this procedure.

- b Use a screwdriver to disconnect the F-bus ribbon cables from the card.

## Interface paddle boards in a SuperNode SE MS (continued)

29

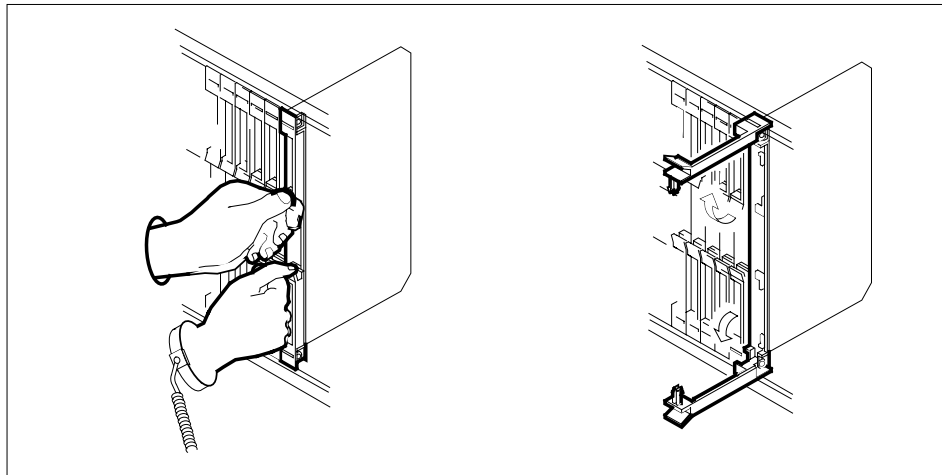


### **DANGER**

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

If you hold a card by the levers, you can cause lever breakage. When you pull the card half way out, grasp the card underneath for support. Continue to remove the card from the shelf. Avoid contact with any wires or internal parts on the card.

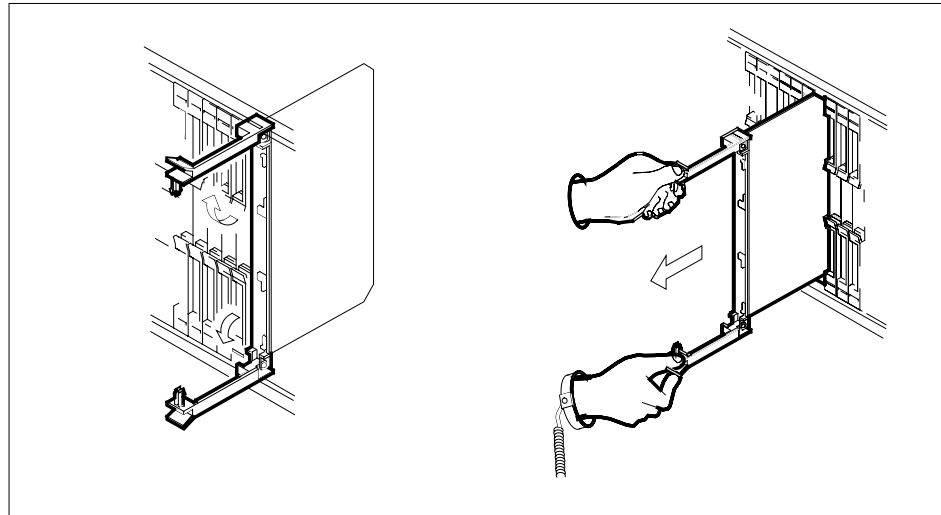
Open the locking levers on the card you replace.



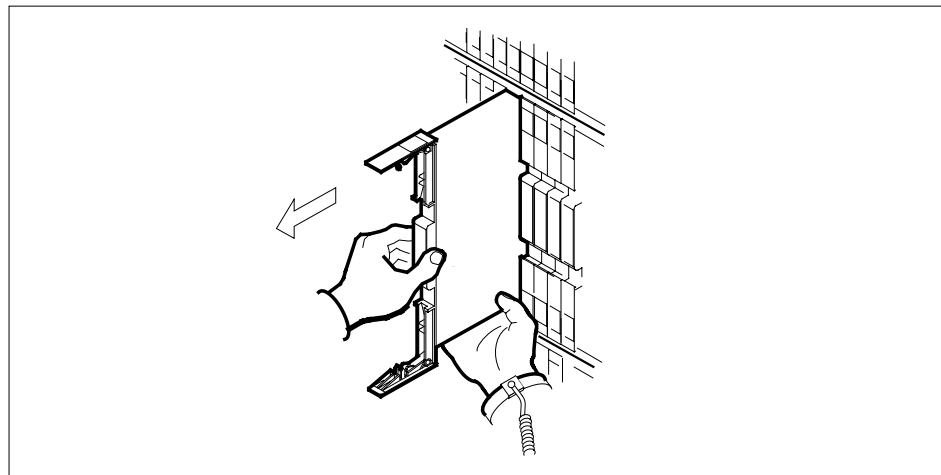
- 30** Grasp the locking levers. Pull the card toward you until the card protrudes 2 in. (5.1 cm) from the equipment shelf.

## Interface paddle boards in a SuperNode SE MS (continued)

---



- 31** Hold the card by the face plate with one hand. Support the bottom edge with the other hand. Carefully pull the card toward you until the card clears the shelf.

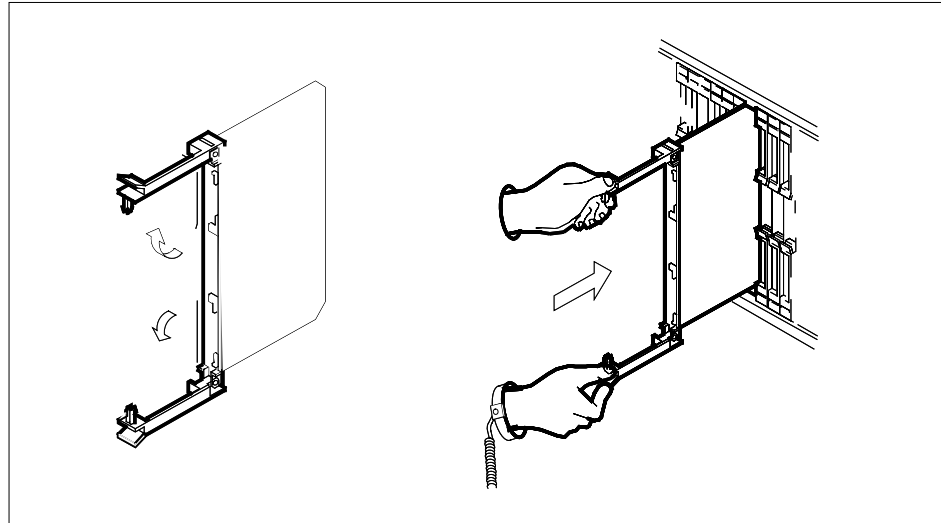


- 32** Place the card you removed in an electrostatic discharge (ESD) protective container.
- 33** Make sure that the replacement card has the same PEC and the PEC suffix as the card you replace.
- 34** Insert the replacement card into the shelf.
- a** Open the locking levers on the card.
  - b** Hold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

---

## Interface paddle boards in a SuperNode SE MS (continued)

---



- 35** The next action depends on the type of the card you replace

| If the card you   | Do      |
|-------------------|---------|
| replace is NT9X23 | step 36 |
| replace is NT9X54 | step 38 |
| replace is NT9X62 | step 39 |
| replace is NT9X69 | step 41 |
| replace is NT9X79 | step 43 |

- 36** Connect the RS-232 cable to the replacement card, as follows:
- a** To prevent damage to the pins, carefully insert the connector into the card with the latch handles up.
  - b** The retaining screws on the RS-232 connection must be tight and screwed in completely. This makes sure that all pins make proper contact.
- 37** Go to step 44.
- 38** Connect the cables to the replacement card.  
Go to step 44.



## Interface paddle boards in a SuperNode SE MS (continued)

---

39



### **DANGER**

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

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

Connect the fiber cables to the card in use, as follows:

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

**40** Go to step 44.

**41** Reconnect the DS30 cables, as follows:

- a** To prevent damage to the pins, carefully insert the connectors in to the card.
- b** Tighten the DS30 connections.
- c** The retaining screws on the DS30 connections must be tight and fully screwed in. This makes sure that all pins make contact.

**42** Go to step 44.

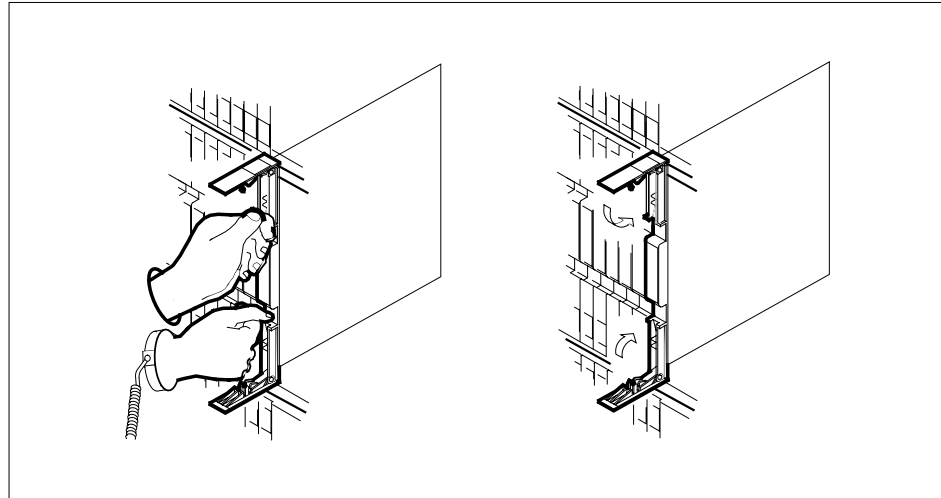
**43** Connect the cables to the replacement card, as follows:

- a** To prevent damage to the pins, carefully insert the cables.
- b** Use a screwdriver to tighten the retaining screws on the F-bus ribbon cables. To make sure that all pins make the proper contact, the retaining screws must be tight and screwed in completely.

**44** Seat and lock the card.

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

## Interface paddle boards in a SuperNode SE MS (continued)



- 45 The next action depends on which MS is the slave MS.

| If the slave MS | Do      |
|-----------------|---------|
| is MS 0         | step 46 |
| is MS 1         | step 48 |

- 46 Power up the slave MS, as follows:

- a Lift and release the switch on the faceplate of the NT9X31 power converter in slot 1F.
- b Lift and release the switch on the faceplate of the NT9X30 power converter in slot 4F.

- 47 Go to step 49.

- 48 Power up the slave MS, as follows:

- a Lift and release the switch on the faceplate of the NT9X31 power converter in slot 33F.
- b Lift and release the switch on the faceplate of the NT9X30 power converter in slot 36F.

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

- 49 To make sure you are at the MS level of the MAP display, type  
**>MAPCI;MTC;MS**  
 and press the Enter key.
- 50 To load the slave MS again, type  
**>LOADMS ms\_number**  
 and press the Enter key.

## Interface paddle boards in a SuperNode SE MS (continued)

---

where

**ms\_number**

is the number of the slave MS (0 or 1)

*Example of a MAP response:*

Active boot file CSP04AX\_MS from S01DV0L1 on SLM DISK  
will be loaded

Do you want to proceed with loading?

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

|           | <b>If the response</b>                                                                                          | <b>Do</b> |
|-----------|-----------------------------------------------------------------------------------------------------------------|-----------|
|           | indicates the LOADMS command passed                                                                             | step 52   |
|           | requests confirmation                                                                                           | step 51   |
| <b>51</b> | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.                                      |           |
|           | <b>If the LOADMS command</b>                                                                                    | <b>Do</b> |
|           | passed                                                                                                          | step 52   |
|           | failed                                                                                                          | step 56   |
| <b>52</b> | The next action depends on the reason that you perform this procedure.                                          |           |
|           | <b>If a maintenance procedure</b>                                                                               | <b>Do</b> |
|           | directed you to this procedure                                                                                  | step 53   |
|           | did not direct you to this procedure                                                                            | step 54   |
| <b>53</b> | Return to the maintenance procedure that sent you to this procedure and continue as directed.                   |           |
| <b>54</b> | To perform an out-of-service test on the slave MS, type<br><b>&gt;TST ms_number</b><br>and press the Enter key. |           |
|           | where                                                                                                           |           |
|           | <b>ms_number</b>                                                                                                |           |
|           | is the number of the slave MS (0 or 1)                                                                          |           |
|           | <i>Example of a MAP response:</i>                                                                               |           |

## Interface paddle boards in a SuperNode SE MS (continued)

Request to TEST OOS MS: 0 submitted.  
 Request to TEST OOS MS: 0 passed.  
 No node faults were found on MS 0.  
 No cards were found to be faulty on MS0.  
 Request to TEST VIA MATE MS: 0 submitted.  
 Request to TEST VIA MATE MS: 0 passed.  
 No node faults were found on MS 0.  
 No cards were found to be faulty on MS 0.

| If the TST command | Do      |
|--------------------|---------|
| passed             | step 55 |
| failed             | step 56 |

- 55** To return the slave MS to service, type

**>RTS ms\_number**

and press the Enter key.

*where*

**ms\_number**

is the number of the slave MS (0 or 1)

*Example of a MAP response:*

Request to RTS MS: 0 submitted.  
 Request to RTS MS: 0 passed.  
 No node faults were found on MS 0.  
 No cards were found to be faulty on MS 0.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 57 |
| failed             | step 56 |

- 56** For additional help, contact the next level of support.

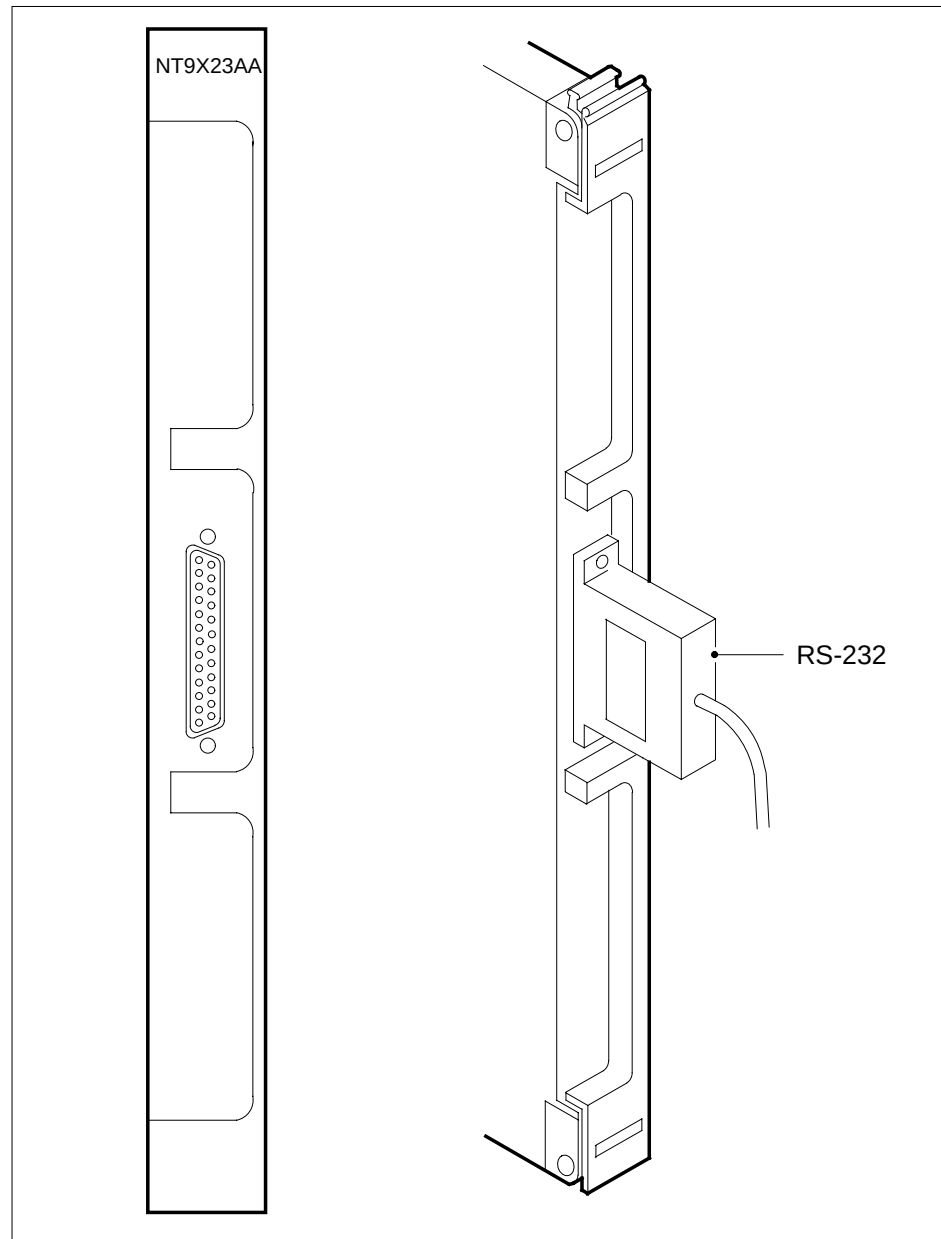
- 57** The procedure is complete.

The following diagrams show the cable connections for the cards covered in this procedure.

## Interface paddle boards in a SuperNode SE MS (continued)

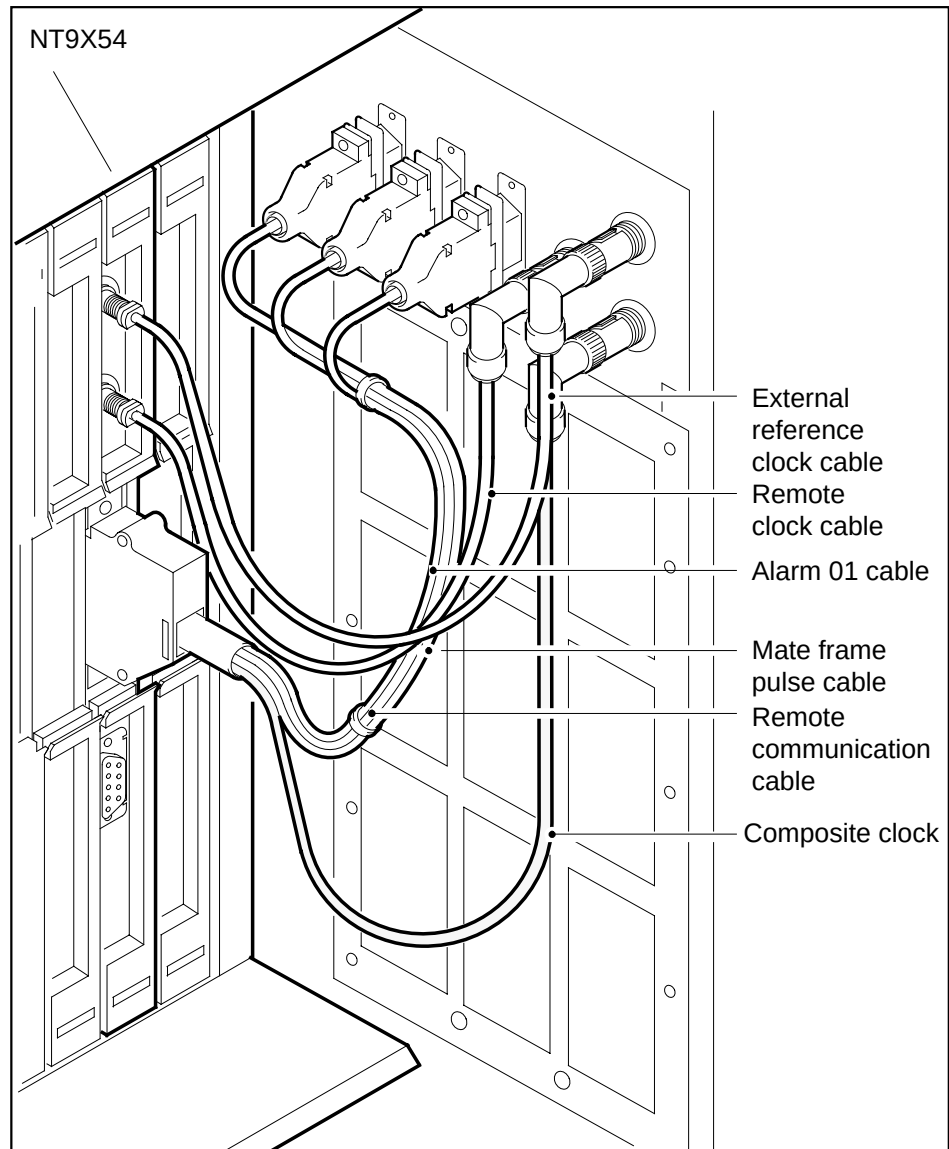
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### Cable connections for an NT9X23 in a SuperNode SE MS



## Interface paddle boards in a SuperNode SE MS (continued)

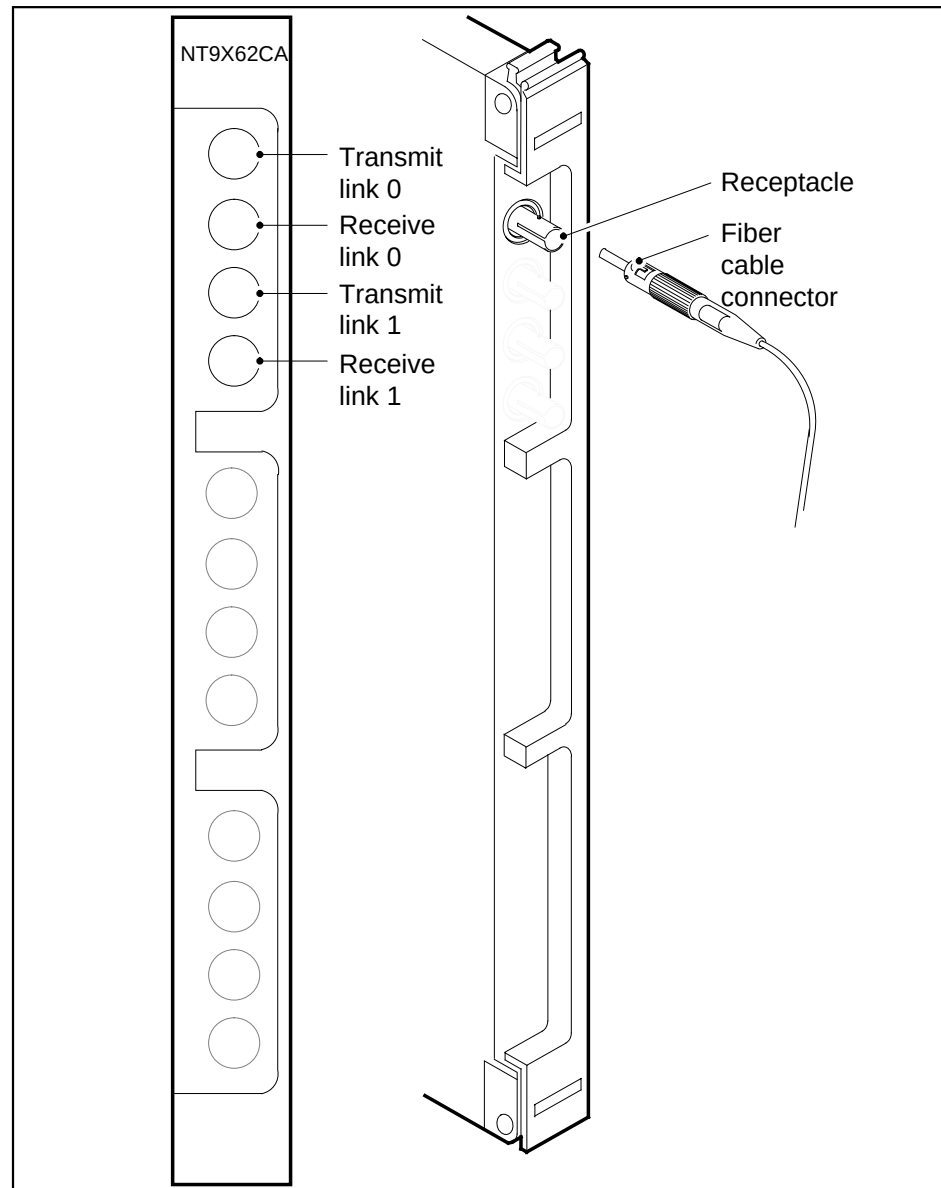
### Cable connections for an NT9X54 in a SuperNode SE MS



## Interface paddle boards in a SuperNode SE MS (continued)

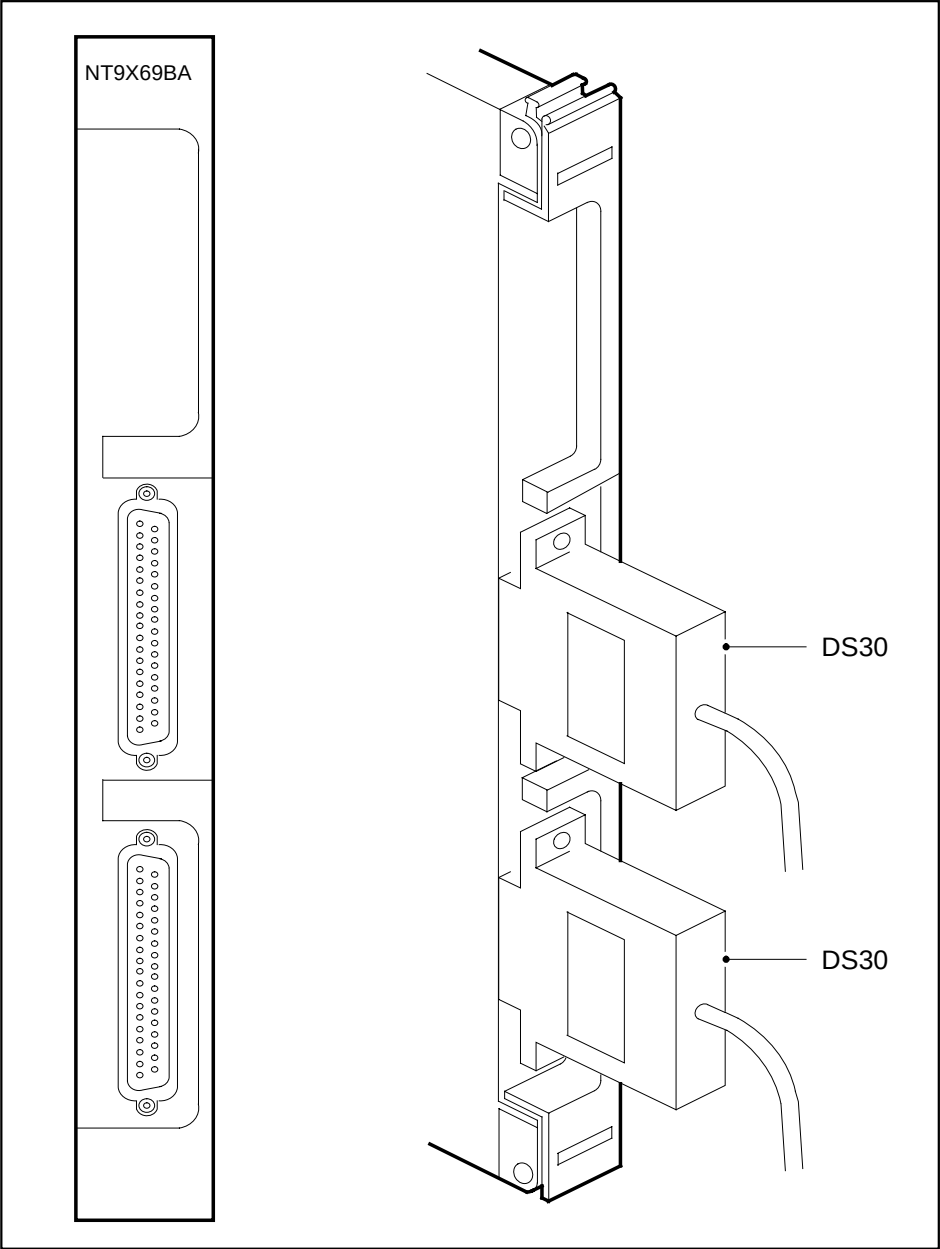
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### Cable connections for an NT9X62 in a SuperNode SE MS



**Interface paddle boards  
in a SuperNode SE MS (continued)**

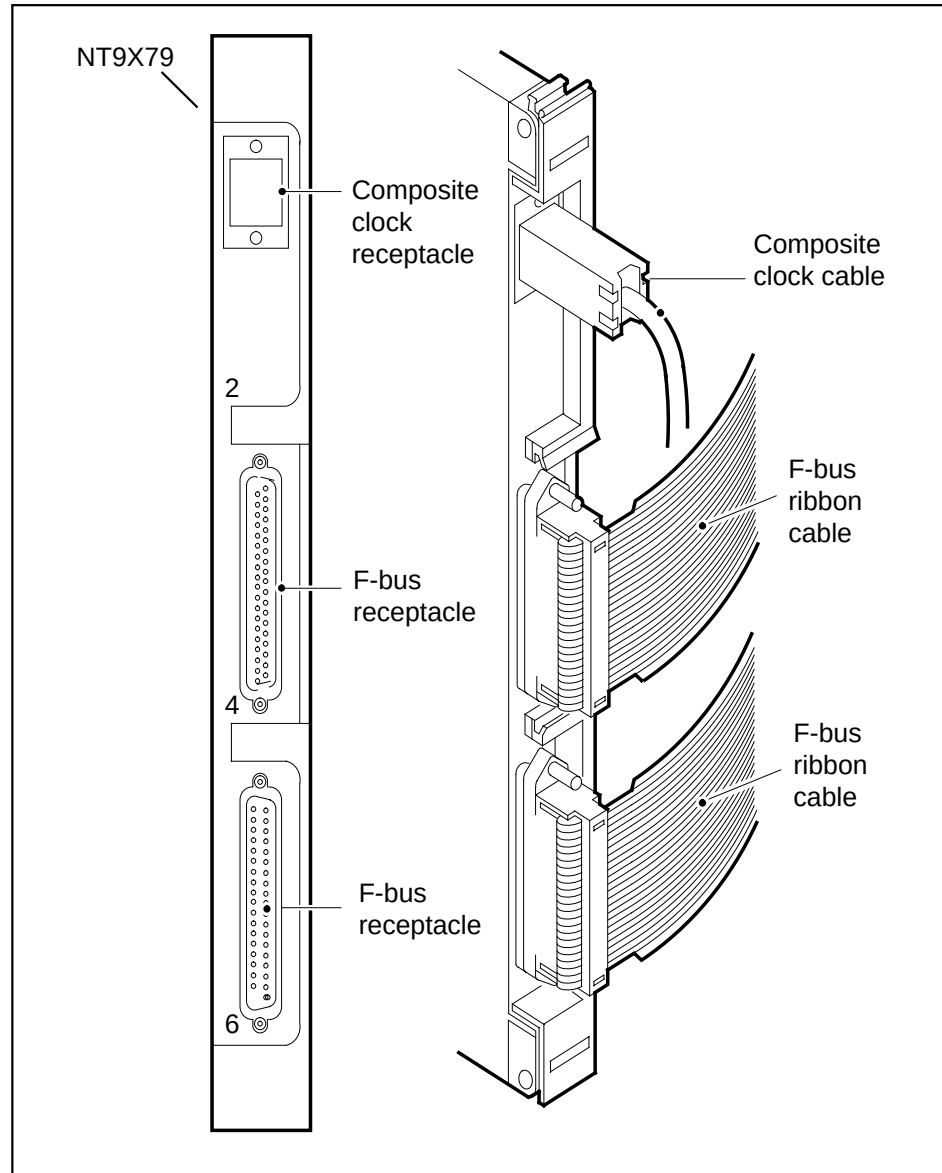
**Cable connections for an NT9X69 in a Supernode SE MS**





## Interface paddle boards in a SuperNode SE MS (end)

### Cable connections for an NT9X79 in a SuperNode SE MS



## System cards in a SuperNode SE MS

### Application

Use this procedure to replace the following cards in a SuperNode SE (SNSE) message switch (MS).

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

| PEC    | Suffix | Card name                              | Shelf or frame name |
|--------|--------|----------------------------------------|---------------------|
| NT9X13 | NA     | CPU card                               | MS                  |
| NT9X15 | AA     | Mapper card                            | MS                  |
| NT9X17 | AA, AD | Message switch four-port card          | MS                  |
| NT9X17 | BB     | DMS-bus 32-port card                   | MS                  |
| NT9X17 | CA     | DMS-bus 128-port card                  | MS                  |
| NT9X17 | DA     | Message switch 64-port card            | MS                  |
| NT9X25 | BA     | MS port terminator paddle board        | MS                  |
| NT9X26 | AB     | remote terminal interface paddle board | MS                  |
| NT9X30 | AA     | +5V 86-A power converter               | MS                  |
| NT9X31 | AA     | -5V 20-A power converter               | MS                  |
| NT9X49 | CC     | Message switch P-bus terminator card   | MS                  |
| NT9X52 | AA     | MSP T-bus access card                  | MS                  |
| NT9X53 | AC     | SuperNode clock card                   | MS                  |

## System cards in a SuperNode SE MS (continued)

---

| PEC    | Suffix | Card name                   | Shelf or frame name |
|--------|--------|-----------------------------|---------------------|
| NT9X53 | AD     | SuperNode clock card        | MS                  |
| NT9X73 | BA     | LMS F-bus rate adapter card | MS                  |

### Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Failure to switch clock mastership*
- *Replacing a card*

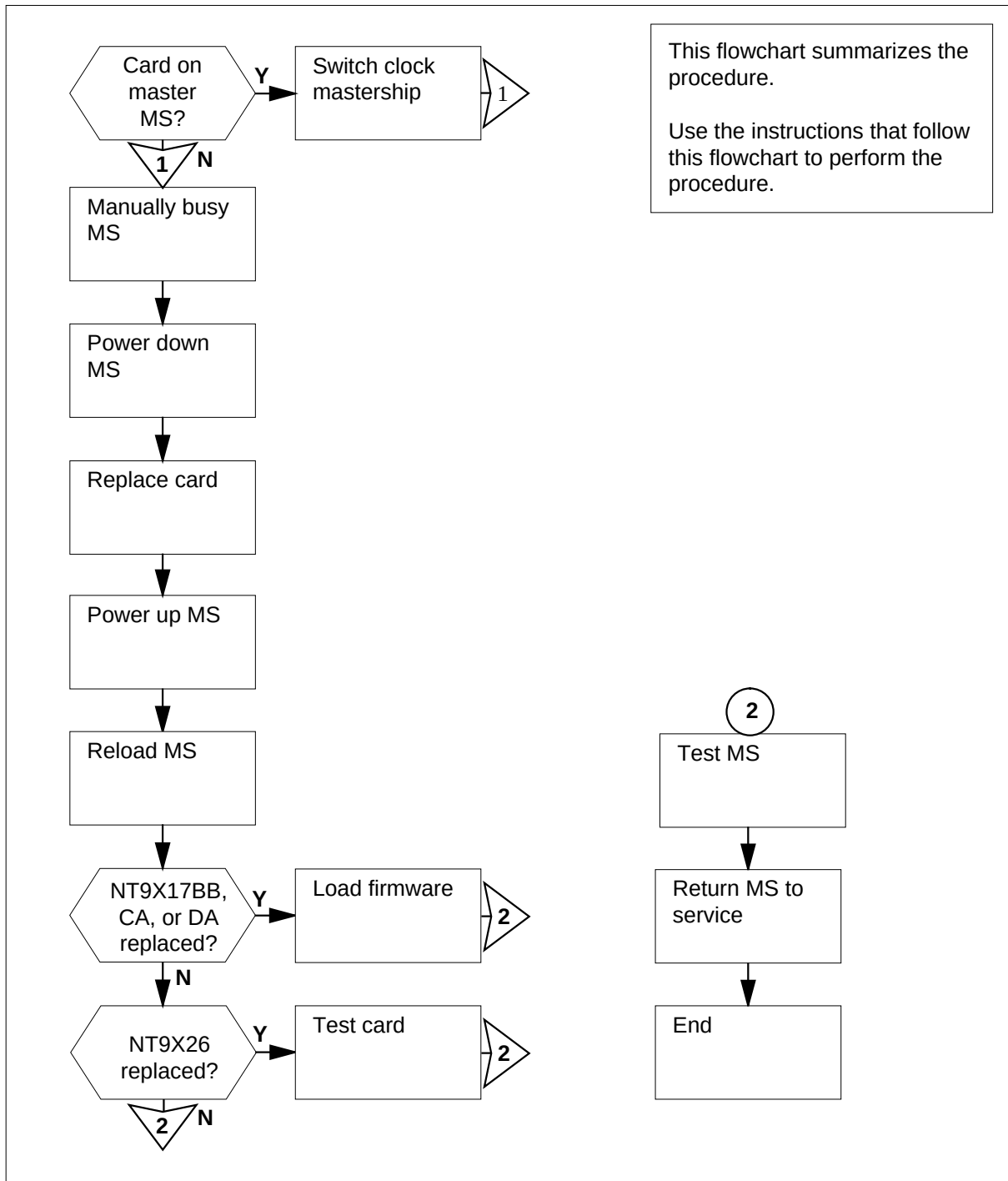
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## System cards in a SuperNode SE MS (continued)

### Summary of Replacing System cards in a SuperNode SE MS



## System cards in a SuperNode SE MS (continued)

### Replacing System cards in a SuperNode SE MS

#### At the MAP terminal

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

*Example of a MAP response:*

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

- 4 Determine the clocking configuration.

**Note:** The clocking configuration appears under the Clock header of the MAP display.

| If the MS with the card you                                                                                                | Do     |
|----------------------------------------------------------------------------------------------------------------------------|--------|
| replace is the slave MS, indicated by <b>Slave</b> , <b>S Flt</b> , <b>S 00S</b> , or <b>S Free</b> under the Clock header | step 8 |
| replace is the master MS, indicated by <b>Master</b> , <b>M Free</b> or <b>M Flt</b> under the Clock header                | step 5 |

- 5 To switch clock mastership, type

**>SWMAST**

and press the Enter key.

*Example of a MAP response:*

Request to Switch Clock Mastership MS: 0 submitted.  
Request to Switch Clock Mastership MS: 0 passed.

| If the SWMAST command | Do     |
|-----------------------|--------|
| passed                | step 7 |
| failed                | step 6 |

## System cards in a SuperNode SE MS (continued)

- 6 Perform the procedure *Failure to switch clock mastership* in this document. Complete the procedure and return to this point.
- 7 Wait 10 min to make sure of MS stability. Continue with the procedure.
- 8 Determine if the slave MS is manual busy.

**Note:** A letter M on the right side of the MS 0 or MS 1 header on the MAP display identifies a manual busy MS.

| If the slave MS    | Do      |
|--------------------|---------|
| is not manual busy | step 9  |
| is manual busy     | step 10 |

- 9 To manually busy the slave MS, type

**>BSY ms\_number**

and press the Enter key.

where

**ms\_number**

is the number of the slave MS (0 or 1)

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 10 |
| aborted or failed  | step 36 |

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

| If the card you                   | Do      |
|-----------------------------------|---------|
| replace is an NT9X30 or NT9X31    | step 14 |
| replace is other than listed here | step 11 |

- 11 To access the Shelf level of the MAP display, type

**>SHELF shelf\_number**

and press the Enter key.

where

**shelf\_number**

is the number of the shelf (0 to 3)

*Example of a MAP response:*

## System cards in a SuperNode SE MS (continued)

```
Shelf 0 1 1 1 1
Card 1 2 3 4 5 6 7 8 9 0 1 2 3
Chain
MS 0 F
MS 1
```

- 12** To translate the location of the card, type

**>TRNSL ms\_number card\_number**

and press the Enter key.

*where*

**ms\_number**

is the number of the MS (0 or 1) that contains the card you must replace

**card\_number**

is the card identification number (1 to 13)

*Example of a MAP response:*

```
Site Flr RPos Bay_id Shf Description Slot EqPEC
HOST 00 A00 SCC 0 39 MS 1 :0: 3 22 9X13NA FRNT
HOST 00 A00 SCC 0 39 MS 1 :0: 3 22 9X26AB BACK
No resources to translate on card 3.
```

- 13** Record the location, description, slot number, PEC, and PEC suffix of the card you replace.
- 14** The next action depends on which MS is the slave MS.

| If the slave MS | Do      |
|-----------------|---------|
| is MS 0         | step 15 |
| is MS 1         | step 19 |

## System cards in a SuperNode SE MS (continued)

---

### At the MS shelf

15



**WARNING**

**Possible loss of service**

Make sure that you power down the slave MS. If you power down the master MS, the system will shut down completely.



**WARNING**

**Static electricity damage**

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

Power down the slave MS, as follows:

- a** Press down and release the switch on the faceplate of the NT9X30 power converter in slot 4F.
  - b** Press down and release the switch on the faceplate of the NT9X31 power converter in slot 1F.
- 16** Perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- 17** Power up the slave MS, as follows:
  - a** Lift and release the switch on the faceplate of the NT9X31 power converter in slot 1F.
  - b** Lift and release the switch on the faceplate of the NT9X30 power converter in slot 4F.
- 18** Go to step 22.



## System cards in a SuperNode SE MS (continued)

---

### *At the MS shelf*

19



#### **WARNING**

##### **Possible loss of service**

Make sure that you power down the slave MS. If you power down the MS that contains the master clock, the system shuts down completely.



#### **WARNING**

##### **Static electricity damage**

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

Power down the slave MS, as follows:

- a Press down and release the switch on the faceplate of the NT9X30 power converter in slot 36F.
  - b Press down and release the switch on the faceplate of the NT9X31 power converter in slot 33F.
- 20 Perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- 21 Power up the slave MS, as follows:
- a Lift and release the switch on the faceplate of the NT9X31 power converter in slot 33F.
  - b Lift and release the switch on the faceplate of the NT9X30 power converter in slot 36F.

### *At the MAP terminal*

- 22 To make sure you are at the MS level of the MAP display, type  
**>MAPCI ;MTC ;MS**  
and press the Enter key.
- 23 To reload the slave MS, type  
**>LOADMS ms\_number**  
and press the Enter key.  
*where*  
**ms\_number**  
is the number of the slave MS (0 or 1)

## System cards in a SuperNode SE MS (continued)

*Example of a MAP response:*

Active boot file CSP04AX\_MS from S01DVOL1 on SLM DISK  
will be loaded  
Do you want to proceed with loading?  
Please confirm ("YES", "Y", "NO", or "N"):

|           | <b>If the response</b>                                                                                                                                                                                                                                                                                                                                                      | <b>Do</b> |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | indicates the LOADMS command passed                                                                                                                                                                                                                                                                                                                                         | step 25   |
|           | requests confirmation                                                                                                                                                                                                                                                                                                                                                       | step 24   |
| <b>24</b> | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.                                                                                                                                                                                                                                                                                                  |           |
|           | <b>If the LOADMS command</b>                                                                                                                                                                                                                                                                                                                                                | <b>Do</b> |
|           | passed                                                                                                                                                                                                                                                                                                                                                                      | step 25   |
|           | failed                                                                                                                                                                                                                                                                                                                                                                      | step 36   |
| <b>25</b> | The next action depends on the type of card that you replace.                                                                                                                                                                                                                                                                                                               |           |
|           | <b>If the card you</b>                                                                                                                                                                                                                                                                                                                                                      | <b>Do</b> |
|           | replace is an NT9X17BB, NT9X17CA, or NT9X17DA                                                                                                                                                                                                                                                                                                                               | step 26   |
|           | replace is other than listed here                                                                                                                                                                                                                                                                                                                                           | step 28   |
| <b>26</b> | To access the Shelf level of the MAP display, type<br><b>&gt;SHELF</b><br>and press the Enter key.                                                                                                                                                                                                                                                                          |           |
| <b>27</b> | To load the firmware into the replacement card, type<br><b>&gt;LOADCD ms_number card_number1 FROMCD card_number2</b><br>and press the Enter key.<br><i>where</i><br><b>ms_number</b><br>is the number of the slave MS (0 or 1)<br><b>card_number1</b><br>is the number of the card you replaced<br><b>card_number2</b><br>is the number of the card you from where you load |           |

## System cards in a SuperNode SE MS (continued)

**Note:** Both cards must be in the same MS. The card the system loads from must be an NT9X17DA.

*Example input*

**>LOADCD 0 5 FROMCD 7**

### **At the MAP terminal**

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

| <b>If a maintenance procedure</b>    | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 29   |
| did not direct you to this procedure | step 30   |

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

**30** To perform an out-of-service test on the slave MS, type

**>TST ms\_number**

and press the Enter key.

*where*

**ms\_number**

is the number of the slave MS (0 or 1)

*Example of a MAP response:*

Request to TEST OOS MS: 0 submitted.  
Request to TEST OOS MS: 0 passed.  
No node faults were found on MS 0.  
No cards were found to be faulty on MS0.  
Request to TEST VIA MATE MS: 0 submitted.  
Request to TEST VIA MATE MS: 0 passed.  
No node faults were found on MS 0.  
No cards were found to be faulty on MS 0.

| <b>If the TST command</b> | <b>Do</b> |
|---------------------------|-----------|
| passed                    | step 31   |
| failed                    | step 36   |

**31** To return the slave MS to service, type

**>RTS ms\_number**

and press the Enter key.

*where*

## System cards in a SuperNode SE MS (continued)

**ms\_number**

is the number of the slave MS (0 or 1)

*Example of a MAP response:*

Request to RTS MS: 0 submitted.  
Request to RTS MS: 0 passed.  
No node faults were found on MS 0.  
No cards were found to be faulty on MS 0.

|           | <b>If the RTS command</b>                                                                                                                                                                                                                                                                                                             | <b>Do</b> |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed                                                                                                                                                                                                                                                                                                                                | step 32   |
|           | failed                                                                                                                                                                                                                                                                                                                                | step 36   |
| <b>32</b> | The next action depends on the type of the card that you replace.                                                                                                                                                                                                                                                                     |           |
|           | <b>If the card</b>                                                                                                                                                                                                                                                                                                                    | <b>Do</b> |
|           | is an NT9X26                                                                                                                                                                                                                                                                                                                          | step 33   |
|           | is other than listed here                                                                                                                                                                                                                                                                                                             | step 37   |
| <b>33</b> | To access the Shelf level of the MAP display, type<br><b>&gt;SHELF</b><br>and press the Enter key.                                                                                                                                                                                                                                    |           |
| <b>34</b> | To access the Card level for the card that you replaced, type<br><b>&gt;CARD 3</b><br>and press the Enter key.                                                                                                                                                                                                                        |           |
| <b>35</b> | To test the card, type<br><b>&gt;TST ms_number BACK</b><br>and press the Enter key.<br><i>where</i><br><b>ms_number</b><br>is the number of the slave MS (0 or 1)<br><i>Example of a MAP response:</i><br><br>Request to TEST INSV MS: 0 shelf: 0 card: 3 back submitted.<br>Request to TEST InSV MS: 0 shelf: 0 card: 3 back passed. |           |
|           | <b>If the TST command</b>                                                                                                                                                                                                                                                                                                             | <b>Do</b> |
|           | passed                                                                                                                                                                                                                                                                                                                                | step 37   |

**System cards**  
**in a SuperNode SE MS (end)**

---

|           | <b>If the TST command</b>                               | <b>Do</b> |
|-----------|---------------------------------------------------------|-----------|
|           | failed                                                  | step 36   |
| <b>36</b> | For additional help, contact the next level of support. |           |
| <b>37</b> | The procedure is complete.                              |           |

---

## 8 Message switch and buffer card replacement procedures

---

### Introduction

This chapter contains card replacement procedures for the message switch and buffer (MSB). The first section in the chapter provides diagrams that show MSB shelf layouts.

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

Each procedure contains the following sections:

- Application
- Common procedures
- Action

### Application

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

### Common procedures

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

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

### Action

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

## **Recording card replacement activities**

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

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

## MSB shelf layouts

---

### Application

This procedure provides frame layouts for the following frames used to provision a message switch and buffer (MSB):

- CCS6 MSB equipment frame (MS6E)
- CCS6 signaling terminal equipment frame (ST6E)
- CCS7 MSB equipment frame (MS7E)
- CCS7 signaling terminal equipment frame (ST7E)

This procedure provides shelf layouts for the following shelves in an MSB:

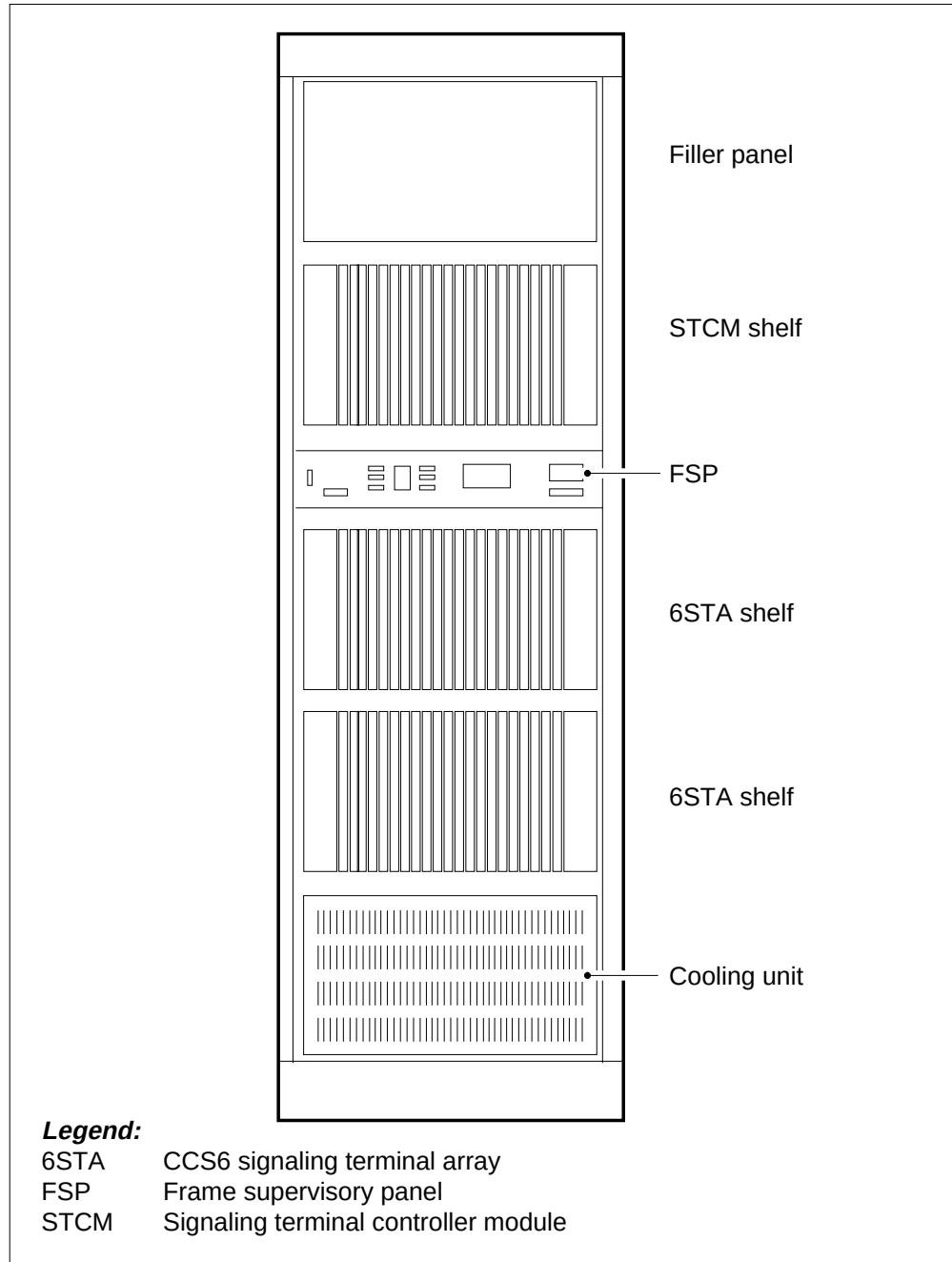
- CCS6 signaling terminal array (6STA) for MSB6
- CCS6 signaling terminal controller array (STCM) for MSB6
- CCS7 signaling terminal group (ST7G) for MSB7
- CCS7 signaling terminal array (STA7) for MSB7

**Note:** The frame and shelf layouts provided on the following pages are standard. The shelves in your office can have some differences.



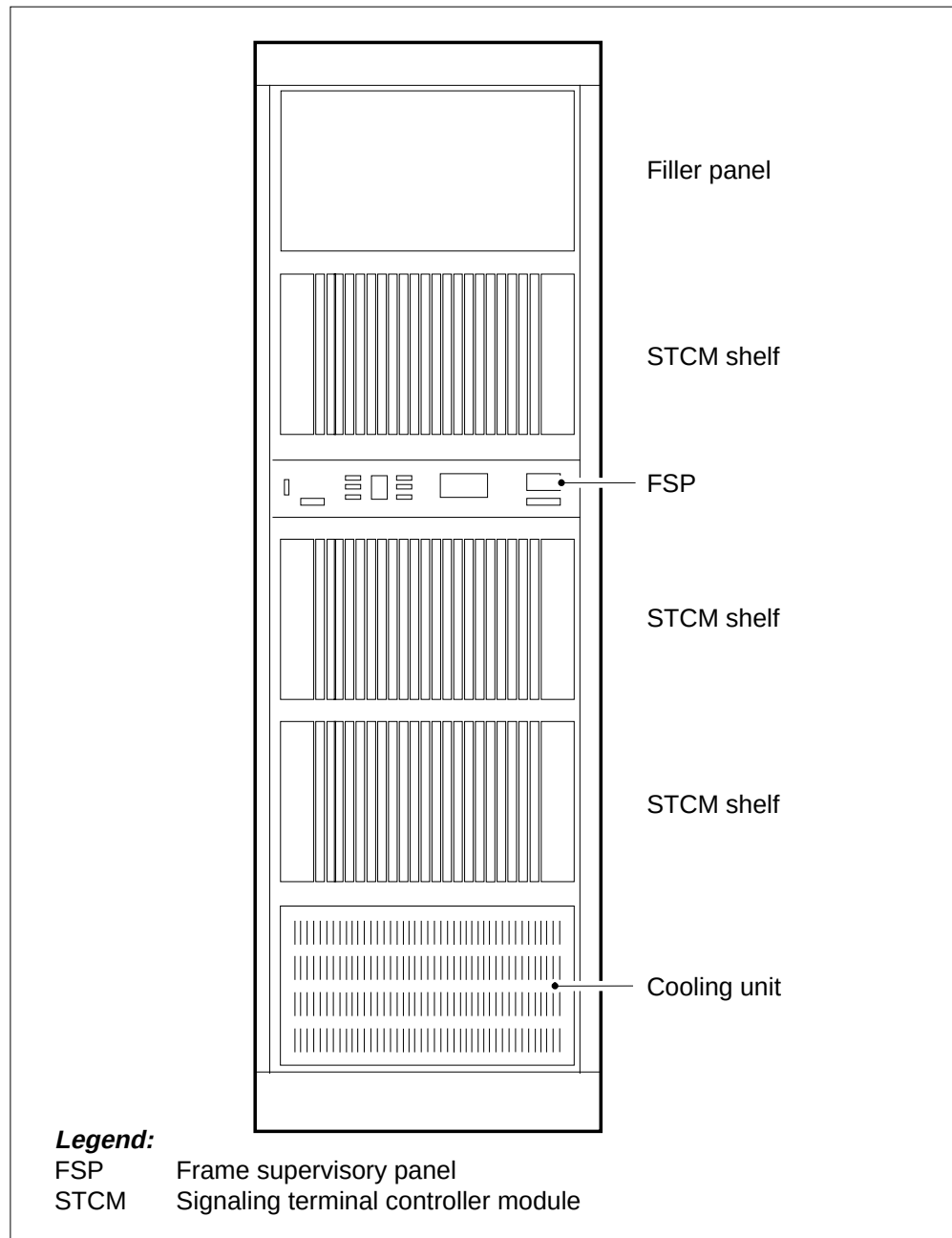
## MSB shelf layouts (continued)

Frame layout for CCS6 MSB equipment frame (MS6E)



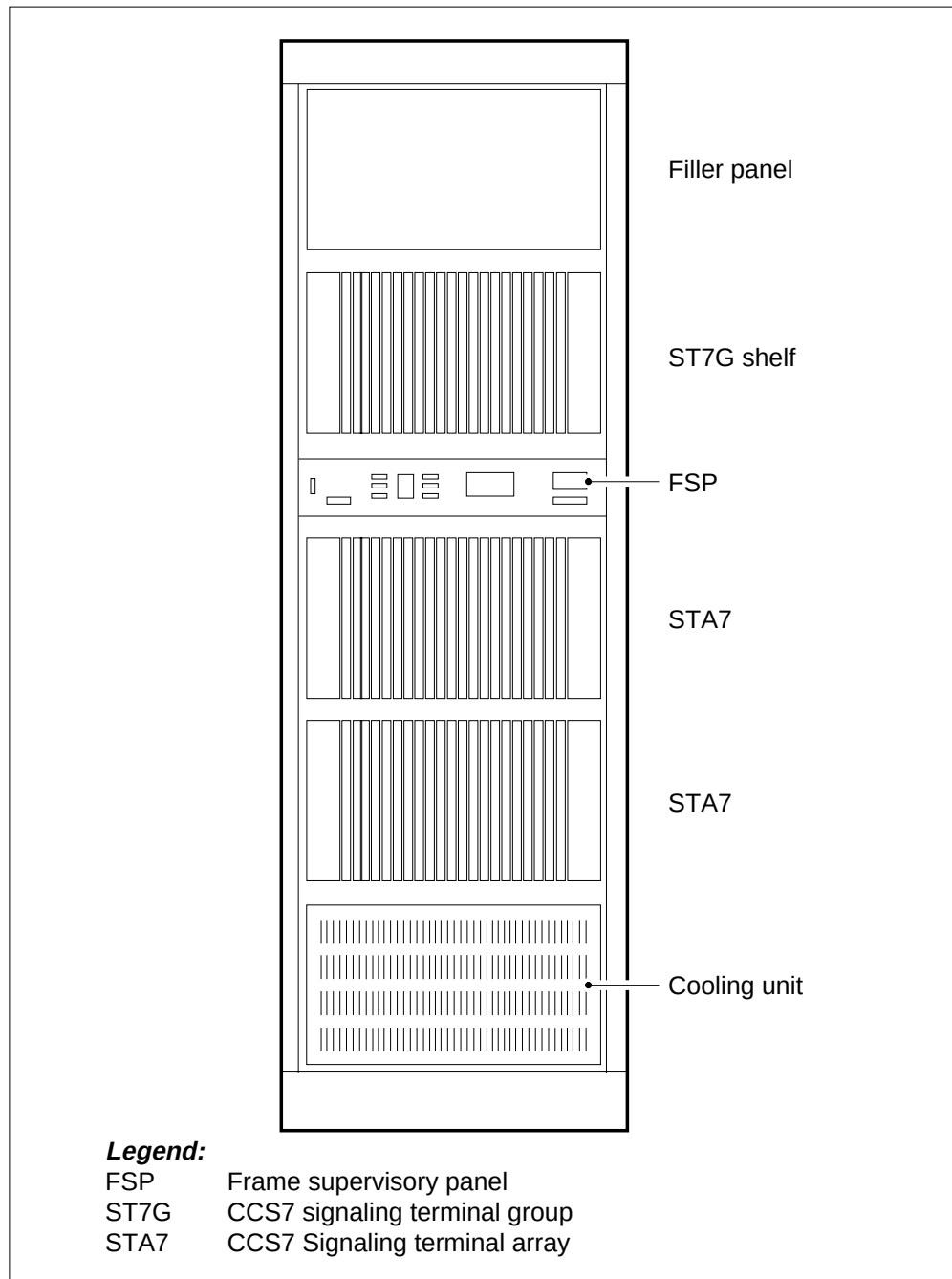
## MSB shelf layouts (continued)

### Frame layout for CCS6 signaling terminal equipment frame (ST6E)



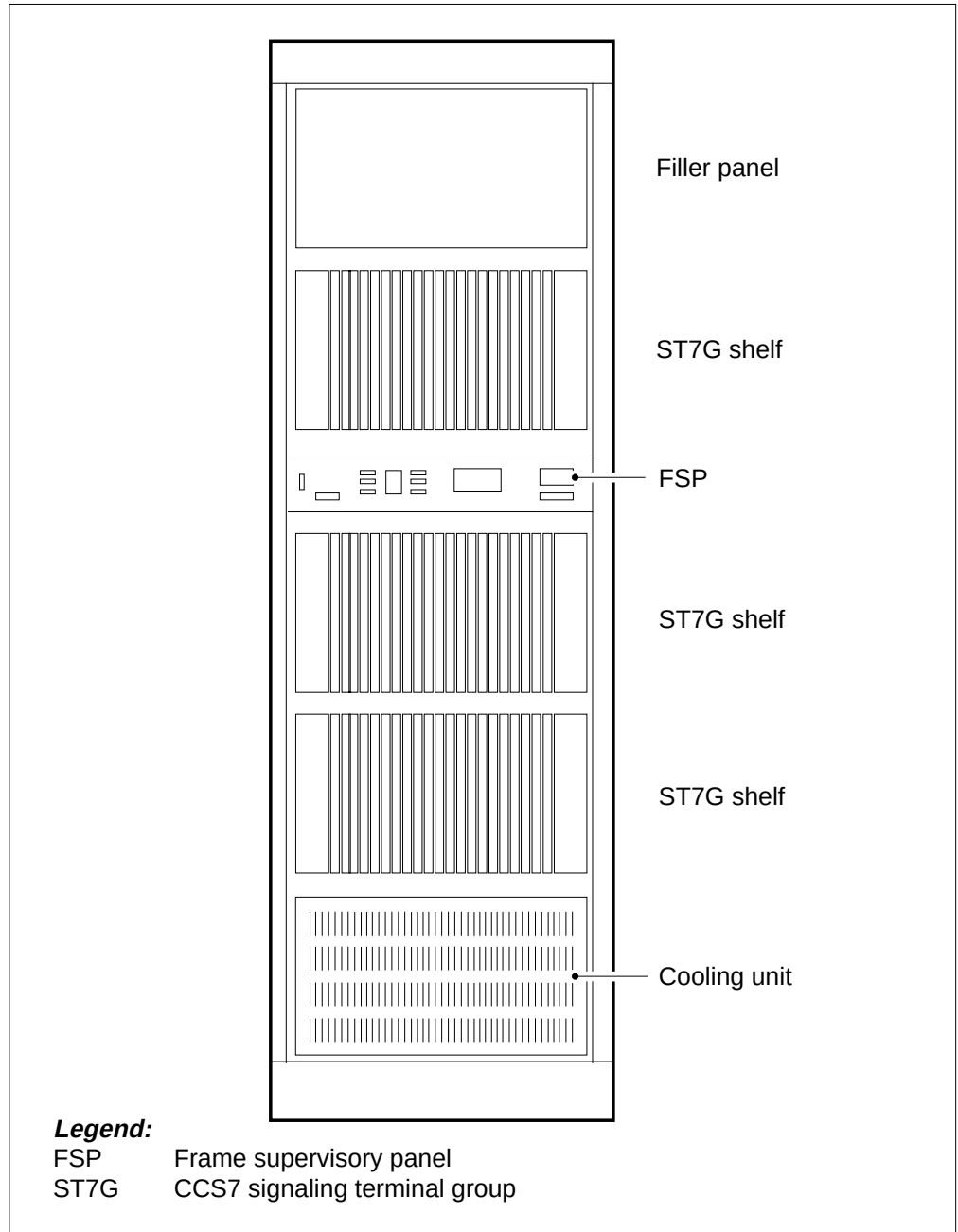
## MSB shelf layouts (continued)

Frame layout for CCS7 MSB equipment frame (MS7E)



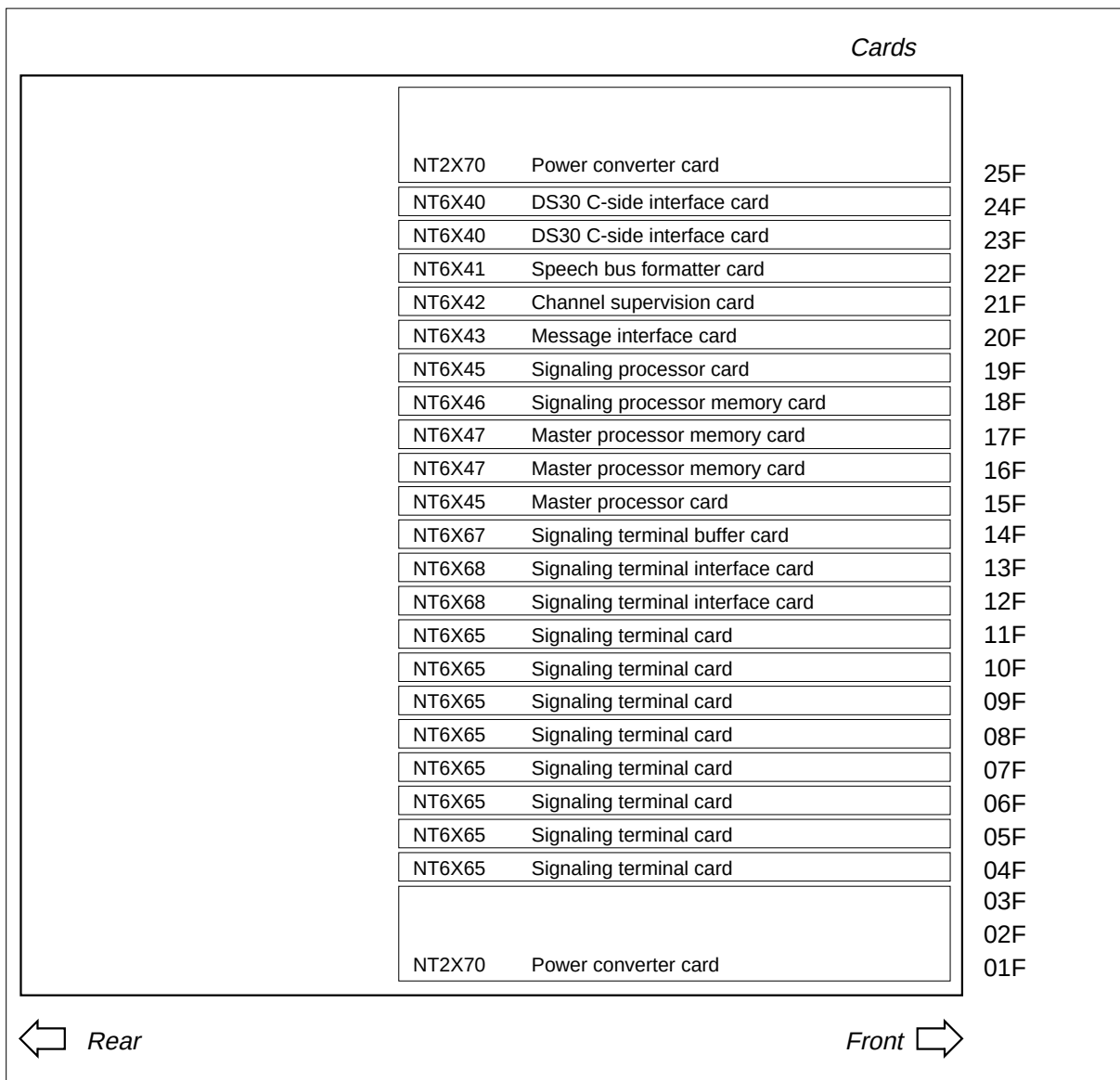
## MSB shelf layouts (continued)

### Frame layout for CCS7 signaling terminal equipment frame (ST7E)



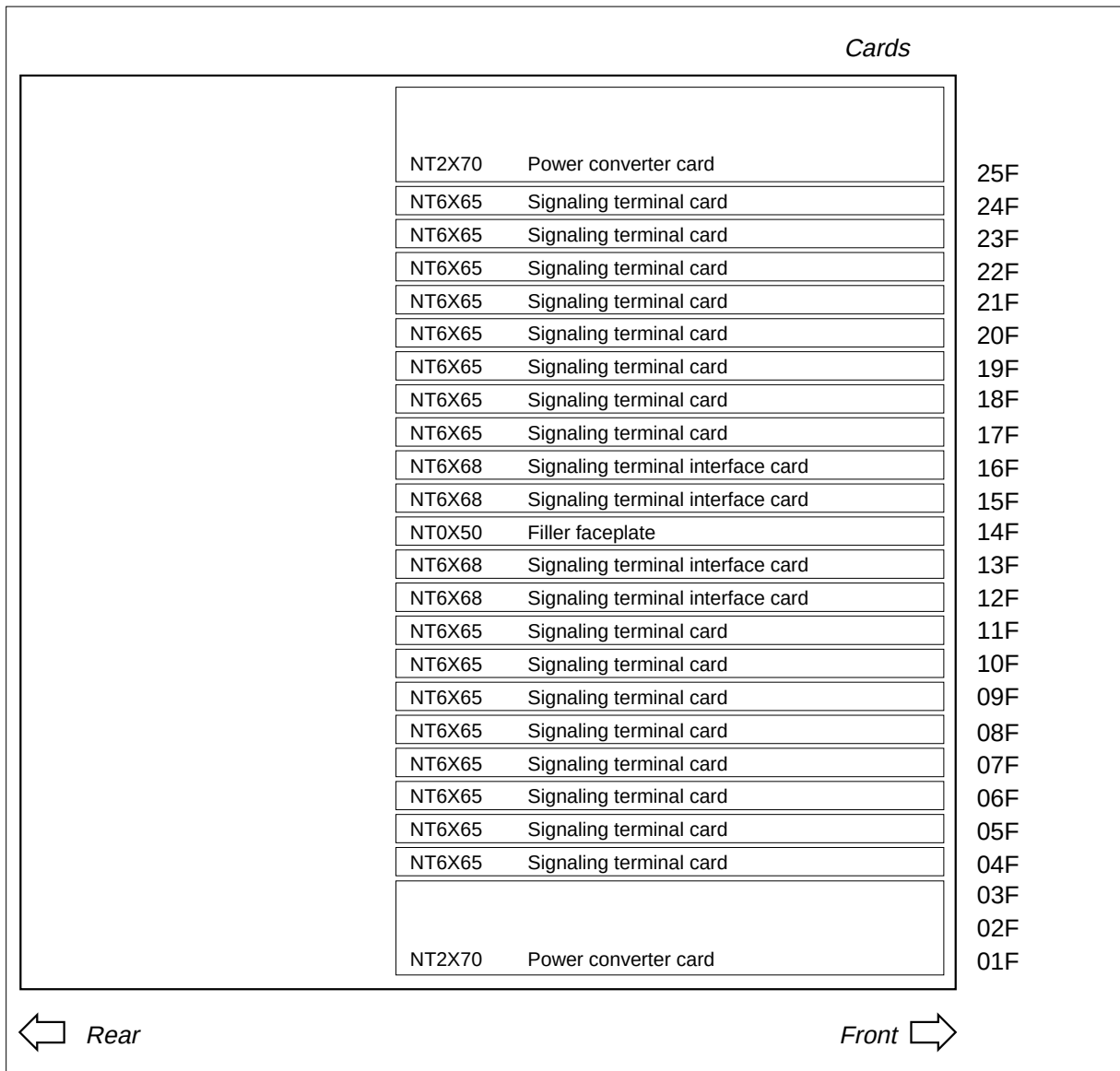
## MSB shelf layouts (continued)

### Shelf layout for CCS6 signaling terminal array shelf



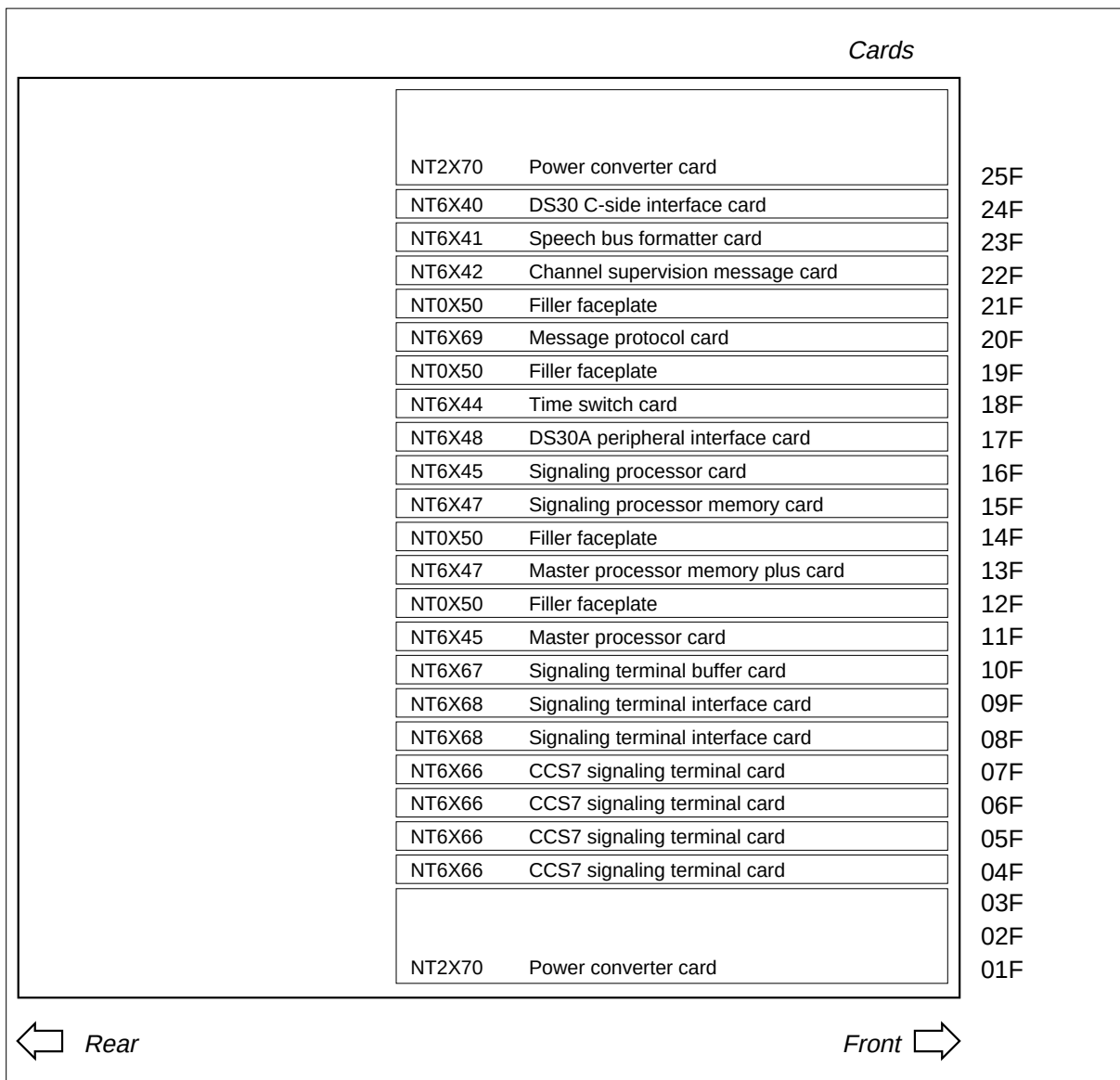
## MSB shelf layouts (continued)

### Shelf layout for CCS6 signaling terminal shelf



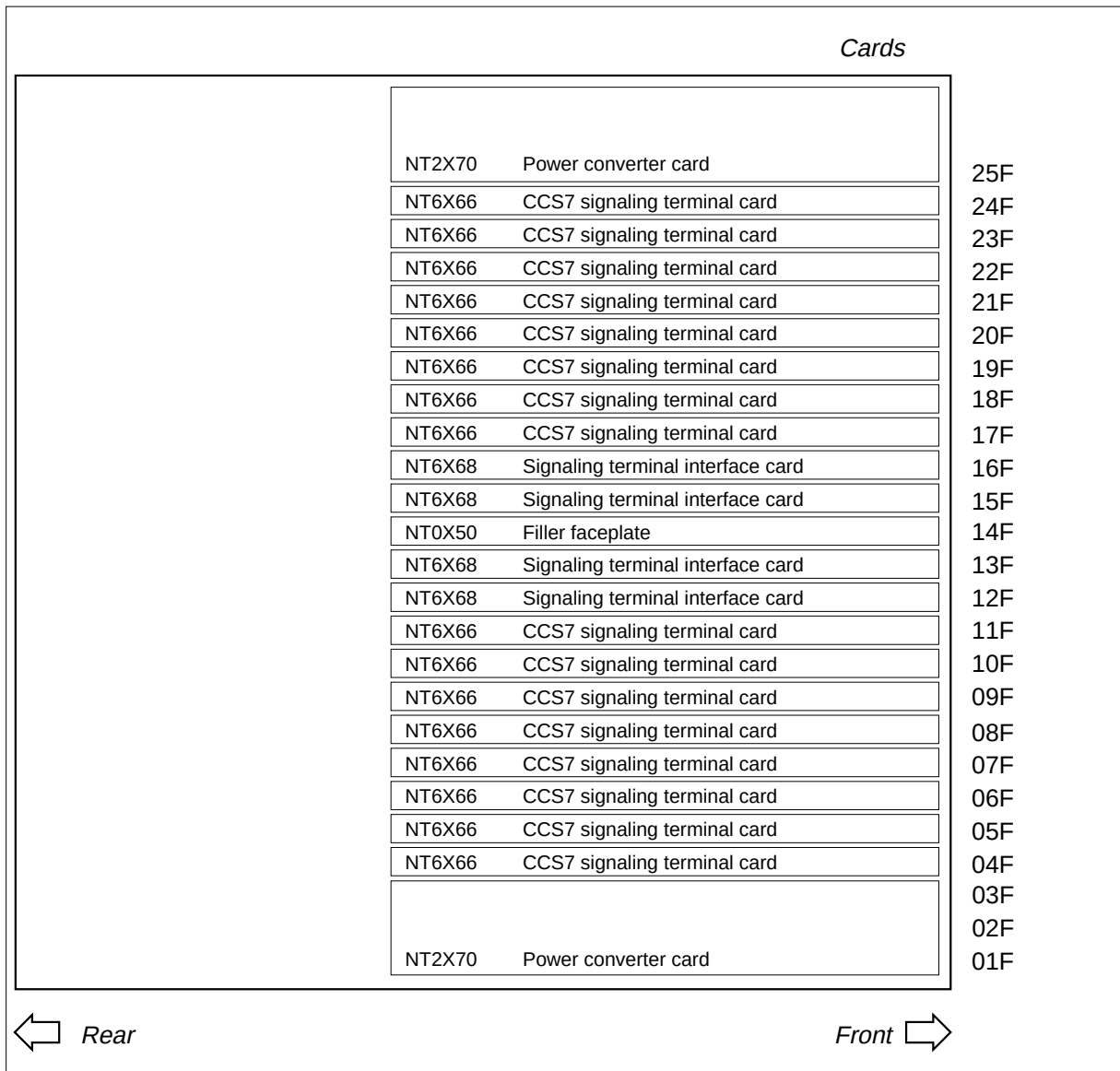
## MSB shelf layouts (continued)

### Shelf layout for CCS7 signaling terminal array shelf



## MSB shelf layouts (end)

### Shelf layout for signaling terminal 7 group shelf





## Control complex cards in an MSB

### Application

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

| PEC    | Suffix         | Card name                                                                           | Shelf or frame name                                                                                                                                              |
|--------|----------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NT6X41 | AA, AB, AC     | Speech bus formatter card (The NT6X41AB is reserved for international application.) | CCS6 signaling terminal array (6STA) of a CCS6 message switch and buffer (MSB6), CCS7 signaling terminal array (STA7) of a CCS7 message switch and buffer (MSB7) |
| NT6X42 | AA             | Channel supervision message card                                                    | 6STA, STA7                                                                                                                                                       |
| NT6X43 | AA, BA         | Message interface card                                                              | 6STA                                                                                                                                                             |
| NT6X44 | AA, AB, AC     | Time switch card                                                                    | STA7                                                                                                                                                             |
| NT6X44 | BA, EA         | Universal time switch card                                                          | STA7                                                                                                                                                             |
| NT6X44 | DA             | Time switch DPNSS card                                                              | STA7                                                                                                                                                             |
| NT6X48 | AA             | DS30A peripheral interface card                                                     | STA7                                                                                                                                                             |
| NT6X67 | AA             | Signaling terminal buffer card                                                      | 6STA, STA7                                                                                                                                                       |
| NT6X69 | AA             | CPP message protocol card                                                           | 6STA, STA7                                                                                                                                                       |
| NT6X69 | AB, AC, DA, MA | CPP message protocol and tones card                                                 | 6STA, STA7                                                                                                                                                       |
| NT6X69 | LA, LB         | CPP message protocol and downloadable tones card                                    | 6STA, STA7                                                                                                                                                       |

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

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

## Control complex cards in an MSB (continued)

---

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

### Common procedures

This procedure refers to *Replacing a card*.

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

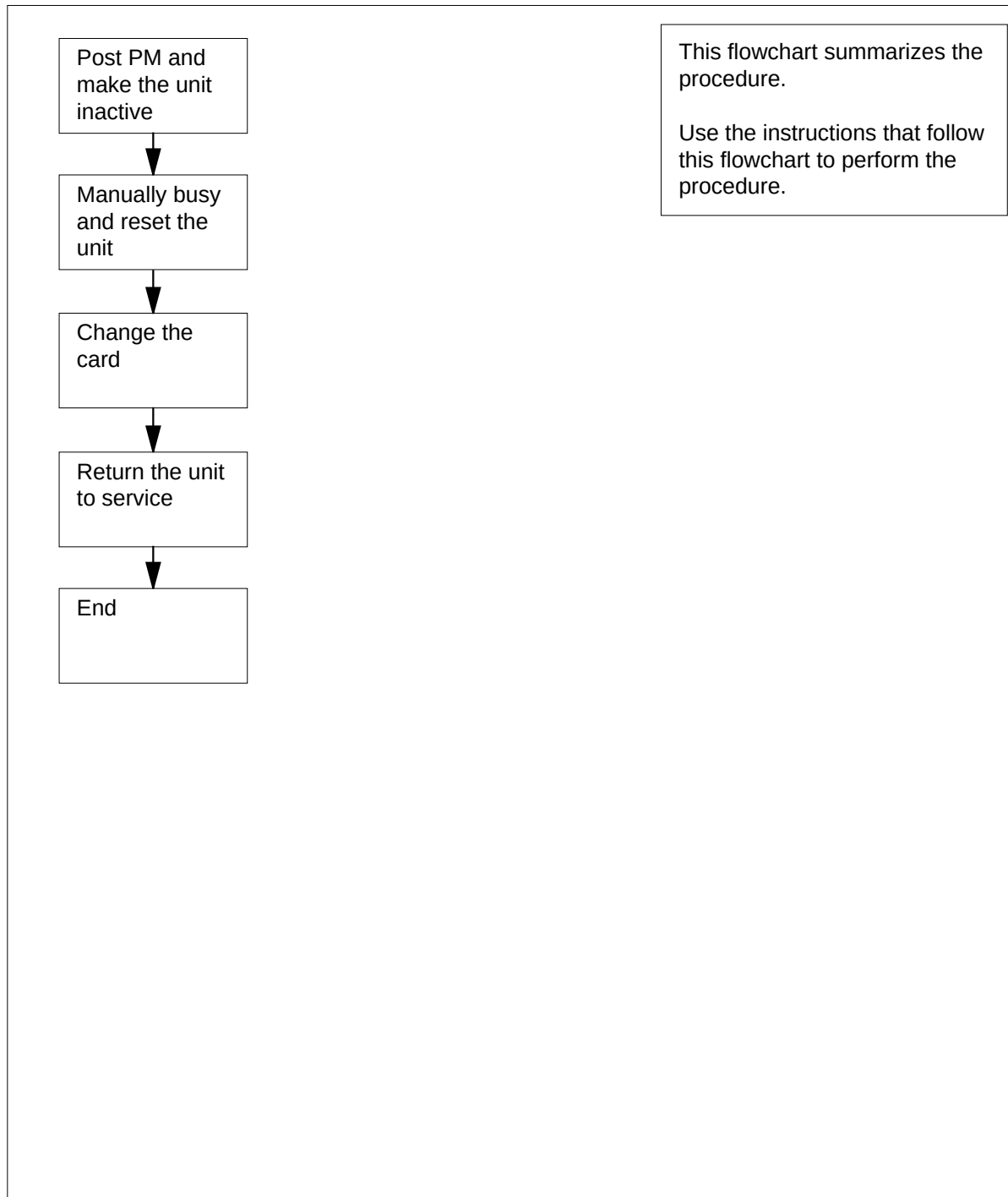
### Action

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

## Control complex cards in an MSB (continued)

---

### Summary of replacing Control complex cards in an MSB



## Control complex cards in an MSB (continued)

### Replacing Control complex cards in an MSB

#### *At your current location*

1



#### **CAUTION**

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

This procedure directs you to manually busy a minimum of one peripheral module (PM) unit, which can cause service degradation. Perform this procedure if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement and the card that you remove have the same PEC and PEC suffix.

#### *At the shelf*

- 2 Locate the card that you want to replace. Record the number of the signaling terminal array (STA) and the number of the PM unit that associate with the card.

**Note:** Switch activity to the other PM unit before you remove the card from the shelf.

#### *At the MAP terminal*

- 3 To access the PM level of the MAP display, type:

**>MAPCI ; MTC ; PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | Cbsy | ISTb | InSv |
| PM | 0    | 0    |      | 2 0  | 13   | 24   |

- 4 To post the MSB, type

**>POST pm\_type pm\_no**

and press the Enter key.

*where*

**pm\_type**

is the PM type (MSB6 or MSB7)

**pm\_no**

is the PM number (0 to 999)

## Control complex cards in an MSB (continued)

*Example of a MAP display:*

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
|      | SysB | ManB | OffL | Cbsy | ISTb | InSv |
| PM   | 0    | 0    |      | 2    | 0    | 13   |
| MSB7 | 0    | 0    | 0    | 0    | 0    | 24   |
|      |      |      |      |      |      | 3    |

MSB7 0 InSv Links\_OOS: CSide 0 , PSide 0  
Unit0: Inact InSv  
Unit1: Act InSv

- 5 Determine the state and activity of the PM unit that contains the card you replace.

| If the state of the PM unit               | Do      |
|-------------------------------------------|---------|
| is ISTb, InSv, SysB, or CBSy, and active  | step 6  |
| isISTb, InSv, SysB, or CBSy, and inactive | step 9  |
| is ManB                                   | step 11 |
| is OffL                                   | step 16 |

- 6 From the MAP display, determine the state of the mate PM unit.

| If the state of the mate PM unit | Do      |
|----------------------------------|---------|
| is ISTb or InSv                  | step 7  |
| is other than listed here        | step 18 |

- 7 To switch activity, type  
**>SWACT**  
and press the Enter key.

*Example of a MAP response:*

MSB7 0 A Warm SwAct will be performed after  
data sync of active terminals.  
Please confirm ("YES", "Y", "NO", or "N"):

| If                           | Do      |
|------------------------------|---------|
| you must confirm the command | step 8  |
| the system rejects the SWACT | step 17 |

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

## Control complex cards in an MSB (continued)

and press the Enter key.

*Example of a MAP response:*

Unit0: Inact SysB Mtce

Unit1: Act ISTb

MSB7 0 SwAct Passed

| If the MAP response       | Do      |
|---------------------------|---------|
| is SWACT passed           | step 9  |
| is other than listed here | step 17 |

- 9** A maintenance flag (Mtce) can appear. This flag indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status lines for both PM units before you proceed to the next step.

- 10** To manually busy the inactive unit, type

**>BSY INACTIVE**

and press the Enter key.

*Example of a MAP display:*

MSB7 0 ISTb Links\_OOS: CSide 0 , PSide 0

Unit0: Inact ManB

Unit1: Act InSv

bsy unit 0

MSB7 0 Unit 0 Bsy Passed

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 11 |
| failed             | step 18 |

- 11** To reset the PM unit, type

**>PMRESET UNIT unit\_no NORUN**

and press the Enter key.

*where*

**unit\_no**

is the PM unit number (0 or 1)

*Example of a MAP response:*

MSB7 0 Unit 0 PMReset Passed

## Control complex cards in an MSB (continued)

---

### *At the shelf*

12



#### **WARNING**

##### **Static electricity damage**

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

To replace the card, perform the procedure *Replacing a card* in this document. When you complete the procedure, return to this point.

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

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

| <b>If a maintenance procedure</b>    | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 14   |
| did not direct you to this procedure | step 15   |

14 Return to the maintenance procedure that directed you to this procedure. Continue as directed by the maintenance procedure.

### *At the MAP terminal*

15 To return the inactive unit to service, type  
**>RTS INACTIVE**  
and press the Enter key.

| <b>If the RTS command</b> | <b>Do</b> |
|---------------------------|-----------|
| passed                    | step 19   |
| failed                    | step 18   |

16 To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

17 For additional help with switch of activity, contact the next level of support.

**Note:** If the system recommends that you use the SWACT command with the FORCE option, consult operating company personnel. Consult operating company personnel to determine if you must use the FORCE option.

**Control complex cards  
in an MSB (end)**

---

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



## NT2X70 in an MSB

---

### Application

Use this procedure to replace an NT2X70 in the shelves or frames listed in the following table.

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

| PEC    | Suffix                       | Card name                  | Shelf or frame name                                                                        |
|--------|------------------------------|----------------------------|--------------------------------------------------------------------------------------------|
| NT2X70 | AA, AB,<br>AC, AD,<br>AE, AF | Power converter card       | CCS6 signaling terminal array (6STA) slot 25, CCS7 signaling terminal array (STA7) slot 25 |
| NT2X70 | EA                           | -48 V power converter card | 6STA slot 25, STA7 slot 25                                                                 |
| NT2X70 | KA                           | -60 V power converter card | 6STA slot 25, STA7 slot 25                                                                 |

**Note:** This procedure is not used to change the NT2X70 power converter card in the CCS6 signaling terminal controller module (STCM) of an MSB6, or the CCS7 signaling terminal group (ST7G) of an MSB7. Refer to the “Index” to locate the correct procedure for these card/shelf configurations.

### Common procedures

The following common procedures are referenced:

- “Manually busying Series II PM C-side links”
- “Loading a PM”

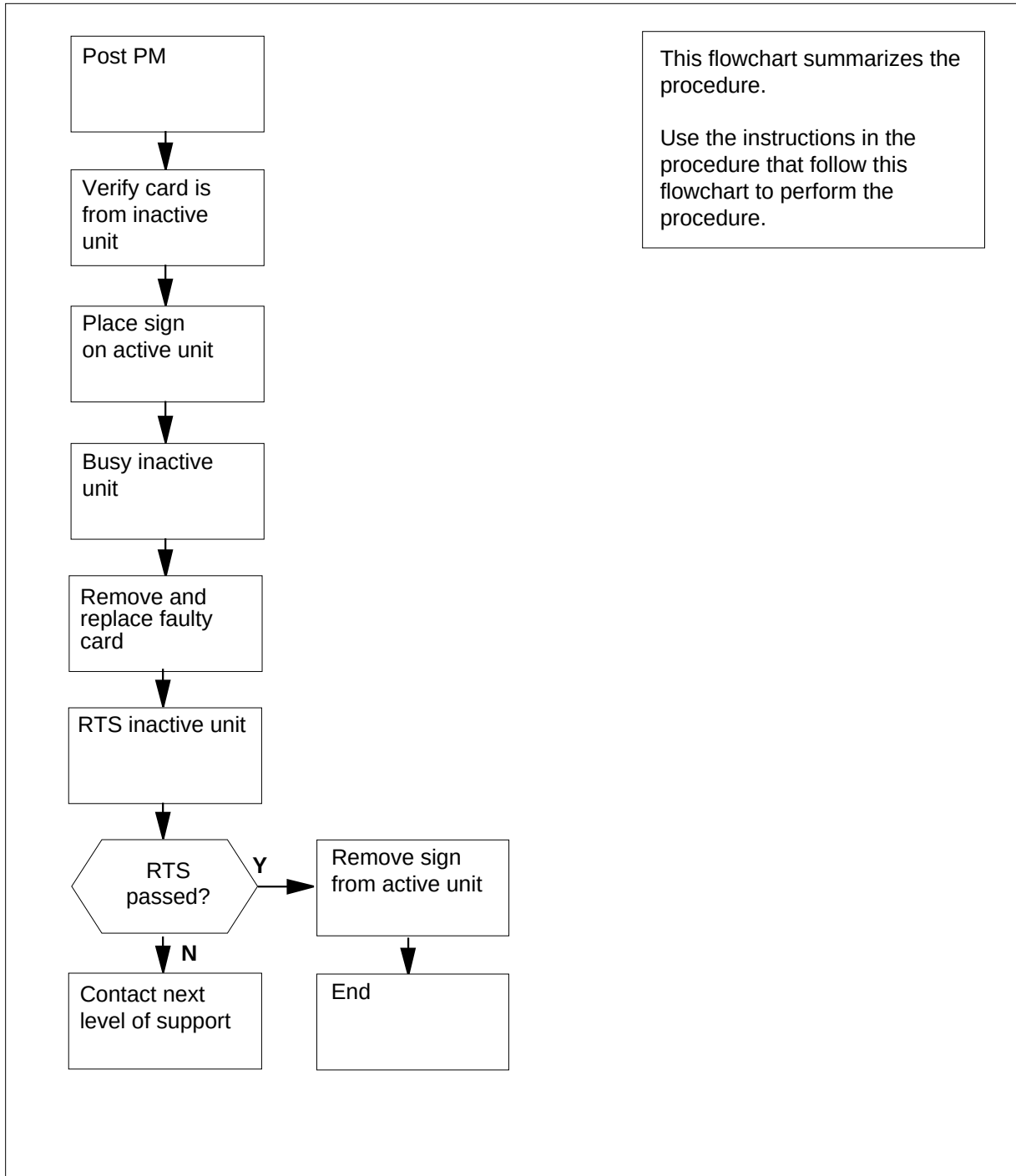
Do not go to the common procedure unless directed to do so in the step-action procedure.

### Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

## NT2X70 in an MSB (continued)

### Summary of replacing an NT2X70 in an MSB



## NT2X70 in an MSB (continued)

---

### Replacing an NT2X70 in an MSB

#### *At your current location*

1



#### **CAUTION**

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

This procedure includes directions to manually busy one or more peripheral module (PM) units. Since manually busy-ing a PM unit can cause service degradation, perform this procedure only if necessary to restore out-of-service components. Otherwise, carry out this procedure during periods of low traffic.

Obtain a replacement card. Ensure that the replacement card has the same PEC, including suffix, as the card being removed.

#### *At the shelf*

- 2 Identify the physical location of the power converter you are replacing. Record the number of the signaling terminal array (STA) and the number of the PM unit associated with the power converter.

**Note:** When removing power from an STA shelf, you must switch activity to the other in-service PM unit. You must also manually busy the network links associated with the DS-30 interface card located on the shelf that is being powered down.

#### *At the MAP terminal*

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

*Example of a MAP display:*

|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
|----|------|------|------|------|------|------|
| PM | 12   | 0    | 2    | 0    | 13   | 24   |

- 4 To post the MSB, type  
**>POST pm\_type pm\_no**  
and press the Enter key.

*where*

**pm\_type**  
is the PM type (MSB6, MSB7)

**pm\_no**  
is the PM number (0 to 999)

## NT2X70 in an MSB (continued)

*Example of a MAP display:*

|      |  |      |      |      |      |      |      |
|------|--|------|------|------|------|------|------|
|      |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
|      |  | 12   | 0    | 2    | 0    | 13   | 24   |
| PM   |  | 0    | 0    | 0    | 0    | 0    | 3    |
| MSB6 |  |      |      |      |      |      |      |

MSB6 0 InSv Links\_00S: CSide 0 , PSide 0  
Unit0: Inact InSv  
Unit1: Act InSv

- 5 Determine the state and activity of the PM unit associated with the card you are replacing.

| If the state of the PM unit is          | Do      |
|-----------------------------------------|---------|
| ISTb, InSv, SysB, or CBsy, and active   | step 6  |
| ISTb, InSv, SysB, or CBsy, and inactive | step 9  |
| ManB                                    | step 11 |
| OffL                                    | step 39 |

- 6 Determine the state of the mate PM unit.

| If the state of the mate PM unit is | Do      |
|-------------------------------------|---------|
| ISTb or InSv                        | step 7  |
| any other state                     | step 40 |

- 7 To switch activity, type  
**>SWACT**  
and press the Enter key.

*Example of a MAP response:*

MSB6 0 A Warm SwAct will be performed after  
data sync of active terminals.  
Please confirm ("YES", "Y", "NO", or "N"):

| If                           | Do      |
|------------------------------|---------|
| you must confirm the command | step 8  |
| the system rejects the SWACT | step 40 |

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

## NT2X70

### in an MSB (continued)

and press the Enter key.

*Example of a MAP response:*

```
Unit0: Inact SysB Mtce
Unit1: Act ISTb

MSB6 0 SwAct Passed
```

| If the message is         | Do      |
|---------------------------|---------|
| SWACT passed              | step 9  |
| is other than listed here | step 40 |

- 9** A maintenance flag (Mtce) may appear, indicating that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status lines for both PM units before proceeding to the next step.

- 10** To manually busy the inactive unit, type

**>BSY INACTIVE**

and press the Enter key.

*Example of a MAP response:*

```
MSB6 0 ISTb Links_00S: CSide 0 , PSide 0
Unit0: Inact ManB
Unit1: Act InSv
bsy unit 0
MSB6 0 Unit 0 Bsy Passed
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 11 |
| failed             | step 40 |

- 11** To reset the PM unit, type

**>PMRESET UNIT unit\_no NORUN**

and press the Enter key.

where

**unit\_no**

is the PM unit number (0 or 1)

*Example of a MAP response:*

```
MSB6 0 Unit 0 PMReset Passed
```

- 12** Manually busy all C-side links associated with the shelf you are working on using the procedure "Manually busying Series II PM C-side links" in this document. When you have completed the procedure, return to this point.

## NT2X70 in an MSB (continued)

### At the shelf

13



#### **DANGER**

##### **Static electricity damage**

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while handling circuit cards. This protects the cards against damage caused by static electricity.

Put on a wrist strap.

14

Determine the type of MSB you are working on.

**If you are working on an**

**Do**

MSB6

step 15

MSB7

step 16

15

Unseat cards in the MSB6 control complex.

- a Unseat the NT6X43 message interface card in slot 20.
  - b Unseat the NT6X45 signaling processor card in slot 19.
  - c Unseat the NT6X45 master processor card from slot 15.
- Go to step 17.

16

Unseat cards in the MSB7 control complex.

- a Unseat the NT6X69 message protocol card in slot 20.
- b Unseat the NT6X45 signaling processor card in slot 16.
- c Unseat the NT6X45 master processor card from slot 11.

17

Power down the unit by pulling and setting the handle of the power converter POWER switch downward to the OFF position.

18



#### **DANGER**

##### **Equipment damage**

Take the following precautions when removing or inserting a card:

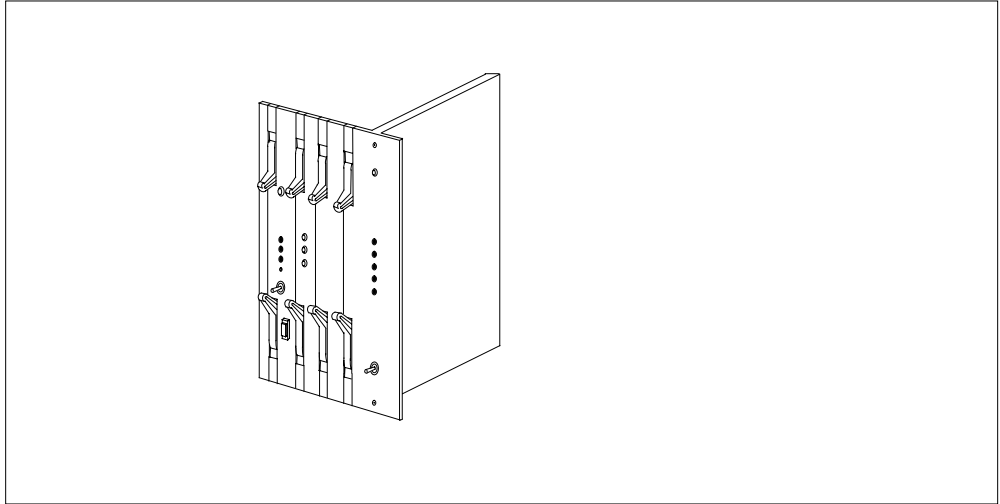
- 1. Do not apply direct pressure to the components.
- 2. Do not force the cards into the slots.

Remove the NT2X70 power converter card as shown in the following figures.

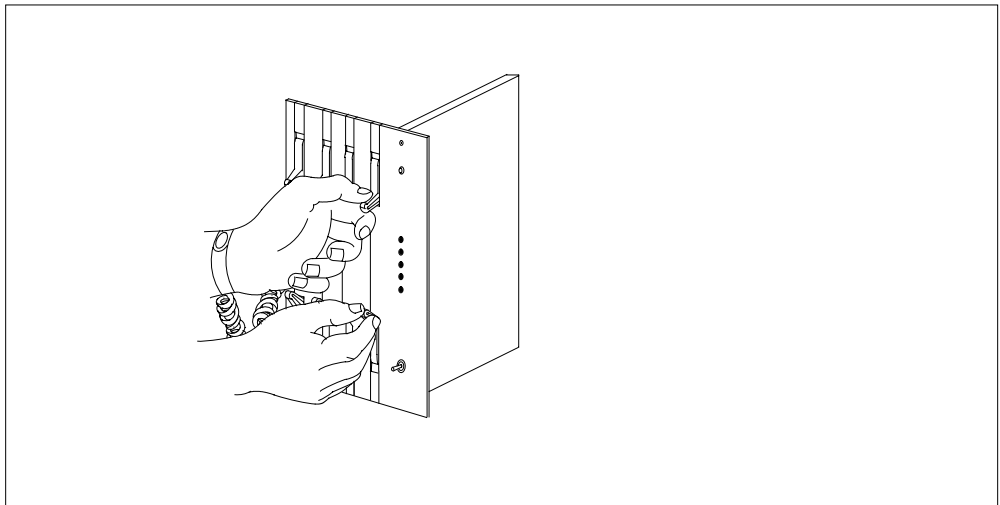
## NT2X70 in an MSB (continued)

---

- a** Locate the card to be removed on the appropriate shelf.



- b** If the card has an ENBL/DSBL switch, operate the switch to the DSBL position.
- c** Grasp the top and the bottom latch assemblies.

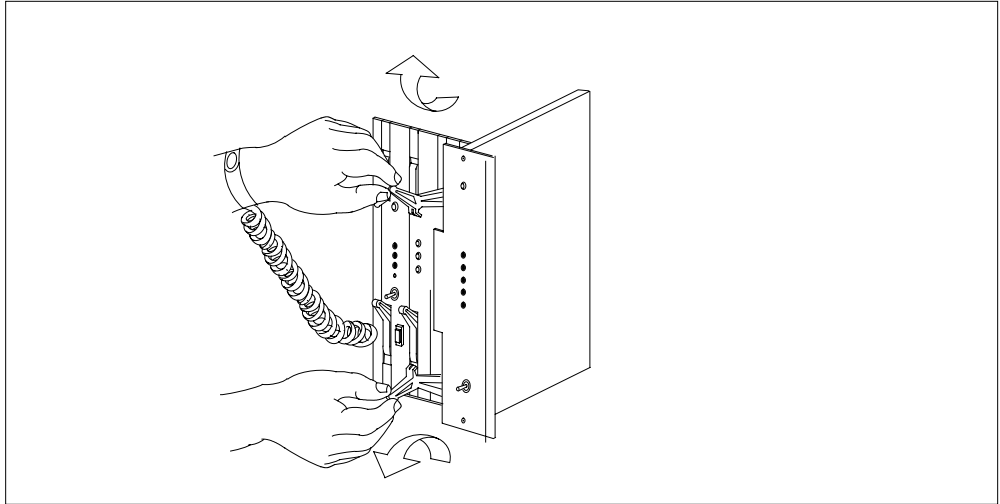


- d** Simultaneously rotate the top latch upward and the bottom latch downward until the latches are in the horizontal position. This will move the card 1/2 inch from the shelf backplane.

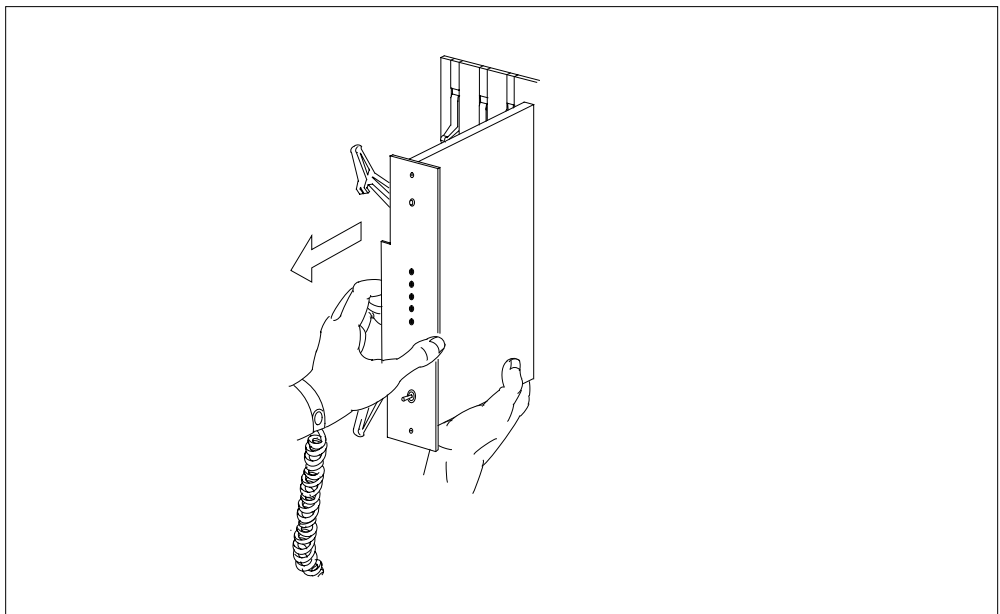
---

**NT2X70**  
**in an MSB (continued)**

---



- e** Holding the card by the face plate, slide the card along the guides until the card is free from the shelf.



- f** Immediately place the card into an approved electro-static discharge (ESD) protective container.



## NT2X70 in an MSB (continued)

---

19



### **DANGER**

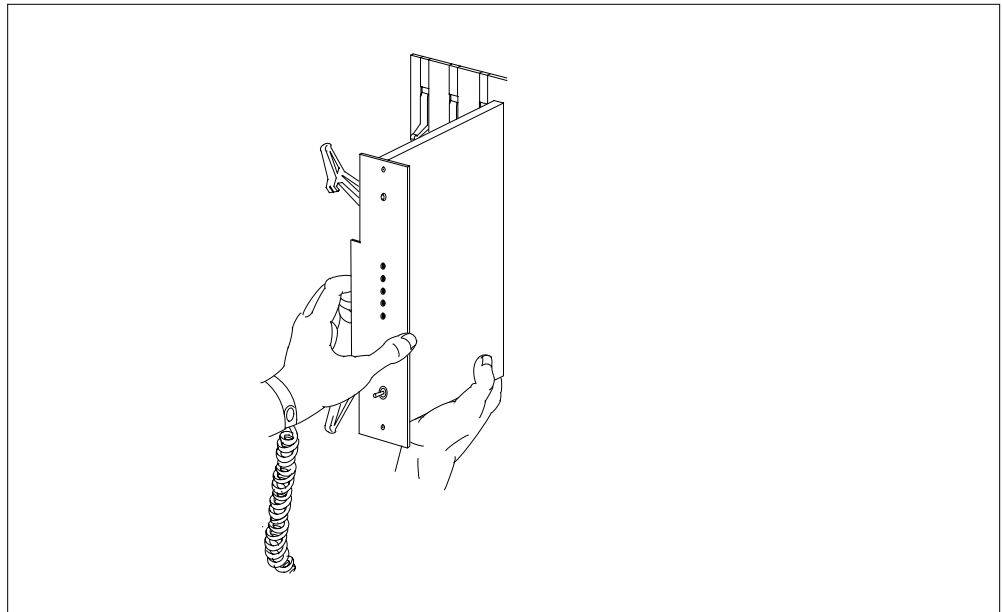
#### **Equipment damage**

Take these precautions when removing or inserting a card:

1. Do not apply direct pressure to the components.
2. Do not force the cards into the slots.

Insert the NT2X70 power converter replacement card as shown in the following figures.

- a Hold the card by the face plate with the components visible on the right-hand side.
- b If the card has an ENBL/DSBL switch, operate the switch to the DSBL position.
- c Place the back edge of the card into the upper and lower guides of the desired slot position on the shelf.

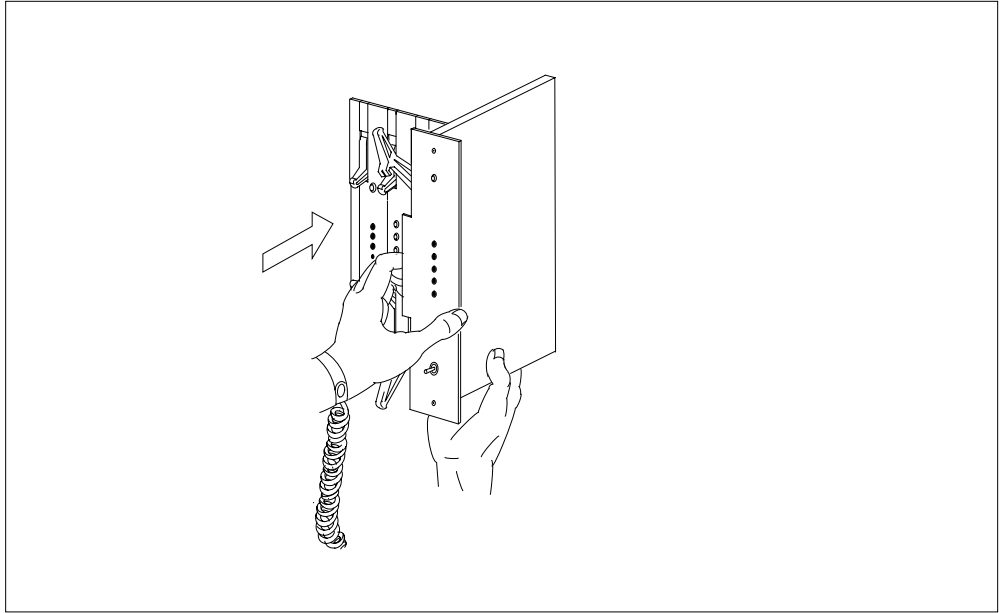


- d Gently slide the card into the shelf.

---

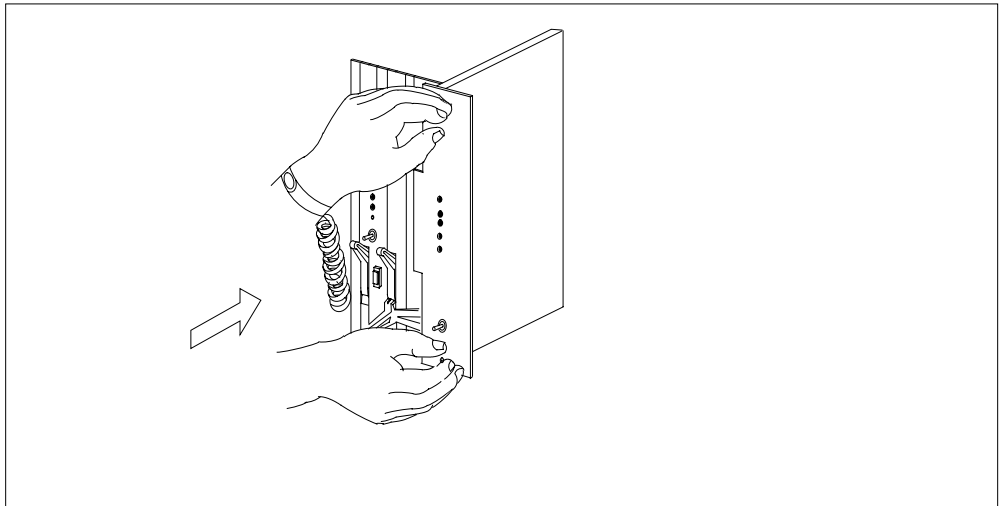
**NT2X70**  
**in an MSB (continued)**

---



**20** Seat and lock the card.

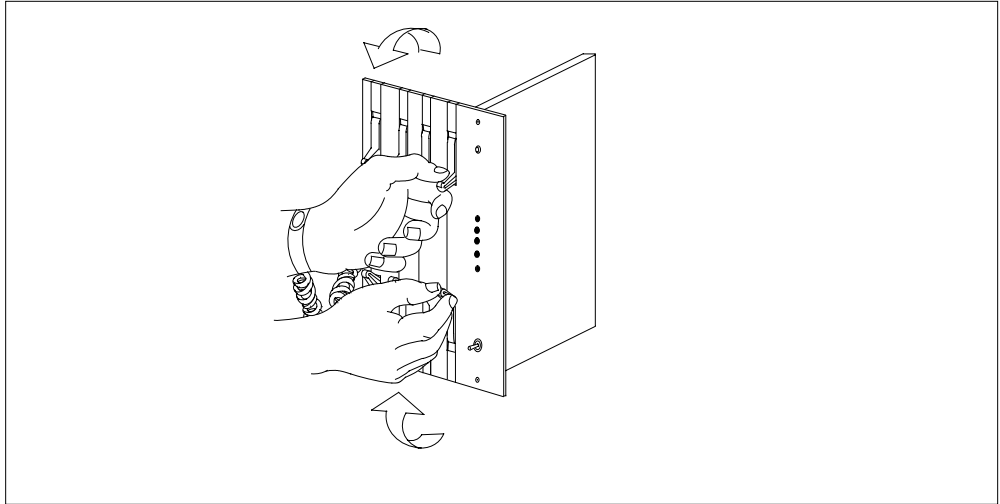
- a** Push the card into the shelf. The card will stop about 1/2 inch from its final position..



- b** Rotate the top latch down and the bottom latch up at the same time. The card will lock into position when the lock-latches are flush with the faceplate of the card.

## NT2X70 in an MSB (continued)

---



- c** If the card has an ENBL/DSBL switch, operate the switch to the ENBL position.

- 21** The next action depends on the power converter version and the type of supervisory panel.

---

| <b>If you are</b>                                                              | <b>Do</b> |
|--------------------------------------------------------------------------------|-----------|
| replacing an NT2X70 card and the FSP or MSP has circuit breakers               | step 22   |
| replacing an NT2X70 card and the FSP or MSP does not have circuit breakers     | step 23   |
| not replacing an NT2X70 card and the FSP or MSP has circuit breakers           | step 24   |
| not replacing an NT2X70 card and the FSP or MSP does not have circuit breakers | step 25   |

---

- 22** Power up the converter.
- a** Pull and set the handle of the POWER switch upward to the RESET position and hold.
  - b** Set the switch of the converter circuit breaker on the FSP or MSP upwards until it clicks into place.

## NT2X70 in an MSB (continued)

- c Release the handle of the POWER switch and the switch of the circuit breaker.  
Go to step 26.
- 23 Power up the converter.
  - a Pull and set the handle of the POWER switch upward to the RESET position and hold until the CONVERTER FAIL LED goes off.
  - b Release the handle of the POWER switch.  
Go to step 26.
- 24 Power up the converter.
  - a Pull and set the handle of the POWER switch upward to the ON position.
  - b Press and hold the RESET button on the power converter.
  - c Set the switch of the converter circuit breaker on the FSP or MSP upwards until it clicks into place.
  - d Release the RESET button and circuit breaker.  
Go to step 26.
- 25 Power up the converter.
  - a Pull and set the handle of the POWER switch upward to the ON position.
  - b Press and hold the RESET button on the power converter until the CONVERTER FAIL LED goes off.
  - c Release the RESET button.
- 26 The next action depends on the type of MSB you are working on.
 

| If you are working on an | Do      |
|--------------------------|---------|
| MSB6                     | step 27 |
| MSB7                     | step 28 |
- 27 Reseat cards in the MSB6 control complex.
  - a Reseat the NT6X45 master processor card in slot 15.
  - b Reseat the NT6X45 signaling processor card in slot 19.
  - c Reseat the NT6X43 message interface card in slot 20.  
Go to step 29.
- 28 Reseat cards in the MSB7 control complex.
  - a Reseat the NT6X45 master processor card in slot 11.
  - b Reseat the NT6X45 signaling processor card in slot 16.
  - c Reseat the NT6X69 message protocol card in slot 20.

## NT2X70 in an MSB (continued)

### *At the MAP terminal*

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

| <b>If you are working on</b> | <b>Do</b> |
|------------------------------|-----------|
| JNET                         | step 30   |
| ENET                         | step 32   |

**30** To return to service one of the network links associated with the PM unit you are working on, type

**>RTS plane\_no link\_no**

and press the Enter key.

*where*

**plane\_no**  
is the number of the plane (0 or 1) for the link

**link\_no**  
is the link number (0 to 63)

| <b>If the link</b>                                          | <b>Do</b> |
|-------------------------------------------------------------|-----------|
| returned to service and there are more manual-busy links    | step 31   |
| returned to service and there are no more manual-busy links | step 33   |
| did not return to service                                   | step 40   |

**31** Repeat step 30 for all C-side links for the PM unit you are working on.

**32** To return the link to service, type

**>RTS plane\_no LINK link\_no**

and press the Enter key.

*where*

**plane\_no**  
is the number of the plane (0 or 1) for the link

**link\_no**  
is the link number (0 to 63)

*Example of a MAP response:*

Request to RTS ENET Plane:0 Shelf:00 Slot:32 Link:01 submitted.  
Request to RTS ENET Plane:0 Shelf:00 Slot:32 Link:01 passed.

## NT2X70 in an MSB (continued)

|                                                             | <table> <tr> <th>If the link</th><th>Do</th></tr> <tr> <td>returned to service</td><td>step 33</td></tr> <tr> <td>did not return to service</td><td>step 40</td></tr> </table>                                                                                                                                                    | If the link           | Do | returned to service                                     | step 33 | did not return to service                                   | step 40 |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----|---------------------------------------------------------|---------|-------------------------------------------------------------|---------|
| If the link                                                 | Do                                                                                                                                                                                                                                                                                                                                |                       |    |                                                         |         |                                                             |         |
| returned to service                                         | step 33                                                                                                                                                                                                                                                                                                                           |                       |    |                                                         |         |                                                             |         |
| did not return to service                                   | step 40                                                                                                                                                                                                                                                                                                                           |                       |    |                                                         |         |                                                             |         |
| 33                                                          | <p>To post the MSB you are working on, type<br/> <b>&gt;PM;POST pm_type pm_no</b><br/> and press the Enter key.<br/> <i>where</i><br/> <b>pm_type</b><br/> is the PM type (MSB6, MSB7)<br/> <b>pm_no</b><br/> is the PM number (0 to 256)</p>                                                                                     |                       |    |                                                         |         |                                                             |         |
| 34                                                          | <p>The next action depends on your reason for performing this procedure.</p> <table> <tr> <th>If you were</th><th>Do</th></tr> <tr> <td>directed to this procedure from a maintenance procedure</td><td>step 35</td></tr> <tr> <td>not directed to this procedure from a maintenance procedure</td><td>step 36</td></tr> </table> | If you were           | Do | directed to this procedure from a maintenance procedure | step 35 | not directed to this procedure from a maintenance procedure | step 36 |
| If you were                                                 | Do                                                                                                                                                                                                                                                                                                                                |                       |    |                                                         |         |                                                             |         |
| directed to this procedure from a maintenance procedure     | step 35                                                                                                                                                                                                                                                                                                                           |                       |    |                                                         |         |                                                             |         |
| not directed to this procedure from a maintenance procedure | step 36                                                                                                                                                                                                                                                                                                                           |                       |    |                                                         |         |                                                             |         |
| 35                                                          | <p>Return to the maintenance procedure that sent you to this procedure and continue as directed.</p>                                                                                                                                                                                                                              |                       |    |                                                         |         |                                                             |         |
| 36                                                          | <p>To load the inactive unit, type<br/> <b>&gt;LOADPM INACTIVE</b><br/> and press the Enter key.</p> <table> <tr> <th>If the LOADPM command</th><th>Do</th></tr> <tr> <td>failed</td><td>step 37</td></tr> <tr> <td>passed</td><td>step 38</td></tr> </table>                                                                     | If the LOADPM command | Do | failed                                                  | step 37 | passed                                                      | step 38 |
| If the LOADPM command                                       | Do                                                                                                                                                                                                                                                                                                                                |                       |    |                                                         |         |                                                             |         |
| failed                                                      | step 37                                                                                                                                                                                                                                                                                                                           |                       |    |                                                         |         |                                                             |         |
| passed                                                      | step 38                                                                                                                                                                                                                                                                                                                           |                       |    |                                                         |         |                                                             |         |
| 37                                                          | <p>Load the PM unit using the procedure <i>Loading a PM</i> in this document. When you have completed the procedure, return to this point.</p>                                                                                                                                                                                    |                       |    |                                                         |         |                                                             |         |
| 38                                                          | <p>Return the inactive unit to service by typing<br/> <b>&gt;RTS INACTIVE</b><br/> and pressing the Enter key.</p> <table> <tr> <th>If the RTS command</th><th>Do</th></tr> <tr> <td>passed</td><td>step 41</td></tr> </table>                                                                                                    | If the RTS command    | Do | passed                                                  | step 41 |                                                             |         |
| If the RTS command                                          | Do                                                                                                                                                                                                                                                                                                                                |                       |    |                                                         |         |                                                             |         |
| passed                                                      | step 41                                                                                                                                                                                                                                                                                                                           |                       |    |                                                         |         |                                                             |         |

**NT2X70**  
**in an MSB (end)**

---

|           | <b>If the RTS command</b>                                                                            | <b>Do</b> |
|-----------|------------------------------------------------------------------------------------------------------|-----------|
|           | failed                                                                                               | step 40   |
| <b>39</b> | Contact operating company personnel to determine why the component is offline. Continue as directed. |           |
| <b>40</b> | For further assistance, contact the personnel responsible for the next level of support.             |           |
| <b>41</b> | You have completed this procedure.                                                                   |           |

## NT2X70 in an ST7G or STCM

---

### Application

Use this procedure to replace an NT2X70 in the shelves or frames listed in the following table.

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

| PEC    | Suffix                       | Card name                  | Shelf or frame name                                                                        |
|--------|------------------------------|----------------------------|--------------------------------------------------------------------------------------------|
| NT2X70 | AA, AB,<br>AC, AD,<br>AE, AF | Power converter card       | CCS6 signalling terminal controller module (STCM),<br>CCS7 signaling terminal group (ST7G) |
| NT2X70 | EA                           | -48 V power converter card | STCM, ST7G                                                                                 |
| NT2X70 | KA                           | -60 V power converter card | STCM, ST7G                                                                                 |

**Note:** This procedure is not used to change the NT2X70 power converter card in the CCS6 signaling terminal controller module (STCM) of an MSB6. Refer to the “Index” to locate the correct procedure for this card/shelf combination.

### Common procedures

The common procedure “Loading a PM” is referenced in this procedure.

Do not go to the common procedure unless directed to do so in the step-action procedure.

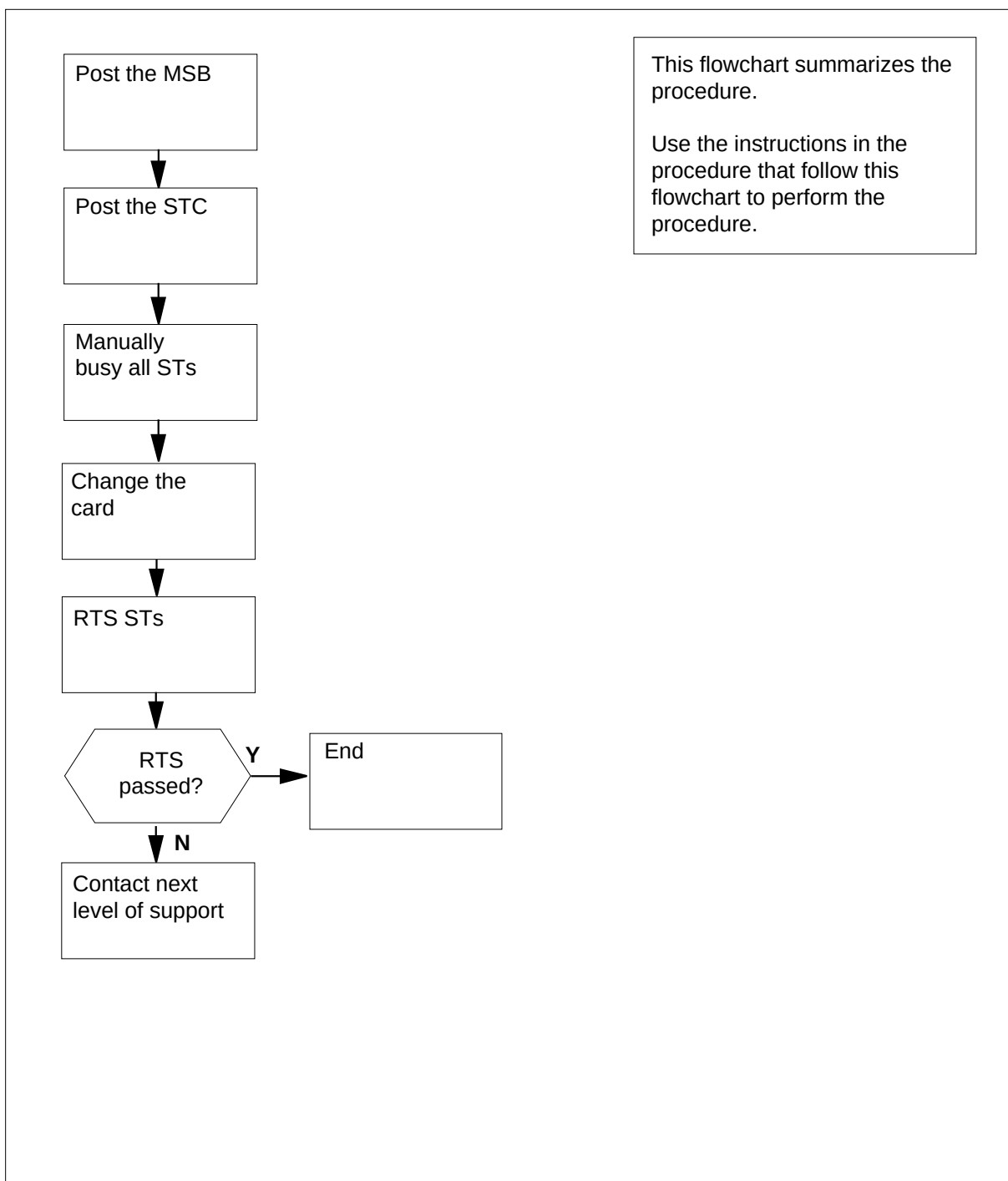
### Action

The following flowchart is only a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.



## NT2X70 in an ST7G or STCM (continued)

### Summary of replacing an NT2X70 in an ST7G or STCM



## NT2X70 in an ST7G or STCM (continued)

### Replacing an NT2X70 in an ST7G or STCM

#### *At your current location*

1



#### **CAUTION**

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

This procedure includes directions to manually busy one or more signaling terminals (ST). Since manually busy-ing an ST can cause service degradation, perform this procedure only if necessary to restore out-of-service components. Otherwise, carry out this procedure during periods of low traffic.

Obtain a replacement card. Ensure that the replacement card has the same PEC, including suffix, as the card being removed.

#### *At the shelf*

2

Identify the physical location of the power converter you are replacing. Record the STCM number or the ST7G number associated with that power converter.

**Note:** When removing power from an STCM or an ST7G, you must manually busy all signaling terminals in the group before card replacement.

#### *At the MAP terminal*

3

To access the PM level of the MAP display, type

**>MAPCI ; MTC ; PM**

and press the Enter key.

*Example of a MAP display:*

|    |            |           |           |           |            |            |
|----|------------|-----------|-----------|-----------|------------|------------|
| PM | SysB<br>12 | ManB<br>0 | OffL<br>2 | CBsy<br>0 | ISTb<br>13 | InSv<br>24 |
|----|------------|-----------|-----------|-----------|------------|------------|

4

To post the MSB, type

**>POST pm\_type pm\_no**

and press the Enter key.

*where*

**pm\_type**

is the PM type (MSB6, MSB7)

**pm\_no**

is the PM number (0 to 256)

*Example of a MAP display:*

## NT2X70 in an ST7G or STCM (continued)

|      |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
|------|--|------|------|------|------|------|------|
| PM   |  | 12   | 0    | 2    | 0    | 13   | 24   |
| MSB7 |  | 0    | 0    | 0    | 0    | 3    | 0    |

MSB7 0 ISTb Links\_00S: CSide 0 , PSide 0  
Unit0: Inact ISTb  
Unit1: Act ISTb

- 5 To access the STC level of the MAP display, type  
**>STC**

and press the Enter key.

*Example of a MAP display:*

|      |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
|------|--|------|------|------|------|------|------|
| PM   |  | 12   | 0    | 2    | 0    | 13   | 24   |
| MSB7 |  | 0    | 0    | 0    | 0    | 3    | 0    |

MSB7 1 ISTb Links\_00S: CSide 0 , PSide 0  
Unit0: Inact ISTb  
Unit1: Act ISTb

STC

- 6 To post the STCM or ST7G that you recorded in step 2, type  
**>POST stcm\_no**

and press the Enter key.

*where*

**stcm\_no**  
is the STCM number (0 to 9)

*Example of a MAP display:*

|      |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
|------|--|------|------|------|------|------|------|
| PM   |  | 12   | 0    | 2    | 0    | 13   | 24   |
| MSB7 |  | 0    | 0    | 0    | 0    | 3    | 0    |

MSB7 1 ISTb Links\_00S: CSide 0 , PSide 0  
Unit0: Inact ISTb  
Unit1: Act ISTb

|     |  |   |   |   |   |   |    |
|-----|--|---|---|---|---|---|----|
| STC |  | 4 | 0 | 0 | 0 | 0 | 20 |
|-----|--|---|---|---|---|---|----|

|     |     |      |   |      |   |    |      |      |  |      |
|-----|-----|------|---|------|---|----|------|------|--|------|
| STC | 102 | STCM | 0 | Ctrl | 0 | Bd | SysB | Diag |  | Mtce |
|-----|-----|------|---|------|---|----|------|------|--|------|

- 7 To manually busy the STs, type  
**>BSY ALL**

and press the Enter key.

*Example of a MAP response:*

## NT2X70 in an ST7G or STCM (continued)

```
STC 301
STC 302
STC 303
STC 304
This will busy the above STC(S)
Please confirm ("YES", "Y", "NO", or "N"):
```

8 To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

```
STC 301 Bsy Passed
STC 302 Bsy Passed
STC 303 Bsy Passed
STC 304 Bsy Passed
```

**At the shelf**

9



### **DANGER**

#### **Static electricity damage**

Wear a wrist strap connected to the wrist-strap grounding point of a frame supervisory panel (FSP) or a modular supervisory panel (MSP) while handling circuit cards. This protects the cards against damage caused by static electricity.

Put on a wrist strap.

10 Power down the unit by pulling and setting the handle of the power converter POWER switch downward to the OFF position.

11



### **DANGER**

#### **Equipment damage**

Take the following precautions when removing or inserting a card:

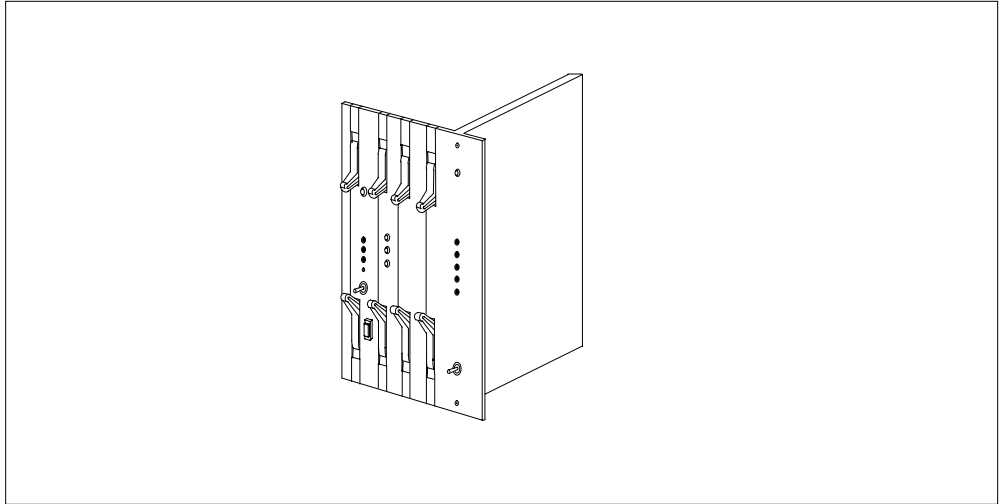
1. Do not apply direct pressure to the components.
2. Do not force the cards into the slots.

Remove the NT2X70 power converter card as shown in the following figures.

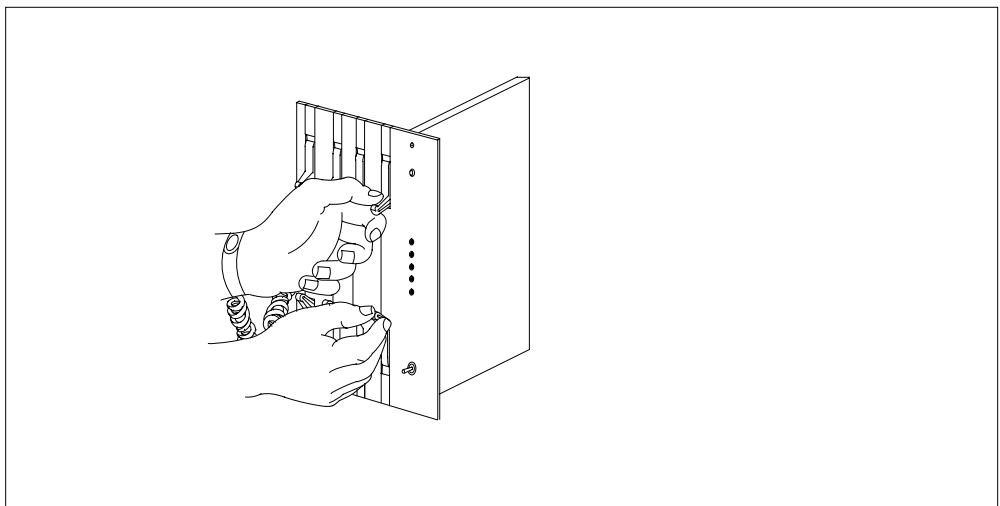
a Locate the card to be removed on the appropriate shelf.

## NT2X70 in an ST7G or STCM (continued)

---



- b** If the card has an ENBL/DSBL switch, set the switch to the DSBL position.
- c** Grasp the top and the bottom latch assemblies.

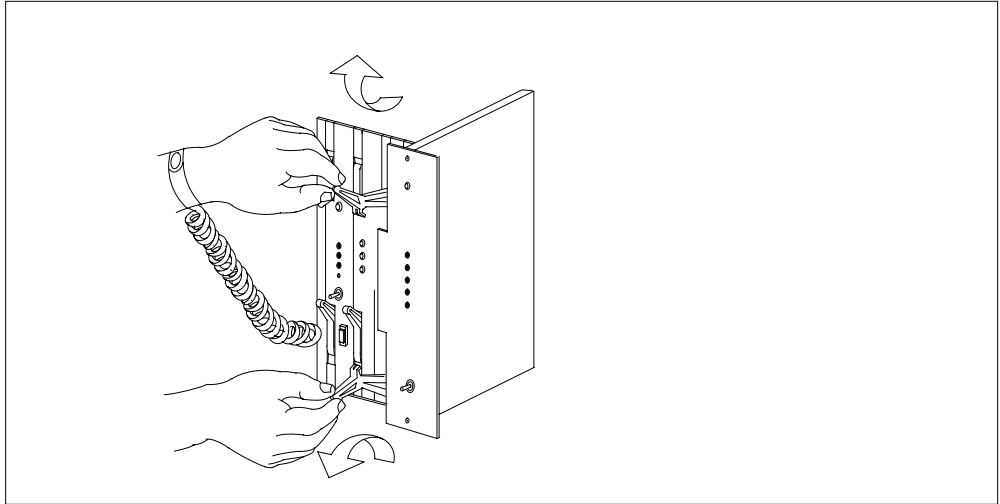


- d** Rotate the top latch up and the bottom latch down at the same time until the latches are in the horizontal position. This action will move the card 1/2 inch from the shelf backplane.

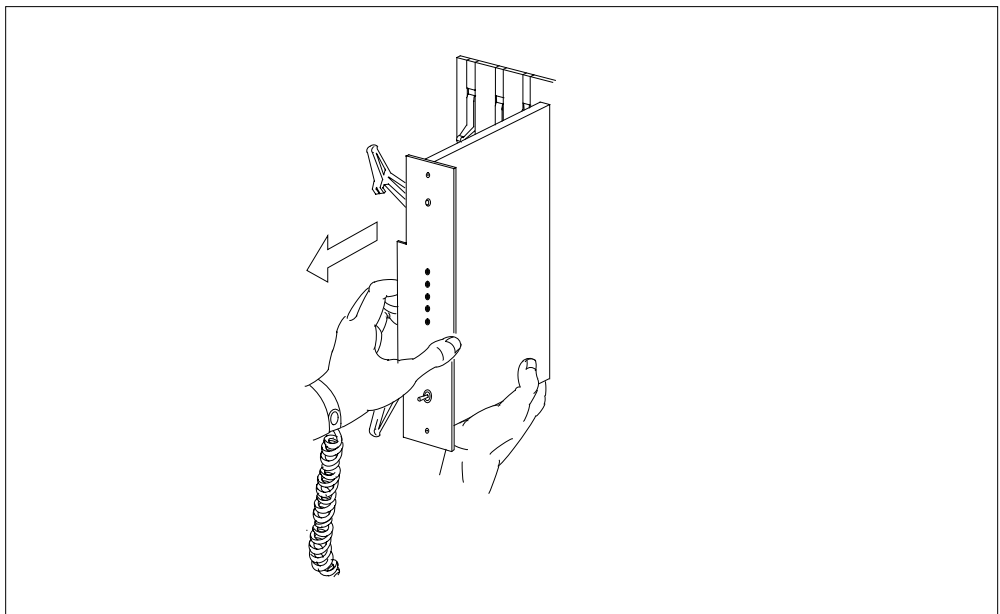
---

**NT2X70**  
**in an ST7G or STCM (continued)**

---



- e** Hold the card by the face plate and slide the card along the guides until the card is free from the shelf.



- f** Immediately place the card into an approved electro-static discharge (ESD) protective container.

## NT2X70 in an ST7G or STCM (continued)

---

12



### **DANGER**

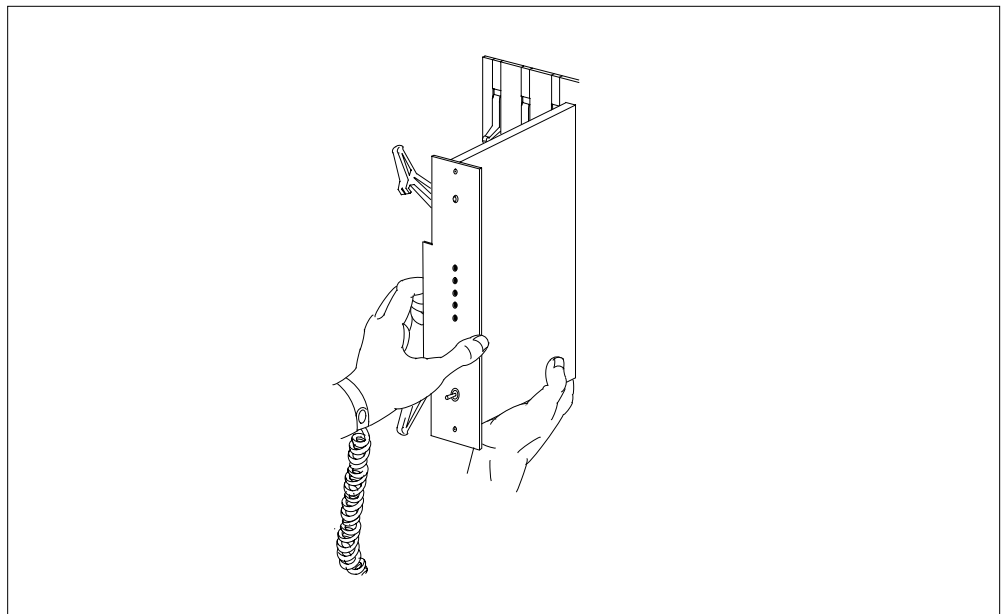
#### **Equipment damage**

Take these precautions when removing or inserting a card:

1. Do not apply direct pressure to the components.
2. Do not force the cards into the slots.

Insert the NT2X70 power converter replacement card as shown in the following figures.

- a Hold the card by the face plate with the components visible on the right-hand side.
- b If the card has an ENBL/DSBL switch, set the switch to the DSBL position.
- c Place the back edge of the card into the upper and lower guides of the desired slot position on the shelf.

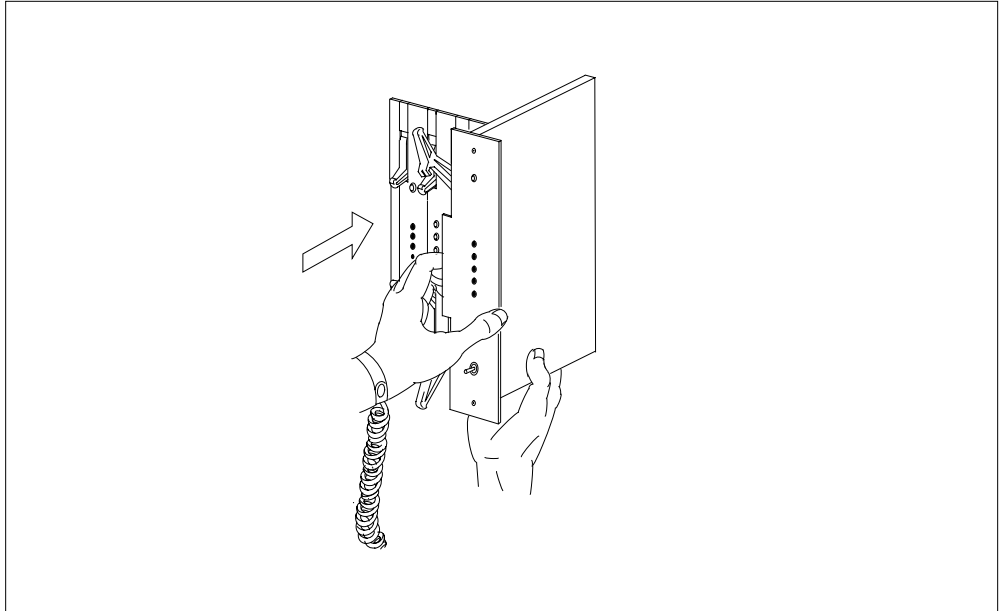


- d Gently slide the card into the shelf.

---

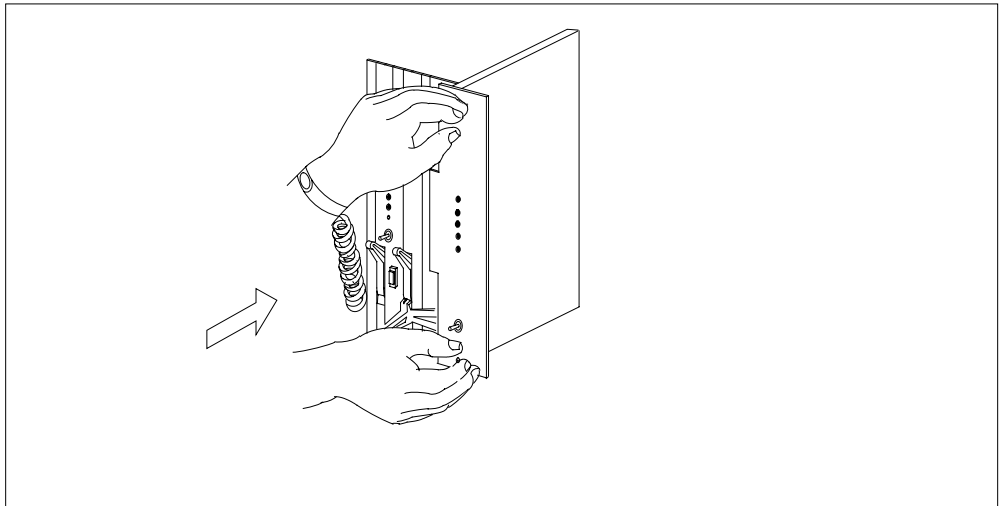
**NT2X70**  
**in an ST7G or STCM (continued)**

---



**13** Seat and lock the card.

- a** Push the card into the shelf. The pack will stop about 1/2 inch from its final position.

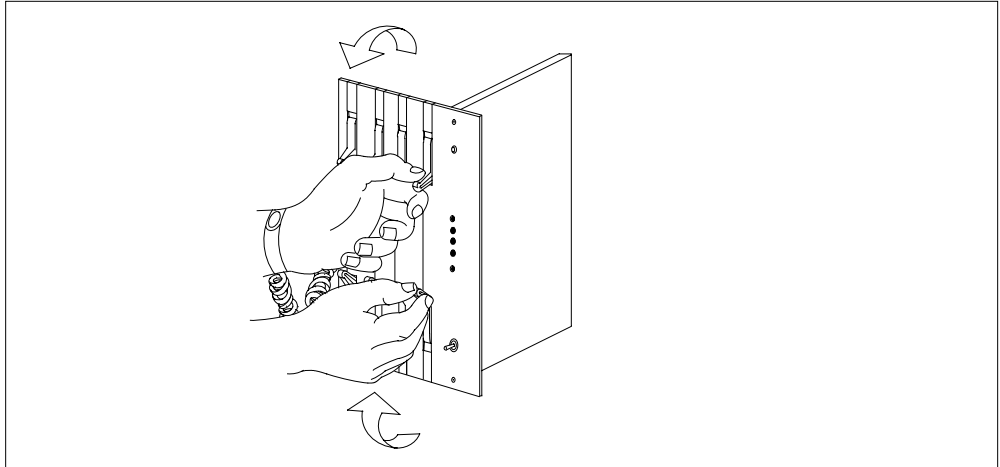


- b** Simultaneously rotate the top latch downward and the bottom latch upward. The card will lock into position when the lock-latches are flush with the face plate of the card.



## NT2X70 in an ST7G or STCM (continued)

---



- c If the card has an ENBL/DSBL switch, set the switch to the ENBL position.

- 14** The next action depends on the power converter version and the type of supervisory panel.

| If you are                                                                     | Do      |
|--------------------------------------------------------------------------------|---------|
| replacing an NT2X70 card and the FSP or MSP has circuit breakers               | step 15 |
| replacing an NT2X70 card and the FSP or MSP does not have circuit breakers     | step 16 |
| not replacing an NT2X70 card and the FSP or MSP has circuit breakers           | step 17 |
| not replacing an NT2X70 card and the FSP or MSP does not have circuit breakers | step 18 |

- 15** Power up the converter.
- a Pull and set the handle of the POWER switch upward to the RESET position and hold.
  - b Set the switch of the converter circuit breaker on the FSP or MSP upwards until it clicks into place.
  - c Release the handle of the POWER switch and the switch of the circuit breaker.

**NT2X70**  
**in an ST7G or STCM (continued)**

---

Go to step 19.

**16** Power up the converter.

- a** Pull and set the handle of the POWER switch upward to the RESET position and hold until the CONVERTER FAIL LED goes off.
- b** Release the handle of the POWER switch.

Go to step 19.

**17** Power up the converter.

- a** Pull and set the handle of the POWER switch upward to the ON position.
- b** Press and hold the RESET button on the power converter.
- c** Set the switch of the converter circuit breaker on the FSP or MSP upwards until it clicks into place.
- d** Release the RESET button and circuit breaker.

Go to step 19.

**18** Power up the converter.

- a** Pull and set the handle of the POWER switch to the ON position.
- b** Press and hold the RESET button on the power converter until the CONVERTER FAIL LED goes off.
- c** Release the RESET button.

***At the MAP terminal***

**19** To load the STs, type

**>LOADPM ALL**

and press the Enter key.

*Example of a MAP response #1:*

```
STC 301 load Passed : M7CQA01
STC 302 load Passed : M7CQA01
STC 303 load Passed : M7CQA01
STC 304 load Passed : M7CQA01
```

*Example of a MAP response #2:*

## NT2X70

### in an ST7G or STCM (continued)

STC load 'M7CQA01' not in MSB7 0

| If the LOADPM command                                          | Do      |
|----------------------------------------------------------------|---------|
| passed                                                         | step 25 |
| failed, with the message STC Load <loadname> not in <msb_unit> | step 20 |
| failed, with any other message                                 | step 22 |

**Note:** As shown above in “Example of a MAP response #2”, loadname is the name of the ST load; msb\_unit is the MSB (MSB6, MSB7) and the unit number.

- 20 To return to the PM level of the MAP display, type

**>QUIT**

and press the Enter key.

- 21 To add the load to the MSB, type

**>STCLOAD PM ADD loadname**

and press the Enter key.

| If the STCLOAD command | Do      |
|------------------------|---------|
| failed                 | step 22 |
| passed                 | step 23 |

- 22 Load the PM unit using the procedure “Loading a PM” in this document. When you have completed the procedure, return to this point.

- 23 To access the STC level of the MAP display, type

**>STC**

and press the Enter key.

- 24 To post the STCM or ST7G that you recorded in step 2, type

**>POST stcm\_no**

and press the Enter key.

where

**stcm\_no**  
is the STCM number (0 to 9)

Go to step 19.

- 25 To return the STs to service, type

**>RTS ALL**

## NT2X70 in an ST7G or STCM (end)

and press the Enter key.

*Example of a MAP response:*

```
STC 301 Out-of-service test initiated
STC 301 Tst Passed
STC 301 Rts Passed
STC 302 Out-of-service test initiated
STC 302 Tst Passed
STC 302 Rts Passed
STC 303 Out-of-service test initiated
STC 303 Tst Passed
STC 303 Rts Passed
STC 304 Out-of-service test initiated
STC 304 T Passed
STC 304 Rts Passed
```

| If the RTS command  | Do      |
|---------------------|---------|
| passed for all STCs | step 26 |
| failed for any STC  | step 31 |

**26** Send any faulty cards for repair according to local procedure.

**27** Record the following items in office records:

- date the card was replaced
- serial number of the card
- symptoms that prompted replacement of the card.

Go to step 28.

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

| If you were                                                 | Do      |
|-------------------------------------------------------------|---------|
| directed to this procedure from a maintenance procedure     | step 29 |
| not directed to this procedure from a maintenance procedure | step 32 |

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

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

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

**32** You have completed this procedure.

## NT6X40 in an MSB

---

### Application

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

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

| PEC    | Suffix            | Card name                     | Shelf or frame name                                                                                                                                                             |
|--------|-------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NT6X40 | AA, AB,<br>AC, BA | DS30 C-side interface<br>card | CCS6 signaling terminal array<br>(6STA) of a CCS6 message<br>switch and buffer (MSB6),<br>CCS7 signaling terminal array<br>(STA7) of a CCS7 message<br>switch and buffer (MSB7) |

### Common procedures

This procedure refers to the following common procedures:

- *Manually busying Series II PM C-side links*
- *Replacing a card*

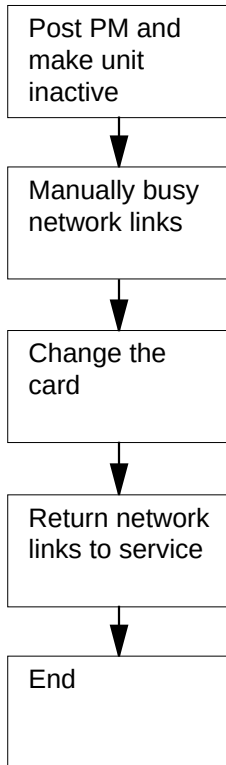
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## NT6X40 in an MSB (continued)

### Summary of replacing NT6X40 in an MSB



This flowchart summarizes the procedure.

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

## NT6X40 in an MSB (continued)

---

### Replacing an NT6X40 in an MSB

#### *At your current location*

1



#### **WARNING**

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

This procedure manually busies network links and removes network link redundancy. Perform this procedure if you need to restore out-of-service components. Unless it is urgent, perform the procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card you replace have the same PEC and PEC suffix.

#### *At the shelf*

2 Locate the card you replace.

**Note:** Before you remove the NT6X40 from the shelf, you must switch activity to the other PM unit. Manually busy network links that associate with the card.

#### *At the MAP terminal*

3 To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
| PM | SysB | ManB | OffL | Cbsy | ISTb | InSv |
|    | 12   | 0    | 2    | 0    | 13   | 24   |

4 To post the MSB, type

**>POST pm\_type pm\_no**

and press the Enter key.

*where*

#### **PM\_TYPE**

the PM type (MSB6 or MSB7)

#### **PM\_NO**

is the PM number (0 to 999)

*Example of a MAP display:*

## NT6X40 in an MSB (continued)

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
|      | SysB | ManB | OffL | Cbsy | ISTb | InSv |
| PM   | 12   | 0    | 2    | 0    | 13   | 24   |
| MSB7 | 0    | 0    | 0    | 0    | 0    | 3    |

```
MSB7 0 InSv Links_00S: CSide 0 , PSide 0
Unit0: Inact InSv
Unit1: Act InSv
```

- 5** Determine the state and activity of the PM unit that contains the card you replace.

| If the state of the PM unit                      | Do      |
|--------------------------------------------------|---------|
| is ISTb, InSv, SysB, or Cbsy, and active         | step 6  |
| is ISTb, InSv, SysB, Cbsy, or ManB, and inactive | step 9  |
| is OffL                                          | step 18 |

- 6** From the MAP display, determine the state of the mate PM unit.

| If the state of the mate PM unit | Do      |
|----------------------------------|---------|
| is ISTb or InSv                  | step 7  |
| is other than listed here        | step 20 |

- 7** To switch activity, type  
**>SWACT**  
and press the Enter key.

*Example of a MAP response:*

```
MSB7 0 A Warm SwAct will be performed after
data sync of active terminals.
Confirm ("YES", "Y", "NO", or "N"):
```

| If                           | Do      |
|------------------------------|---------|
| you must confirm the command | step 8  |
| the system rejects the SWACT | step 19 |

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

*Example of a MAP response:*



## NT6X40 in an MSB (continued)

```
Unit0: Inact SysB Mtce
Unit1: Act ISTb

MSB7 0 SwAct Passed
```

| If the MAP response       | Do      |
|---------------------------|---------|
| is SWACT passed           | step 9  |
| is other than listed here | step 19 |

- 9 A maintenance flag (Mtce) indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status lines for both PM units before you proceed to the next step.
- 10 Manually busy all C-side links associated with the NT6X40 involved. Perform the procedure *Manually busying Series II PM C-side links* in this document. Complete the procedure and return to this point.

### At the shelf

11



#### WARNING

##### Static electricity damage

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

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

**Note:** Make sure that the replacement card and the card you remove have the same switch settings.

### At the MAP terminal

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

| If             | Do      |
|----------------|---------|
| JNET is in use | step 13 |
| ENET is in use | step 15 |

- 13 To return to service one of the network links, type  
**>RTS plane\_no link\_no**

## NT6X40 in an MSB (continued)

and press the Enter key.

where

**plane\_no**

is the number of the plane (0 or 1) for the link

**link\_no**

is the link number (0 to 63)

|  | <b>If the link</b>                                          | <b>Do</b> |
|--|-------------------------------------------------------------|-----------|
|  | returned to service and there are more manual-busy links    | step 14   |
|  | returned to service and there are no more manual-busy links | step 16   |
|  | did not return to service                                   | step 20   |

**14** Repeat step 13 for each manual busy C-side link. Return all C-side links to service and go to step 16.

**15** To return the link to service, type

**>RTS plane\_no LINK link\_no**

and press the Enter key.

where

**plane\_no**

is the number of the surface (0 or 1) for the link

**link\_no**

is the link number (0 to 63)

*Example of a MAP response:*

Request to RTS ENET Surface:0 Shelf:00 Slot:32 Link:01 submitted  
Request to RTS ENET Surface:0 Shelf:00 Slot:32 Link:01 passed.

|           | <b>If the link</b>                                                | <b>Do</b> |
|-----------|-------------------------------------------------------------------|-----------|
|           | returned to service                                               | step 16   |
|           | did not return to service                                         | step 20   |
| <b>16</b> | The next action depends on the reason you perform this procedure. |           |
|           | <b>If a maintenance procedure</b>                                 | <b>Do</b> |
|           | directed you to this procedure                                    | step 17   |
|           | did not direct you to this procedure                              | step 21   |

## NT6X40

### in an MSB (end)

---

- 17 Return to the maintenance procedure that sent you to this procedure and continue as directed.
- 18 Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.
- 19 For additional help with switch of activity, contact the next level of support.  
**Note:** If the system recommends that you use the SWACT command with the FORCE option, contact operating company personnel to determine if you must use the FORCE option.
- 20 For additional help, contact the next level of support.
- 21 The procedure is complete.

## NT6X68 in an MSB

---

### Application

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

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

| PEC    | Suffix | Card name                                                       | Shelf or frame name                   |
|--------|--------|-----------------------------------------------------------------|---------------------------------------|
| NT6X68 | AA     | Signaling terminal interface card                               | CCS6 message switch and buffer (MSB6) |
| NT6X68 | AB     | Signaling terminal interface card with terminator               | MSB6                                  |
| NT6X68 | AC     | Signaling terminal interface card                               | CCS7 message switch and buffer (MSB7) |
| NT6X68 | AD     | Signaling terminal interface card with terminator               | MSB7                                  |
| NT6X68 | CA     | International signaling terminal interface card                 | MSB7                                  |
| NT6X68 | DA     | International signaling terminal interface card with terminator | MSB7                                  |

### Common procedures

This procedure refers to *Replacing a card*.

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

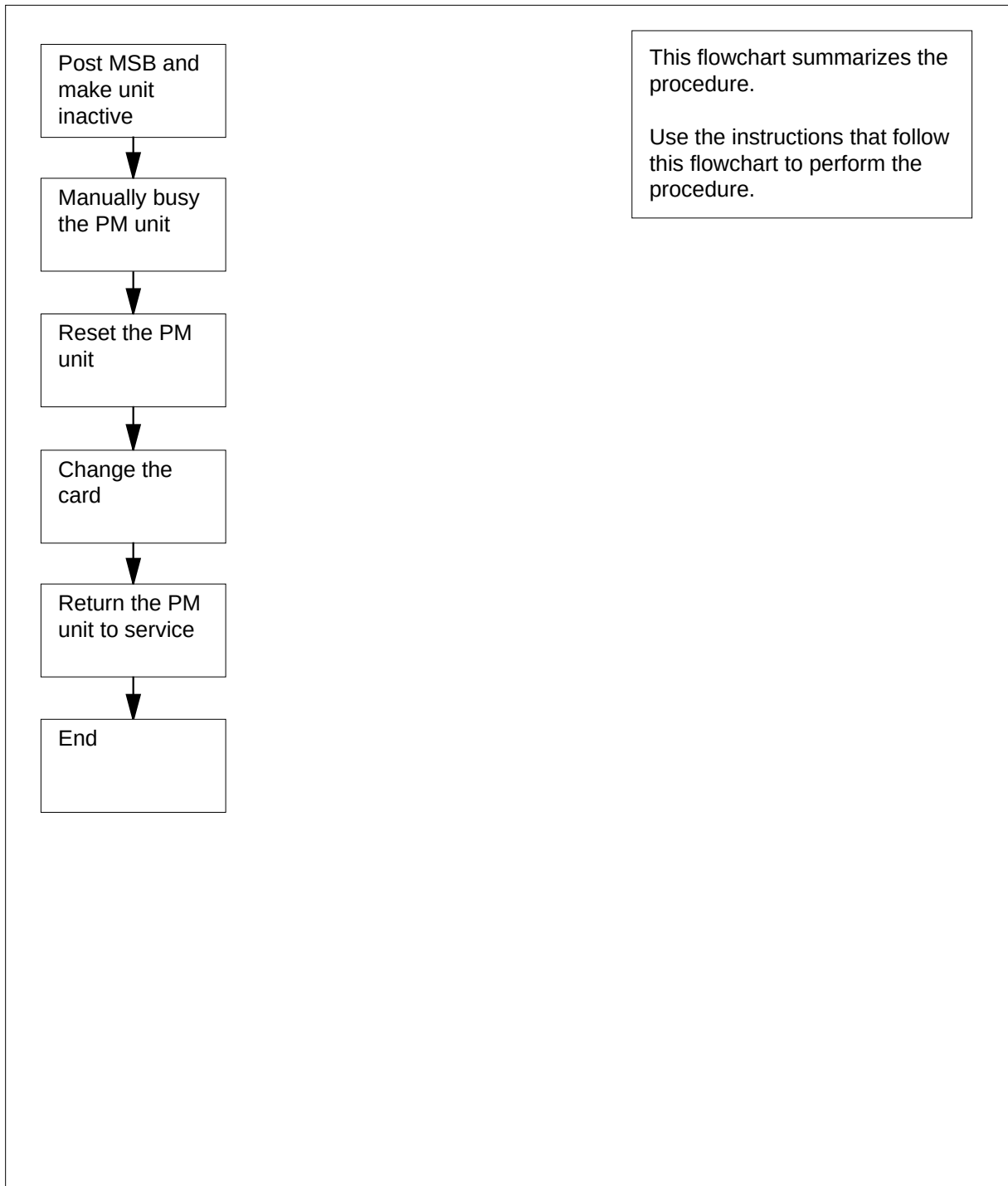
### Action

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

## NT6X68 in an MSB (continued)

---

### Summary of replacing NT6X68 in an MSB



## NT6X68 in an MSB (continued)

### Replacing an NT6X68 in an MSB

#### *At your current location*

1



#### **WARNING**

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

This procedure manually busies a minimum of one peripheral module (PM) unit, which can result in a loss of service. Perform this procedure if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

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

#### *At the shelf*

2

Locate the card you replace. Record the number of the PM unit that associates with the card. To identify the PM unit associated with the card you will replace, use the following table:

| MSB and shelf     | Slot    | Associated PM unit |
|-------------------|---------|--------------------|
| MSB7, upper shelf | slot 08 | MSB7 unit 0        |
|                   | slot 09 | MSB7 unit 1        |
| MSB7, lower shelf | slot 08 | MSB7 unit 1        |
|                   | slot 09 | MSB7 unit 0        |
| MSB6, upper shelf | slot 12 | MSB6 unit 0        |
|                   | slot 13 | MSB6 unit 1        |
| MSB6, lower shelf | slot 12 | MSB6 unit 1        |
|                   | slot 13 | MSB6 unit 0        |

**Note:** Before you replace the card, you must switch activity to the PM unit that does not associate with the card you replace.

## NT6X68 in an MSB (continued)

### *At the MAP terminal*

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

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | Cbsy | ISTb | InSv |
| PM | 12   | 0    | 2    | 0    | 13   | 24   |

- 4** To post the PM associated with the card that you replace, type  
**>POST pm\_type pm\_no**  
 and press the Enter key.

*where*

**pm\_type**  
 is the PM type (MSB6 or MSB7)

**pm\_no**  
 is the PM identification number (0 to 999)

*Example of a MAP display:*

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
|      | SysB | ManB | OffL | Cbsy | ISTb | InSv |
| PM   | 12   | 0    | 2    | 0    | 13   | 24   |
| MSB7 | 0    | 0    | 0    | 0    | 0    | 3    |

MSB7 0 InSv Links\_00S: CSide 0 , PSide 0  
 Unit0: Inact InSv  
 Unit1: Act InSv

- 5** Determine the state and activity of the PM unit that associates with the card that you replace.

| If the state of the PM unit                | Do      |
|--------------------------------------------|---------|
| is ISTb, InSv, SysB, or Cbsy, and active   | step 6  |
| is ISTb, InSv, SysB, or Cbsy, and inactive | step 9  |
| is ManB                                    | step 11 |
| is OffL                                    | step 16 |

- 6** From the MAP display, determine the state of the mate PM unit.

| If the state of the mate PM unit | Do     |
|----------------------------------|--------|
| is ISTb or InSv                  | step 7 |

## NT6X68 in an MSB (continued)

|           | If the state of the mate PM unit                                                                                                                                                                                                                                   | Do      |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|           | is other than listed here                                                                                                                                                                                                                                          | step 18 |
| <b>7</b>  | <p>To switch activity, type<br/> <b>&gt;SWACT</b><br/> and press the Enter key.<br/> <i>Example of a MAP response:</i></p> <pre>MSB7 0    A Warm SwAct will be performed after            data sync of active terminals. Confirm ("YES", "Y", "NO", or "N"):</pre> |         |
|           | If                                                                                                                                                                                                                                                                 | Do      |
|           | you must confirm the command                                                                                                                                                                                                                                       | step 8  |
|           | the system rejects the SWACT                                                                                                                                                                                                                                       | step 17 |
| <b>8</b>  | <p>To confirm the command, type<br/> <b>&gt;YES</b><br/> and press the Enter key.<br/> <i>Example of a MAP response:</i></p> <pre>Unit0:    Inact SysB Mtce Unit1:    Act   ISTbMSB7 0    SwAct Passed</pre>                                                       |         |
|           | If the MAP response                                                                                                                                                                                                                                                | Do      |
|           | is SWACT passed                                                                                                                                                                                                                                                    | step 9  |
|           | is any other response                                                                                                                                                                                                                                              | step 17 |
| <b>9</b>  | <p>A maintenance flag (Mtce) indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status lines for both PM units before you proceed to the next step.</p>                                                    |         |
| <b>10</b> | <p>To manually busy the inactive unit, type<br/> <b>&gt;BSY INACTIVE</b><br/> and press the Enter key.<br/> <i>Example of a MAP response:</i></p>                                                                                                                  |         |



## NT6X68 in an MSB (continued)

```
MSB7 0 ISTb Links_00S: CSide 0 , PSide 0
Unit0: Inact ManB
Unit1: Act InSv
bsy unit 0
MSB7 0 Unit 0 Bsy Passed
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 11 |
| failed             | step 18 |

- 11** To reset the PM unit, type  
**>PMRESET UNIT unit\_no NORUN**  
 and press the Enter key.

where

**unit\_no**  
 is the PM unit number (0 or 1)

*Example of a MAP response:*

```
MSB7 0 Unit 0 PMReset Passed
```

### At the shelf

**12**



#### WARNING

##### Static electricity damage

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

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

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

- 13** The next action depends on the reason you perform this procedure.

| If a maintenance procedure     | Do      |
|--------------------------------|---------|
| directed you to this procedure | step 14 |

**NT6X68**  
**in an MSB (end)**

- |                            | If a maintenance procedure                                                                                                                                                                                                                                      | Do      |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                            | did not direct you to this procedure                                                                                                                                                                                                                            | step 15 |
| <b>14</b>                  | Return to the maintenance procedure that sent you to this procedure and continue as directed.                                                                                                                                                                   |         |
| <b>At the MAP terminal</b> |                                                                                                                                                                                                                                                                 |         |
| <b>15</b>                  | To return the inactive PM unit to service, type<br><b>&gt;RTS INACTIVE</b><br>the Enter key.                                                                                                                                                                    |         |
|                            |                                                                                                                                                                                                                                                                 |         |
|                            | If the RTS command                                                                                                                                                                                                                                              | Do      |
|                            | passed                                                                                                                                                                                                                                                          | step 19 |
|                            | failed                                                                                                                                                                                                                                                          | step 18 |
| <b>16</b>                  | Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.                                                                                                                             |         |
| <b>17</b>                  | For additional help with switch of activity, contact the next level of support.<br><b>Note:</b> If the system recommends the use of the SWACT command with the FORCE option, contact operating company personnel to determine if you must use the FORCE option. |         |
| <b>18</b>                  | For additional help, contact the next level of support.                                                                                                                                                                                                         |         |
| <b>19</b>                  | The procedure is complete.                                                                                                                                                                                                                                      |         |

## Processor and memory cards in an MSB

---

### Application

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

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

| PEC    | Suffix                                             | Card name                         | Shelf or frame name                                                                                                                                              |
|--------|----------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NT6X45 | AA, AB,<br>AC, AD,<br>AE, AF,<br>BC, BD,<br>BA, BB | Processor card                    | CCS6 signaling terminal array (6STA) of a CCS6 message switch and buffer (MSB6), CCS7 signaling terminal array (STA7) of a CCS7 message switch and buffer (MSB7) |
| NT6X46 | AB, AC,<br>BA, BB                                  | Signaling processor memory card   | 6STA, STA7                                                                                                                                                       |
| NT6X47 | AA, AB                                             | Master memory processor plus card | 6STA, STA7                                                                                                                                                       |

### Common procedures

This procedure refers to the following common procedures:

- *Loading a PM*
- *Replacing a card*
- *Replacing cards in equipment shelves*
- *Removing cards in equipment shelves*

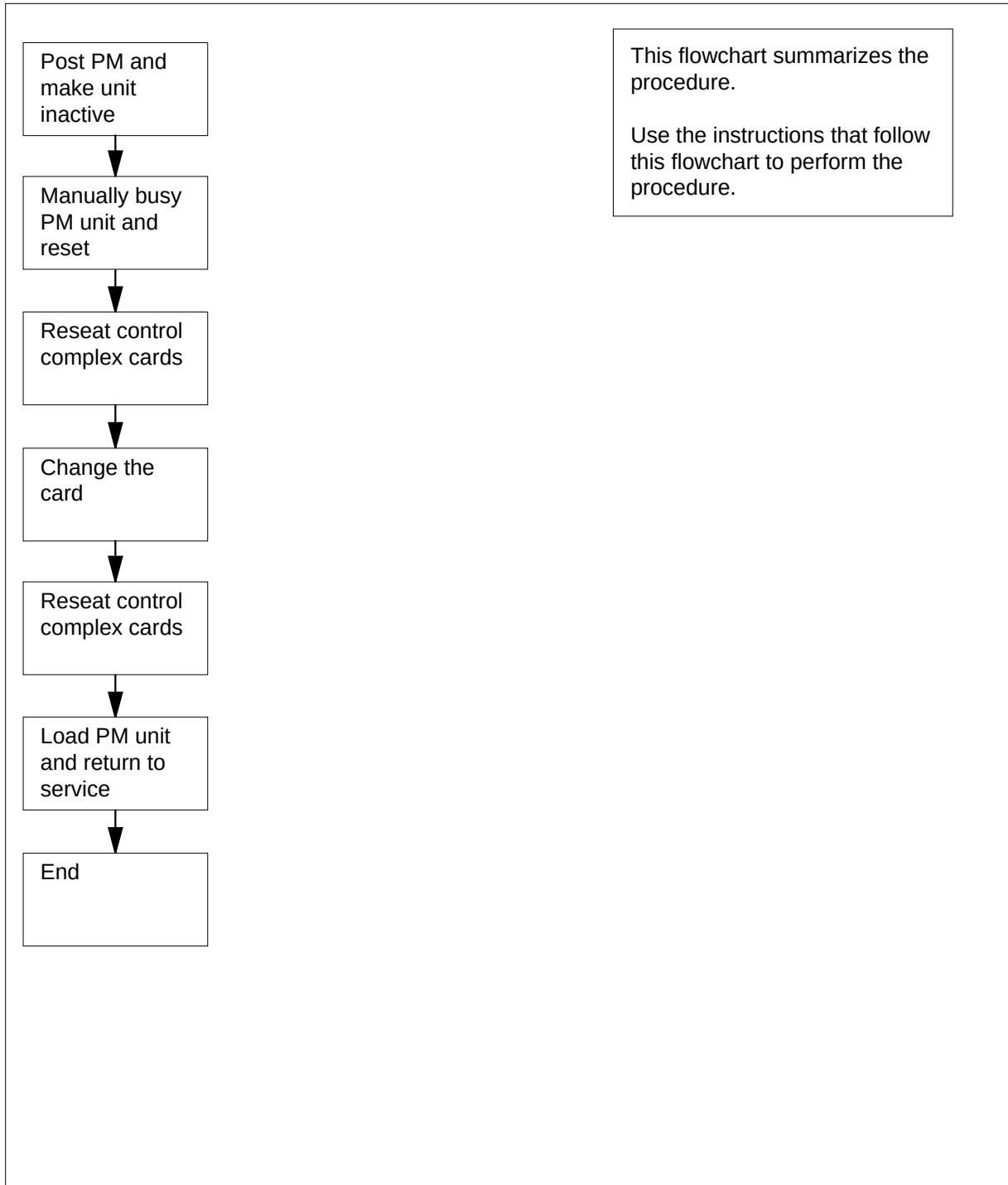
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## Processor and memory cards in an MSB (continued)

### Summary of replacing Processor and memory cards in an MSB



## Processor and memory cards in an MSB (continued)

---

### Replacing Processor and memory cards in an MSB

#### *At your current location*

1



#### **WARNING**

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

This procedure manually busies a minimum of one peripheral module (PM) units, which can degrade service. Perform this procedure only if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card you replace have the same PEC and PEC suffix.

#### *At the shelf*

2 Locate the card that you will replace. Record the number of the STA7 and the number of the PM unit that associate with the card.

**Note:** Before you remove the card from the shelf, switch activity to the other PM unit.

#### *At the MAP terminal*

3 To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | Cbsy | ISTb | InSv |
| PM | 0    | 0    | 2    | 0    | 13   | 24   |

4 To post the MSB7, type

**>POST pm\_type pm\_no**

and press the Enter key.

*where*

**pm\_type**

is the PM type (MSB6 or MSB7)

**pm\_no**

is the PM number (0 to 999)

*Example of a MAP display:*

## Processor and memory cards in an MSB (continued)

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
| PM   | SysB | ManB | OffL | Cbsy | ISTb | InSv |
|      | 0    | 0    | 2    | 0    | 13   | 24   |
| MSB7 | 0    | 0    | 0    | 0    | 0    | 3    |

```
MSB7 0 InSv Links_00S: CSide 0 , PSide 0
Unit0: Inact InSv
Unit1: Act InSv
```

- 5** Determine the state and activity of the PM unit that contains the card that you replace.

| If the state of the PM unit                | Do      |
|--------------------------------------------|---------|
| is ISTb, InSv, SysB, or Cbsy, and active   | step 6  |
| is ISTb, InSv, SysB, or Cbsy, and inactive | step 9  |
| is ManB                                    | step 11 |
| is OffL                                    | step 28 |

- 6** From the MAP display, determine the state of the mate PM unit.

| If the state of the mate PM unit | Do      |
|----------------------------------|---------|
| is ISTb or InSv                  | step 7  |
| is other than listed here        | step 30 |

- 7** To switch activity, type  
**>SWACT**  
and press the Enter key.

*Example of a MAP response:*

```
MSB7 0 A Warm SwAct will be performed after
data sync of active terminals.
Please confirm ("YES", "Y", "NO", or "N"):
```

| If                           | Do      |
|------------------------------|---------|
| you must confirm the command | step 8  |
| the system rejects the SWACT | step 29 |

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

## Processor and memory cards in an MSB (continued)

and press the Enter key.

*Example of a MAP response:*

```
Unit0: Inact SysB Mtce
Unit1: Act ISTb

MSB7 0 SwAct Passed
```

| If the MAP response                  | Do      |
|--------------------------------------|---------|
| is SWACT passed                      | step 9  |
| is a response other than listed here | step 29 |

- 9** A maintenance flag (Mtce) indicates that system-initiated maintenance tasks are in progress. Wait until the flag disappears from the status lines for both PM units before you proceed to the next step.

- 10** To manually busy the inactive unit, type

**>BSY INACTIVE**

and press the Enter key.

*Example of a MAP response:*

```
MSB7 0 ISTb Links_00S: CSide 0 , PSide 0
Unit0: Inact ManB
Unit1: Act InSv
bsy unit 0
MSB7 0 Unit 0 Bsy Passed
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 11 |
| failed             | step 30 |

- 11** To reset the PM unit, type

**>PMRESET UNIT unit\_no NORUN**

and press the Enter key.

where

**unit\_no**

is the PM unit number (0 or 1)

*Example of a MAP response:*

```
MSB7 0 Unit 0 PMReset Passed
```

## Processor and memory cards in an MSB (continued)

### At the shelf

12



#### WARNING

##### Static electricity damage

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

The next action depends on the processor configuration of the PM involved.

|    | If you                                                                                                                                                                       | Do                                                     |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
|    | replace an NT6X45 in an MSB6                                                                                                                                                 | step 13                                                |
|    | replace an NT6X46 in an MSB6                                                                                                                                                 | step 14                                                |
|    | replace an NT6X45 in an MSB7                                                                                                                                                 | step 15                                                |
|    | replace an NT6X46 in an MSB7                                                                                                                                                 | step 16                                                |
|    | replace an NT6X47 in either an MSB6 or an MSB7                                                                                                                               | step 17                                                |
| 13 | Unseat processor and memory cards in the MSB6 control complex. For each substep below, perform the procedure <i>Unseating cards in equipment shelves</i> in this document.   |                                                        |
|    | a                                                                                                                                                                            | Unseat the NT6X43 message interface card in slot 20.   |
|    | b                                                                                                                                                                            | Unseat the NT6X45 signaling processor card in slot 19. |
|    | c                                                                                                                                                                            | Unseat the NT6X45 master processor card from slot 15.  |
|    | Go to step 17.                                                                                                                                                               |                                                        |
| 14 | Unseat the NT6X67 signaling terminal buffer card in slot 14 of the MSB6 control complex. Perform the procedure <i>Unseating cards in equipment shelves</i> in this document. |                                                        |
|    | Go to step 17.                                                                                                                                                               |                                                        |
| 15 | Unseat processor and memory cards in the MSB7 control complex. For each substep below, perform the procedure <i>Unseating cards in equipment shelves</i> in this document.   |                                                        |
|    | a                                                                                                                                                                            | Unseat the NT6X69 message protocol card in slot 20.    |
|    | b                                                                                                                                                                            | Unseat the NT6X45 signaling processor card in slot 16. |
|    | c                                                                                                                                                                            | Unseat the NT6X45 master processor card from slot 11.  |
|    | Go to step 17.                                                                                                                                                               |                                                        |



## Processor and memory cards in an MSB (continued)

- 16** Unseat the NT6X67 signaling terminal buffer card in slot 10 of the MSB7 control complex. Perform the procedure *Unseating cards in equipment shelves* in this document.
- 17** To replace the card, perform the procedure *Replacing a card* in this document. Complete the procedure and return to this point.
- Note 1:** If the card that you replace was unseated in a previous step, leave the replacement card unseated in the shelf.
- Note 2:** If the card that you replace has switches, make sure that the replacement card and the card you replace have the same settings.
- 18** The next action depends on the processor configuration of the PM .
- | If                                               | Do      |
|--------------------------------------------------|---------|
| an NT6X45 in an MSB6 is in use                   | step 19 |
| an NT6X46 in an MSB6 is in use                   | step 20 |
| an NT6X45 in an MSB7 is in use                   | step 21 |
| an NT6X46 in an MSB7 is in use                   | step 22 |
| an NT6X47 in either an MSB6 or an MSB7 is in use | step 23 |
- 19** Reseat processor and memory cards in the MSB6 control complex. For each substep below, perform the procedure *Reseating cards in equipment shelves* in this document.
- a** Reseat the NT6X45 master processor card in slot 15.
  - b** Reseat the NT6X45 signaling processor card in slot 19.
  - c** Reseat the NT6X43 message interface card in slot 20.
- Go to step 23.
- 20** Reseat the NT6X67 signaling terminal buffer card in slot 14 of the MSB6 control complex. Perform the procedure *Reseating cards in equipment shelves* in this document.
- Go to step 23.
- 21** Reseat processor and memory cards in the MSB7 control complex. For each substep below, perform the procedure *Reseating cards in equipment shelves* in this document.
- a** Reseat the NT6X45 master processor card in slot 11.
  - b** Reseat the NT6X45 signaling processor card in slot 16.
  - c** Reseat the NT6X69 message protocol card in slot 20.
- Go to step 23.
- 22** Reseat the NT6X67 signaling terminal buffer card in slot 10 of the MSB7 control complex. Perform the procedure *Reseating cards in equipment shelves* in this document.

## Processor and memory cards in an MSB (end)

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

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 24 |
| did not direct you to this procedure | step 25 |

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

### At the MAP terminal

- 25 To load the inactive unit, type  
**>LOADPM INACTIVE**  
and press the Enter key.

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 27 |
| failed                | step 26 |

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

- 27 To return the inactive unit to service, type  
**>RTS INACTIVE**  
and press the Enter key.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 31 |
| failed             | step 30 |

- 28 Contact operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.

- 29 For additional help with switch of activity, contact the next level of support.  
**Note:** If the system recommends that you use the SWACT command with the FORCE option, contact operating company personnel to determine if you must use the FORCE option.

- 30 For additional help, contact the next level of support.  
31 The procedure is complete.

## Signaling terminal cards in an MSB

---

### Application

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

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

| PEC    | Suffix     | Card name                                          | Shelf or frame name                              |
|--------|------------|----------------------------------------------------|--------------------------------------------------|
| NT6X65 | AA         | Common channel interoffice signaling terminal card | CCS6 signaling terminal controller module (STCM) |
| NT6X66 | AA, AB, AC | CCS7 signaling terminal card                       | CCS7 signaling terminal group (ST7G)             |

### Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Loading a PM*

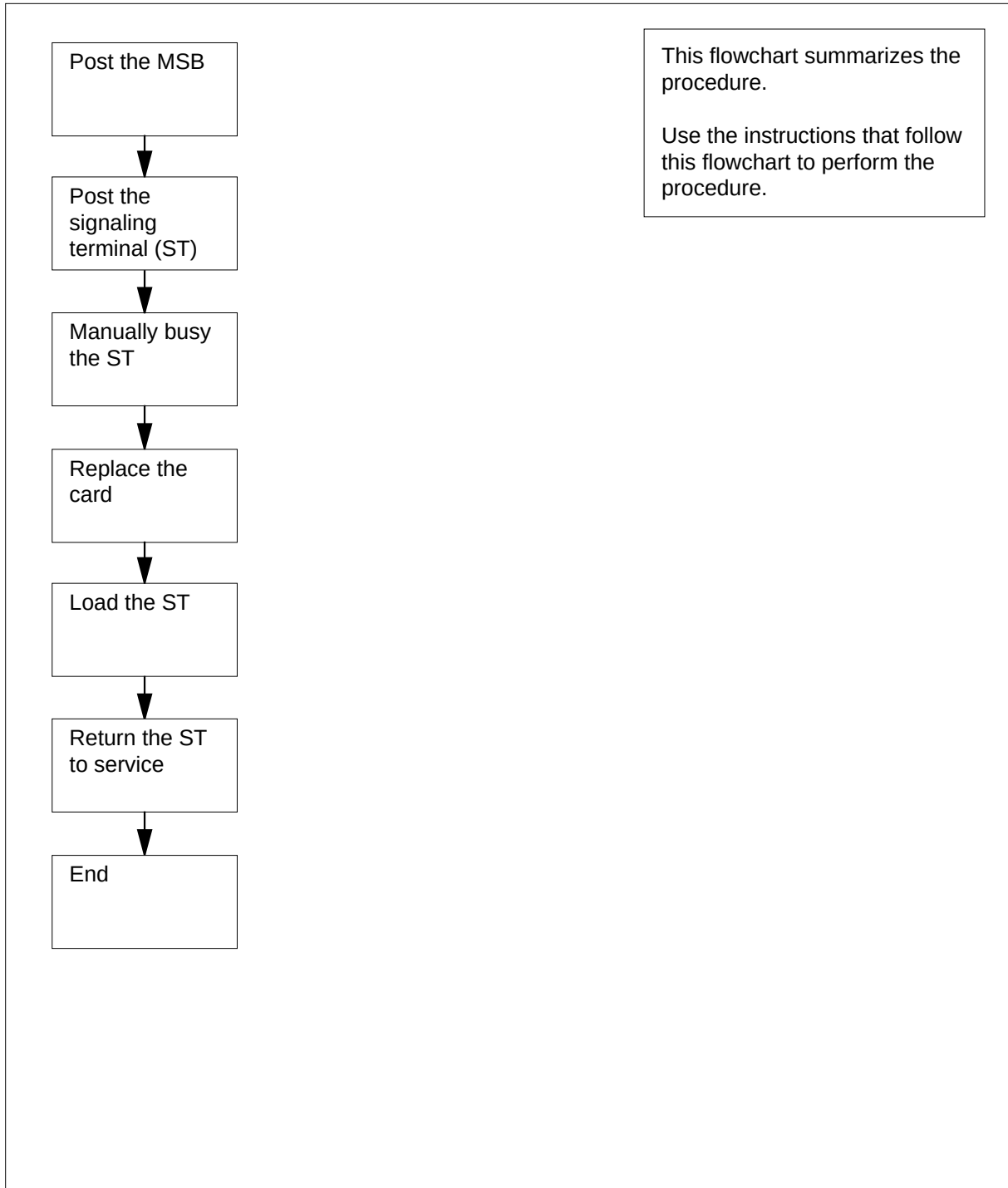
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## Signaling terminal cards in an MSB (continued)

### Summary of Replacing Signaling terminal cards in an MSB



## Signaling terminal cards in an MSB (continued)

---

### Replacing Signaling terminal cards in an MSB

#### *At your current location*

1



#### **WARNING**

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

This procedure manually busies one or more signaling terminals (ST), which can degrade service. Perform this procedure only if you need to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card and the card you replace have the same PEC and PEC suffix.

#### *At the shelf*

- 2 Locate the card you replace. Record the number of the signaling-terminal controller module (STCM) for the MSB6 or the signaling terminal group (STG) for the MSB7 that associates with the card.

#### *At the MAP terminal*

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

**>MAPCI ; MTC ; PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
| PM | SysB | ManB | OffL | Cbsy | ISTb | InSv |
|    | 12   | 0    | 2    | 0    | 13   | 24   |

- 4 To post the PM associated with the card you replace, type

**>POST pm\_type pm\_no**

and press the Enter key.

*where*

**pm\_type**

is the PM type (MSB6, MSB7)

**pm\_no**

is the PM identification number (0 to 999)

*Example of a MAP display:*

## Signaling terminal cards in an MSB (continued)

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
| PM   | SysB | ManB | OffL | Cbsy | ISTb | InSv |
| MSB7 | 12   | 0    | 2    | 0    | 13   | 24   |
|      | 0    | 0    | 0    | 0    | 0    | 3    |

```
MSB7 0 InSv Links_00S: CSide 0 , PSide 0
Unit0: Inact InSv
Unit1: Act InSv
```

**5** To access the STC level of the MAP display, type

**>STC**

and press the Enter key.

*Example of a MAP display:*

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
| PM   | SysB | ManB | OffL | Cbsy | ISTb | InSv |
| MSB7 | 12   | 0    | 2    | 0    | 13   | 24   |
|      | 0    | 0    | 0    | 0    | 1    | 2    |

```
MSB7 0 ISTb Links_00S: CSide 0 , PSide 0
Unit0: Inact ManB
Unit1: Act InSv
```

|     |   |   |   |   |   |    |
|-----|---|---|---|---|---|----|
| STC | 4 | 0 | 0 | 0 | 0 | 20 |
|-----|---|---|---|---|---|----|

**6** To post the STCM or ST7G you recorded in step 2, type

**>POST stcm\_no**

and press the Enter key.

*where*

**stcm\_no**

is the STCM number (0 to 9)

*Example of a MAP display:*

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
| PM   | SysB | ManB | OffL | Cbsy | ISTb | InSv |
| MSB7 | 12   | 0    | 2    | 0    | 13   | 24   |
|      | 0    | 0    | 0    | 0    | 1    | 2    |

```
MSB7 1 ISTb Links_00S: CSide 0 , PSide 0
Unit0: Inact ManB
Unit1: Act InSv
```

|     |   |   |   |   |   |    |
|-----|---|---|---|---|---|----|
| STC | 4 | 0 | 0 | 0 | 0 | 20 |
|-----|---|---|---|---|---|----|

|     |     |      |   |      |   |    |      |      |      |
|-----|-----|------|---|------|---|----|------|------|------|
| STC | 301 | STCM | 0 | Ctrl | 0 | Bd | InSv | Diag | Mtce |
|-----|-----|------|---|------|---|----|------|------|------|

**7** To display location information for the displayed ST, type

**>QUERYPM**

and press the Enter key.

*Example of a MAP response:*

---

## Signaling terminal cards in an MSB (continued)

---

```
Site Flr RPos Bay_id Shf Description Slot EqPEC
HOST 01 D00 MS7E 00 51 MSB7 : 000 19 6X66
STC type : C7, STINV Loadname : M7CQA01, Intl Index : 5
PM State : InSv, Node Status : {OK, FALSE}
```

---

| If the display | Do |
|----------------|----|
|----------------|----|

---

|                                                    |        |
|----------------------------------------------------|--------|
| lists the location for the card you want to change | step 9 |
|----------------------------------------------------|--------|

|                                     |        |
|-------------------------------------|--------|
| lists the location for another card | step 8 |
|-------------------------------------|--------|

---

**8** To display the next ST in the posted set, type

**>NEXT**

and press the Enter key.

Go to step 7.

**9** Record the ST number.

**10** To manually busy the ST, type

**>BSY**

and press the Enter key.

*Example of a MAP response:*

```
STC 301
This will busy the above STC(S)
Please confirm ("YES", "Y", "NO", or "N"):
```

**11** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

```
STC 301 Bsy Passed
```

## Signaling terminal cards in an MSB (continued)

### At the shelf

12



#### WARNING

##### Static electricity damage

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

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

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

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

| If a maintenance procedure           | Do      |
|--------------------------------------|---------|
| directed you to this procedure       | step 14 |
| did not direct you to this procedure | step 15 |

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

### At the MAP terminal

15 To load the ST, type  
**>LOADPM**  
and press the Enter key.

where

**unit\_no**

is the PM unit number (0 or 1)

*Example #1 of a MAP response:*

STC 301 load Passed : M7CQA01

*Example #2 of a MAP response:*



## Signaling terminal cards in an MSB (continued)

STC load 'M7CQA01' not in MSB7 0

| If the LOADPM command                                          | Do      |
|----------------------------------------------------------------|---------|
| passed                                                         | step 21 |
| failed, with the message STC Load <loadname> not in <msb_unit> | step 16 |
| failed, with a message other than listed here                  | step 18 |

**Note:** In *Example #2 of a MAP response*, loadname is the name of the ST load. The msb\_unit is the MSB (MSB6, MSB7) and the unit number.

- 16** To return to the PM level of the MAP display, type

**>QUIT**

and press the Enter key.

- 17** To add the load to the MSB, type

**>STCLOAD PM ADD loadname**

and press the Enter key.

where

**loadname**  
is the STC load name

| If the STCLOAD command | Do      |
|------------------------|---------|
| failed                 | step 18 |
| passed                 | step 19 |

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

- 19** To access the STC level of the MAP display, type

**>STC**

and press the Enter key.

- 20** To post the STCM or ST7G, type

**>POST stcm\_no**

and press the Enter key.

where

**stcm\_no**  
is the STCM number (0 to 9)

## Signaling terminal cards in an MSB (end)

- Go to step 15.
- 21** To return the ST to service, type  
**>RTS**  
and press the Enter key.

*Example of a MAP response:*

```
STC 301 Out-of-service test initiated
STC 301 Tst Passed
STC 301 Rts Passed
```

| If the RTS command | Do      |
|--------------------|---------|
| failed             | step 23 |
| passed             | step 24 |

- 22** Consult operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.
- 23** For additional help, contact the next level of support.
- 24** The procedure is complete.



---

## 9 SuperNode network card replacement procedures

---

### Introduction

This chapter contains card replacement procedures for the SuperNode junctored network (JNET) and enhanced network (ENET). The first section in the chapter provides illustrations that show network shelf layouts.

Card replacement procedures for the SuperNode SE ENET are in the chapter titled “SuperNode SE ENET card replacement procedures”.

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

Each procedure contains the following sections:

- Application
- Common procedures
- Action

### Application

This section identifies the network card(s) that the replacement procedure covers.

### Common procedures

This section lists the common procedures to use during the ENET card replacement procedure. A common procedure is a series of steps that repeats within maintenance procedures, such as the steps to remove and replace a card. Common procedures are in the common procedures chapter in this NTP.

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

**Action**

This section provides a summary flowchart of the procedure. A detailed step-action procedure follows the flowchart.

**Recording card replacement activities**

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

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

## Network shelf layouts

---

### Application

Frame layouts are provided for the following:

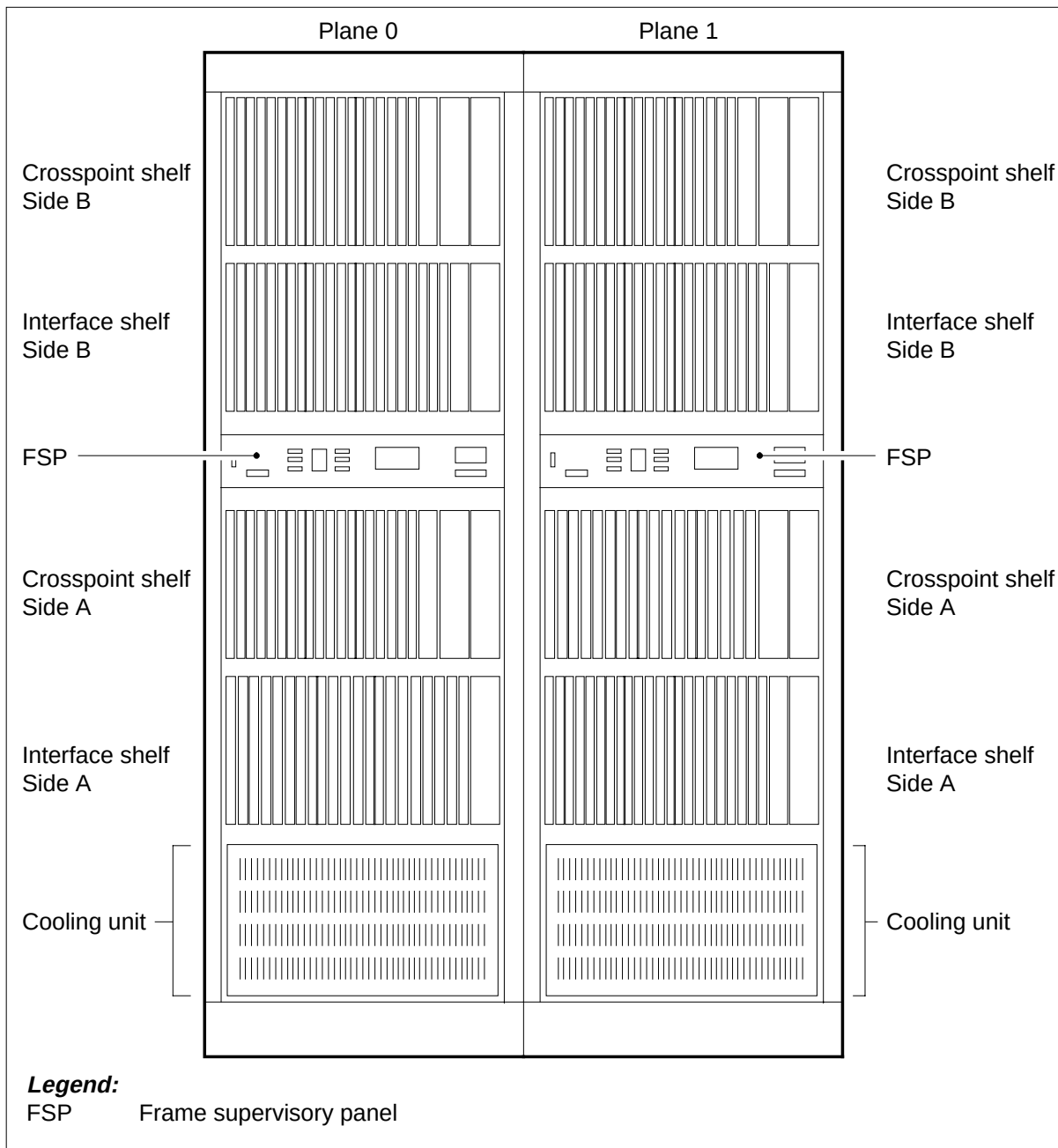
- NT0X48 (single-bay network-NET)
- NT5X13 (combined single-bay network-NETC)
- NT8X11 (dual-shelf network-DSN)
- SuperNode enhanced network (ENET) for 64k
- SuperNode ENET for 128k

Shelf layouts are provided for the following shelves:

- NET interface shelf
- NET crosspoint shelf
- NETC interface shelf
- NETC crosspoint shelf
- DSN shelf
- enhanced network shelf

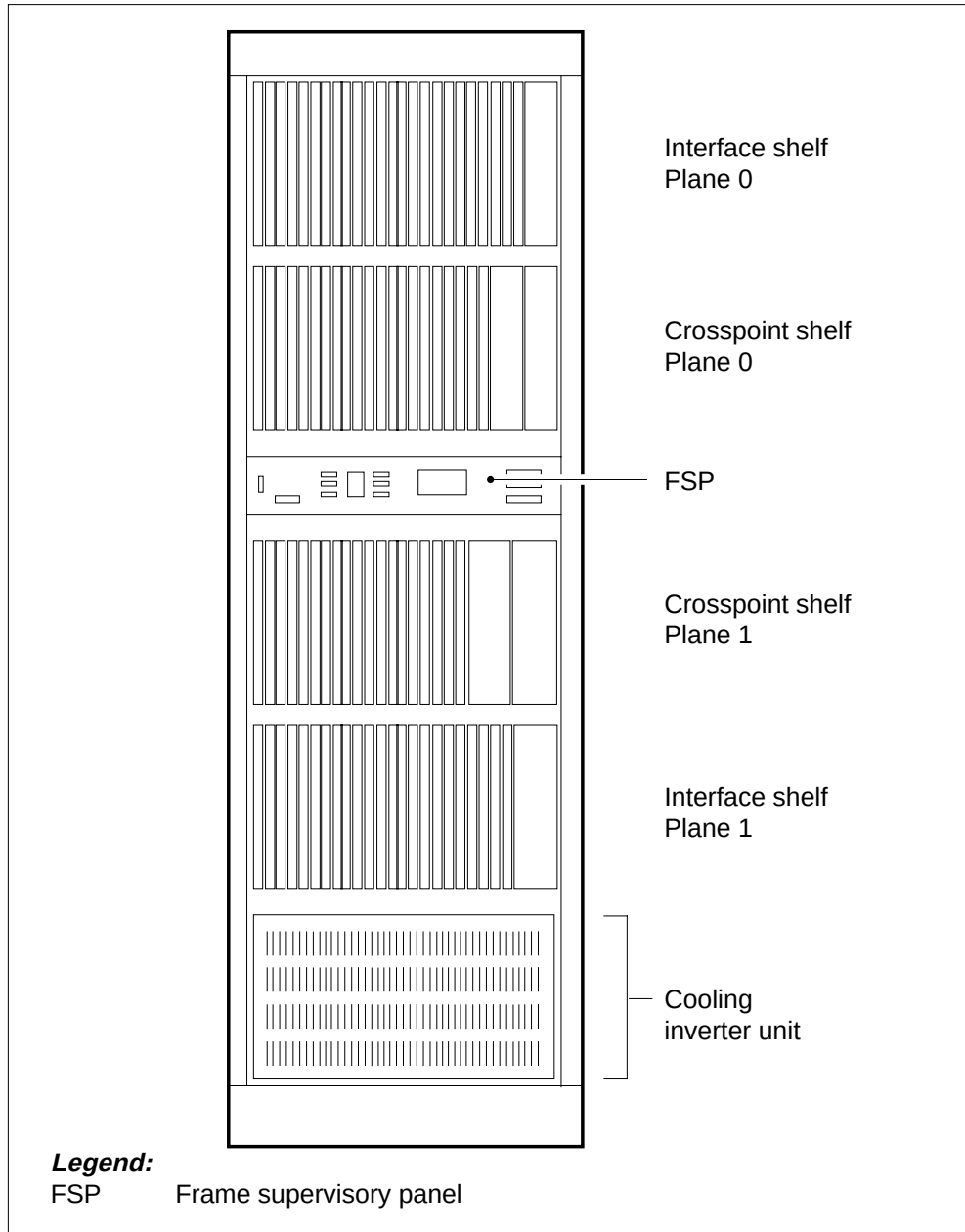
## Network shelf layouts (continued)

Figure NT0X48AG single-bay network (NET) equipment frame, in dual-bay configuration



## Network shelf layouts (continued)

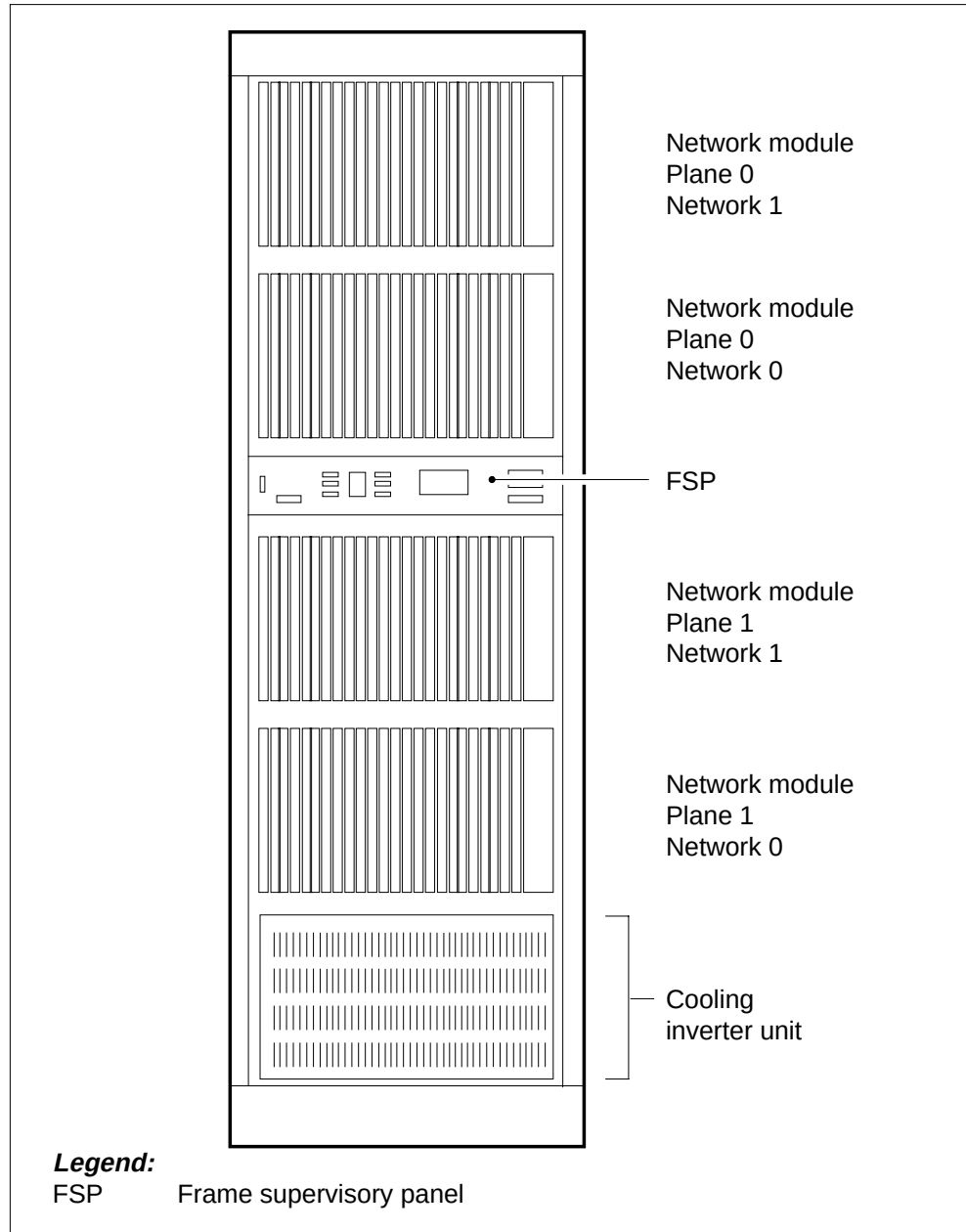
**Figure NT5X13 combined single-bay network (NETC) equipment frame**





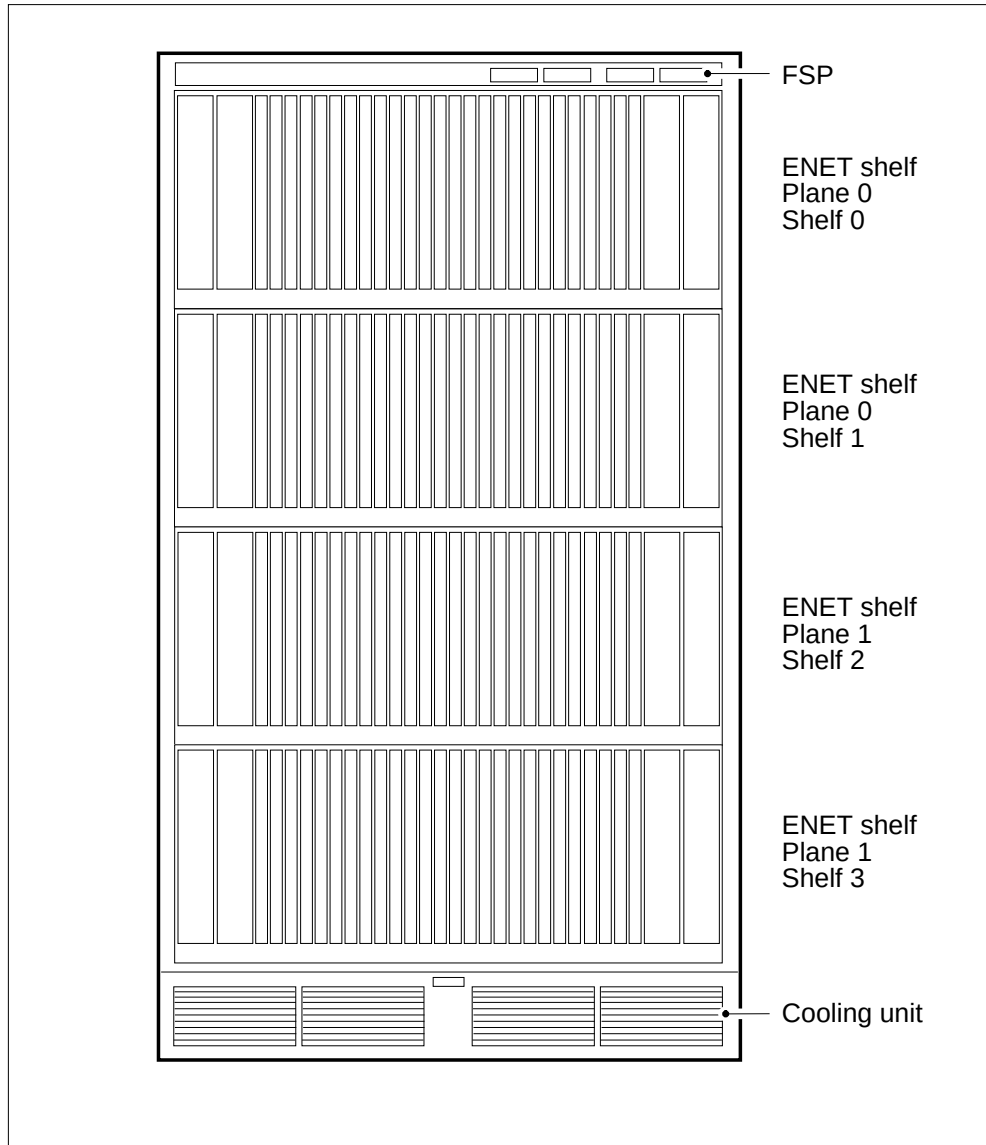
## Network shelf layouts (continued)

Figure NT8X11 dual-shelf network (DSN) equipment frame



## Network shelf layouts (continued)

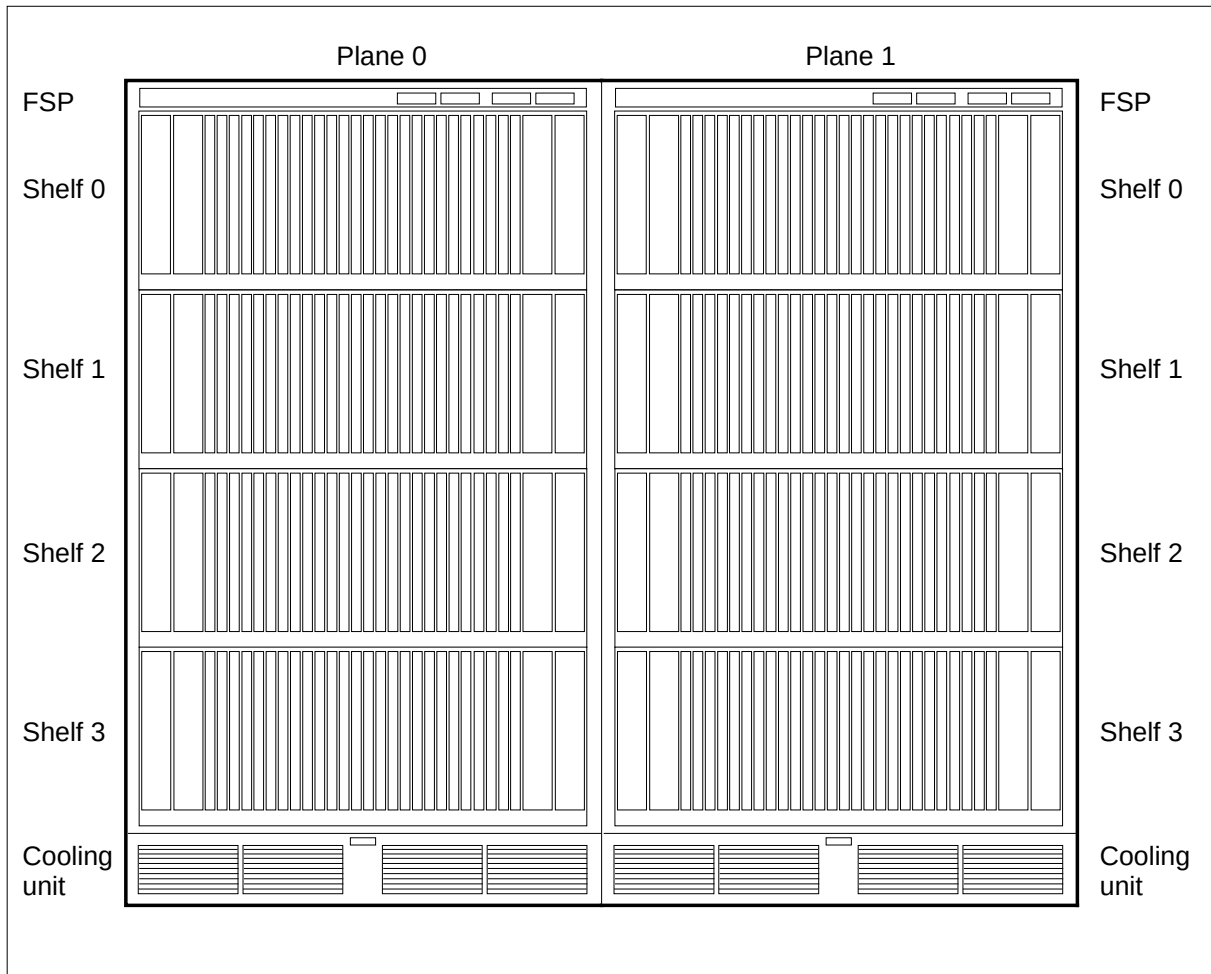
Figure SuperNode 64k ENET cabinet



## Network shelf layouts (continued)

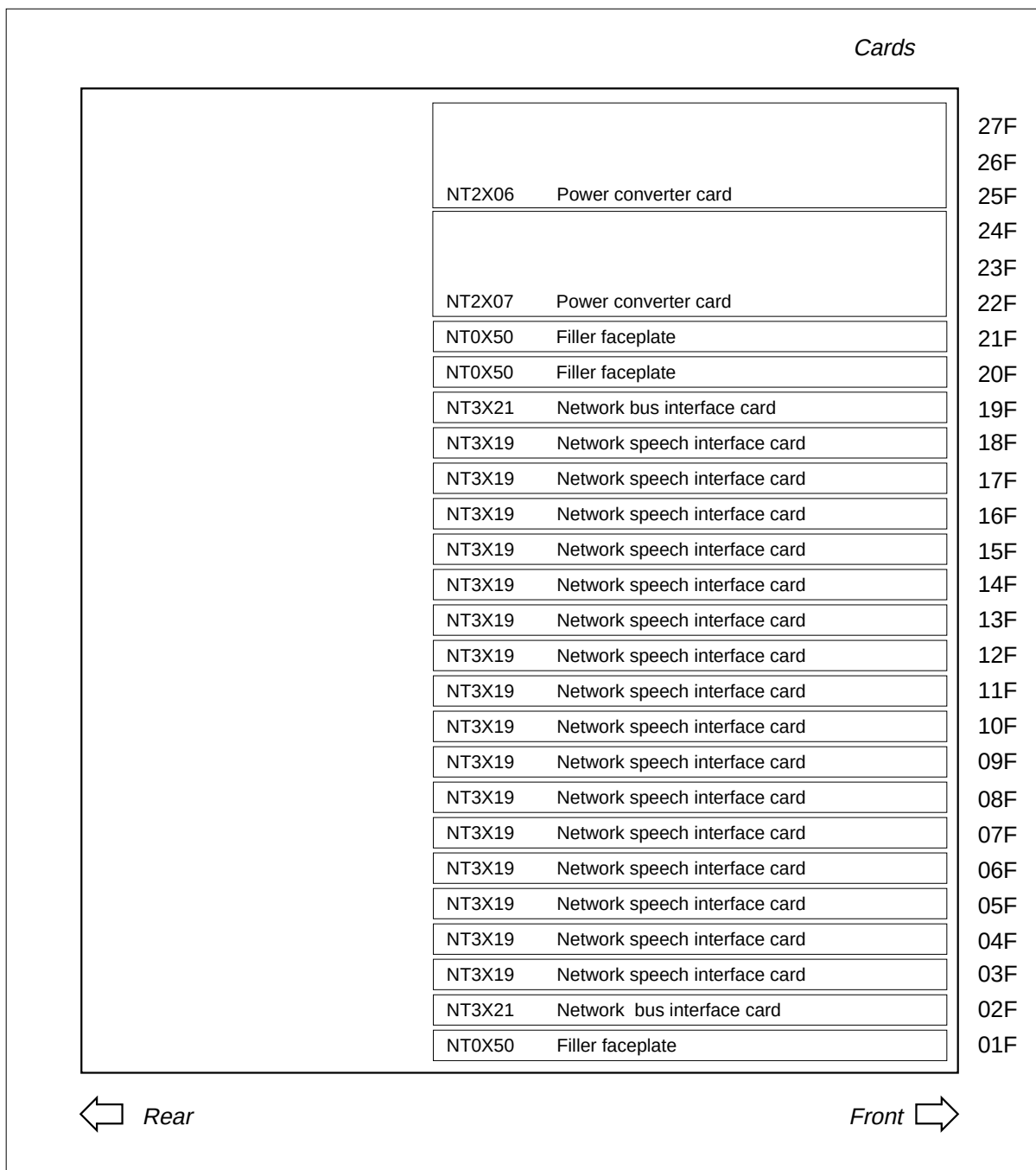
---

**Figure SuperNode 128k ENET cabinet**



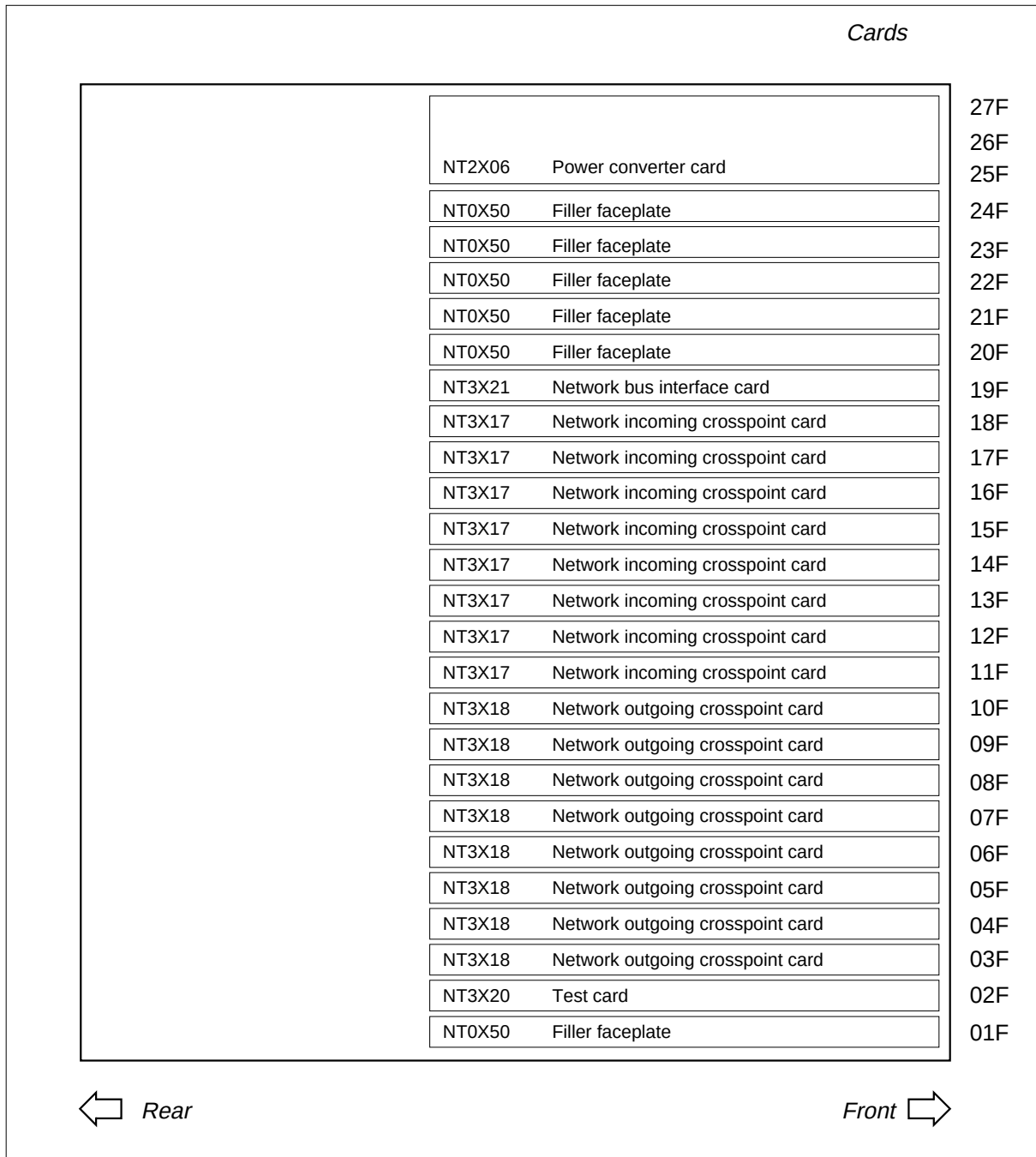
## Network shelf layouts (continued)

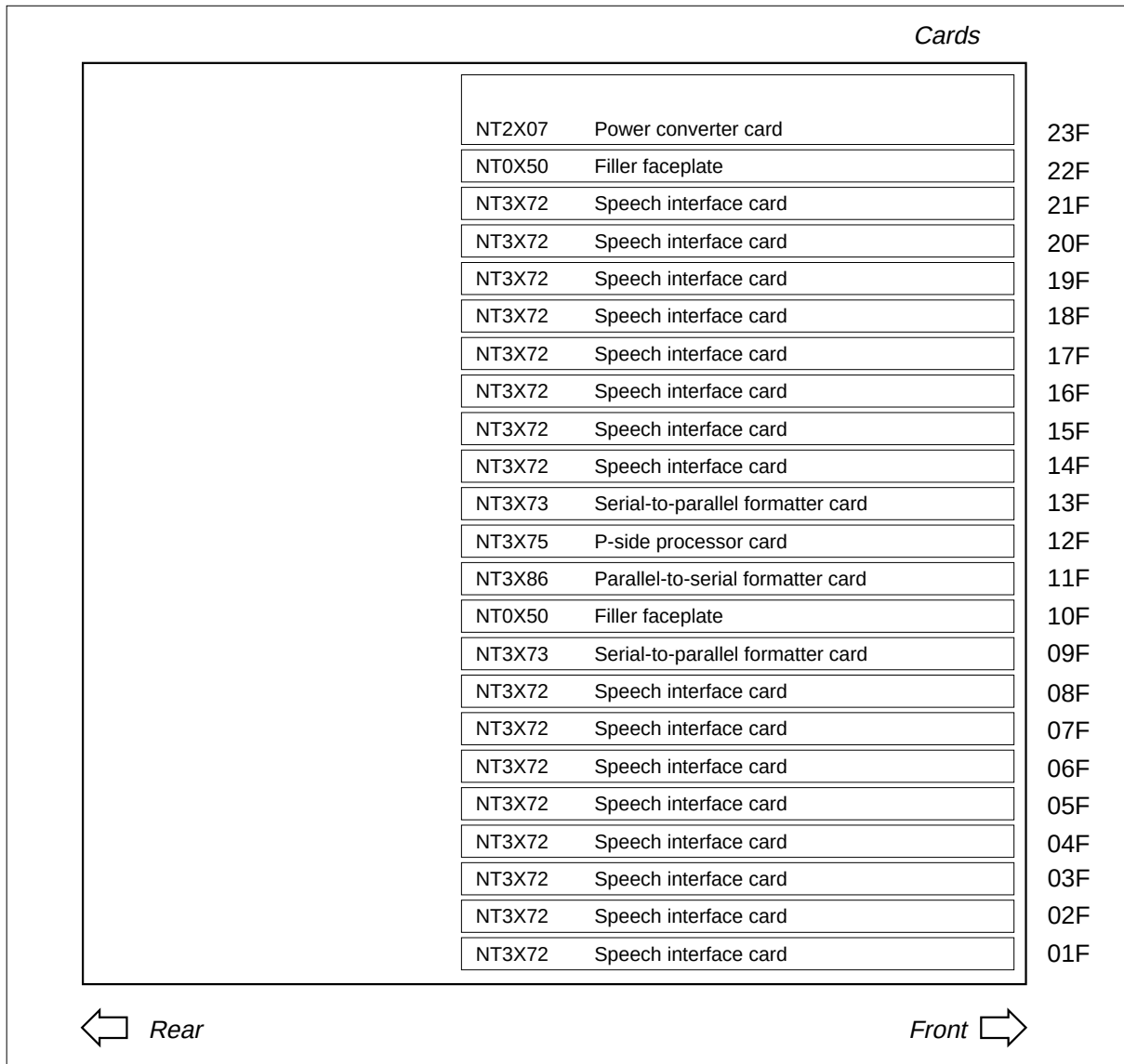
**Figure NET interface shelf**



## Network shelf layouts (continued)

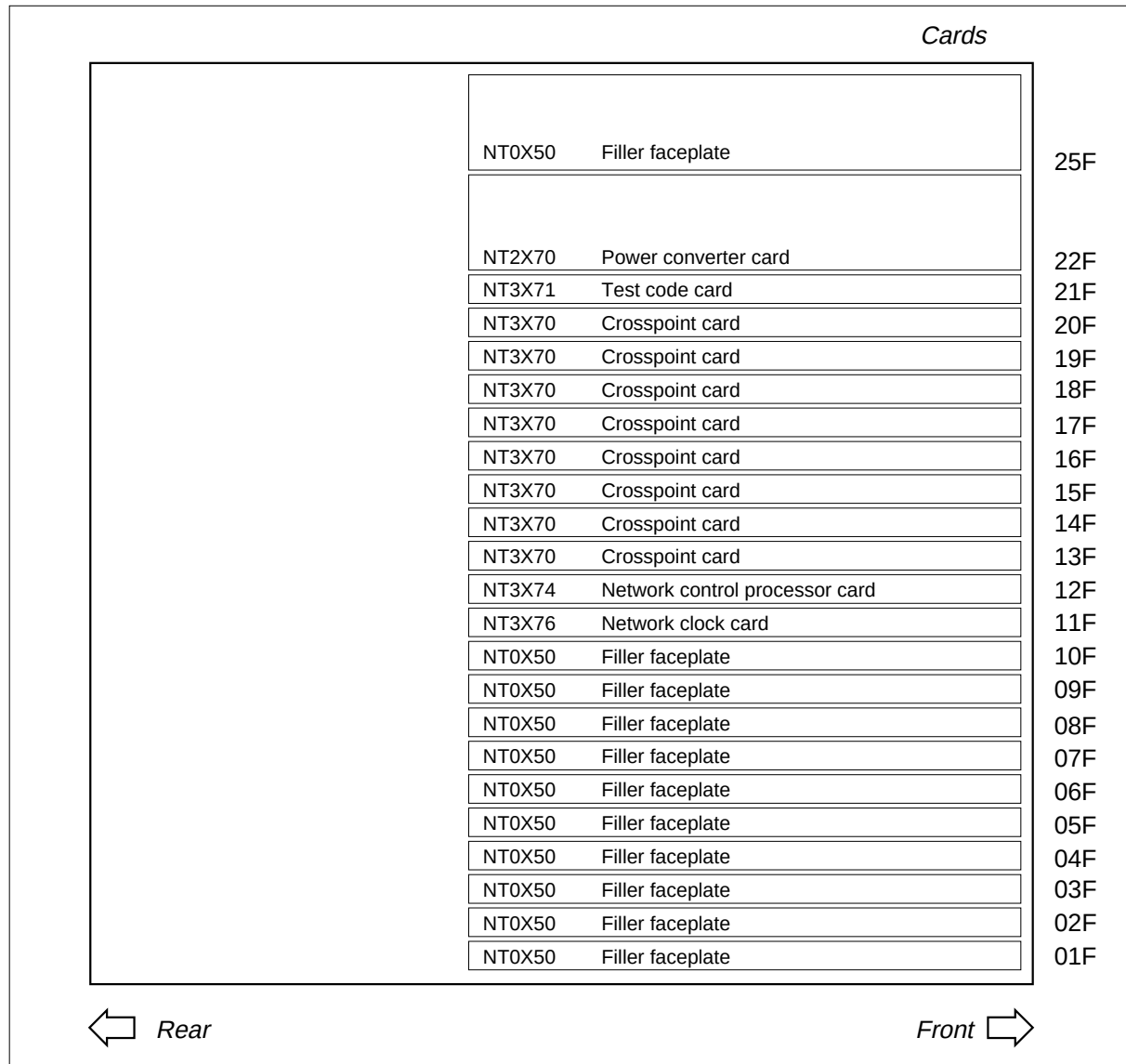
Figure NET crosspoint shelf

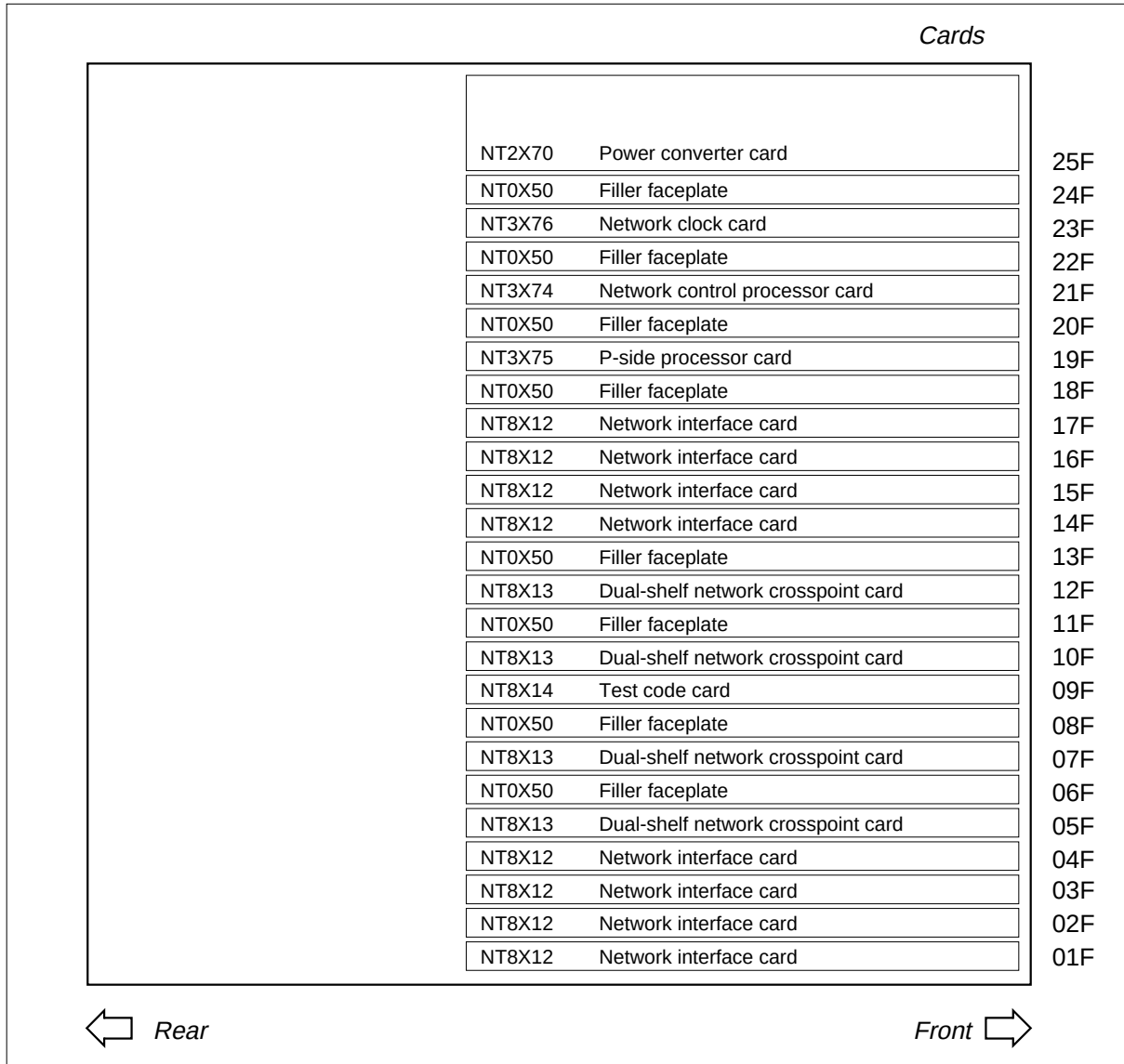


**Network shelf layouts** (continued)**Figure NETC interface shelf**

## Network shelf layouts (continued)

Figure NETC crosspoint shelf

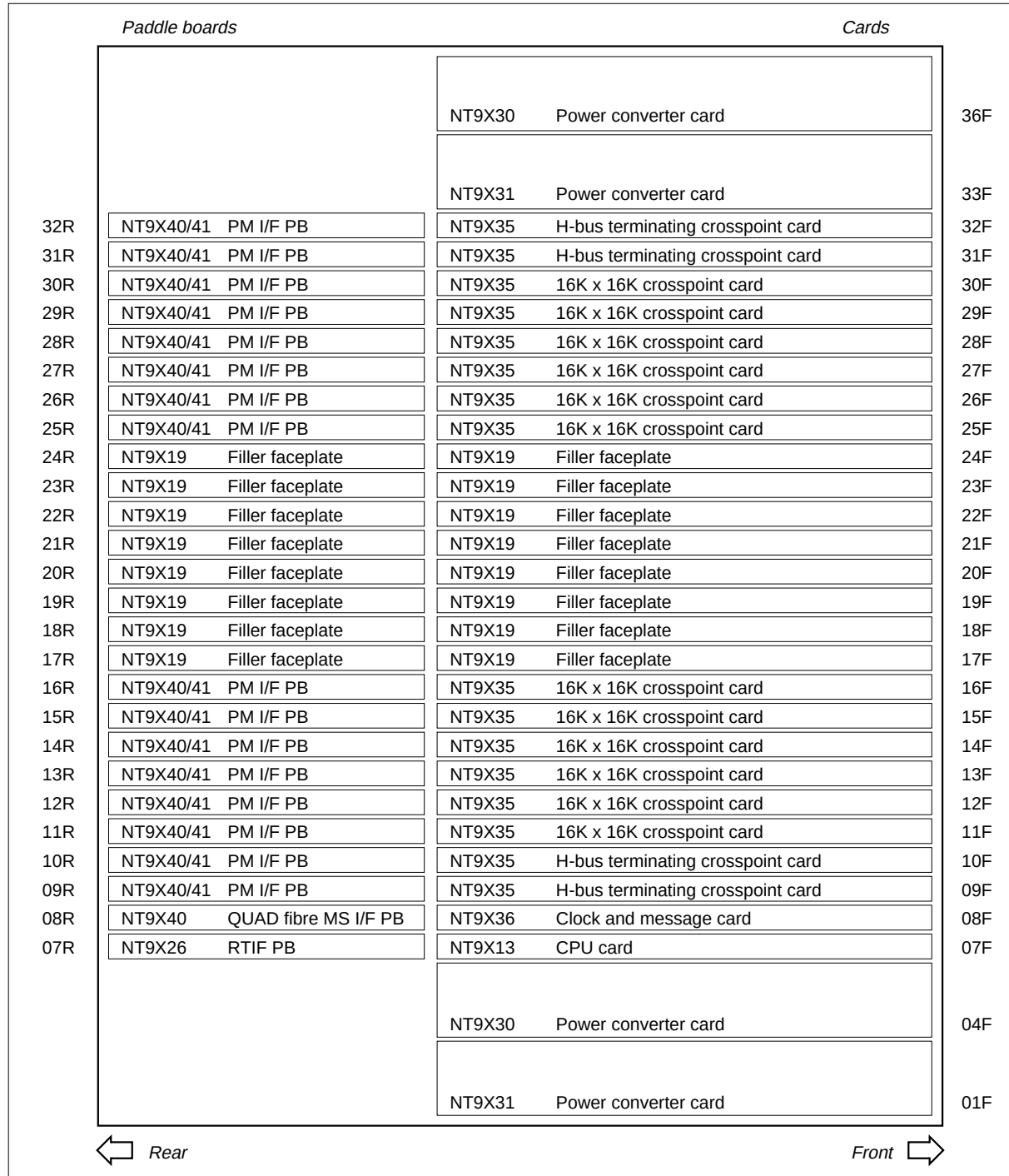


**Network shelf layouts (continued)****Figure DSN shelf**



## Network shelf layouts (end)

**Figure Enhanced network shelf**



## Crosspoint and interface cards in a 64k or 128k ENET

### Application

Use this procedure to replace the following cards in a 64k or 128k enhanced network (ENET) shelf.

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

| PEC    | Suffix | Card name                                                                    | Shelf or frame name                             |
|--------|--------|------------------------------------------------------------------------------|-------------------------------------------------|
| NT9X35 | BA, CA | 128K ENET crosspoint card                                                    | 64k ENET, 128k ENET                             |
| NT9X40 | BA     | ENET quad fiber interface paddle board (primarily for North America)         | 64k ENET, 128k ENET slots 10 to 16 and 25 to 32 |
| NT9X40 | BB     | ENET quad fiber interface paddle board (for International and North America) | 64k ENET, 128k ENET slots 10 to 16 and 25 to 32 |
| NT9X40 | DA     | ENET quad fiber interface paddle board                                       | 64k ENET, 128k ENET slots 10 to 16 and 25 to 32 |
| NT9X41 | BA     | International 16-port DS-30 paddle board                                     | 64k ENET, 128k ENET                             |
| NT9X45 | BA     | Three DS-512 link and 16 DS-30 port paddle board                             | 64k ENET, 128k ENET                             |

**Note:** To replace an NT9X40 in slot 8, use the procedure *System cards in a 64k or 128k ENET* in this chapter.

### Common procedures

The following common procedures are referenced:

- *Replacing a card*
- *Verifying load compatibility of SuperNode cards*
- *Cleaning fiber optic components and assemblies*

## **Crosspoint and interface cards in a 64k or 128k ENET (continued)**

---

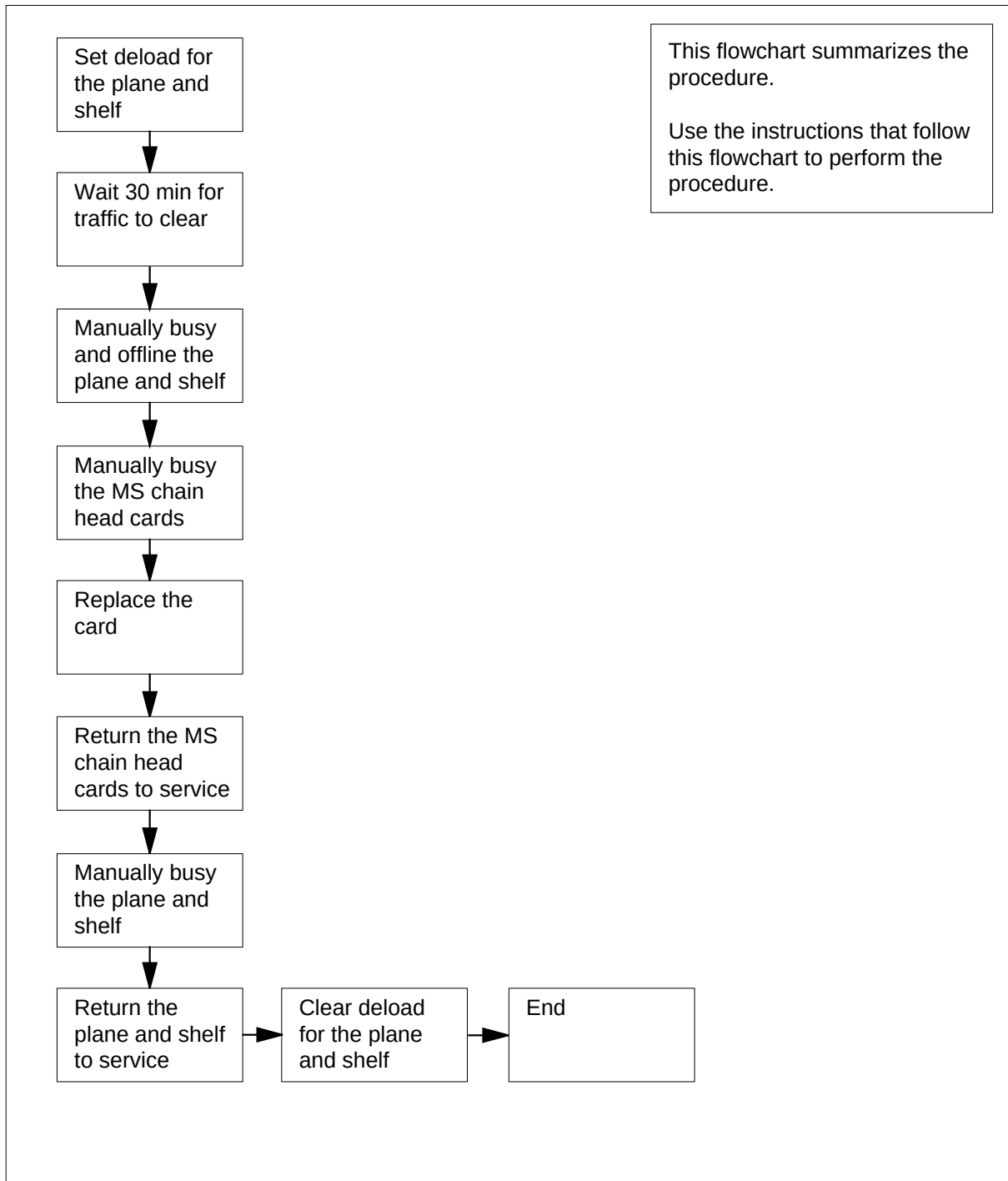
Do not go to the common procedure unless the step-action procedure directs you to go.

### **Action**

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

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

### Summary of Replacing Crosspoint and interface cards in a 64k or 128k ENET



---

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

---

### Replacing Crosspoint and interface cards in a 64k or 128k ENET



#### CAUTION

##### Calls can drop

This procedure removes an ENET shelf from service, and potentially drops calls in progress. Perform this procedure to return crosspoint and interface cards to service. Perform this procedure only if necessary and during periods of low traffic.

#### At the MAP terminal

- 1 Obtain a replacement card. Make sure that the replacement card has the same PEC, including suffix, as the card being removed.

**Note:** For North American switches, NT9X40BA and NT9X40BB are interchangeable and can both be present. For international switches, only NT9X40BB can be present.

- 2 Make sure the replacement card is compatible with the software load. Use the procedure *Verifying load compatibility of SuperNode cards* in this document. Complete the procedure and return to this point.
- 3 To access the NET;SYSTEM level of the MAP display, type

**>MAPCI;MTC;NET;SYSTEM**

and press the Enter key.

*Example of a MAP display:*

```
SYSTEM
Shelf Plane 0 Plane 1
00 | CLink 1 closed .
01 . .
02 . .
03 . .
```

- 4 Check the status of the node for the card that you replace. The Plane headers on the SYSTEM level MAP display indicate the status. The example in step 3 shows that the node defined by shelf 00 plane 1 is in-service trouble. In this example, all other nodes are in service.

| If that state of the node is | Do      |
|------------------------------|---------|
| T (TEST)                     | step 5  |
| M (MANBUSY)                  | step 14 |
| O (OFFLINE)                  | step 15 |

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

|   | If that state of the node is                                                                                                                                                                                                                                                                                                                                  | Do     |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|   | anything else                                                                                                                                                                                                                                                                                                                                                 | step 6 |
| 5 | Wait 1 min for the system to complete the test.<br>Go to step 4 to evaluate the state of the node again.                                                                                                                                                                                                                                                      |        |
| 6 | To determine if there are deloaded crosspoint cards in the other plane for the shelf in use, type<br><b>&gt;DELOAD plane_no shelf_no QUERY</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1) of the mate node<br><b>shelf_no</b><br>is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET) |        |

*Example of a MAP response:*

```
Request to QUERY DELOAD ENET Plane:0 Shelf:00 submitted.
Request to QUERY DELOAD ENET Plane:0 Shelf:00 passed.
 1111111 11122222 22222333
 90123456 78901234 56789012
Plane:0 Shelf:00 ..Y-----
```

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

|   | If the node                                                                                                                                                                                                                                                                                                      | Do      |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|   | has deloaded cards                                                                                                                                                                                                                                                                                               | step 56 |
|   | does not have deloaded cards                                                                                                                                                                                                                                                                                     | step 7  |
| 7 | To determine if there are deloaded crosspoint cards in the node, type<br><b>&gt;DELOAD plane_no shelf_no QUERY</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1)<br><b>shelf_no</b><br>is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET) |         |
|   | If the node                                                                                                                                                                                                                                                                                                      | Do      |
|   | has deloaded cards                                                                                                                                                                                                                                                                                               | step 8  |

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

|    | If the node                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Do      |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | does not have deloaded cards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | step 9  |
| 8  | Record the plane number, shelf number, and slot number for any deloaded crosspoint cards in the node. Complete this procedure and refer to this list to make sure that these cards return to the deloaded state.                                                                                                                                                                                                                                                                                                                                                     |         |
| 9  | Set all crosspoint cards to a deloaded state for the node that associates with the card that you replaced. To set all crosspoint cards to a deloaded status, type<br><b>&gt;DELOAD plane_no shelf_no SET</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1)<br><b>shelf_no</b><br>is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)<br><i>Example of a MAP response:</i><br><br>Request to SET DELOAD ENET Plane:0 Shelf:00 submitted.<br>Request to SET DELOAD ENET Plane:0 Shelf:00 passed. |         |
| 10 | Wait 30 min to permit network traffic on the node to clear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |
| 11 | To manually busy the node, type<br><b>&gt;BSY plane_no shelf_no</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1)<br><b>shelf_no</b><br>is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)                                                                                                                                                                                                                                                                                                    |         |
|    | If the response is                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Do      |
|    | WARNING: This action will abort ENET dump.Please confirm ("YES", "Y", "NO, or "N"):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | step 12 |
|    | Note: The above Warning message is generated when a BSY request and ENET imaging take place at the same time. As card replacement procedures are usually performed during scheduled maintenance periods this conflict may never occur.                                                                                                                                                                                                                                                                                                                               |         |

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

|    | If the response is                                                                                                                                                                                                                                                                                                                                                                                          | Do        |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|    | Request to MAN BUSY ENET Plane:0 Shelf:00 Slot:25 submitted. Request to MAN BUSY ENET Plane:0 Shelf:00 Slot:25 passed.                                                                                                                                                                                                                                                                                      | step 14   |
| 12 | To confirm the command, type<br><b>&gt;YES</b><br>and press the Enter key.                                                                                                                                                                                                                                                                                                                                  |           |
|    | <b>If Responding to the message</b>                                                                                                                                                                                                                                                                                                                                                                         | <b>Do</b> |
|    | with YES, abort dump and continue with busy                                                                                                                                                                                                                                                                                                                                                                 | step 13   |
|    | with NO, abort busy, continue with dump                                                                                                                                                                                                                                                                                                                                                                     | step 57   |
| 13 | To abort ENET dump and continue with BSY, type<br><b>&gt;YES</b><br>and press the Enter key.                                                                                                                                                                                                                                                                                                                |           |
| 14 | To offline the node, type<br><b>&gt;OFFL plane_no shelf_no</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1)<br><b>shelf_no</b><br>is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128k ENET)<br><i>Example of a MAP response:</i><br><br>Request to OFFL ENET Plane:0 Shelf:00 submitted.<br>Request to OFFL ENET Plane:0 Shelf:00 passed. |           |
|    | <b>If the OFFL command</b>                                                                                                                                                                                                                                                                                                                                                                                  | <b>Do</b> |
|    | passed                                                                                                                                                                                                                                                                                                                                                                                                      | step 15   |
|    | failed                                                                                                                                                                                                                                                                                                                                                                                                      | step 58   |
| 15 | To locate the chain head card of the message switch (MS) that associates with the ENET plane involved, type<br><b>&gt;TRNSL plane_no shelf_no</b><br>and press the Enter key.<br><i>where</i>                                                                                                                                                                                                               |           |



## Crosspoint and interface cards in a 64k or 128k ENET (continued)

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

*Example of a MAP response:*

Request to TRNSL ENET Plane:0 Shelf:00 submitted.  
Request to TRNSL ENET Plane:0 Shelf:00 passed.  
ENET Plane:0 Shelf:00 : MS 0 and 1 Card:16 Link:00 Port:000

**Note:** In the example, the number of the chain head card is 16. The link number is 0.

**16** Record the number of the chain head card and the link number.

**17** To access the MS SHELF level of the MAP display, type

**>MS;SHELF**

and press the Enter key.

*Example of a MAP display:*

```

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

Shelf 0 1 1 1 1 1 1 1 1 1 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 12 3 4 5 6
Chain ||
MS 0 F I
MS 1 F I

```

**18** To post the chain head card, type

**>CHAIN card\_no**

and press the Enter key.

where

**card\_no**

is the card number you recorded in step 16

*Example of a MAP display:*

```

Chain 16 Range Link 0 1
MS 0 . 16-17 DS512 ..
MS 1 . 16-17 DS512 ..

```

**19** To manually busy the link on the chain on MS 1, type

**>BSY 0 LINK link\_no**

and press the Enter key.

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

where

**link\_no**

is the link number you recorded in step 16

Example of a MAP response:

```
Request to MAN BUSY MS: 0 shelf: 0 chain:16 submitted.
Request to MAN BUSY MS: 0 shelf: 0 chain:16 passed.
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 20 |
| failed             | step 58 |

- 20** To manually busy the link on the chain on MS 0, type  
**>BSY 1 LINK link\_no**  
 and press the Enter key.

where

**link\_no**

is the link number you recorded in step 16

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 21 |
| failed             | step 58 |

- 21** To access the ENET SHELF level of the MAP display, type  
**>NET;SHELF shelf\_no**  
 and press the Enter key.

where

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

Example of a MAP display:

```
SHELF 01 Slot 1111111 11122222 22222333 333333
 123456 78 90123456 78901234 56789012 345678
Plane 0 O O OO CCCCCCCC ----- CCCCCCCC O O
Plane 1
```

- 22** To manually busy the slot that contains the card you replace, type  
**>BSY plane\_no slot\_no**  
 and press the Enter key.

where

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to MAN BUSY ENET Plane:0 Shelf:01 Slot:15 submitted.  
Warning: Card replacement requires front and back bsy/rts to prevent  
possible service degradation to peripherals.  
Request to MAN BUSY ENET Plane:0 Shelf:01 Slot:15 passed.

- 23 To take the slot that contains the card you replaced offline, type

**>OFFL plane\_no slot\_no**

and press the Enter key.

*where*

**plane\_no**

is the plane number

*Example of a MAP response:*

Request to OFFLINE ENET Plane:0 Shelf:01 Slot:15 submitted.  
Request to OFFLINE ENET Plane:0 Shelf:01 Slot:15 passed.

### *At the shelf*

24



#### **WARNING**

##### **Static electricity damage**

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

Determine the type of card that you must replace.

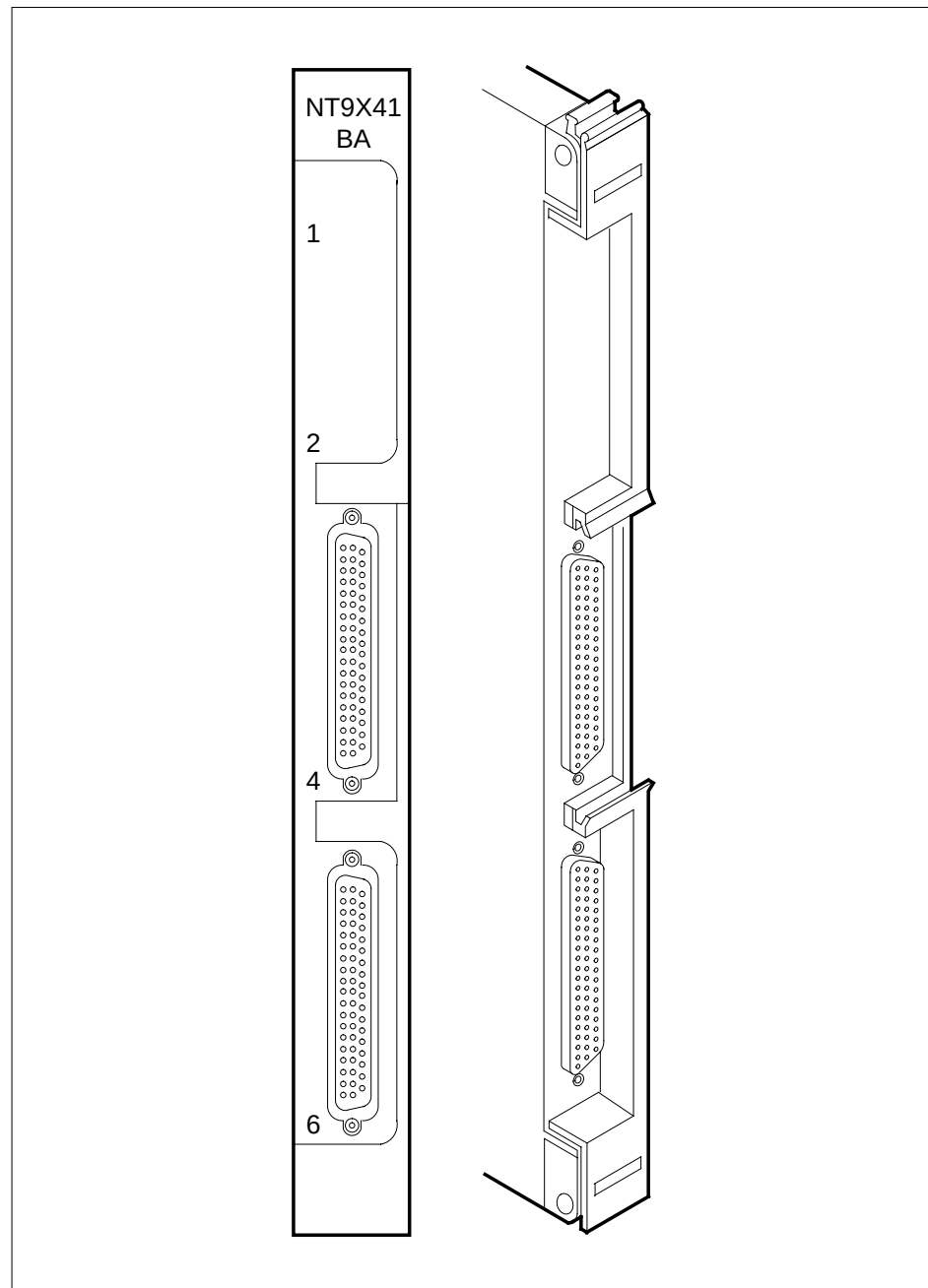
| <b>If you must</b>          | <b>Do</b> |
|-----------------------------|-----------|
| replace an NT9X35           | step 25   |
| replace an NT9X41           | step 27   |
| replace an NT9X40 or NT9X45 | step 31   |

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

---

- 25** Use the procedure *Replacing a card* in this document to replace the card. Complete the procedure and return to this point.
- Note:** If the card to be replace has switches, make sure that the switches on the replacement card have the same settings.
- 26** Go to step 39.
- 27** The following diagram shows the faceplate of the NT9X41BA interface card.

## Crosspoint and interface cards in a 64k or 128k ENET (continued)



- 28** Locate the NT9X41 card and disconnect the DS30 connectors, as follows:
- a** Loosen the connector retaining screws.
  - b** Unplug the connectors.

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

- 29** Use the procedure *Replacing a card* in this document to replace the card. Complete the procedure and return to this point.

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

- 30** Connect the DS30 connectors again, as follows:

- a** Plug the connectors into the card.
- b** Tighten the connector retaining screws.
- c** Go to step 39.

**31**

### ATTENTION

Make sure you correctly identify connector zone numbers. Refer to Figure , "NT9X40BA/BB connector zone numbers" on page -37 (for the NT9X40) and Figure , "NT9X45BA connector zone numbers" on page -38 for the NT9X45) to identify zone numbers. Diagrams of fiber connector components for these cards are provided in Figure , "Fiber connector detail" on page -39 and Figure , "Fiber connector and receptacle detail" on page -39 on page .

Before you disconnect the fiber cables, make sure that you are at the correct ENET node (plane and shelf name) and the correct interface card (slot).

Make sure that each cable has a label that has the following information:

- the ENET shelf number
- the plane number
- the slot number
- the link number
- the signal type (transmit or receive)

If this information is not present, create a label and attach it to the cable. This label provides the necessary information to correctly reconnect the fiber cables to the card.

*Example of a label:*

|      |     |     |
|------|-----|-----|
| ENCO | 00  | 39  |
| 10R  | 04  | 17T |
| LTE  | 000 | 18  |
| 22R  | RX  |     |

*Label field descriptions*

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

---

|      |                                                                 |
|------|-----------------------------------------------------------------|
| ENC0 | ENET plane (0 or 1)                                             |
| 00   | cabinet number                                                  |
| 39   | ENET shelf by its base mounting position number                 |
| 10R  | slot number and position (R for rear, or F for front)           |
| 04   | zone number                                                     |
| 17T  | link number and the signal type (T for transmit, R for receive) |
| LTE  | PM that the cable terminates on                                 |
| 000  | PM frame number                                                 |
| 18   | PM shelf by its base mounting position number                   |
| 22R  | slot number and position (R for rear, or F for front)           |
| RX   | signal type at the PM end (RX for receive or TX for transmit)   |

32



### **DANGER**

#### **Avoid contaminating the fiber tip surface**

Do not touch the tip of the fiber. Dirt or oil from the skin transferred to the fiber tip surface degrades fiber performance.



### **DANGER**

#### **Fiber cable may become damaged**

Exercise care in handling fiber cables. Do not crimp fiber cables or bend fiber cables to a radius of less than 3 cm (1.180 in.).

Disconnect the transmit and receive connectors for each fiber cable.

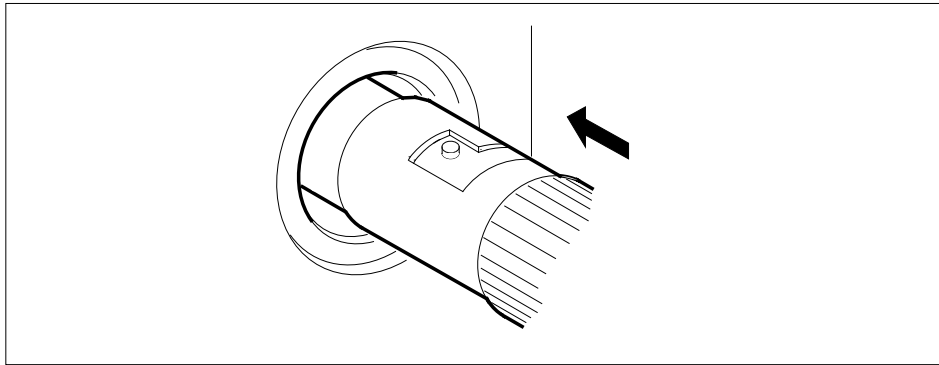
**Note:** Place dust caps on the ends of the connectors as you disconnect them.

- a** Grasp the sleeve with two fingers and gently push the sleeve toward the frame.

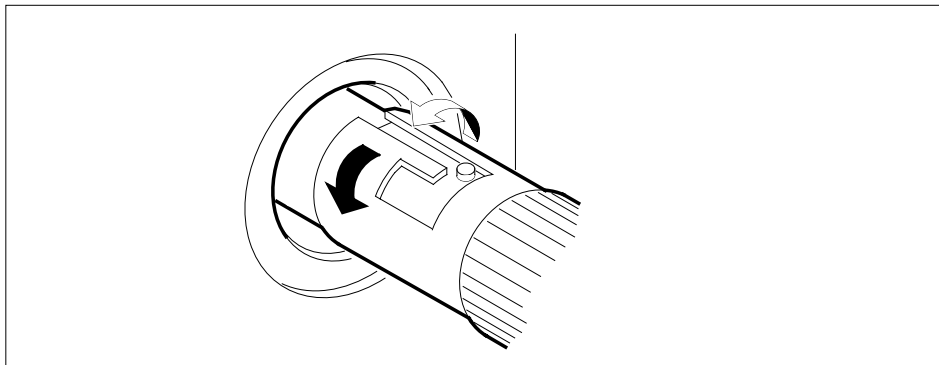
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## Crosspoint and interface cards in a 64k or 128k ENET (continued)

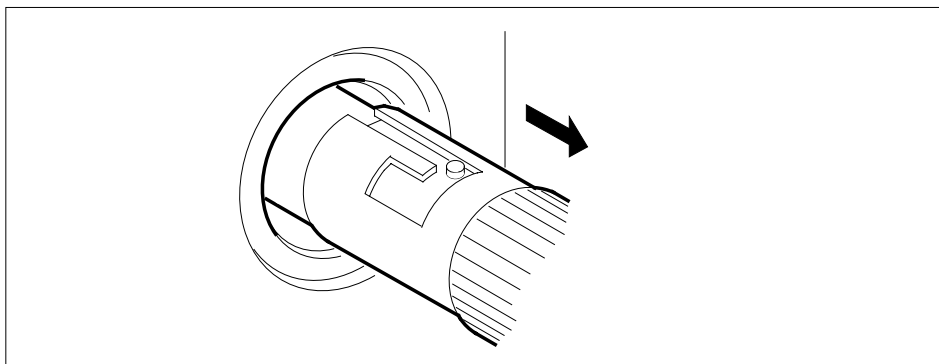
---



- b** Turn the connector counter-clockwise until the connector pin is in the position shown at the right.



- c** Carefully pull the connector away from the frame.



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



## Crosspoint and interface cards in a 64k or 128k ENET (continued)

---

- 33 Determine the next action to perform.

| If you                  | Do      |
|-------------------------|---------|
| are replacing an NT9X45 | step 34 |
| are replacing an NT9X40 | step 35 |

- 34 Disconnect the DS30 connectors.

- a Loosen the connector retaining screws.
- b Unplug the connectors.

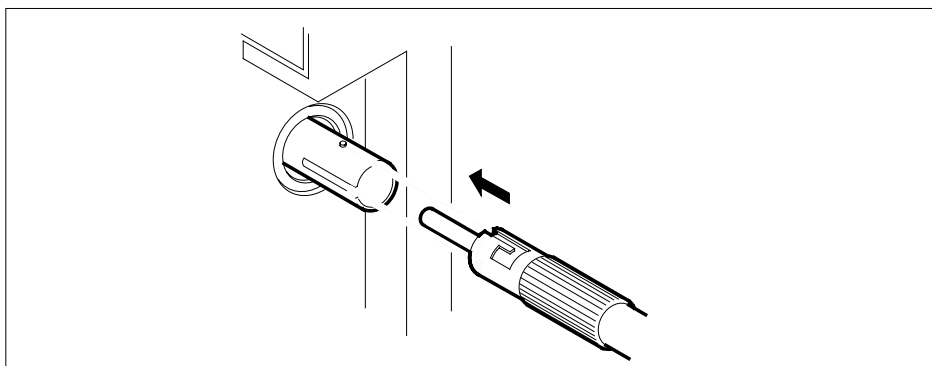
- 35 Use the procedure *Replacing a card* in this document to replace the card. Complete the procedure and return to this point.

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

- 36 Remove the dust caps on the transmit and receive connectors as you reconnect them to the new card.

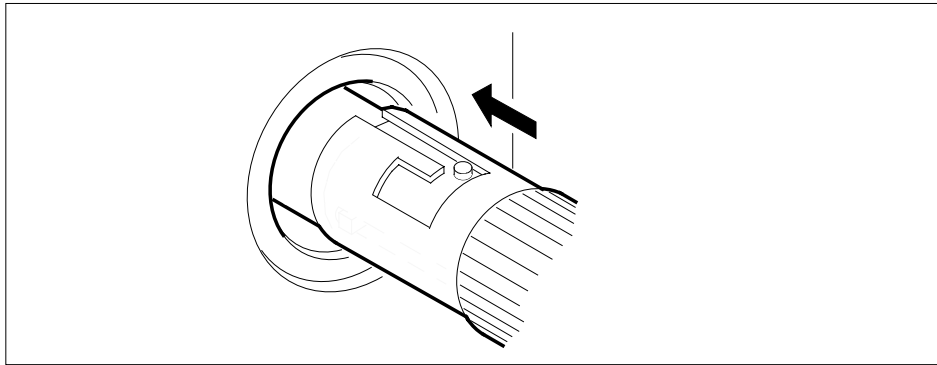
Reconnect the transmit and receive connectors for each fiber cable as follows:

- a Align the connector pin and slot with the receptacle slot and pin, as shown.

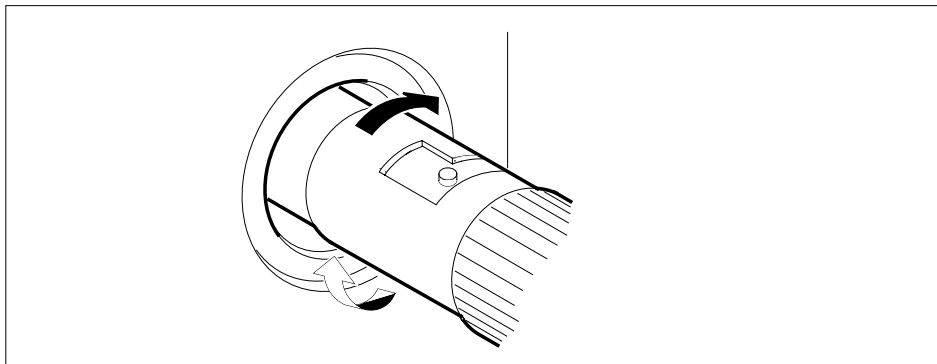


- b Carefully slide the connector into the receptacle.

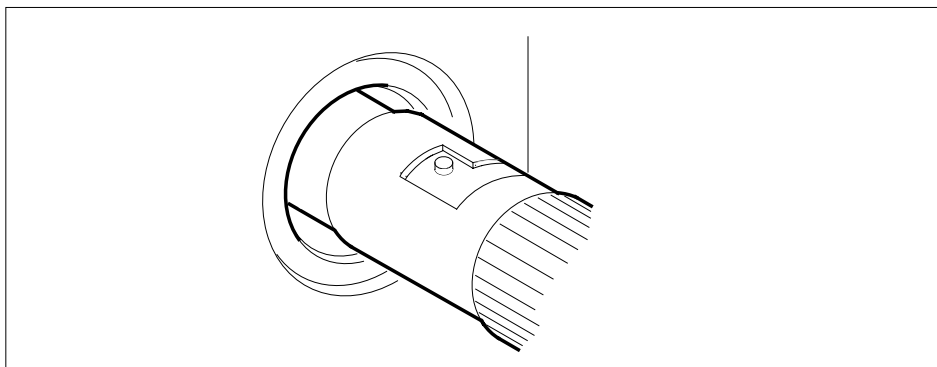
## Crosspoint and interface cards in a 64k or 128k ENET (continued)



**c** Turn the connector clockwise to lock the connector in place.



**d** Release the connector. The following figure shows the final connector position.



**37** Determine the next action to perform.

| If you                  | Do      |
|-------------------------|---------|
| are replacing an NT9X45 | step 38 |

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

|                            | If you                                                                                                                                                                                                                                                                                                                                                | Do      |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                            | are replacing an NT9X40                                                                                                                                                                                                                                                                                                                               | step 38 |
| <b>38</b>                  | Connect the DS30 connectors again.<br>a Plug the connectors into the card.<br>b Tighten the connector retaining screws.                                                                                                                                                                                                                               |         |
| <i>At the MAP terminal</i> |                                                                                                                                                                                                                                                                                                                                                       |         |
| <b>39</b>                  | To access the Chain level of the MAP display, type<br><b>&gt;MS;SHELF;CHAIN card_no</b><br>and press the Enter key.<br><i>where</i><br><b>card_no</b><br>is the card number you recorded in step 16                                                                                                                                                   |         |
| <b>40</b>                  | To return the link on the chain on MS 0 to service, type<br><b>&gt;RTS 0 LINK link_no</b><br>and press the Enter key.<br><i>where</i><br><b>link_no</b><br>is the link number you recorded in step 16<br><i>Example of a MAP response:</i><br><br>Request to RTS MS: 0 shelf: 0 chain:16 submitted.<br>Request to RTS MS: 0 shelf: 0 chain:16 passed. |         |
|                            | If the RTS command                                                                                                                                                                                                                                                                                                                                    | Do      |
|                            | passed                                                                                                                                                                                                                                                                                                                                                | step 41 |
|                            | failed                                                                                                                                                                                                                                                                                                                                                | step 58 |
| <b>41</b>                  | To return the link on the chain on MS 1 to service, type<br><b>&gt;RTS 1 LINK link_no</b><br>and press the Enter key.<br><i>where</i><br><b>link_no</b><br>is the link number you recorded in step 16                                                                                                                                                 |         |
|                            | If the RTS command                                                                                                                                                                                                                                                                                                                                    | Do      |
|                            | passed                                                                                                                                                                                                                                                                                                                                                | step 42 |

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

|    | If the RTS command                                                                                                                                                                                                                                                | Do      |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | failed                                                                                                                                                                                                                                                            | step 58 |
| 42 | To access the NET;SYSTEM level of the MAP display, type<br><b>&gt;NET;SYSTEM</b><br>and press the Enter key.                                                                                                                                                      |         |
| 43 | To manually busy the node, type<br><b>&gt;BSY plane_no shelf_no</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1)<br><b>shelf_no</b><br>is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET) |         |

|    | If the BSY command                                                                                                                                                                                                                                                    | Do      |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | passed                                                                                                                                                                                                                                                                | step 44 |
|    | failed                                                                                                                                                                                                                                                                | step 58 |
| 44 | To return the node to service, type<br><b>&gt;RTS plane_no shelf_no</b><br>and press the Enter key.<br><i>where</i><br><b>plane_no</b><br>is the ENET plane number (0 or 1)<br><b>shelf_no</b><br>is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET) |         |

*Example of a MAP response:*

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

There are no suspect cards.

|  | If the RTS command | Do      |
|--|--------------------|---------|
|  | passed             | step 45 |
|  | failed             | step 58 |

---

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

---

- 45 To access the ENET SHELF of the MAP display, type  
**SHELF shelf\_no**  
and press the Enter key.

*where*

**shelf\_no**  
is the shelf number

- 46 To manually busy all cards in the ENET shelf, type  
**>BSY plane\_no ALL**  
and press the Enter key.

*where*

**plane\_no**  
is the ENET plane number (0 or 1)

- 47 To return all cards in the ENET shelf to service, type  
**>RTS plane\_no ALL**  
and press the Enter key.

*where*

**plane\_no**  
is the ENET plane number (0 or 1)

*Example of a MAP response:*

Request to RTS ENET Plane:0 Shelf:01 submitted.  
Request to RTS ENET Plane:0 Shelf:01 passed.

---

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 50 |
| failed             | step 48 |

---

- 48 The replacement card is damaged. Obtain another replacement card.
- 49 Access the ENET system level of the MAP display by typing  
**>SYSTEM**  
and pressing the Enter key.  
Go to Step 11
- 50 To access the ENET system level of the MAP display, type  
**>SYSTEM**  
and press the Enter key.
- 51 To clear the deload condition on all crosspoint cards in the node, type  
**>DELOAD plane\_no shelf\_no CLEAR**
-

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

Example of a MAP response:

Request to CLEAR DELOAD ENET Plane:0 Shelf:00 submitted.

Request to CLEAR DELOAD ENET Plane:0 Shelf:00 passed.

- 52 Determine if the deloaded cards were listed in step 8.

| If deloaded cards | Do      |
|-------------------|---------|
| are listed        | step 53 |
| are not listed    | step 59 |

- 53 To access the SHELF level of the MAP display, type

**>SHELF shelf\_no**

and press the Enter key.

where

**shelf\_no**

is the number of the shelf that contains the node in use

- 54 To set the first card on the list to deloaded status, type

**>DELOAD plane\_no slot\_no SET**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

| If                                                    | Do      |
|-------------------------------------------------------|---------|
| more cards are on the list that<br>you did not deload | step 55 |
| you deloaded all cards on the list                    | step 59 |

- 55 Repeat step 54 for the next card on the list.

- 56 This procedure instructs you to deload and manually busy a node. Do not continue with this procedure except under special conditions because the

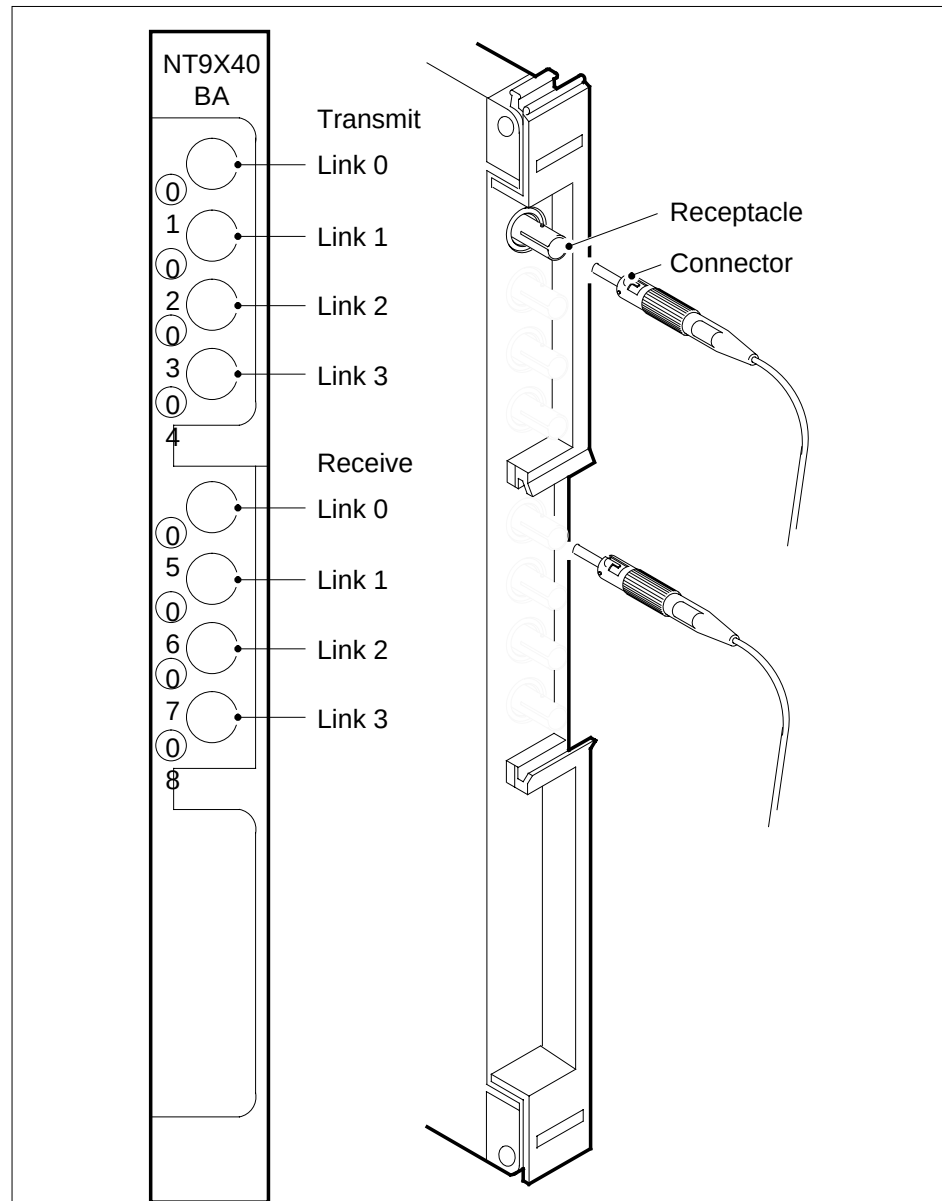
## Crosspoint and interface cards in a 64k or 128k ENET (continued)

---

- mate node has deloaded cards. Consult operating company personnel or the next level of support. Continue as directed by operating company personnel or the next level of support.
- 57** Abort ENET busy request and continue with the dump by typing  
**>NO**  
and pressing the Enter key.  
BSY request has been aborted, ENET dump is continuing.
- 58** For additional help, contact the next level of support.
- 59** The procedure is complete.

## Crosspoint and interface cards in a 64k or 128k ENET (continued)

### NT9X40BA/BB connector zone numbers

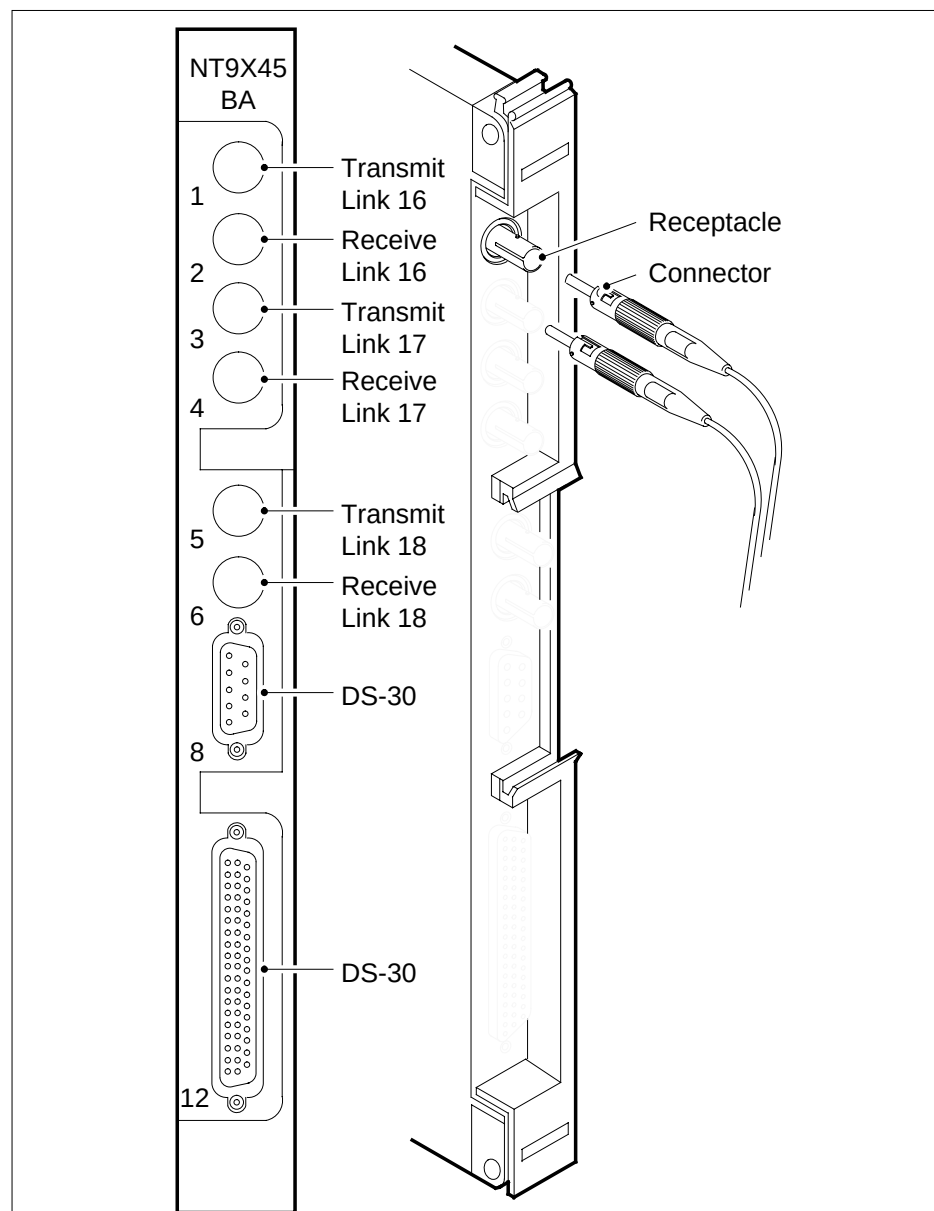


The figure relates the zone numbers and the link numbers. The zone numbers (1 to 8) appear on the face of the card. The link numbers appear on the MAP display for the NT9X40BA or NT9X40BB interface card. Note that the figure shows only fiber connections. Note the zone designations for transmit and receive.



## Crosspoint and interface cards in a 64k or 128k ENET (continued)

### NT9X45BA connector zone numbers



The figure relates the zone numbers and the link numbers. The zone numbers (1 to 12) appear on the face of the card. The link numbers appear on the MAP display for the NT9X45BA interface card. Note that the figure shows only fiber connections. Note the zone designations for transmit and receive.

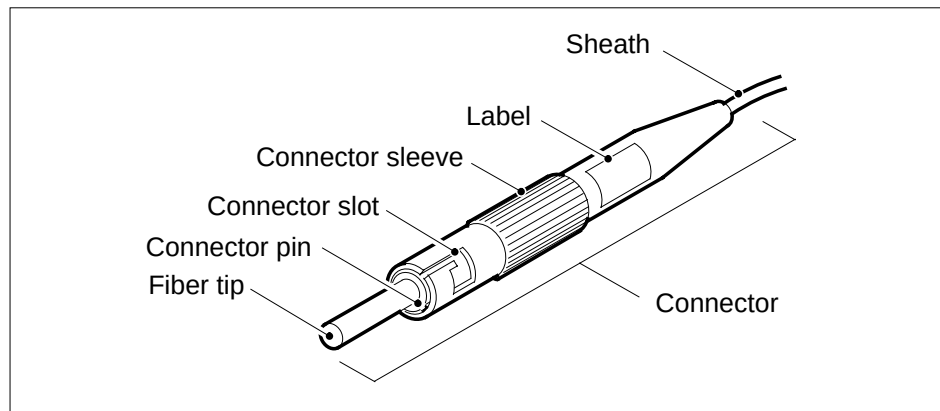
---

## Crosspoint and interface cards in a 64k or 128k ENET (end)

---

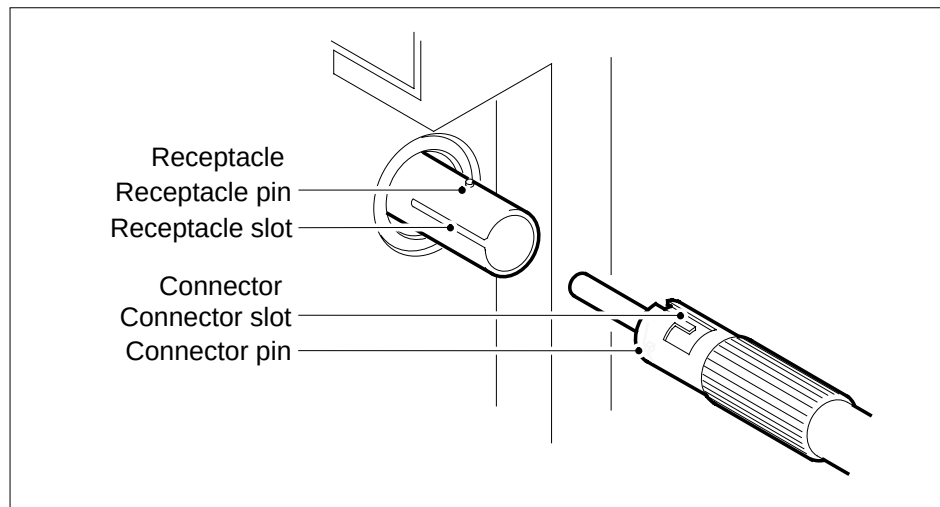
This diagram shows the type of connector for fiber connections to an NT9X40 or NT9X45 paddle board.

### Fiber connector detail



This diagram shows the different parts of the connector and receptacle as referred to in this procedure.

### Fiber connector and receptacle detail



## Power converter cards in JNET shelves

---

### Application

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

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

| PEC    | Suffix         | Card name                            | Shelf or frame name                                                        |
|--------|----------------|--------------------------------------|----------------------------------------------------------------------------|
| NT2X06 | AA, AB         | Power converter common features card | NT0X48 single-bay network (NET)                                            |
| NT2X07 | AA, AB, AC     | Power converter (5V/12V) card        | NET                                                                        |
| NT2X70 | AA, AB, AC, AD | Power converter (5V/12V) card        | NT5X13 combined single-bay network (NETC), NT8X11 dual shelf network (DSN) |

### Common procedures

This procedure refers to *Replacing a card*.

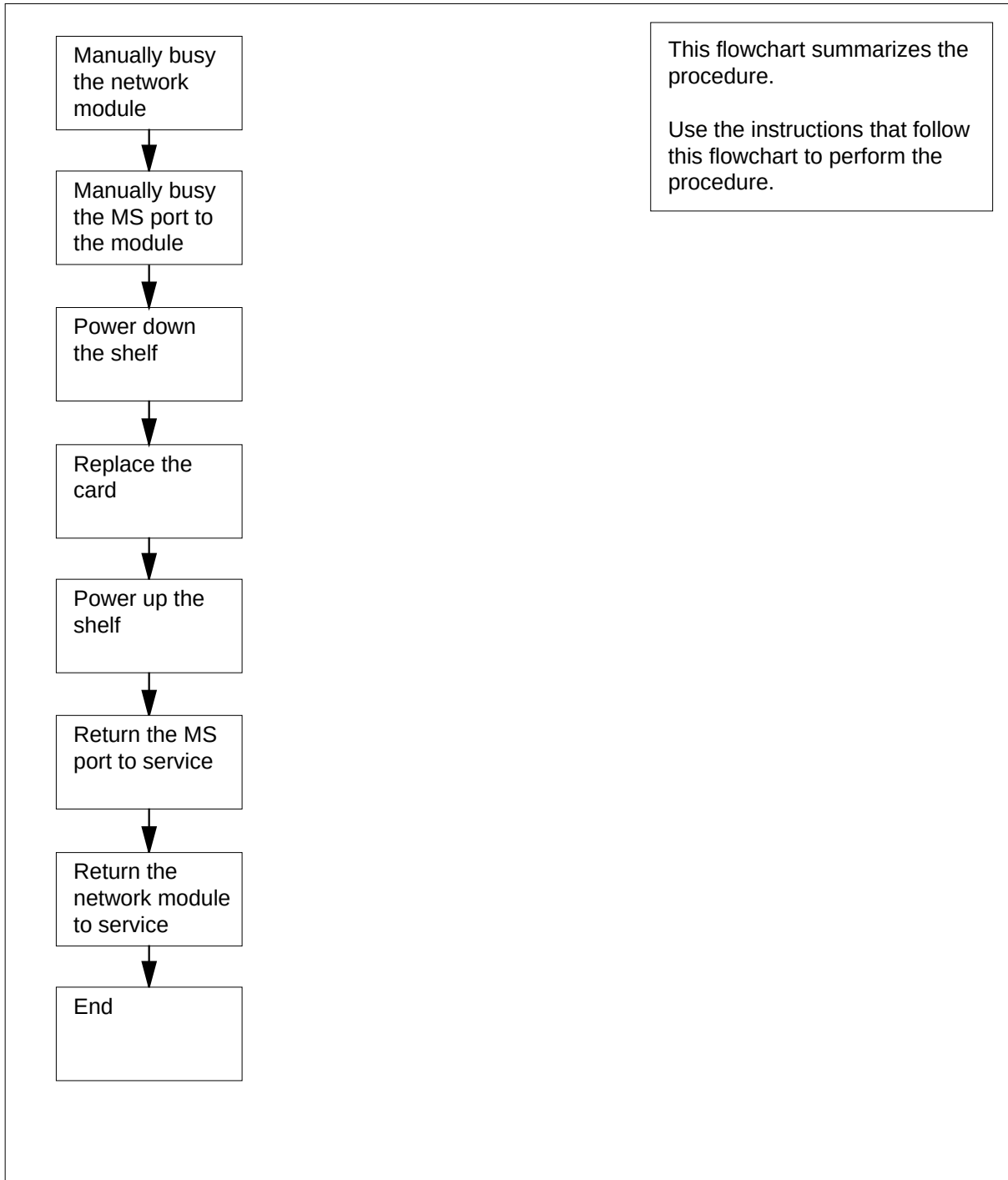
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

The following flowchart is a summary of the procedure. To replace the card, use the instructions in the step-action procedure that follows the flowchart.

## Power converter cards in JNET shelves (continued)

### Summary of replacing Power converter cards in JNET shelves



---

## Power converter cards in JNET shelves (continued)

---

### Replacing Power converter cards in JNET shelves

#### *At the MAP terminal*

1

**CAUTION****Loss of service**

The out-of-service test used in this procedure can cause a momentary alarm in far-end offices. Before performing this procedure, notify all far-end offices with common channel signaling of a possible momentary alarm.

**CAUTION****Loss of service**

This procedure explains how to manually busy one plane of a network pair, resulting in loss of network redundancy. Perform this procedure only if necessary to restore out-of-service components. Carry out this procedure during periods of low traffic.

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

2

To access the NET level of the MAP display, type

**>MAPCI;MTC;NET**

and press the Enter key.

*Example of a MAP display:*

```
Net 11111 11111 22222 22222 33
Plane 01234 56789 01234 56789 01
 0 S...
 1
JNET:
```

3

Determine the state of the plane and pair associated with the card you replace.

---

| If the state   | Do     |
|----------------|--------|
| is T (testing) | step 4 |

---

## Power converter cards in JNET shelves (continued)

|   | If the state                                                                                                                                                                                                                                                                                                                                                                                      | Do      |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|   | is M (manual busy)                                                                                                                                                                                                                                                                                                                                                                                | step 6  |
|   | is O (offline)                                                                                                                                                                                                                                                                                                                                                                                    | step 29 |
|   | is other than listed here                                                                                                                                                                                                                                                                                                                                                                         | step 5  |
| 4 | Wait 5 min for the test to complete. When system testing is complete, go to step 3 to evaluate the state of the plane and pair again.                                                                                                                                                                                                                                                             |         |
| 5 | <p>To manually busy the network module that contains the card you want to replace, type</p> <p><b>&gt;BSY plane_no pair_no</b></p> <p>and press the Enter key.</p> <p>where</p> <p><b>plane_no</b><br/>is the number of the network plane (0 to 1)</p> <p><b>pair_no</b><br/>is the number of the network plane pair (0 to 31)</p> <p><i>Example of a MAP response:</i></p> <pre>bsy 0 0 OK</pre> |         |
|   | If the BSY command                                                                                                                                                                                                                                                                                                                                                                                | Do      |
|   | passed                                                                                                                                                                                                                                                                                                                                                                                            | step 6  |
|   | needs to be confirmed                                                                                                                                                                                                                                                                                                                                                                             | step 28 |
|   | failed                                                                                                                                                                                                                                                                                                                                                                                            | step 30 |
| 6 | Wait 30 min to make sure that calls in progress are complete.                                                                                                                                                                                                                                                                                                                                     |         |
| 7 | <p>To obtain information on the link to the message switch (MS), type</p> <p><b>&gt;TRNSL plane_no pair_no</b></p> <p>and press the Enter key.</p> <p>where</p> <p><b>plane_no</b><br/>is the number of the network plane (0 to 1)</p> <p><b>pair_no</b><br/>is the number of the network plane pair (0 to 31)</p> <p><i>Example of a MAP response:</i></p>                                       |         |

---

## Power converter cards in JNET shelves (continued)

---

NM 0-0 = MS 0 and 1, Card 22 Port 1

- 8 Record the slot position and the port number of the MS port card connected to the network plane and pair involved.

**Note:** In the example MAP response in step 6, the slot position is 22 and the port number is 1.

- 9 To access the MS;SHELF level of the MAP display, type

**>MS;SHELF**

and press the Enter key.

*Example of a MAP display:*

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

Shelf 0
Card 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 2 2 2 2 2 2
Chain
MS 0 . . I . . - - - - - - - - - - - F .
MS 1 C C C C C - - - - - - - - - - - C C C C C C C C C
```

- 10 To post the card in the slot that you recorded in step 6, type

**>CARD slot\_no**

and press the Enter key.

*where*

**slot\_no**

is the number of the card slot recorded in step 8

*Example of a MAP display:*

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

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

Card 22 Protocol Port 0____3
MS 0 . DS30 4 . P . . .
MS 1 . DS30 4 . P . . .
```

## Power converter cards in JNET shelves (continued)

- 11** To manually busy the port on MS 0 that connects to the network plane and pair on which you work, type

```
>BSY 0 PORT port_no
```

and press the Enter key.

where

**port\_no**

is the number of the card slot recorded in step 8

*Example of a MAP response:*

Request to MAN BUSY MS: 0 shelf: 0 card:22 port: 1 submitted.

Request to MAN BUSY MS: 0 shelf: 0 card:22 port: 1 passed.

- 12** To manually busy the port on MS1 that connects to the network plane and pair on which you work, type

```
>BSY 1 PORT port_no
```

and press the Enter key.

where

**port\_no**

is the number of the card slot recorded in step 8

### At the shelf

**13**



#### WARNING

##### Static electricity damage

Wear a wrist strap connected to the wrist strap grounding point of a frame supervisory panel (FSP) or modular supervisory panel (MSP) to handle circuit cards. The wrist strap protects the cards against static electricity damage.

Set the handle of the POWER switch on the power converter you replace down to the OFF position.

- 14** The next action depends on the power converter configuration for the shelf involved.

| If the shelf             | Do      |
|--------------------------|---------|
| has one power converter  | step 16 |
| has two power converters | step 15 |

- 15** Set the handle of the POWER switch on the other power converter for the shelf involved down to the OFF position.



---

## Power converter cards in JNET shelves (continued)

---

- 16** Use the procedure *Replacing a card* in this document to replace the card. Complete the procedure and return to this point.

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

**Note 2:** If the card that you replace has switches, make sure that the switches on the replacement card have the same settings.

- 17** The next action depends on the power converter you replaced and the type of supervisory panel.

---

| If you                                                                  | Do      |
|-------------------------------------------------------------------------|---------|
| are replacing an NT2X06 or an NT2X07                                    | step 20 |
| are replacing an NT2X70 card and the FSP has circuit breakers           | step 18 |
| are replacing an NT2X70 card and the FSP does not have circuit breakers | step 19 |

---

- 18** Power up the converter, as follows:

- a** Pull and set the handle of the POWER switch up to the ON position.
- b** Press and hold the RESET button on the power converter.
- c** Set the handle of the converter circuit breaker on the FSP up until it clicks into place.
- d** Release the RESET button.
- e** Go to step 21.

- 19** Power up the converter, as follows:

- a** Pull and set the handle of the POWER switch up to the ON position.
- b** Press and hold the RESET button on the power converter until the CONVERTER FAIL LED goes off.
- c** Release the RESET button.
- d** Go to step 21.

- 20** Power up the converter, as follows:

- a** Set the handle of the POWER switch up on the power converter.
- b** Press and hold the RESET button on the power converter.
- c** Release the RESET button.

- 21** The next action depends on the power converter configuration for the shelf you are working on.

---

| If the shelf            | Do      |
|-------------------------|---------|
| has one power converter | step 22 |

---

## Power converter cards in JNET shelves (continued)

| If the shelf                                                                                                        | Do      |
|---------------------------------------------------------------------------------------------------------------------|---------|
| has two power converters, and you have powered up both converters                                                   | step 22 |
| has two power converters, and you have powered up only one converter (the mate converter is an NT2X06 or an NT2X07) | step 20 |

### At the MAP terminal

- 22** To return to service the port on MS0 that connects to the network plane and pair, type

```
>RTS 0 PORT port_no
```

and press the Enter key.

where

**port\_no**

is the number of the card slot recorded in step 8

*Example of a MAP response:*

```
Request to RTS MS: 0 shelf: 0 card:22 port: 1 submitted.
Request to RTS MS: 0 shelf: 0 card:22 port: 1 passed.
```

- 23** To return to service the port on MS1 that connects to the network plane and pair, type

```
>RTS 1 PORT port_no
```

and press the Enter key.

where

**port\_no**

is the number of the card slot recorded in step 8

- 24** To access the NET level of the MAP display, type

```
>NET
```

and press the Enter key.

- 25** To return the network module to service, type

```
>RTS plane_no pair_no
```

and press the Enter key.

where

**plane\_no**

is the number of the network plane (0 to 1) associated with the card you replace

## Power converter cards in JNET shelves (end)

### **pair\_no**

is the number of the network plane pair (0 to 31) associated with the card you replace

*Example of a MAP response:*

```
rts 0 0
Request submitted. Reply expected within 3 mins.
Test Passed
OK
```

|           | <b>If the RTS command</b>                                                                                                            | <b>Do</b> |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------|-----------|
|           | passed                                                                                                                               | step 26   |
|           | failed                                                                                                                               | step 30   |
| <b>26</b> | The next action depends on the reason you perform this procedure.                                                                    |           |
|           | <b>If a maintenance procedure</b>                                                                                                    | <b>Do</b> |
|           | directed you to this procedure                                                                                                       | step 27   |
|           | did not direct you to this procedure                                                                                                 | step 31   |
| <b>27</b> | Return to the maintenance procedure that sent you to this procedure and continue as directed.                                        |           |
| <b>28</b> | Consult the next level of support to determine if you can proceed to manually busy the network plane and pair. Continue as directed. |           |
| <b>29</b> | Consult operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.  |           |
| <b>30</b> | For additional help, contact the next level of support.                                                                              |           |
| <b>31</b> | The procedure is complete.                                                                                                           |           |

## System cards in a 64k or 128k ENET

### Application

Use this procedure to replace the following cards in a 64k or 128k enhanced network shelf (ENET).

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

| PEC    | Suffix     | Card name                                    | Shelf or frame name      |
|--------|------------|----------------------------------------------|--------------------------|
| NT9X13 | FA, KA     | DMS SuperNode processor card                 | 64k ENET, 128k ENET      |
| NT9X26 | AA, AB     | Reset terminal interface (RTIF) paddle board | 64k ENET, 128k ENET      |
| NT9X30 | AA, AB     | +5V 86-A power converter card                | 64k ENET, 128k ENET      |
| NT9X31 | AA, AB     | -5V 20-A power converter for DMS-100E card   | 64k ENET, 128k ENET      |
| NT9X36 | BA         | ENET messaging clock card                    | 64k ENET, 128k ENET      |
| NT9X40 | BA         | ENET + quad fiber paddle board               | 32k ENET, slot 8         |
| NT9X40 | BA, BB, DA | ENET + quad fiber paddle board               | 64k or 128k ENET, slot 8 |

### Common procedures

The procedure references the following common procedures:

- *Replacing a card*
- *Verifying load compatibility of SuperNode cards*
- *Cleaning fiber optic components and assemblies*

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

## **System cards in a 64k or 128k ENET (continued)**

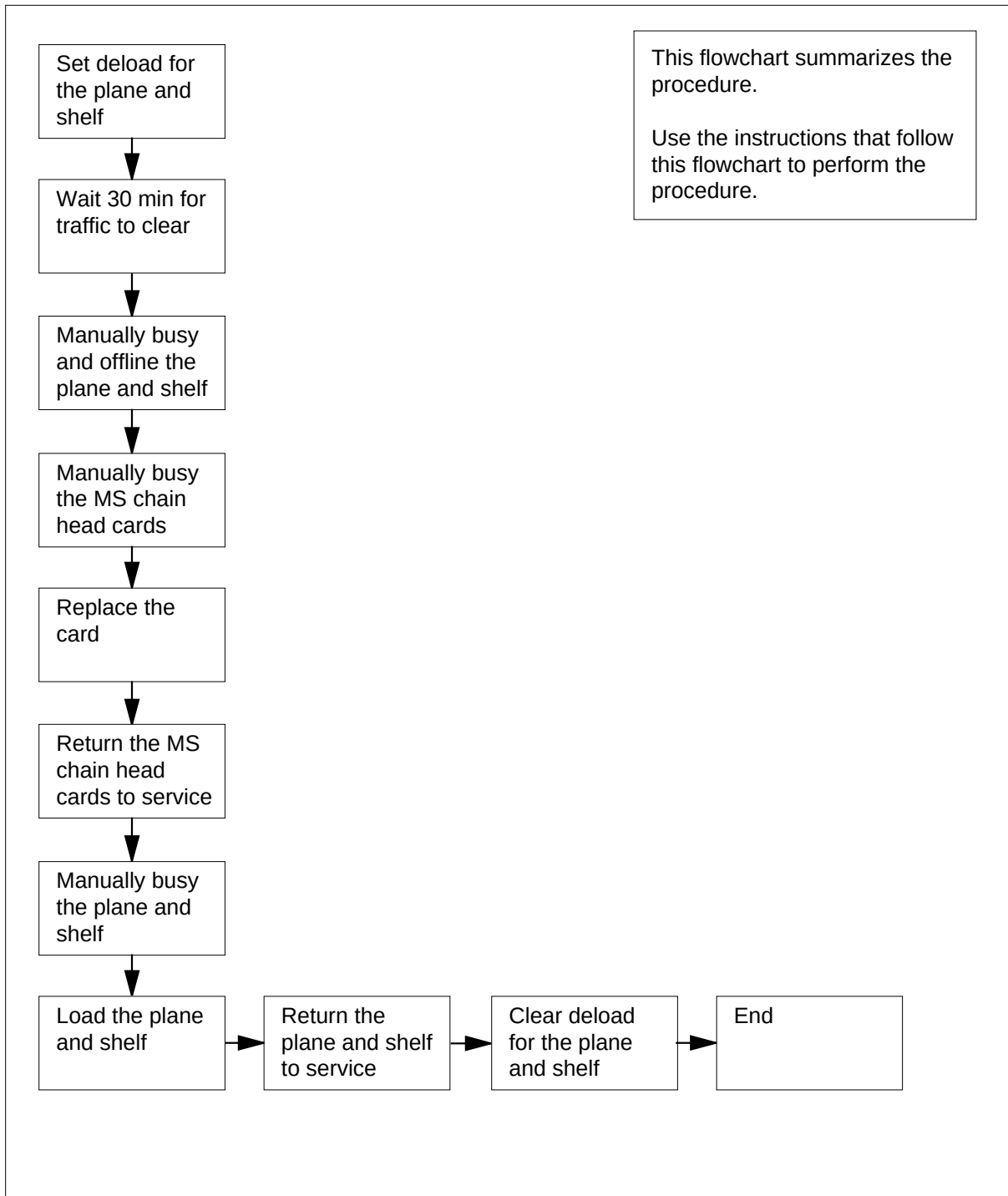
---

### **Action**

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

## System cards in a 64k or 128k ENET (continued)

### Summary of How to replace System cards in a 64k or 128k ENET



## System cards in a 64k or 128k ENET (continued)

### How to replace System cards in a 64k or 128k ENET

#### At the MAP terminal

1



#### WARNING

##### Calls may drop

This procedure removes an ENET shelf from service, and can drop calls in progress. Perform this procedure to return system and power converter cards to service. Carry out this procedure only if necessary and during periods of low traffic.

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

2 Make sure that the replacement card is compatible with the software load. Use the procedure *How to verify load compatibility of SuperNode cards* in this document. Complete the procedure and return to this point.

3 To access the NET;SYSTEM level of the MAP display, type

**>MAPCI;MTC;NET;SYSTEM**

and press the Enter key.

*Example of a MAP display:*

```
SYSTEM
Shelf Plane 0 Plane 1
00 I CSLink 1 closed .
01 . .
02 . .
03 . .
```

4 Check the status of the node for the card that you replace. The Plane headers on the SYSTEM level MAP display indicates the status of the node. In the example in step 3, the node that associates with shelf 00 plane 1 is in-service trouble. All other nodes in the example are in service.

| If that status of the node | Do      |
|----------------------------|---------|
| is O                       | step 13 |
| is M                       | step 12 |
| is T                       | step 5  |
| is other than listed here  | step 6  |

5 Wait 1 min for testing to complete.

When system initiated testing is complete, go to step 4 to evaluate the state of the node again.

## System cards in a 64k or 128k ENET (continued)

- 6 To determine if there are deloaded crosspoint cards in the other plane for the shelf, type

**>DELOAD plane\_no shelf\_no QUERY**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1) for the mate node

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

*Example of a MAP response:*

```
Request to QUERY DELOAD ENET Plane:0 Shelf:00 submitted.
Request to QUERY DELOAD ENET Plane:0 Shelf:00 passed.
 1111111 11122222 22222333
 90123456 78901234 56789012
Plane:0 Shelf:00 ..Y.-----
```

**Note:** A deloaded crosspoint card is indicated by the letter Y under the slot number.

| If the node                  | Do      |
|------------------------------|---------|
| has deloaded cards           | step 59 |
| does not have deloaded cards | step 7  |

- 7 To determine if there are deloaded crosspoint cards in the node, type

**>DELOAD plane\_no shelf\_no QUERY**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

| If the node                  | Do     |
|------------------------------|--------|
| has deloaded cards           | step 8 |
| does not have deloaded cards | step 9 |

- 8 Record the plane number, shelf number, and slot number for any deloaded crosspoint cards in the node. Use this list to make sure that these cards are returned to the deloaded state when you complete this procedure.

- 9 To set all crosspoint cards to a deloaded status for the node associated with the card that you replace, type

**>DELOAD plane\_no shelf\_no SET**



## System cards in a 64k or 128k ENET (continued)

---

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

*Example of a MAP response:*

Request to SET DELOAD ENET Plane:0 Shelf:00 submitted.  
Request to SET DELOAD ENET Plane:0 Shelf:00 passed.

**10** Wait 30 min to permit network traffic on the node to clear.

**11** To manually busy the node, type

**>BSY plane\_no shelf\_no**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

*Example of a MAP response:*

Request to MAN BUSY ENET Plane:0 Shelf:00 submitted.  
Request to MAN BUSY ENET Plane:0 Shelf:00 passed.

---

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 12 |
| failed             | step 60 |

---

**12** To offline the node, type

**>OFFL plane\_no shelf\_no**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

*Example of a MAP response:*

## System cards in a 64k or 128k ENET (continued)

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

| If the OFFL command | Do      |
|---------------------|---------|
| passed              | step 13 |
| failed              | step 60 |

- 13** To locate the message switch (MS) chain head card that associates with the ENET node, type

**>TRNSL plane\_no shelf\_no**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

*Example of a MAP response:*

Request to TRNSL ENET Plane:0 Shelf:00 submitted.  
Request to TRNSL ENET Plane:0 Shelf:00 passed.  
ENET Plane:0 Shelf:00 : MS 0 and 1 Card:16 Link:00 Port:000

**Note:** In the example, the number of the chain head card is 16. The link number is 0.

- 14** To access the MS SHELF level of the MAP display, type

**>MS;SHELF**

and press the Enter key.

*Example of a MAP display:*

```

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

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

```

- 15** Record the number of the chain head card and record the link number.

- 16** To post the chain head card, type

**>CHAIN card\_no**

and press the Enter key.

## System cards in a 64k or 128k ENET (continued)

where

**card\_no**

is the card number you recorded in step 15

*Example of a MAP display:*

```
Chain 16 Range Link 0 1
MS 0 . 16-17 DS512 . .
MS 1 . 16-17 DS512 . .
```

- 17** To manually busy the link on the chain on MS 0, type

**>BSY 0 LINK link\_no**

and press the Enter key.

where

**link\_no**

is the link number you recorded in step 15

*Example of a MAP response:*

```
Request to MAN BUSY MS: 0 shelf: 0 chain:16 link 0
submitted.
Request to MAN BUSY MS: 0 shelf: 0 chain:16 link 0 passed.
```

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 18 |
| failed             | step 60 |

- 18** To manually busy the link on the chain on MS 1, type

**>BSY 1 LINK link\_no**

and press the Enter key.

where

**link\_no**

is the link number you recorded in step 15

- 19** To access the ENET SHELF level of the MAP display, type

**>NET;SHELF shelf\_no**

and press the Enter key.

where

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128kENET)

*Example of a MAP display:*

## System cards in a 64k or 128k ENET (continued)

```

SHELF 01 Slot 1111111 11122222 22222333 3333333
 123456 78 90123456 78901234 56789012 345678
Plane 0 0 0 00 CCCCCCCC ----- CCCCCCCC 0 0
Plane 1 -----

```

- 20** To access the Card level for the card you replace, type

**>CARD card\_no**

and press the Enter key.

where

**card\_no**

is the card number

*Example of a MAP display:*

```

CARD 07 Front: Back:
 CPU RTIF
Plane 0 0 0
Plane 1 . .

```

- 21** To manually busy the slot that contains the card you replace, type

**>BSY plane\_no**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

*Example of a MAP response:*

```

Request to MAN BUSY ENET Plane:0 Shelf:01 Slot:15
submitted.
Warning: Card replacement requires front and back bsy/rts
to prevent possible service degradation to peripherals.
Request to MAN BUSY ENET Plane:0 Shelf:01 Slot:15 passed.

```

- 22** To offline the slot that contains the card you replace, type

**>OFFL plane\_no**

and press the Enter key.

where

**plane\_no**

is the plane number

*Example of a MAP response:*

## System cards in a 64k or 128k ENET (continued)

Request to OFFLINE ENET Plane:0 Shelf:01 Slot:07  
submitted.  
Request to OFFLINE ENET Plane:0 Shelf:01 Slot:07 passed.

### At the shelf

23



#### WARNING

##### Static electricity damage

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

The next action depends on the ENET card you replace.

|    | If you                                                                                                                                                                                                                                   | Do      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | are replacing an NT9X30 or NT9X31                                                                                                                                                                                                        | step 26 |
|    | are replacing an NT9X13                                                                                                                                                                                                                  | step 24 |
|    | are replacing an NT9X40                                                                                                                                                                                                                  | step 28 |
|    | are replacing an NT9X26 or NT9X36                                                                                                                                                                                                        | step 31 |
| 24 | Unseat the NT9X36 (messaging clock) card on the shelf. Use the procedure <i>How to unseat cards in equipment shelves</i> in this NTP. When you complete the procedure, wait 20 s and return to this point.                               |         |
| 25 | Use the procedure <i>How to reseat cards in equipment shelves</i> in this NTP to reseat the NT9X36 card. When you complete the procedure, wait 20 s and return to this point.<br>Go to step 31.                                          |         |
| 26 | To power down the NT9X30 card that associates with the ENET shelf side, press down and release the power switch on the faceplate of the card.<br><b>Note:</b> The CONVERTER OFF LED will light when the converter correctly powers down. |         |
|    | If the CONVERTER OFF LED                                                                                                                                                                                                                 | Do      |
|    | is lit                                                                                                                                                                                                                                   | step 27 |

## System cards in a 64k or 128k ENET (continued)

|    | If the CONVERTER OFF LED                                                                                                                                                                                                                 | Do      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|    | is not lit                                                                                                                                                                                                                               | step 60 |
| 27 | To power down the NT9X31 card that associates with the ENET shelf side, press down and release the power switch on the faceplate of the card.<br><b>Note:</b> The CONVERTER OFF LED will light when the converter correctly powers down. |         |
|    | If the CONVERTER OFF LED                                                                                                                                                                                                                 | Do      |
|    | is lit                                                                                                                                                                                                                                   | step 31 |
|    | is not lit                                                                                                                                                                                                                               | step 60 |

28

**ATTENTION**

Make sure you correctly identify connector zone numbers. Refer to figure “NT9X40BA/BB connector zone numbers” (at the end of this procedure) for the NT9X40 to identify zone numbers. Figures “Fiber connector detail” and “Fiber connector and receptacle detail” provide diagrams of fiber connector components for these cards.

Make sure that you are at the correct ENET node (plane and shelf name) and the correct interface card (slot). Disconnect the fiber cables.

29 Make sure that each cable has a label that has the following information:

- the ENET shelf number
- the plane number
- the slot number
- the link number
- the signal type (transmit or receive)

If this information is not present, create a label and attach it to the cable. This label provides the necessary information to correctly reconnect the fiber cables to the card.

*Example of a label:*

|      |     |     |
|------|-----|-----|
| ENCO | 00  | 39  |
| 10R  | 04  | 17T |
| LTE  | 000 | 18  |
| 22R  | RX  |     |

*Label field descriptions*

## System cards in a 64k or 128k ENET (continued)

---

|      |                                                                 |
|------|-----------------------------------------------------------------|
| ENCO | ENET plane (0 or 1)                                             |
| 00   | cabinet number                                                  |
| 39   | ENET shelf by its base mounting position number                 |
| 10R  | slot number and position (R for rear, or F for front)           |
| 04   | zone number                                                     |
| 17T  | link number and the signal type (T for transmit, R for receive) |
| LTE  | PM that the cable terminates on                                 |
| 000  | PM frame number                                                 |
| 18   | PM shelf by its base mounting position number                   |
| 22R  | slot number and position (R for rear, or F for front)           |
| RX   | signal type at the PM end ( RX for receive or TX for transmit)  |

30



### **DANGER**

#### **Avoid contaminating the fiber tip surface**

Do not touch the tip of the fiber. Dirt or oil from the skin that transfers to the fiber tip surface degrades fiber performance.



### **DANGER**

#### **Fiber cable may become damaged**

Exercise care in handling fiber cables. Do not crimp fiber cables or bend fiber cables to a radius of less than 3 cm (1.180 in.).

Disconnect the transmit and receive connectors for each fiber cable, as follows:

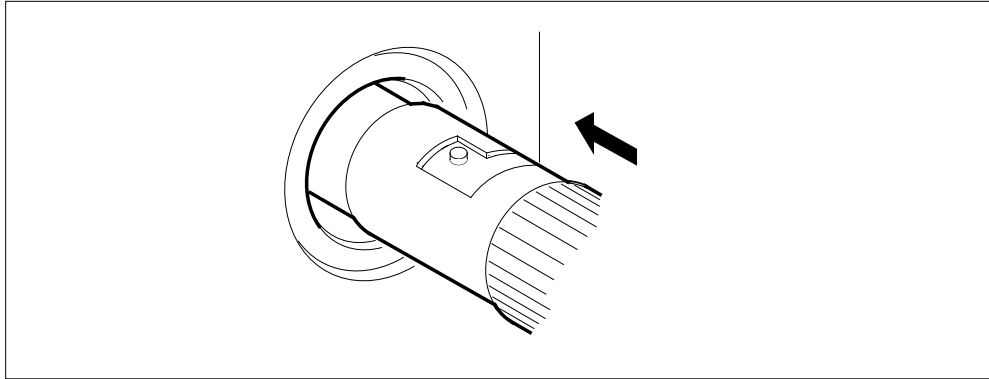
**Note:** As you disconnect the connectors place dust caps on the ends of the connectors.

- a** Grasp the sleeve with two fingers and gently push the sleeve towards the frame.

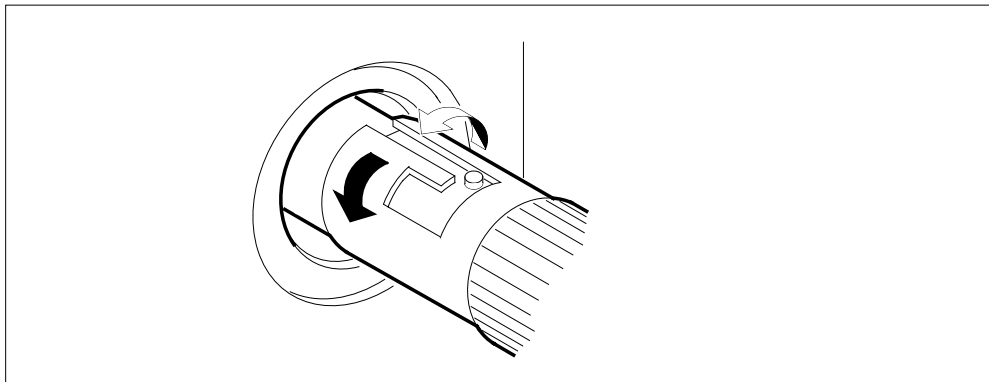
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## System cards in a 64k or 128k ENET (continued)

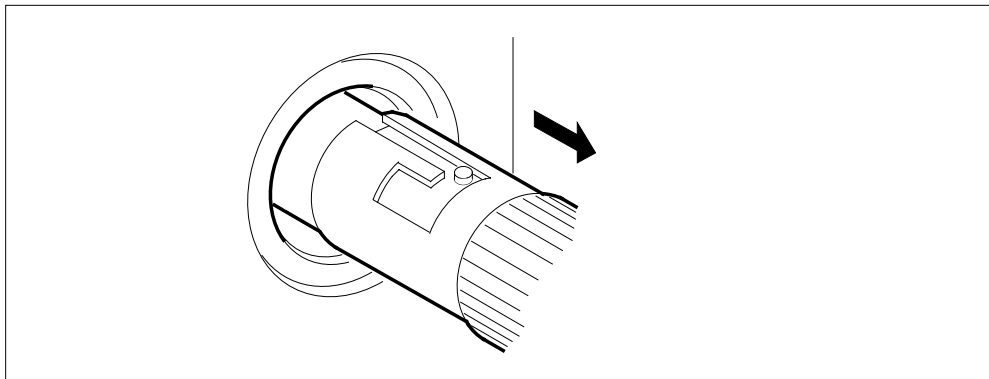
---



- b** Turn the connector counter-clockwise until the connector pin is in the position shown below.



- c** Gently pull the connector away from the frame.



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



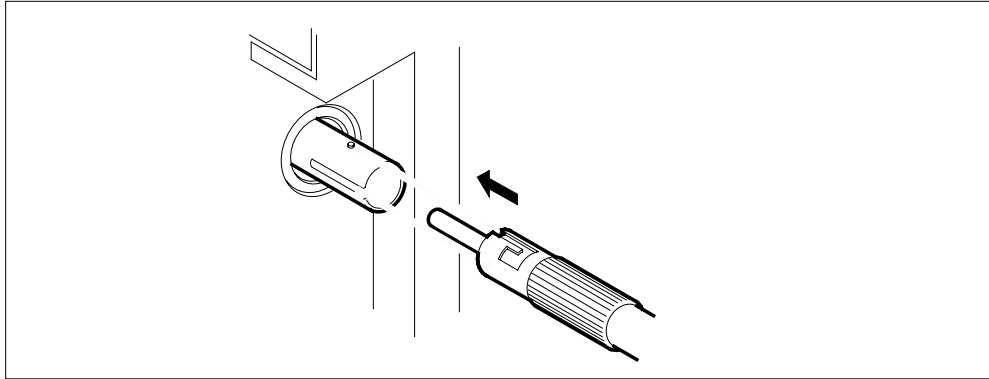
## System cards in a 64k or 128k ENET (continued)

- 31** Use the procedure *How to replace a card* in this document to replace the card. Complete the procedure and return to this point.
- Note 1:** If you replace the power converter card, make sure that the PWR switch on the replacement power converter is in the OFF position.
- Note 2:** If the card that you replace has switches, make sure that the switches on the replacement card have the same settings.
- 32** The next action depends on the ENET card you replace.
- | If you                      | Do      |
|-----------------------------|---------|
| replace an NT9X30 or NT9X31 | step 33 |
| replace an NT9X13           | step 38 |
| replace an NT9X40           | step 35 |
| replace an NT9X26 or NT9X36 | step 36 |
- 33** Press up and release the power switch on the faceplate of the card to power up the NT9X30 card.
- Note:** The CONVERTER OFF LED will go out when the converter correctly powers up.
- | If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is not lit               | step 34 |
| is lit                   | step 60 |
- 34** Press up and release the power switch on the faceplate of the card to power up the NT9X31 card.
- Note:** The CONVERTER OFF LED will go out when the converter correctly powers up.
- | If the CONVERTER OFF LED | Do      |
|--------------------------|---------|
| is not lit               | step 38 |
| is lit                   | step 60 |
- 35** Remove the dust caps on the transmit and receive connectors as you reconnect them to the new card.
- Reconnect the transmit and receive connectors for each fiber cable, as follows:
- a** Align the connector pin and slot with the receptacle slot and pin, as shown.

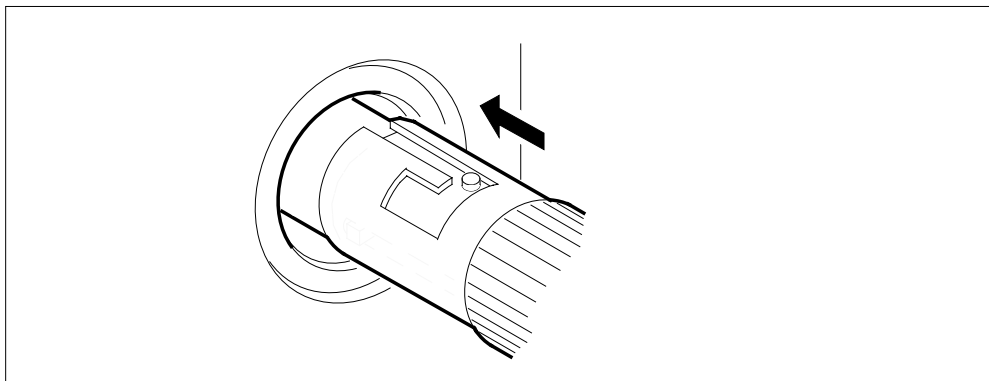
---

## System cards in a 64k or 128k ENET (continued)

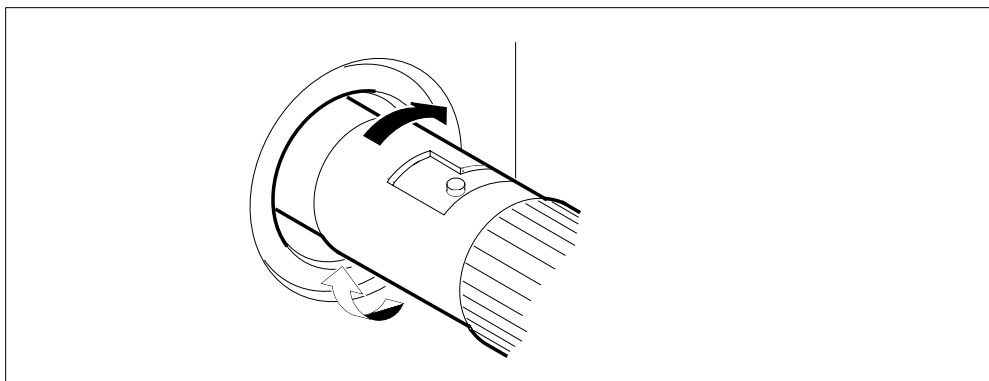
---



**b** Carefully slide the connector into the receptacle.

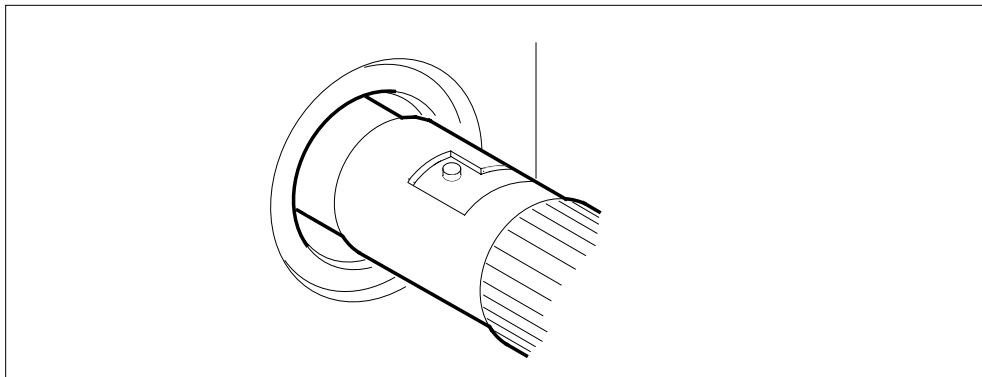


**c** Turn the connector clockwise to lock the connector in place.



**d** Release the connector. The figure illustrates the final connector position.

## System cards in a 64k or 128k ENET (continued)



- 36 Unseat the NT9X13 (processor) card on the shelf side involved. Perform the procedure *How to unseat cards in equipment shelves* in this NTP. Complete the procedure and return to this point.
- 37 Reseat the NT9X13 card on the shelf side involved. Perform the procedure *How to reseat cards in equipment shelves* in this NTP. Complete the procedure and return to this point.

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

- 38 To access the Chain level of the MAP display, type  
**>MS;SHELF;CHAIN card\_no**  
 and press the Enter key.  
*where*  
**card\_no**  
 is the card number you recorded in step 15
- 39 To return the link on the chain on MS 0 to service, type  
**>RTS 0 LINK link\_no**  
 and press the Enter key.  
*where*  
**link\_no**  
 is the link number you recorded in step 15

*Example of a MAP response:*

Request to RTS MS: 0 shelf: 0 chain:16 link 0 submitted.  
 Request to RTS MS: 0 shelf: 0 chain:16 link 0 passed.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 40 |
| failed             | step 60 |

## System cards in a 64k or 128k ENET (continued)

- 40** To return the link on the chain on MS 1 to service, type

**>RTS 1 LINK link\_no**

and press the Enter key.

where

**link\_no**

is the link number you recorded in step 15

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 41 |
| failed             | step 60 |

- 41** To access the NET;SYSTEM level of the MAP display, type

**>NET;SYSTEM**

and press the Enter key.

- 42** To manually busy the node, type

**>BSY plane\_no shelf\_no**

and press the Enter key.

where

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128k ENET)

| If the BSY command | Do      |
|--------------------|---------|
| passed             | step 43 |
| failed             | step 60 |

- 43** The next action depends on the location of the load file.

| If the load file                                                 | Do      |
|------------------------------------------------------------------|---------|
| is as specified in tables PM-LOADS and ENINV                     | step 44 |
| is different from the file specified in tables PMLOADS and ENINV | step 45 |

- 44** To load the node, type

**>LOADEN plane\_no shelf\_no**

and press the Enter key.

## System cards in a 64k or 128k ENET (continued)

where

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128k ENET)

*Example of a MAP response:*

WARNING Any software load in the ENET will be destroyed.  
Please confirm ("YES" or "NO"):

Go to step 48.

**45** To access the DISKUT utility, type

**>DISKUT**

and press the Enter key.

*Example of a MAP response:*

Disk utility is now active.  
DISKUT:

**46** To list the contents for the volume that contains the loadfile, type

**>LISTFILE vol\_name**

and press the Enter key.

where

**vol\_name**

is the name of the volume

*Example of a MAP response:*

File information for volume S00DVOL1:  
{NOTE: 1 BLOCK = 512 BYTES }

| LAST FILE<br>MODIFY DATE | FILE O R I O<br>CODE R E T P<br>G C O E<br>C N | FILE<br>SIZE<br>IN<br>BLOCKS | NUM OF<br>RECORDS<br>IN<br>FILE | MAX<br>REC<br>LEN | FILE NAME        |
|--------------------------|------------------------------------------------|------------------------------|---------------------------------|-------------------|------------------|
| 760128                   | 0 0 F                                          | 277                          | 3219                            | 44                | EDRMAC07         |
| 941101                   | 0 I F Y                                        | 9494                         | 4747                            | 1020              | RAPC03AW_1101_MS |
| 760104                   | 0 0 V                                          | 651                          | 162                             | 2048              | MPC402BX         |
| 760104                   | 0 0 F                                          | 63                           | 424                             | 76                | TDCMPA01         |
| 760104                   | 0 0 F                                          | 37                           | 249                             | 76                | TTMNA01          |
| 941101                   | 0 I F Y                                        | 202934                       | 101467                          | 1020              | RAPC03AW_1101_CM |
| 941025                   | 0 I F                                          | 9494                         | 4747                            | 1020              | RBCS35CV_1025_MS |
| 941025                   | 0 I F                                          | 242454                       | 121227                          | 1020              | RBCS35CV_1025_CM |
| 940426                   | 0 0 F                                          | 784                          | 392                             | 1024              | MPCX33AB         |
| 930427                   | 0 0 F                                          | 314                          | 2006                            | 80                | MTULI01          |

## System cards in a 64k or 128k ENET (continued)

- 47 To load the node, type  
**>LOADEN plane\_no shelf\_no filename**  
 and press the Enter key.  
*where*  
**plane\_no**  
 is the ENET plane number (0 or 1)  
**shelf\_no**  
 is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128k ENET)  
**filename**  
 is the name of the load file

*Example of a MAP response:*

WARNING Any software load in the ENET will be destroyed.  
 Please confirm ("YES" or "NO"):

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

*Example of a MAP response:*

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

- 49 To return the node to service, type  
**>RTS plane\_no shelf\_no**  
 and press the Enter key.  
*where*  
**plane\_no**  
 is the ENET plane number (0 or 1)  
**shelf\_no**  
 is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128k ENET)

*Example of a MAP response:*

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

There are no suspect cards.

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 50 |
| failed             | step 60 |

## System cards in a 64k or 128k ENET (continued)

---

- 50 To access the ENET SHELF level of the MAP display, type  
**>SHELF shelf\_no**  
and press the Enter key.  
*where*  
**shelf\_no**  
is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128k ENET)
- 51 To busy all crosspoint cards on the shelf, type  
**>BSY plane\_no ALL**  
and press the Enter key.  
**plane\_no**  
is the ENET plane number (0 or 1)  
*Example of a MAP response:*  
  
WARNING: This action will be performed on ALL XPT slots  
in ENET Plane:1 that are MBSY, INSV, OFFL,  
SBSY, or CBSY.  
Please confirm ("YES", "Y", "NO", or "N"):
- 52 To return all crosspoint cards on the shelf to service, type  
**>RTS plane\_no ALL**  
and press the Enter key.  
**plane\_no**  
is the ENET plane number (0 or 1)  
*Example of a MAP response:*  
  
Request to RTS ENET Plane:1 Shelf:00 submitted.  
Request to RTS ENET Plane:1 Shelf:00 passed.
- 53 To access the ENET SYSTEM level of the MAP display, type  
**>SYSTEM**  
and press the Enter key.
- 54 To clear the deload condition on all crosspoint cards in the node, type  
**>DELOAD plane\_no shelf\_no CLEAR**  
and press the Enter key.  
*where*  
**plane\_no**  
is the ENET plane number (0 or 1)  
**shelf\_no**  
is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128k ENET)  
*Example of a MAP response:*

## System cards in a 64k or 128k ENET (continued)

Request to CLEAR DELOAD ENET Plane:0 Shelf:00 submitted.  
Request to CLEAR DELOAD ENET Plane:0 Shelf:00 passed.

- 55 Determine if you recorded the deloaded cards in step 8.

| If there            | Do      |
|---------------------|---------|
| are cards listed    | step 56 |
| are no cards listed | step 61 |

- 56 To access the SHELF level of the MAP display, type

**>SHELF shelf\_no**

and press the Enter key.

*where*

**shelf\_no**

is the number of the shelf that contains the node on which you are working

- 57 To set the first card on the list to deloaded status, type

**>DELOAD plane\_no slot\_no SET**

and press the Enter key.

*where*

**plane\_no**

is the ENET plane number (0 or 1)

**shelf\_no**

is the ENET shelf number (0 or 1 for 64k ENET; 0 to 3 for 128k ENET)

| If                                                 | Do      |
|----------------------------------------------------|---------|
| more cards are on the list that you did not deload | step 58 |
| you deloaded all cards on the list                 | step 61 |

- 58 Repeat step 57 for the next card on the list.

- 59 This procedure instructs you to deload and manually busy a node. Do not continue with this procedure except under special conditions because the mate node has deloaded cards. Consult operating company personnel or the next level of support. Continue as directed by operating company personnel or the next level of support.

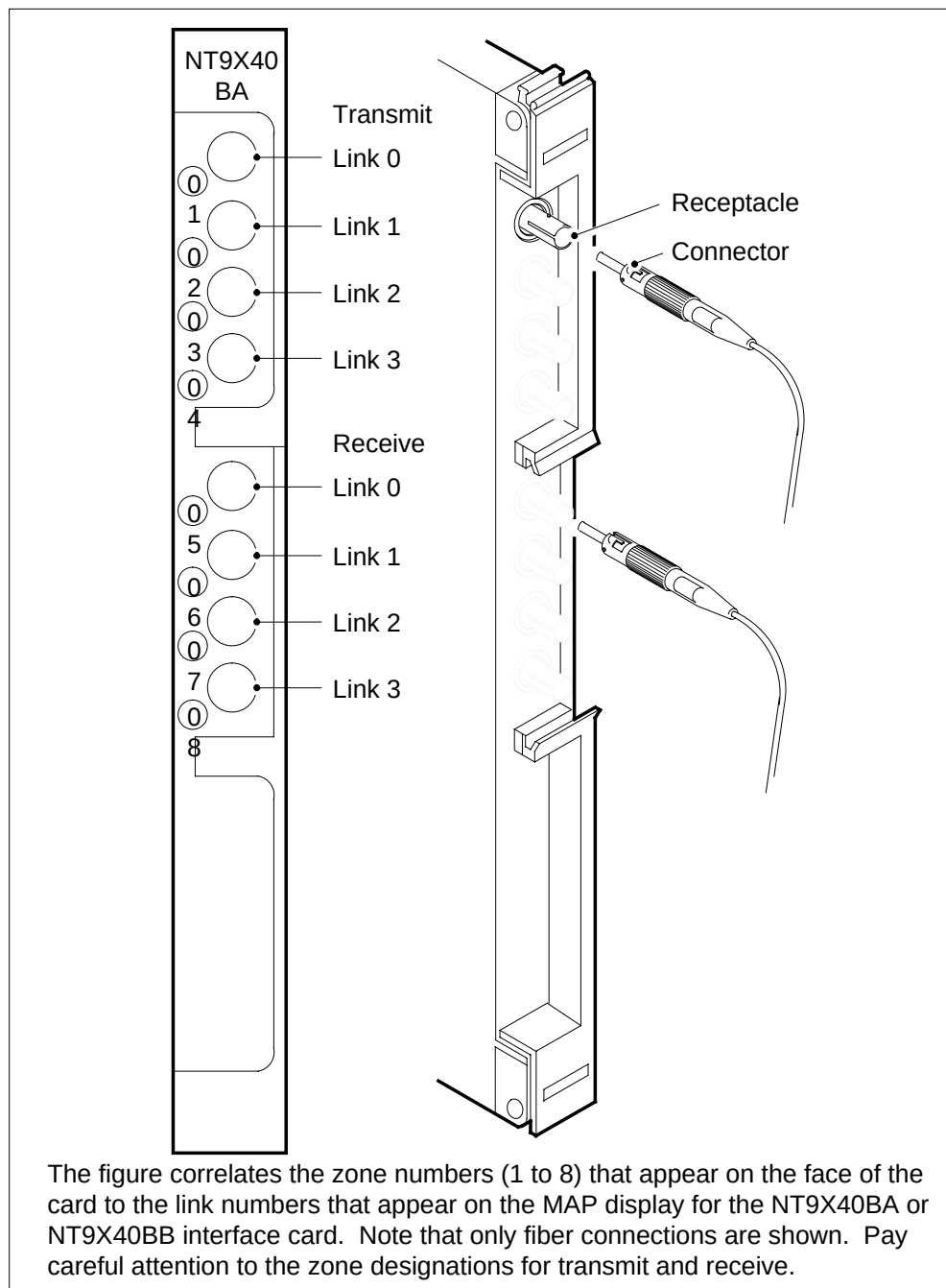
- 60 For additional help, contact the next level of support.

- 61 The procedure is complete.



## System cards in a 64k or 128k ENET (continued)

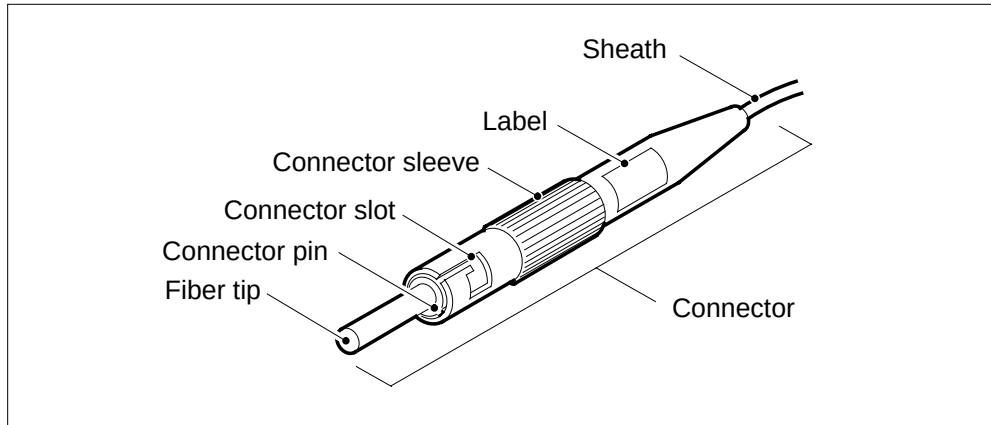
### NT9X40BA/BB connector zone numbers



This diagram shows the type of connector used for fiber connections to an NT9X40 or NT9X45 paddle board.

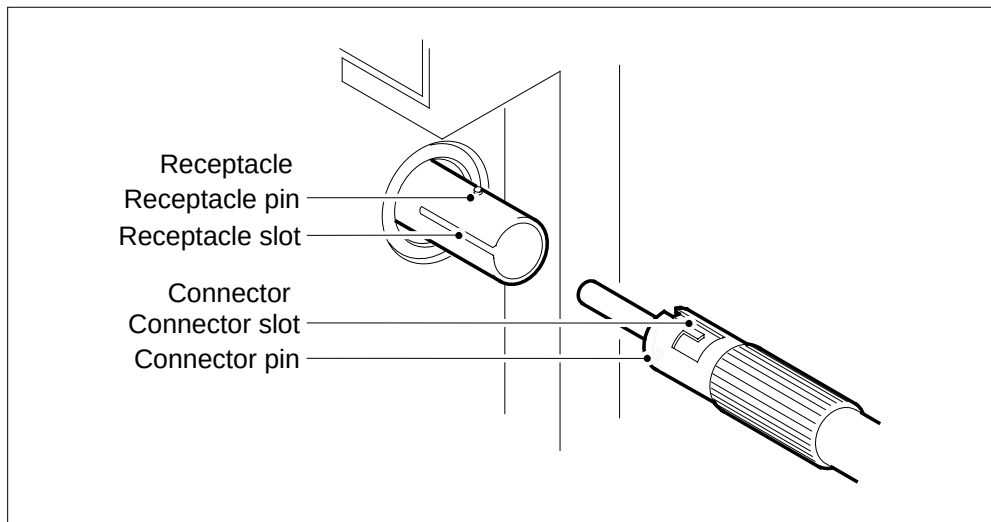
## System cards in a 64k or 128k ENET (end)

### Fiber connector detail



This diagram shows the different parts of the connector and receptacle as this procedure refers to them.

### Fiber connector and receptacle detail



## System, interface, and crosspoint cards in JNET shelves

### Application

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

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

| PEC    | Suffix | Card name                                  | Shelf or frame name                       |
|--------|--------|--------------------------------------------|-------------------------------------------|
| NT3X17 | AA     | Network incoming crosspoint card           | NT0X48 single-bay network (NET)           |
| NT3X18 | AA     | Network outgoing crosspoint card           | NET                                       |
| NT3X19 | AA     | Network speech interface card              | NET                                       |
| NT3X20 | AA     | Network test access card                   | NET                                       |
| NT3X21 | AA     | Network interface bus card                 | NET                                       |
| NT3X22 | AA     | Network module input/output interface card | NET                                       |
| NT3X23 | AA     | Crosspoint controller card                 | NET                                       |
| NT3X23 | AB     | Network signaling controller card          | NET                                       |
| NT3X24 | AA     | Network clock card                         | NET                                       |
| NT3X70 | AA, AB | Network crosspoint card                    | NT5X13 combined single-bay network (NETC) |
| NT3X71 | AA     | Network test code card                     | NETC                                      |
| NT3X72 | AA, AB | Network serial port interface card         | NETC                                      |

## System, interface, and crosspoint cards in JNET shelves (continued)

| PEC    | Suffix | Card name                                 | Shelf or frame name                                                 |
|--------|--------|-------------------------------------------|---------------------------------------------------------------------|
| NT3X73 | AA     | Network serial to parallel formatter card | NETC                                                                |
| NT3X74 | AA, CB | Network card processor                    | Combined single-bay network (NETC), NT8X11 dual shelf network (DSN) |
| NT3X75 | AA     | Network P-side message processor card     | NETC, DSN                                                           |
| NT3X76 | AA     | Network clock card                        | NETC, DSN                                                           |
| NT3X86 | AA     | Network serial to parallel formatter card | NETC                                                                |
| NT8X12 | AA     | Network port card                         | DSN                                                                 |
| NT8X13 | AA     | Dual-shelf network crosspoint card        | DSN                                                                 |
| NT8X14 | AA     | Network test code card                    | DSN                                                                 |

### Common procedures

This procedure references the procedure *Replacing a card*.

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

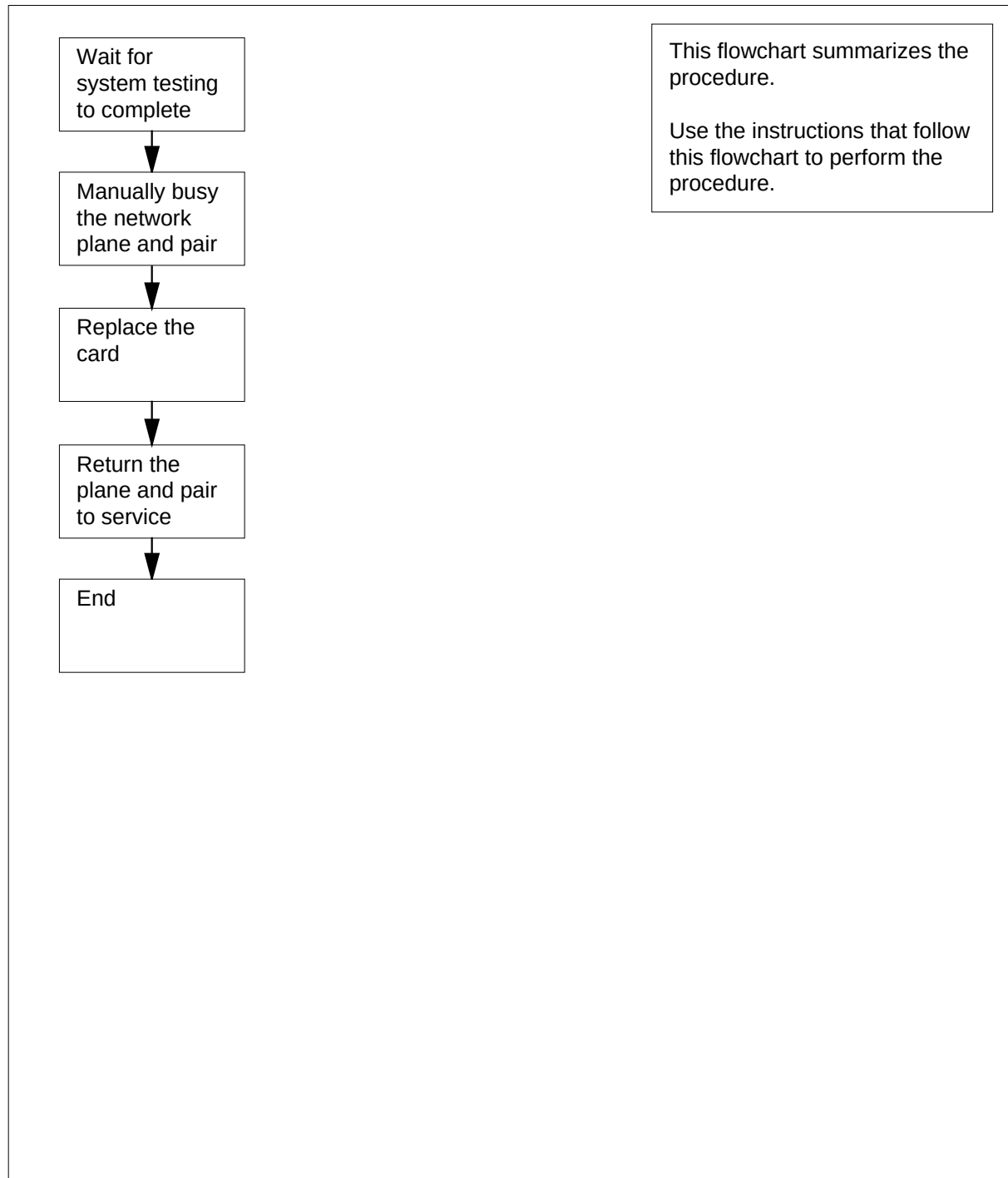
### Action

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

## System, interface, and crosspoint cards in JNET shelves (continued)

---

### Summary of replacing System, interface, and crosspoint cards in JNET shelves



## System, interface, and crosspoint cards in JNET shelves (continued)

### Replacing System, interface, and crosspoint cards in JNET shelves

#### At the MAP terminal

1



#### CAUTION

##### Loss of service

The out-of-service test used in this procedure can cause a momentary alarm in far-end offices. Before you perform this procedure, notify all far-end offices with common channel signaling of a possible momentary alarm.



#### CAUTION

##### Loss of service

This procedure includes instructions to manually busy one plane of a network pair. This results in loss of network redundancy. Perform this procedure only when necessary to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

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

2

To access the NET level of the MAP display, type

**>MAPCI;MTC;NET**

and press the Enter key.

*Example of a MAP display:*

```

Net 11111 11111 22222 22222 33
Plane 01234 56789 01234 56789 01
 0 .S.S
 1 .S.S
JNET:

```

3

Determine the state of the plane and pair for the card you replace.

| If the state       | Do     |
|--------------------|--------|
| is T (testing)     | step 4 |
| is M (manual busy) | step 6 |

## System, interface, and crosspoint cards in JNET shelves (continued)

|   | If the state                                                                                                                                                                                                                                                                                                                                                       | Do      |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|   | is 0 (offline)                                                                                                                                                                                                                                                                                                                                                     | step 11 |
|   | is other than listed here                                                                                                                                                                                                                                                                                                                                          | step 5  |
| 4 | Wait 5 min for the test to complete. When system testing is complete, go to step 3 to evaluate the state of the plane and pair again.                                                                                                                                                                                                                              |         |
| 5 | <p>To manually busy the network module that contains the card to be replaced, type</p> <p><b>&gt;BSY plane_no pair_no</b></p> <p>and press the Enter key.</p> <p>where</p> <p><b>plane_no</b><br/>is the network plane number (0 and 1)</p> <p><b>pair_no</b><br/>is the plane pair number (0 to 31)</p> <p><i>Example of a MAP response:</i></p> <p>bsy 0 00K</p> |         |
|   | If the BSY command                                                                                                                                                                                                                                                                                                                                                 | Do      |
|   | passed                                                                                                                                                                                                                                                                                                                                                             | step 6  |
|   | needs to be confirmed                                                                                                                                                                                                                                                                                                                                              | step 12 |
|   | failed                                                                                                                                                                                                                                                                                                                                                             | step 13 |
| 6 | Wait 30 min to make sure that calls in progress are complete.                                                                                                                                                                                                                                                                                                      |         |
| 7 |                                                                                                                                                                                                                                                                                                                                                                    |         |



### WARNING

#### Static electricity damage

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

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

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

## System, interface, and crosspoint cards in JNET shelves (end)

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

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

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

### *At the MAP terminal*

- 10 To return the network module to service, type  
**>RTS plane\_no pair\_no**  
 and press the Enter key.  
*where*

**plane\_no**  
 is the network plane number (0 and 1)

**pair\_no**  
 is the plane pair number (0 to 31)

*Example of a MAP response:*

```
rts 0 0
Request submitted. Reply expected within 3 mins.
Test Passed
OK
```

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 14 |
| failed             | step 13 |

- 11 Consult operating company personnel to determine why the component is offline. Continue as directed by operating company personnel.
- 12 Consult the next level of support to determine if you can proceed to manually busy the network plane and pair. Continue as directed.
- 13 For additional help, contact the next level of support.
- 14 This procedure is complete.





---

# 10 Office alarm unit card replacement procedures

---

## Introduction

This chapter contains card replacement procedures for the office alarm unit (OAU). The first section in the chapter illustrates OAU shelf layouts.

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

Each procedure contains the following sections:

- Application
- Common procedures
- Action

## Application

This section identifies the OAU card(s) that the replacement procedure covers.

## Common procedures

This section lists common procedures that the OAU card replacement procedures use. A common procedure is a series of steps that you repeat within maintenance procedures. Common procedures appear in the common procedures chapter in this NTP.

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

## Action

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

## **Recording card replacement activities**

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

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

## OAU shelf layouts

---

### Application

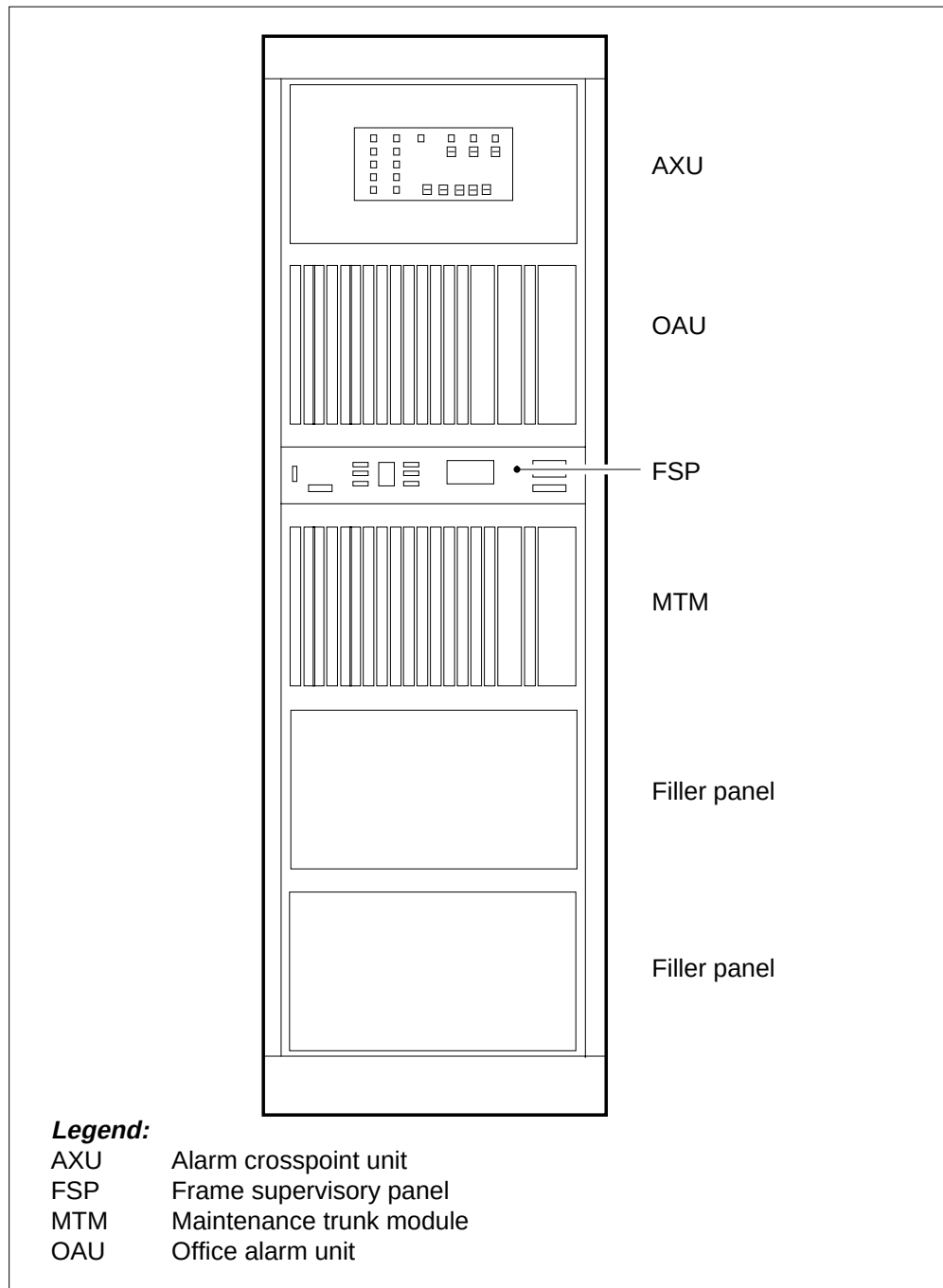
This section shows a frame layout diagram for the trunk module equipment (TME) frame that contains the office alarm unit (OAU). It also shows shelf diagrams for the OAU shelf.

**Note 1:** The frame and shelf layouts on the following pages are standard. There can be some difference in the shelves in your office.

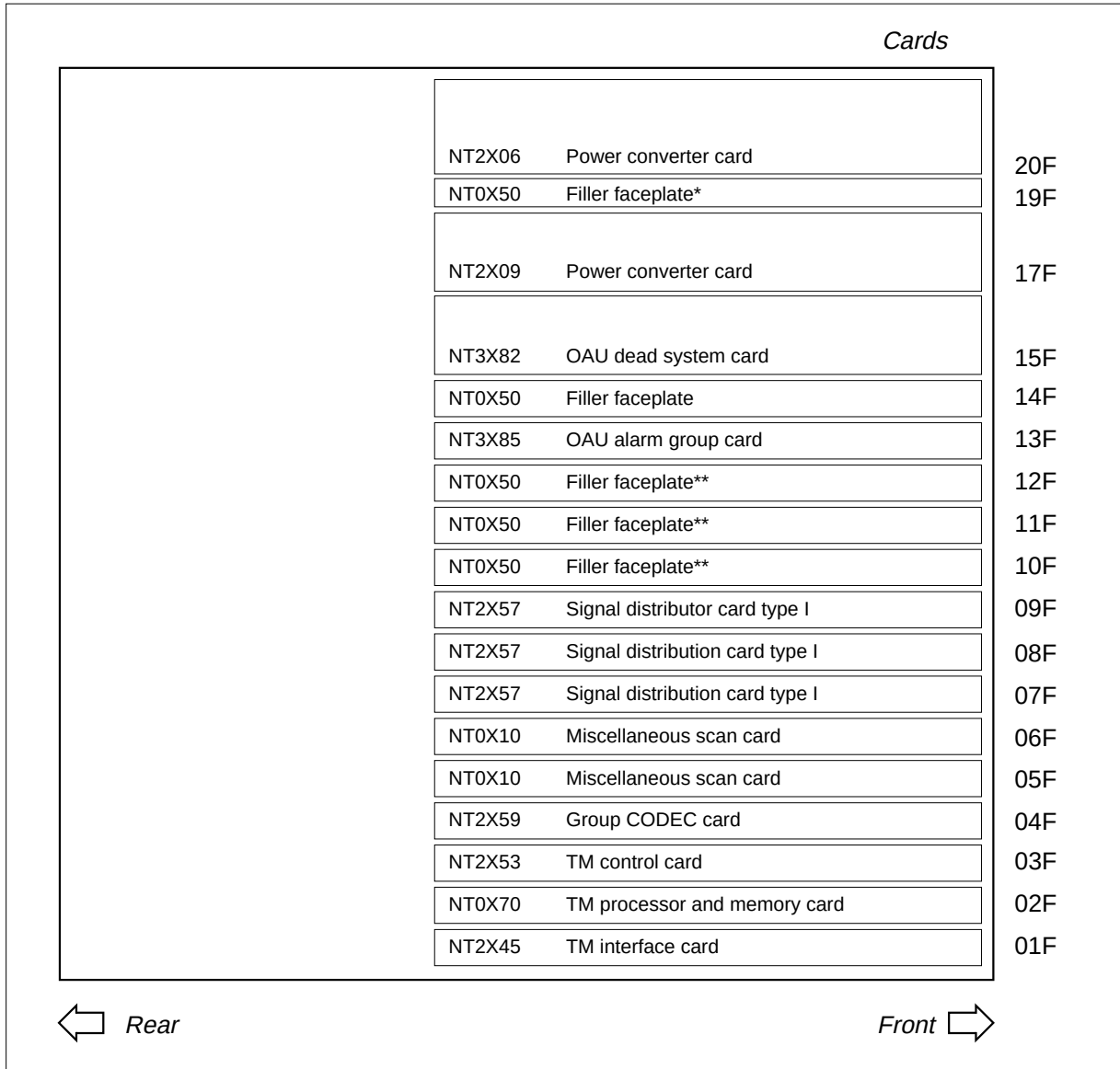
**Note 2:** Slot widths vary, depending on the PM type and the card type. Cards occupy a slot that is 1 in wide (double-slot cards are 2 in wide). The NT2X09 power converter occupies a slot that is 2 in wide. The NT2X06 power converter occupies a slot that is 2.25 in wide. Filler faceplates are 1 in wide, except when there is an asterisk (\*). This indicates that filler faceplates are 0.75 in wide.

## OAU shelf layouts (continued)

Trunk module equipment frame



**Note:** Shelf positions 4 and 18 can be equipped with any combination of the following: integrated service modules (ISM), maintenance trunk modules (MTM), service trunk modules (STM), and trunk modules (TM).

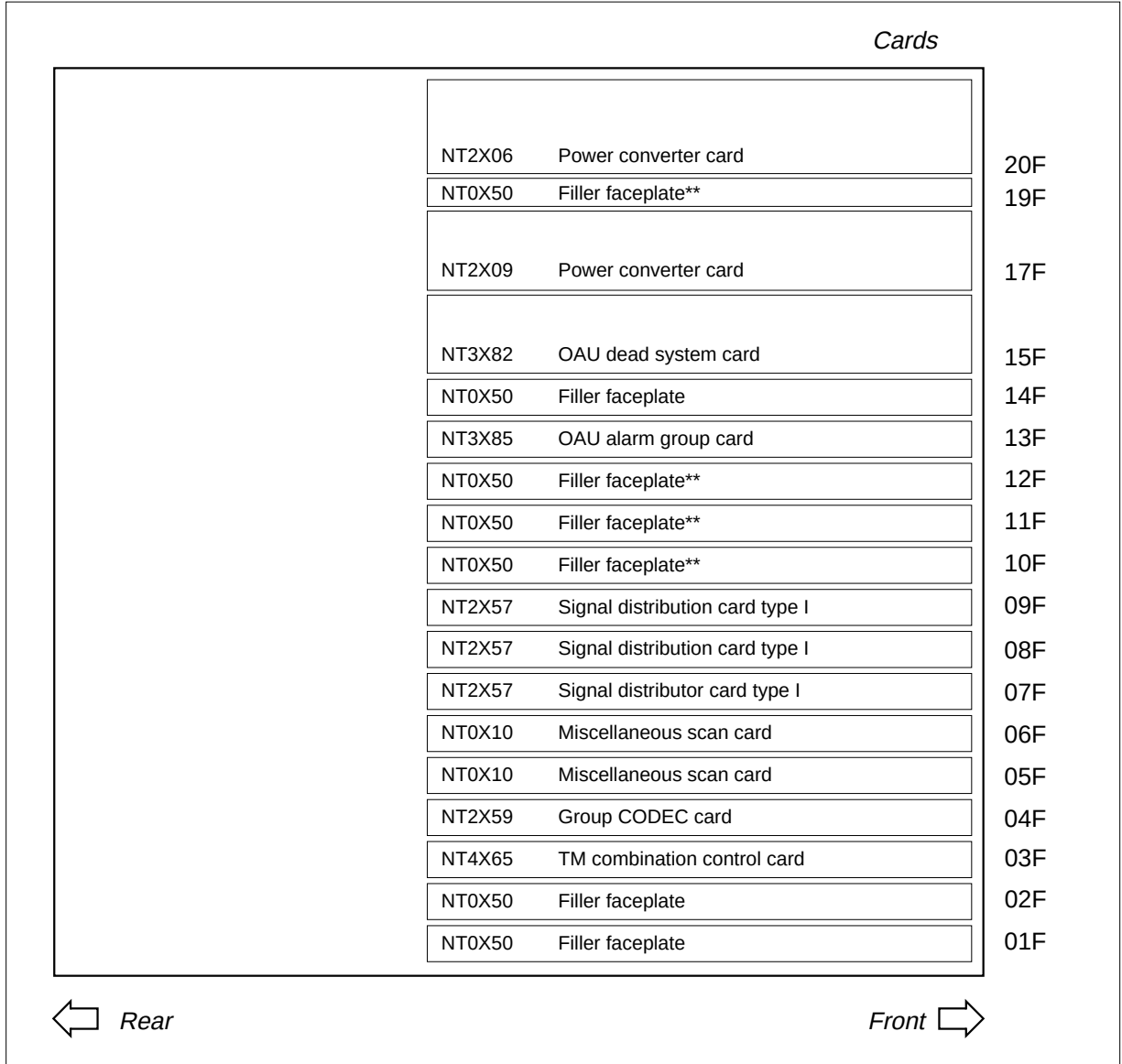
**OAU shelf layouts** (continued)**Office alarm unit with NT0X70 TM processor and memory card**

**Note 1:** Slots marked with double asterisk (\*\*) are available for service circuit or alarm cards.

**Note 2:** Slots 08F, 09F, and 10F are available for office alarm circuit cards (NT2X41, NT2X42, and NT2X43).

## OAU shelf layouts (end)

### Office alarm unit with NT4X65 TM group control card



**Note 1:** Slots marked with double asterisk (\*\*) are available for service circuit or alarm cards.

**Note 2:** Slots 08F, 09F, and 10F can have office alarm circuit cards (NT2X41, NT2X42, and NT2X43).

## Control and circuit cards in the office alarm unit

### Application

Use this procedure to replace the following cards in the office alarm unit (OAU).

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

| PEC    | Suffix                  | Card name                                                       | Shelf or frame name |
|--------|-------------------------|-----------------------------------------------------------------|---------------------|
| NT0X10 | AA                      | Miscellaneous scan detector card                                | OAU                 |
| NT0X70 | AA                      | TM processor card                                               | OAU                 |
| NT2X41 | AA                      | Office alarm circuit #1                                         | OAU                 |
| NT2X42 | AA                      | Office alarm circuit #2                                         | OAU                 |
| NT2X43 | AB                      | Office alarm circuit #3                                         | OAU                 |
| NT2X45 | AB                      | TM interface card                                               | OAU                 |
| NT2X53 | AA                      | TM control card                                                 | OAU                 |
| NT2X57 | AA                      | Signal distribution card, type I                                | OAU                 |
|        | AB                      | Signal distribution card with office alarm unit monitor circuit | OAU                 |
| NT2X59 | AA                      | Group CODEC and tone card                                       | OAU                 |
| NT3X82 | AA, AC, AE, AF, AH, AK, | Office alarm unit dead system with unique audibles card         | OAU                 |
|        | AB, AD, AG, AJ          | Office alarm unit dead system with common audibles card         | OAU                 |
|        | BA                      | LPA dead system with audibles card                              | OAU                 |
| NT3X83 | AA, AB, AC, AD          | Office alarm unit alarm transfer card                           | OAU                 |
|        | BA                      | LP alarm transfer & sending card                                | OAU                 |



## Control and circuit cards in the office alarm unit (continued)

---

| PEC    | Suffix | Card name                            | Shelf or frame name |
|--------|--------|--------------------------------------|---------------------|
| NT3X84 | AA, AB | Office alarm unit alarm sending card | OAU                 |
| NT3X85 | AA, AB | Office alarm unit alarm group card   | OAU                 |
| NT4X65 | AA     | TM combination control card          | OAU                 |

**Note:** The OAU has either the NT4X65 card or the NT0X70, NT2X45, and NT2X53 cards. The NT4X65 card combines the functionality of the NT0X70, NT2X45, and NT2X53 cards.

### Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Loading a PM*

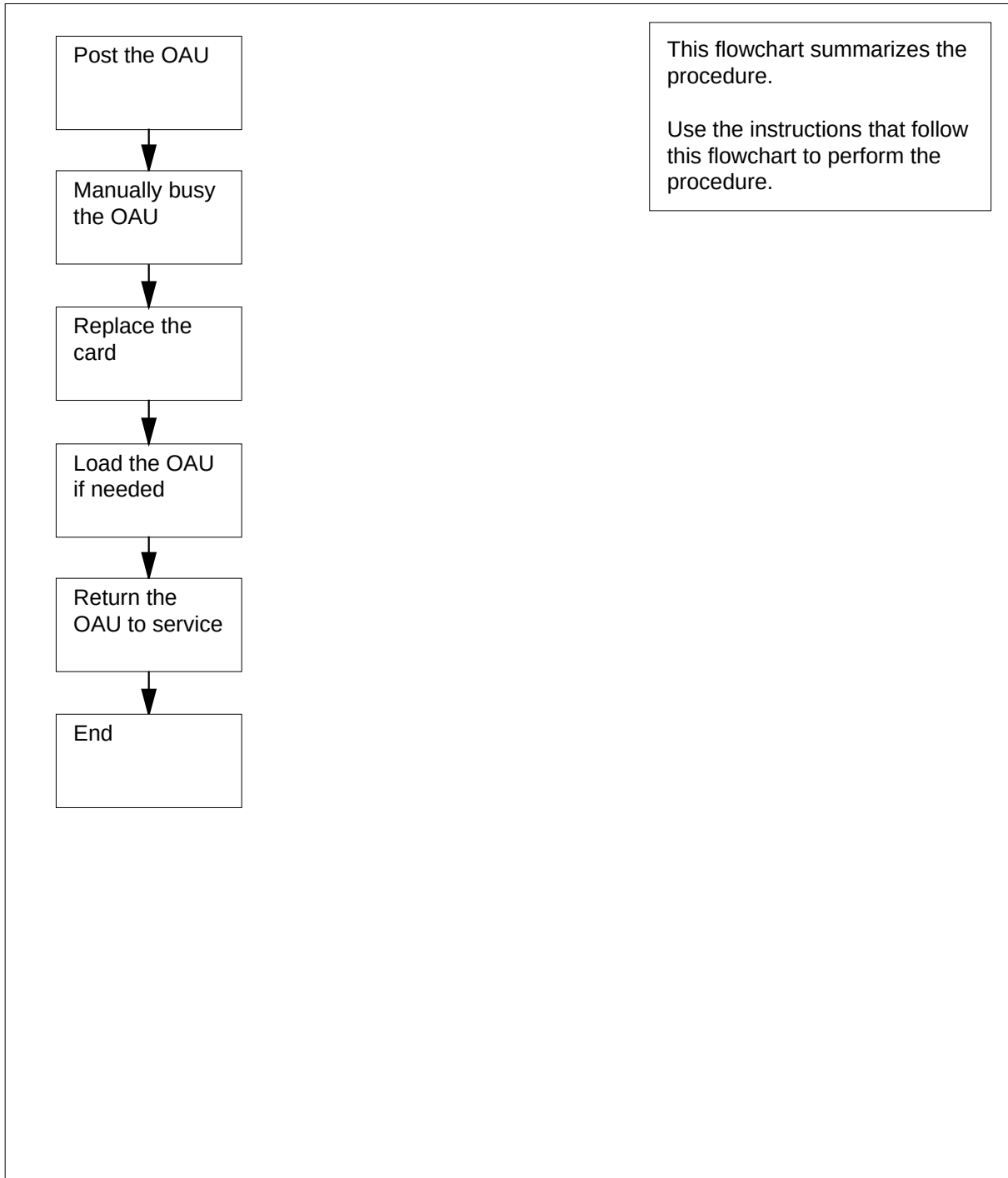
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## Control and circuit cards in the office alarm unit (continued)

### Summary of replacing Control and circuit cards in the office alarm unit



## Control and circuit cards in the office alarm unit (continued)

---

### Replacing Control and circuit cards in the office alarm unit

#### *At the MAP terminal*

1



#### **CAUTION**

##### **Loss of alarm indication**

This procedure includes directions to remove the OAU from service, which renders alarm indicators unavailable. Perform this procedure only if necessary to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card has the same product engineering code (PEC) and PEC suffix as the card you remove.

2

To access the PM level of the MAP display, type

**>PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 1    |      | 6    |      |      | 102  |

3

To post the OAU, type

**>POST OAU pm\_no**

and press the Enter key.

*where*

**pm\_no**

is the number of the PM (0 to 9999)

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 1    | 0    | 6    | 0    | 0    | 102  |
| OAU | 1    | 0    | 0    | 0    | 0    | 0    |
| OAU | 0    | SysB |      |      |      |      |

## Control and circuit cards in the office alarm unit (continued)

- 4 Determine the state of the PM.

**Note:** The PM state appears on the right of the PM number. In the example display in step 3, the PM state is system busy (SysB).

| If the PM                 | Do      |
|---------------------------|---------|
| is OffL                   | step 13 |
| is ManB                   | step 6  |
| is other than listed here | step 5  |

- 5 To manually busy the PM, type

**>BSY**

and press the Enter key.

*Example of a MAP display:*

|     |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|
|     | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  | 0    | 1    | 6    | 0    | 0    | 102  |
| OAU | 0    | 1    | 0    | 0    | 0    | 0    |

```

OAU 0 ManB
bsy
OAU 0 Bsy
OK.
```

### At the shelf

6



#### WARNING

##### Static electricity damage

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

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

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

## Control and circuit cards in the office alarm unit (continued)

- 7 Determine the reason you performed this procedure.

| If a maintenance procedure           | Do     |
|--------------------------------------|--------|
| directed you to this procedure       | step 8 |
| did not direct you to this procedure | step 9 |

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

### *At the MAP terminal*

- 9 Determine the type of card you replaced.

| If the card you                                        | Do      |
|--------------------------------------------------------|---------|
| replaced is the NT0X70, NT2X45, NT2X53, NT2X59, NT4X65 | step 10 |
| replaced is other than listed here                     | step 12 |

- 10 To load the PM, type  
**>LOADPM**  
and press the Enter key.  
*Example of a MAP response:*

OAU 0 LoadPM Passed

| If the LOADPM command | Do      |
|-----------------------|---------|
| passed                | step 12 |
| failed                | step 11 |

- 11 Use the procedure *Loading a PM* in this document to load the PM. Complete the procedure and return to this point.

- 12 To return the PM to service, type

**>RTS**  
and press the Enter key.  
*Example of a MAP response:*

OAU 0 Rts Passed

| If the RTS command | Do      |
|--------------------|---------|
| passed             | step 15 |

**Control and circuit cards  
in the office alarm unit (end)**

---

|           | <b>If the RTS command</b>                                                                            | <b>Do</b> |
|-----------|------------------------------------------------------------------------------------------------------|-----------|
|           | failed                                                                                               | step 14   |
| <b>13</b> | Consult operating company personnel to determine why the component is offline. Continue as directed. |           |
| <b>14</b> | For additional help contact the next level of support.                                               |           |
| <b>15</b> | The procedure is complete.                                                                           |           |

## Power converter cards in the office alarm unit

---

### Application

Use this procedure to replace the following cards in the office alarm unit (OAU).

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

| PEC    | Suffix | Card name            | Shelf or frame name |
|--------|--------|----------------------|---------------------|
| NT2X06 | AB     | Power converter card | OAU                 |
| NT2X09 | AA     | Power converter card | OAU                 |

### Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Loading a PM*

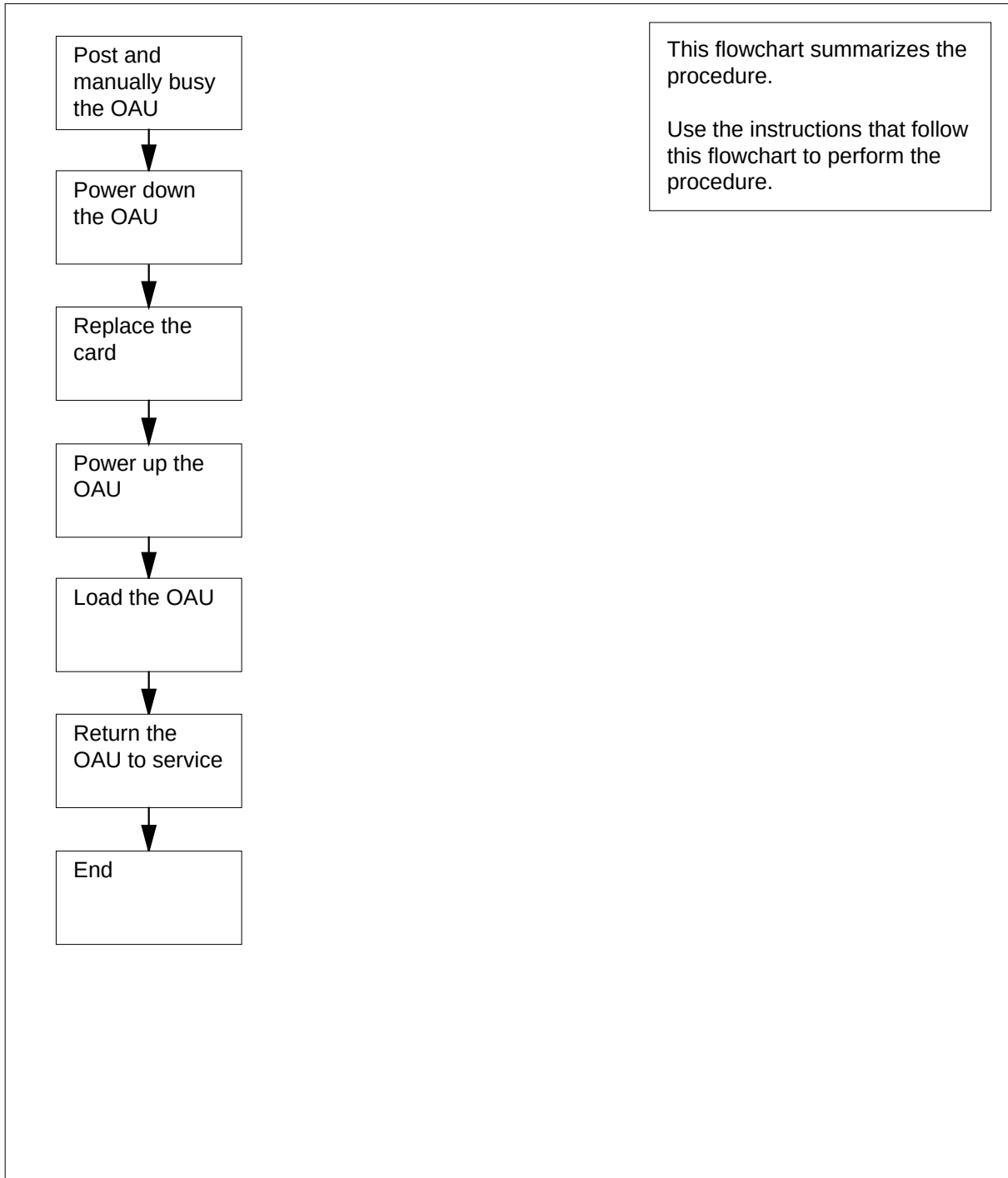
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## Power converter cards in the office alarm unit (continued)

### Summary of replacing Power converter cards in the office alarm unit





## Power converter cards in the office alarm unit (continued)

---

### Replacing Power converter cards in the office alarm unit

#### *At the MAP terminal*

1



#### **CAUTION**

##### **Loss of alarm indication**

This procedure includes directions to remove the OAU from service, which renders alarm indicators unavailable. Perform this procedure only if necessary to restore out of service components. Unless it is urgent, perform this procedure during periods of low traffic only.

Obtain a replacement card. Make sure that the replacement card has the same product engineering code (PEC) and PEC suffix as the card you remove.

2

To access the PM level of the MAP display, type

**>MAPCI ; MTC ; PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 1    |      | 6    |      |      | 102  |

3

To post the OAU, type

**>POST OAU pm\_no**

and press the Enter key.

*where*

**pm\_no**

is the number of the PM (0 to 9999)

*Example of a MAP display:*

## Power converter cards in the office alarm unit (continued)

|     |  |      |      |      |      |      |      |
|-----|--|------|------|------|------|------|------|
|     |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  |  | 1    | 0    | 6    | 0    | 0    | 102  |
| OAU |  | 1    | 0    | 0    | 0    | 0    | 0    |

OAU      0      SysB  
bsy  
OAU 0 Bsy  
OK.

- 4** Determine the state of the PM.

**Note:** The PM state appears on the right of the PM number. In the example display in step 3, the PM state is system busy (SysB).

| If the PM                 | Do      |
|---------------------------|---------|
| is OffL                   | step 18 |
| is ManB                   | step 6  |
| is other than listed here | step 5  |

- 5** To manually busy the PM, type

**>BSY**

and press the Enter key.

*Example of a MAP display:*

|     |  |      |      |      |      |      |      |
|-----|--|------|------|------|------|------|------|
|     |  | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM  |  | 0    | 1    | 6    | 0    | 0    | 102  |
| OAU |  | 0    | 1    | 0    | 0    | 0    | 0    |

OAU      0      ManB  
bsy  
OAU 0 Bsy  
OK.

## Power converter cards in the office alarm unit (continued)

---

### *At the shelf*

6



#### **WARNING**

##### **Static electricity damage**

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

For the power converter you replace, pull and set the handle of the POWER switch down to the OFF position.

- 7 For the other power converter on the shelf, pull and set the handle of the POWER switch down to the OFF position.

- 8 To replace a card, use the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

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

**Note 2:** If the card you replace has switches, make sure that the switches on the replacement card have the same settings.

- 9 Determine the type of supervisory panel.

| <b>If the FSP or MSP</b>       | <b>Do</b> |
|--------------------------------|-----------|
| has circuit breakers           | step 10   |
| does not have circuit breakers | step 11   |

- 10 Power up the converter as follows:

- a Pull and set the handle of the POWER switch up to the ON position.
- b Press and hold the RESET button on the power converter.
- c Set the handle of the converter circuit breaker on the FSP or MSP up until it clicks into place.
- d Release the RESET button.
- e Go to step 12.

- 11 Power up the converter as follows.

- a Pull and set the handle of the POWER switch up to the ON position.
- b Press and hold the RESET button on the power converter until the CONVERTER FAIL LED goes off.
- c Release the RESET button.

- 12 For the other power converter on the shelf, repeat step 9. Go to step 13.

## Power converter cards in the office alarm unit (end)

- 13** Determine the reason you performed this procedure.

| <b>If a maintenance procedure</b>    | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 14   |
| did not direct you to this procedure | step 15   |

- 14** Return to the maintenance procedure that sent you to this procedure and continue as directed.

**At the MAP terminal**

- 15** To load the OAU, type  
**>LOADPM**  
and press the Enter key.  
*Example of a MAP response:*

OAU 0 Load PM Passed

| <b>If the LOADPM command</b> | <b>Do</b> |
|------------------------------|-----------|
| passed                       | step 17   |
| failed                       | step 16   |

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

- 17** To return the PM to service, type  
**>RTS**  
and press the Enter key.  
*Example of a MAP response:*

OAU 0 Rts Passed

| <b>If the RTS command</b> | <b>Do</b> |
|---------------------------|-----------|
| passed                    | step 20   |
| failed                    | step 19   |

- 18** Consult operating company personnel to determine why the component is offline. Continue as directed by office personnel.

- 19** For additional help, contact the next level of support.

- 20** The procedure is complete.



---

# 11 Remote line module card replacement procedures

---

## Introduction

This chapter contains card replacement procedures for the remote line module (RLM). The first section in the chapter provides RLM shelf layouts.

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

Each procedure contains the following sections:

- Application
- Common procedures
- Action

## Application

This section identifies the RLM card(s) the replacement procedures cover.

## Common procedures

This section lists common procedures the RLM card replacement procedures use. A common procedure is a series of steps repeated within maintenance procedures. Common procedures appear in the common procedures chapter in this NTP.

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

## Action

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

**Recording card replacement activities**

Record the following information in office records when you replace cards:

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

## RLM shelf layouts

---

### Application

This module provides a frame layout for the remote line module (RLM) frame. The RLM frame contains line drawers and the remote line controller (RLC). The module provides shelf diagrams for the following:

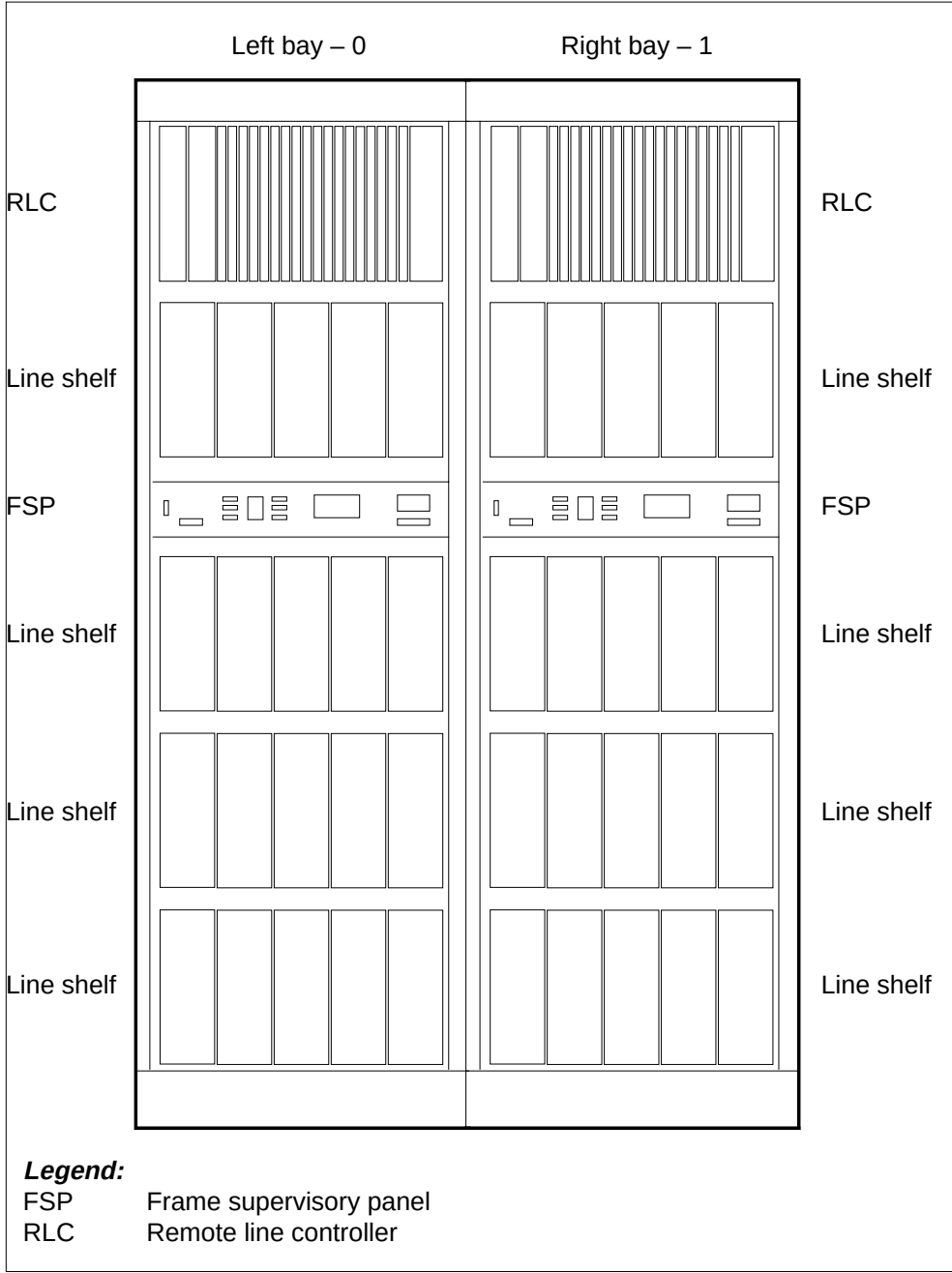
- RLC
- line drawer shelf
- line drawer layout

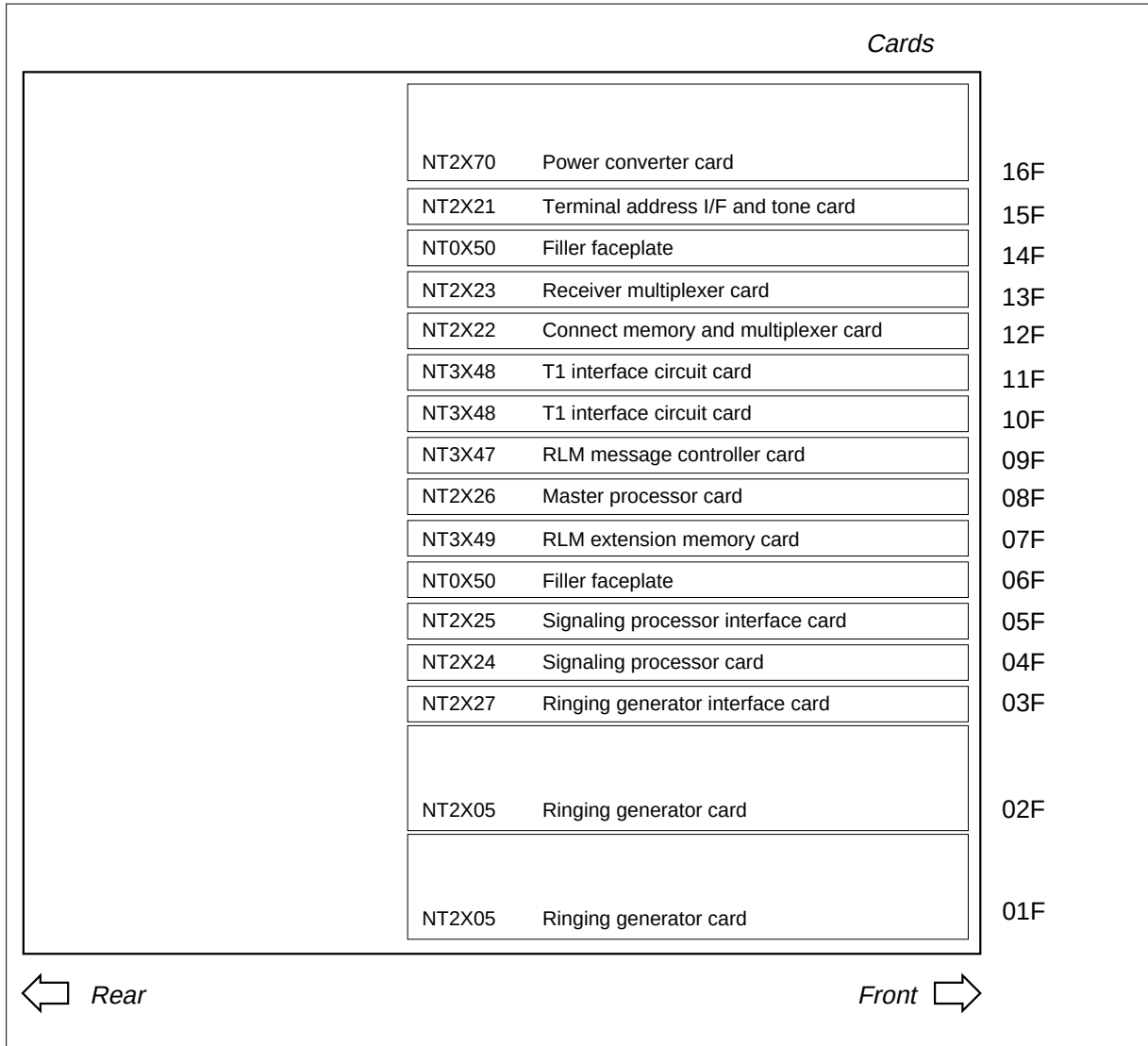
**Note:** The frame and shelf layouts on the following pages are standard. There can be differences in the shelves in your RLM.



RLM shelf layouts (continued)

Remote line module frame (double bay)

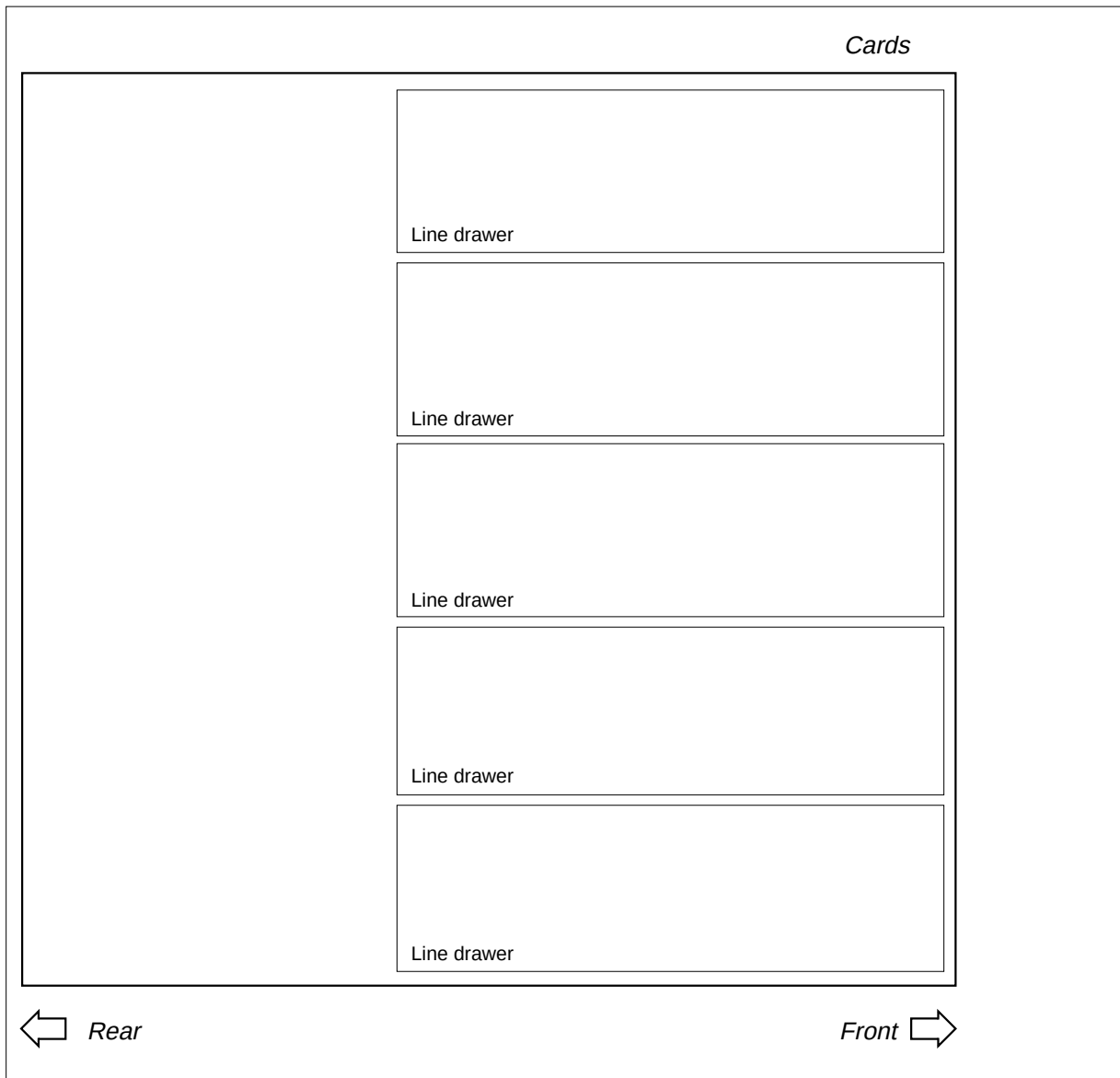


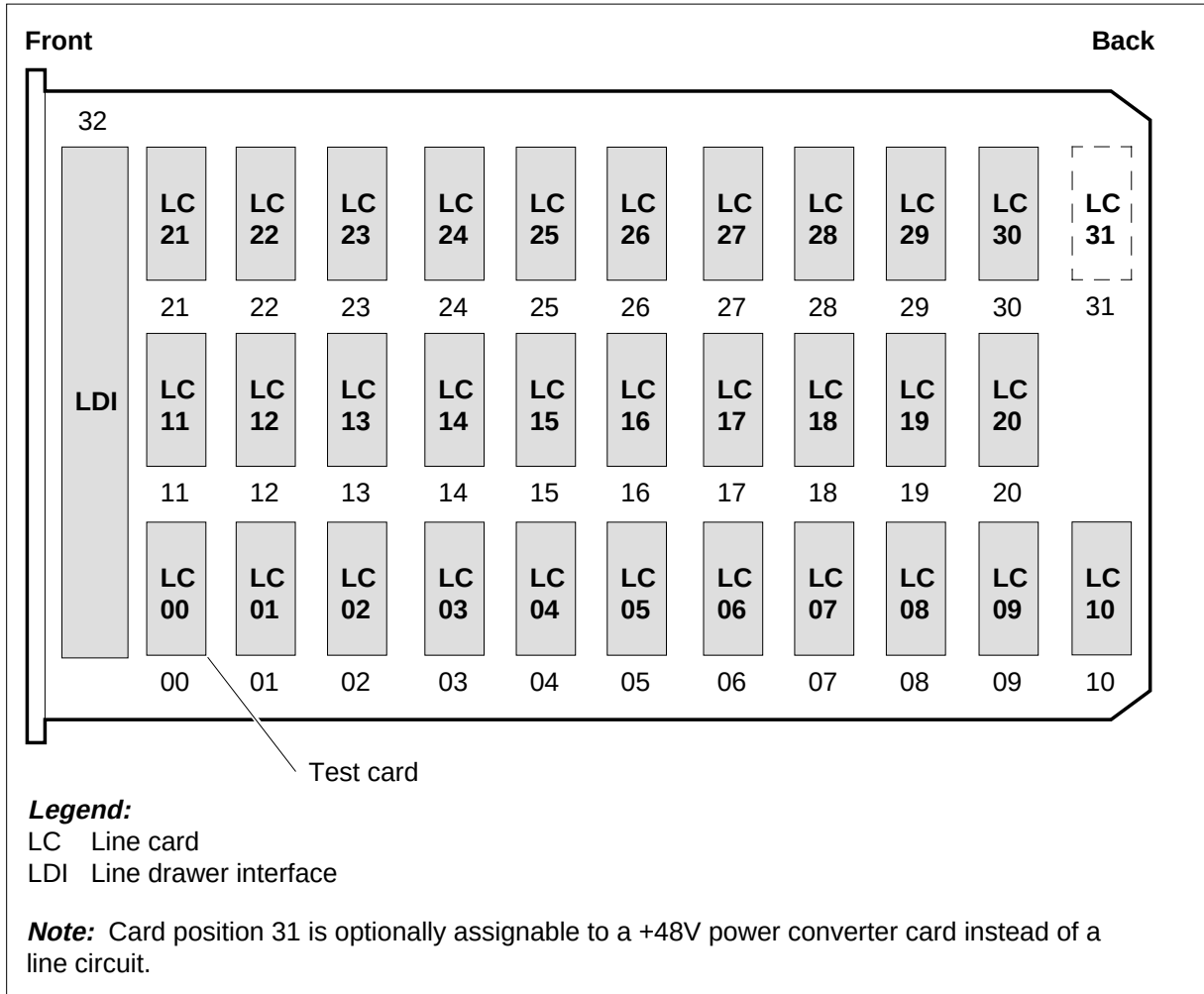
**RLM shelf layouts** (continued)**Remote line controller**

## RLM shelf layouts (continued)

---

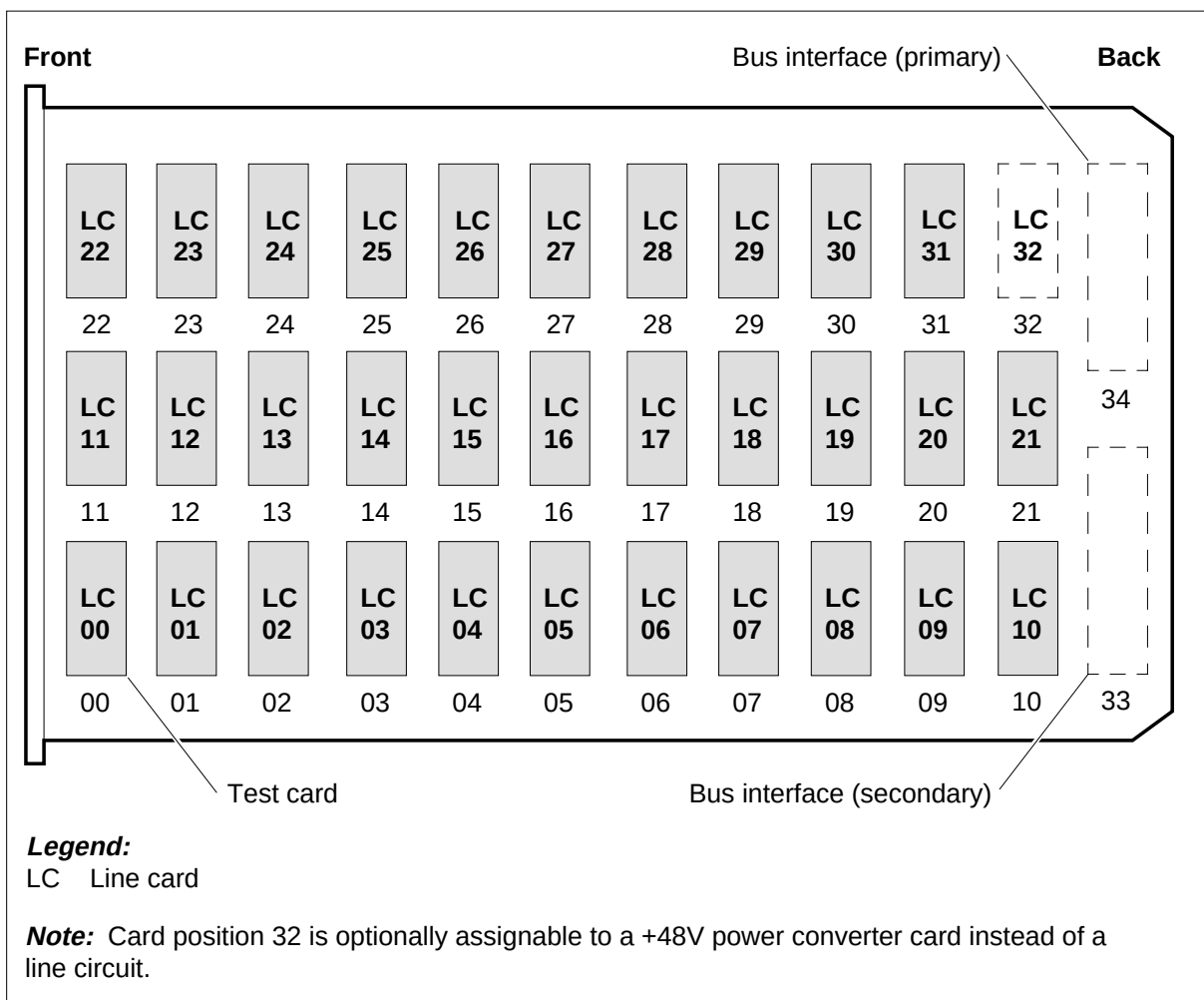
### Line drawer shelf



**RLM shelf layouts** (continued)**Line drawer design (plastic)**

## RLM shelf layouts (end)

### Line drawer design (metal)



## Control complex cards in a remote line controller

### Application

Use this procedure to replace the following cards in a remote line controller (RLC).

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

| PEC    | Suffix | Card name                                                                  | Shelf or frame name |
|--------|--------|----------------------------------------------------------------------------|---------------------|
| NT2X21 | AA     | Terminal address interface and tone generator card                         | RLC                 |
| NT2X22 | AA, AB | Connection memory and transmit MUX card                                    | RLC                 |
| NT2X23 | AA     | Receive MUX card                                                           | RLC                 |
| NT2X24 | AB     | Signaling processor card                                                   | RLC                 |
| NT2X25 | AB     | Signaling processor interface card                                         | RLC                 |
| NT2X26 | AB     | Main processor card                                                        | RLC                 |
| NT2X27 | AA     | Ringling generator interface - 20Hz Bell system card                       | RLC                 |
| NT2X27 | AB     | Ringling generator interface decimonic multifrequency ringing card         | RLC                 |
| NT2X27 | AC     | Ringling generator interface harmonic multifrequency ringing card          | RLC                 |
| NT2X27 | AD     | Ringling generator interface syndronomic 16KHz multifrequency ringing card | RLC                 |

## Control complex cards in a remote line controller (continued)

---

| PEC    | Suffix | Card name                                                    | Shelf or frame name |
|--------|--------|--------------------------------------------------------------|---------------------|
| NT2X27 | AE     | Ringing generator interface SYNC multifrequency ringing card | RLC                 |
| NT3X47 | AA     | RLM message controller card                                  | RLC                 |
| NT3X48 | AA     | T1 interface circuit card                                    | RLC                 |
| NT3X49 | AA     | RLM extension memory card                                    | RLC                 |

### Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Loading a PM*

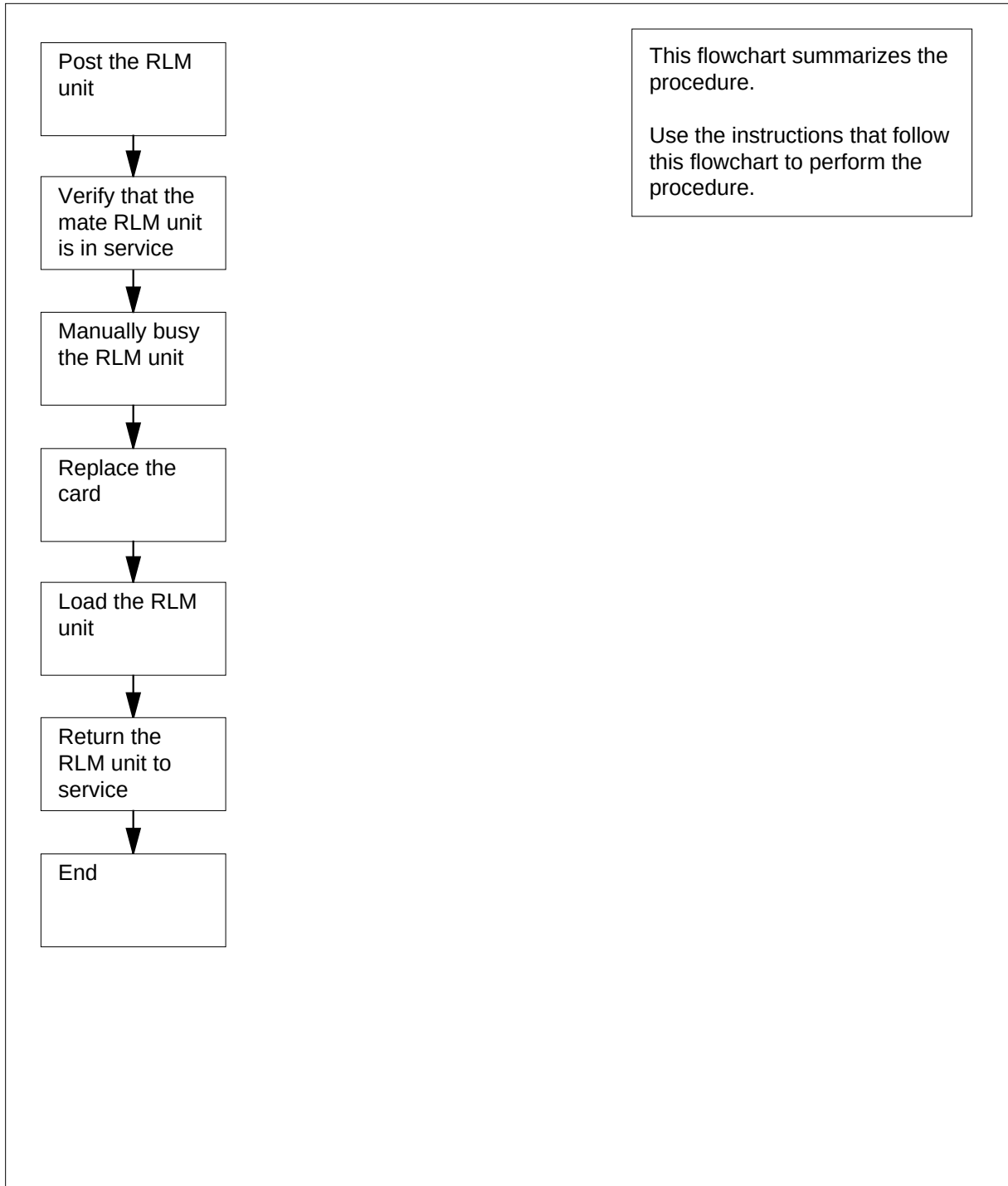
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## Control complex cards in a remote line controller (continued)

### Summary of Replacing Control complex cards in a remote line controller





## Control complex cards in a remote line controller (continued)

### Replacing Control complex cards in a remote line controller



#### **WARNING**

##### **Potential loss of service**

This procedure includes directions to manually busy one or more RLCs. Since manually busy-ing an RLC can cause service degradation, perform this procedure only if necessary to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

#### **At your current location**

- 1 Obtain a replacement card. Make sure that the replacement card has the same PEC and PEC suffix as the card you remove.

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

- 2 To access the PM level of the MAP display, type

**>MAPCI;MTC;PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 3    | 0    | 0    | 0    | 1    | 71   |

- 3 To post the RLM unit, type

**>POST LM site frame\_no unit\_no**

and press the Enter key.

*where*

**site**

is the RLM location (alphanumeric)

**frame\_no**

is the frame number (0 to 511)

**unit\_no**

is the PM unit number (0 or 1)

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 3    | 0    | 0    | 0    | 1    | 71   |
| LM | 0    | 0    | 0    | 0    | 1    | 1    |

|      |      |    |      |      |      |
|------|------|----|------|------|------|
| LM   | HOST | 00 | 0    | ISTb |      |
| RGen | :    | 0  | InSv | 1    | InSv |

## Control complex cards in a remote line controller (continued)

**Note:** In commands and MAP displays, the acronym LM means the same as RLM.

- 4 Determine the state of the RLM unit.

| If the state of the RLM unit | Do      |
|------------------------------|---------|
| is InSv or ISTb              | step 5  |
| is SysB or CBSy              | step 8  |
| is ManB                      | step 9  |
| is Offl                      | step 15 |

- 5 To post the mate RLM unit, type  
**>POST LM site frame\_no unit\_no**  
 and press the Enter key.

where

**site**  
 is the RLM location (alphanumeric)

**frame\_no**  
 is the frame number (0 to 511)

**unit\_no**  
 is the PM unit number (0 or 1)

- 6 Determine the state of the mate RLM unit and the ringing generators (RG) of the unit.

| If                                                             | Do      |
|----------------------------------------------------------------|---------|
| the state of the mate LM is InSv or ISTb and both RGs are InSv | step 7  |
| the mate LM and RG states are other than listed here           | step 16 |

- 7 To post the RLM unit on which you want to replace a card, type  
**>POST LM site frame\_no unit\_no**  
 and press the Enter key.

where

**site**  
 is the RLM location (alphanumeric)

**frame\_no**  
 is the frame number (0 to 511)

## Control complex cards in a remote line controller (continued)

**unit\_no**

is the PM unit number (0 or 1)

- 8 To manually busy the RLM unit, type

**>BSY**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 3    | 1    | 0    | 0    | 0    | 71   |
| LM | 0    | 1    | 0    | 0    | 0    | 1    |

LM HOST 01 0 ManB  
RGen : 0 Standby 1 InSv  
bsy  
OK.

**At the shelf**

9



### WARNING

#### Static electricity damage

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

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

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

- 10 Determine the reason that you perform this procedure.

**If a maintenance procedure**

**Do**

directed you to this procedure

step 11

did not direct you to this  
procedure

step 12

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

## Control complex cards in a remote line controller (end)

---

### *At the MAP terminal*

- 12** To load the RLM unit, type

**>LOADPM**

and press the Enter key.

*Example of a MAP response:*

```
LM HOST 01 0 LoadPM PASSED
```

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

- 14** To return the RLM unit to service, type

**>RTS**

and press the Enter key.

*Example of a MAP response:*

```
rts
OK.
InSvce Tests Initiated
OK.
```

Go to step 18.

- 15** Consult operating company personnel to determine why the component is offline. Continue as directed.
- 16** You cannot manually busy an RLM unit without losing calls in progress. Consult your next level of support to proceed. Continue as directed.
- 17** For additional help, contact the next level of support.
- 18** The procedure is complete.

## Line cards in an RLM line drawer

---

### Application

Use this procedure to replace the following cards in the remote line module (RLM) line drawer.

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

| PEC    | Suffix                       | Card name                | Shelf or frame name |
|--------|------------------------------|--------------------------|---------------------|
| NT2X17 | AA, AB,<br>AC, AD,<br>UK     | Line circuit card type A | RLM line drawer     |
| NT2X18 | AA, AC,<br>AD, AE,<br>AF, AG | Line circuit card type B | RLM line drawer     |

### Common procedures

This procedure refers to *Replacing a line card*.

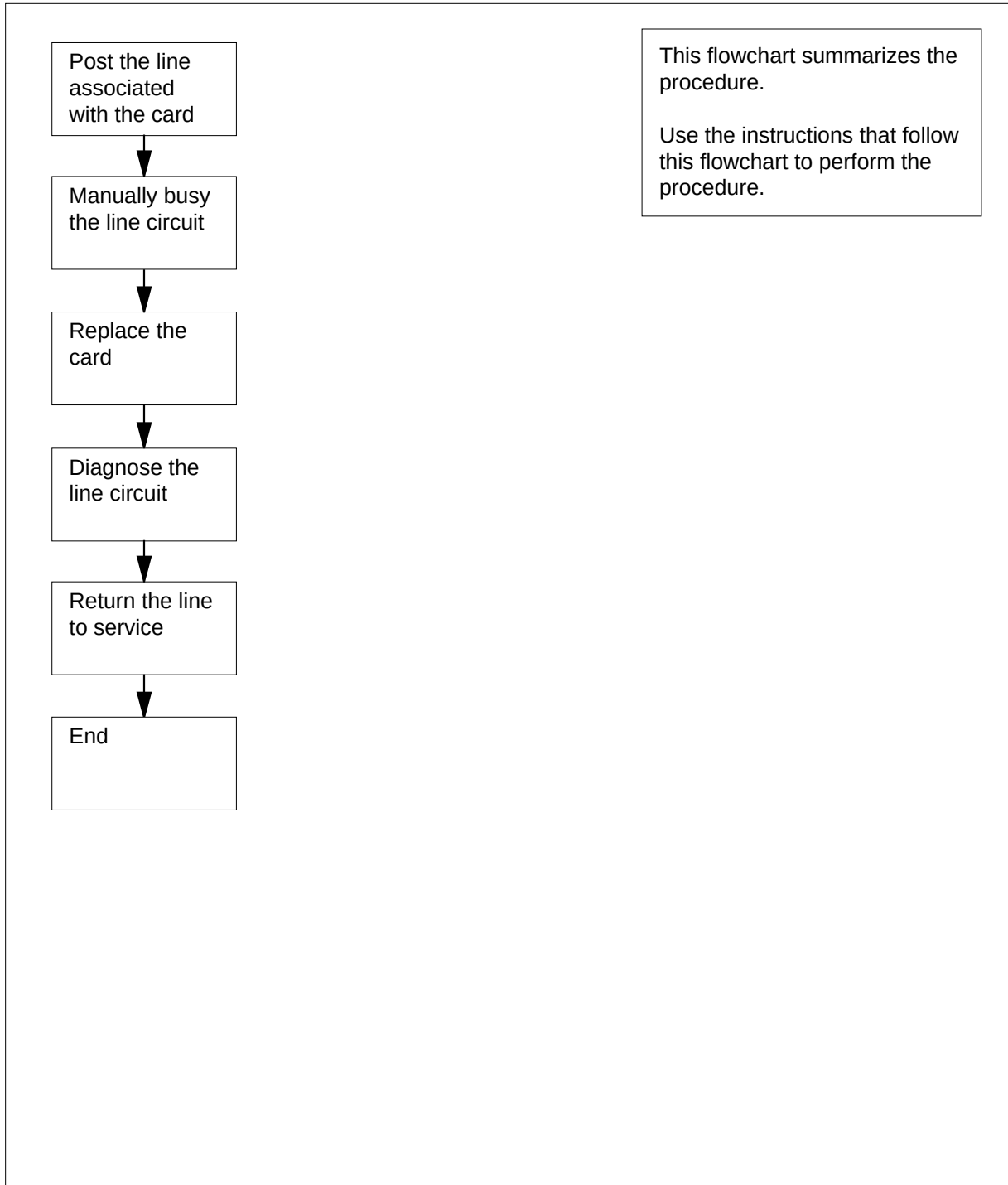
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## Line cards in an RLM line drawer (continued)

### Summary of Replacing Line cards in a RLM line drawer



## Line cards in an RLM line drawer (continued)

---

### Replacing Line cards in an RLM line drawer



#### **WARNING**

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

This procedure includes directions to manually busy one or more lines. Removal of a line from service drops calls in progress. Perform this procedure only if necessary to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

#### ***At your current location***

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

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

- 2 To access the LTP level of the MAP display, type

**>MAPCI;MTC;LNS;LTP**

and press the Enter key.

*Example of a MAP display:*

| POST        | DELQ          | BUSYQ | PREFIX                |
|-------------|---------------|-------|-----------------------|
| LCC PTY RNG | .....LEN..... | DN    | STA F S LTA TE RESULT |

- 3 To post the line that associates with the card you remove, type  
**>POST L site frame\_no unit\_no drawer\_no slot\_no**  
and press the Enter key.

*where*

##### **site**

is the PM location (alphanumeric)

##### **frame\_no**

is the frame number (0 to 511)

##### **unit\_no**

is the PM unit number (0 or 1)

##### **drawer\_no**

is the logical drawer number (0 to 19)

##### **slot\_no**

is the card slot number (0 to 31)

*Example of a MAP display:*

## Line cards in an RLM line drawer (continued)

```

POST DELQ BUSYQ PREFIX
LCC PTY RNG LEN..... DN STA F S LTA TE RESULT
1FR HOST 01 0 01 00 621 1134 SB

```

- 4** Determine the state of the posted line.

| If the state of the line      | Do      |
|-------------------------------|---------|
| is CPB, CPD                   | step 5  |
| is CUT, HAZ, IDL, LO, PLO, SB | step 6  |
| is MB                         | step 7  |
| is NEQ                        | step 12 |
| is DEL, DMB, INB, LMB         | step 13 |

- 5** Wait until the line state changes. Return to step 4.

- 6** To manually busy the line circuit, type

**>BSY**

and press the Enter key.

*Example of a MAP display:*

```

POST 30 DELQ BUSYQ PREFIX
LCC PTY RNG LEN..... DN STA F S LTA TE RESULT
IBN HOST 01 0 00 01 722 3211 MB

```

**Note:** When the BSY command is successful, the line status reads MB.

| If BSY command | Do      |
|----------------|---------|
| passed         | step 7  |
| failed         | step 13 |



## Line cards in an RLM line drawer (continued)

---

### *At the shelf*

7



#### **WARNING**

##### **Static electricity damage**

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

To replace the card, use the procedure *Replacing a line card* in this document. Complete the procedure and return to this point.

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

- 8 Determine the reason you perform this procedure.

| <b>If a maintenance procedure</b>    | <b>Do</b> |
|--------------------------------------|-----------|
| directed you to this procedure       | step 9    |
| did not direct you to this procedure | step 10   |

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

### *At the MAP terminal*

- 10 To perform a diagnostic test on the line, type  
**>DIAG**  
and press the Enter key.

*Example of a MAP response:*

```
COMRUS031BL ***+LINE100 DEC01 17:25:31 8800 PASS LN_DIAG
LEN HOST 01 0 00 02 DN 7223212
DIAGNOSTIC RESULT Card Diagnostic OK
ACTION REQUIRED None
CARD TYPE 2X17AB
```

| <b>If the DIAG command</b> | <b>Do</b> |
|----------------------------|-----------|
| passed                     | step 11   |
| failed                     | step 13   |

- Example of a MAP display:*

| POST | 30  | DELQ |       |            |  |  | BUSYQ    | PREFIX |   |   |     |    |        |
|------|-----|------|-------|------------|--|--|----------|--------|---|---|-----|----|--------|
| LCC  | PTY | RNG  | ..... | LEN.....   |  |  | DN       | STA    | F | S | LTA | TE | RESULT |
| IBN  |     |      | HOST  | 01 0 00 01 |  |  | 722 3211 | IDL    |   |   |     |    |        |

| If RTS command | Do      |
|----------------|---------|
| passed         | step 14 |
| failed         | step 13 |

- 12** Consult operating company personnel to determine why the component is not equipped. Continue as directed by operating company personnel.
- 13** For additional help, contact the next level of support.
- 14** The procedure is complete.

## NT2X05 in a remote line controller

---

### Application

Use this procedure to replace an NT2X05 in a remote line controller (RLC).

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

| PEC    | Suffix | Card name                          | Shelf or frame name |
|--------|--------|------------------------------------|---------------------|
| NT2X05 | AA     | Line module converter<br>+24V card | RLC                 |

**Note:** This procedure refers to the NT2X05 as a ringing generator (RG).

### Common procedures

This procedure refers to *Replacing a card*.

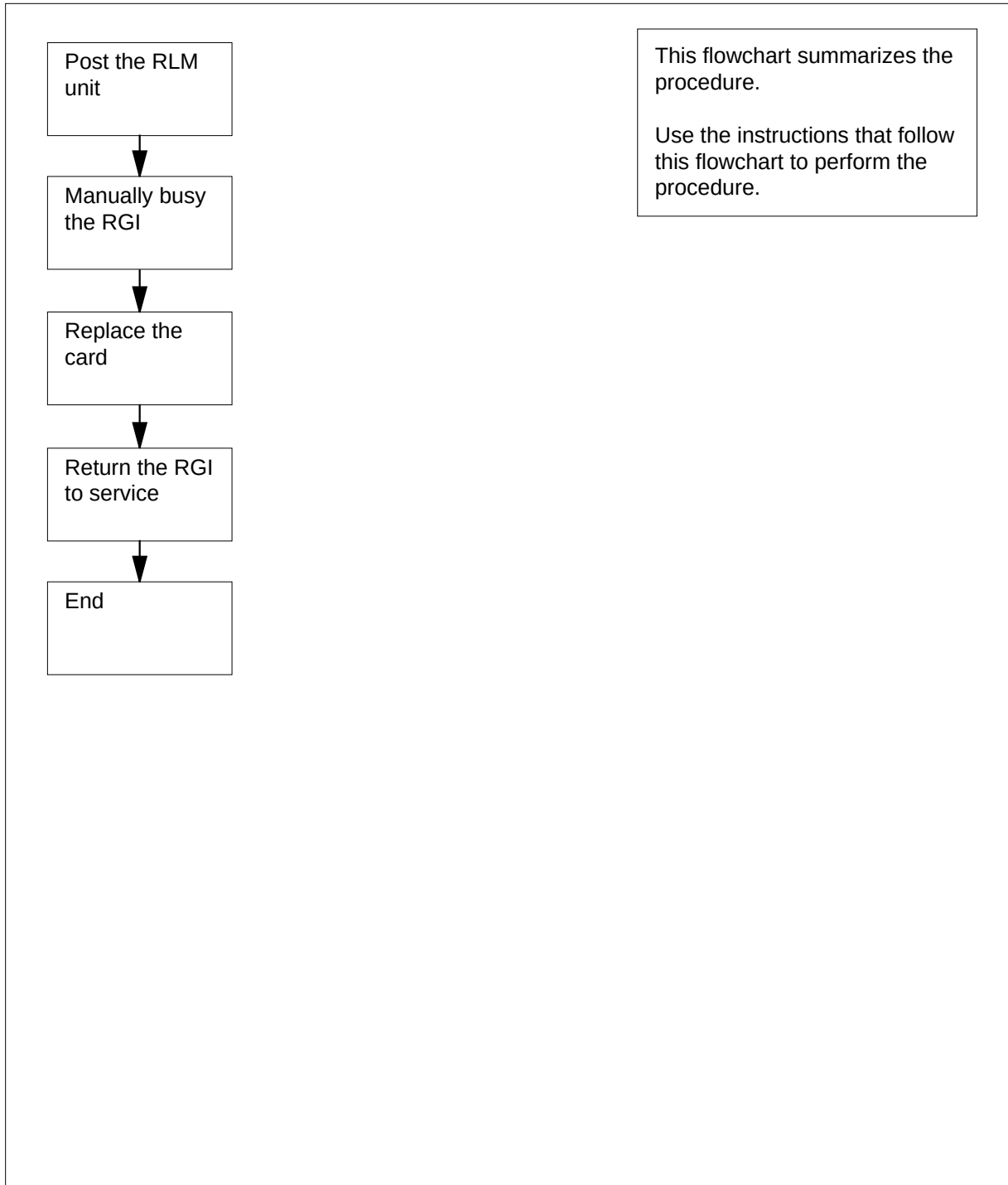
Do not go to the common procedure unless the step-action procedure directs you to go.

### Action

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

## NT2X05 in a remote line controller (continued)

### Summary of Replacing an NT2X05 in a remote line controller



## NT2X05 in a remote line controller (continued)

### Replacing NT2X05 in a remote line controller



#### **WARNING**

##### **Potential loss of service**

This procedure includes directions to manually busy an RG in an RLC . When you manually busy an RG, you remove RG redundancy from the bay. Perform this procedure only if necessary to restore out-of-service components. Unless it is urgent, perform this procedure during periods of low traffic only.

#### **At your current location**

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

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

- 2 To access the PM level of the MAP display, type

**>MAPCI ; MTC ; PM**

and press the Enter key.

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 3    | 0    | 0    | 0    | 0    | 71   |

- 3 To post the RLM unit, type

**>POST LM site frame\_no unit\_no**

and press the Enter key.

*where*

##### **site**

is the RLM location (alphanumeric)

##### **frame\_no**

is the frame number (0 to 511)

##### **unit\_no**

is the PM unit number (0 or 1)

*Example of a MAP display:*

|    |      |      |      |      |      |      |
|----|------|------|------|------|------|------|
|    | SysB | ManB | OffL | CBsy | ISTb | InSv |
| PM | 3    | 0    | 0    | 0    | 1    | 71   |
| LM | 0    | 0    | 0    | 0    | 1    | 6    |

LM HOST 00 0 InSv  
RGen : 0 InSv 1 InSv

**NT2X05****in a remote line controller** (continued)

**Note:** In commands and MAP displays, the system uses the acronym LM instead of RLM.

- 4** Determine the state of the ringing generators.

| <b>If</b>                                                          | <b>Do</b> |
|--------------------------------------------------------------------|-----------|
| either RG is Standby                                               | step 13   |
| the RG you want to replace is InSv and the mate RG is InSv or ISTb | step 5    |
| the RG you want to replace is InSv and the mate RG is ManB or SysB | step 13   |
| the RG you want to replace is ManB                                 | step 7    |
| the RG you want to replace is SysB                                 | step 5    |

- 5** To manually busy the RG, type

**>BSY RGI rgi\_no**

and press the Enter key.

where

**rgi\_no**

is the number (0 or 1) of the ringing generator interface (RGI)

*Example of a MAP response:*

WARNING:CALLS IN RINGING STATE USING THIS RGI WILL BE LOST  
DO YOU WANT TO CONTINUE ?  
Please confirm ("YES", "Y", "NO", or "N"):

- 6** To confirm the command, type

**>YES**

and press the Enter key.

*Example of a MAP response:*

OK

## NT2X05

### in a remote line controller (continued)

---

#### *At the shelf*

7



#### **WARNING**

##### **Static electricity damage**

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

Pull and set the handle of the RG POWER switch down to the OFF position.

- 8 To replace a card, use the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

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

**Note 2:** If the card you replace has switches, make sure that the switches on the replacement card have the same settings.

- 9 Power up the RG, as follows:
- a Pull and set the handle of the POWER switch up to the ON position.
  - b Press and hold the RESET button on the ringing generator.
  - c Set the handle of the converter circuit breaker on the FSP or MSP up until the handle clicks into place.
  - d Release the RESET button.
- 10 Determine the reason you perform this procedure.

---

| If a maintenance procedure | Do |
|----------------------------|----|
|----------------------------|----|

---

|                                |         |
|--------------------------------|---------|
| directed you to this procedure | step 11 |
|--------------------------------|---------|

|                                      |         |
|--------------------------------------|---------|
| did not direct you to this procedure | step 12 |
|--------------------------------------|---------|

---

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

#### *At the MAP terminal*

- 12 To return the RGI to service, type
- ```
>RTS RGI rgi_no
```
- and press the Enter key.
- where*

NT2X05
in a remote line controller (end)

rgi_no

is the number (0 or 1) of the RGI

Example of a MAP response:

OK.

Go to step 15.

- 13** When you manually busy the RG in use, you must disable all RGs in the RLM bay. Consult operating company personnel or the next level of support to determine how to proceed. Continue as directed.
- 14** For additional help, contact the next level of support.
- 15** The procedure is complete.

NT2X70 in a remote line controller

Application

Use this procedure to replace the following cards in a remote line controller (RLC).

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

PEC	Suffix	Card name	Shelf or frame name
NT2X70	AA, AB, AC, AD, BA, DA, EA	Power converter card	RLC

Common procedures

This procedure refers to the following common procedures:

- *Replacing a card*
- *Loading a PM*

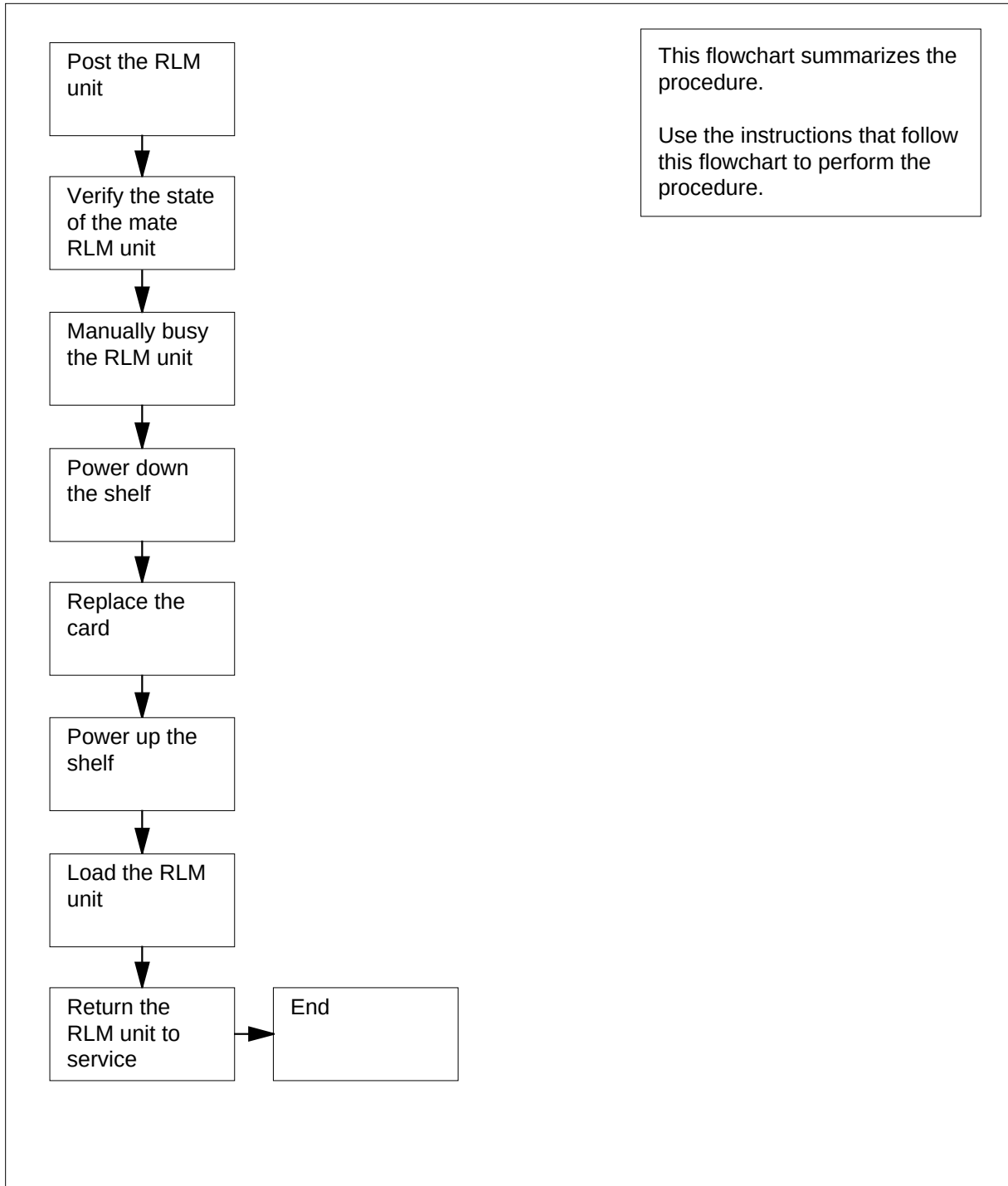
Do not go to the common procedure unless the step-action procedure directs you to go.

Action

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

NT2X70 in a remote line controller (continued)

Summary of Replacing an NT2X70 in a remote line controller



NT2X70 in a remote line controller (continued)

Replacing an NT2X70 in a remote line controller



WARNING

Potential loss of service

This procedure includes directions to manually busy one or more RLCs. Since manually busy-ing an RLC can cause service degradation, perform this procedure only if necessary to restore out of service components. Unless it is urgent, perform this procedure during periods of low traffic only.

At your current location

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

At the MAP terminal

- 2 To access the PM level of the MAP display, type

>MAPCI;MTC;PM

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	3	0	0	0	1	71

- 3 To post the RLM unit, type

>POST LM site frame_no unit_no

and press the Enter key.

where

site

is the RLM location (alphanumeric)

frame_no

is the frame number (0 to 511)

unit_no

is the PM unit number (0 or 1)

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	3	0	0	0	1	71
LM	0	0	0	0	1	1

LM HOST 00 0 ISTb
RGen : 0 InSv 1 InSv

NT2X70

in a remote line controller (continued)

Note: In commands and MAP displays, the system uses the acronym LM instead of RLM.

- 4 Determine the state of the RLM unit.

If the state of the RLM unit	Do
is InSv or ISTb	step 5
is SysB or CBSy	step 8
is ManB	step 9
is Offl	step 18

- 5 To post the mate RLM unit, type
>POST LM site frame_no unit_no
 and press the Enter key.

where

site
 is the RLM location (alphanumeric)

frame_no
 is the frame number (0 to 511)

unit_no
 is the PM unit number (0 or 1)

- 6 Determine the state of the mate RLM unit and the ringing generators (RG) of the unit.

If	Do
the state of the mate LM is InSv or ISTb and both RGs are InSv	step 7
the mate LM and RG states are other than listed here	step 19

- 7 To post the RLM unit on which you want to replace a card, type
>POST LM site frame_no unit_no
 and press the Enter key.

where

site
 is the RLM location (alphanumeric)

frame_no
 is the frame number (0 to 511)

NT2X70 in a remote line controller (continued)

unit_no

is the PM unit number (0 or 1)

- 8 To manually busy the RLM unit, type

>BSY

and press the Enter key.

Example of a MAP display:

	SysB	ManB	OffL	CBsy	ISTb	InSv
PM	3	1	0	0	0	71
LM	0	1	0	0	0	1

LM HOST 01 0 ManB
RGen : 0 Standby 1 InSv
bsy
OK.

At the shelf

- 9



WARNING

Static electricity damage

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

Pull and set the handle of the power converter POWER switch down to the OFF position.

- 10 To replace the card, use the procedure *Replacing a card* in this document. Complete the procedure and return to this point.

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

Note 2: If the card you replace has switches, make sure that the switches on the replacement card have the same settings.

- 11 The next action depends on the power converter version and the type of supervisory panel.

- 12 Power up the converter.

- a Pull and set the handle of the POWER switch up to the ON position.
- b Press and hold the RESET button on the power converter.
- c Set the handle of the converter circuit breaker on the FSP or MSP up until the handle clicks into place.
- d Release the RESET button.

NT2X70 in a remote line controller (end)

- 13** The next action depends on the reason you perform this procedure.

If a maintenance procedure	Do
directed you to this procedure	step 14
did not direct you to this procedure	step 15

- 14** Return to the maintenance procedure that sent you to this procedure and continue as directed.

At the MAP terminal

- 15** To load the RLM unit, type

>LOADPM

and press the Enter key.

Example of a MAP response:

```
LM HOST 01 0 LoadPM PASSED
```

- 16** Use the procedure *Loading a PM* in this document to load the RLM unit. Complete the procedure and return to this point.

- 17** To return the RLM unit to service, type

>RTS

and press the Enter key.

Example of a MAP response:

```
rts
OK.
InSvce Tests Initiated
OK.
```

Go to step 21.

- 18** Consult operating company personnel to determine why the component is offline. Continue as directed.
- 19** When you manually busy the RLC, the system drops calls in progress. Consult the next level of support to determine how to proceed. Continue as directed.
- 20** For additional help, contact the next level of support.
- 21** The procedure is complete.

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