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DMS-100 Family

North American DMS-100

Card Replacement Procedures

Volume 2 of 7

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DMS-100 Family

North American DMS-100

Card Replacement Procedures

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NTMX75 in an RSC-S (DS-1) Model B RCC2 Vol. 7, 1-136
NTMX75 in an RSC-S (PCM-30) Model A RCO2 Vol. 7, 1-144
NTMX75 in an RSC-S (PCM-30) Model B RCO2 Vol. 7, 1-153
NTMX75 in an SMA2 Vol. 7, 1-162
NTMX76 in an RSC-M Vol. 7, 1-168
NTMX76 in an RSC RCC2 Vol. 7, 1-175
NTMX76 in an RSC-S (DS-1) Model A RCC2 Vol. 7, 1-182
NTMX76 in an RSC-S (DS-1) Model B RCC2 Vol. 7, 1-188
NTMX76 in an RSC-S (PCM-30) Model A RCO2 Vol. 7, 1-195
NTMX76 in an RSC-S (PCM-30) Model B RCO2 Vol. 7, 1-205
NTMX76 in an SMA2 Vol. 7, 1-214
NTMX77 in an RSC Vol. 7, 1-221
NTMX77 in an RSC-M Vol. 7, 1-234
NTMX77 in an RSC-S (DS-1) Model A RCC2 Vol. 7, 1-241
NTMX77 in an RSC-S (DS-1) Model B RCC2 Vol. 7, 1-254
NTMX77 in an RSC-S (PCM-30) Model A RCO2 Vol. 7, 1-267
NTMX77 in an RSC-S (PCM-30) Model B RCO2 Vol. 7, 1-280
NTMX77 in an SMS Vol. 7, 1-293
NTMX77 in an SMS-R Vol. 7, 1-306

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

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

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

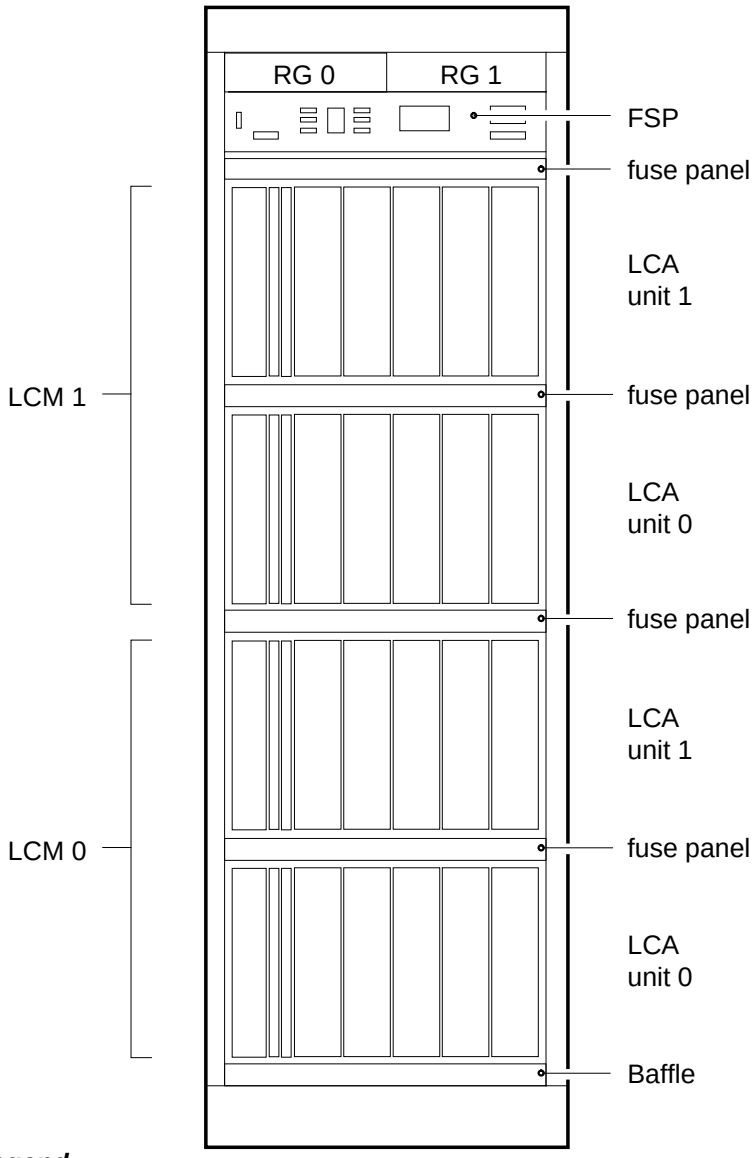
Note 1: The frame and shelf layouts on the following pages are standard. The shelves in your office can have differences.

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

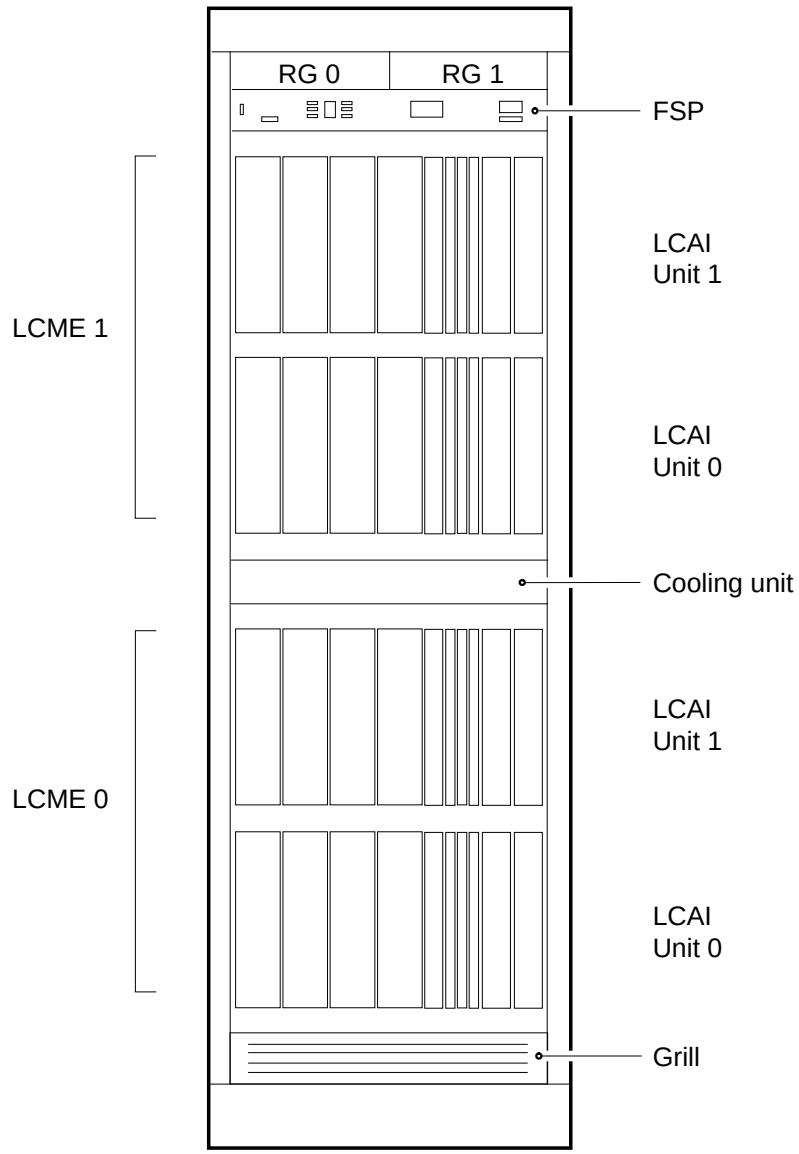


Legend:

FSP	Frame supervisory panel
LCA	Line concentrating array
LCM	Line concentrating module
RG	Ringing generator

LCM shelf layouts (continued)

Frame layout of the ISDN LCE frame

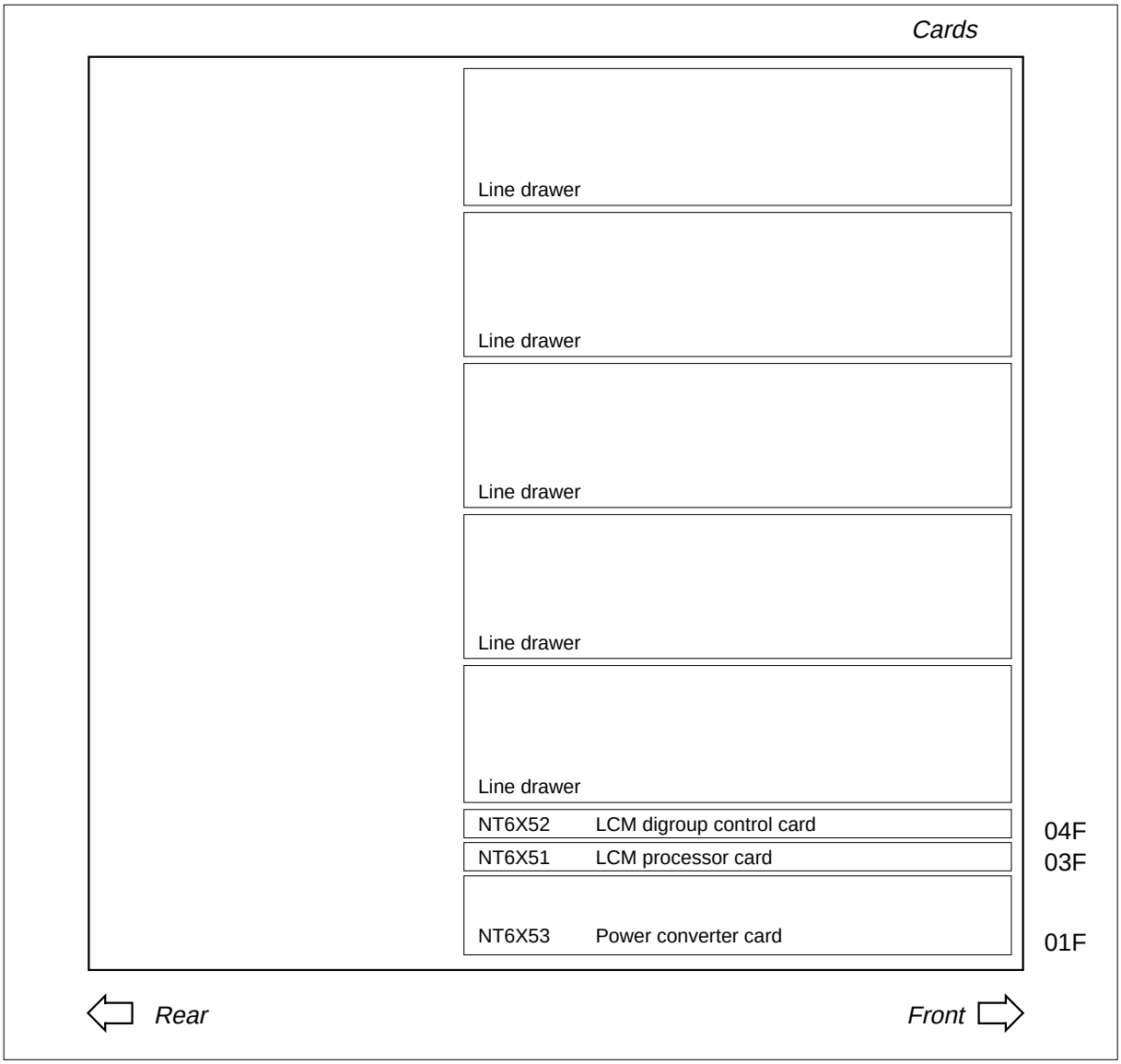


Legend:

FSP	Frame supervisory panel	LCME	Enhanced ISDN line concentrating module
LCAI	ISDN line concentrating array	RG	Ringing generators

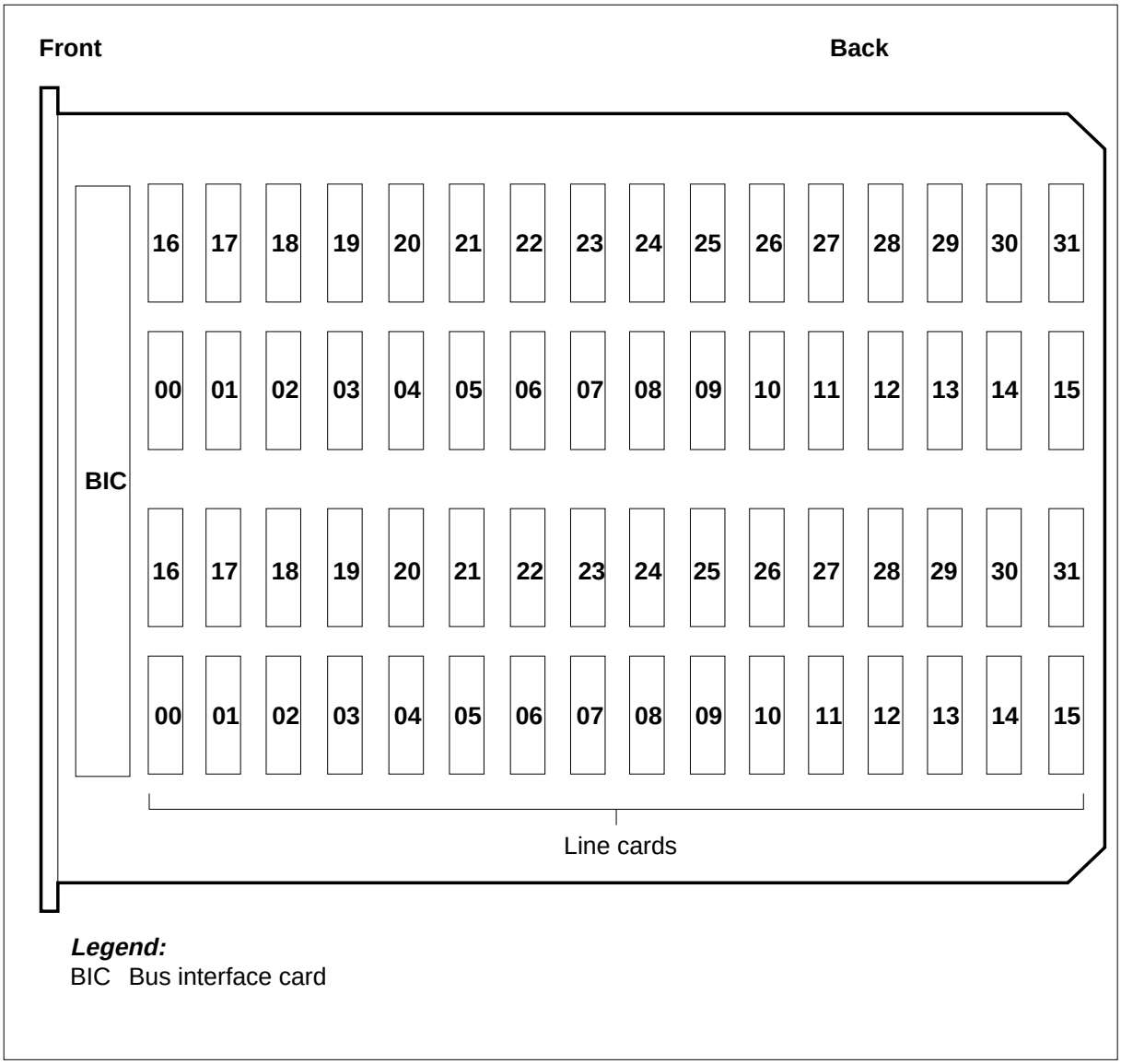
LCM shelf layouts (continued)

Shelf layout of the LCM



LCM shelf layouts (continued)

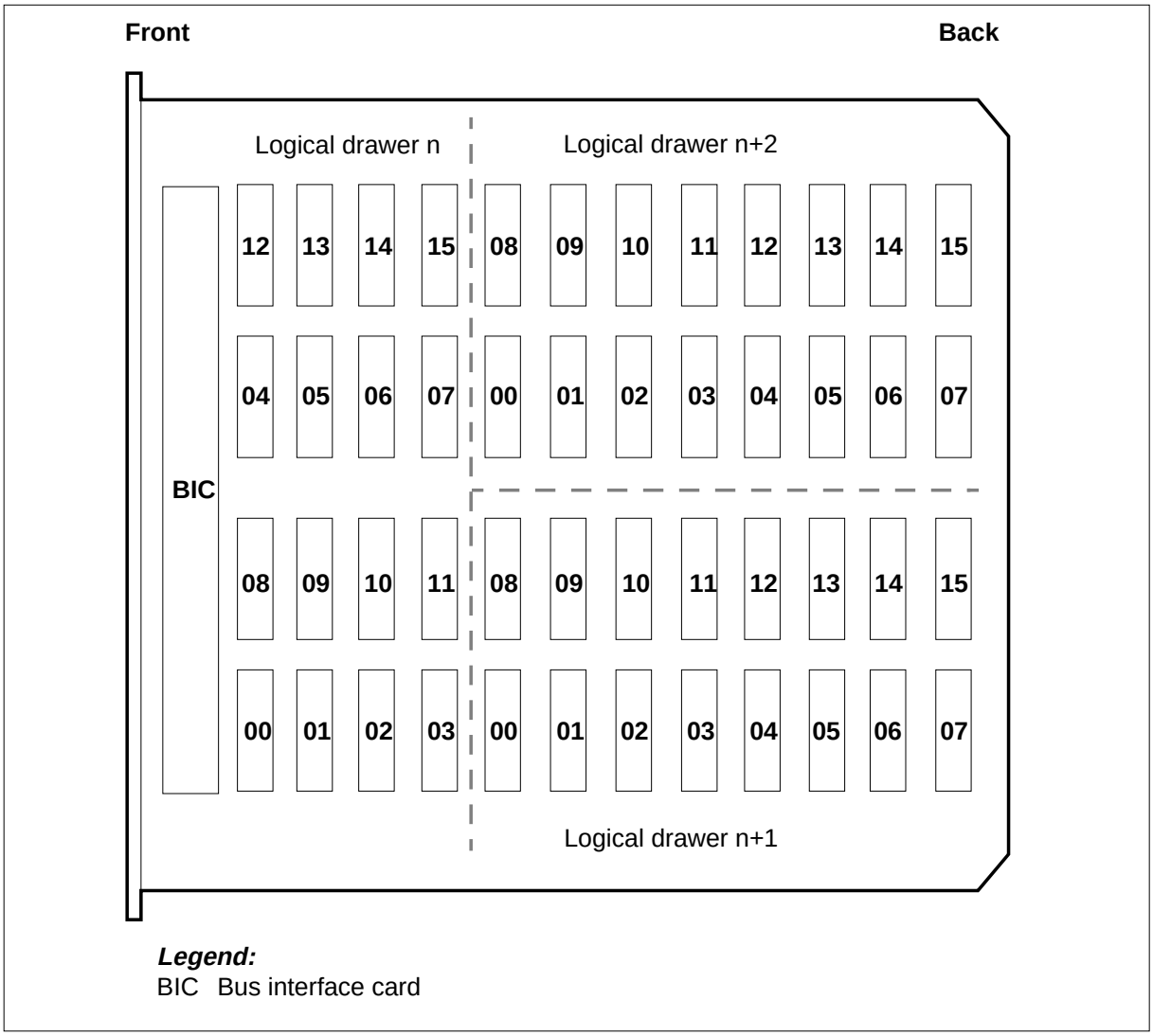
Drawer layout of the LCM line drawer



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

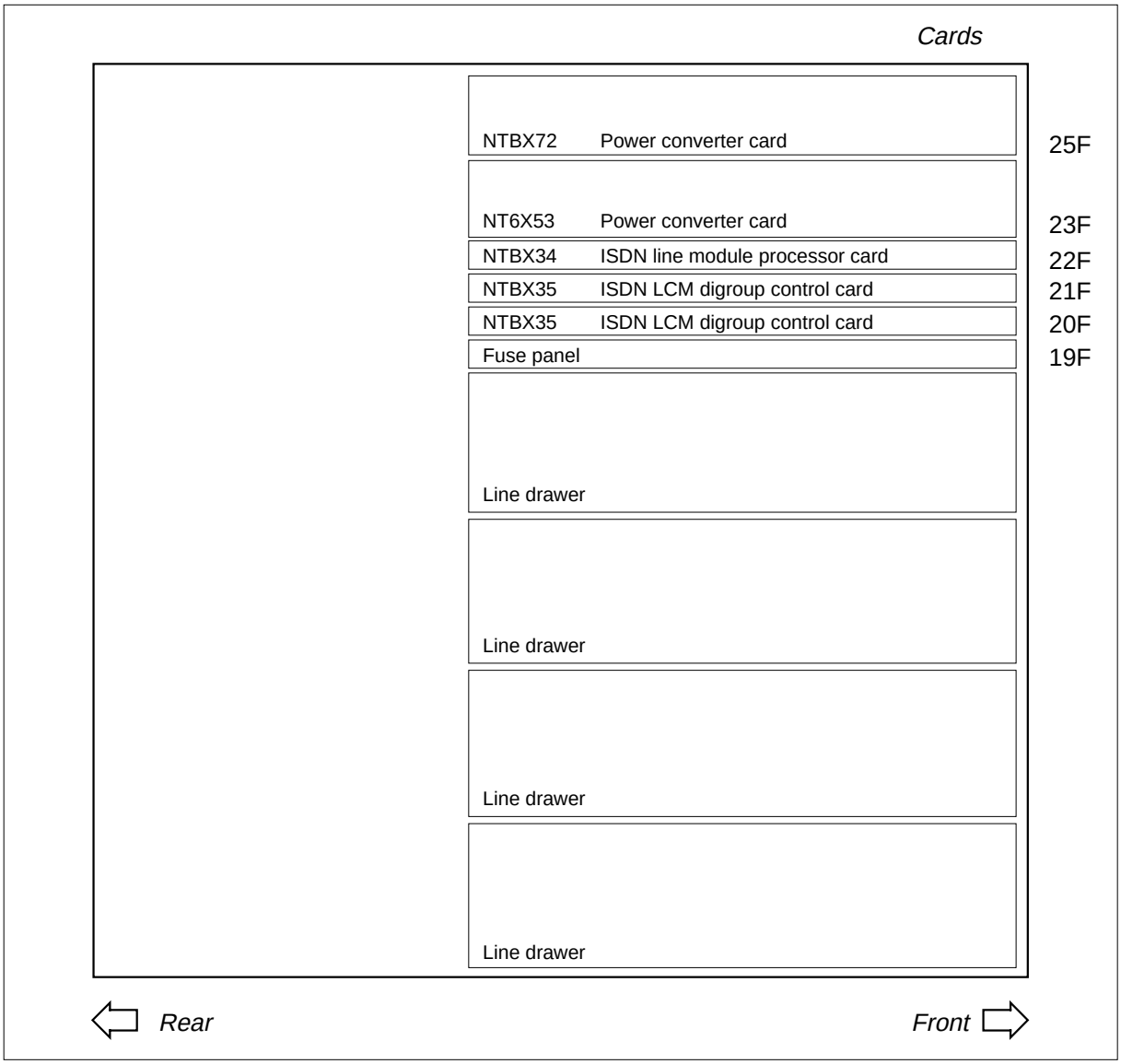


Legend:
BIC Bus interface card

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

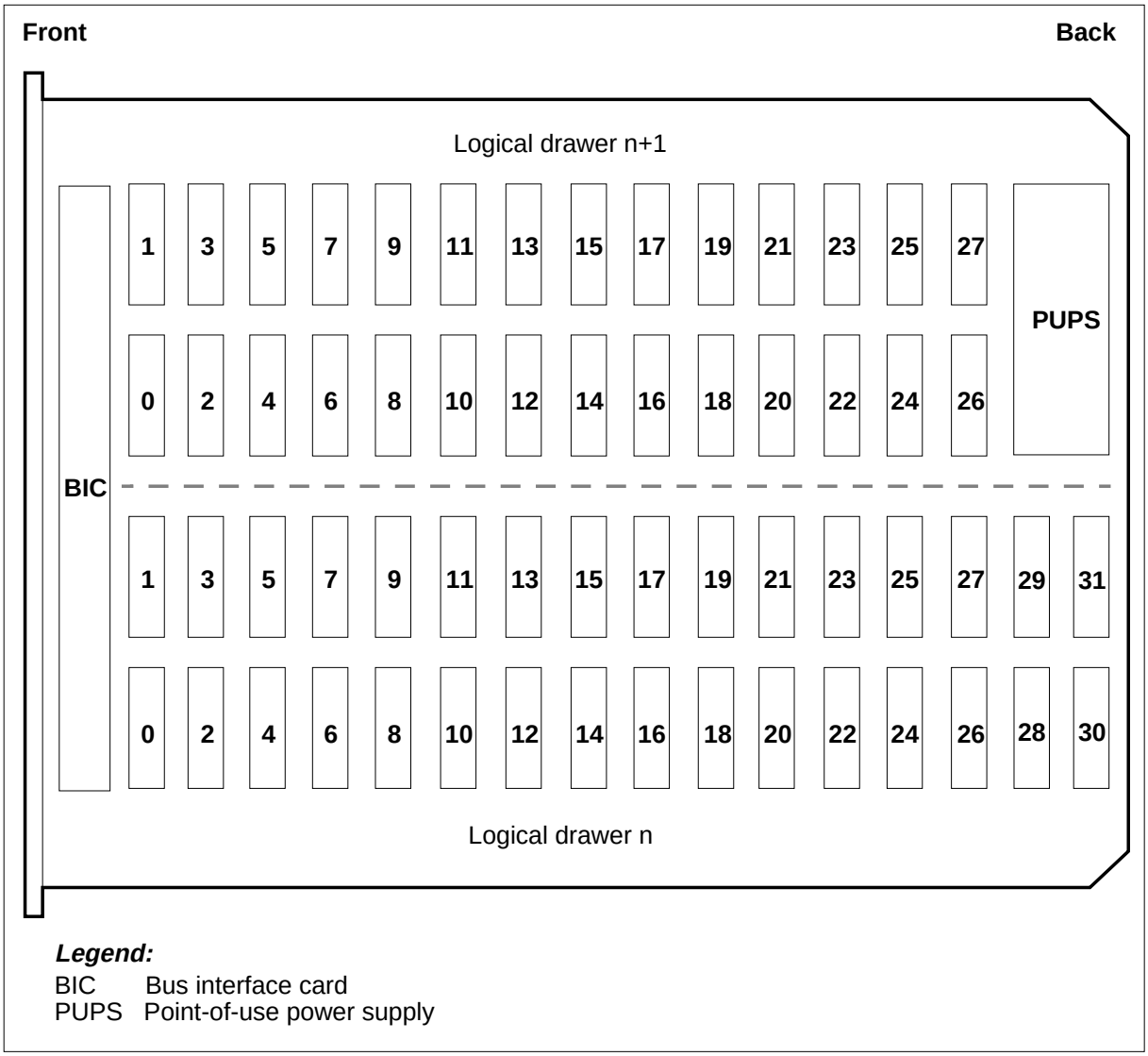
LCM shelf layouts (continued)

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

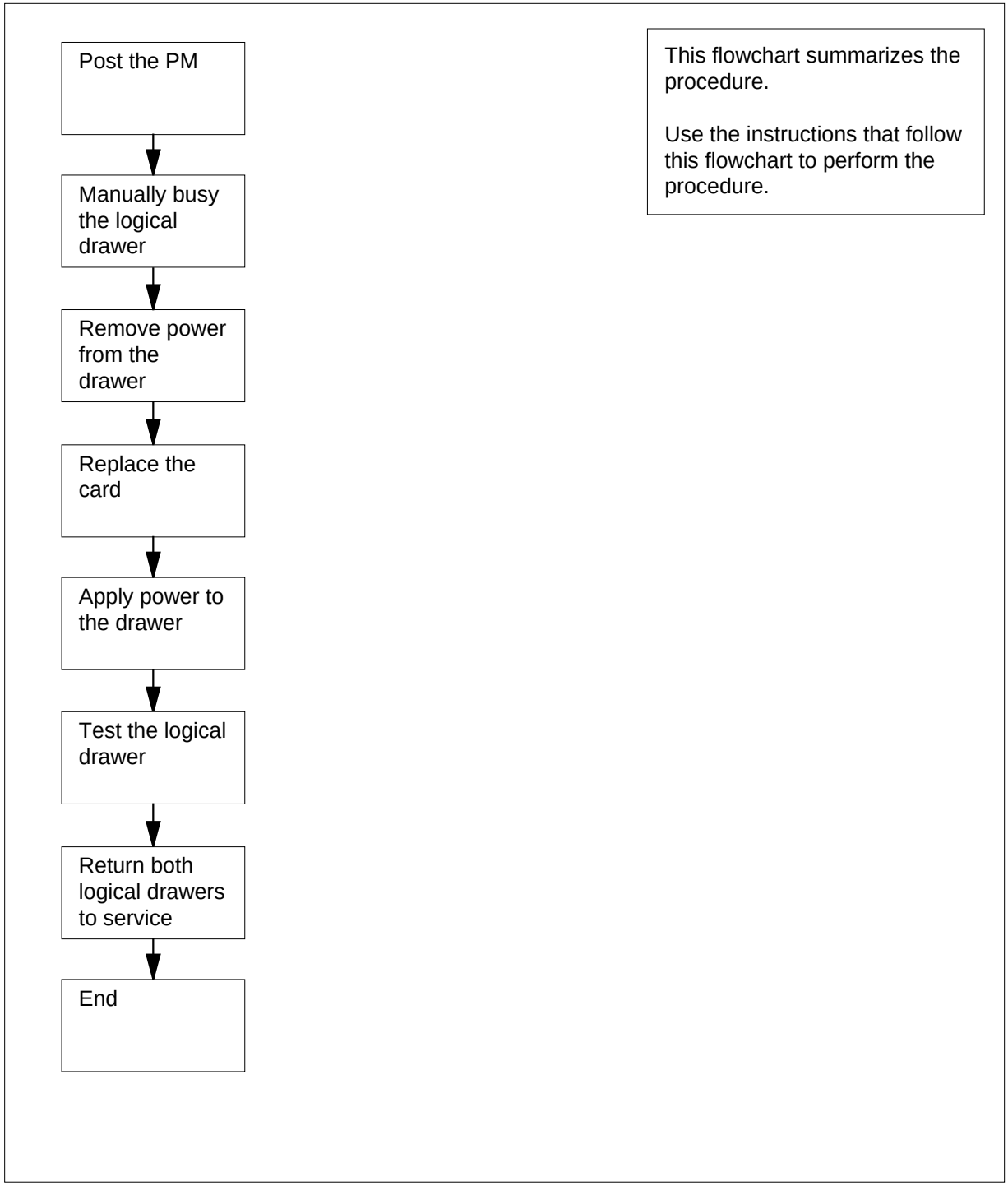
There are no common procedures.

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)

```
                  SysB     ManB     OffL     CBsy     ISTb     InSv
PM                   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.

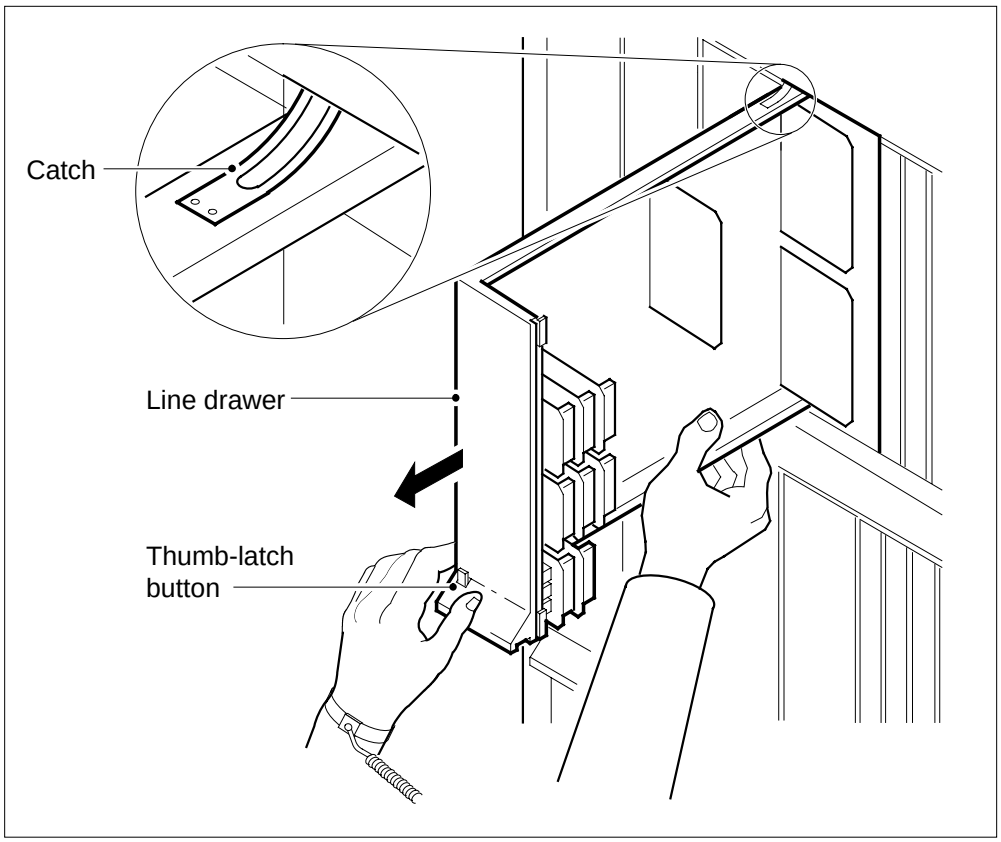
Bus interface cards in an LCD (continued)

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.

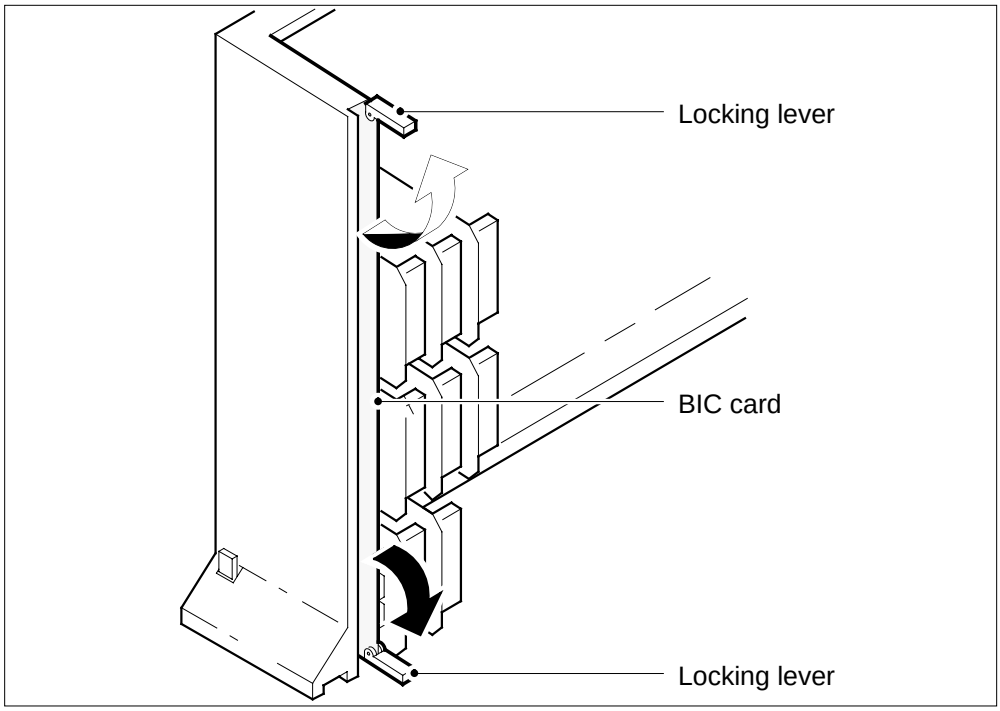
20

DANGER

Do not hold the card by the levers only

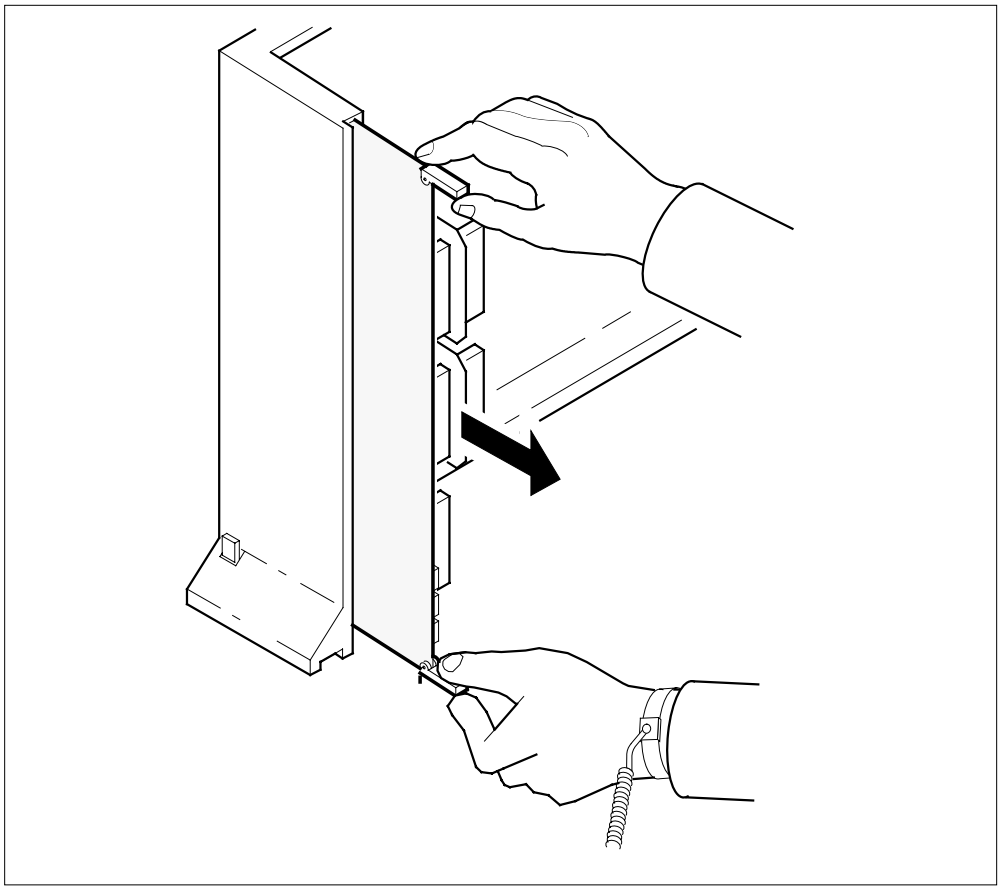
If you hold a card by the locking levers only, the levers can break. Pull the card half way out of the slot. Carefully grasp the card from below for more support. Continue to remove the card from the drawer. Make sure that you do not touch any wires or internal parts on the card.

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)



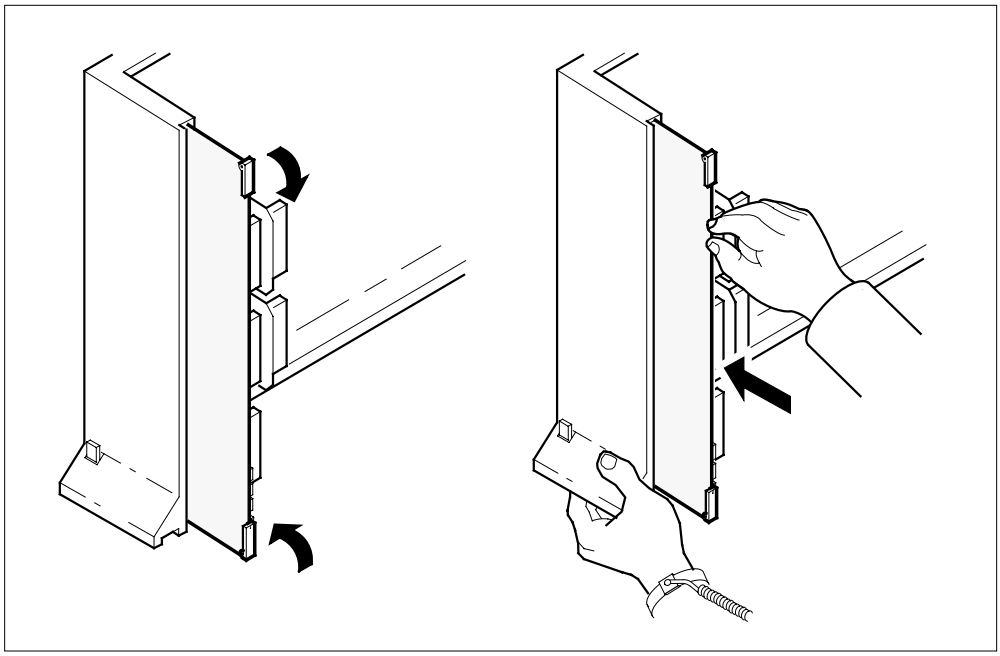
22 Place the card that you removed in an electrostatic discharge (ESD) protective container.

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 your 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.

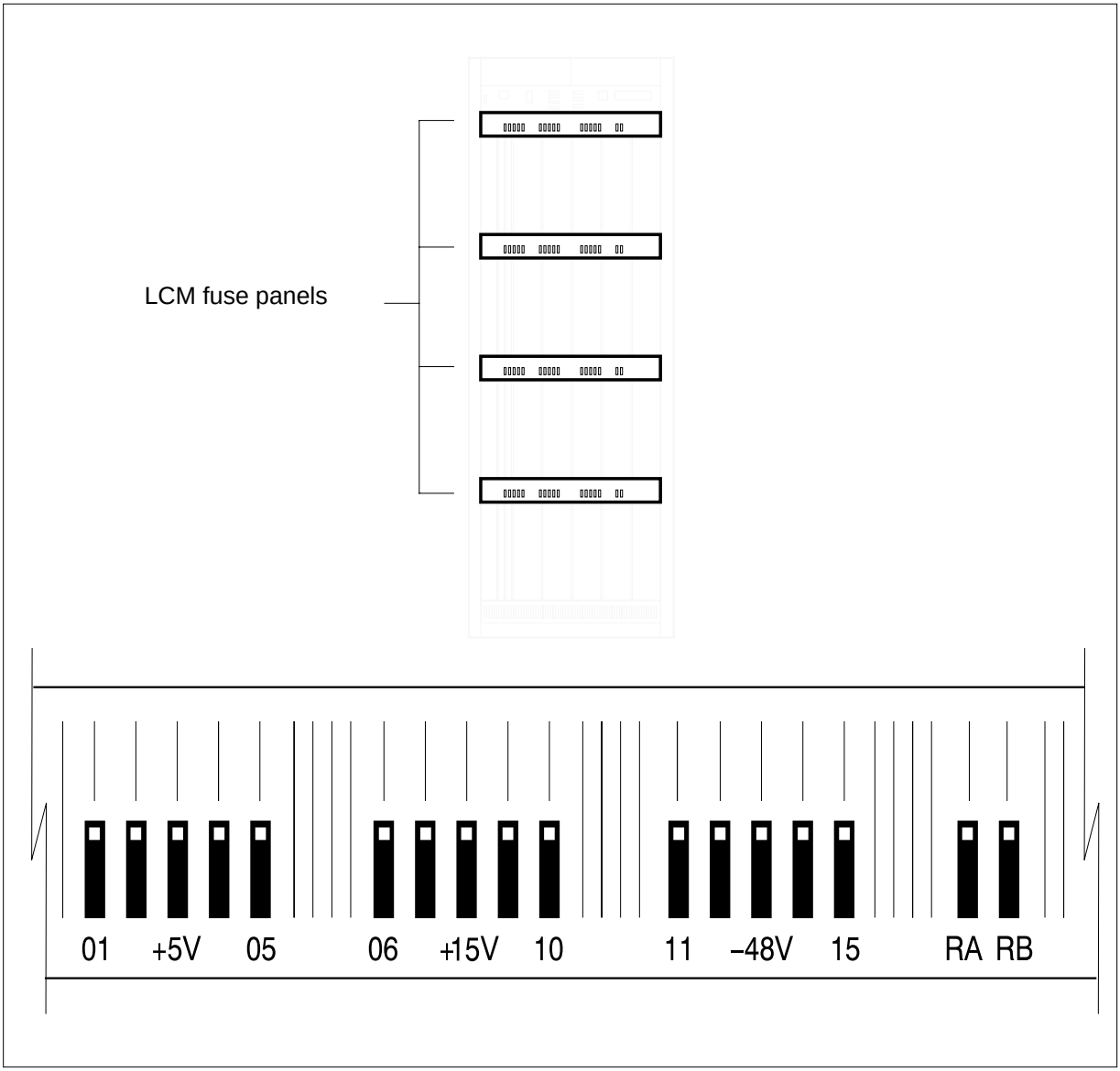
47 To return the card to service, select

`Maintenance -> DBIC -> Rts`

from the pop-up menu.

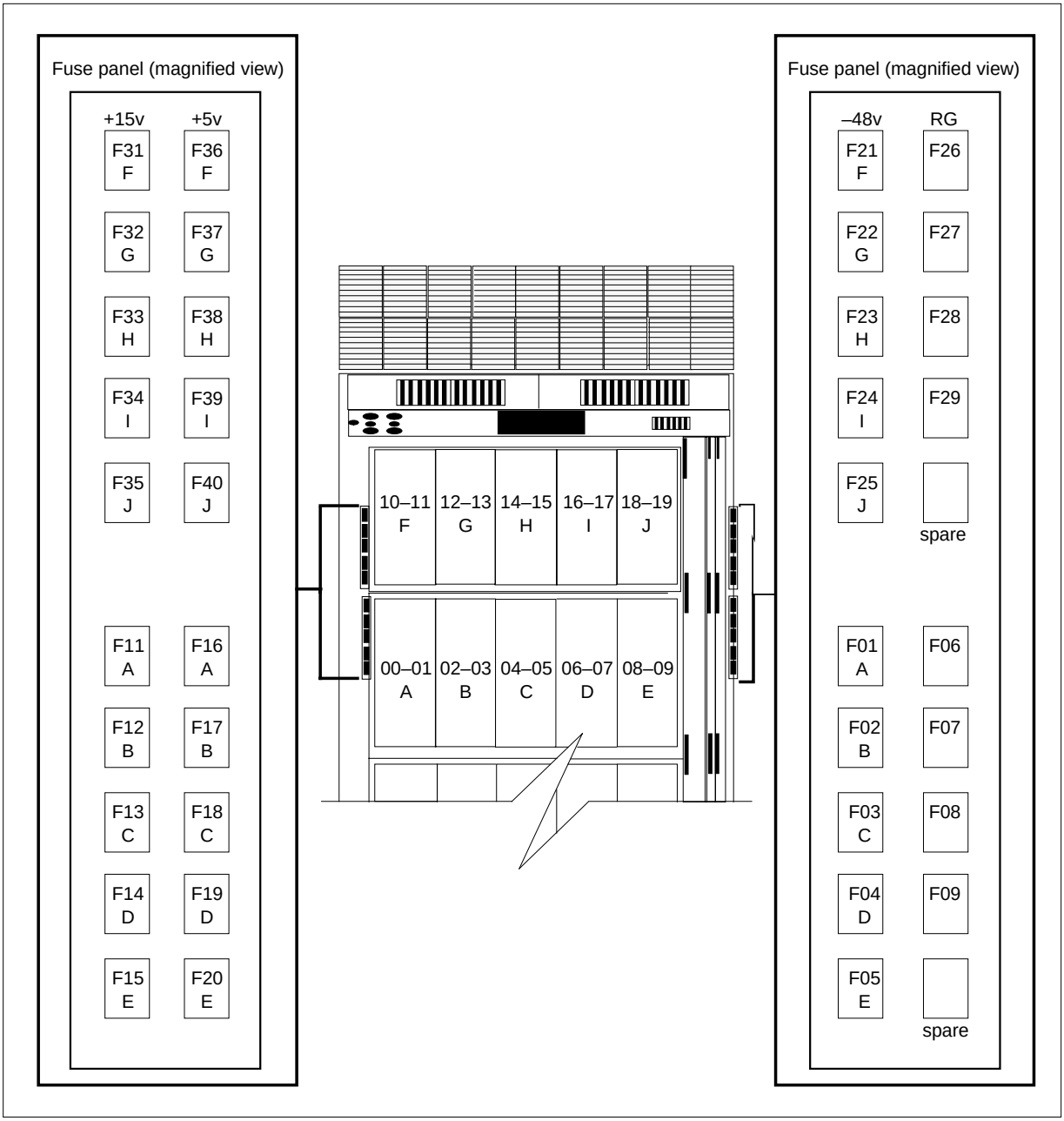
48 You have successfully completed this card replacement procedure.

LCM fuse panel



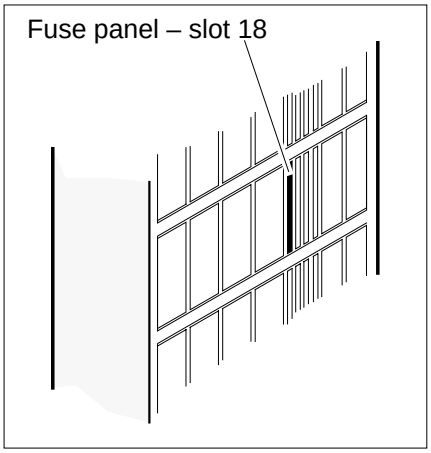
Bus interface cards in an LCD (continued)

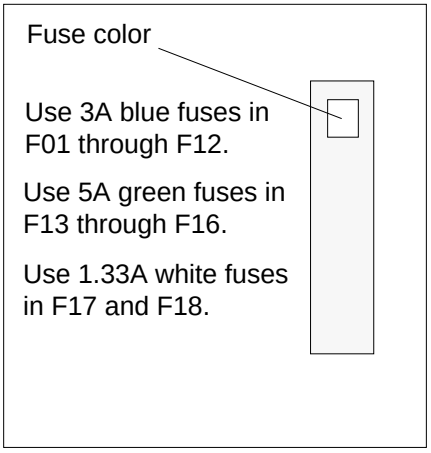
ILCM fuse panel



Bus interface cards in an LCD (continued)

LCME fuse panel

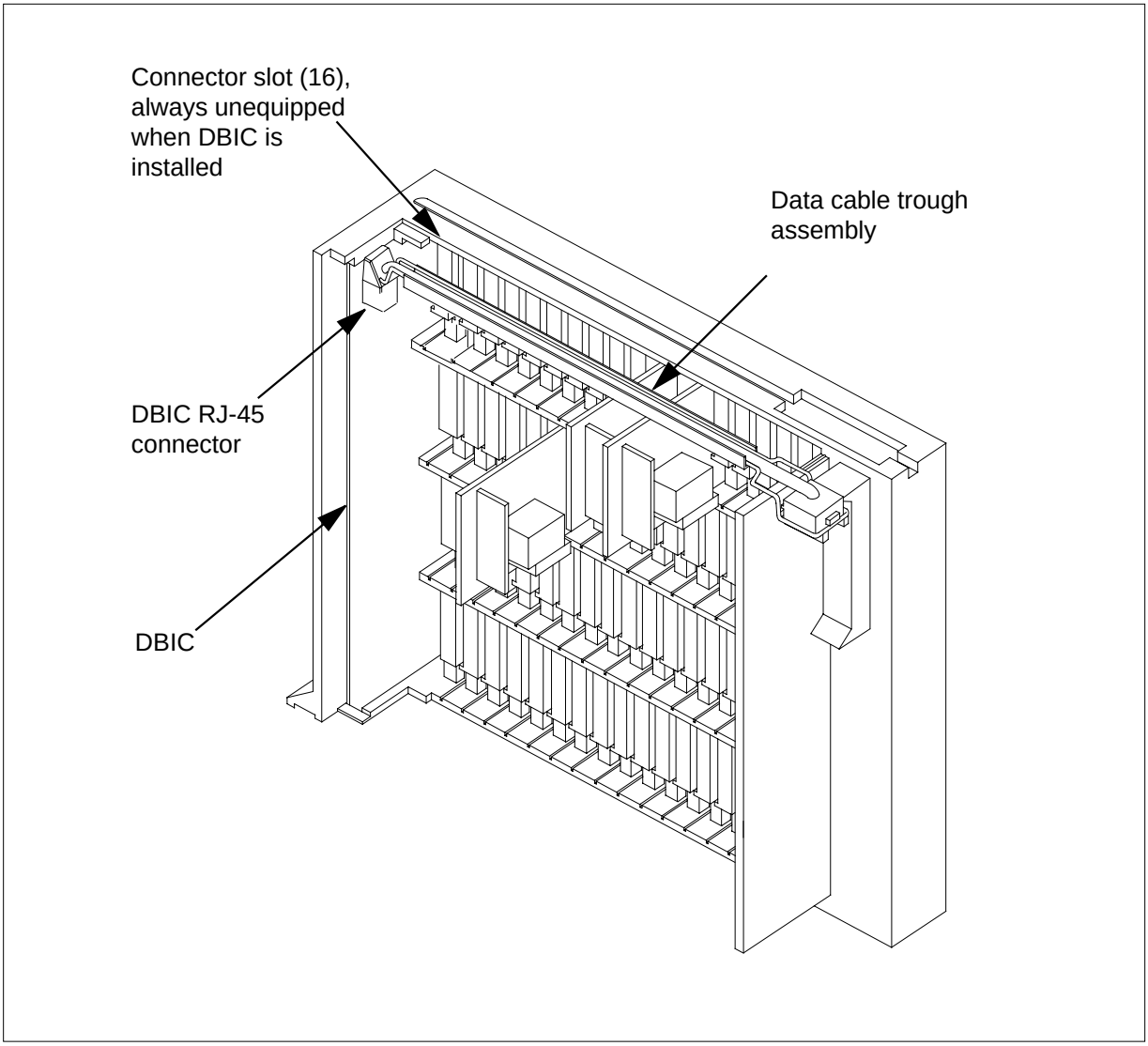




Fuse location		Fuse location
–48V BR drawer 1 3A blue fuse	F01 F02	–48V BR drawer 2 3A blue fuse
–48V BR drawer 3 3A blue fuse	F03 F04	–48V BR drawer 4 3A blue fuse
–48V B drawer 1 3A blue fuse	F05 F06	–48V B drawer 2 3A blue fuse
–48V B drawer 3 3A blue fuse	F07 F08	–48V B drawer 4 3A blue fuse
–48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

Bus interface cards in an LCD (end)

NT6X05AE line drawer with DBIC installed



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.

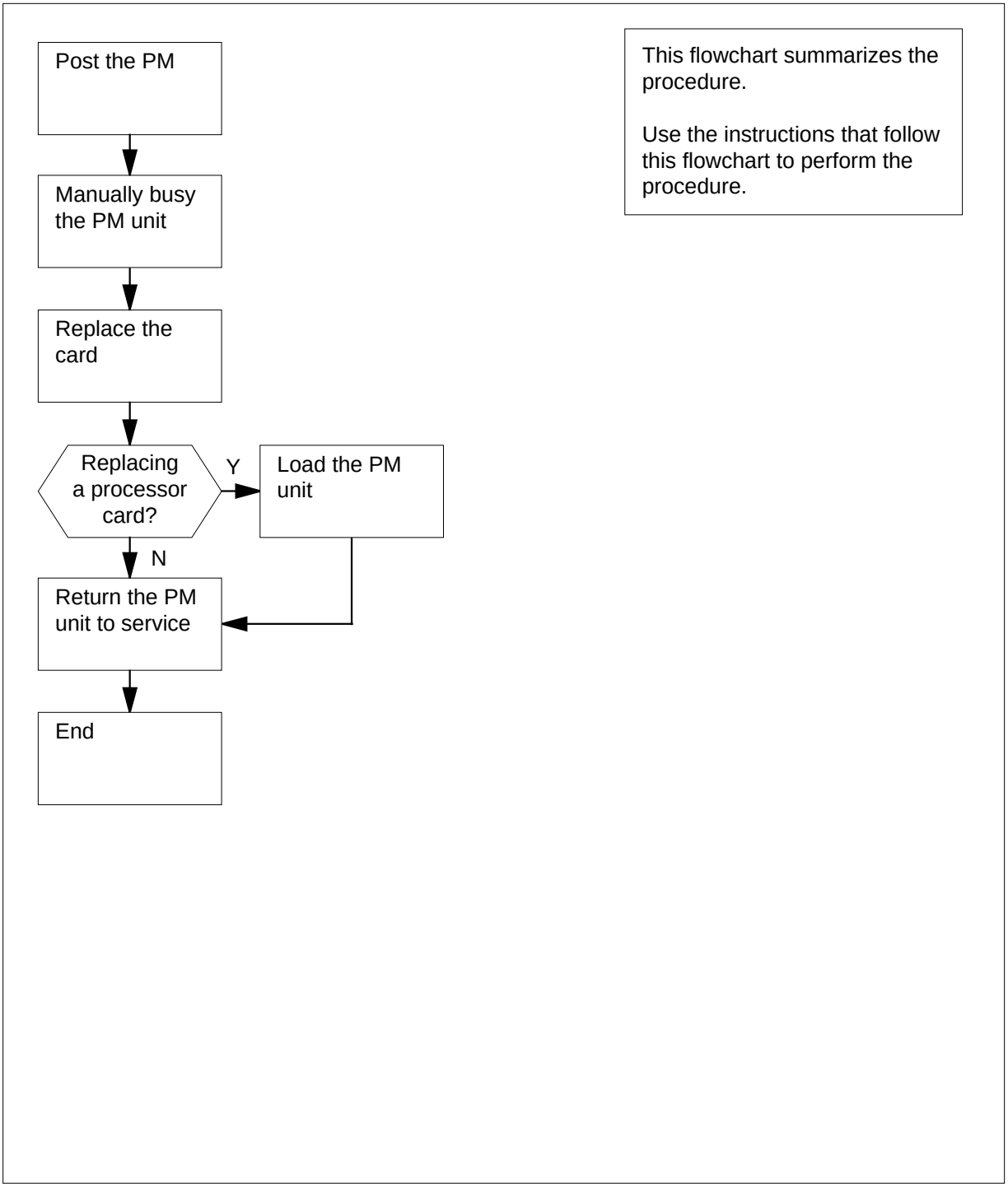
Control complex cards in LCM-type PMs (continued)

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 that the replacement card and the card that you remove have the same PEC and PEC suffix.

At the MAP terminal

2 To access the 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 LCM 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 (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

Example of a MAP display:

Control complex 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 Determine the state of the PM unit that associates with the card you replace.

If the state of the PM unit	Do
is SysB, CBsy, ISTb, or InSv	step 5
is ManB	step 10
is Offl	step 19

5 To manually 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 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 20

6 The next action depends on the type of card to be replaced.

If "Is the card being replaced an NT6X52AA in an NTMX89FA?"	Do
Yes	step 7

Control complex cards in LCM-type PMs (continued)

If "Is the card being replaced an NT6X52AA in an NTMX89FA?"	Do
No	step 10

7 Measure the +5VDC faceplate voltages on each of the two NT6X53AA power converter cards in the LCM to see if they are within 200 millivolts of each other.

If "Are the NT6X53AA +5VDC faceplate voltages within 200 millivolts?"	Do
Yes	step 9
No	step 8

8 Using the procedure entitled "Power cards in LCM-types PMs" replace the NT6X53AA that has the lower +5VDC faceplate voltage and return to step 7.

9 Power down the NT6X53 Power Converter Card in the PM unit containing the NT6X52AA being replaced.

At the shelf

10

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

11 The next action depends on the type of card just replaced.

If "Was the card replaced an NT6X52AA in an NTMX89FA?"	Do
Yes	step 12
No	step 13

Control complex cards in LCM-type PMs (continued)

12 Restore power to the NT6X53 Power Converter Card in the PM unit containing the NT6X52AA that was replaced.

13 The next action depends on the reason that 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.

15 Determine if you need to load the PM.

If you replace	Do
an NT6X51 or an NTBX34	step 16
an NT6X52 or an NTBX35	step 18

At the MAP terminal

16 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
failed	step 17
passed	step 18

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

18 To return the PM to service, type

`>RTS UNIT unit_no`

and press the Enter key.

where

Control complex cards in LCM-type PMs (end)

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 20
passed	step 21

19 To determine why the component is offline, consult operating company personnel. Continue as directed by operating company personnel.

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

21 The procedure is complete.

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*.

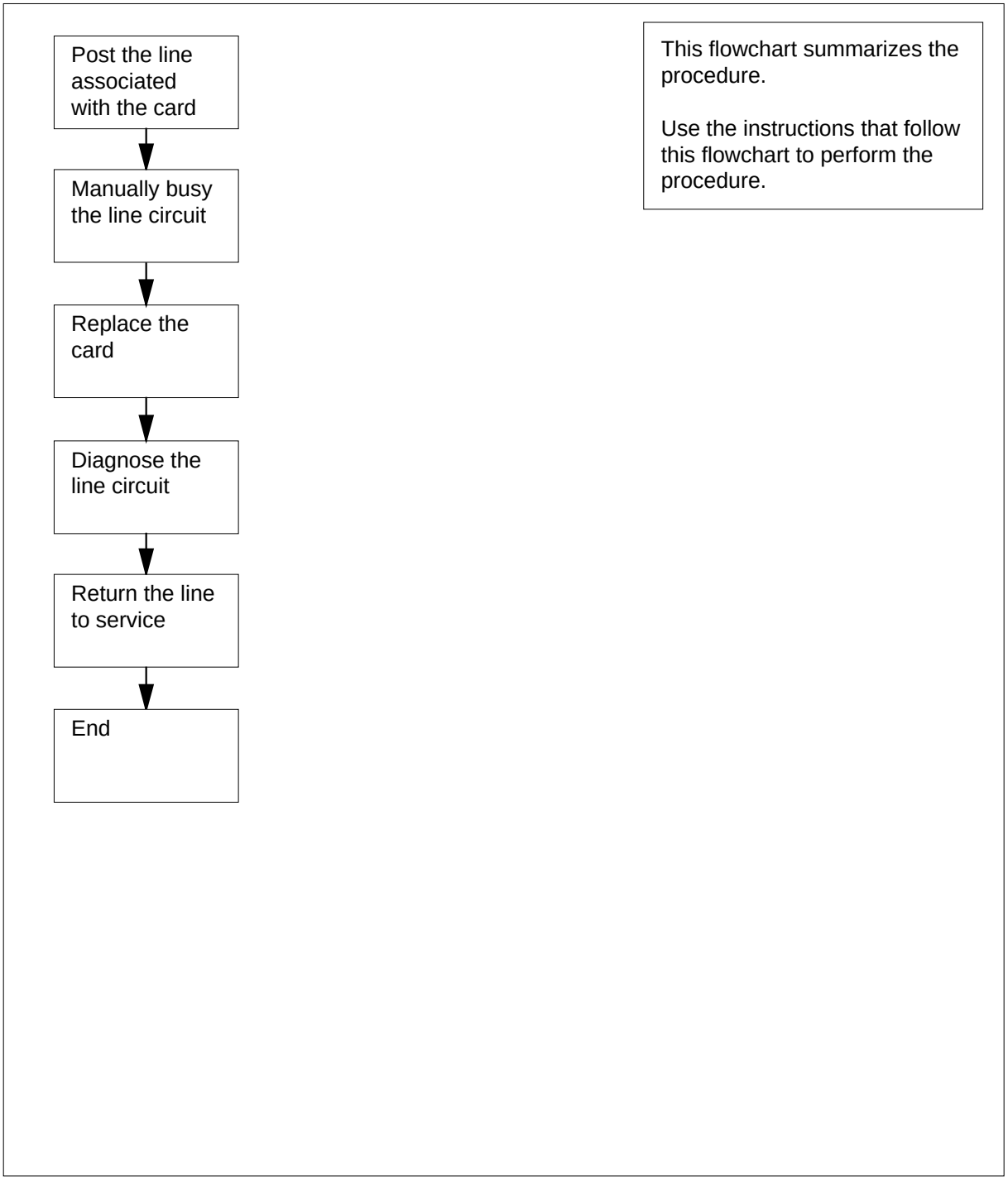
Do not go to the common procedure unless the step-action procedure directs you to go.

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

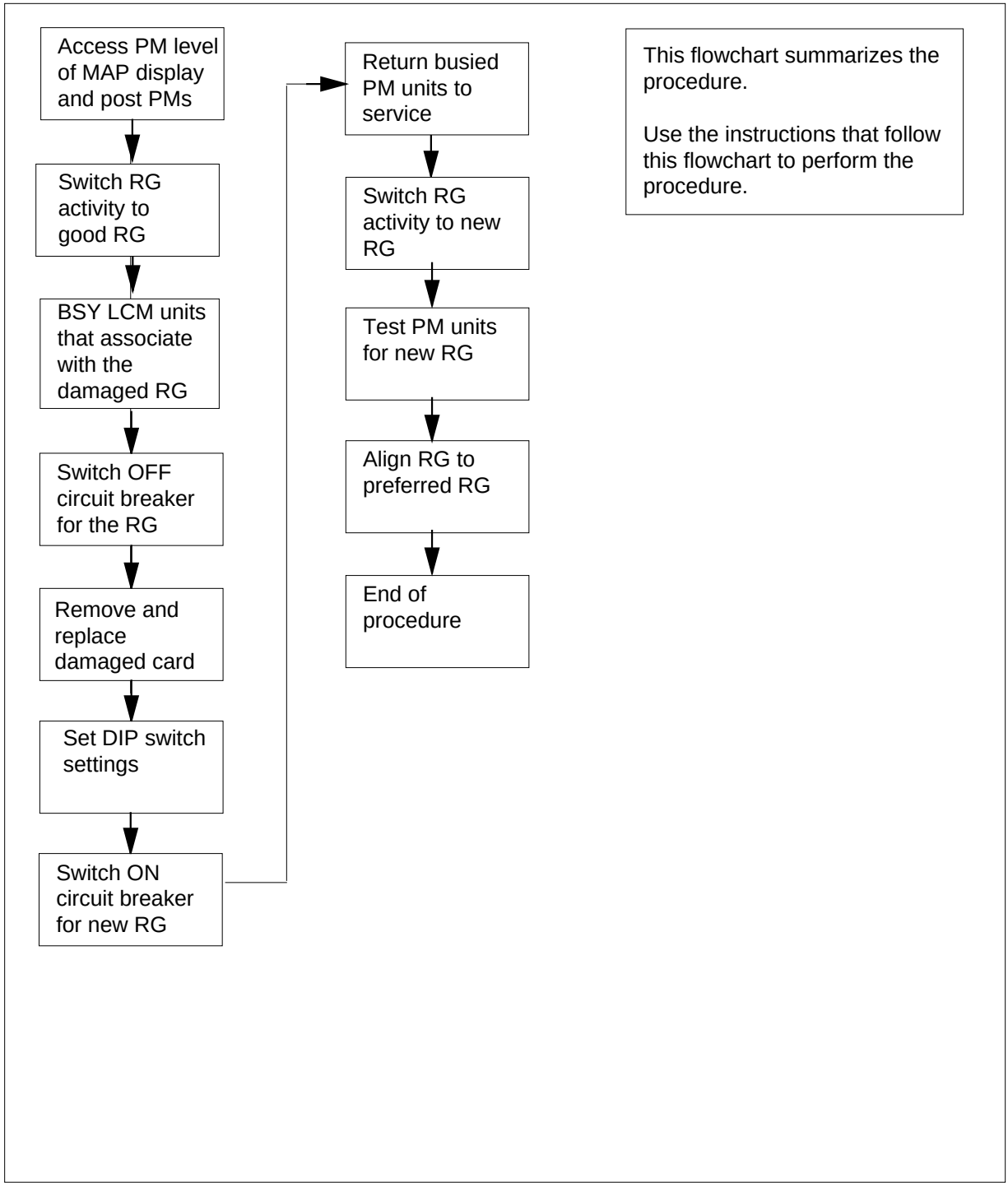
There are no common procedures.

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  OOS: Cside 0 Pside 0
Unit 0: ISTb      /RG:0
Unit 1: InSv      /RG:0
                             11  11  11  11  11  RG: Pref 0 ISTb
Drwr:  01  23  45  67  89  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.

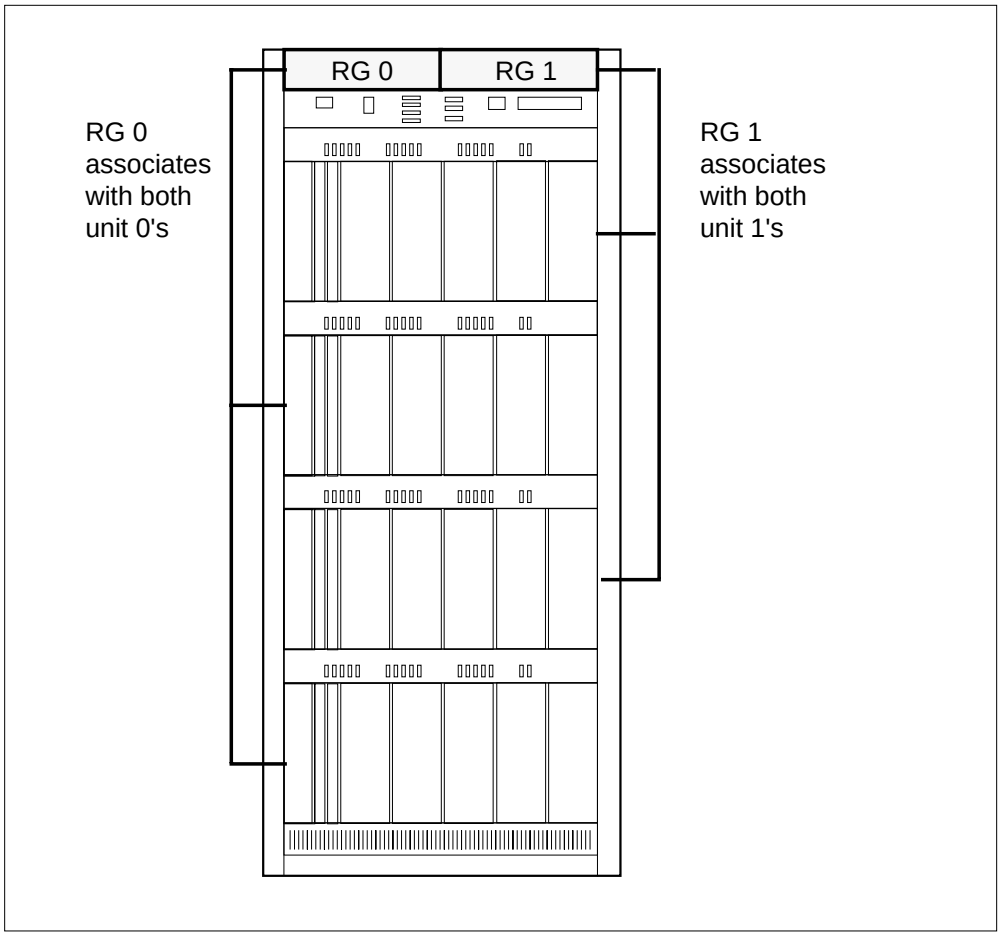
If	Do
the PM or PM units are `Offl or SysB`	step 5
one unit is `InSv or ISTb` and the other unit is `SysB`	step 6

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  OOS: 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
       ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
```

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  OOS: 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

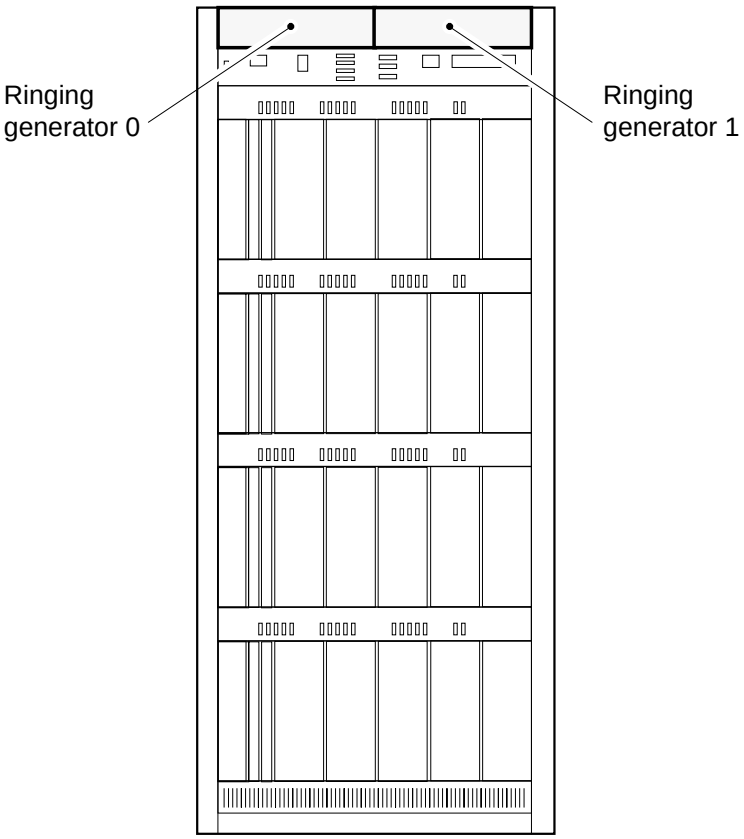
DANGER
Risk of personal injury
Make sure that you switch off the correct circuit breaker on the FSP as the following steps describe. Do not proceed until you locate and switch off the correct circuit breaker for the RG you replace.

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)

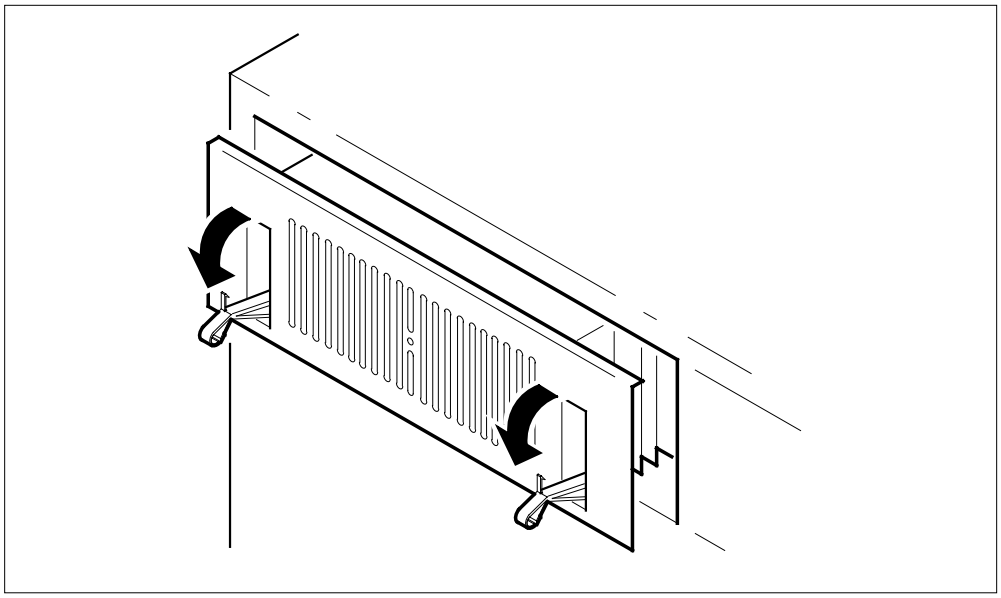


16

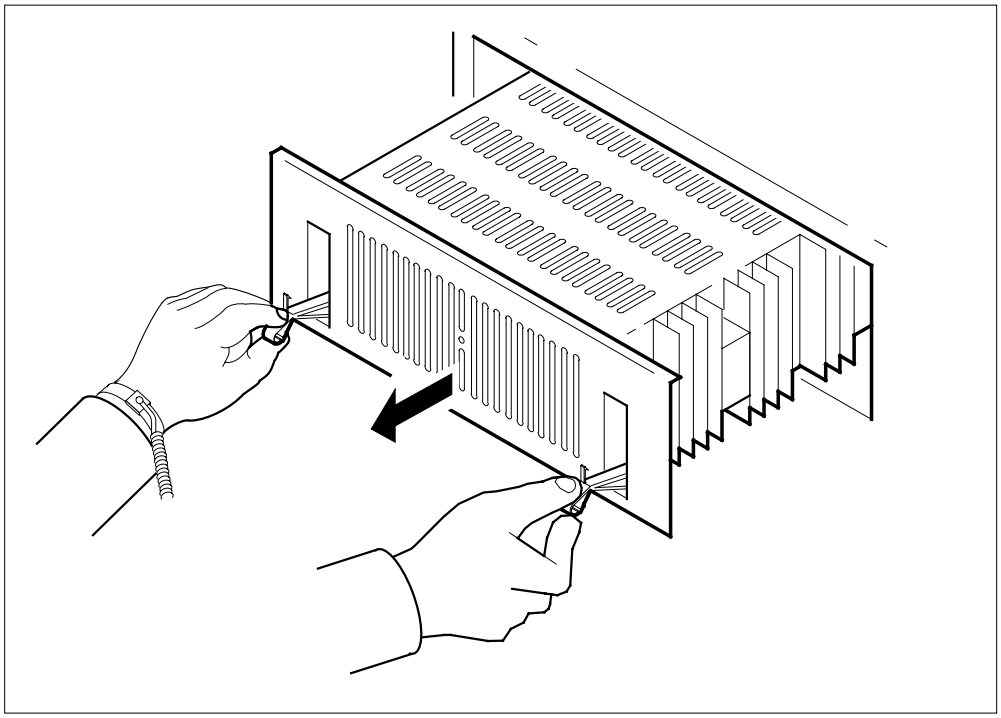
DANGER
Do not hold the card by the levers only
If you hold a card by the locking levers only, the locking levers can break. Pull the card half way out of the shelf and carefully grasp the card from below for more support. Continue to remove the card from the shelf. Do not touch any wires or internal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

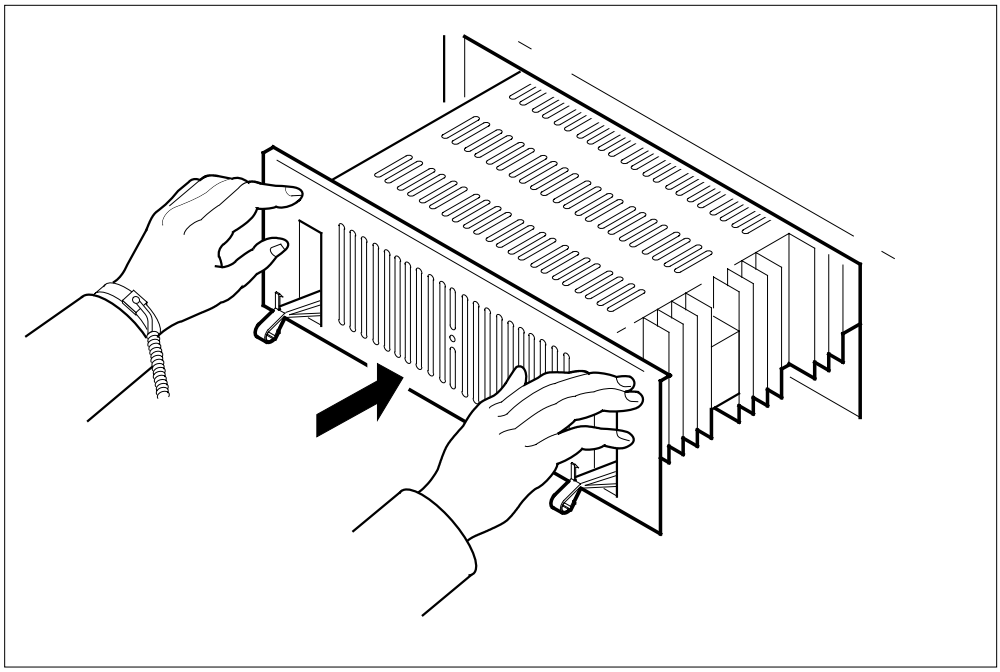
DANGER
Potential equipment damage
The newer versions of the ringing generator (versions with suffixes BB, CA, DB, GB, HA, or JA) use switch 8. Make sure that switch 8 is in the ON position on the replacement card.

Set the DIP switch settings on the replacement card.

Note: 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.

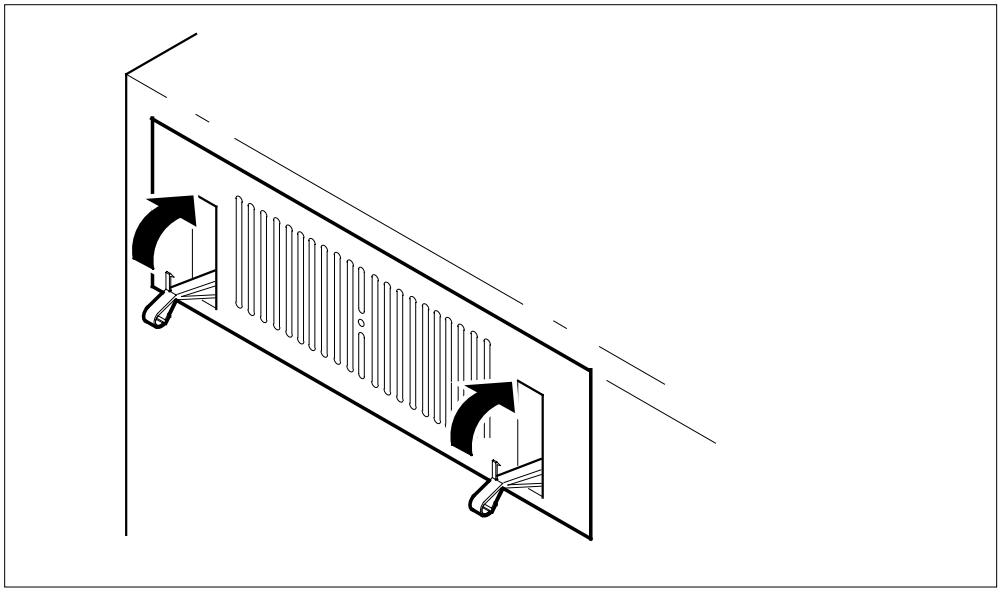
NT6X30
in LCE-type frames (continued)



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  OOS: Cside 0 Pside 0
Unit 0: InSv      /RG:1
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
       ..  ..  ..  ..  ..  ..  ..  ..  ..  ..
```

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

unit_no
is the PM unit number (0 or 1)

Example of a MAP display:

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

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

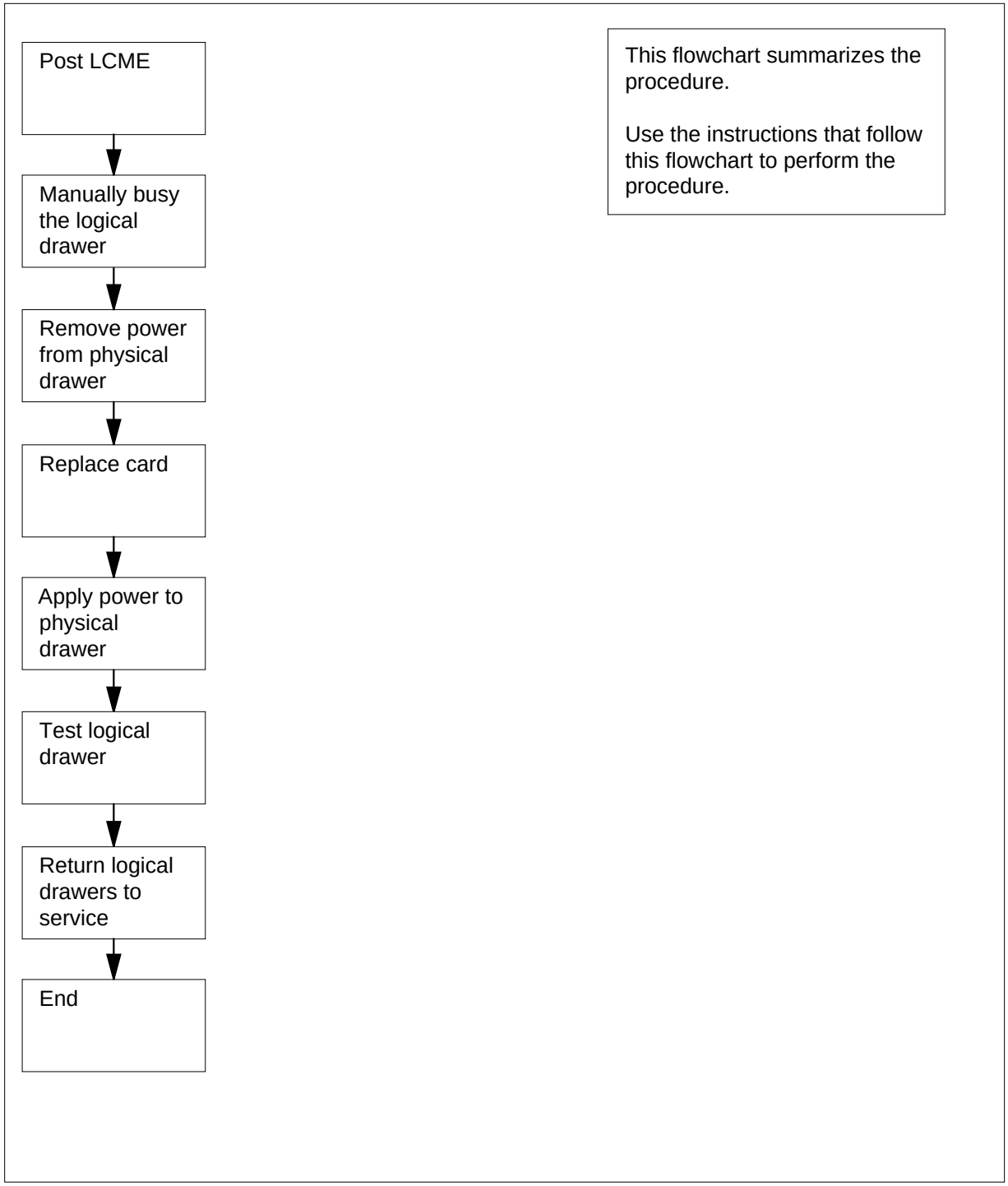
There are no common procedures

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:

```
                  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 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.

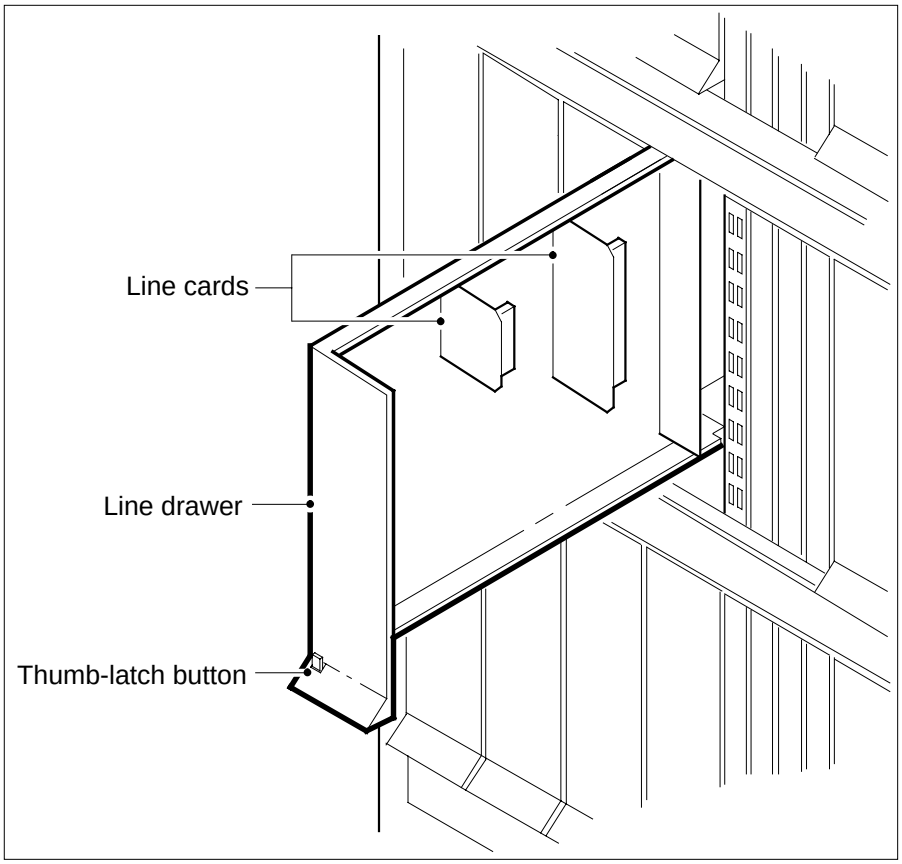
c Remove the -48 V Battery fuse for the line drawer that contains the BIC you replace. Refer to the figure , (LCME fuse panel) for fuse location.

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
```

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
```

If the RTS command	Do
passed	step 26
failed	step 25

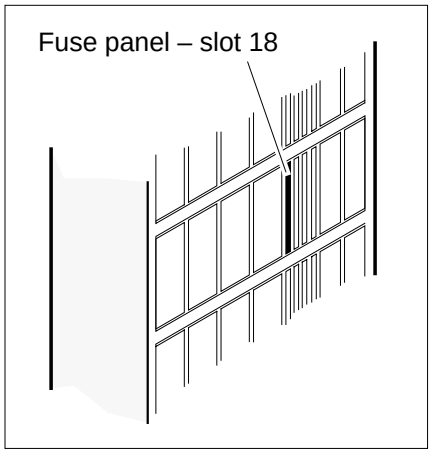
24 Consult operating company personnel to determine why the component is offline or not provided. Continue as directed by operating company personnel.

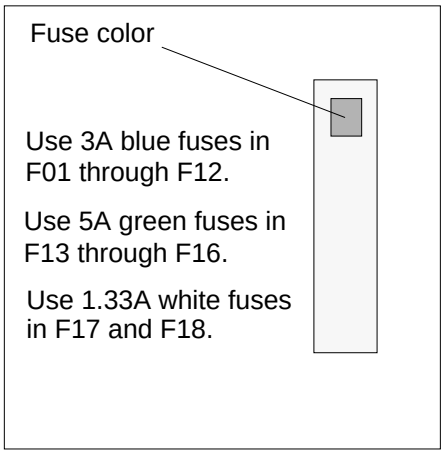
25 For additional help, contact the next level of support.

26 The procedure is complete.

NTBX71
in an LCME (continued)

LCME fuse panel

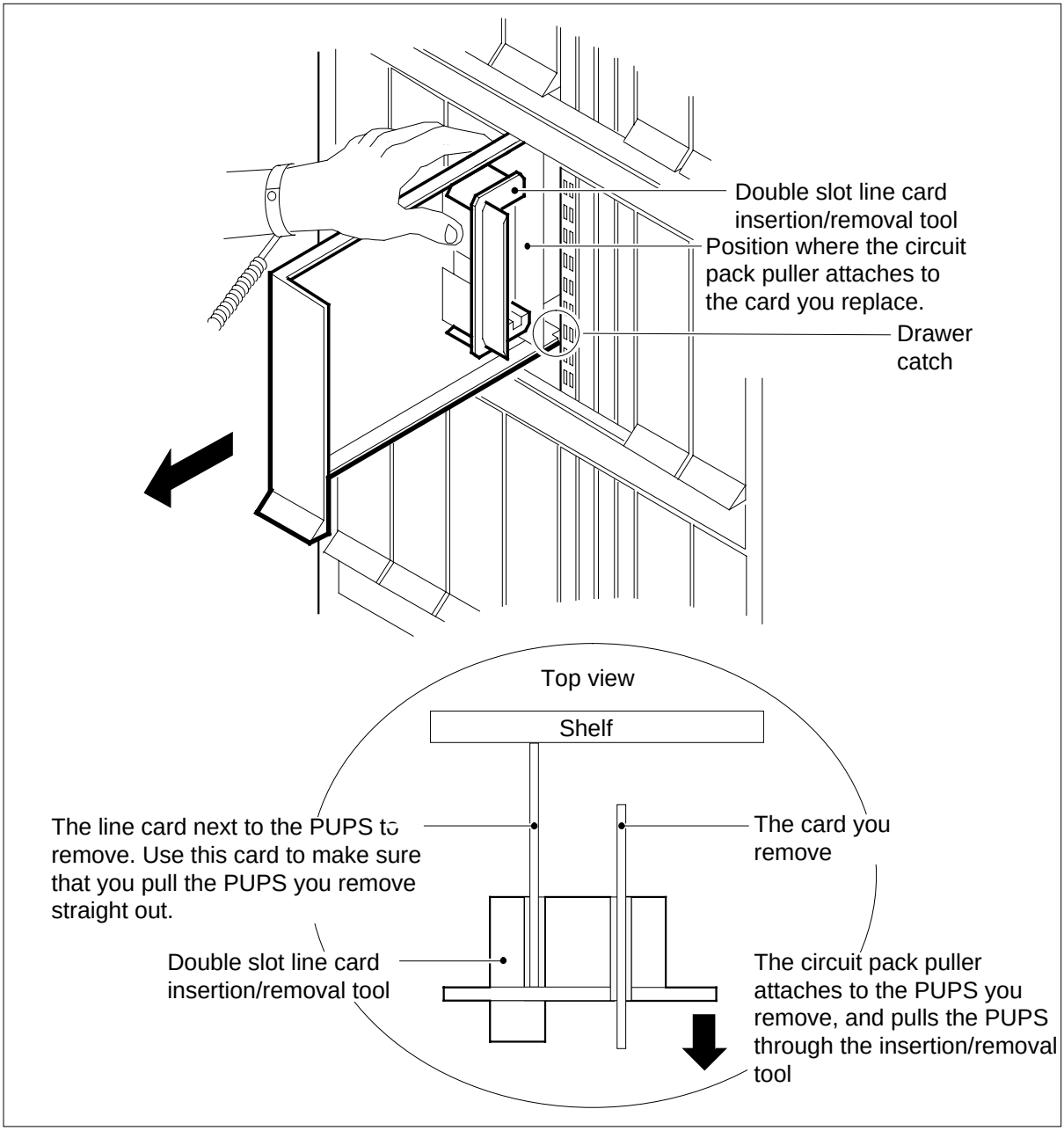




Fuse location			Fuse location
–48 V BR drawer 1 3A blue fuse	F01	F02	–48 V BR drawer 2 3A blue fuse
–48 V BR drawer 3 3A blue fuse	F03	F04	–48 V BR drawer 4 3A blue fuse
–48 V B drawer 1 3A blue fuse	F05	F06	–48 V B drawer 2 3A blue fuse
–48 V B drawer 3 3A blue fuse	F07	F08	–48 V B drawer 4 3A blue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

NTBX71
in an LCME (end)

Removing the PUPS card



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*.

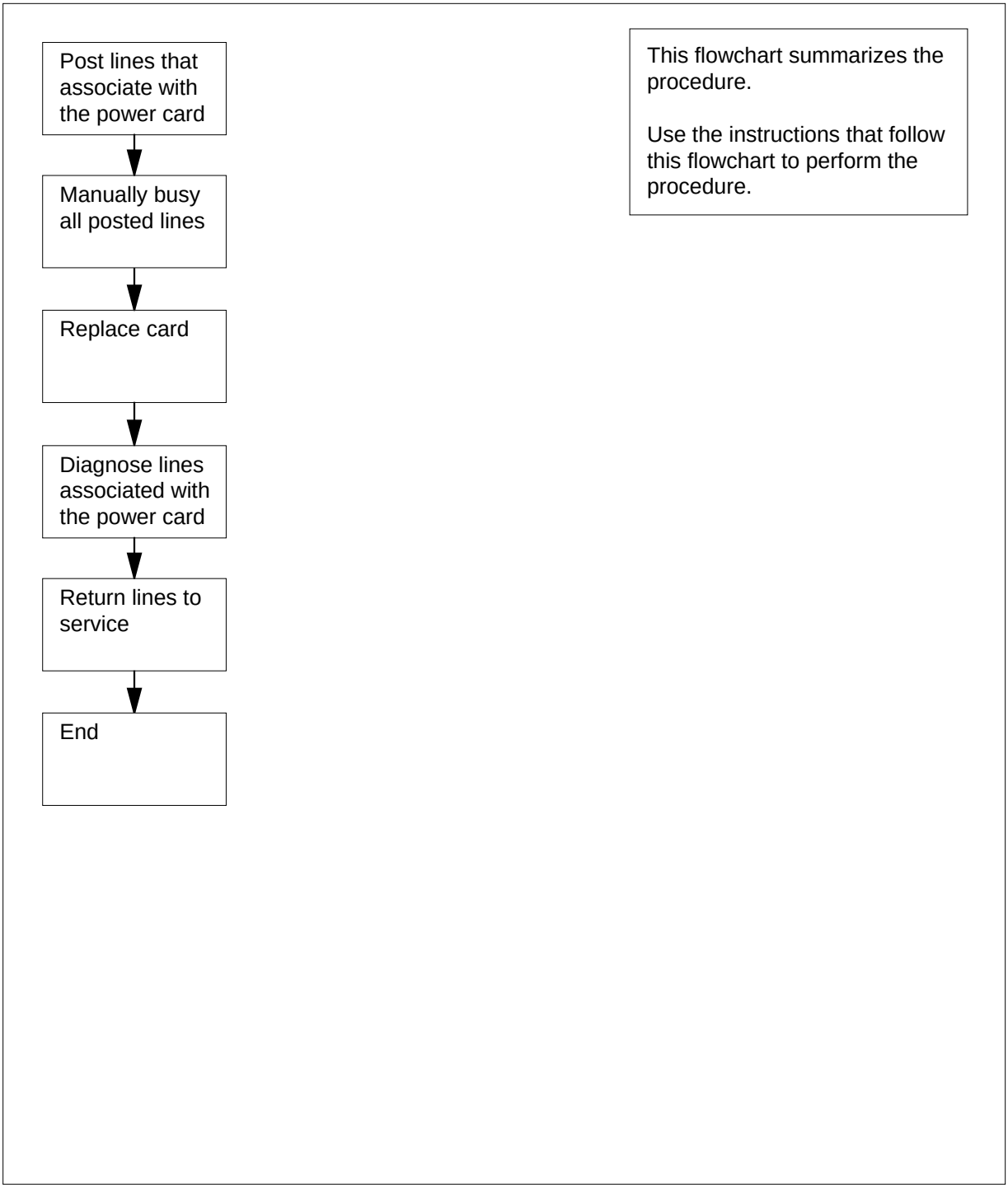
Do not proceed to the common procedure unless the step-action procedure directs you.

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

Note: 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*

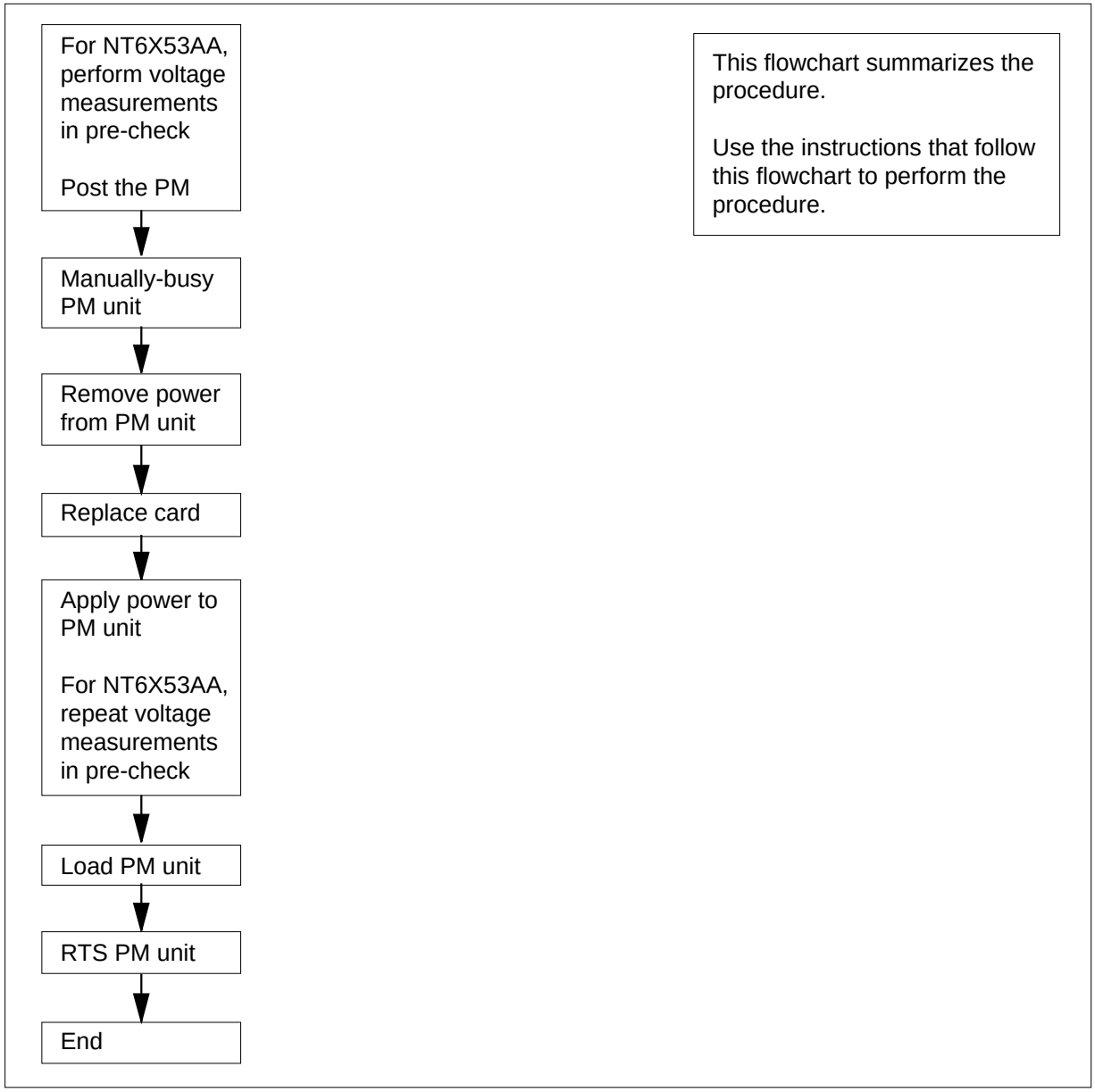
Do not proceed to the common procedure unless the step-action procedure directs you.

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

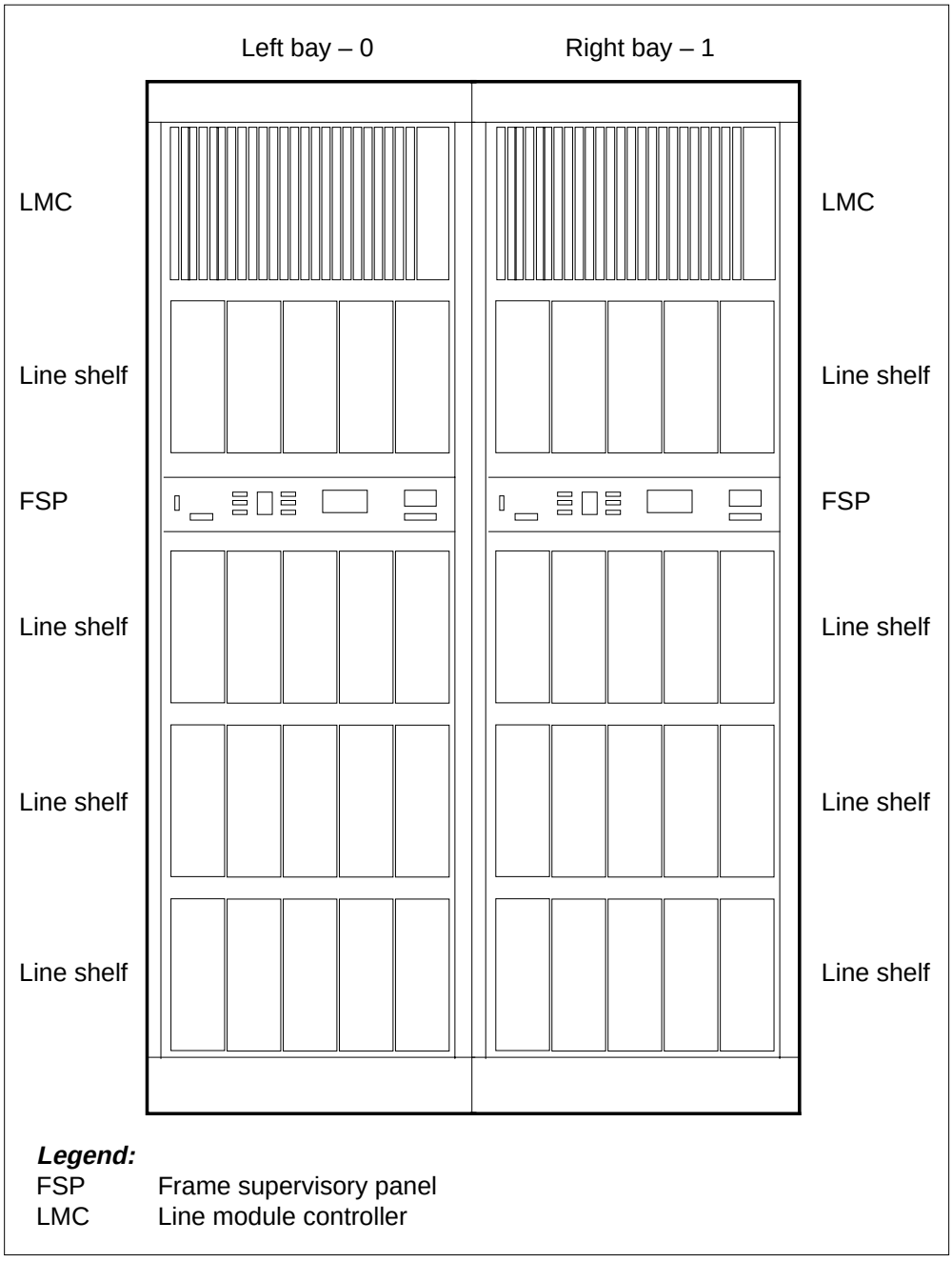
This procedure provides a frame layout diagram for the line module equipment (LME) frame. The LME frame contains line drawers and the line module controller (LMC). The procedure provides shelf diagrams for the following:

- 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)

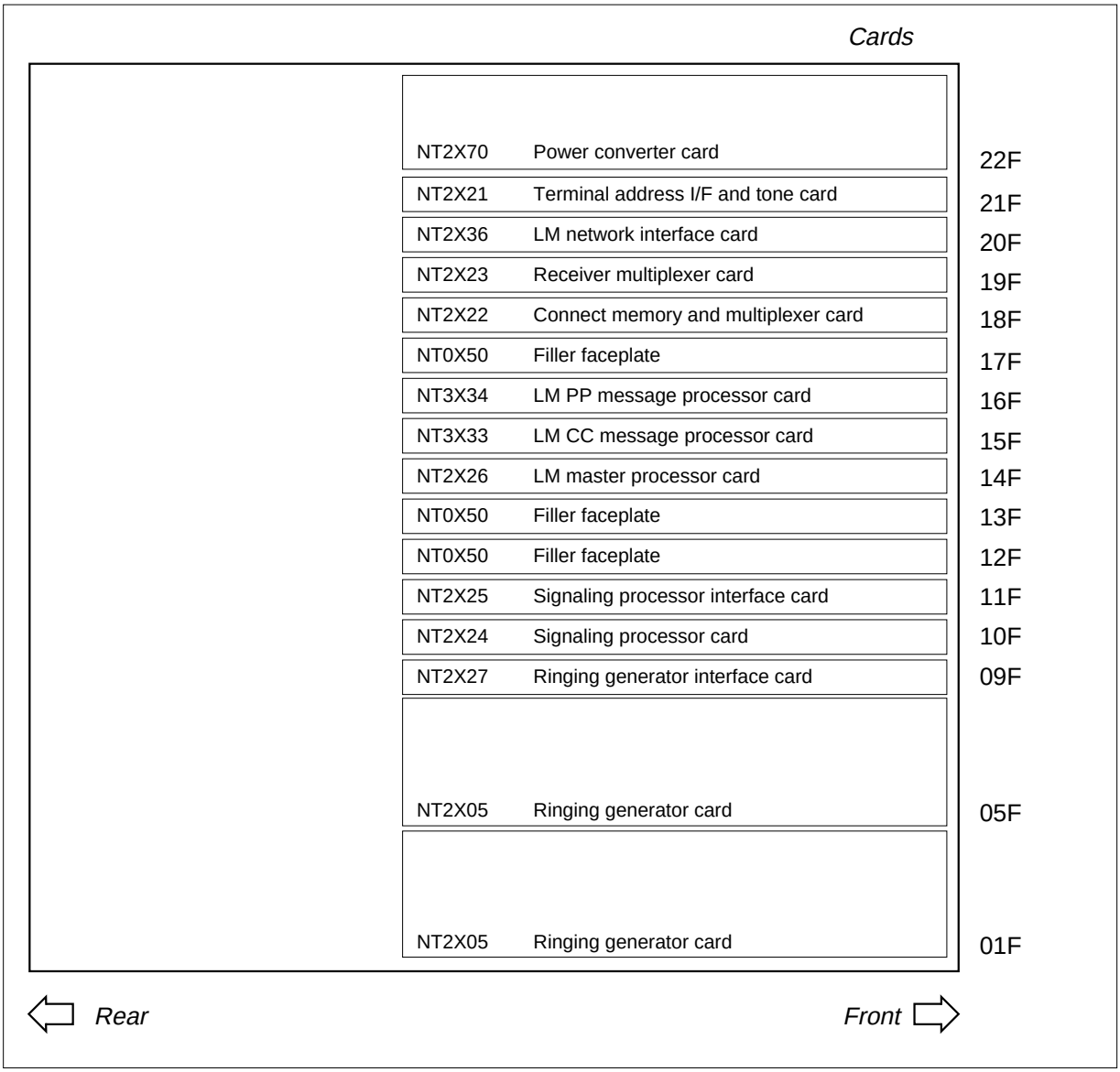


Legend:

FSP	Frame supervisory panel
LMC	Line module controller

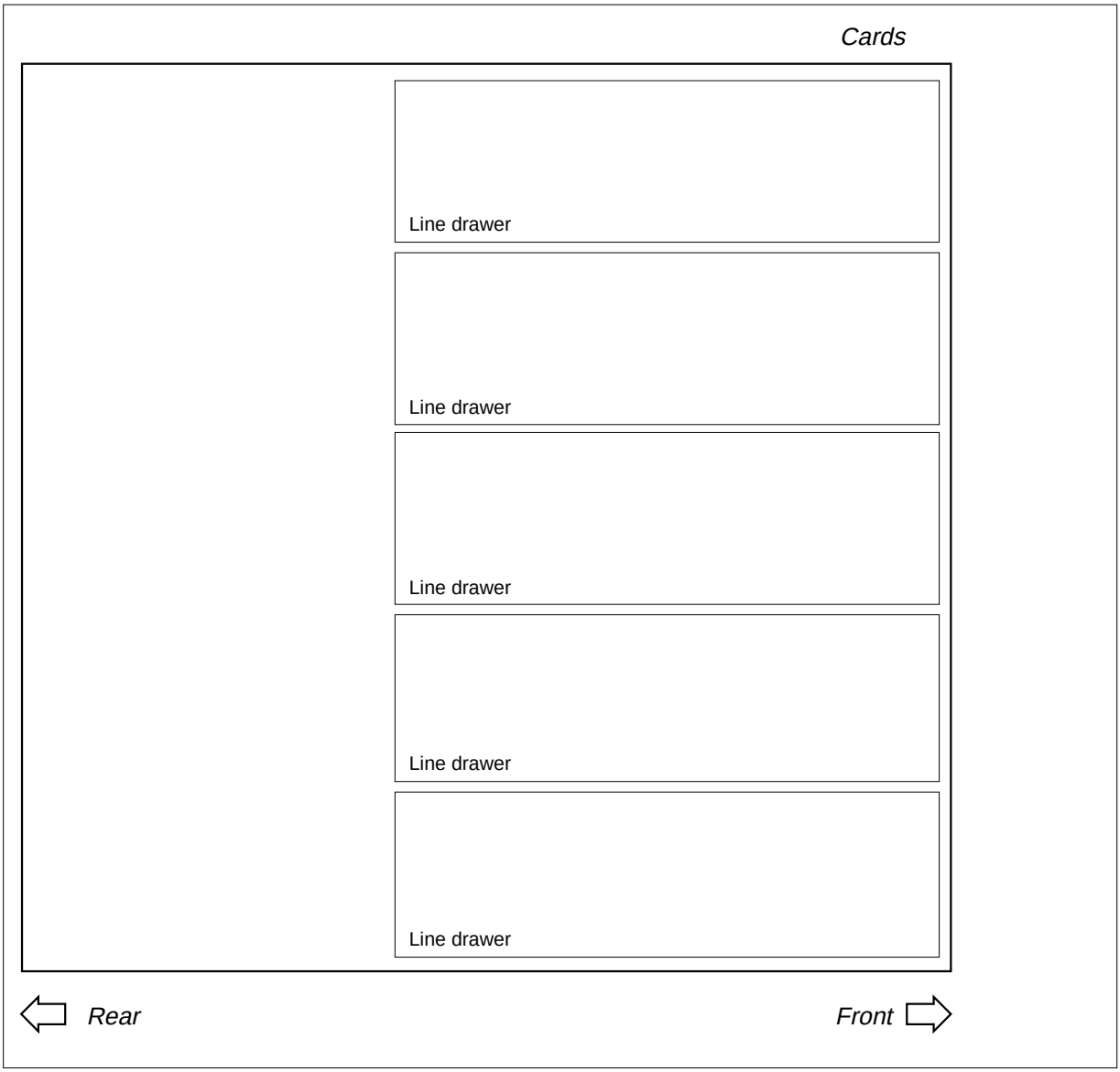
LM shelf layouts (continued)

Line module controller



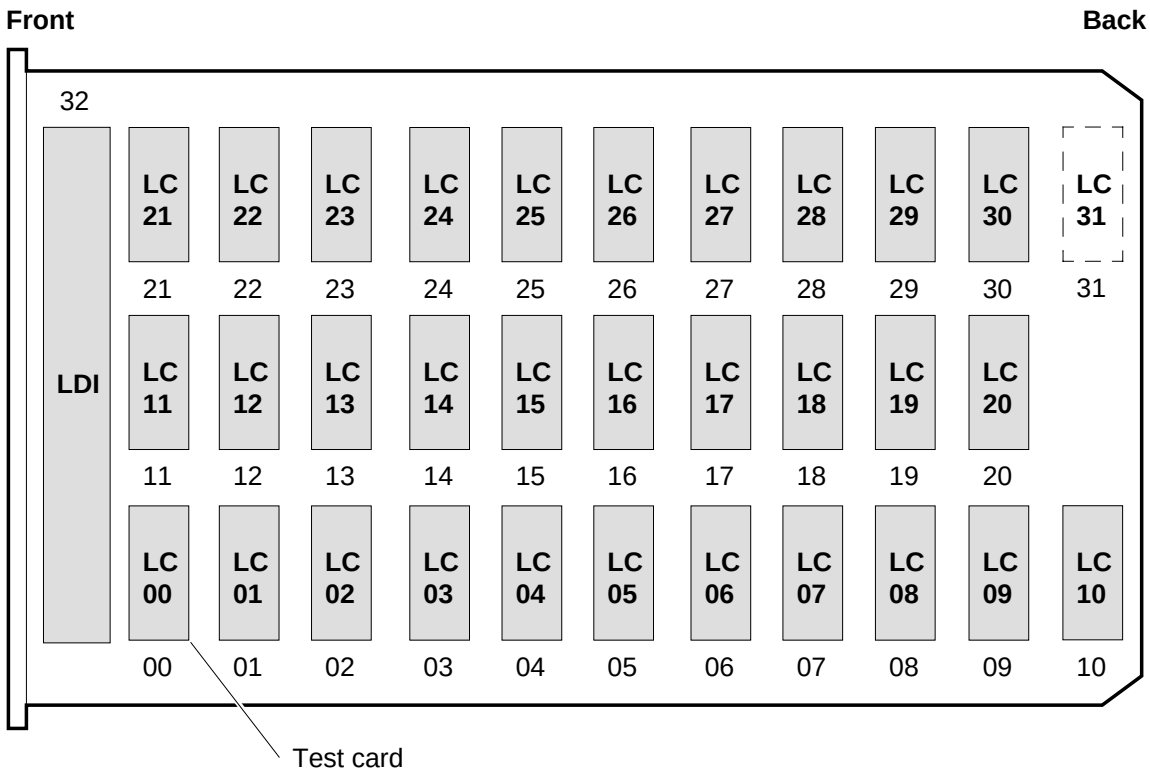
LM shelf layouts (continued)

Line drawer shelf



LM shelf layouts (continued)

Line drawer layout (plastic)

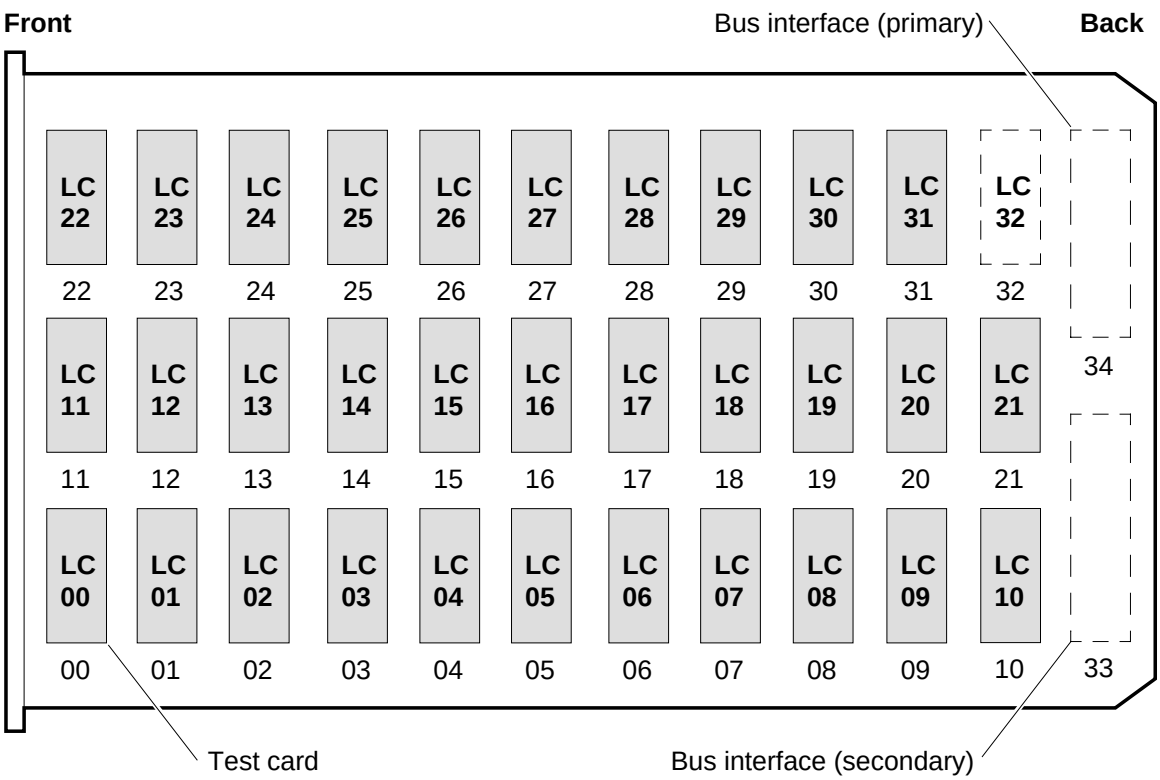


Legend:
LC Line card
LDI Line drawer interface

Note: Card position 31 is optionally assignable to a +48V power converter card instead of a line circuit.

LM shelf layouts (end)

Line drawer layout (metal)



Legend:
LC Line card

Note: Card position 32 is optionally assignable to a +48V power converter card instead of a line circuit.

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	Ringing generator interface - 20Hz Bell system card	LMC
NT2X27	AB	Ringing generator interface decimonic multifrequency ringing card	LMC
NT2X27	AC	Ringing generator interface harmonic multifrequency ringing card	LMC
NT2X27	AD	Ringing generator interface syndronomic 16KHz multifrequency ringing card	LMC
NT2X27	AE	Ringing generator interface SYNC multifrequency ringing card	LMC
NT2X27	AF	Ringing 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*

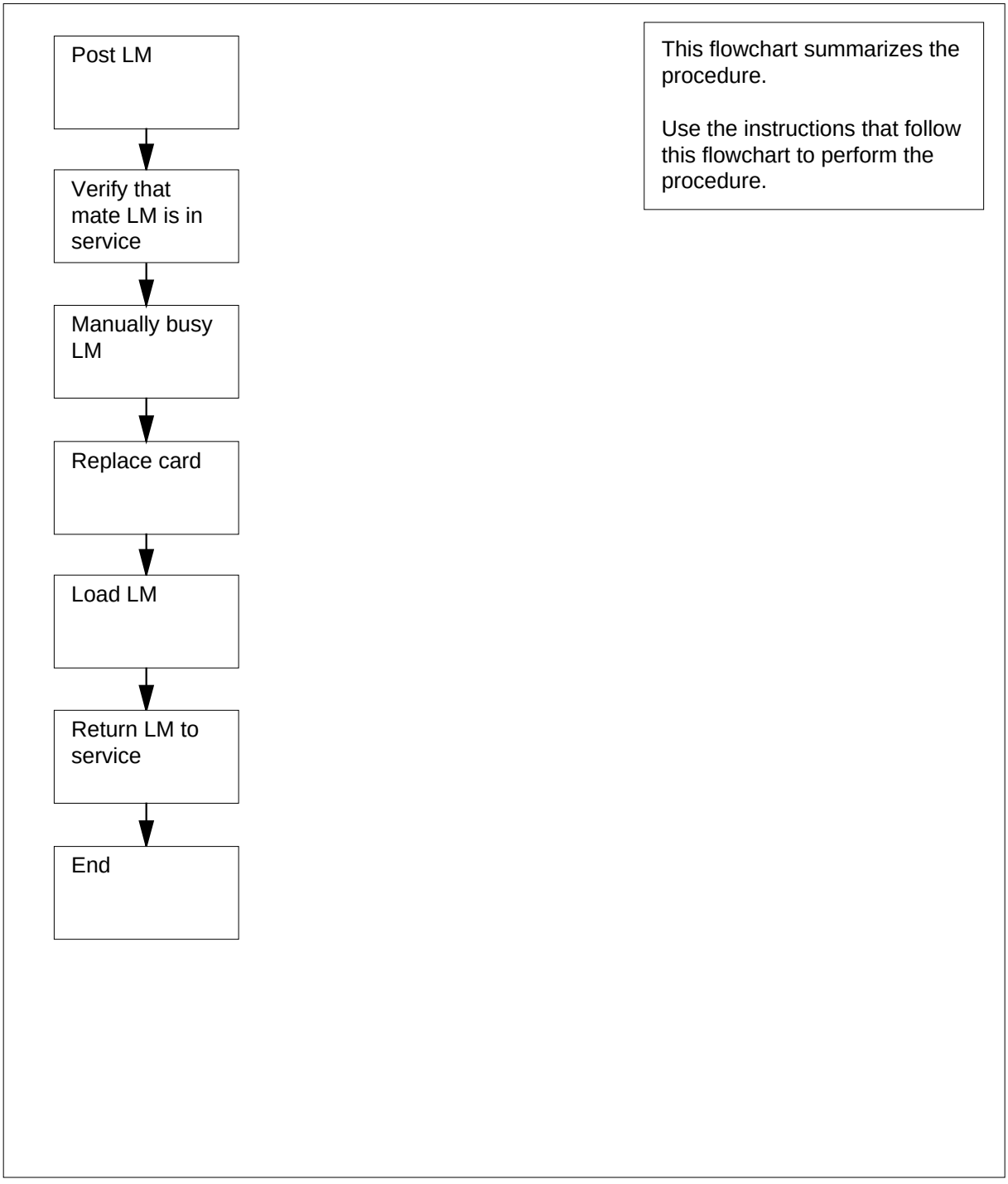
Do not proceed to the common procedure unless the step-action procedure directs you to go.

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.

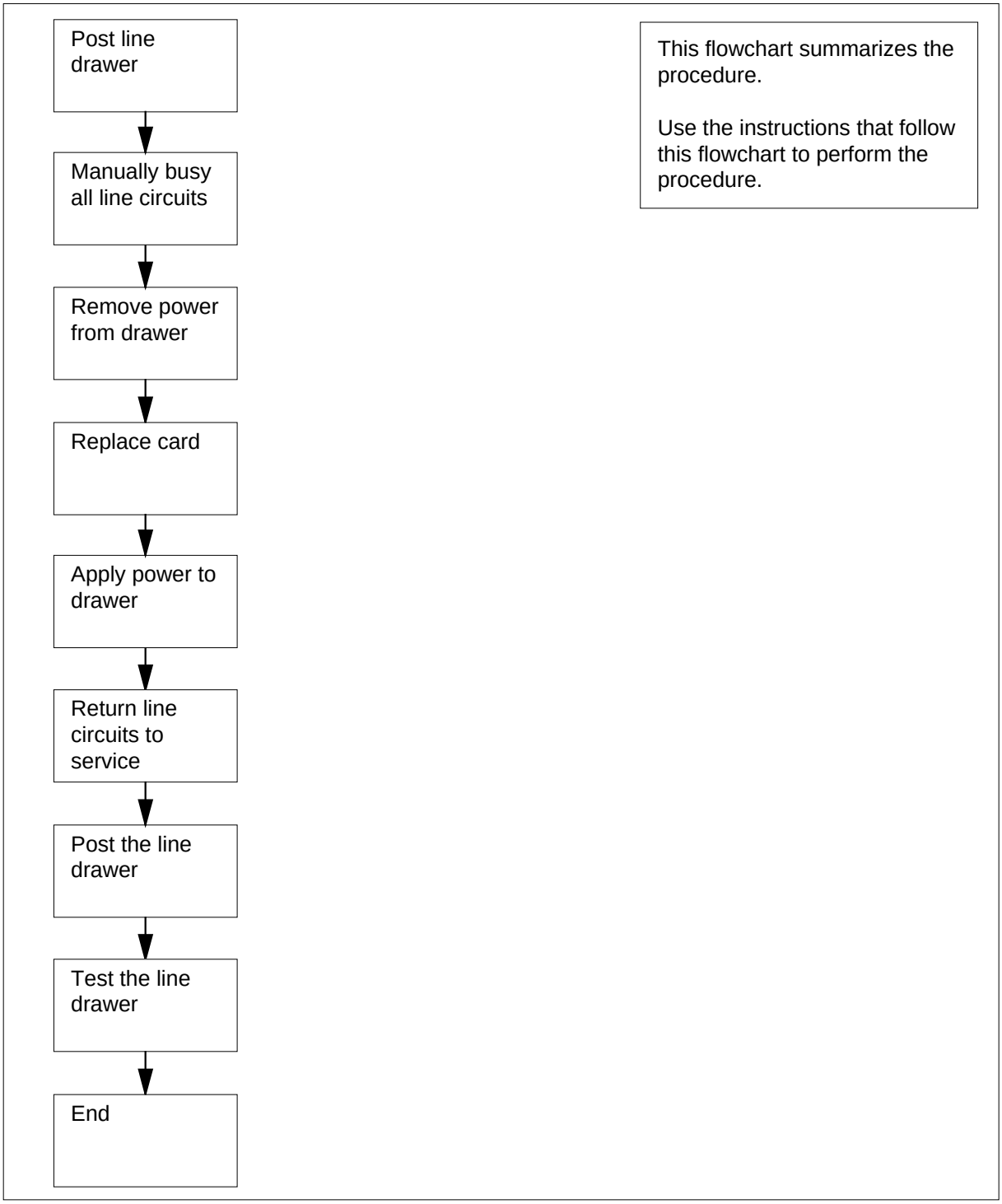
Do not proceed to the common procedure unless the step-action procedure directs you there.

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 ciruits 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.

If the PEC is	Do
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.

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

At the MAP terminal

13 To return the line to service, type

>RTS ALL

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 23
failed	step 18

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

>PM

and pressing the Enter key.

15 To post the line drawer busied in step 4, type

>POST LM site frame pair

and pressing the Enter key.

where

site
is the PM location (host or remote)

frame
is the frame number (00 to 99)

pair
is the frame pair number (0 to 1)

16 To test the line drawers returned to service in step 13, type

>TST DRWR drawer

and pressing the Enter key.

drawer
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, 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*.

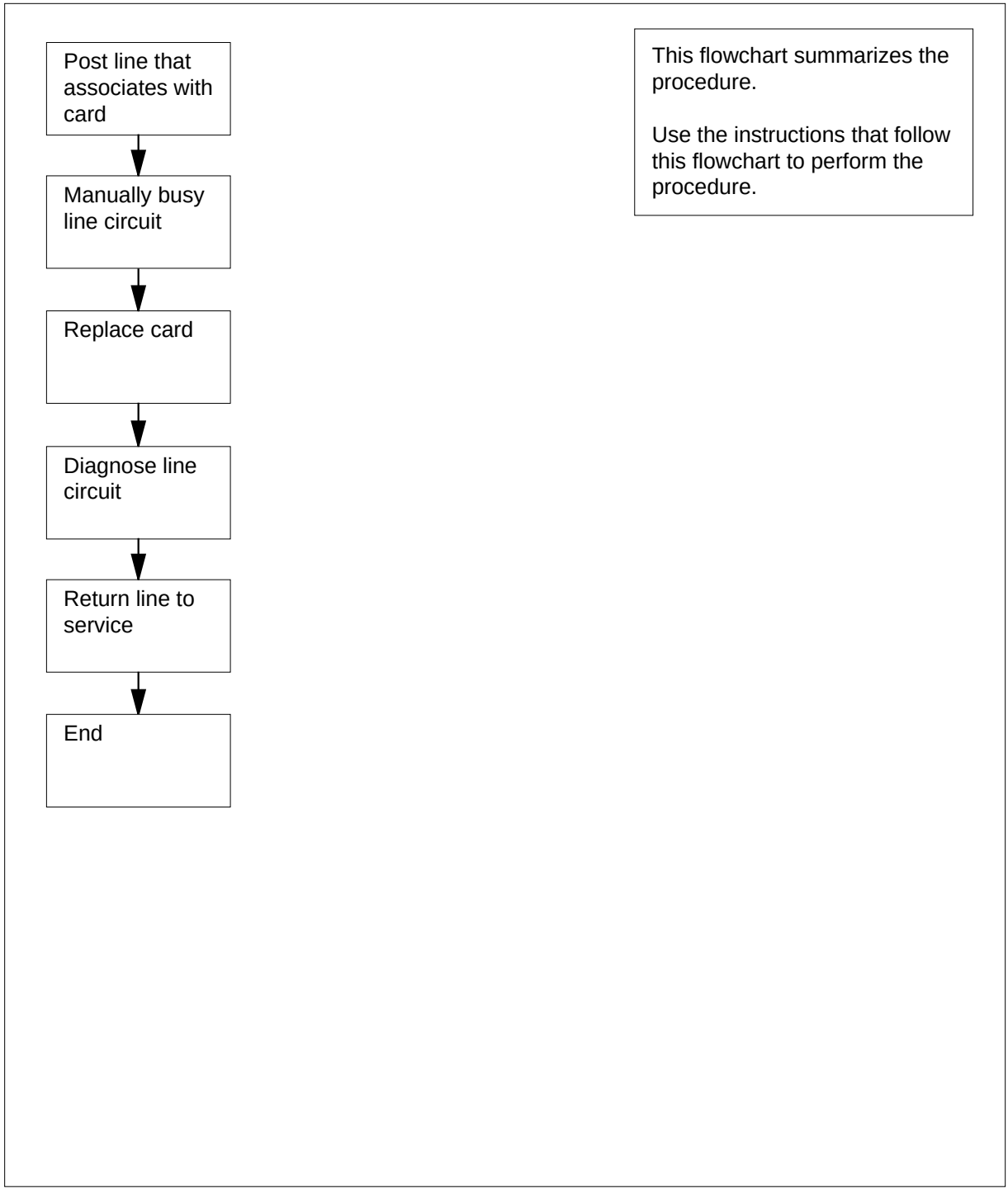
Do not proceed to the common procedure unless the step-action procedure directs you to go.

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.

If a maintenance procedure	Do
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
```

If the DIAG command	Do
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 +24V card	LMC
NT2X05	AC	Line power pack card with improved grounding	LMC
NT2X05	CA	Line power pack card with closing ringing 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*.

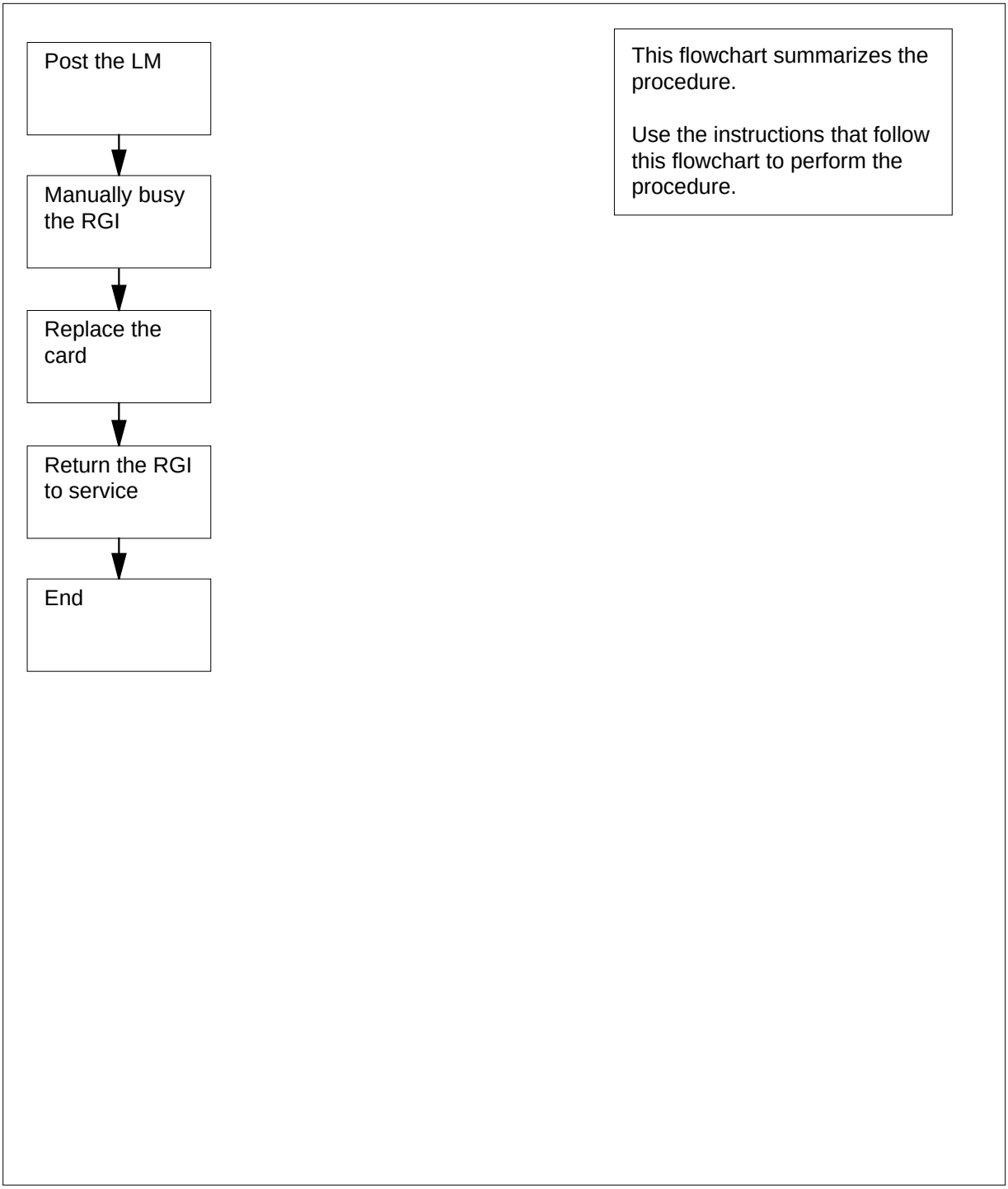
Do not go to the common procedure unless the step-action procedure directs you to go.

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 redundency 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*

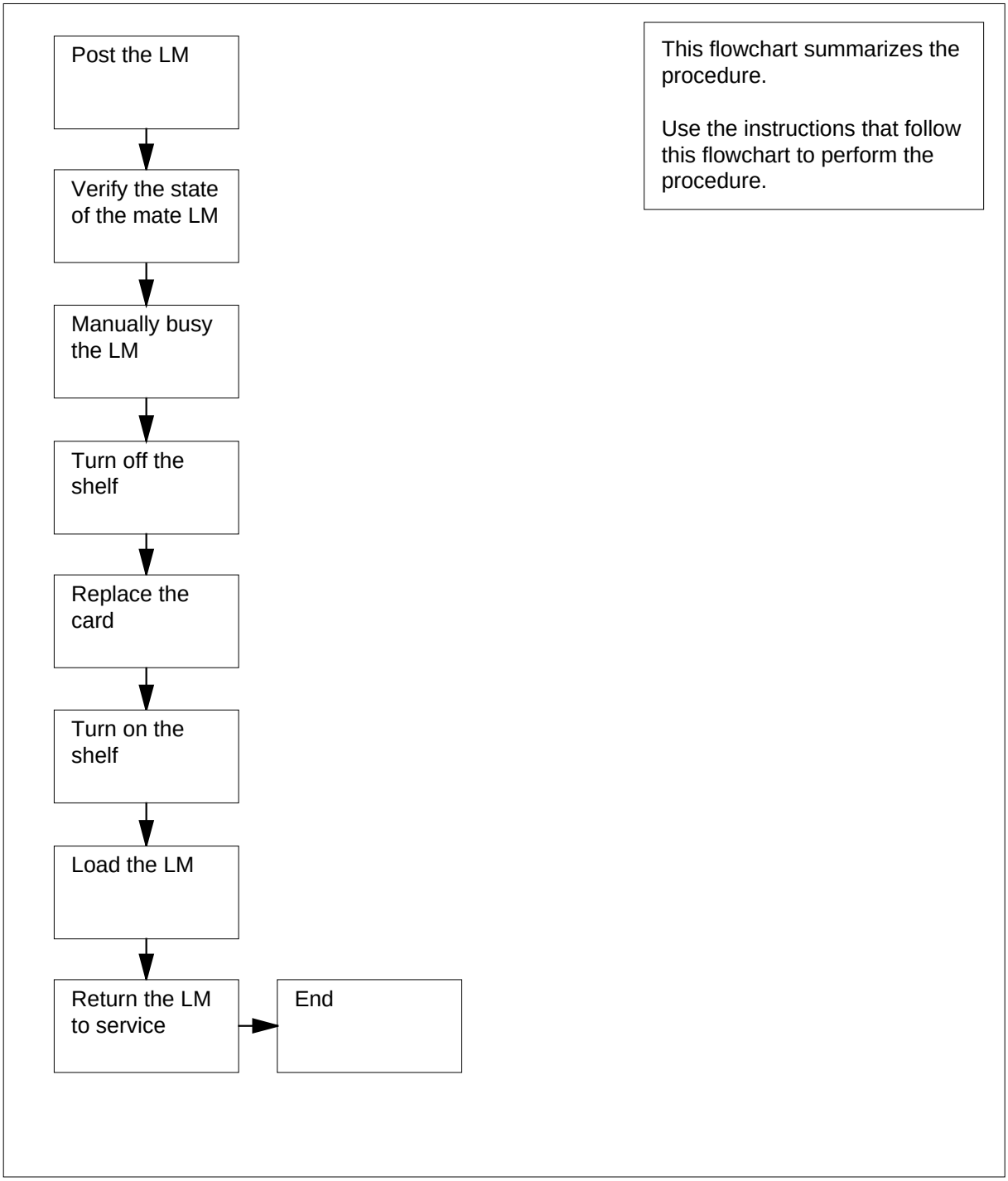
Do not go to the common procedure unless the step-action procedure directs you to go.

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

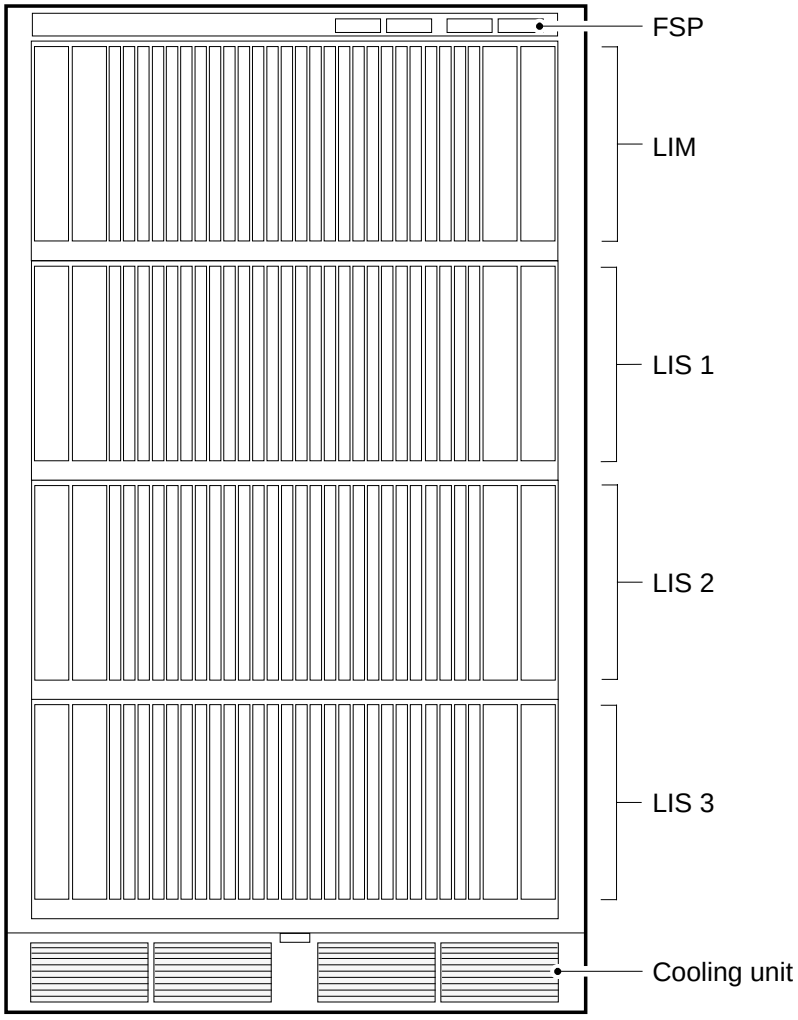
This section shows frame layouts for the link peripheral processor (LPP), as follows:

- 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



Legend:

FSP	Frame supervisory panel
LIM	Link interface module
LIS	Link interface shelf

LPP shelf layouts (continued)

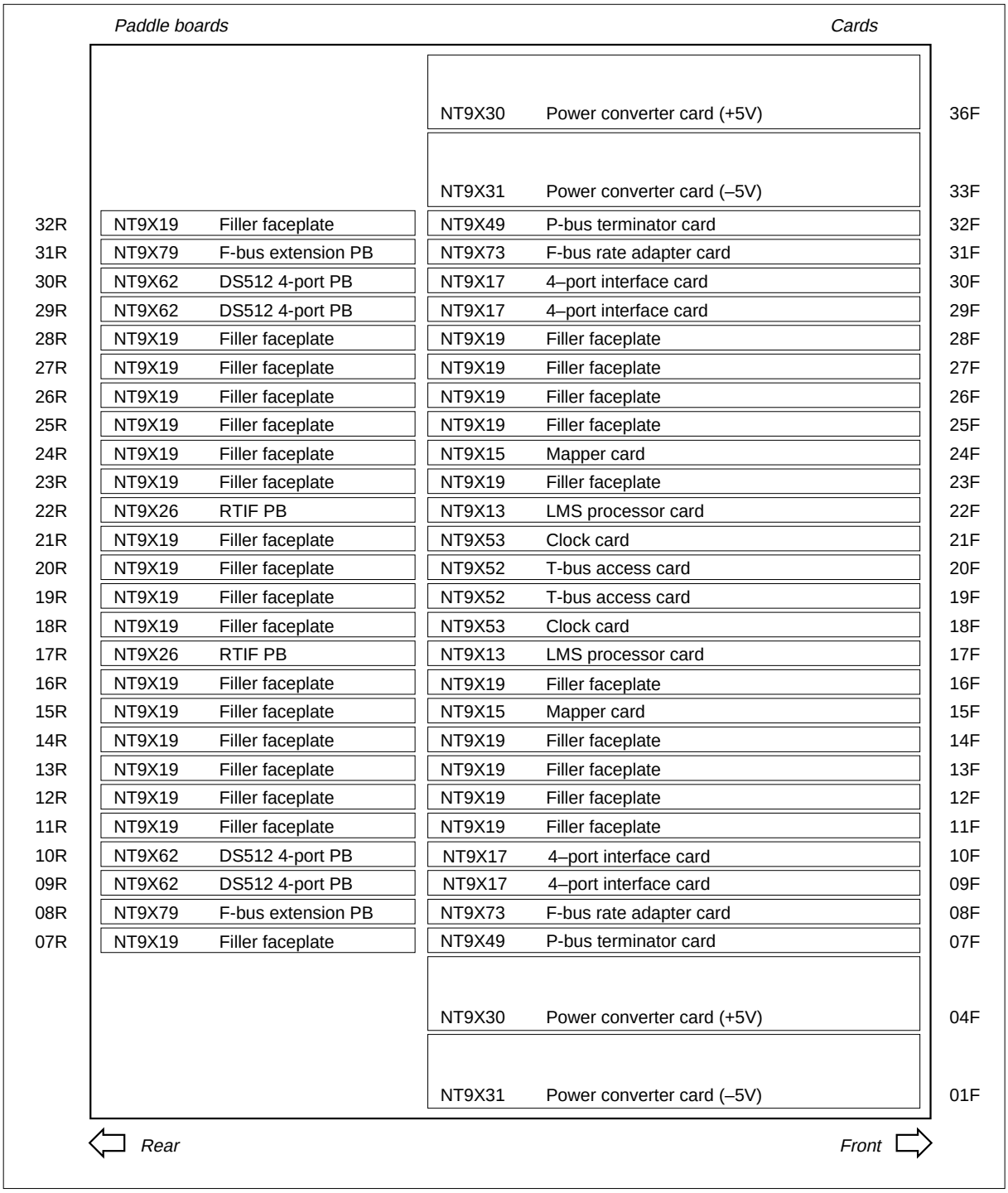
Figure Link interface module, that shows LMS 0 and LMS 1

	Paddle boards		*Cards*		
			NT9X30	Power converter card	36F
			NT9X19	Filler faceplate	33F
32R	NT9X19	Filler faceplate	NT9X49	P-bus terminator card	32F
31R	NT9X79	F-bus extension PB	NT9X73	F-bus rate adapter card	31F
30R	NT9X23	DS30 4-port PB	NT9X17	DS30 4-port card	30F
29R	NT9X23	DS30 4-port PB	NT9X17	DS30 4-port card	29F
28R	NT9X19	Filler faceplate	NT9X19	Filler faceplate	28F
27R	NT9X19	Filler faceplate	NT9X19	Filler faceplate	27F
26R	NT9X19	Filler faceplate	NT9X19	Filler faceplate	26F
25R	NT9X19	Filler faceplate	NT9X19	Filler faceplate	25F
24R	NT9X19	Filler faceplate	NT9X15	Mapper card	24F
23R	NT9X19	Filler faceplate	NT9X14	Memory card (based on NT9X13 version)	23F
22R	NT9X26	RTIF PB	NT9X13	LMS processor card	22F
21R	NT9X19	Filler faceplate	NT9X53	Clock card	21F
20R	NT9X19	Filler faceplate	NT9X52	T-bus access card	20F
19R	NT9X19	Filler faceplate	NT9X52	T-bus access card	19F
18R	NT9X19	Filler faceplate	NT9X53	Clock card	18F
17R	NT9X26	RTIF PB	NT9X13	LMS processor card	17F
16R	NT9X19	Filler faceplate	NT9X14	Memory card (based on NT9X13 version)	16F
15R	NT9X19	Filler faceplate	NT9X15	Mapper card	15F
14R	NT9X19	Filler faceplate	NT9X19	Filler faceplate	14F
13R	NT9X19	Filler faceplate	NT9X19	Filler faceplate	13F
12R	NT9X19	Filler faceplate	NT9X19	Filler faceplate	12F
11R	NT9X19	Filler faceplate	NT9X19	Filler faceplate	11F
10R	NT9X23	DS30 4-port PB	NT9X17	DS30 4-port card	10F
09R	NT9X23	DS30 4-port PB	NT9X17	DS30 4-port card	09F
08R	NT9X79	F-bus extension PB	NT9X73	F-bus rate adapter card	08F
07R	NT9X19	Filler faceplate	NT9X49	P-bus terminator card	07F
			NT9X30	Power converter card	04F
			NT9X19	Filler faceplate	01F

Rear *Front*

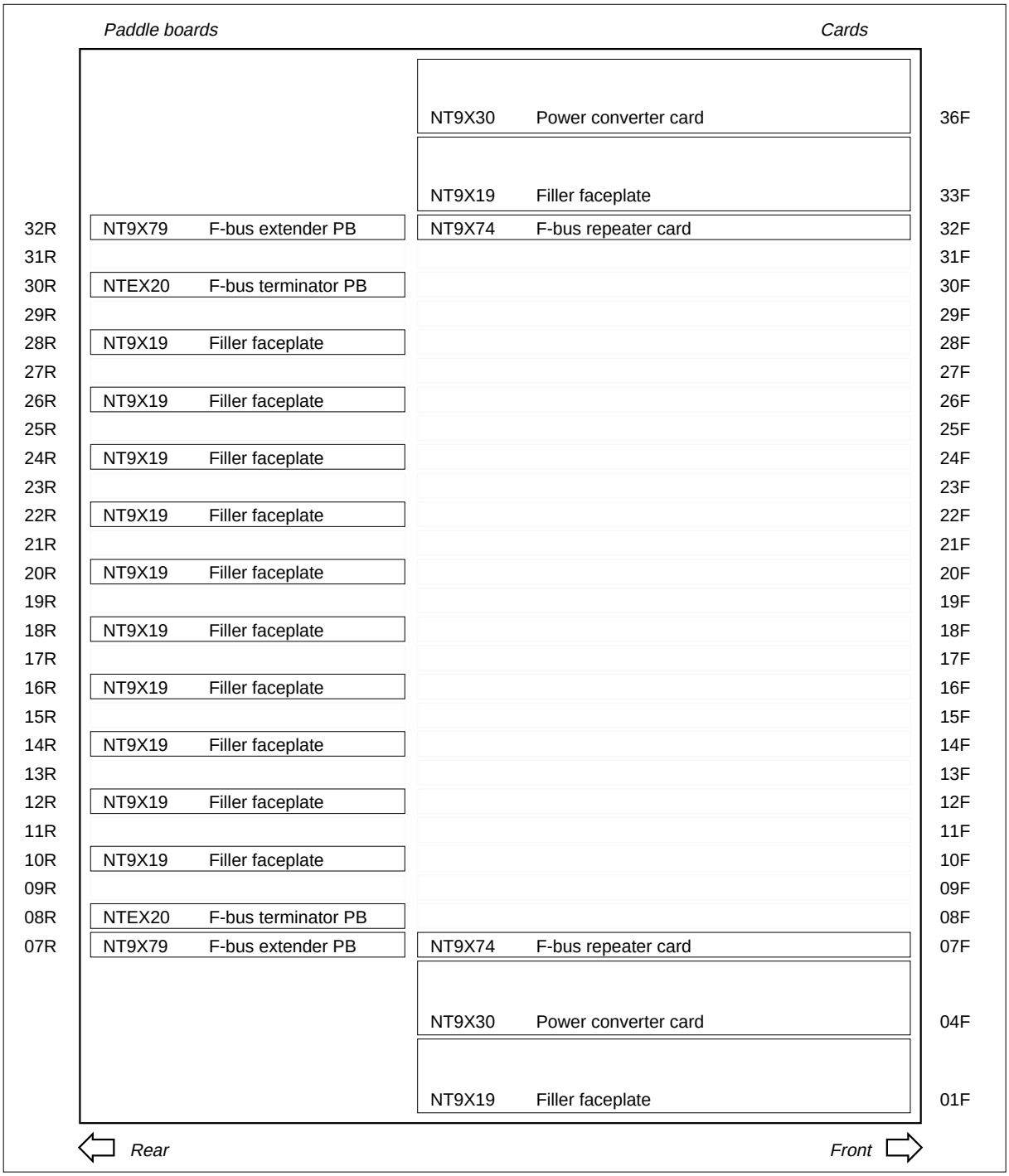
LPP shelf layouts (continued)

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

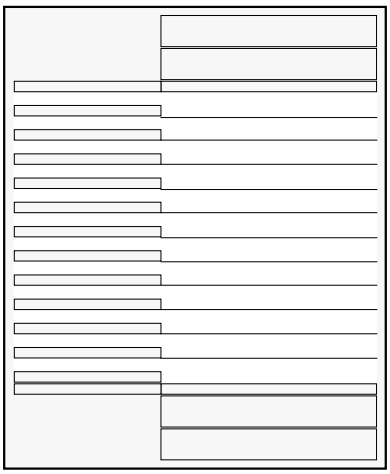


Note: Slots for ASUs have gray outlines.

LPP shelf layouts (end)

Figure Link interface shelf, that shows ASU location

Top view of LIS shelf



Rear paddle boards	**The following are ASUs that can fill these slots.**	*Front cards*
NTEX26 C-bus interface PB		NT9X76 Signaling terminal card
LIU7 (channelized)		NTEX22 Integrated processor and F-bus card
NT9X77 or NT9X78 V.35 or DS-0A PB		NT9X76 Signaling terminal card
LIU7 (non-channelized)		NTEX22 Integrated processor and F-bus card
NTFX09 C-bus access interface PB		NTFX10 HDLC frame processor card
XLIU		NTEX22 Integrated processor and F-bus card
NTEX30 T1 access PB		NTEX31 Frame relay access processor card
FRIU		NTEX22 Integrated processor and F-bus card
NTEX28 NIU link interface PB		NTEX25 Channel bus controller card
NIU		NTEX22 Integrated processor and F-bus card
NT9X19 Filler faceplate		NT9X14 Memory card
APU		NTEX22 Integrated processor and F-bus card
NTMX99 C-bus I/F 412 channels PB		NT9X97 RAP card
VPU		NTEX22 Integrated processor and F-bus card
NT9X85 Ethernet AUI PB		NT9X76 Signaling terminal card
EIU		NTEX22 Integrated processor and F-bus card

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.

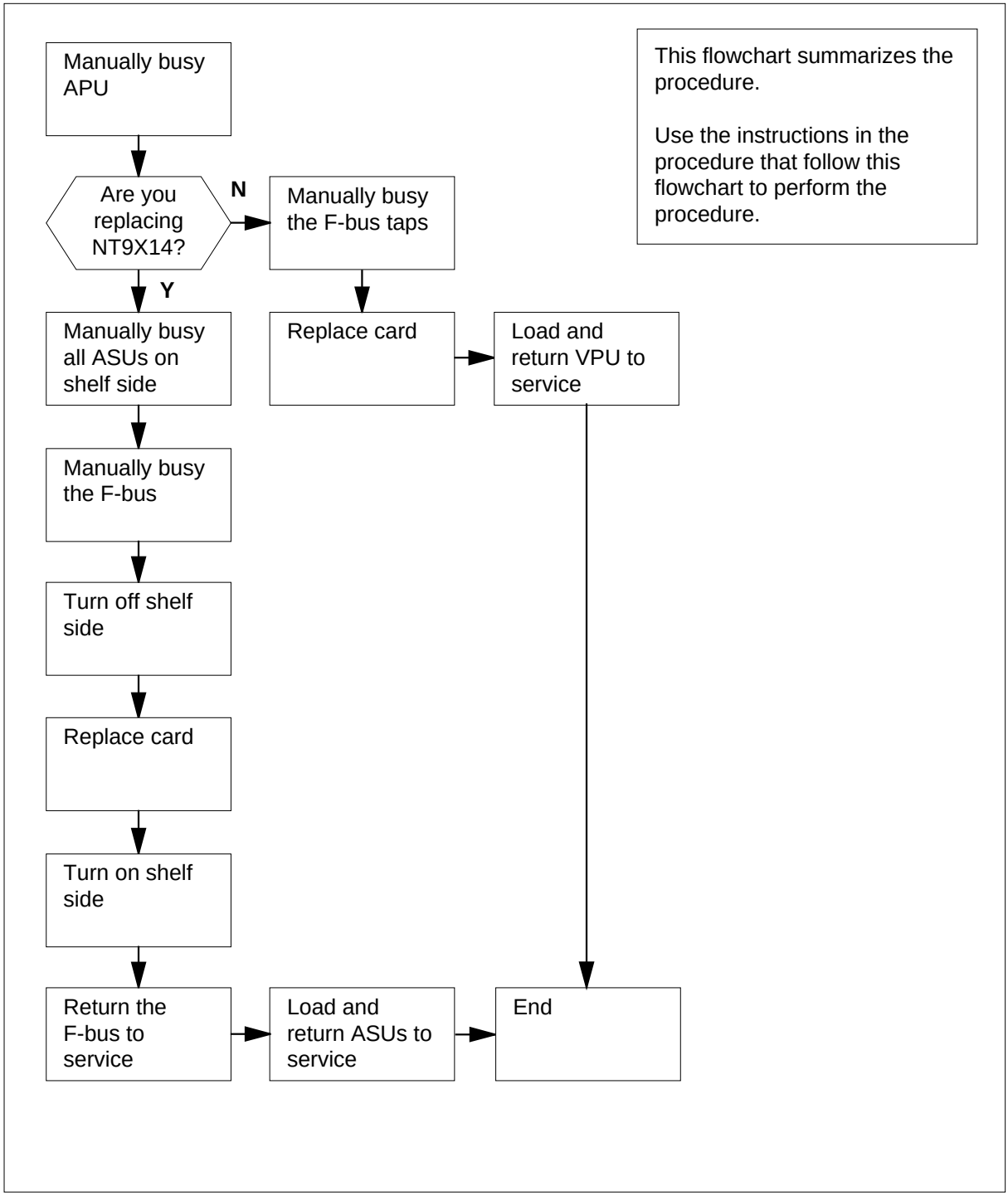
APU cards in an LPP LIS (continued)

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:

```
                  SysB    ManB    OffL    CBsy    ISTb    InSv
PM                  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: ULC02AO
Running Load: ULC02AO
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.

Example of a MAP response:

```
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 opferating 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.

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 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.

Example of a MAP response:

```
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.

Example of a MAP display:

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
         0 1 2 3           CBUS ports OOS
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
          0 1 2 3           CBUS ports OOS
 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 reduces.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 179for 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.

Example of a MAP response:

```
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.

Example of a MAP response:

```
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_OOS Taps_OOS
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.

Example of a MAP display:

```
          Net Links
          0 1 2 3           CBUS ports OOS
PB 0      . . . .               2
PB 1      . . . .               .
RTSLNKS INACTIVE
Command completed.
```

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.

where

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 179for 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:

```
                  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           .         .
```

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 *Unseating cards in equipment shelves* in this document. Complete the procedure and return to this point.

80 To replace the NT9X14 card, perform the procedure *Replacing a card* 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 *Reseating cards in equipment shelves* in this document. Complete the procedure and return to this point.

Go to step 83.

82 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 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.
```

97 The procedure is complete.

LIS and associated LIM components

LIM unit	Associated LIM hardware and F-buses	
0 (left side)	F-bus number: Mate F-bus number:	0 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: Mate F-bus number:	1 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 coresponds to LMS 0. LIM unit 1 coresponds 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.

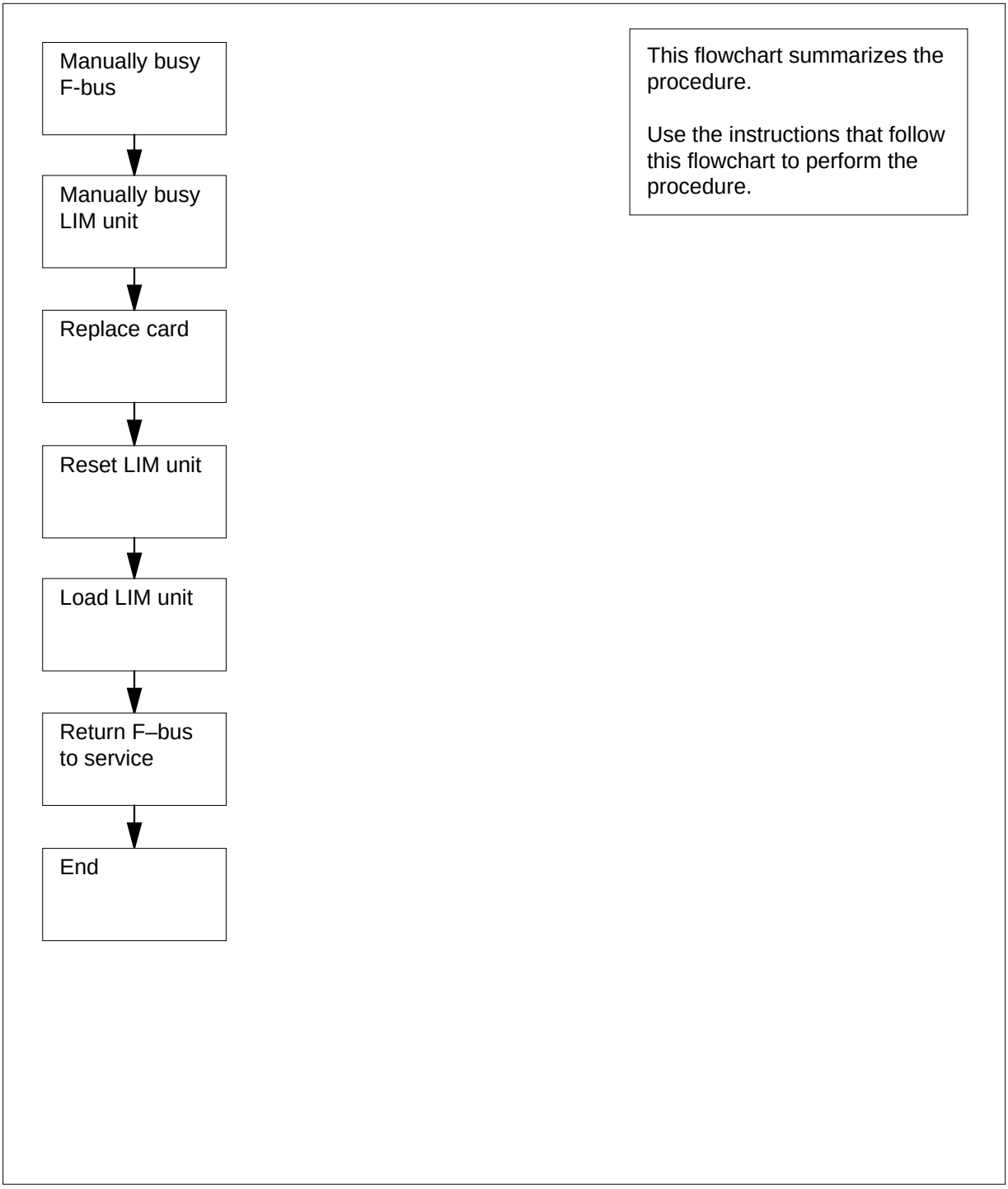
Common fill paddle boards in an LPP LIS (continued)

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:

```
                  SysB    ManB    OffL    CBsy    ISTb    InSv
PM                   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
                    Links_OOS Taps_OOS
Unit0: InSv             .         .
Unit1: InSv             .         .
```

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
                    Links_OOS Taps_OOS
Unit0: InSv             .         .
Unit1: InSv             .         .

             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.

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 must 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:

```
              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            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

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*

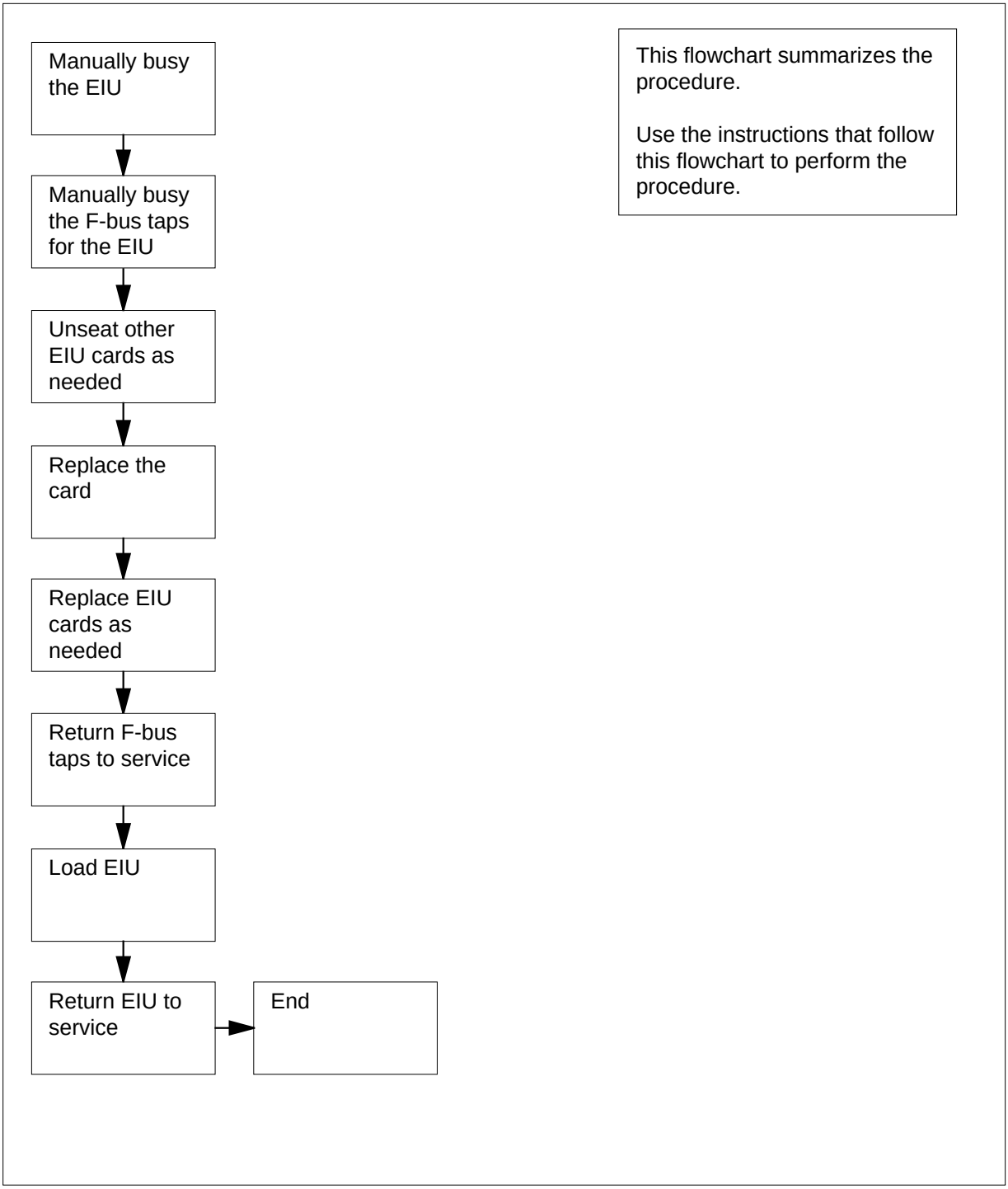
Do not proceed to the common procedure unless the step-action procedure directs you to go.

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:

```
                SysB    ManB    OffL    CBsy    ISTb    InSv
 PM               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:

```
                SysB    ManB    OffL    CBsy    ISTb    InSv
 PM               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: LRS02AO
Running Load: LRS02AO
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)

```
                SysB    ManB    OffL    CBsy    ISTb    InSv
   PM             0       0       1       0       2      48

   LIM            0       0       0       0       1       0

LIM  0 InSv
             Links_OOS Taps_OOS
Unit0: InSv           .         .
Unit1: InSv           .         .
```

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 *Unseating cards in equipment shelves* in this document. Complete the procedure and return to this point.

21 Use the procedure *Replacing a card* 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 *Reseating cards in equipment shelves* 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 *Unseating cards in equipment shelves* in this document. Complete the procedure and return to this point.

24 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 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 *Reseating cards in equipment shelves* 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

Example of a MAP response:

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)

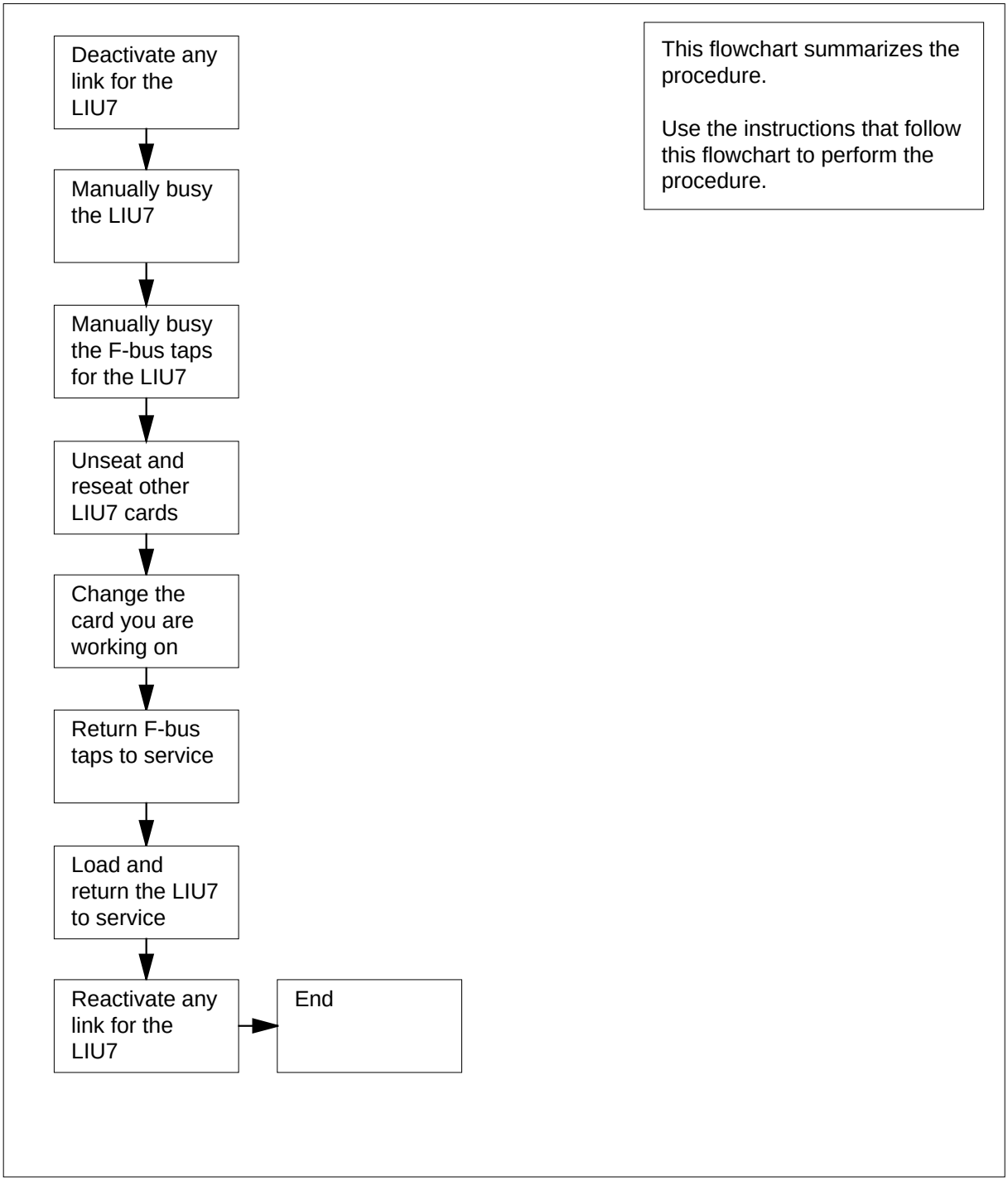
Do not go to the common procedure unless directed to do so in the step-action procedure.

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
                  Links_OOS Taps_OOS
Unit0: ISTb           4         .
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*

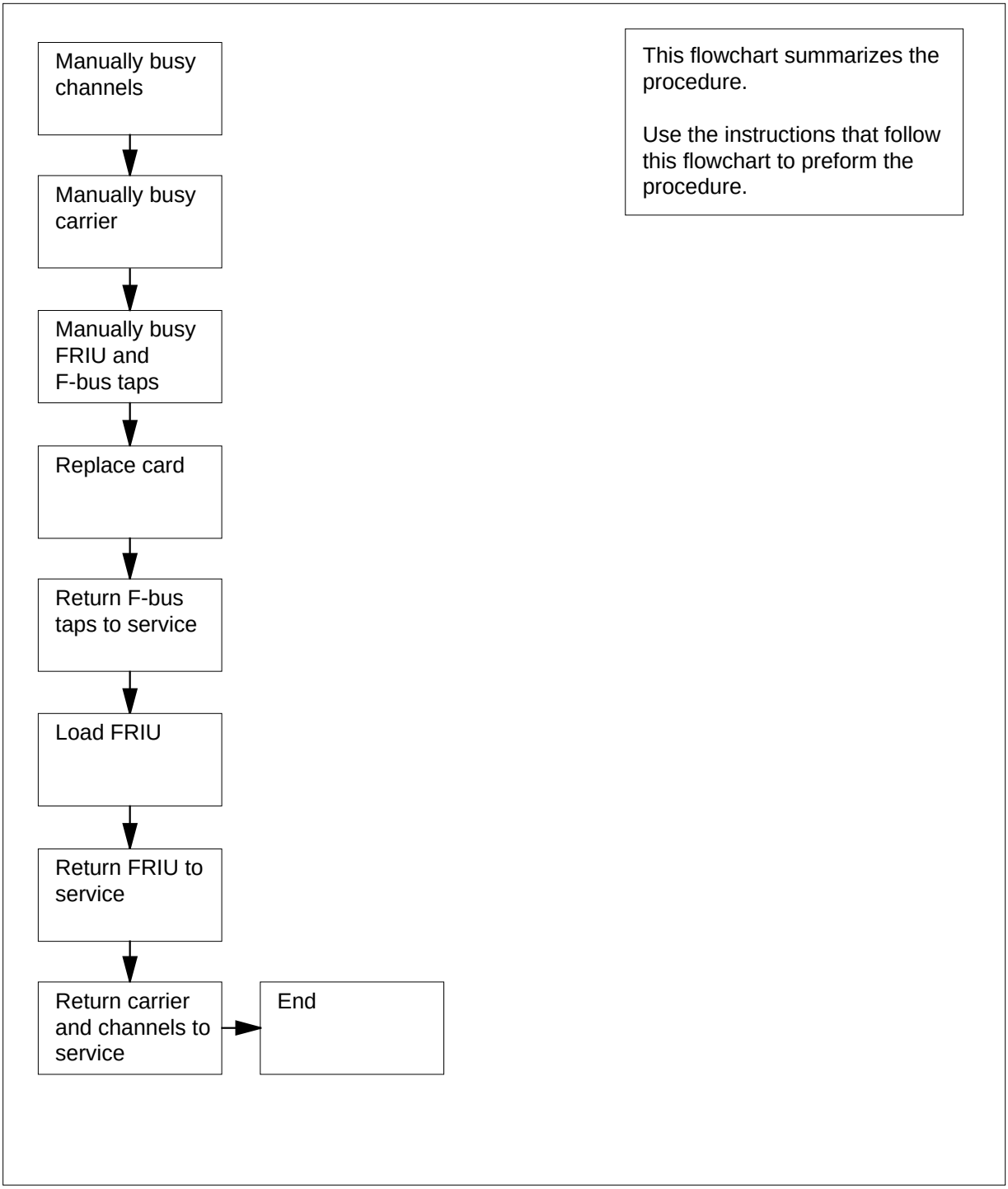
Do not go to the common procedure unless the step-action procedure directs you to go.

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
   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
         .

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
   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

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.

Ifproceed 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.

Example of a MAP response:

```
Imaging will be aborted on FRIU 8.
```

16 To query the FRIU, type

>QUERYPM

and press the Enter key.

Example of a MAP response:

```
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_OOS Taps_OOS
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_OOS Taps_OOS
 Unit0: InSv          .         .
 Unit1: InSv          .         .

                Tap: 0    4    8    12   16   20   24   28   32
 FBus0: InSv         .... .... .... .... .... .... ...IIII ...I

 FBus1: InSv         .... .... .... .... .... .... ...IIII ...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   UAS
 ManB                                    -8.3     0     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
 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   UAS
 ManB                                    -8.3     0     0     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*

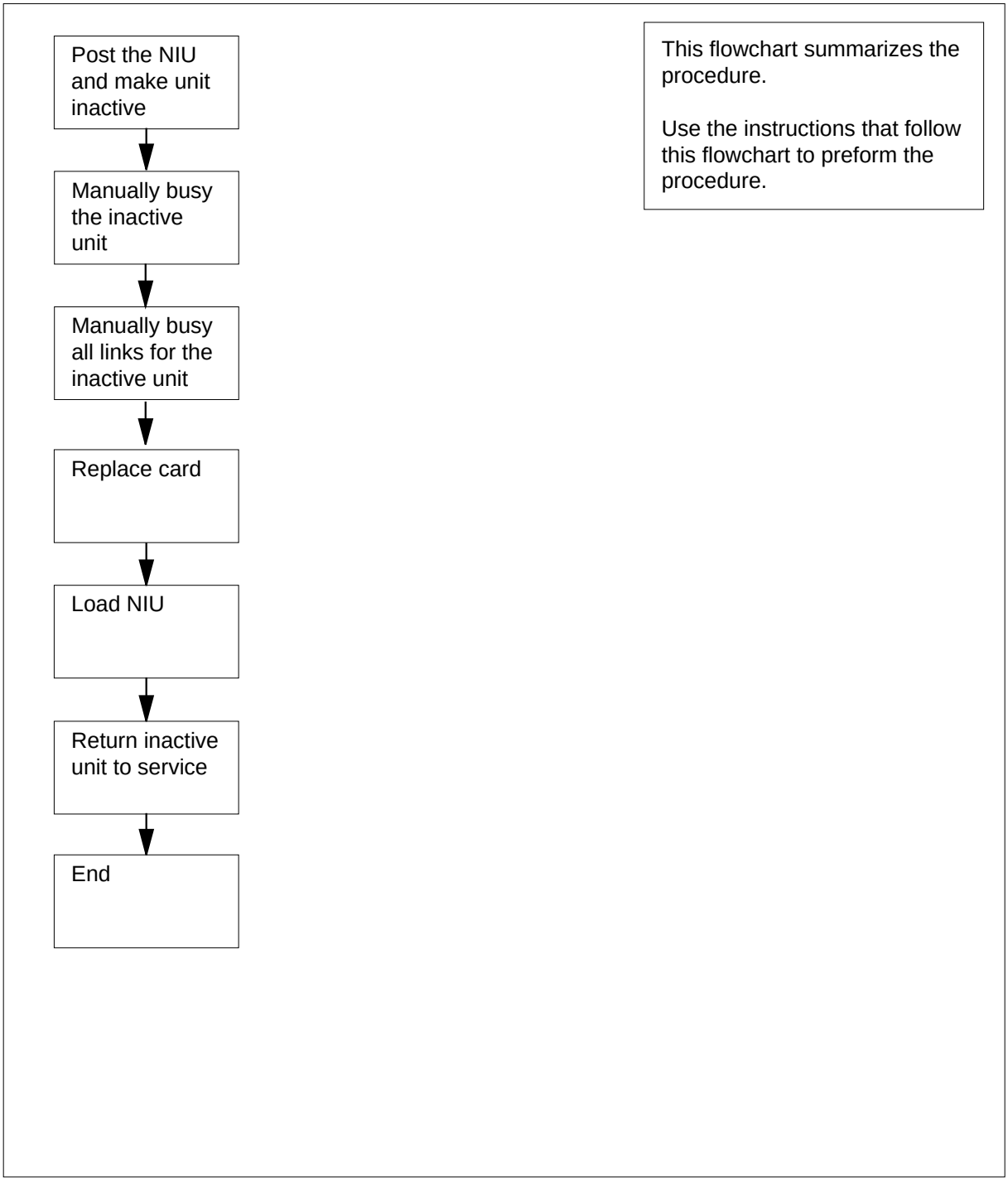
Do not go to the common procedure unless the step-action procedure directs you to go.

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*

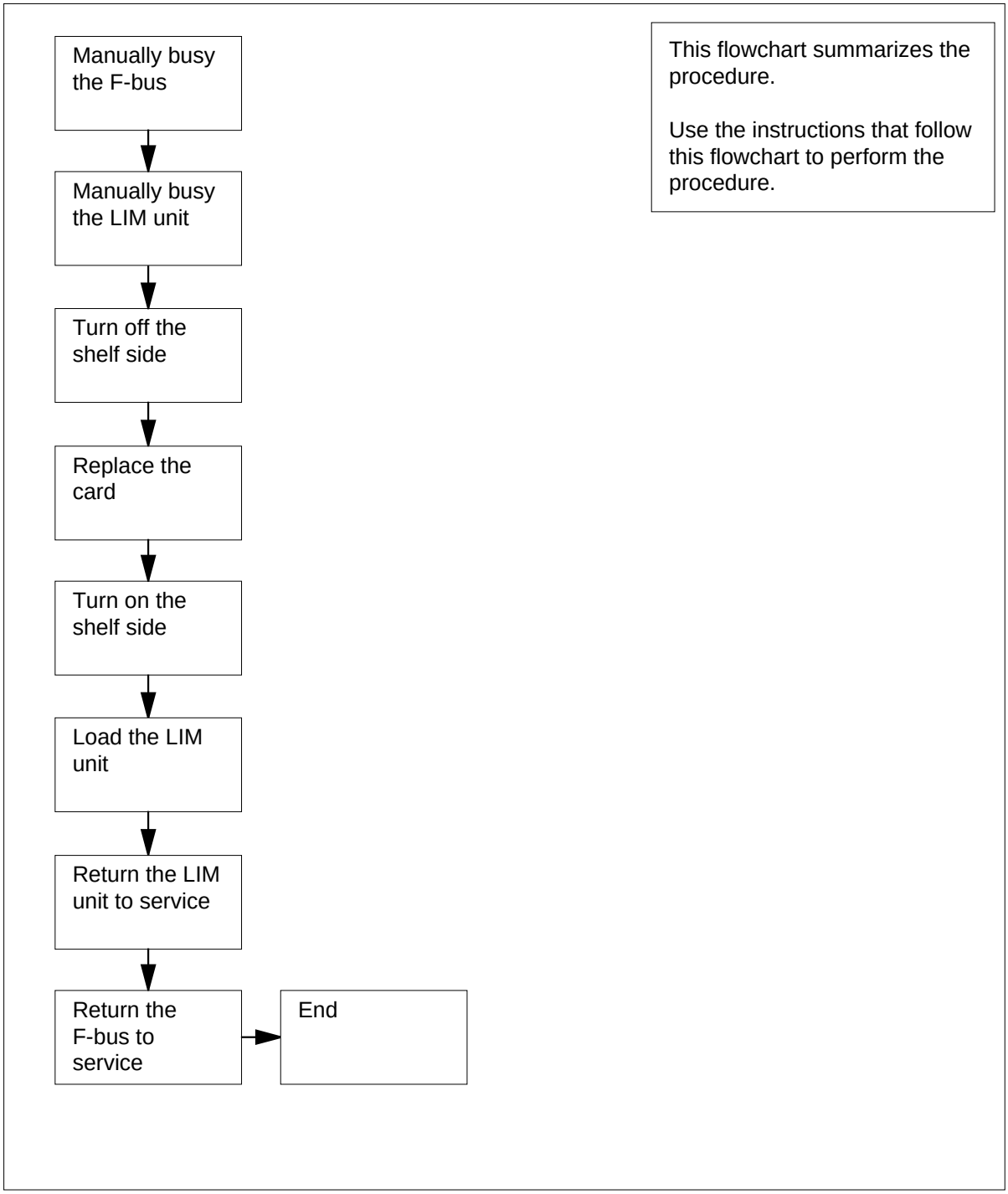
Do not go to the common procedure unless the step-action procedure directs you to go.

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    18
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:

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

LIM  0 InSv
                          Links_OOS Taps_OOS
Unit0: InSv                  .         .
Unit1: InSv                  .         .
                    Tap: 0   4   8   12   16   20   24   28   32
FBus0: InSv   .-.- ---- --.. ...- .--- --.. ...- .... --..
FBus1: InSv   .-.- ---- --.. ...- .--- --.. ...- .... --..
```

8

CAUTION
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 before you manually busy the LIM unit and F-bus that associate with the card you will replace. If you manually busy the F-bus and the LIM unit while the mates are out of service, you will 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 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

9 To manually busy the F-bus associated with the card you will 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 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: Mate LIM unit number: F-bus number: Mate F-bus number: Location of NT9X30 powerconverter: Location of NT9X31 powerconverter:	0 1 0 1 slot 0 1F slot 0 1F
NT9X13	22F	LIM unit number: Mate LIM unit number: F-bus number: Mate F-bus number: Location of NT9X30 powerconverter: Location of NT9X31 powerconverter:	1 0 1 0 slot 36F 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	AB	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.

Common procedures

This procedure refers to the following common procedures:

- *Verifying load compatibility of SuperNode cards*
- *Deactivating CCS7 links*
- *Moving an XSG to a spare XLIU*
- *Replacing a card*
- *Loading a PM*
- *Activating CCS7 links*

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

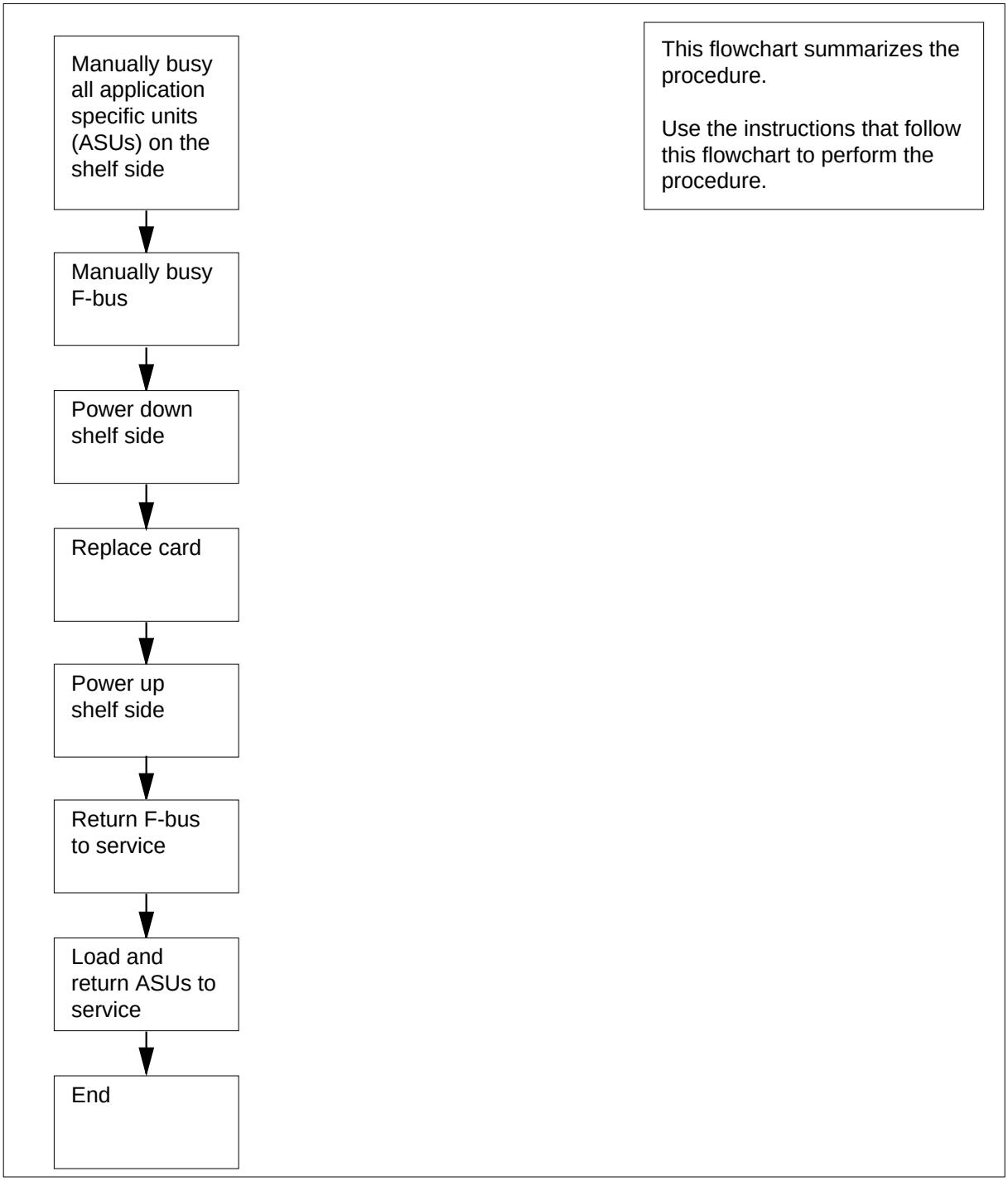
NT9X30
in an LPP LIS (continued)

Action

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

If you	Do
know the PM number and slot location of each ASU on the shelf side	step 12
do not know the PM number and slot location of each ASU on the shelf side	step 6

NT9X30
in an LPP LIS (continued)

Note: The ASUs include:

- network interface units (NIU)
- 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.

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>:  Thefirst column of output is column 1.
```

7 To list the NIUs, type

>LIST ALL

and press the Enter key.

Example of a MAP response:

```
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 present on the LIM shelf that associates with the NT9X30 card you replace	step 8

NT9X30
in an LPP LIS (continued)

If	Do
an NIU is not present on the LIM shelf that associates with the NT9X30 card you replace	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 example, NIU 1 is in LIM 0 on shelf 1 and NIU 2 is in LIM 0 on shelf 2.

8 Record the number of the NIU that associates with the shelf.

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
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
XLIU 132 LIM 3 3 22XRX031BF NTEX22BB NTFX10AA NTFX09AA
FRIU 134 LIM 1 3 26F8C031BG NTEX22BB NTEX31BA NTEX30AA FBUS UNCHAN
   DS1_LLEQ_125 DEFAULT Y B8ZS
APU 135 LIM 1 3 28 ULX03AU NTEX22BB NT9X14DB SOSNIX
BOTTOM
```

If	Do
a minimum of one ASU is present on the LIS shelf that associates with the NT9X30 card you replace	step 11
ASUs are not present on the LIS shelf that associates with the NT9X30 card you replace	step 12

Note: In the MAP response, 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 far left as you face the LPP.

11 Record the number and slot location for each ASU on the shelf side that associates with the NT9X30.

NT9X30
in an LPP LIS (continued)

12

ATTENTION

The following routines provide instructions to remove ASUs from service in this order: NIU, LIU7, XLIU, FRIU, 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 step depends on if 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.

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:

NT9X30
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
```

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 end 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 102

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 99

16 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 17
failed	step 104

NT9X30
in an LPP LIS (continued)

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 103

19 To confirm Busy, type

>YES

and press the Enter key.

Example of a MAP response:

```
Imaging will be aborted on NIU x, Unit y.
```

20 Determine if CCS7 LIU7s are in the shelf side that associates with the NT9X30.

If shelf side	Do
has LIU7s	step 21
does not have LIU7s	step 28

NT9X30
in an LPP LIS (continued)

21

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)

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
```

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.

If the state of the LIU7	Do
is SysB, SysB (NA), ISTb, or InSv	step 24
is ManB or ManB (NA)	step 27
is OffL	step 102

24 To manually busy the LIU7, type

>BSY FORCE

and press the Enter key.

If	Do
you need to confirm the command	step 26
the command passed	step 28

NT9X30
in an LPP LIS (continued)

If	Do
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 25

25 Contact the next level of support to determine if it is safe to continue this procedure.

If it is	Do
proceed with BSY FORCE request	step 26
abort BSY FORCE request	step 103

26 To confirm the command, type

>YES

and press the Enter key.

27 Repeat steps 21 to 26 for all LIU7s on the shelf side.

28 Determine if XLIUs are in the shelf side that associates with the NT9X30.

If shelf side	Do
has XLIU	step 29
does not have XLIU	step 36

29

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:

NT9X30
in an LPP LIS (continued)

```
             SysB     ManB     OffL     CBsy     ISTb     InSv
PM              0        2       23        0       10       30
XLIU            0        0        0        0        0        3

XLIU 27 InSv        Rsvd
```

30 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 29.

If the state of the XLIU	Do
is SysB, ISTb (NA), ManB, ISTb, or InSv	step 31
is OffL	step 102

31 Determine if 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 26. 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 35
is a spare, and the state is other than listed here	step 34
is not a spare	step 32

32 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 33
is not available and the reserved XLIU is out of service	step 34
is not available and the reserved XLIU is in service	step 100

33 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 36.

NT9X30
in an LPP LIS (continued)

34 To manually busy the XLIU, type

>BSY

and press the Enter key.

Example of a MAP response

```
XLIU 27 BSY Passed
```

35 Repeat steps 29 to 34 for all XLIUs on the shelf side you are working on.

36 Determine if FRIUs are in the shelf side that associates with the NT9X30.

If shelf side	Do
has FRIU	step 37
does not have FRIU	step 54

37

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
```

NT9X30
in an LPP LIS (continued)

38 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 37.

If the state of the FRIU	Do
is SysB, ISTb (NA),InSv, or ISTb	step 39
is ManB	step 53
is OffL	step 102

39 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   UAS
InSv                               -8.3   0     0     0

CHANNEL  1
         .
CHANNEL   1     ( 24  x  DS0)
InSv
CHAN:
```

40 Determine if the FRIU has channelized access.

Note: A non-channelized FRIU has one channel assigned. A channelized FRIU has four or 24 channels assigned.

If the FRIU	Do
is non-channelized	step 41
is channelized	step 43

41 To manually busy the channel, type

>BSY

and press the Enter key.

42 To confirm the command, type

>YES

NT9X30
in an LPP LIS (continued)

and press the Enter key.

Note: If the channel is out of service, the system does not request confirmation.

Go to step 46.

43 To manually busy all channels, type

>BSY ALL

and press the Enter key.

44 To manually busy all channels, type

>BSY ALL

and pressing the Enter key.

45 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.

46 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
         .
```

47 To manually busy the carrier, type

>BSY

and press the Enter key.

Example of a MAP response:

```
Busying this carrier will affect 1 channels.
Pleaseconfirm ("YES", "Y", "NO", or "N"):
```

48 To confirm the command, type

>YES

and press the Enter key.

NT9X30
in an LPP LIS (continued)

Example of a MAP response:

```
Confirmed...BSY passed.
```

Note: If the carrier is out of service, the system does not request confirmation.

49 To quit the CARR level, type

>QUIT

and press the Enter key.

50 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 53
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 51

51 Determine if you should proceed with the BYS and proceed as shown below.

Ifproceed with	Do
BUSY and abort imaging	step 52
abort BSY request	step 103

52 Continue with BSY FORCE by typing

>BSY FORCE

and pressing the Enter key.

Example of a MAP response:

```
Imaging will be aborted on FRIU 8.
```

53 Repeat steps 37 to 50 for all FRIUs on the shelf side.

54 Determine if APUs, EIUs, or VPUs are in the shelf side that associates with the NT9X30 in use.

If shelf side	Do
has APUs, EIUs, or VPU	step 55

NT9X30
in an LPP LIS (continued)

If shelf side	Do
does not have APUs, EIUs, or VPU	step 60

55

CAUTION
Loss of service capacity
The following routine can remove an APU 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.

The following routine can remove a VPU from service. Service capacity reduces.

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 179for 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
```

56 Determine the state of the APUs, EIUs, or VPU.

If the state of the PM	Do
is SysB, SysB (NA), ISTb, or InSv	step 57
is ManB or ManB (NA)	step 59
is Offl	step 102

NT9X30
in an LPP LIS (continued)

57 To manually busy the APUs, EIUs, or VPU, type

>BSY

and press the Enter key.

Example of a MAP response:

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

If	Do
the command passed	step 59
you need to confirm the command	step 58

58 To confirm the busy command, type

>YES

and press the Enter key.
VPU 1 BSY Passed.

If the BSY command	Do
passed	step 59
failed	step 104

59 Repeat steps 55 to 58 for all APUs, EIUs, or VPUs on the shelf side.

60 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_OOS Taps_OOS
Unit0: InSv           .         .
Unit1: InSv           .         .
```

NT9X30
in an LPP LIS (continued)

61 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         ...- ---- ---. .-.- ---- ----...- -..- -...
```

62 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 end of this document to identify the F-bus that associates with the card you replace.

At the shelf

63

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 64
is not lit	step 101

64 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)

65 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 66
is lit	step 101

At the MAP terminal

66 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)

67

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 if NIUs are present in the shelf.

If shelf	Do
has NIUs	step 68
does not have NIUs	step 72

68 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)

69 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 71
failed	step 70

70 To load the PM, perform the procedure *How to load a PM* in this document. Complete the procedure and return to this point.

71 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 72
failed	step 104

72 Determine if CCS7 link interface units (LIU7) are in the shelf side that associates with the NT9X30.

If shelf side	Do
has LIU7s	step 73
does not have LIU7s	step 79

73 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)

74 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 76
failed	step 75

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

76 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 77
failed	step 104

77 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.

78 Repeat steps 73 to 77 for all LIU7s on the shelf side.

79 Determine if FRIUs are in the shelf side that associates with the NT9X30.

If shelf side	Do
has FRIU	step 80
does not have FRIU	step 91

80 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)

81 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 83
failed	step 82

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

83 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 84
failed	step 104

84 To access the CARR level of the MAP display, type

>CARR

and press the Enter key.

85 To return the carrier to service, type

>RTS

and press the Enter key.

Example of a MAP response:

```
RTS passed.
```

86 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)

87 Wait 1 min for the carrier to go in service.

If after 1 min the state of the carrier	Do
is InSv	step 88
is other than listed here	step 104

88 To access the CHAN level of the MAP display, type

>CHAN

and press the Enter key.

89 To return the carrier to service, type

>RTS

and press the Enter key.

Example of a MAP response:

```
RTS passed.
```

90 Repeat steps 80 to 89 for all FRIUs on the shelf side in use.

91 Determine if XLIUs, APUs, EIUs, or VPUs are in the shelf side that associates with the NT9X30.

If shelf side	Do
has XLIUs, APUs, EIUs, or VPUs	step 92
does not have XLIUs, APUs, EIUs, or VPUs	step 97

92 To post the XLIU, APUs, EIUs, or VPUs, 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)

93 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 95
failed	step 94

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

95 To return the XLIU, APU, EIU, or VPU to service, type

>RTS

and press the Enter key.

Example of a MAP response:

```
APU 1 RTS Passed
```

If the RTS command	Do
passed	step 96
failed	step 104

96 Repeat steps 92 to 95 for all XLIU, APUs, EIUs, and VPUs on the shelf side.

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

If a maintenance procedure	Do
directed you to this procedure	step 98
did not direct you to this procedure	step 105

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

99 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.

100 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.

101 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)

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

103 Abort the BSY FORCE request by typing

>NO

and pressing the Enter key

Example of a MAP response:

```
Aborted.
```

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

105 The procedure is complete.

NT9X30 (in a LIS) and associated LIM components

PEC	Slot	Associated LIM hardware and F-buses	
NT9X30	04F	LIM unit number: Mate LIM unit number: F-bus number: Mate F-bus number: Shelf side: NIU unit number: Location of NT9X13:	0 1 0 1 slots 0 to 19 unit 0 slot 17F
NT9X30	36F	LIM unit number: Mate LIM unit number: F-bus number: Mate F-bus number: Shelf side: NIU unit number: Location of NT9X13:	1 0 1 0 slots 39 to 20 unit 1 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.

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.

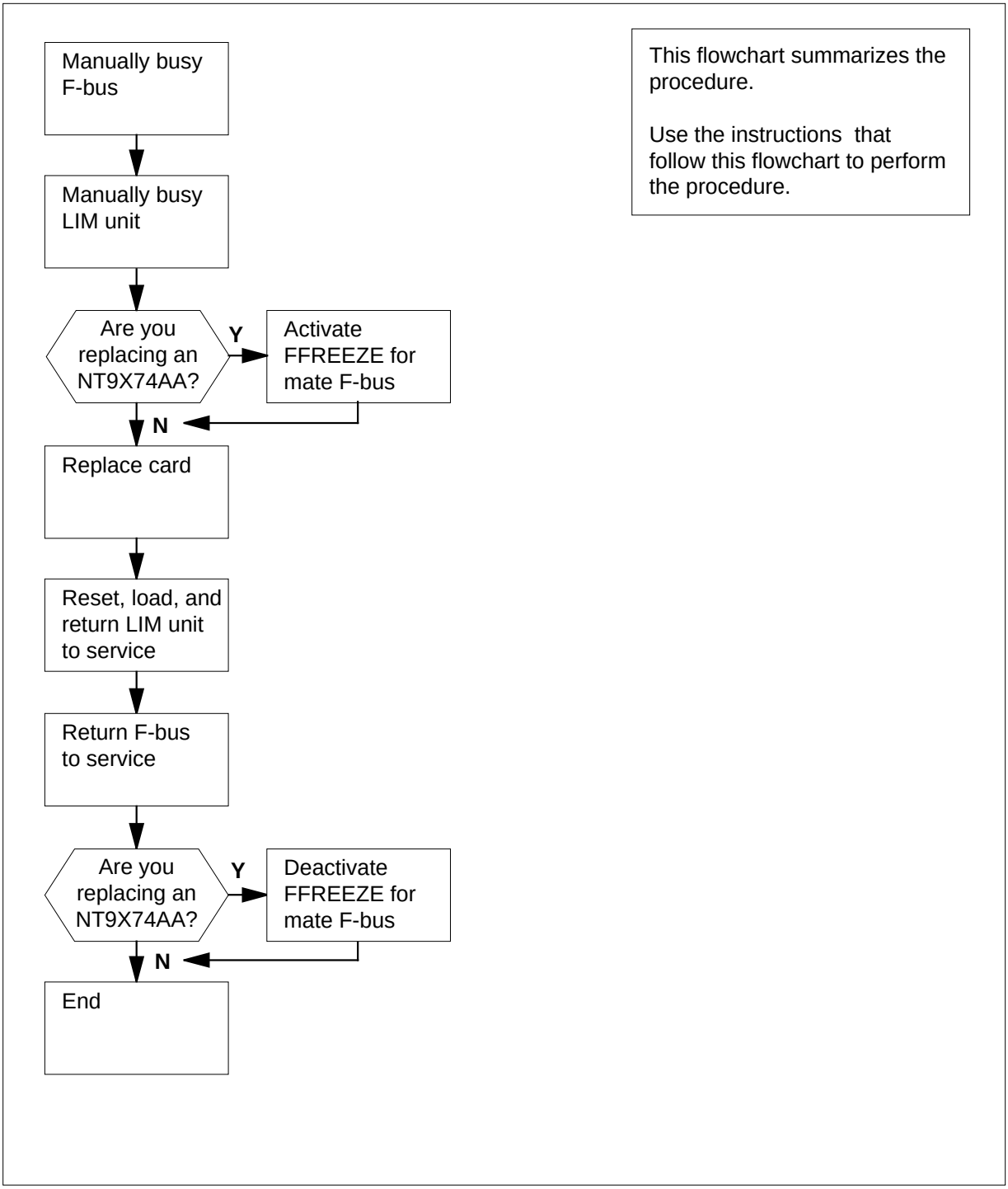
NT9X74
in an LPP LIS (continued)

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_OOS Taps_OOS
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_OOS Taps_OOS
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_OOS Taps_OOS
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

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.

If 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 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 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.
```

If the RTS command	Do
passed	step 28
failed	step 35

28 Determine the suffix of the replaced NT9X74 card.

If the suffix of the NT9X74 card	Do
is AA	step 29
is BA, CA, or DA	step 36

29 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)

If the REMLOGIN command	Do
passed	step 30
failed	step 35

30 To deactivate the FFREEZE command, type

>FFREEZE STOP

and press the Enter key.

Example of a MAP response:

```
FFREEZE now deactivated.
LIM0U0>
```

31 To cancel the remote CI session on the mate LIM unit, type

>REMLOGOUT

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: Mate LIM unit number: F-bus number: Mate F-bus number:	0 1 0 1
NT9X74	32F	LIM unit number: Mate LIM unit number: F-bus number: Mate F-bus number:	1 0 1 0
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. 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:

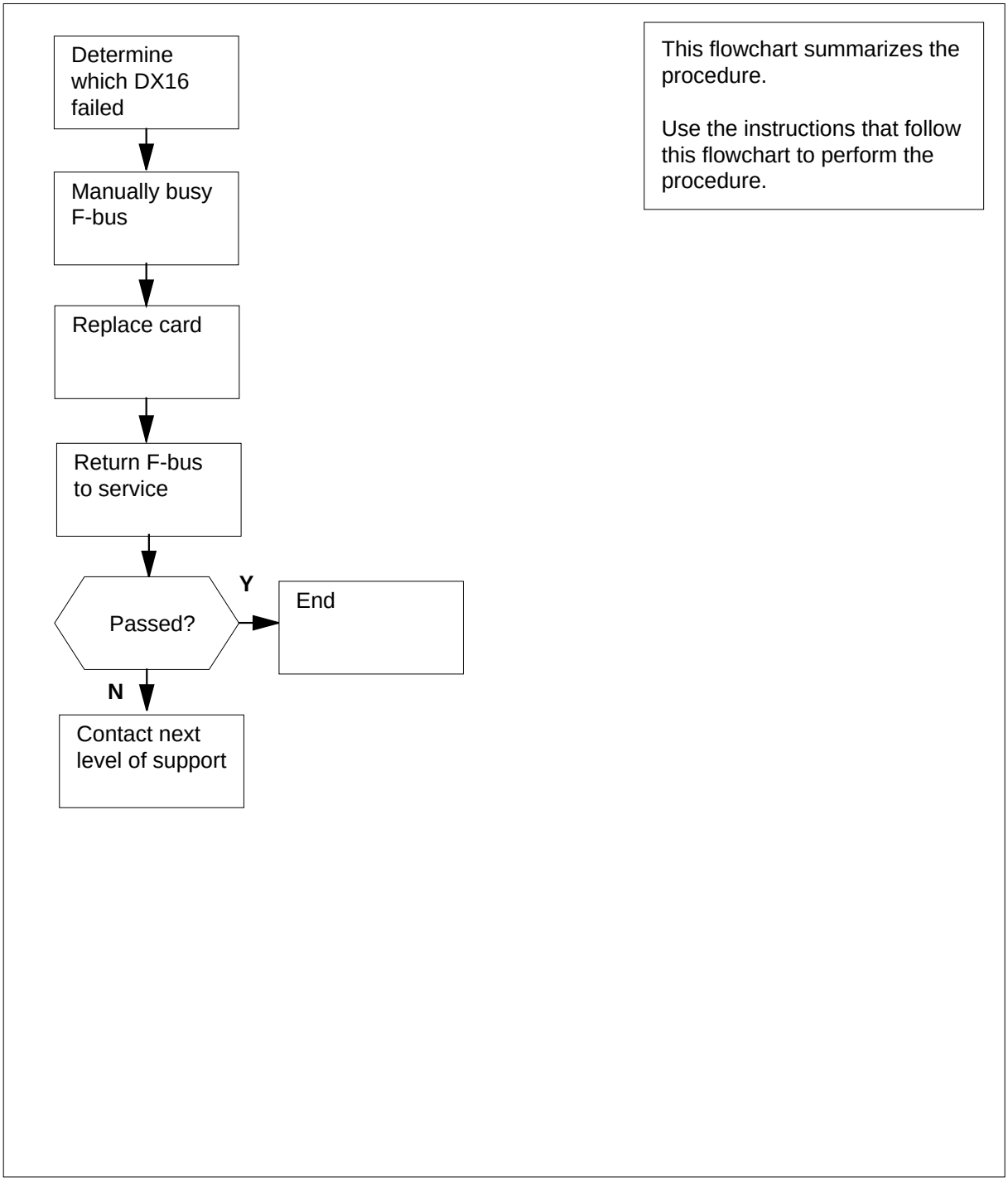
- *Verifying load compatibility of SuperNode cards*
- *Replacing a card*

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_OOS Taps_OOS
Unit0: InSv             .         .
Unit1: InSv             .         .
```

6 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   ...- ---- ---. .-.- ---- ---- ...- -..- -...
```

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.

If a maintenance procedure	Do
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 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*

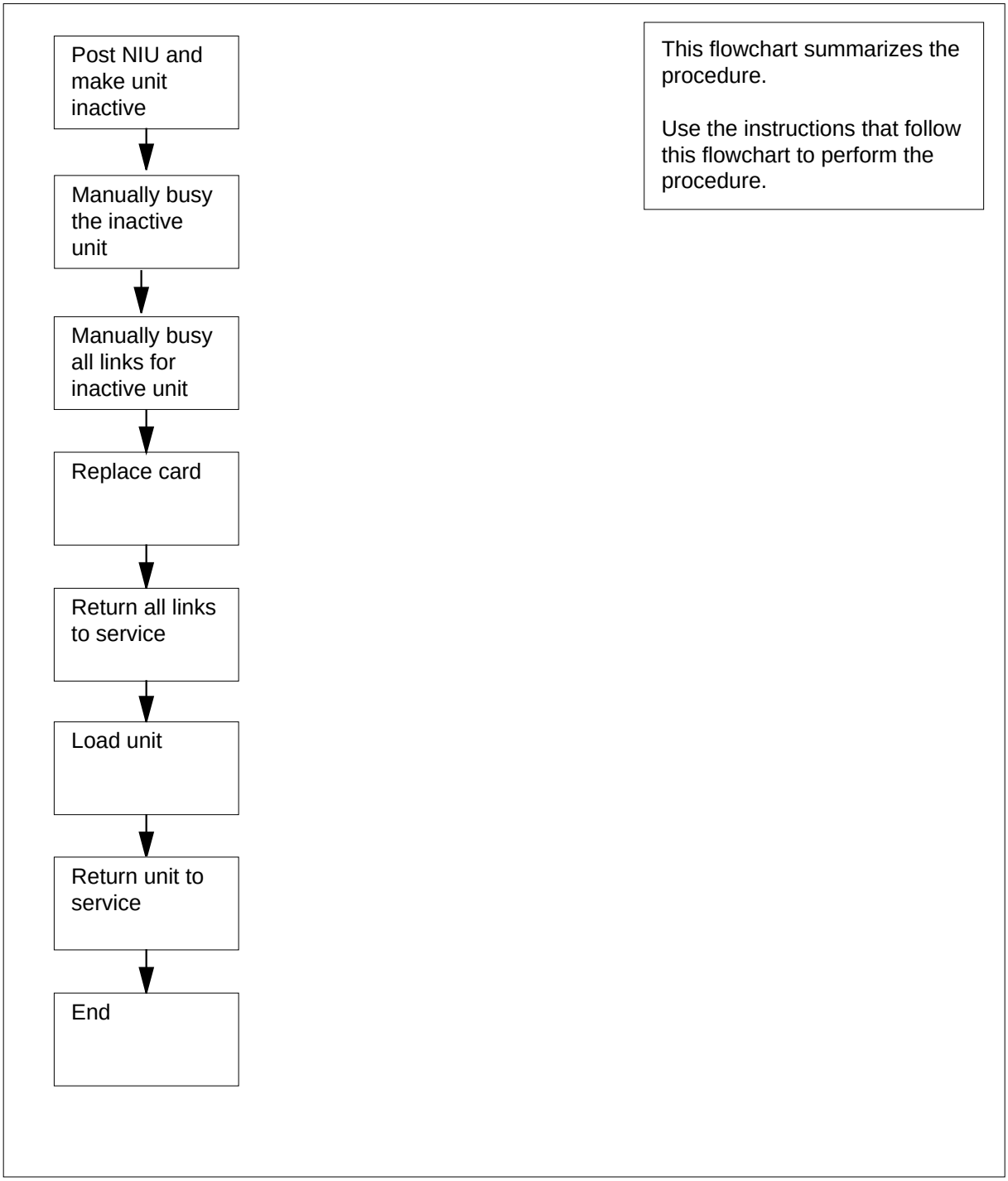
Do not go to the common procedure unless the step-action procedure directs you to go.

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 OOS
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   OOS
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

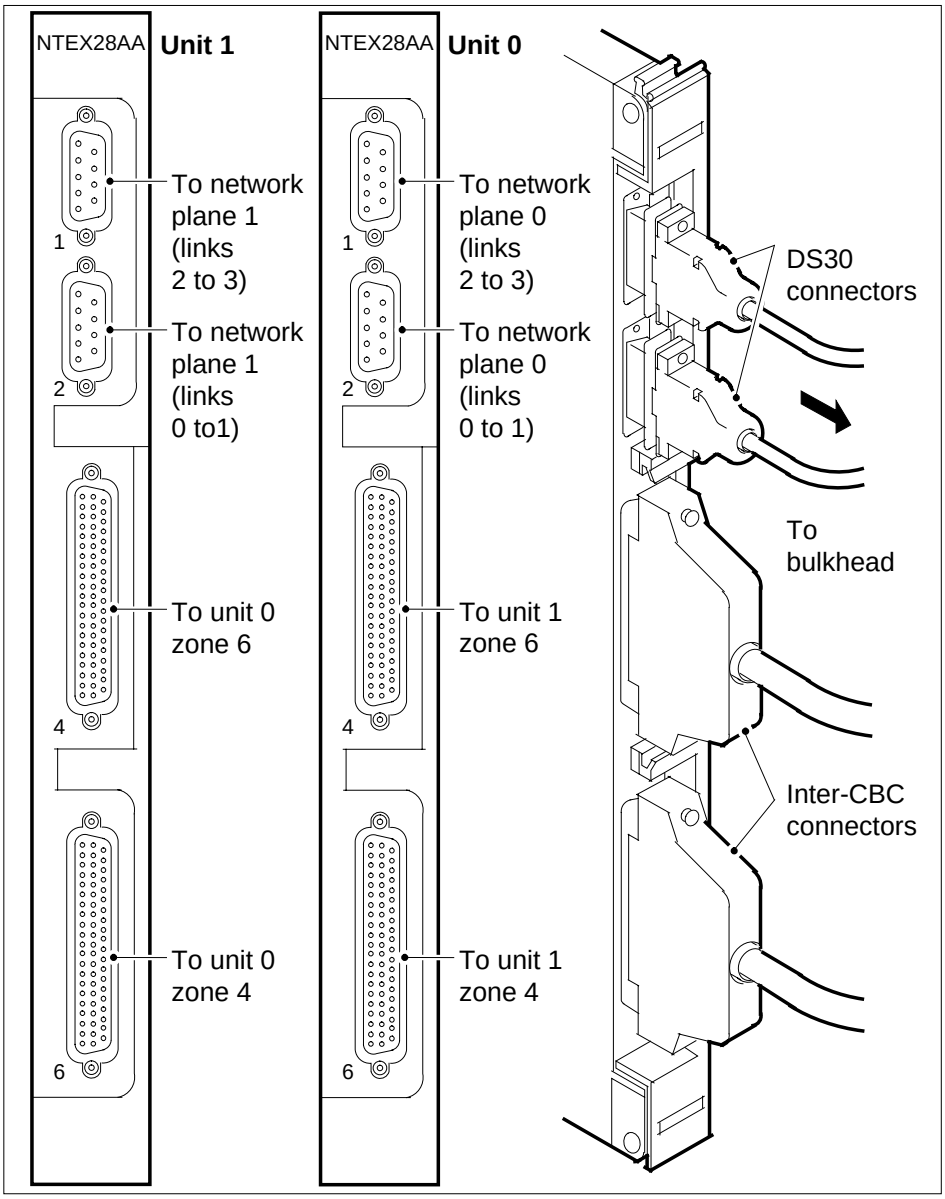
WARNING
Possible loss of service
You must not cross-connect the cables when you connect the cables to the new NTEX28 paddleboard. If you cross-connect the cables, you can cause a loss of service when you return the NIU to service.

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           CBUS ports  OOS
PB 0      . . . .               2
PB 1      . . . .               .
RTSLNKS INACTIVE
Command completed.
```

If the RTSLNKS command	Do
passed	step 16
failed	step 22

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

If a maintenance procedure	Do
directed you here	step 17
did not direct you here	step 18

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

18 To load the NIU, 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

```
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 20

NTEX28
in an NIU in an LPP LIS (end)

If the LOADPM command	Do
failed	step 19

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

20 To return the NIU 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 24
failed	step 22

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

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

23 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.
```

24 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)

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*

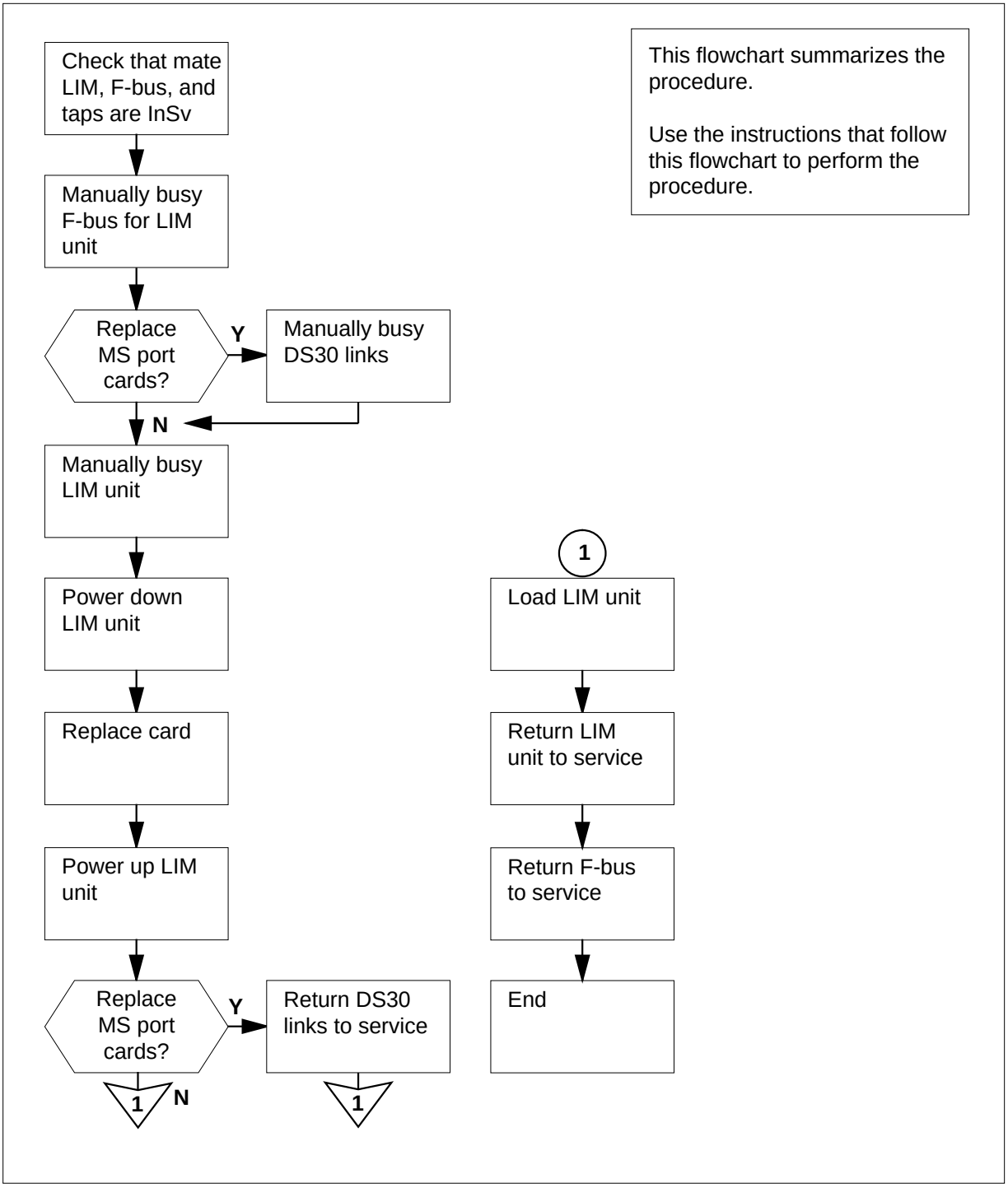
Do not go to the common procedure unless the step-action procedure directs you to go.

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_OOS Taps_OOS

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_OOS Taps_OOS
Unit0: InSv             .         .
Unit1: InSv             .         .

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

8

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_OOS Taps_OOS
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

15 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.

16 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

17

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

18

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".

19 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:	sot 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:	sot 22F
NT9X49	32F	Location of NT9X30 power converter:	slot 36F
NT9X52	20F		
NT9X53	21F		
NT9X73	31F		
NT9X79	31R		

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 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*

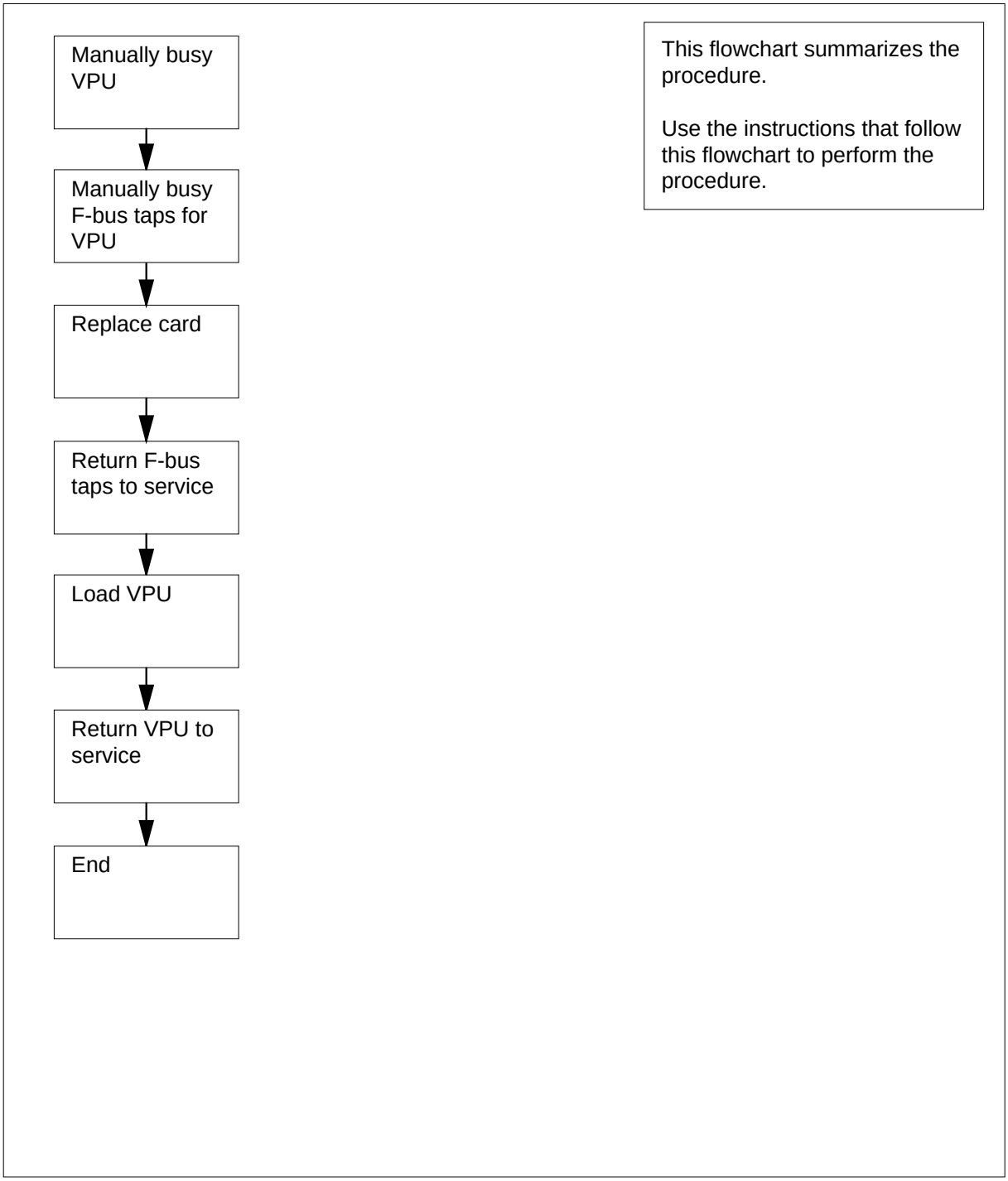
Do not go to the common procedure unless the step-action procedure directs you to go.

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:

```
                SysB     ManB     OffL     CBsy     ISTb   InSv
 PM              2        0        7        0        14       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: NTEX22BB        Other:     NTMX97AA  NTMX99AA
Reserved  : Service:   ADAS          Options:   AUDIO:    PROALF

                    FBus  Message                      CBus
          LIM 0     Tap   Channel  Audits  NIU 0     Port 3
           --------------  -------  ------  --------  -------
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_OOS Taps_OOS
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.

If a maintenance procedure	Do
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 folllowing 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.

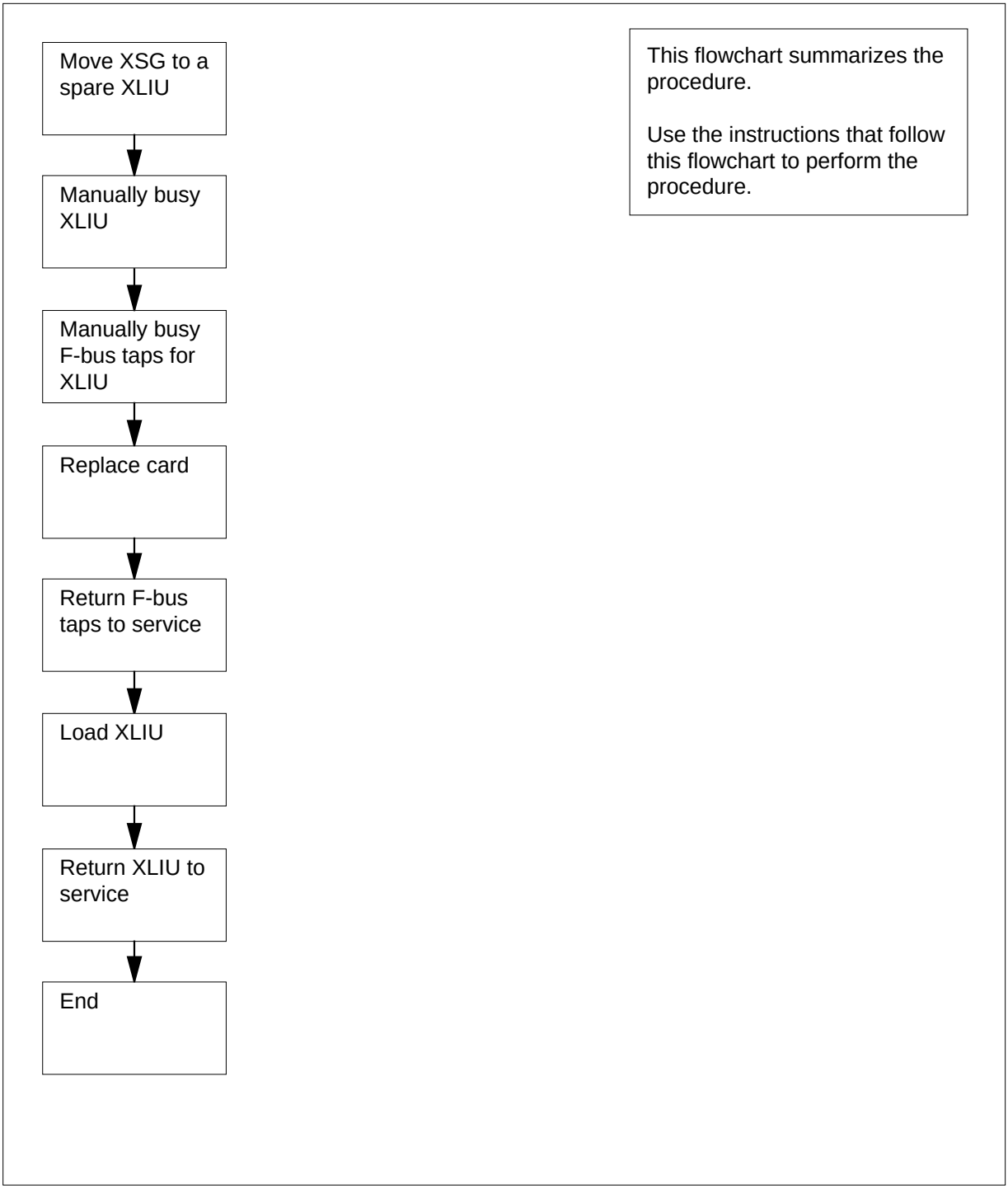
XLIU cards in an LPP LIS (continued)

Action

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

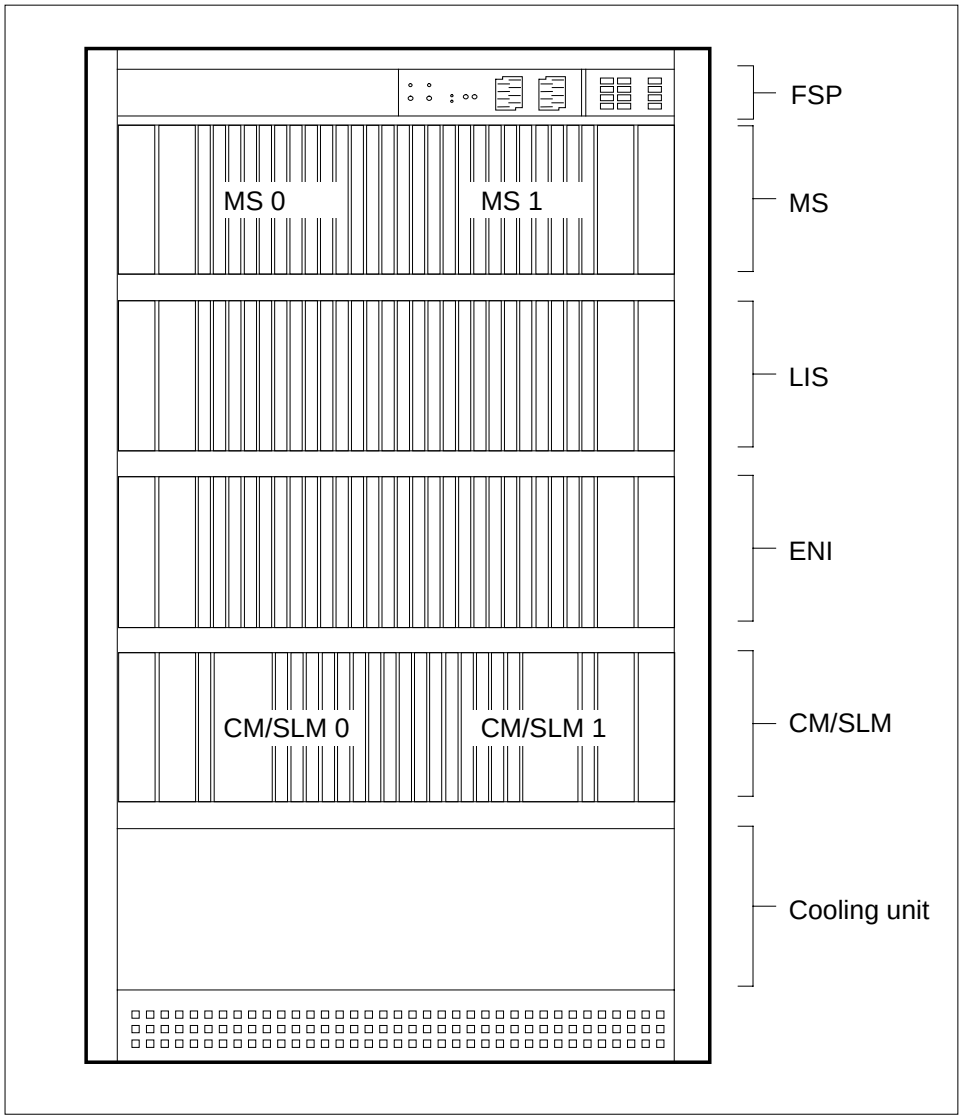
SuperNode SE link interface shelf layouts

Application

This procedure provides layout diagrams for the following:

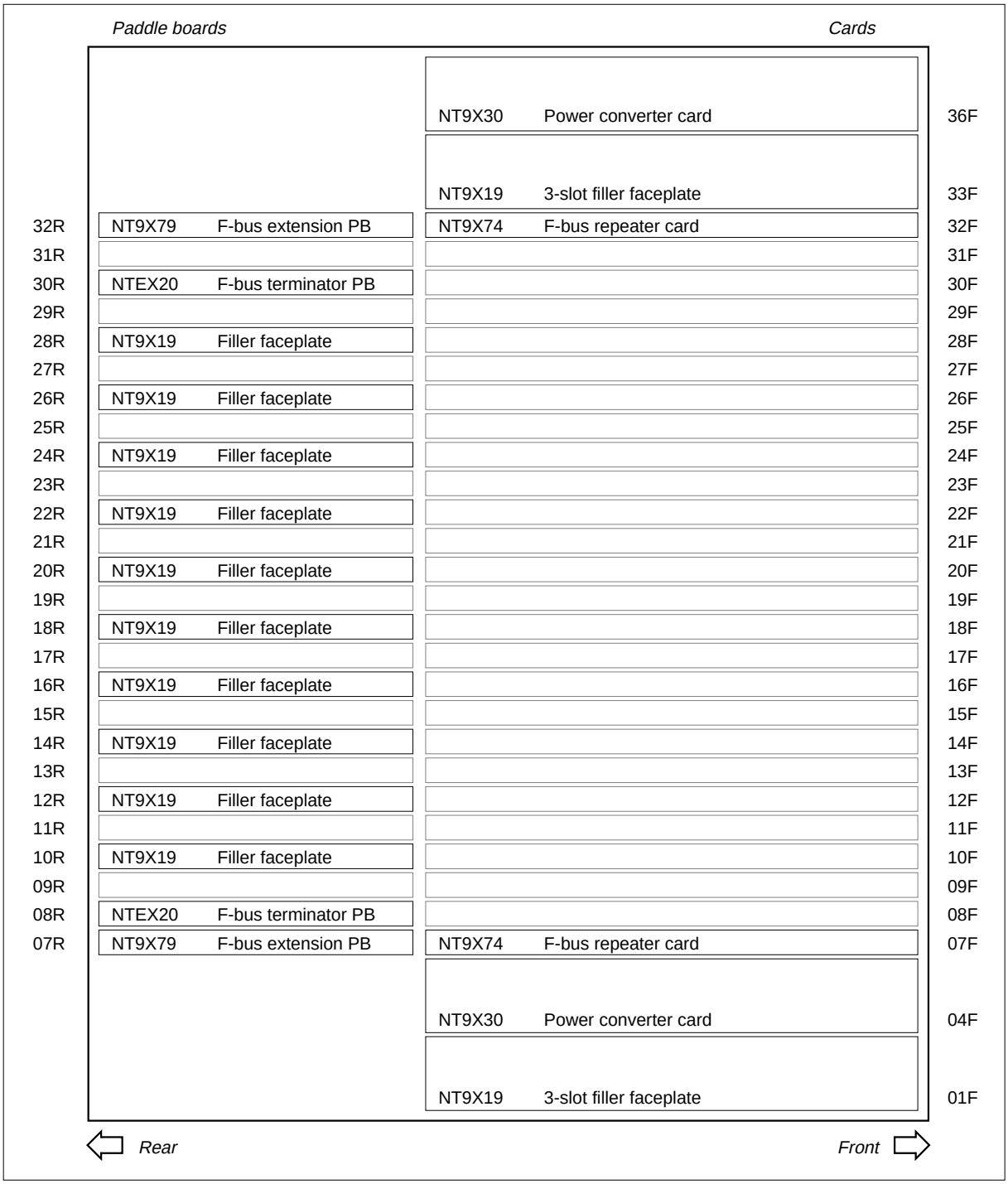
- single core cabinet (SCC) with a link interface shelf (LIS)
- LIS, that shows common fill cards and paddle boards for 2-slot application specific units (ASU)
- LIS 2-slot ASU, that includes ethernet interface units (EIU), frame relay interface units (FRIU), CCS7 link interface units (LIU7), network interface units (NIU), and X.25/X.75 interface units (XLIU)

Figure Single core cabinet



SuperNode SE link interface shelf layouts (continued)

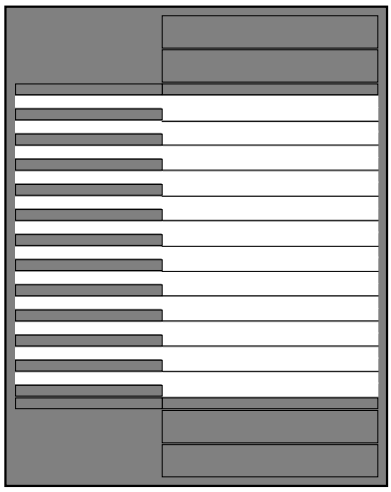
Figure SuperNode SE link interface shelf



SuperNode SE link interface shelf layouts (end)

Figure SuperNode SE link interface shelf

Top view of SNSE LIS shelf



2-slot ASUs appear below.

Rear paddle boards		*Front cards*	
2-slot LIU7 (channelized)			
NTEX26	C-bus interface PB	NT9X76	Signaling terminal card
		NTEX22	Integrated processor and F-bus card
2-slot LIU7 (non-channelized)			
NT9X77 or NT9X78	V.35 or DS-0A PB	NT9X76	Signaling terminal card
		NTEX22	Integrated processor and F-bus card
2-slot XLIU			
NTFX09	C-bus access interface PB	NTFX10	HDLC frame processor card
		NTEX22	Integrated processor and F-bus card
2-slot FRIU			
NTEX30	T1 access PB	NTEX31	Frame relay access processor card
		NTEX22	Integrated processor and F-bus card
2-slot NIU			
NTEX28	NIU link interface PB	NTEX25	Channel bus controller card
		NTEX22	Integrated processor and F-bus card
2-slot EIU			
NT9X85	Ethernet AUI PB	NT9X76	Signaling terminal card
		NTEX22	Integrated processor and F-bus card

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, CA, DA	F-bus repeater card	link interface shelf (LIS), enhanced network and interface (ENI)
NT9X79	AA, BA	F-bus extension paddle board	LIS, ENI
NTEX20	AA, BA	Within the shelf termination paddle 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*

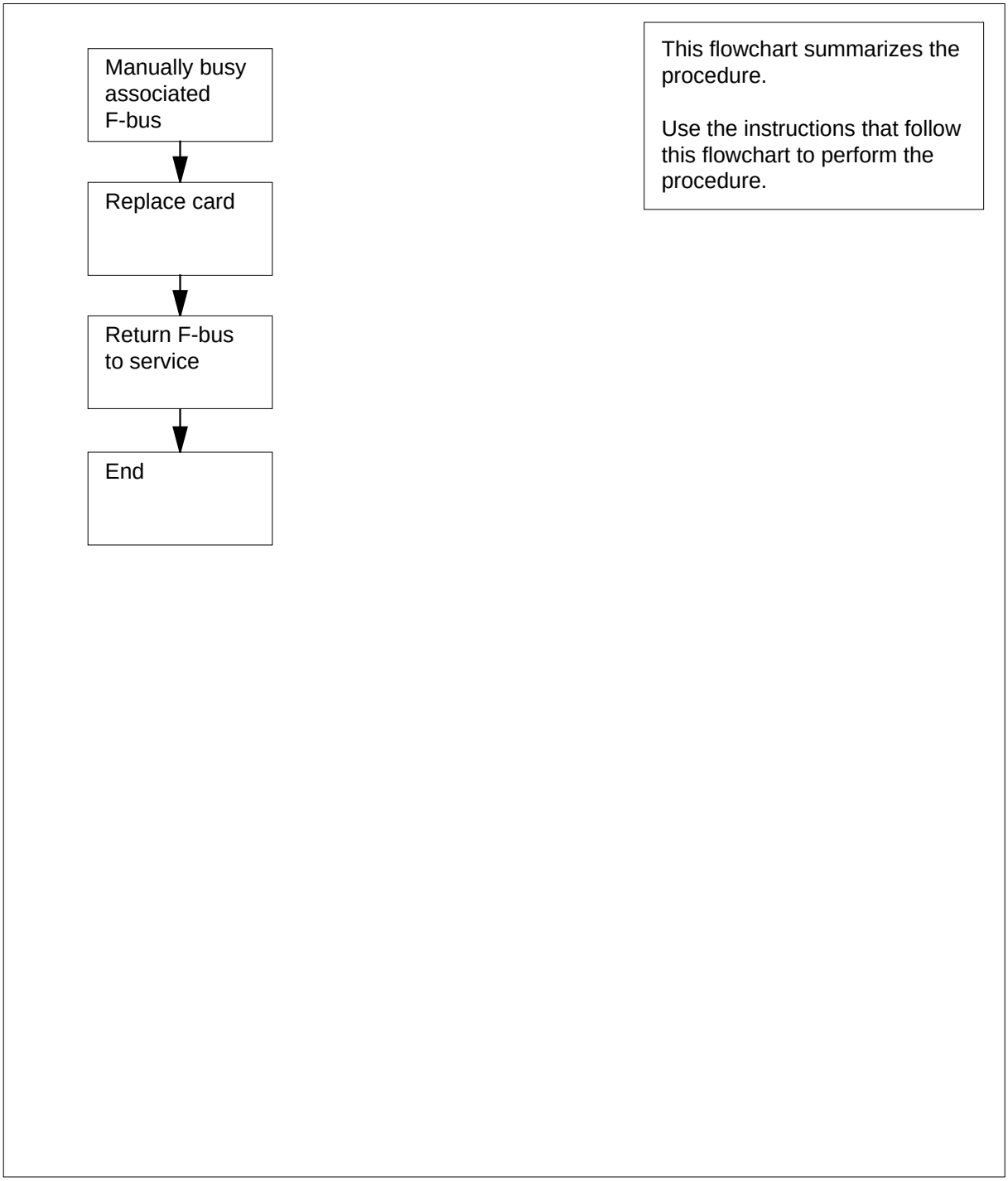
Do not proceed to the common procedure unless the step-action procedure directs you.

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          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. 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.

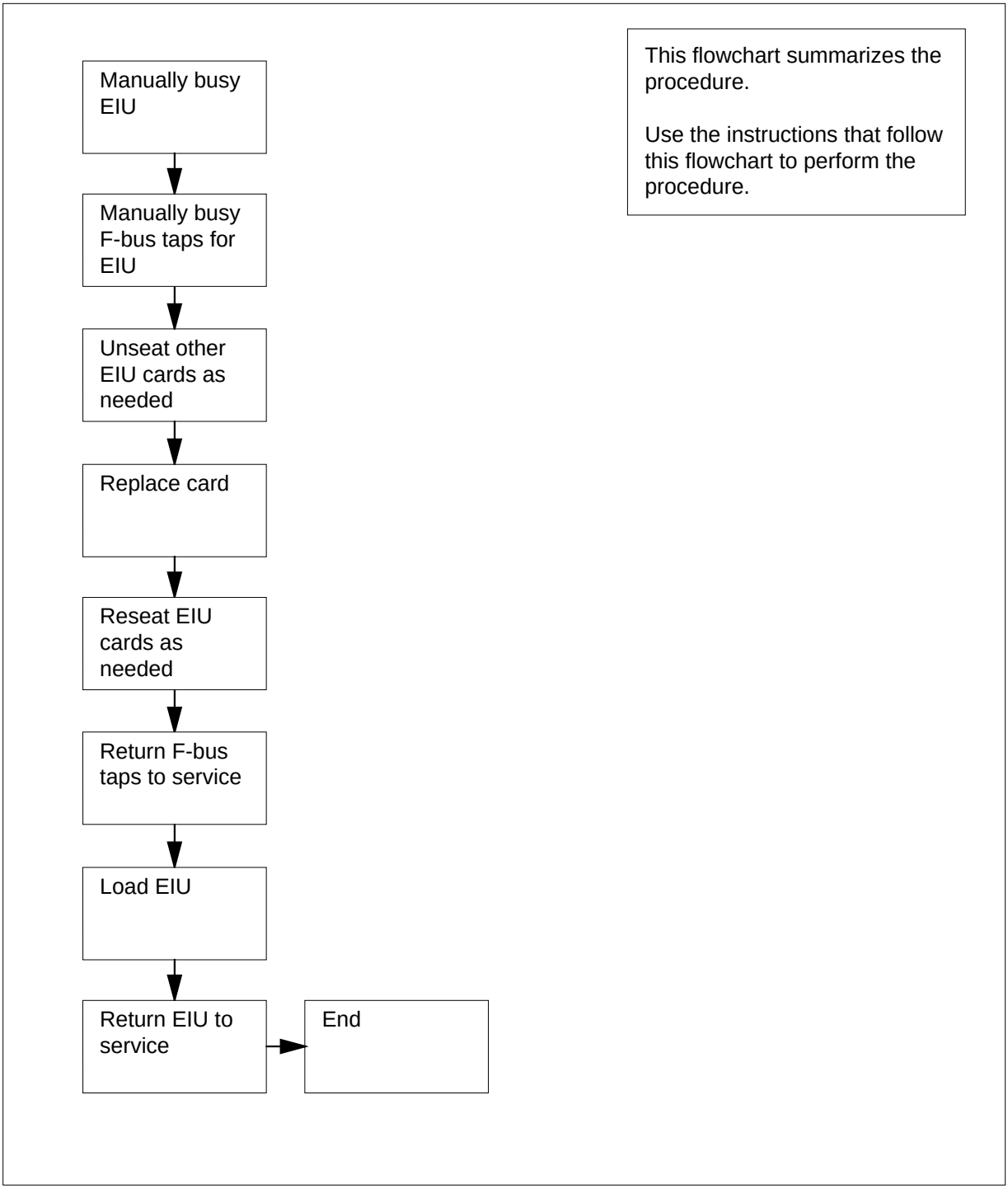
EIU cards in a SuperNode SE LIS (continued)

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)

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 11
is OffL	step 33

6 To manually busy the EIU, type

>BSY

and press the Enter key.

If the response is	Do
Bsy EIU 0 requires confirmation because the action may isolate the SuperNode fromthe 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

7 To manually force bsy the EIU, type

>BSY FORCE

and press the Enter key.

Example of a MAP response:

```
WARNING: 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”):
```

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 36

9 To force bsy the EIU, type

>YES

EIU cards in a SuperNode SE LIS (continued)

and pressing the Enter key. Go to step11

Example of a MAP response:

```
Imaging will be aborted on EIU 0.
```

10 To confirm the command, type

>YES

and press the Enter key

Example of a MAP response:

```
 Confirmed...
 EIU 0 BSY Passed
```

11 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       .                . .
```

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. 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 indicates 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.

If you replace	Do
the NTEX22	step 20
another card	step 21

20 To replace the NTEX22 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 replacement card switches have the same settings.

Go to step 24.

21 To unseat the NTEX22 card for the EIU, perform the procedure *Unseating cards in equipment shelves* 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 reseat 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

>PM

and press the Enter key.

29 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)

30 To load the EIU, type

>LOADPM

and press the Enter key.

Example of a MAP response:

```
EIU 0 LOADPM passed
```

If the LOADPM command	Do
passed	step 32
failed	step 31

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

32 [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 36

EIU cards in a SuperNode SE LIS (end)

If the RTS command	Do
failed	step 34

33 Consult 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.

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.

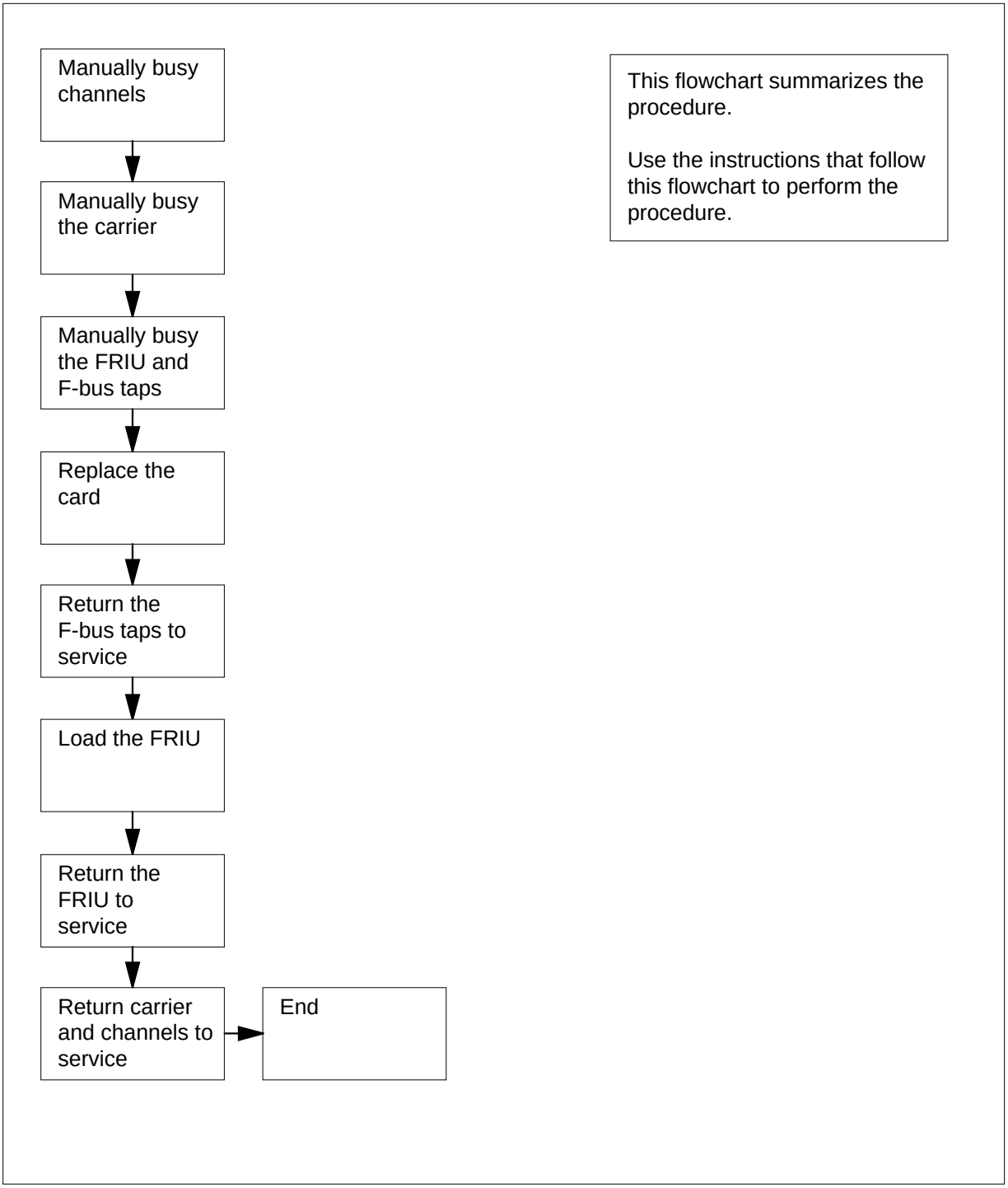
FRIU cards in a SuperNode SE LIS (continued)

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   UAS
 InSv                                     -8.3     0     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          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. 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 To test the F-bus tap, type

>TST 1 TAP tap_no

and press the Enter key.

where

tap_no
is the number of the FRIU tap you recorded in step 19

If the RTS command	Do
passed	step 28
failed	step 42

28 The next action depends on why you perform this procedure.

If the maintenance procedure	Do
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. Continue as directed by the maintenance procedure.

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

>PM

and press the Enter key.

31 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)

32 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 34

FRIU cards in a SuperNode SE LIS (continued)

If the LOADPM command	Do
failed	step 33

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

34 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 35
failed	step 42

35 To access the CARR level of the MAP display, type

>CARR

and press the Enter key.

36 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   UAS
 ManB                                    -8.3     0     0     0


CHANNEL  1
         C
rts
RTS passed.
```

37 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:

```
                  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   UAS
 ManB                                    -8.3     0     0     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)

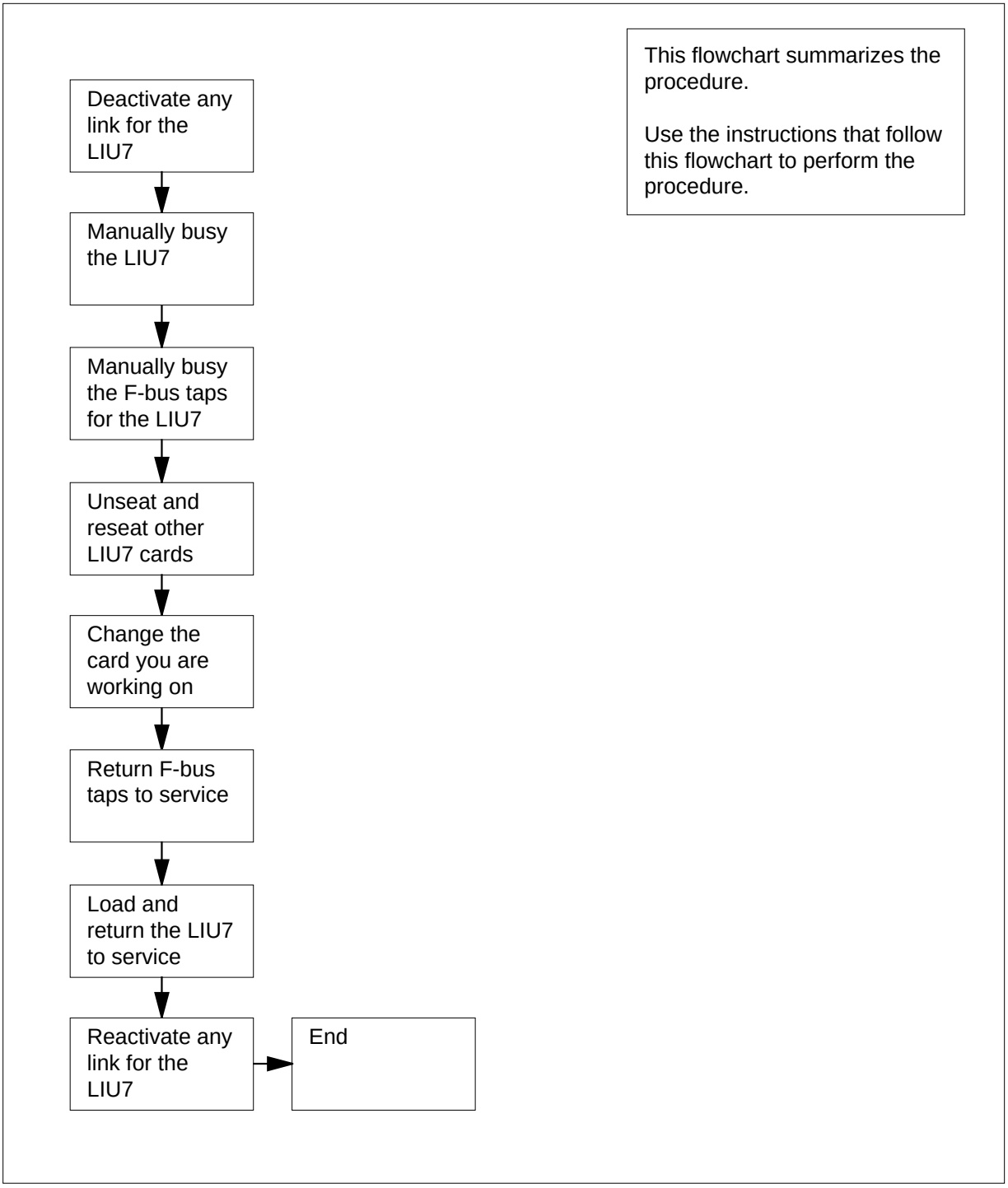
Do not go to the common procedure unless the step action procedure directs you to go.

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.

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 *Deactivating CCS7 links* in this document. Complete the procedure and return to this point.

7 To manually busy the LIU7, type

>BSY F0RCE

and press the Enter key.

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? Please confirm ("YES", "Y", "NO", or "N"):	step 8

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

If it is	Do
safe to proceed with BSY FORCE request	step 9
not safe, abort BSY FORCE request	step 37

9 To force bsy the LIU7, type

>YES

and press the Enter key. Go to step 11

Example of a MAP response:

```
Imaging will be aborted on LIU7 312.
```

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. A 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   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 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.

If you are replacing	Do
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*

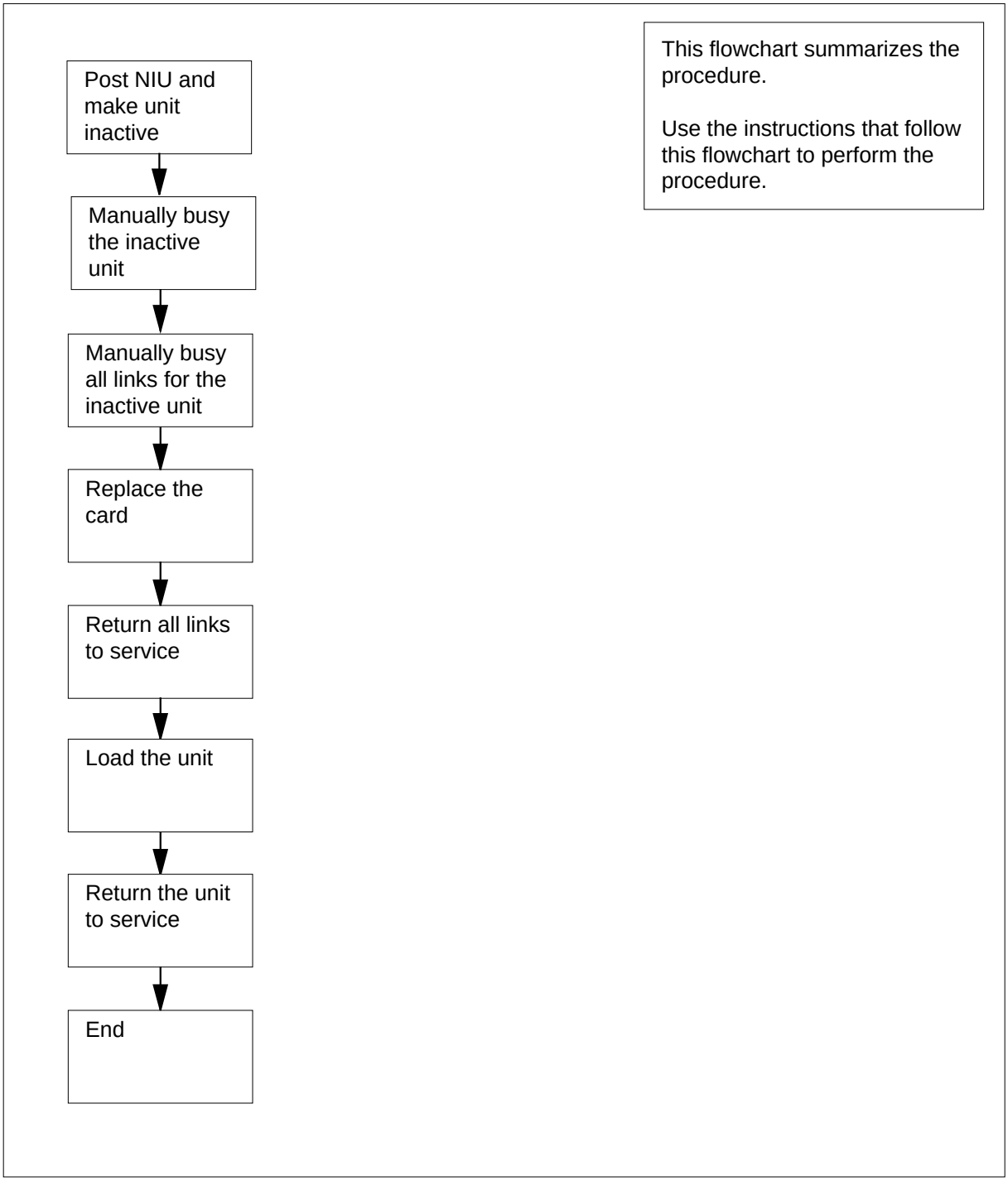
Do not go to the common procedure unless the step-action procedure directs you.

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 soft ware 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           CBUS ports OOS
PB 0     . . . .               2
PB 1     . . . .               .
```

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           CBUS ports  OOS
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 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. A 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:

```
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.

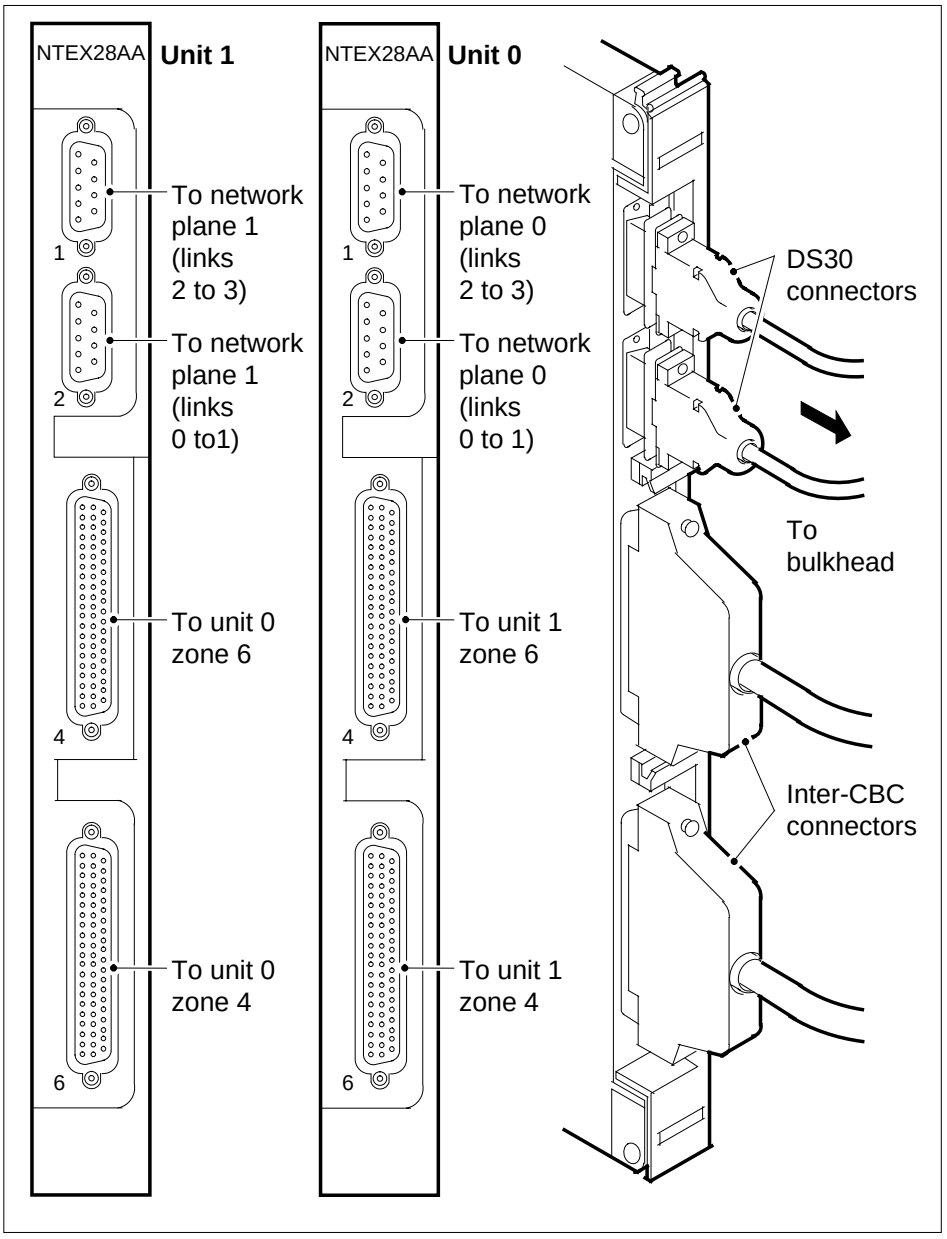
WARNING
Possible loss of service
You must avoid cross-connecting the cables when they are reconnected to the new NTEX28 paddle board. Loss of service can occur if you cross-connect the cables when the NIU returns to service.

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          CBUS ports  OOS
PB 0      . . . .              2
PB 1      . . . .              .
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 Unitcontains 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*

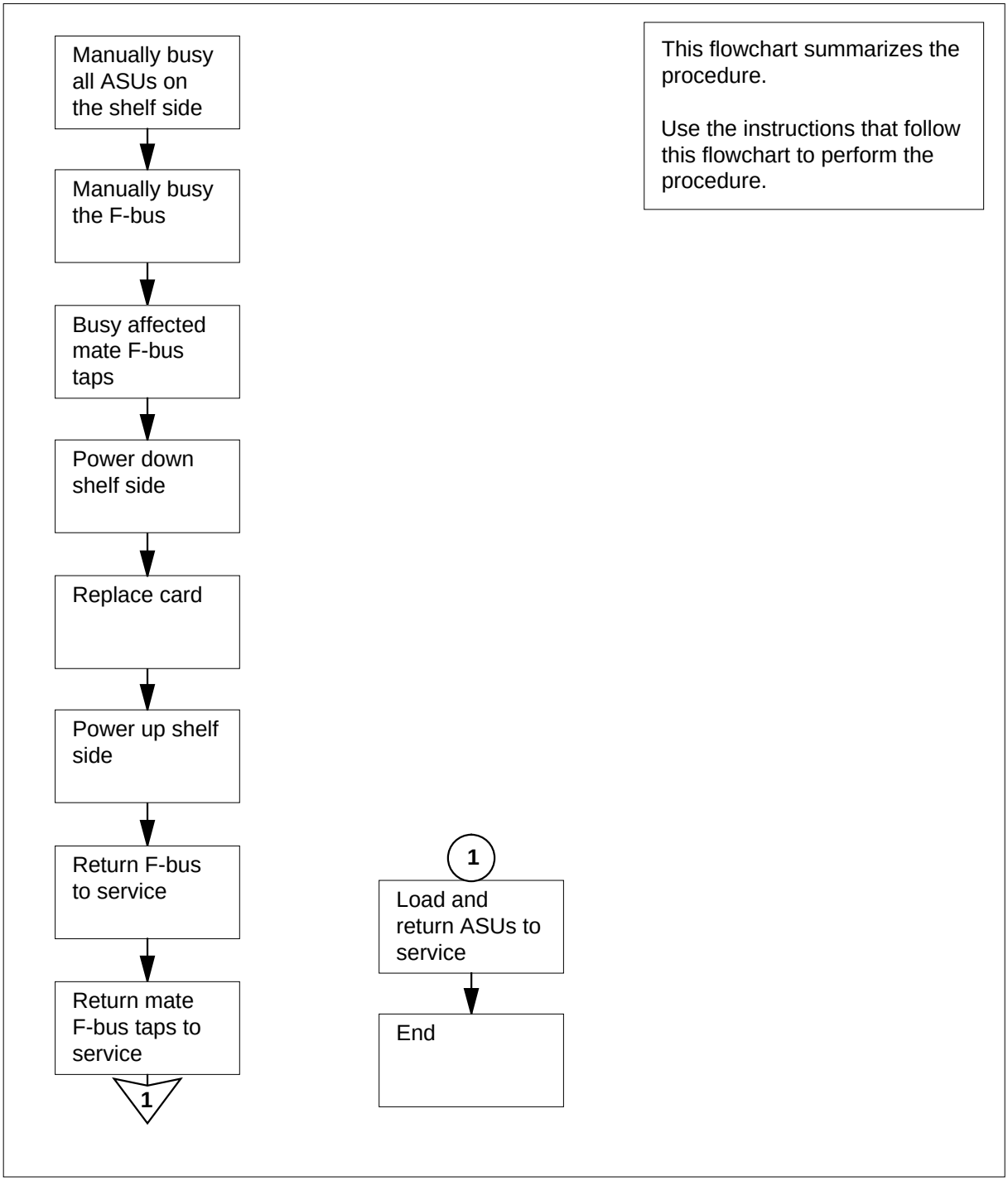
Do not go to the common procedure unless the step-action procedure directs you.

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>:  Thefirst 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
LIUNAME LOCATION LOAD PROCINFO CARDINFO
-------------------------------------
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 are 100 and 111. The numbers of the LIU7 on the LIS shelf are 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

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:

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

>BSY INACTIVE

and press the Enter key.

Example 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.
```

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)

```
            SysB     ManB     OffL     CBsy     ISTb    InSv
 PM          1        0        2        0        3       6
 LIU7        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.

Note: 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 *Moving an XSG to a spare XLIU* in this document. Complete the procedure and return to this point.

Note: The XLIU for which you change cards becomes the spare. In the following steps, this XLIU is the spare.

Go to step 34.

33 To manually busy the XLIU, type

>BSY

and press the Enter key.

Example of a MAP response:

```
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)

If shelf side	Do
does not have FRIUs	step 50

36

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)

```
                    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
         .

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

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
          .
```

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

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 assciates 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)

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 reseat 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:

```
Request to RTS MS: 0 shelf: 0 card: 12 tap: 0
submitted.
Request to RTS MS: 0 shelf: 0 card: 12 tap: 0
passed.
```

If the RTS command	Do
passed	step 76
failed	step 115

76 Repeat step 75 for each of the mate F-bus taps that you busied in steps 66 to 68.

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

>PM

and press the Enter key.

78 Determine if the NIUs are in the LIS you are working on.

If shelf	Do
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)

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)

98 Wait 1 min for the carrier to go in service.

If after 1 min the state of the carrier	Do
is InSv	step 99
is any other state	step 115

99 To access the CHAN level of the MAP display, type

>CHAN

and press the Enter key.

100 To return the carrier to service, type

>RTS

and press the Enter key.

Example of a MAP response:

```
RTS passed.
```

101 Repeat steps 91 to 100 for all FRIUs on the shelf side.

102 Determine if the XLIUs or EIUs are in the shelf side that associates with the NT9X30.

If shelf side	Do
has XLIUs or EIUs	step 103
does not have XLIUs or EIUs	step 108

103 To post the XLIU or EIU, type

>POST asu_type asu_no

and press the Enter key.

where

asu_type
is the ASU type (XLIU or EIU)

asu_no
is the number of the ASU (0 to 511)

104 To load the XLIU or EIU, type

>LOADPM

and press the Enter key.

If the LOADPM command	Do
passed	step 106

NT9X30 in a SuperNode SE LIS (end)

If the LOADPM command	Do
failed	step 105

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

106 To return the XLIU or EIU to service, type

>RTS

and press the Enter key.

If the RTS command	Do
passed	step 107
failed	step 115

107 Repeat steps 103 to 106 for all XLIU and EIUs on the shelf side.

108 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

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

110 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.

111 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.

112 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.

113 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.

114 To determine why the component is offline, contact operating company personnel. Continue as directed by operating company personnel.

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

116 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*

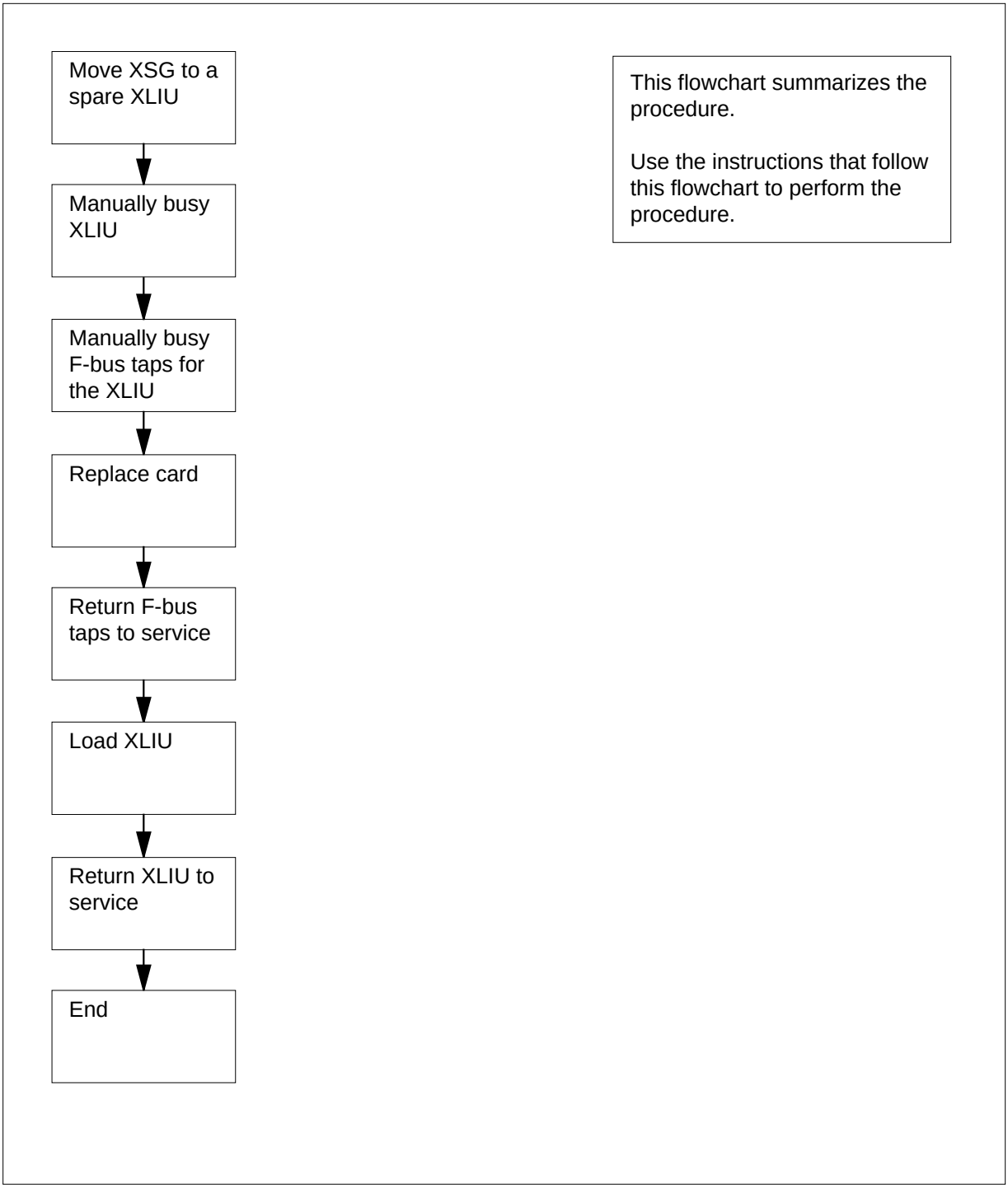
Do not proceed to the common procedure unless the step-action procedure directs you to go.

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:

```
                  SysB    ManB    OffL    CBsy    ISTb    InSv
 PM                  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:

```
                  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 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.

XLIU cards in a SuperNode SE LIS (continued)

```
    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   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 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 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

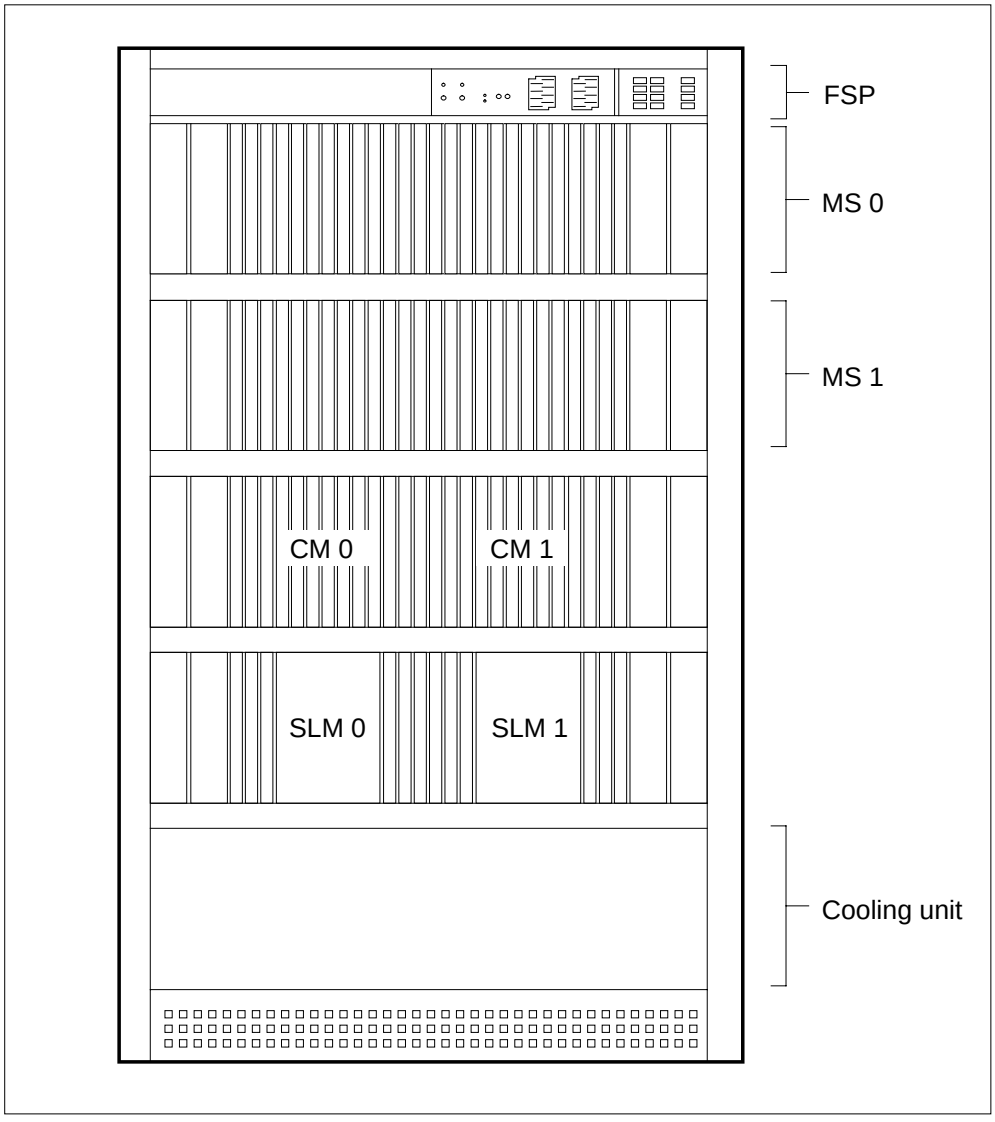
SuperNode MS shelf layouts

Application

This section contains the following diagrams:

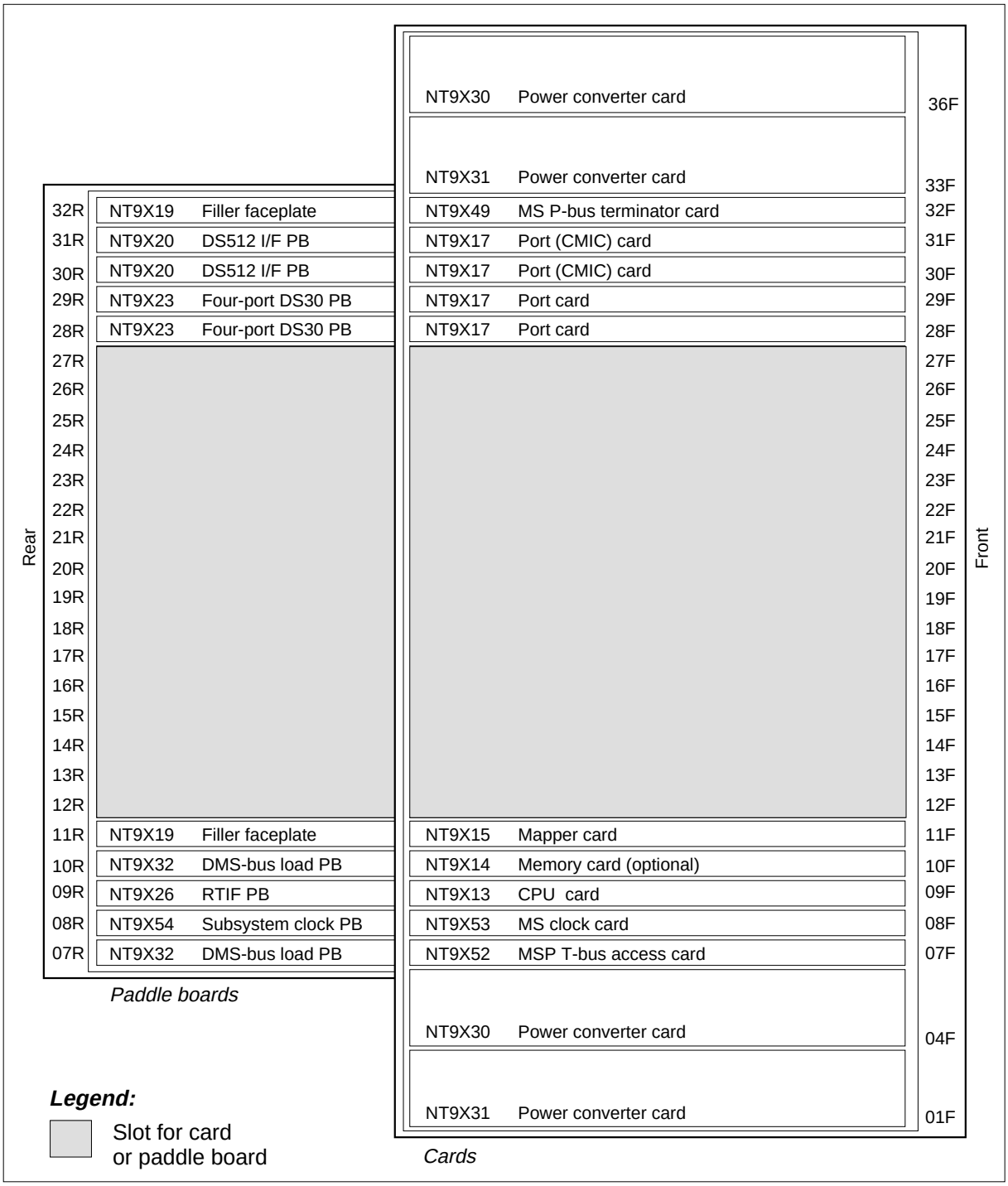
- dual-plane combined core cabinet (DPCC)
- SuperNode message switch (MS)

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 CM-MS EN-MS paddle board	MS
NT9X23	AA, BA	Four-port DS30 paddle board	MS
NT9X54	AA, AB, AC, AD	Subsystem clock paddle board	MS
NT9X62	BA, BB, CB	Four-port subrate DS512 paddle board	MS
NT9X69	BA	DMS-bus 16-link DS30 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.

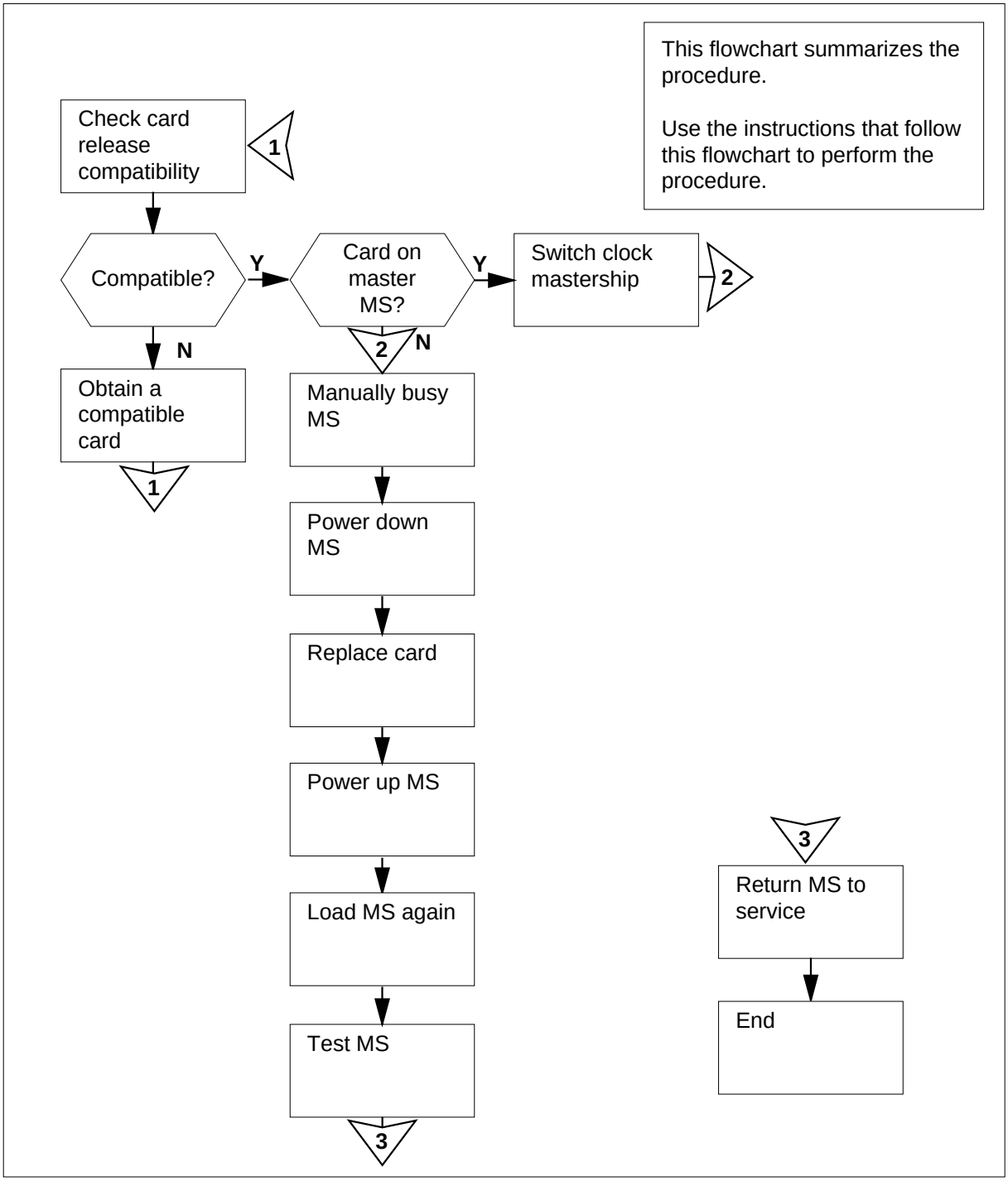
Interface cards in a SuperNode MS (continued)

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 thereplacement 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 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.).

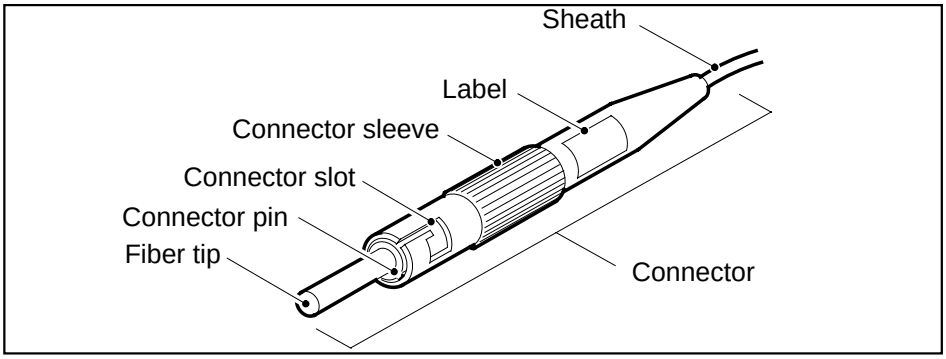
Disconnect the fiber links from the card as follows:

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.

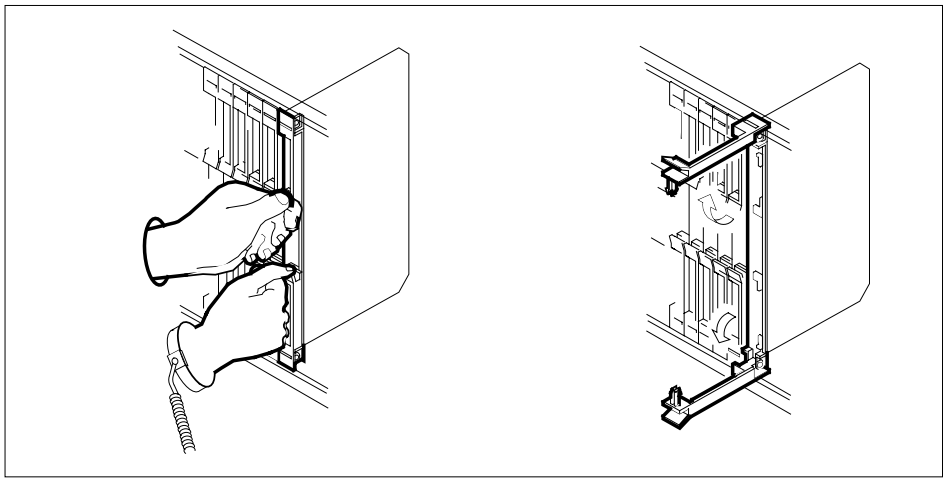
29

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.

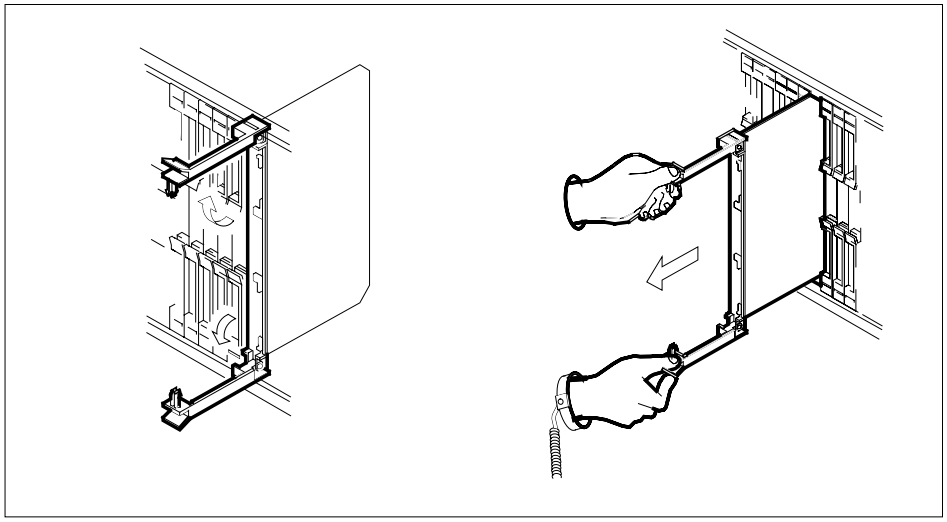
DANGER
Do not hold card by levers only
If you hold a card by the levers only, you can cause lever breakage. When you pull the card halfway out of the shelf, carefully grasp the card from below for more secure support. Continue to remove the card from the shelf. Do not touch any wires or internal parts on the card.

Open the locking levers on the card you will replace.

Interface cards in a SuperNode MS (continued)

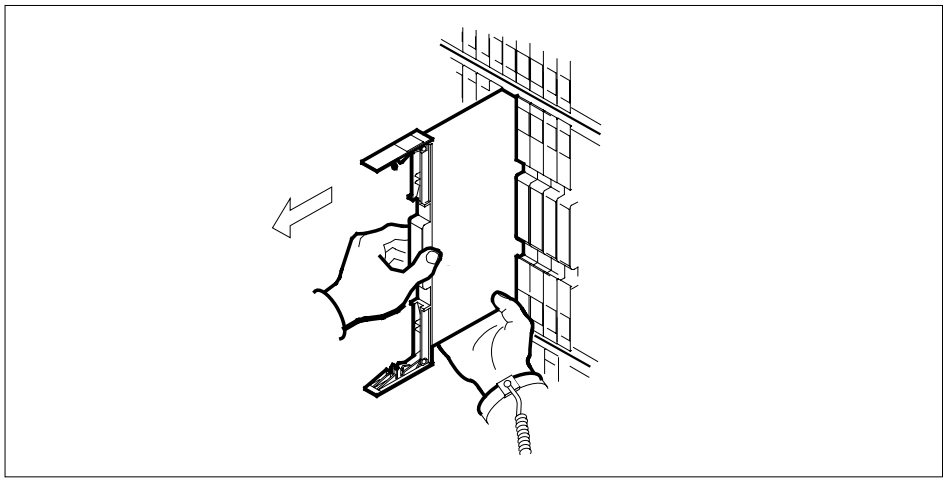


30 Grasp the locking levers. Carefully pull the card toward you until the card protrudes 5 cm (about 2 in.) from the equipment shelf.



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 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.

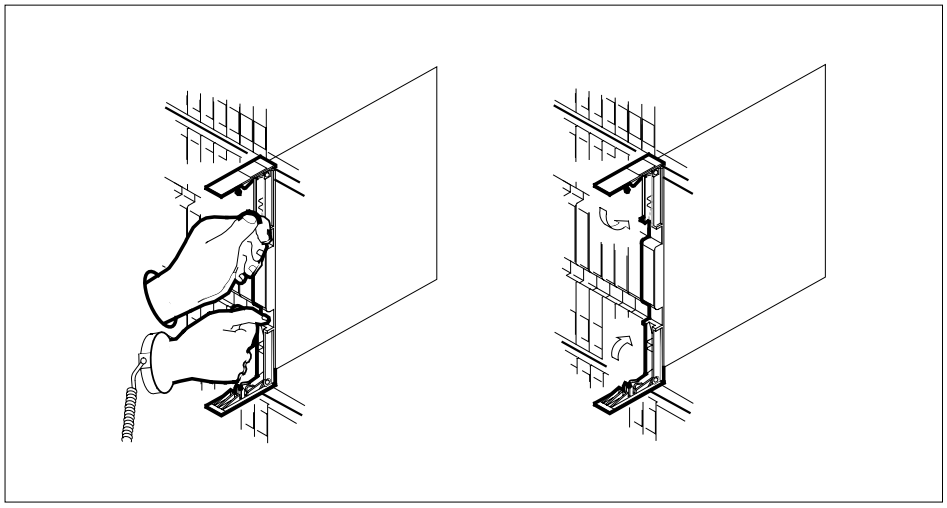
42 Connect the DS30 cables again, as follows:

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

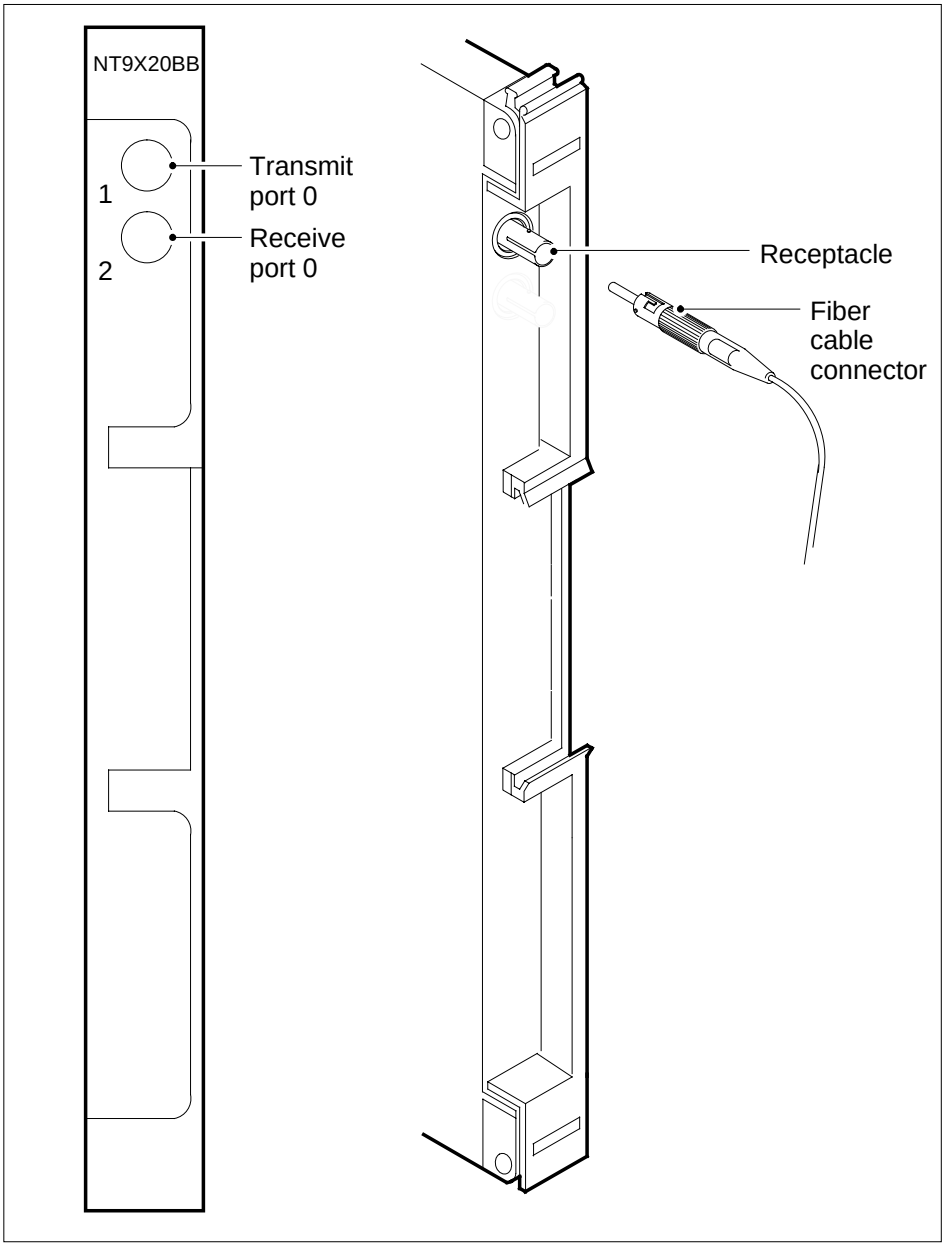
52 For additional help, contact the next level of support.

53 The procedure is complete.

The following diagrams show the cable connections for the cards in this procedure.

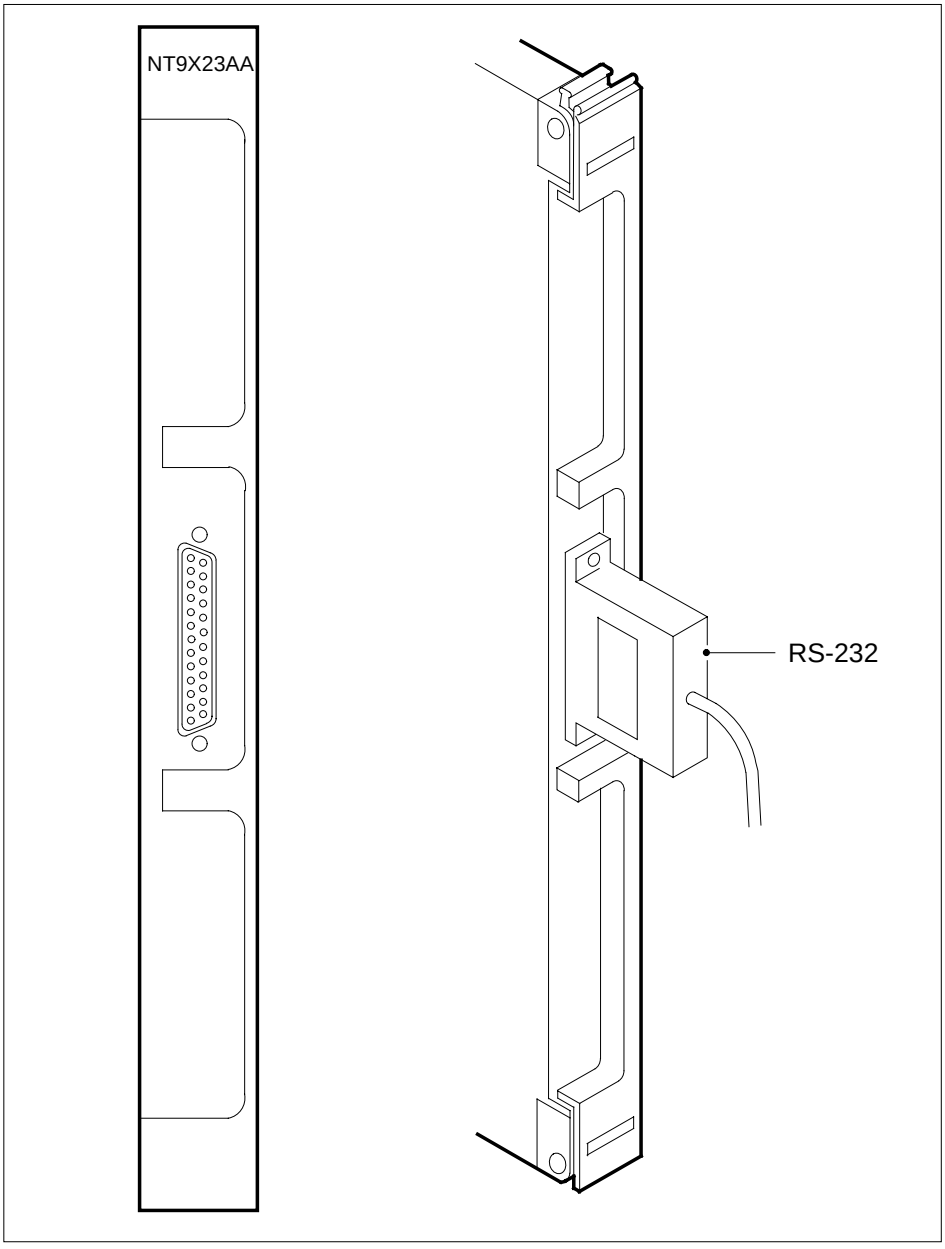
Interface cards in a SuperNode MS (continued)

Cable connections for an NT9X20 in a SuperNode MS



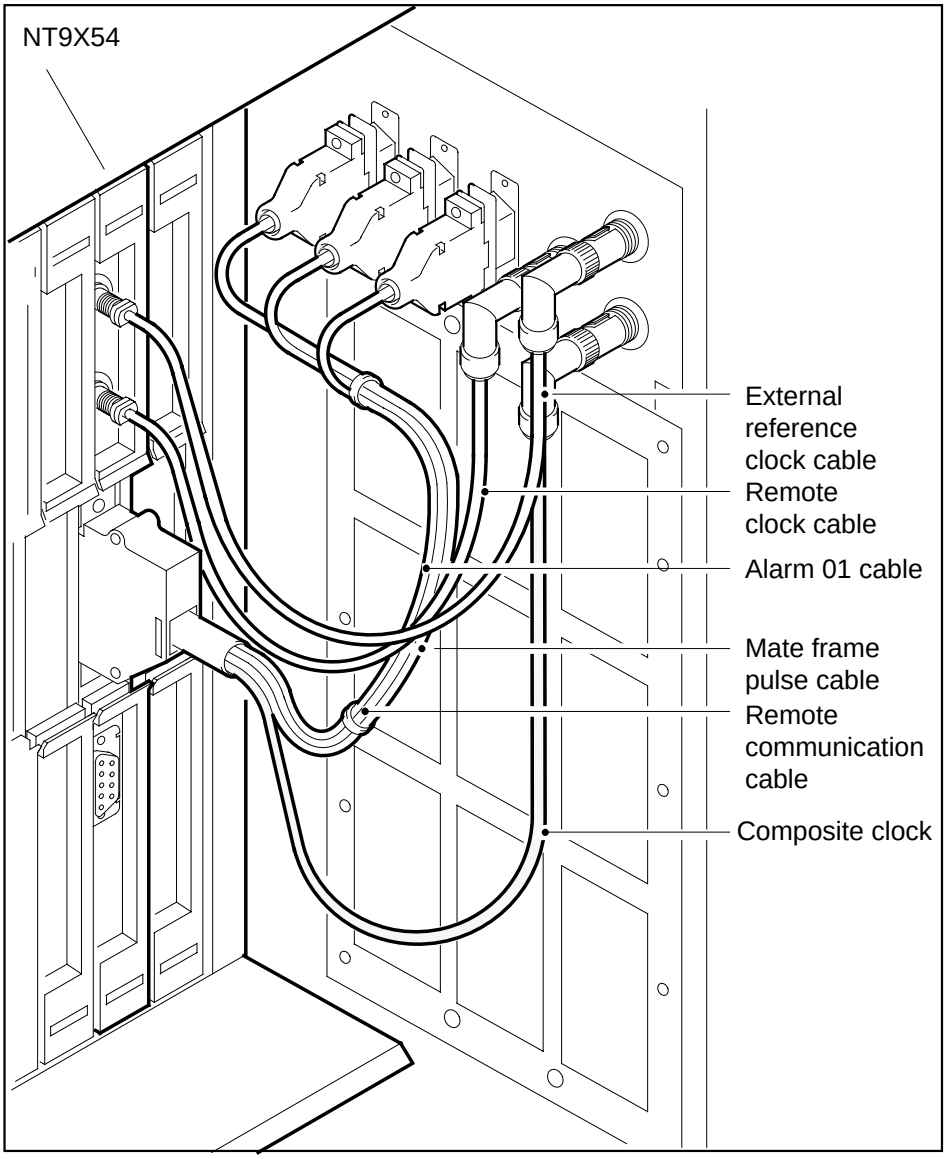
Interface cards in a SuperNode MS (continued)

Cable connections for an NT9X23 in a SuperNode MS



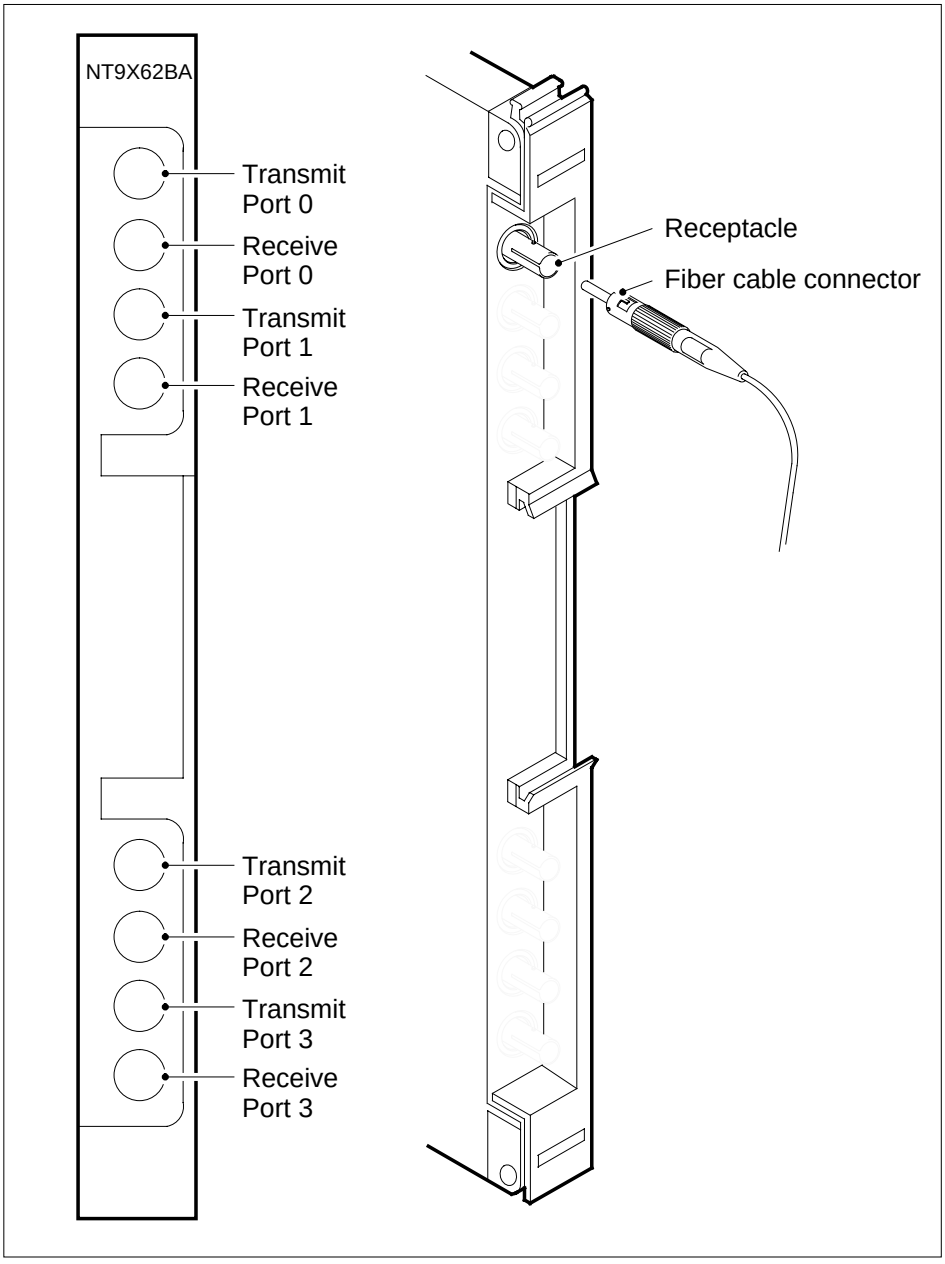
Interface cards in a SuperNode MS (continued)

Cable connections for an NT9X54 in a SuperNode MS



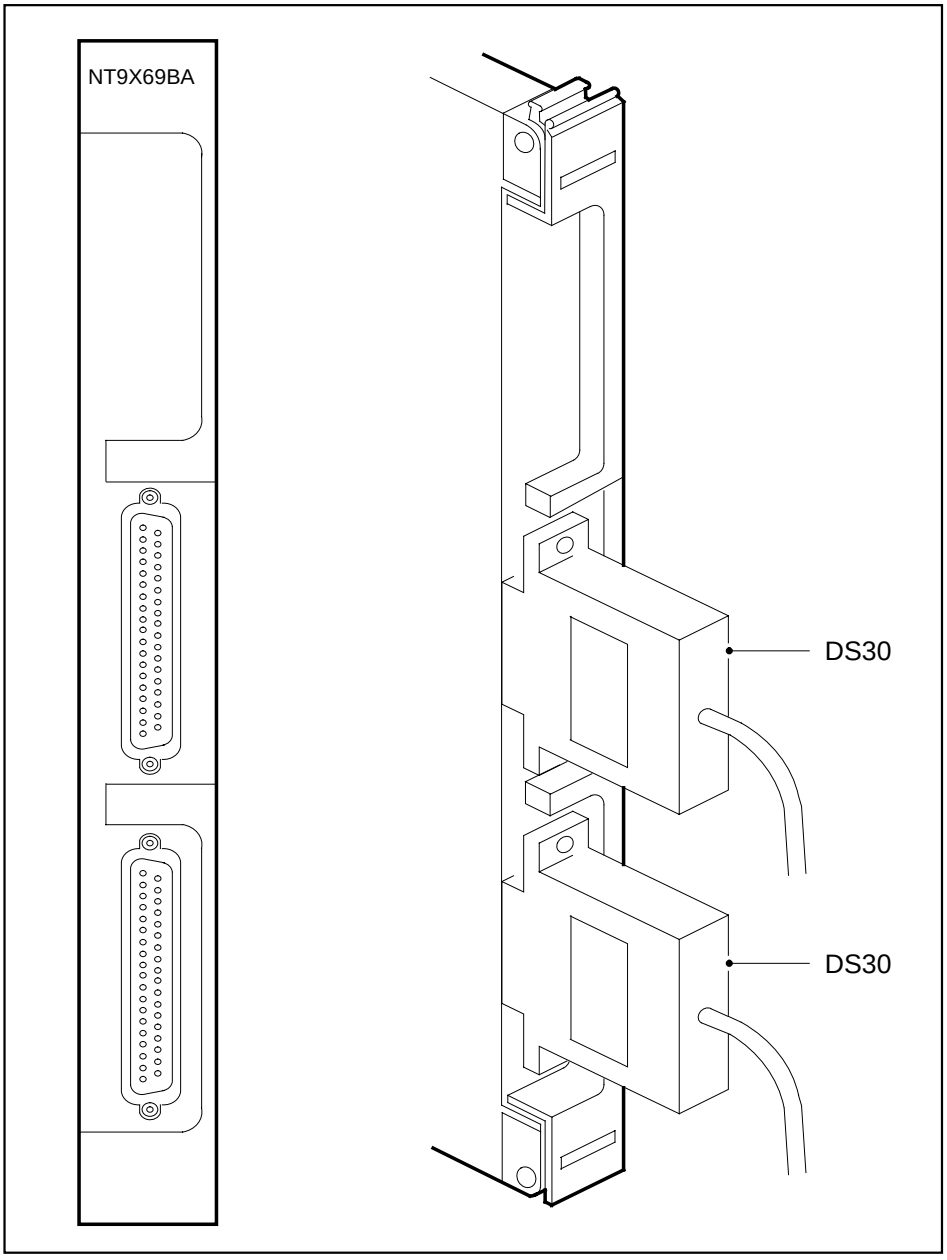
Interface cards in a SuperNode MS (continued)

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.

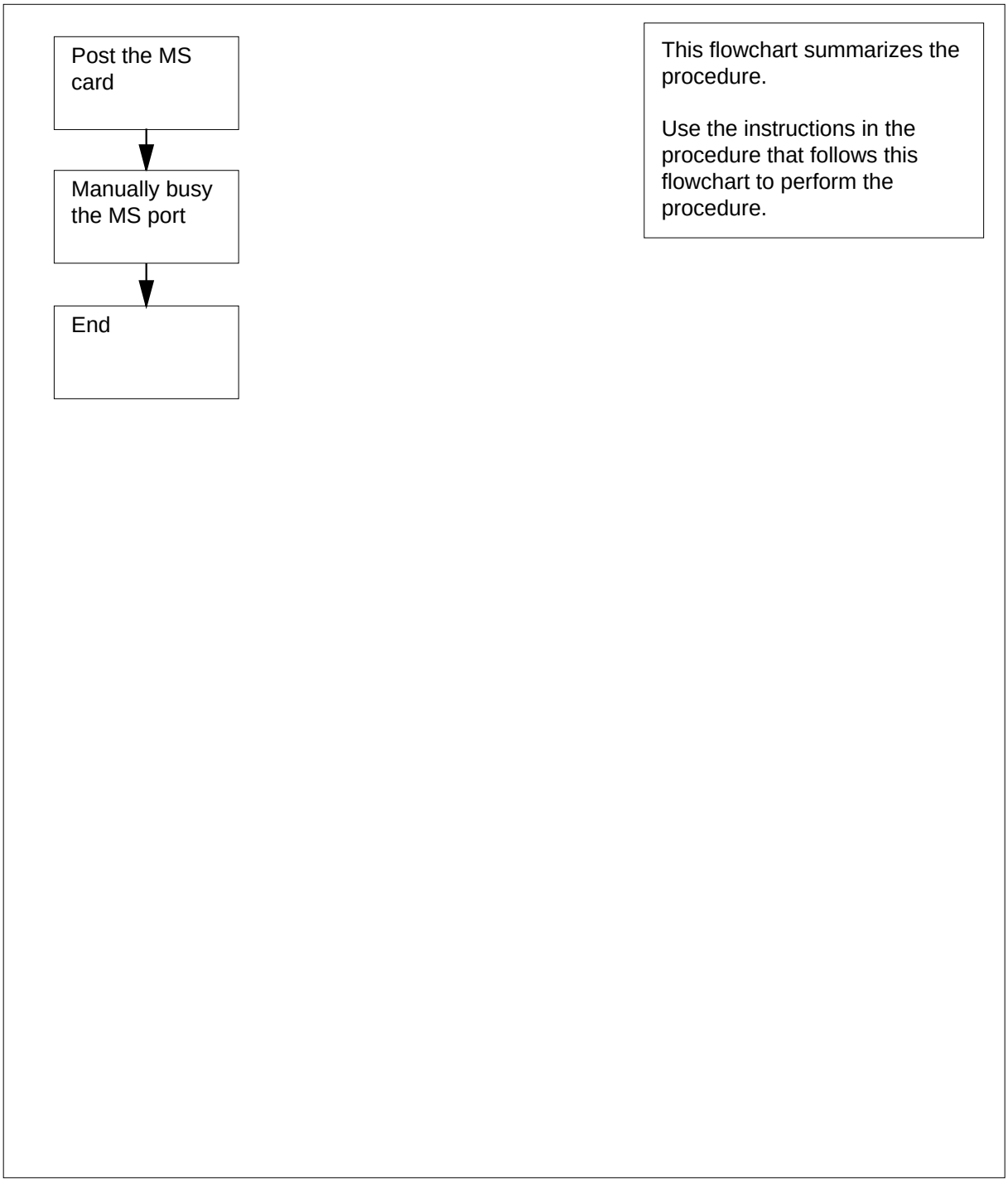
Before using this procedure, the LIM is posted and available for query; this procedure instructs you to again post the LIM you have been working on. This procedure also assumes a known location for the MS port card to be changed on the LIM.

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



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 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 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
                Links_OOS Taps_OOS
Unit0: ISTb         2         .
Unit1: InSv         .         .
```

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

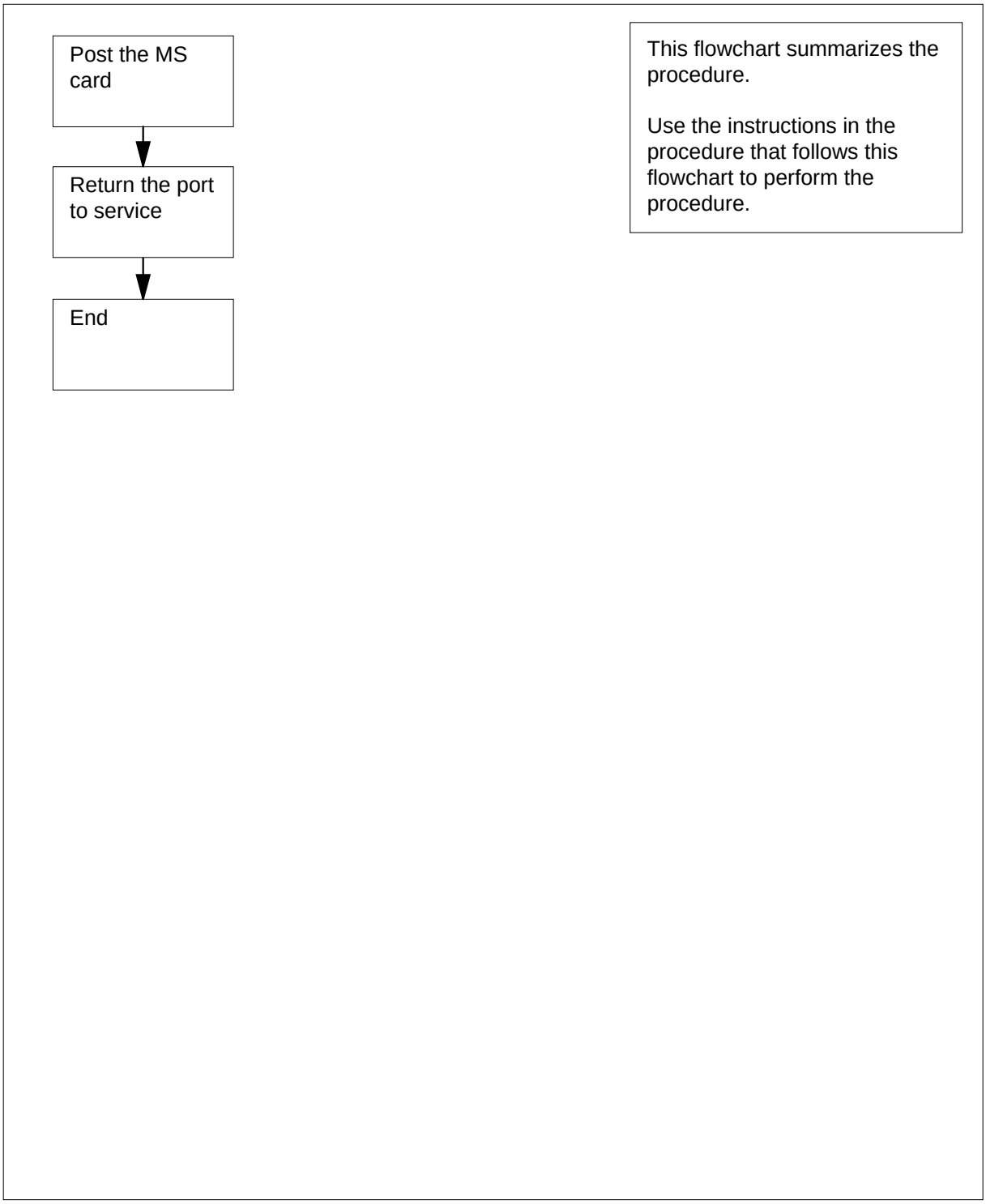
Use this procedure to return SR128 links between a link interface module (LIM) unit and the message switch (MS) to service after replacing an NT9X17 or NT9X62 card in a LIM unit. This procedure applies only to LIM units equipped with SR128 fiber links.

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



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                 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2
Card  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
Chain
MS 0  . . . . . - - - - - - - - - - - - - - F . . . . . .
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                 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2
Card  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
Chain
MS 0  . . . . . - - - - - - - - - - - - - - F . . . . . .
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:

```
Request to RTS MS: 1 shelf: 0 card:20 port:  0
submitted.
Request to RTS MS: 1 shelf: 0 card:20 port:  0
passed.
```

If the RTS 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 Return to service the MS port for the second SR128 link 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 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 RTS command	Do
passed	step 10
failed	step 11

8 Post the MS card number of the second 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 second link recorded instep 2

9 Return to service the MS port for the second SR128 link by typing

>RTS ms_no PORT port_no

and pressing the Enter key.

where

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 instep 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
                    Links_OOS Taps_OOS
Unit0: InSv            .          .
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, 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 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	AA	MS port expander paddle board	MS
NT9X25	BA	MS port terminator paddle board	MS
NT9X26	AA	Remote terminal interface card	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
NT9X32	AA	DMS-bus load paddle board	MS

System cards in a SuperNode MS (continued)

PEC	Suffix	Card name	Shelf or frame name
NT9X49	CA, CB, CC	MS P-bus terminator card	MS
NT9X52	AA	MSP T-bus access card	MS
NT9X53	AA	MS system clock card	MS
NT9X53	AB	DMS SuperNode clock 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*

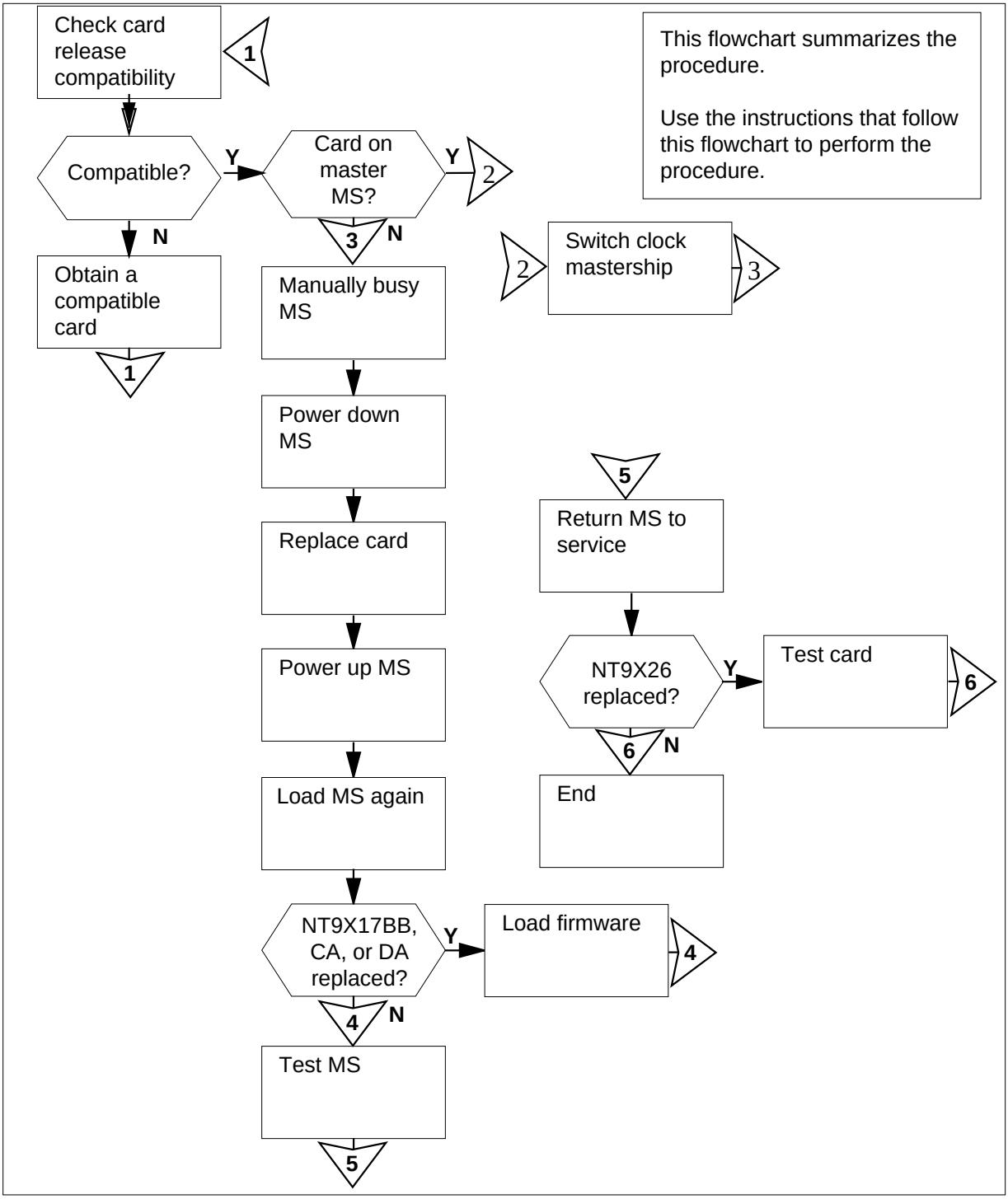
Do not go to the common procedure unless the step-action procedure directs you to go.

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 thereplacement 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 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:

System cards in a SuperNode MS (continued)

```
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.

10 Wait 10 min to make sure the MS has stability. Continue this procedure.

11 Determine if the slave MS is manually busy.

Note: 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.

If the slave MS	Do
is not manually busy	step 12
is manually busy	step 17

12 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 35

13 Determine the type of card you will replace.

If the card you will replace	Do
is an NT9X30 or NT9X31	step 17
is not an NT9X30 or NT9X31	step 14

14 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 1 1 1 1 1 2 2 2 2 2 2 2
Card   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
Chain
MS 0   . . . . F . . . . . . . . . . . . . . . . . . . .
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

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 24
requests confirmation	step 23

23 To confirm the command, type

>YES

and press the Enter key.

If the LOADMS command	Do
passed	step 24
failed	step 35

24 Determine the type of the replaced card.

If the replaced card	Do
is a NT9X17BB, NT9X17CA, or NT9X17DA	step 25
is other than listed here	step 27

25 To access the Shelf level of the MAP display, type

>SHELF

and press the Enter key.

26 To load the firmware into the replacement card, type

>LOADCD ms_number card_number1 FROMCD card_number2

and press the Enter key.

where

ms_number
is the number of the slave MS (0 or 1)

card_number1
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 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 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 30
failed	step 35

30 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 31
failed	step 35

31 Determine the type of card that you replaced.

If the card	Do
is an NT9X26	step 32
is other than an NT9X26	step 36

32 To access the Shelf level of the MAP display, type

>SHELF

and press the Enter key.

33 To access the Card level for the card you replaced, type

>CARD 3

and press the Enter key.

34 To test the card, type

>TST ms_number BACK

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 INSV MS: 0 shelf: 0 card: 3  back
submitted.
Request to TEST InSV MS: 0 shelf: 0 card: 3  back
passed.
```

If the TST command	Do
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.

6 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

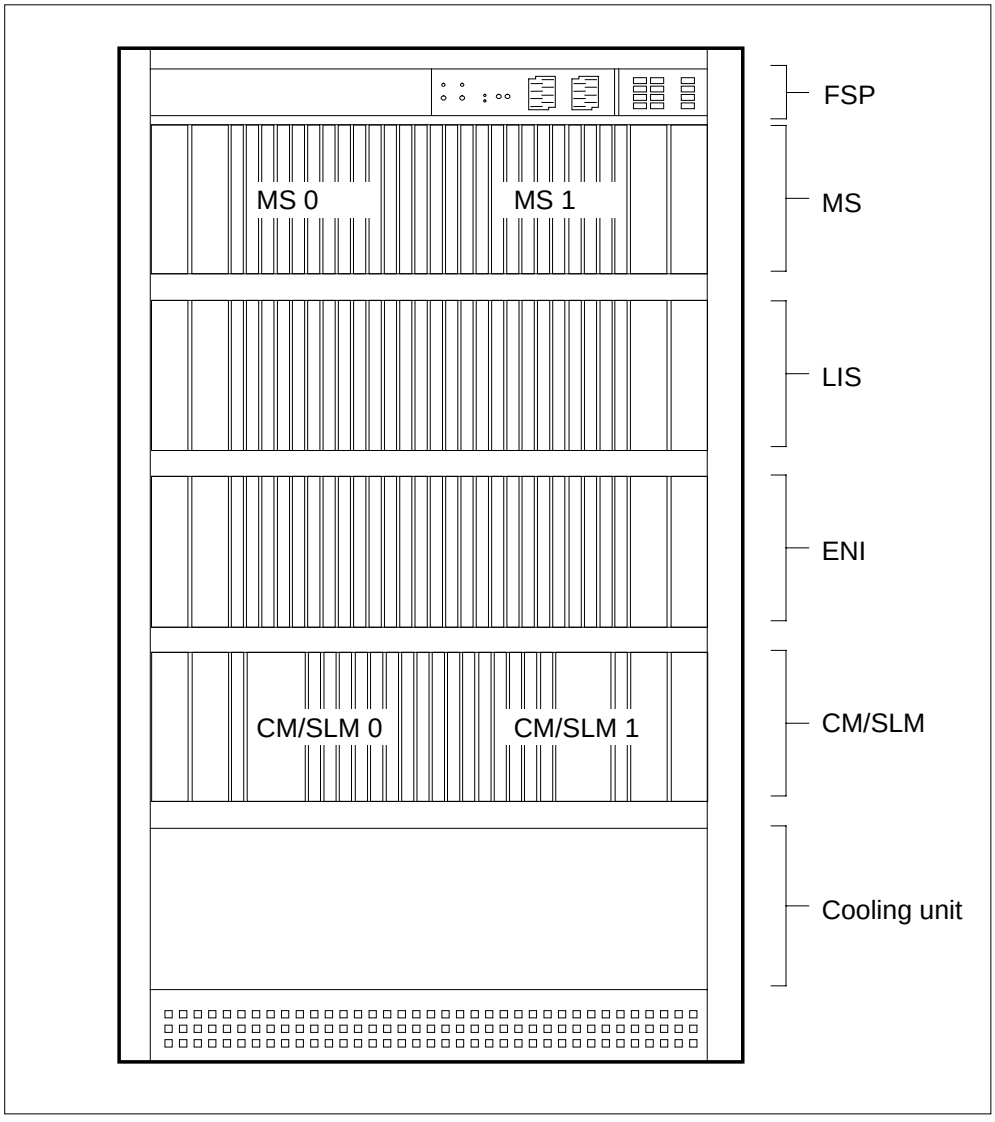
SuperNode SE message switch shelf layouts

Application

This procedure provides the following layout diagrams:

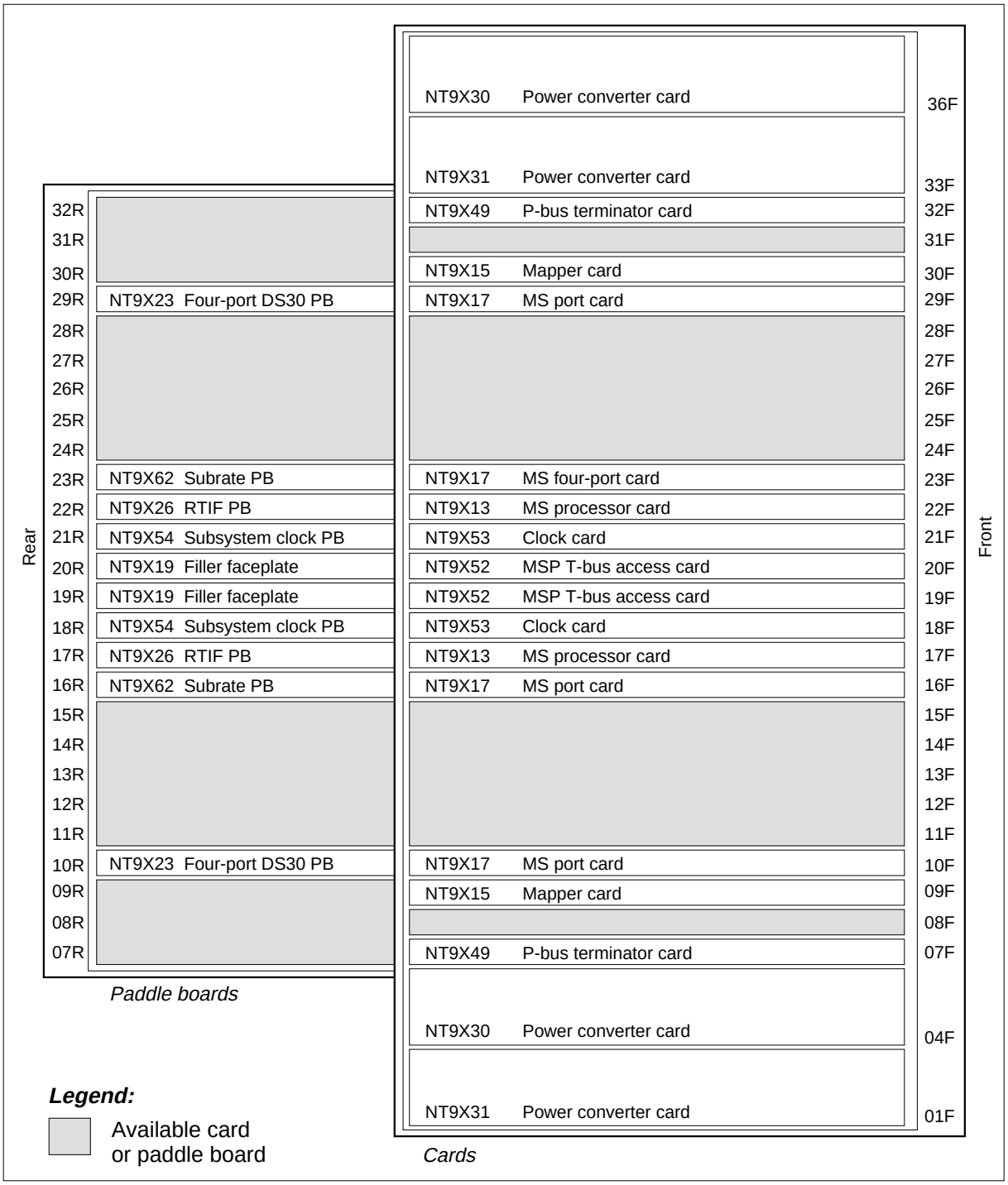
- single core cabinet
- SuperNode SE message switch (MS)

Figure Single core cabinet



SuperNode SE message switch shelf layouts (end)

Figure 2SuperNode 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*

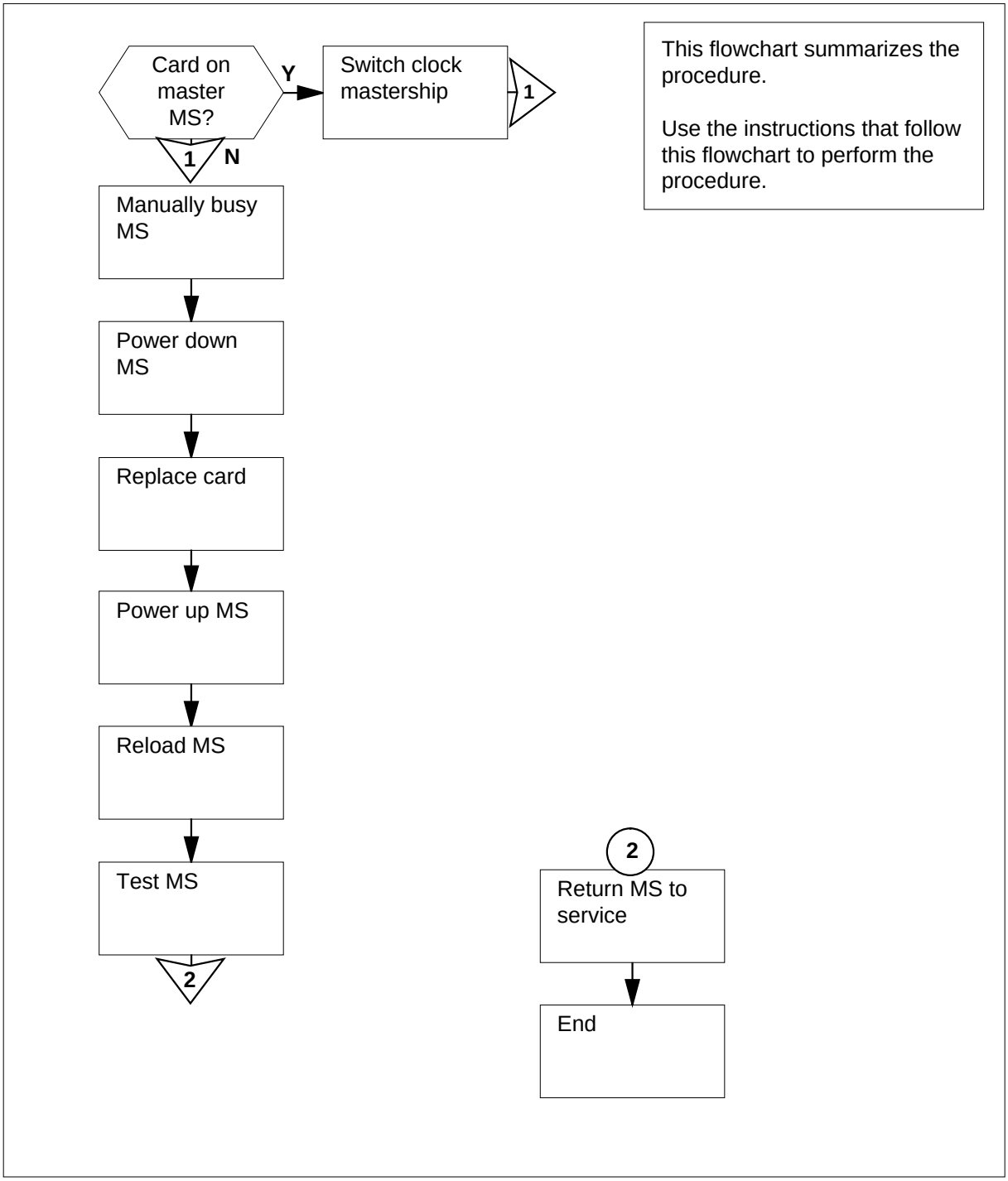
Do not go to the common procedure unless the step-action procedure directs you to go.

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 `Slave`, `S Flt`, `S OOS`, or `S Free` under the Clock header	step 8
replace is the master MS, indicated by `Master`, `M Free` or `M Flt` 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.).

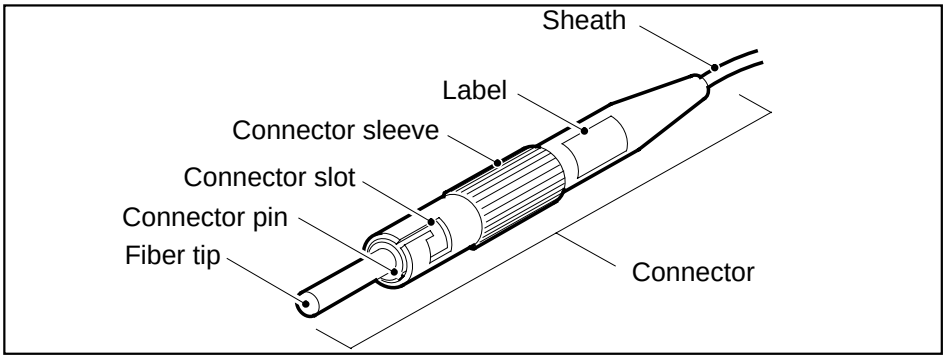
Disconnect the fiber links from the card as follows:

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.

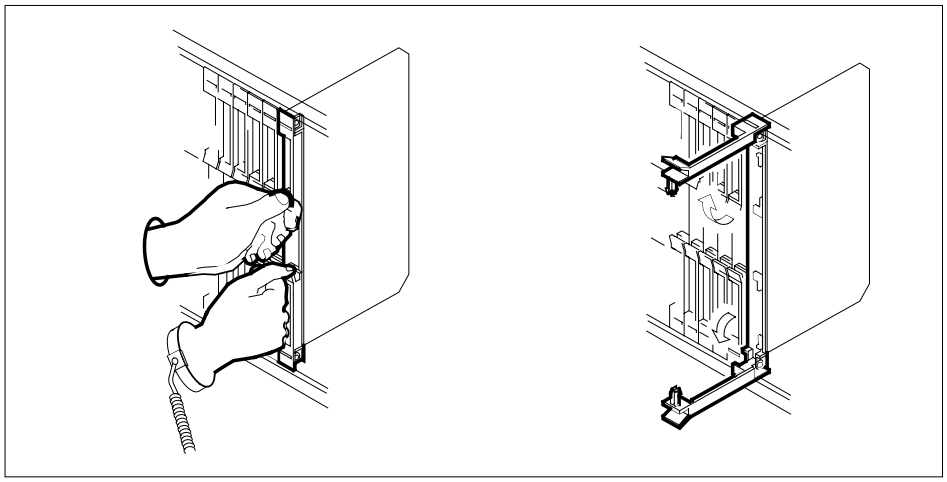
b Use a screwdriver to disconnect the F-bus ribbon cables from the card.

Interface paddle boards in a SuperNode SE MS (continued)

29

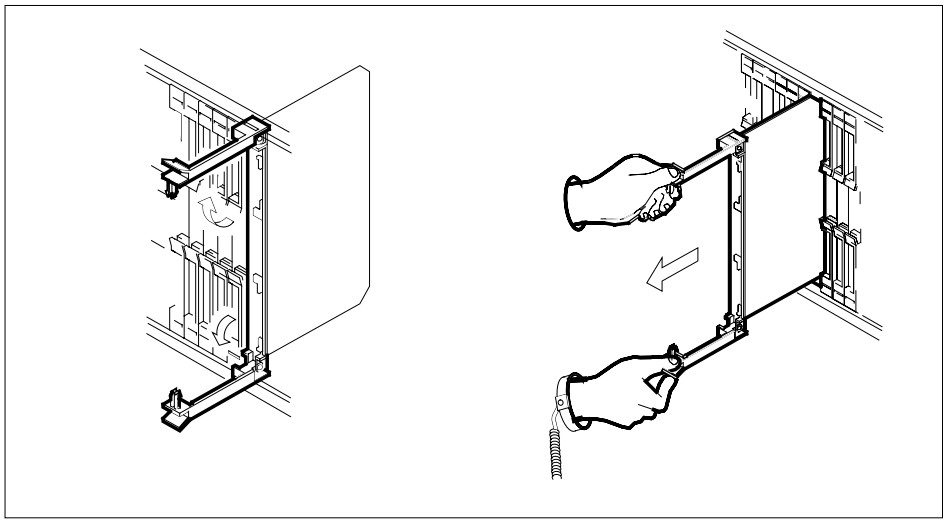
DANGER
Do not hold card by levers only
If you hold a card by the levers, you can cause lever breakage. When you pull the card half way out, grasp the card underneath for support. Continue to remove the card from the shelf. Avoid contact with any wires or internal parts on the card.

Open the locking levers on the card you replace.

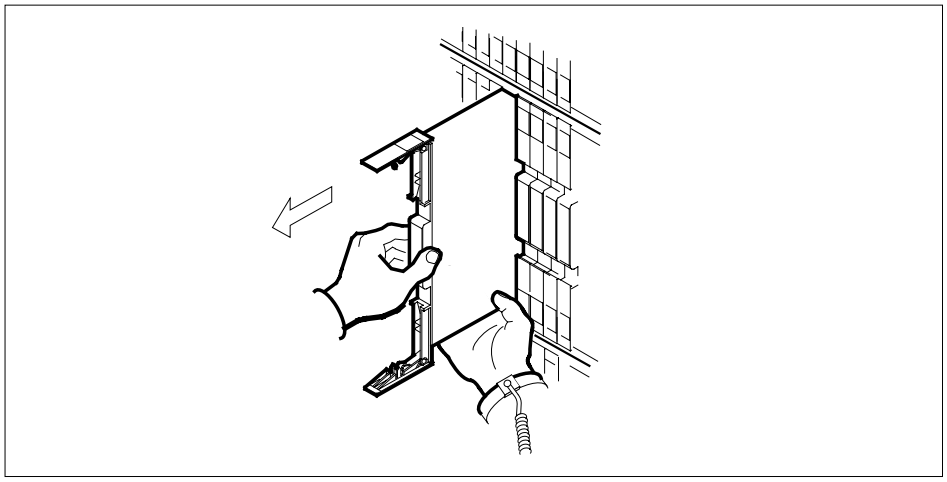


30 Grasp the locking levers. Pull the card toward you until the card protrudes 2 in. (5.1 cm) from the equipment shelf.

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.

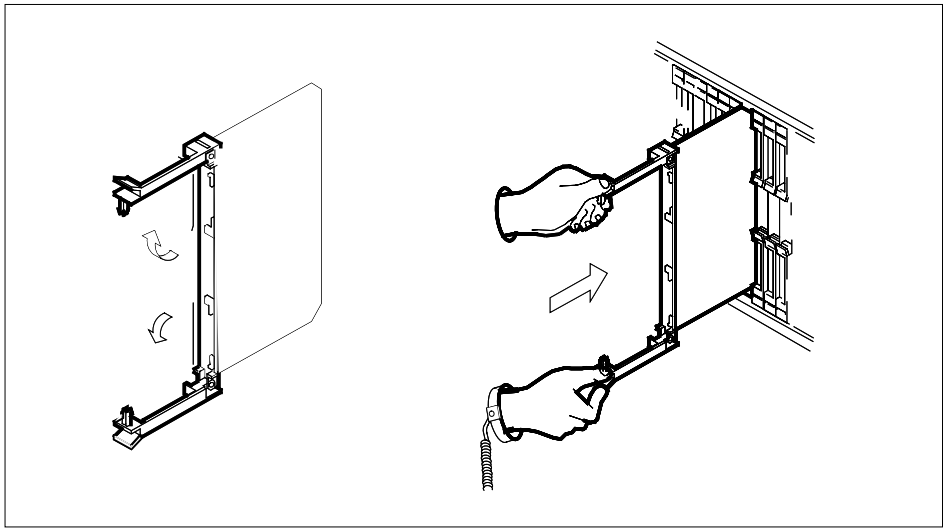
33 Make sure that the replacement card has the same PEC and the PEC suffix as the card you replace.

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.

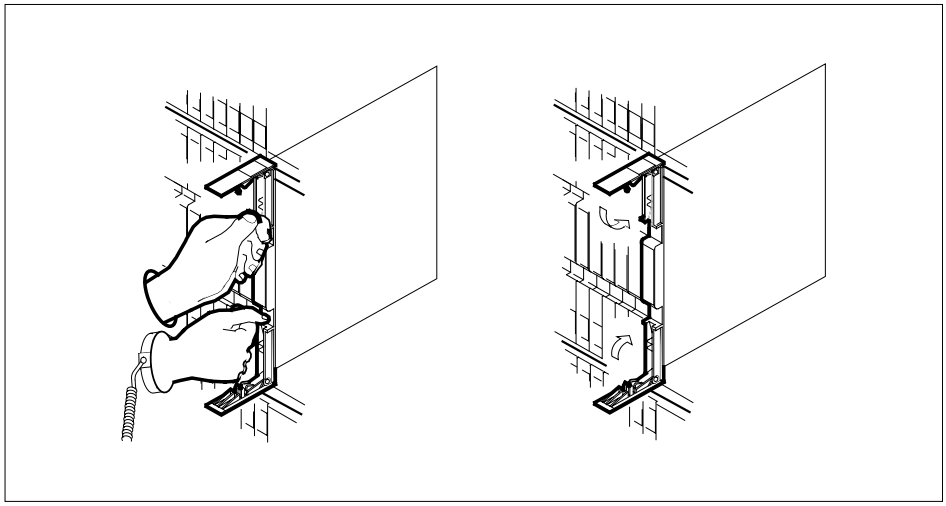
b Use a screwdriver to tighten the retaining screws on the F-bus ribbon cables. To make sure that all pins make the proper contact, the retaining screws must be tight and screwed in completely.

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 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 52
requests confirmation	step 51

51 To confirm the command, type

>YES

and press the Enter key.

If the LOADMS command	Do
passed	step 52
failed	step 56

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

If a maintenance procedure	Do
directed you to this prcoedure	step 53
did not direct you to this procedure	step 54

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

54 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:

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

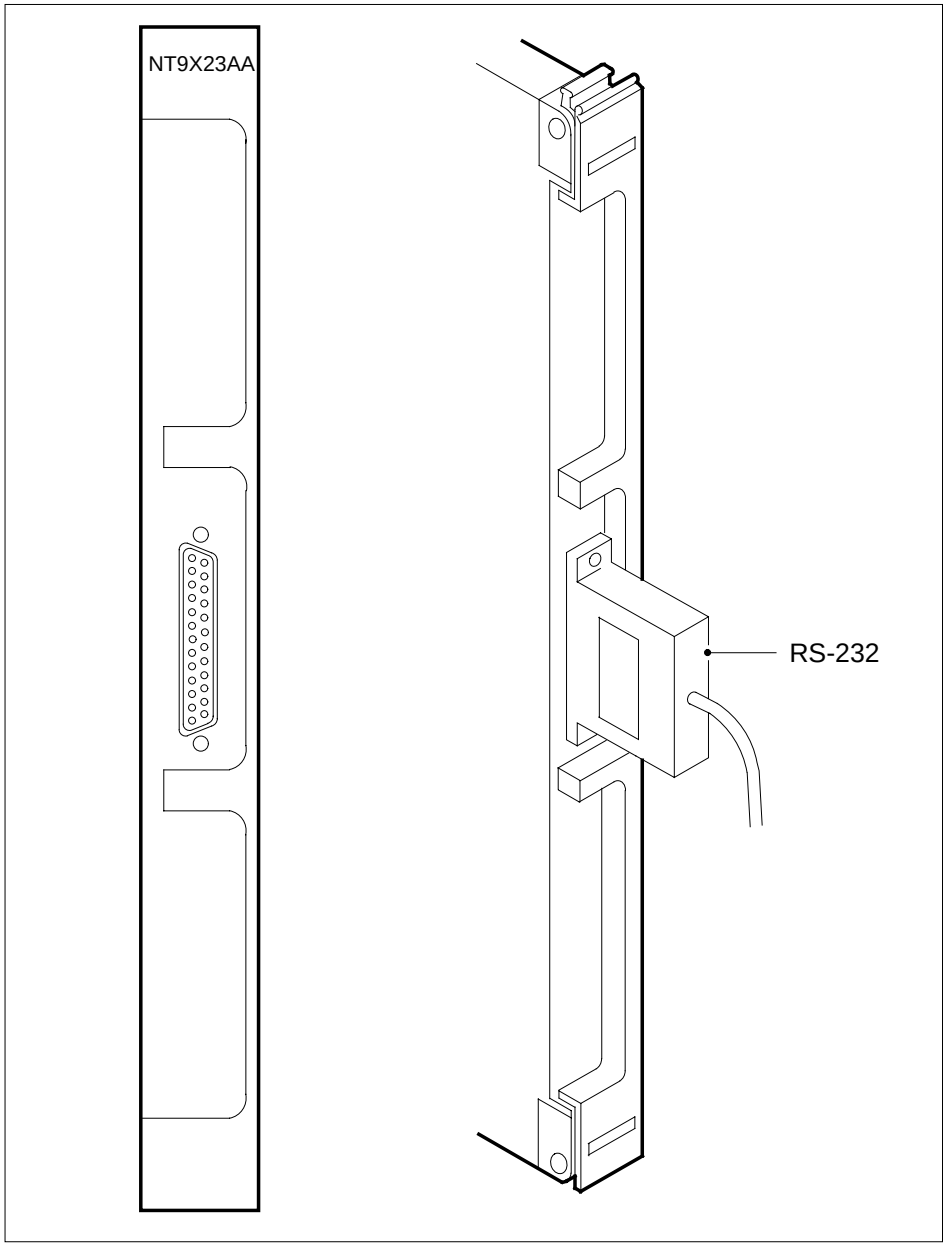
56 For additional help, contact the next level of support.

57 The procedure is complete.

The following diagrams show the cable connections for the cards covered in this procedure.

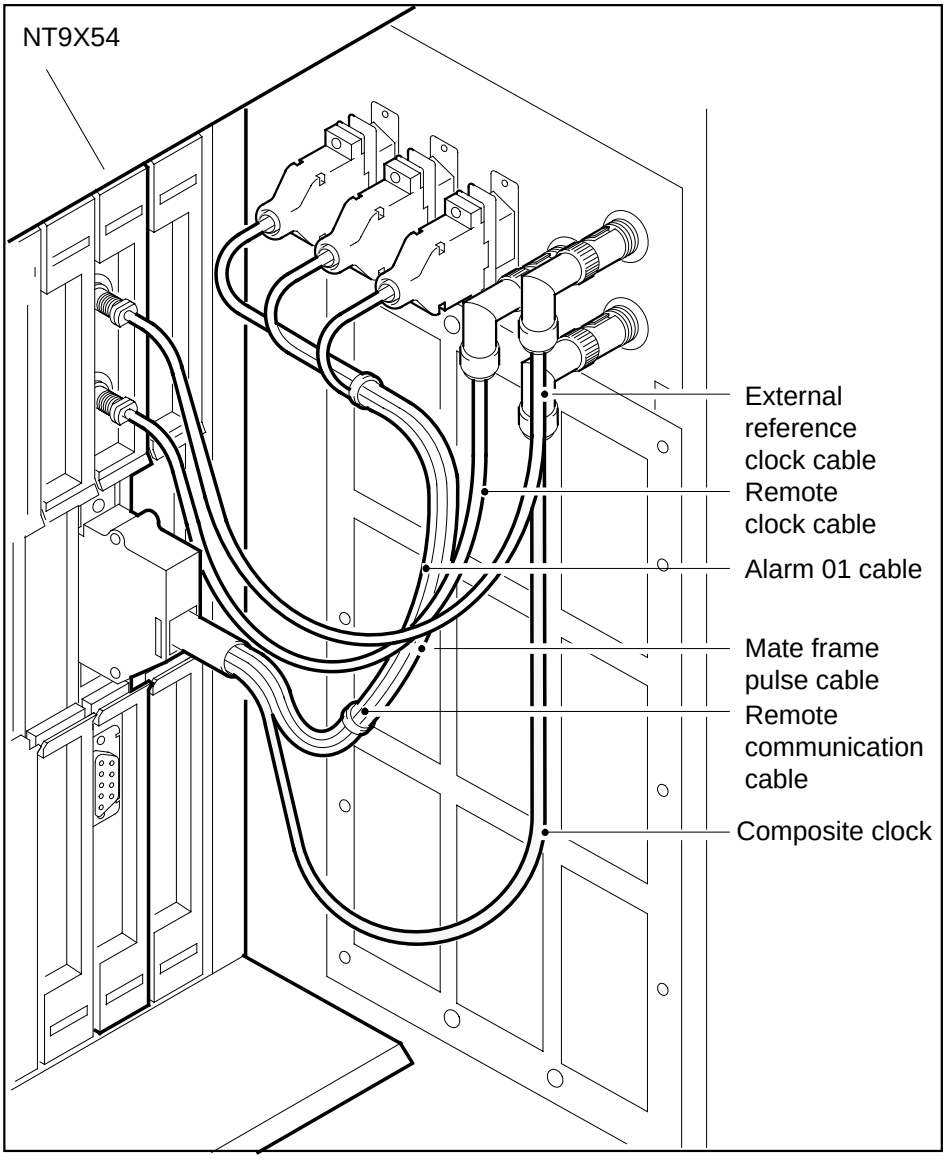
Interface paddle boards in a SuperNode SE MS (continued)

Cable connections for an NT9X23 in a SuperNode SE MS



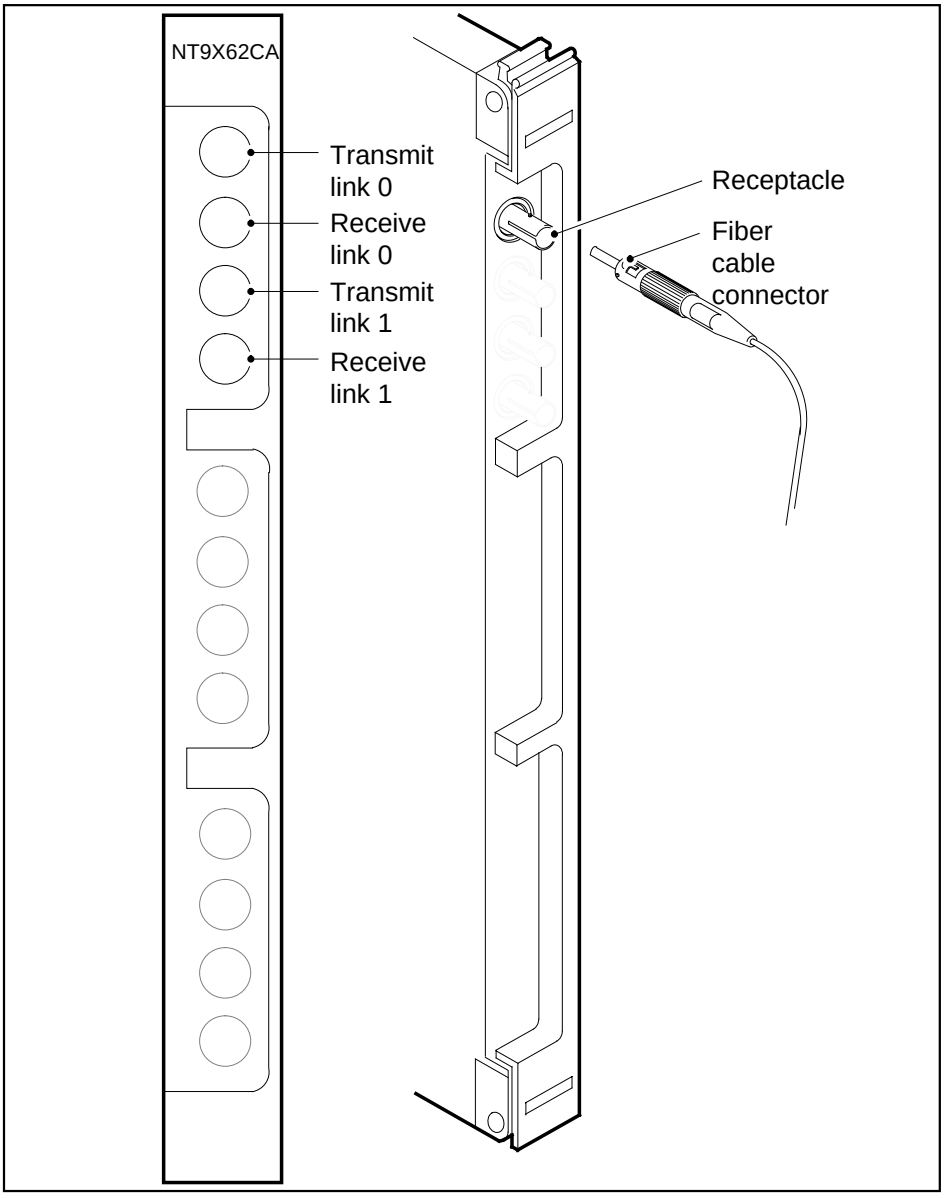
Interface paddle boards in a SuperNode SE MS (continued)

Cable connections for an NT9X54 in a SuperNode SE MS



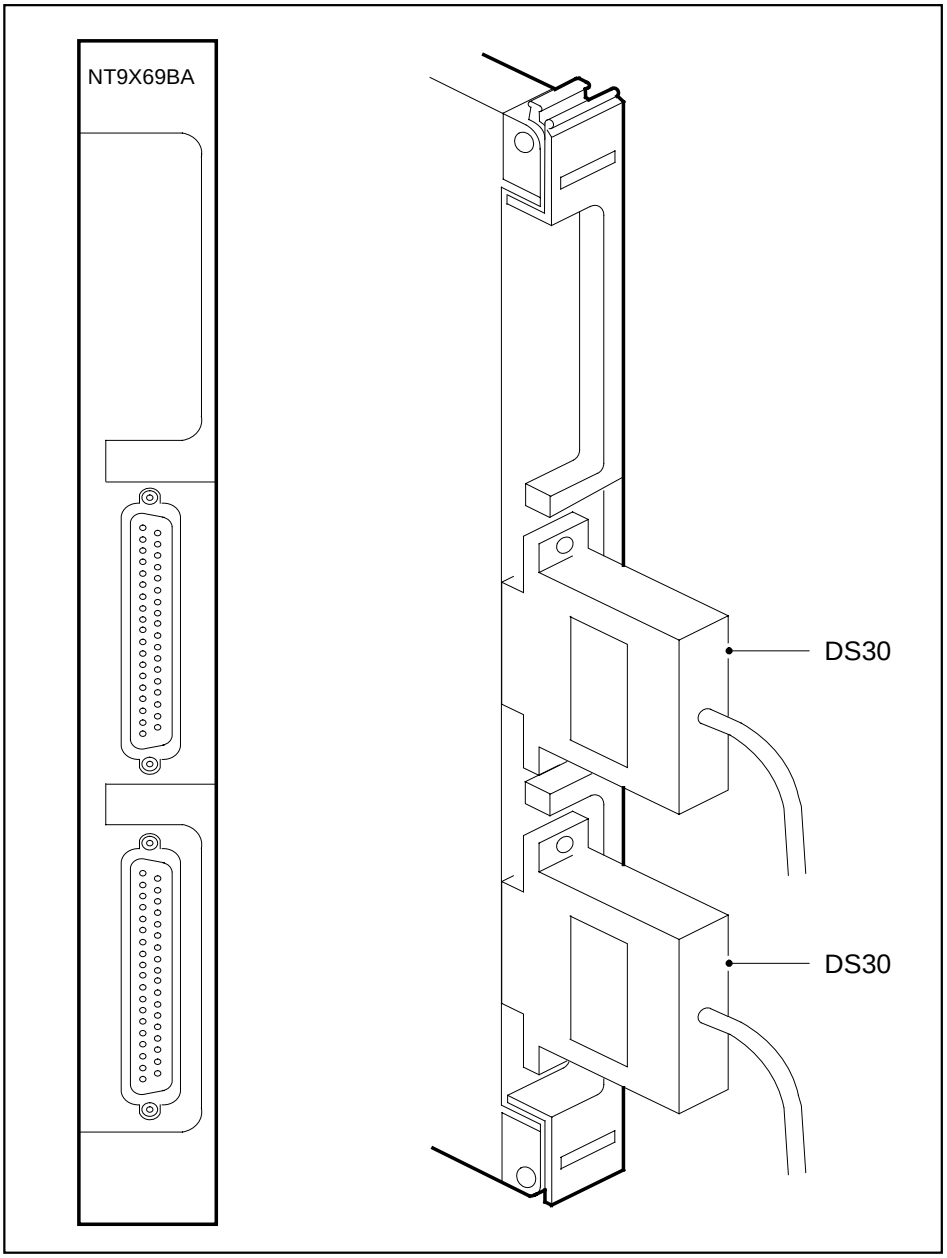
Interface paddle boards in a SuperNode SE MS (continued)

Cable connections for an NT9X62 in a SuperNode SE MS



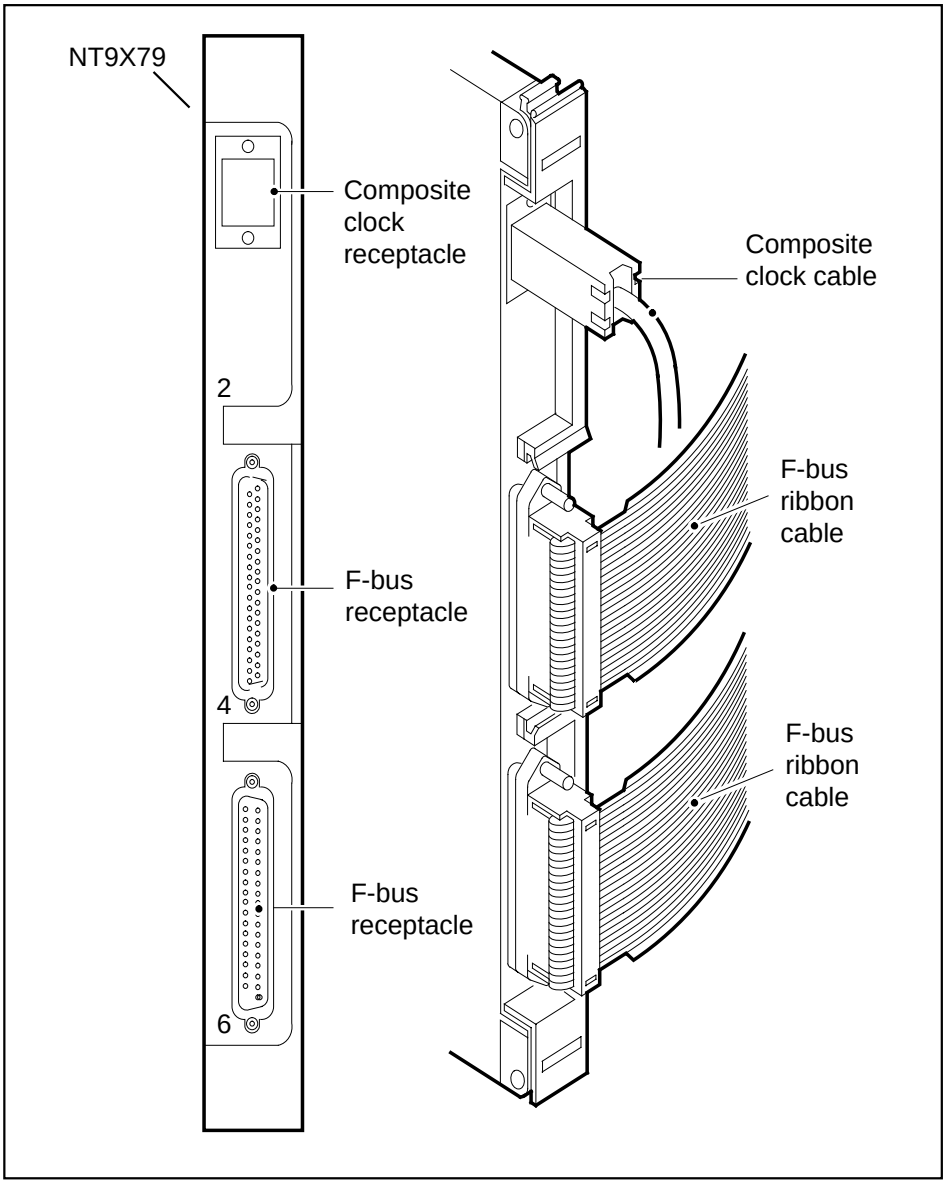
Interface paddle boards in a SuperNode SE MS (continued)

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*

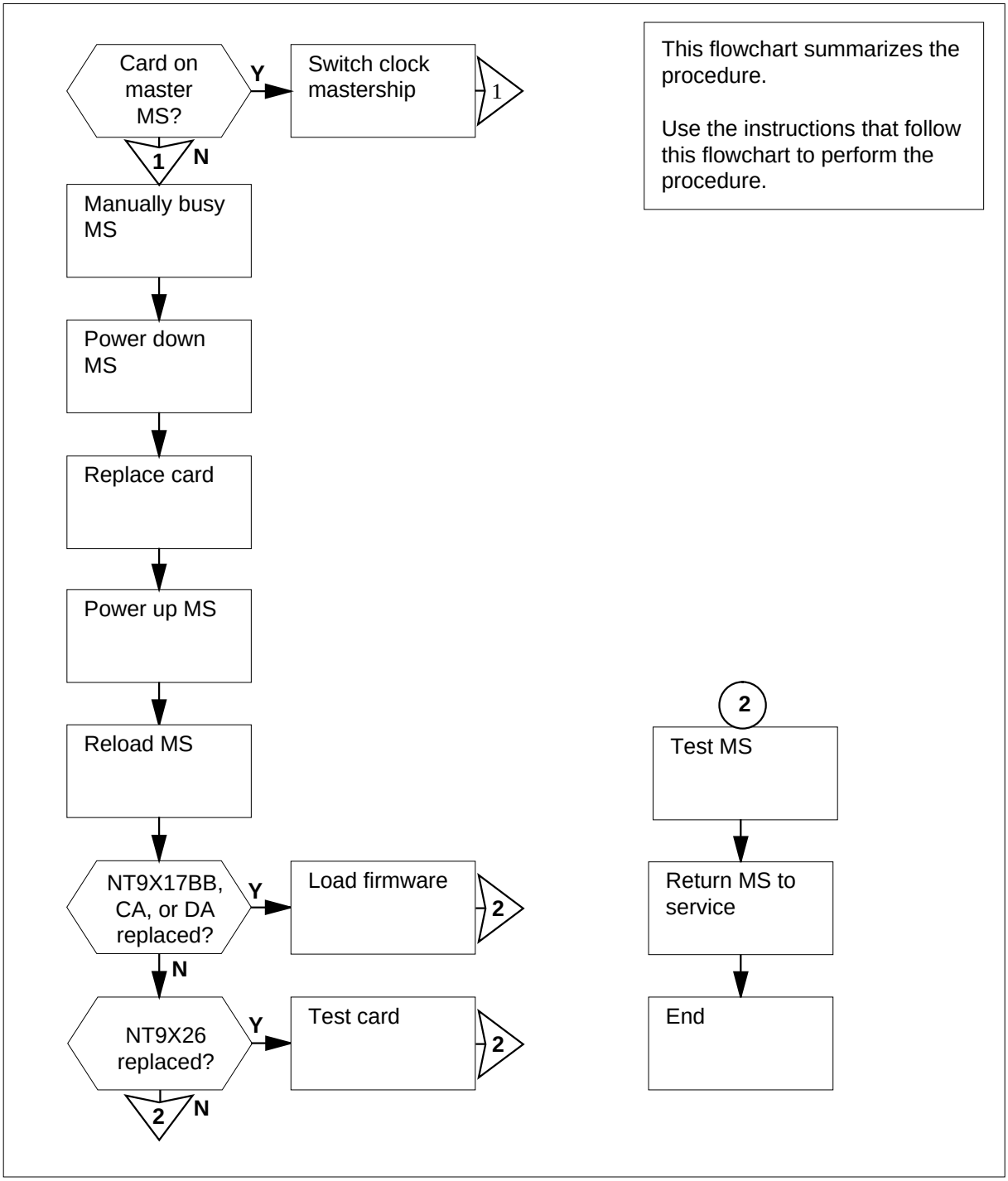
Do not go to the common procedure unless the step-action procedure directs you to go.

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
repalce is the slave MS, indicated by `Slave`, `S Flt`, `S OOS`, or `S Free` under the Clock header	step 8
replace is the master MS, indicated by `Master`, `M Free` or `M Flt` 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”):
```

If the response	Do
indicates the LOADMS command passed	step 25
requests confirmation	step 24

24 To confirm the command, type

>YES

and press the Enter key.

If the LOADMS command	Do
passed	step 25
failed	step 36

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

If the card you	Do
replace is an NT9X17BB, NT9X17CA, or NT9X17DA	step 26
replace is other than listed here	step 28

26 To access the Shelf level of the MAP display, type

>SHELF

and press the Enter key.

27 To load the firmware into the replacement card, type

>LOADCD ms_number card_number1 FROMCD card_number2

and press the Enter key.

where

ms_number
is the number of the slave MS (0 or 1)

card_number1
is the number of the card you replaced

card_number2
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

If a maintenance procedure	Do
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.
```

If the TST command	Do
passed	step 31
failed	step 36

31 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 32
failed	step 36

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

If the card	Do
is an NT9X26	step 33
is other than listed here	step 37

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

>SHELF

and press the Enter key.

34 To access the Card level for the card that you replaced, type

>CARD 3

and press the Enter key.

35 To test the card, type

>TST ms_number BACK

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 INSV MS: 0 shelf: 0 card: 3  back
submitted.
Request to TEST InSV MS: 0 shelf: 0 card: 3  back
passed.
```

If the TST command	Do
passed	step 37

System cards in a SuperNode SE MS (end)

If the TST command	Do
failed	step 36

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

37 The procedure is complete.

7 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)

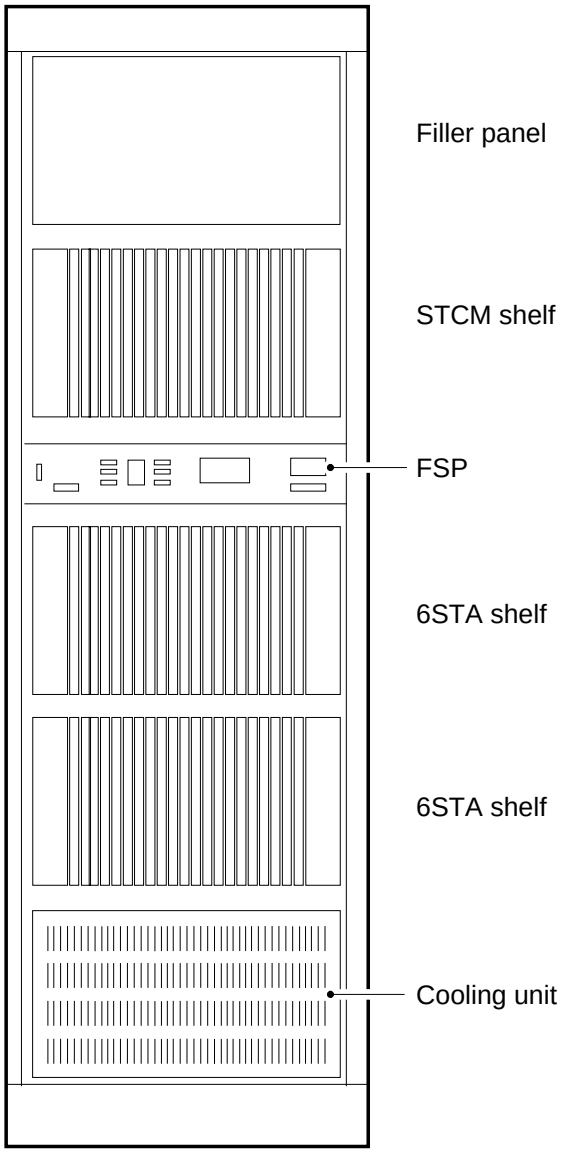
This procedure provides shelf layouts for the following shelves in an MSB:

- 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)

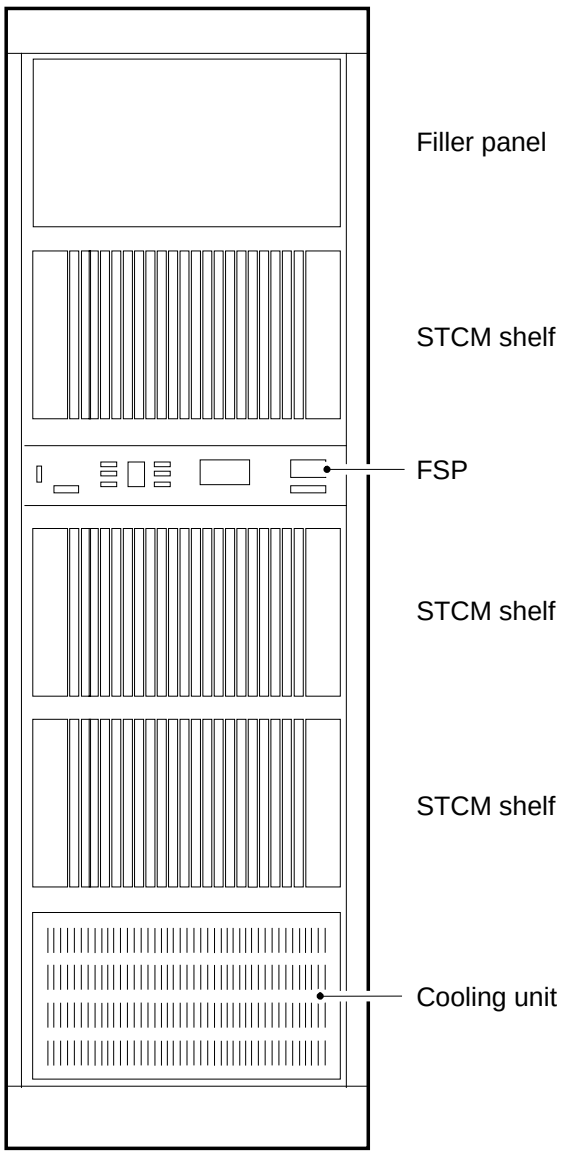


Legend:

6STA	CCS6 signaling terminal array
FSP	Frame supervisory panel
STCM	Signaling terminal controller module

MSB shelf layouts (continued)

Frame layout for CCS6 signaling terminal equipment frame (ST6E)

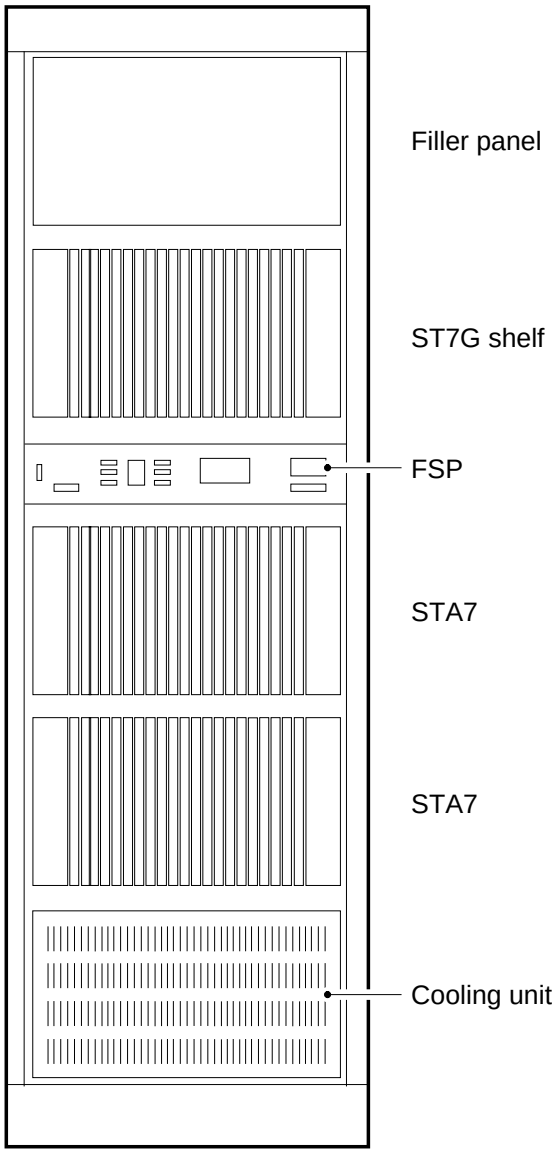


Legend:

FSP	Frame supervisory panel
STCM	Signaling terminal controller module

MSB shelf layouts (continued)

Frame layout for CCS7 MSB equipment frame (MS7E)

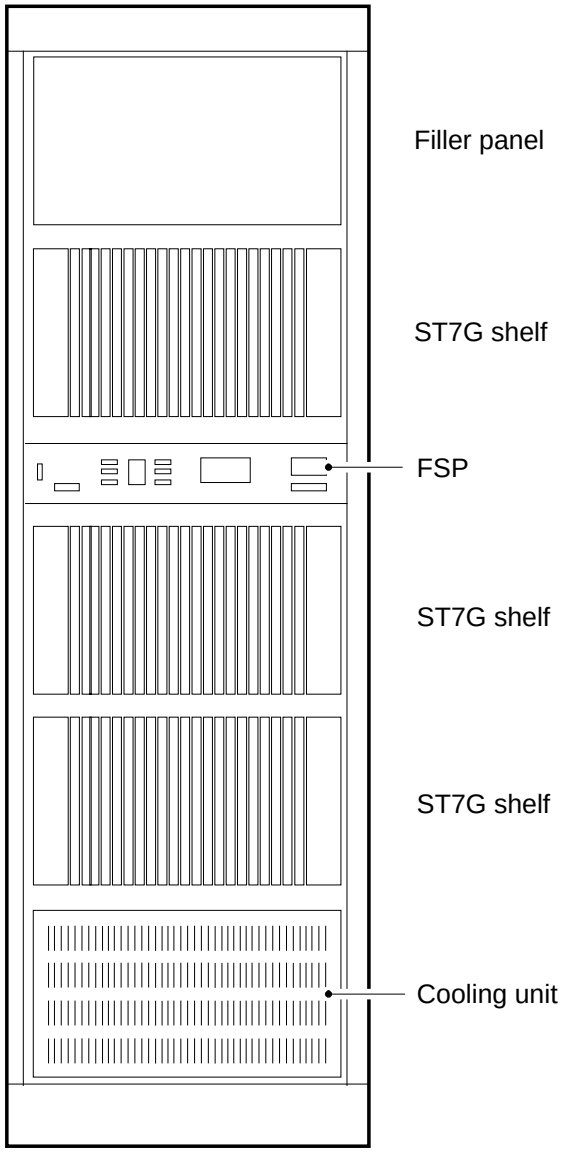


Legend:

FSP	Frame supervisory panel
ST7G	CCS7 signaling terminal group
STA7	CCS7 Signaling terminal array

MSB shelf layouts (continued)

Frame layout for CCS7 signaling terminal equipment frame (ST7E)

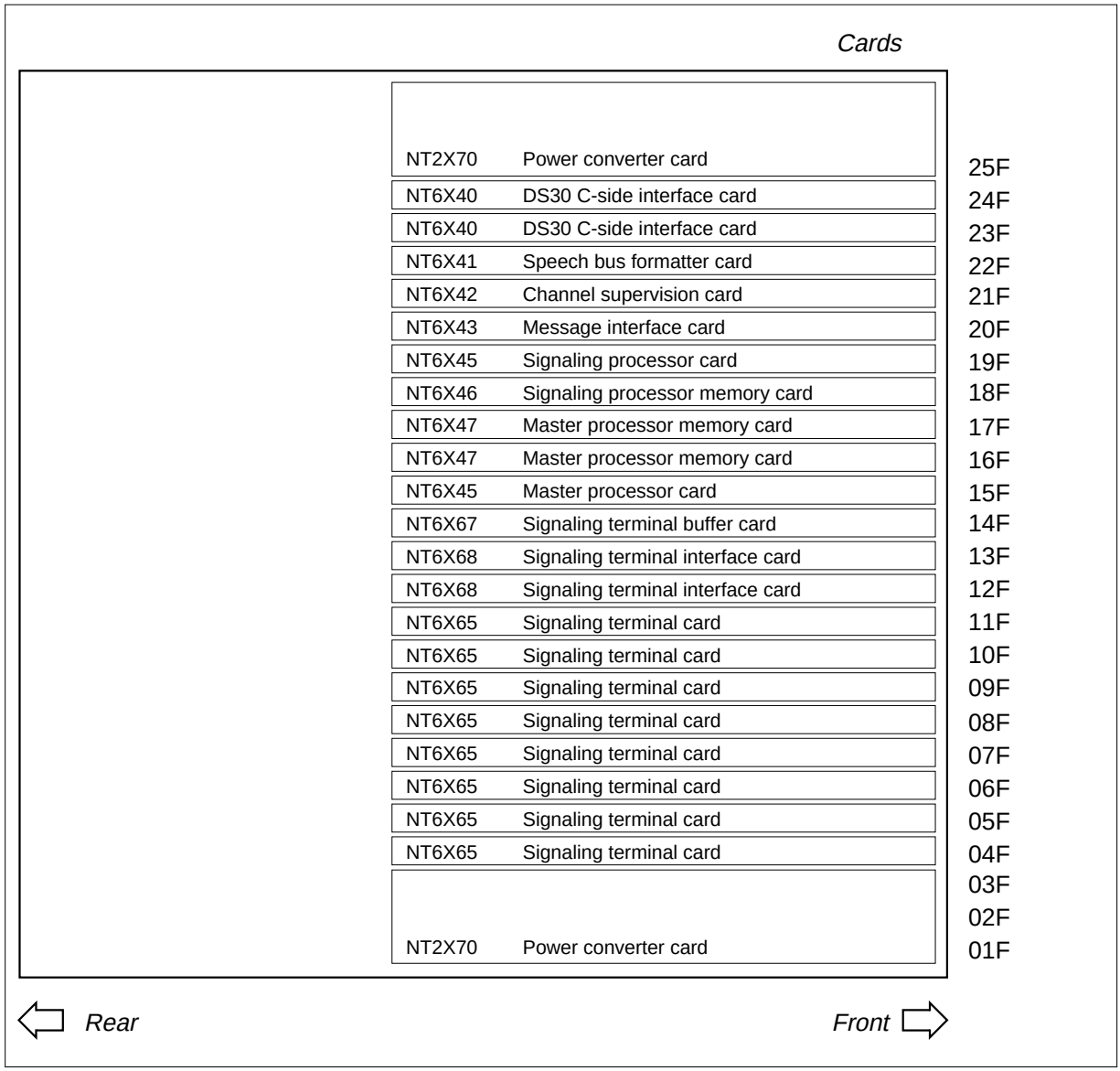


Legend:

FSP	Frame supervisory panel
ST7G	CCS7 signaling terminal group

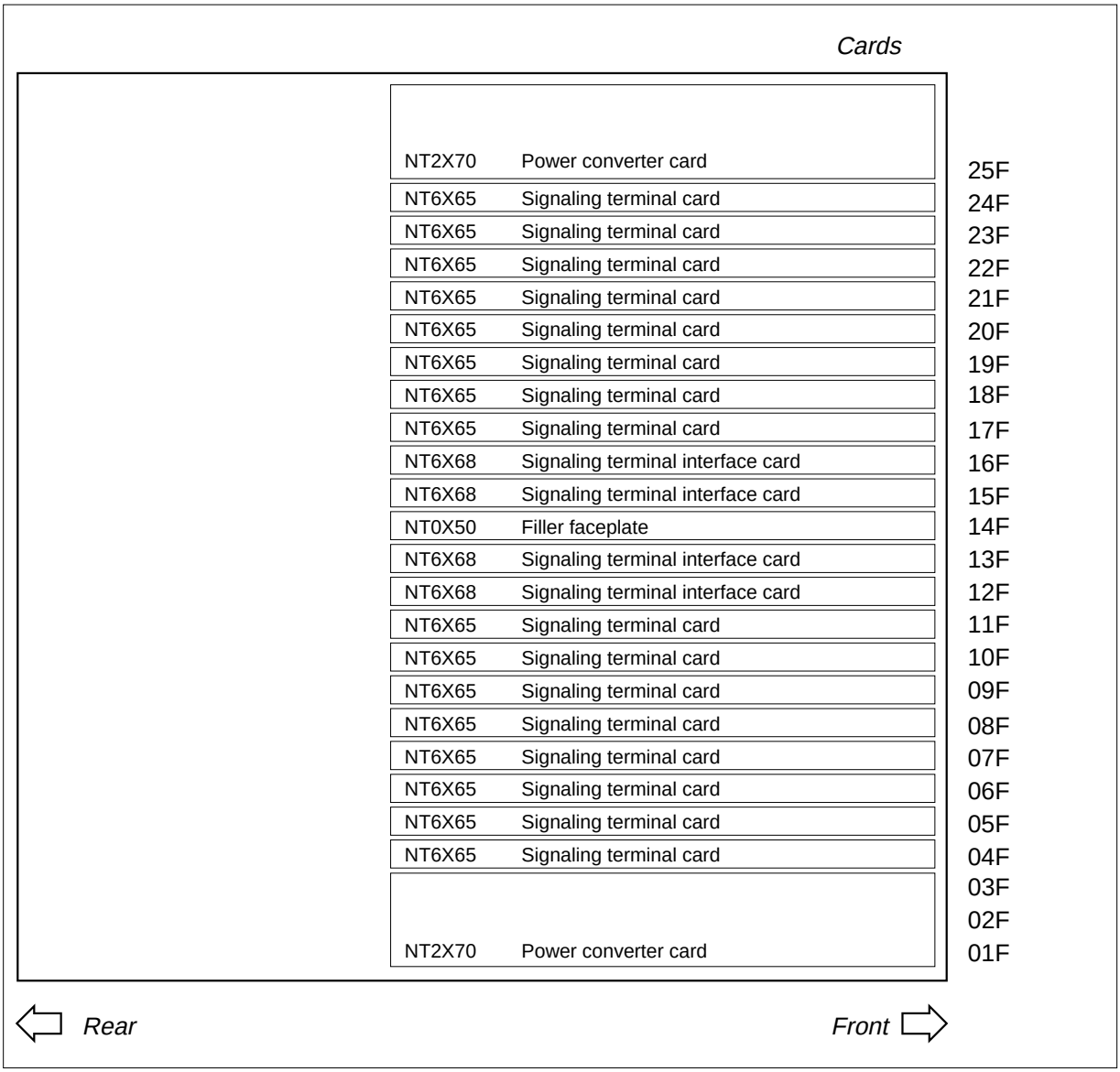
MSB shelf layouts (continued)

Shelf layout for CCS6 signaling terminal array shelf



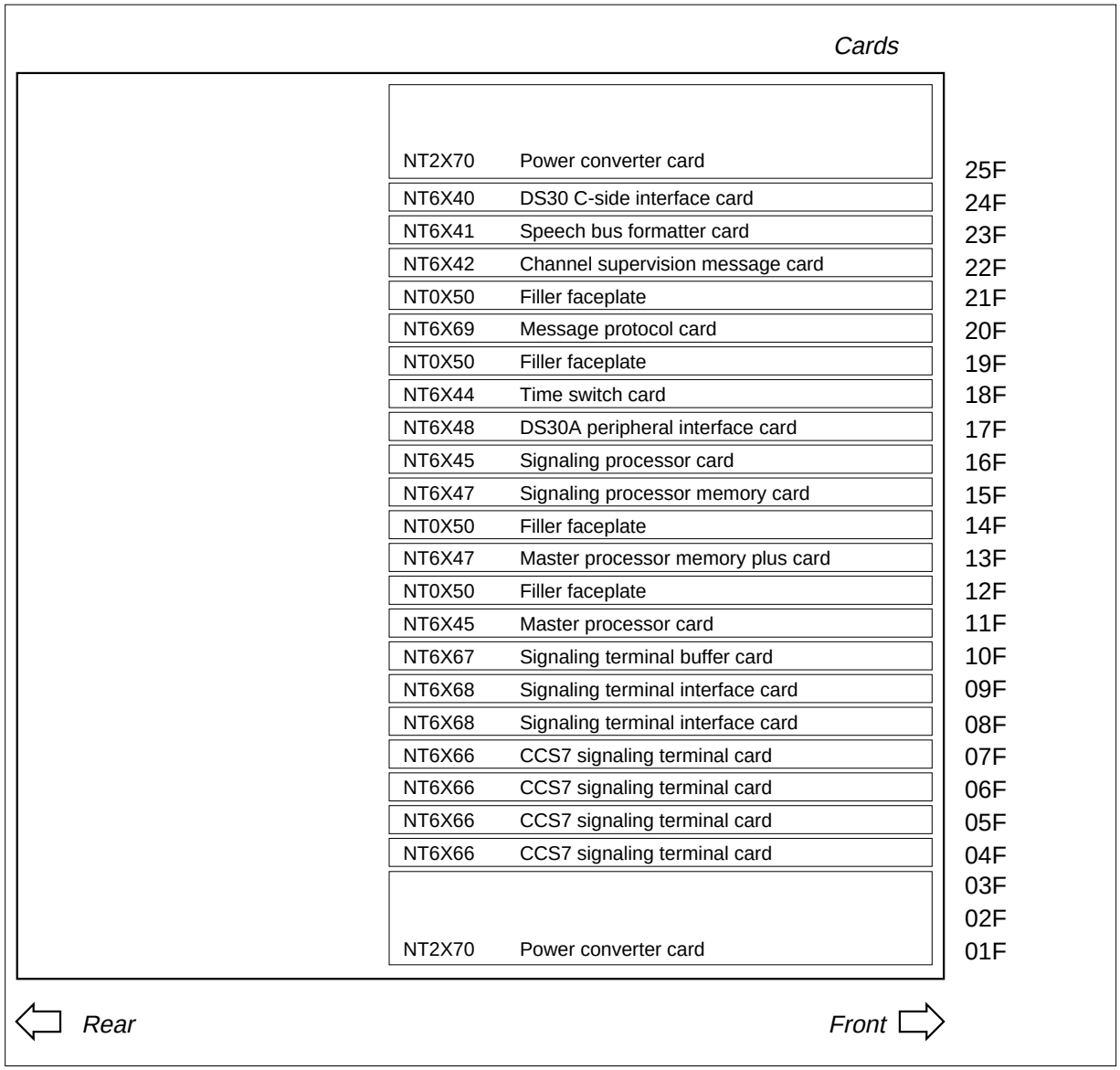
MSB shelf layouts (continued)

Shelf layout for CCS6 signaling terminal shelf



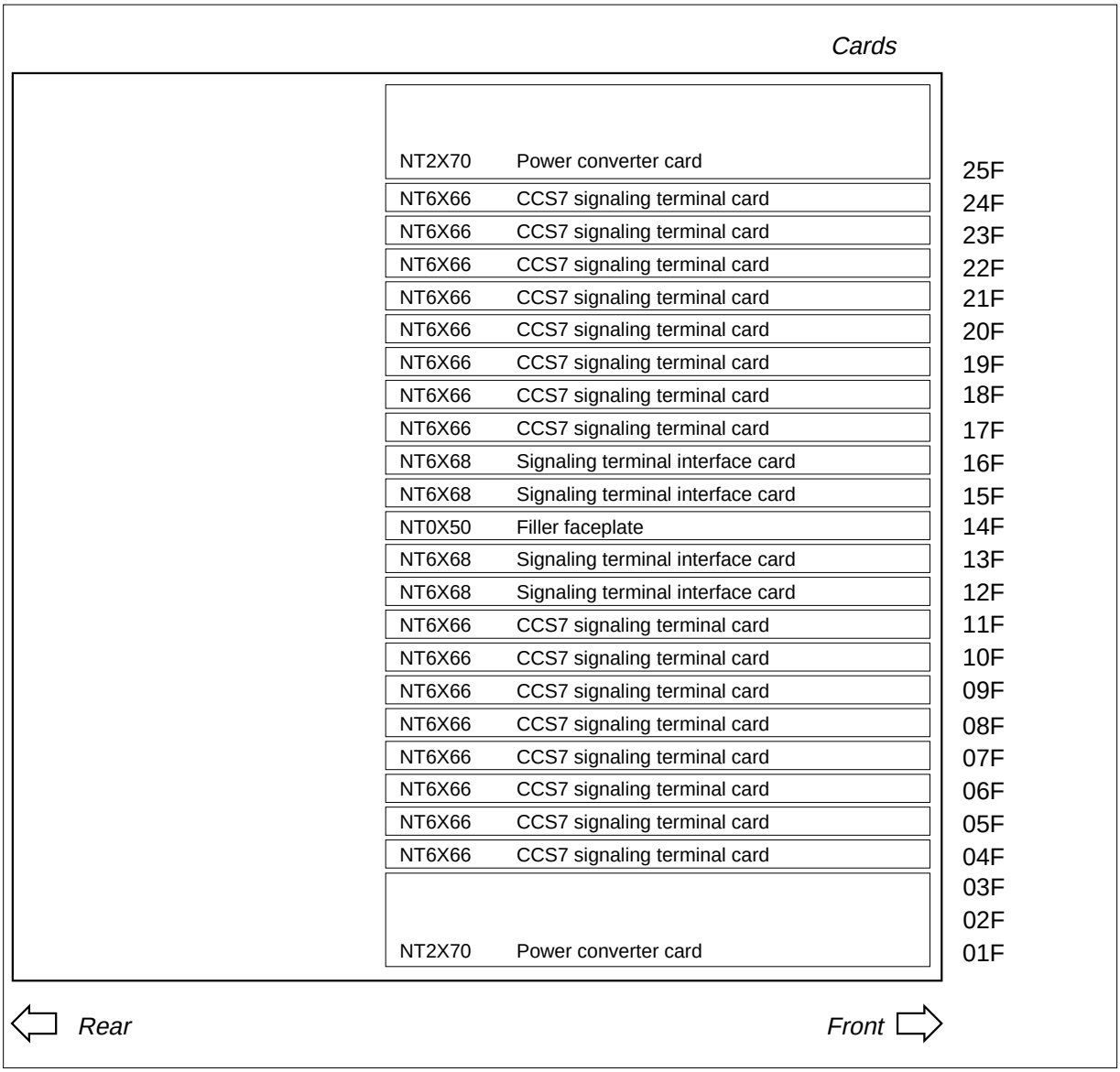
MSB shelf layouts (continued)

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*.

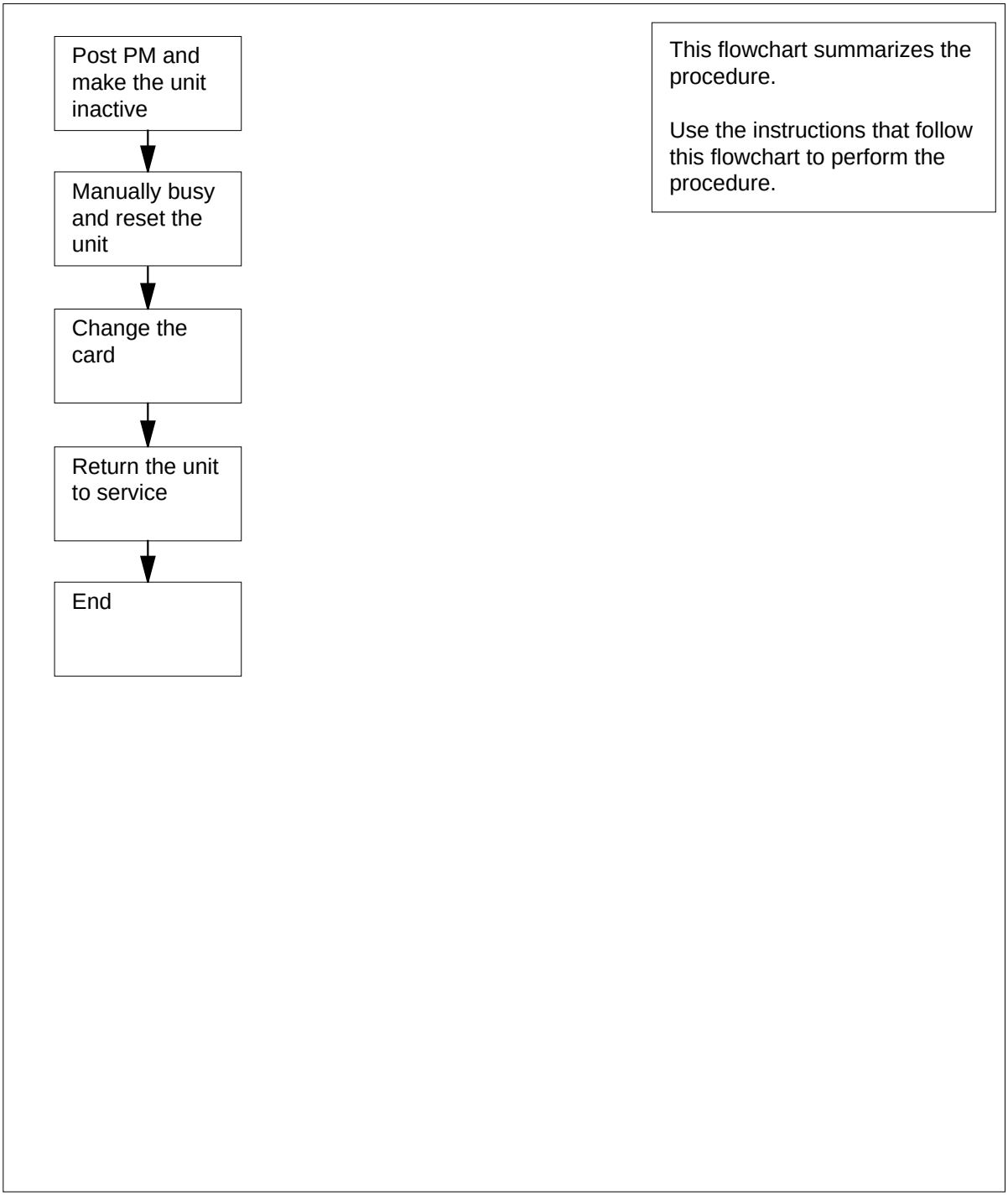
Do not go to the common procedure unless the step-action procedure directs you to go.

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     24
MSB7               0      0      0       0      0      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.

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 return the inactive unit to service, type

```
>RTS  INACTIVE
```

and press the Enter key.

If the RTS command	Do
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, AC, AD, 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”

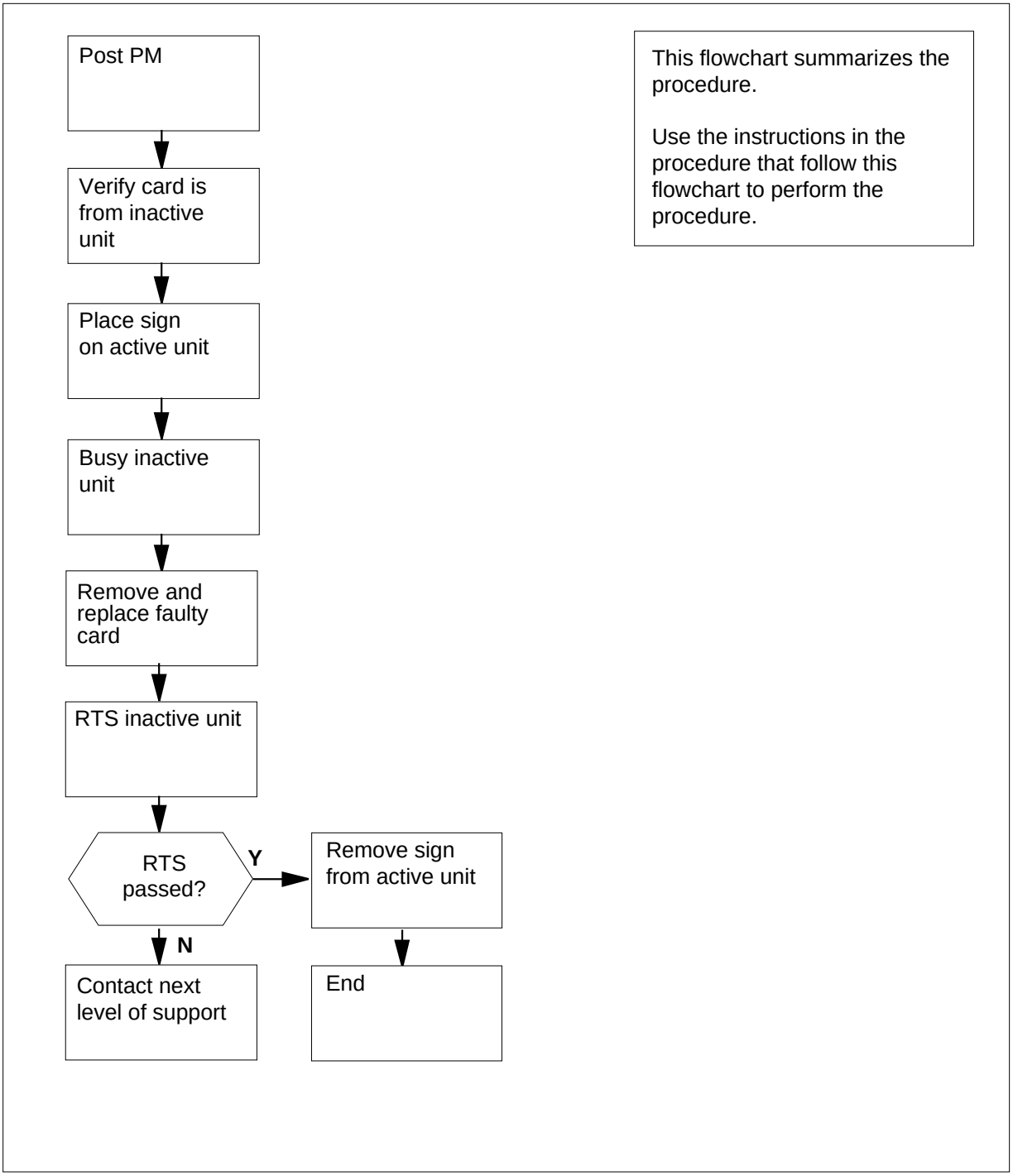
Do not go to the common procedure unless directed to do so in the step-action procedure.

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 busying 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
 PM                   12       0       2       0      13      24
 MSB6                  0       0       0       0       0       3

MSB6    0 InSv  Links_OOS: CSide  0 , PSide  0
Unit0:   Inact InSv
Unit1:   Act   InSv
```

5 Determine the state and activity of the PM unit associated with the card you are replacing.

If the state of the PM unit 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_OOS: 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

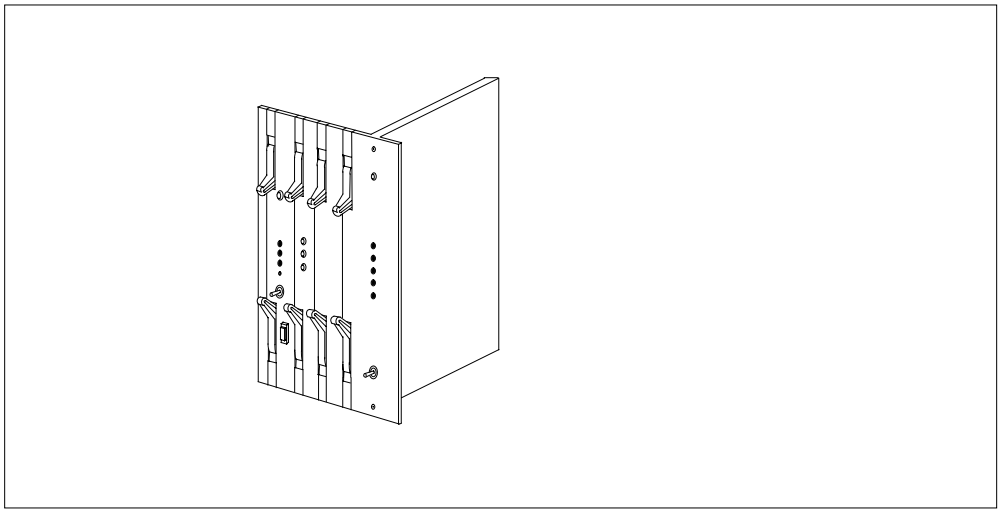
DANGER
Equipment damage
Take the following precautions when removing or inserting a card:

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.

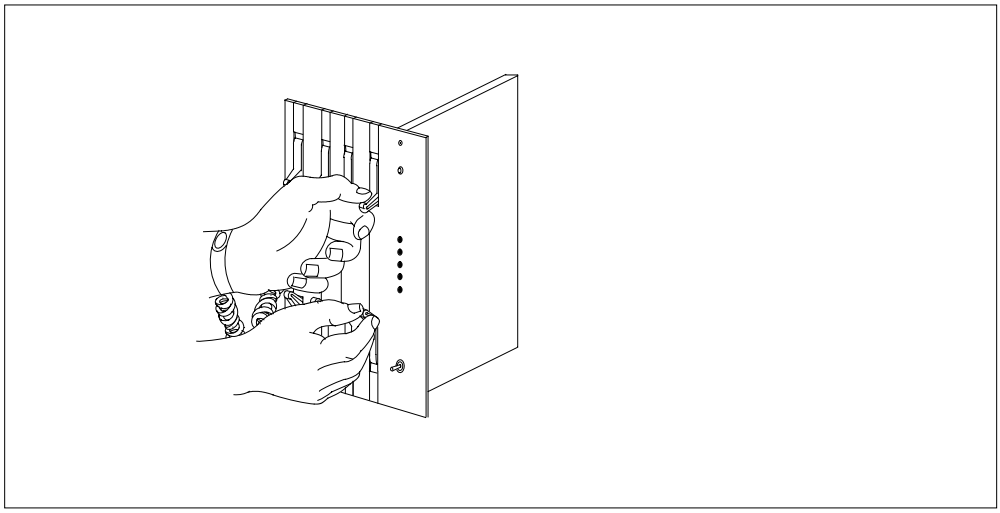
NT2X70
in an MSB (continued)

a Locate the card to be removed on the appropriate shelf.



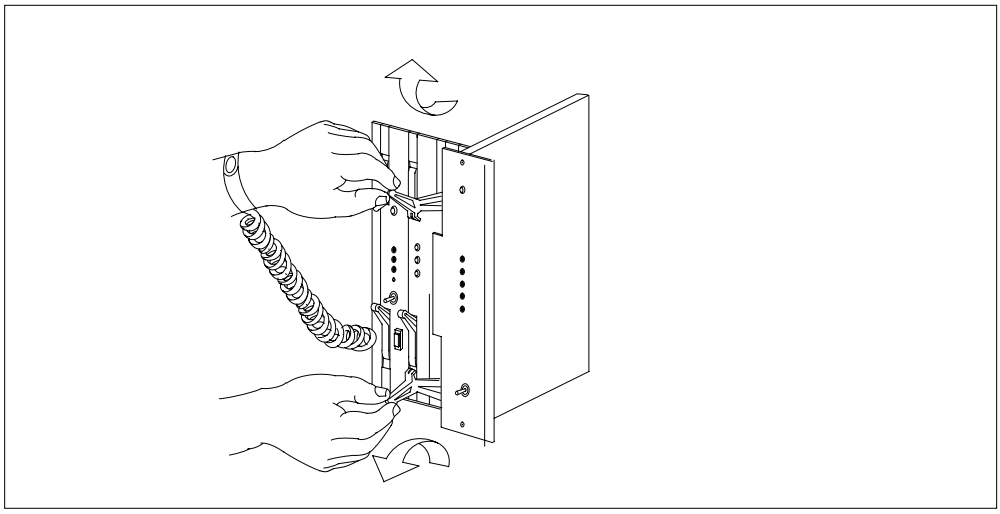
b If the card has an ENBL/DSBL switch, operate the switch to the DSBL position.

c Grasp the top and the bottom latch assemblies.

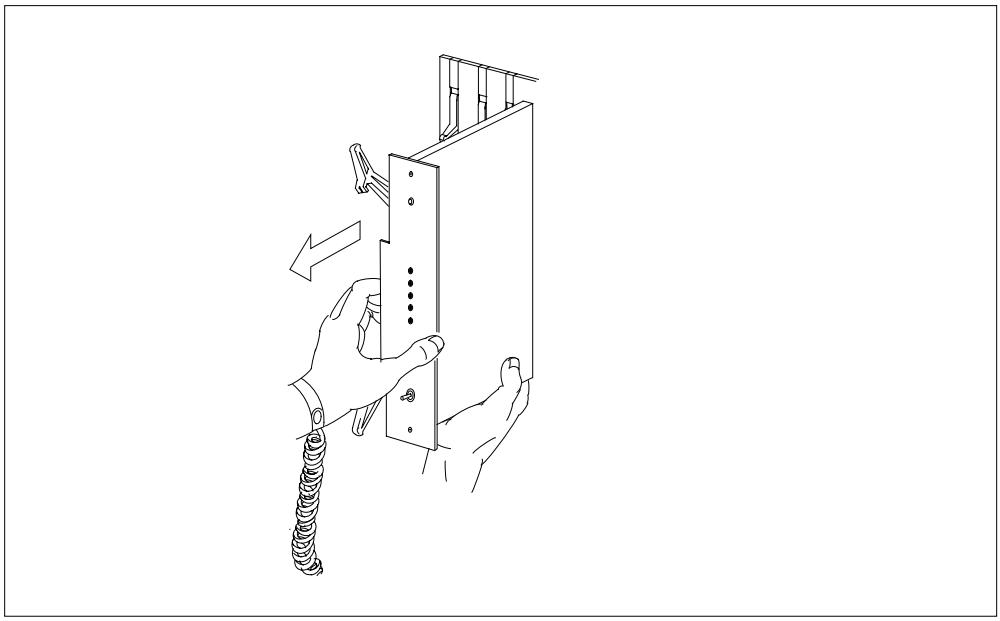


d Simultaneously rotate the top latch upward and the bottom latch downward until the latches are in the horizontal position. This will move the card 1/2 inch from the shelf backplane.

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:

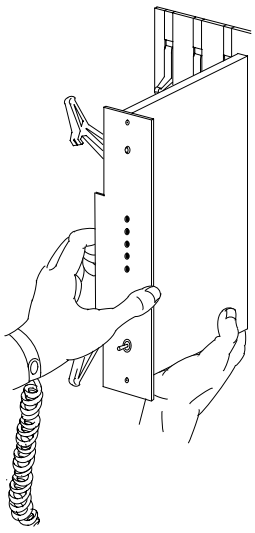
1. Do not apply direct pressure to the components.
2. Do not force the cards into the slots.

Insert the NT2X70 power converter replacement card as shown in the following figures.

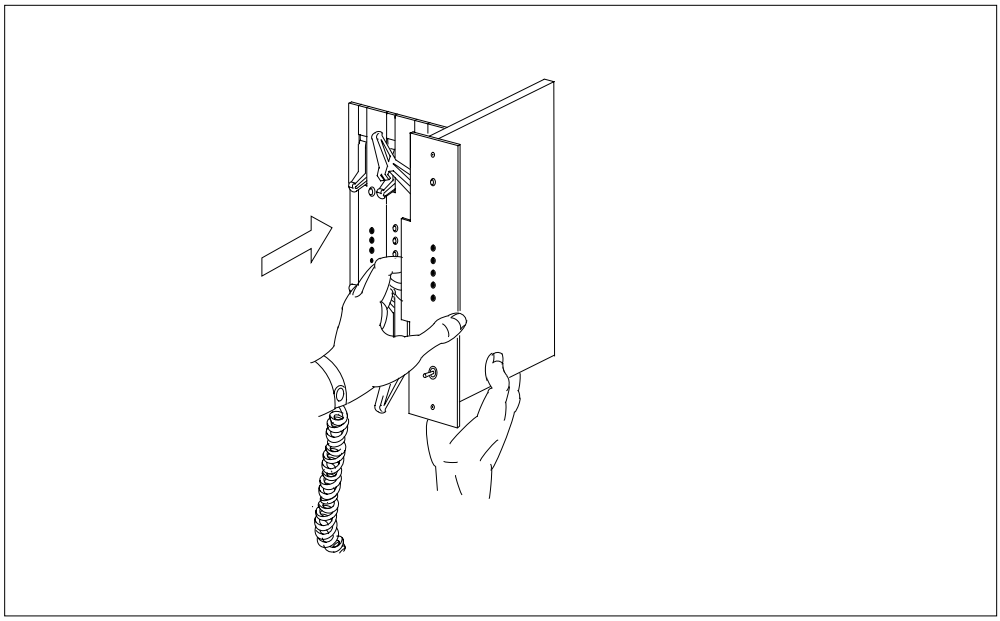
a Hold the card by the face plate with the components visible on the right-hand side.

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.

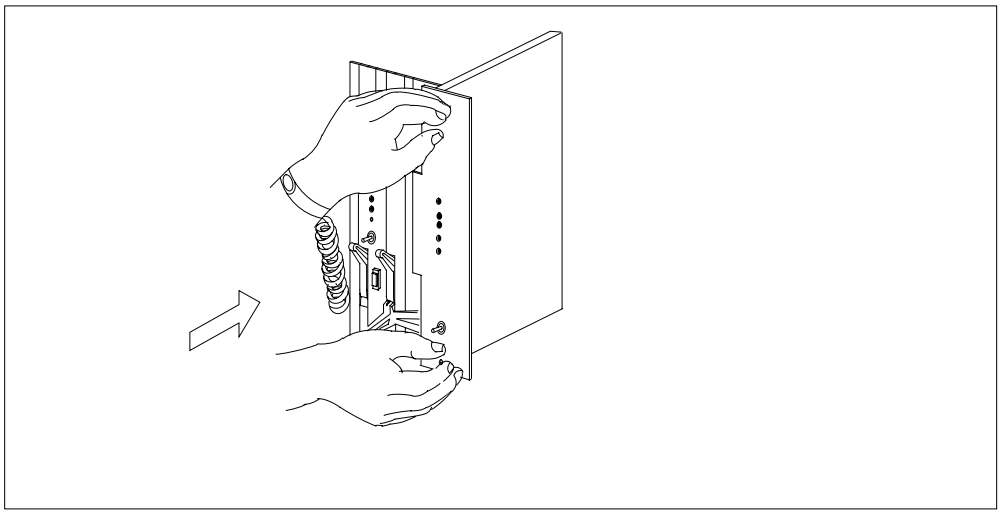


d Gently slide the card int the shelf.



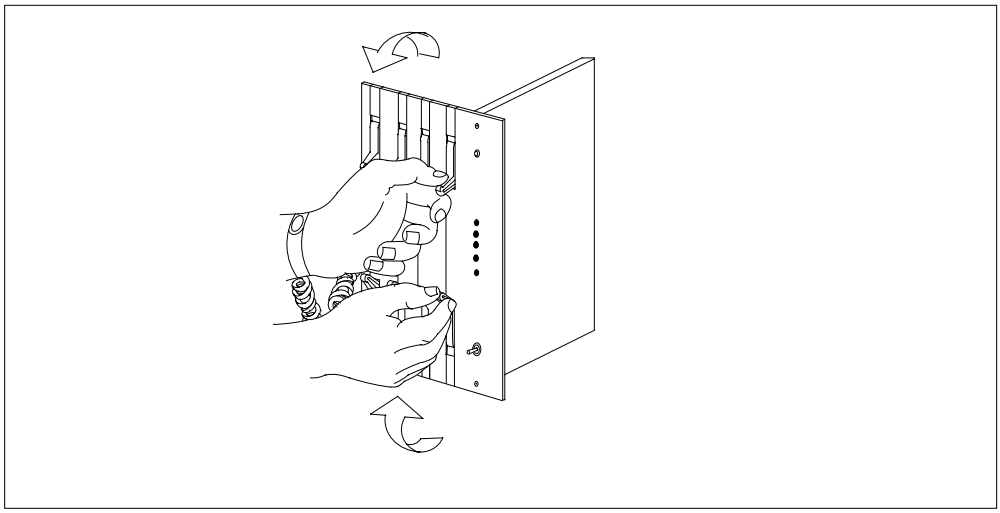
20 Seat and lock the card.

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.

If you are	Do
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.

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.

If you are working on	Do
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)

If the link	Do
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)

If the link	Do
returned to service	step 33
did not return to service	step 40

33 To post the MSB you are working on, type

>PM;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)

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

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

36 To load the inactive unit, type

>LOADPM INACTIVE

and press the Enter key.

If the LOADPM command	Do
failed	step 37
passed	step 38

37 Load the PM unit using the procedure *Loading a PM* in this document. When you have completed the procedure, return to this point.

38 Return the inactive unit to service by typing

>RTS INACTIVE

and pressing the Enter key.

If the RTS command	Do
passed	step 41

NT2X70 in an MSB (end)

If the RTS command	Do
failed	step 40

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

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

41 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, AC, AD, AE, AF	Power converter card	CCS6 signalling terminal controller module (STCM), 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.

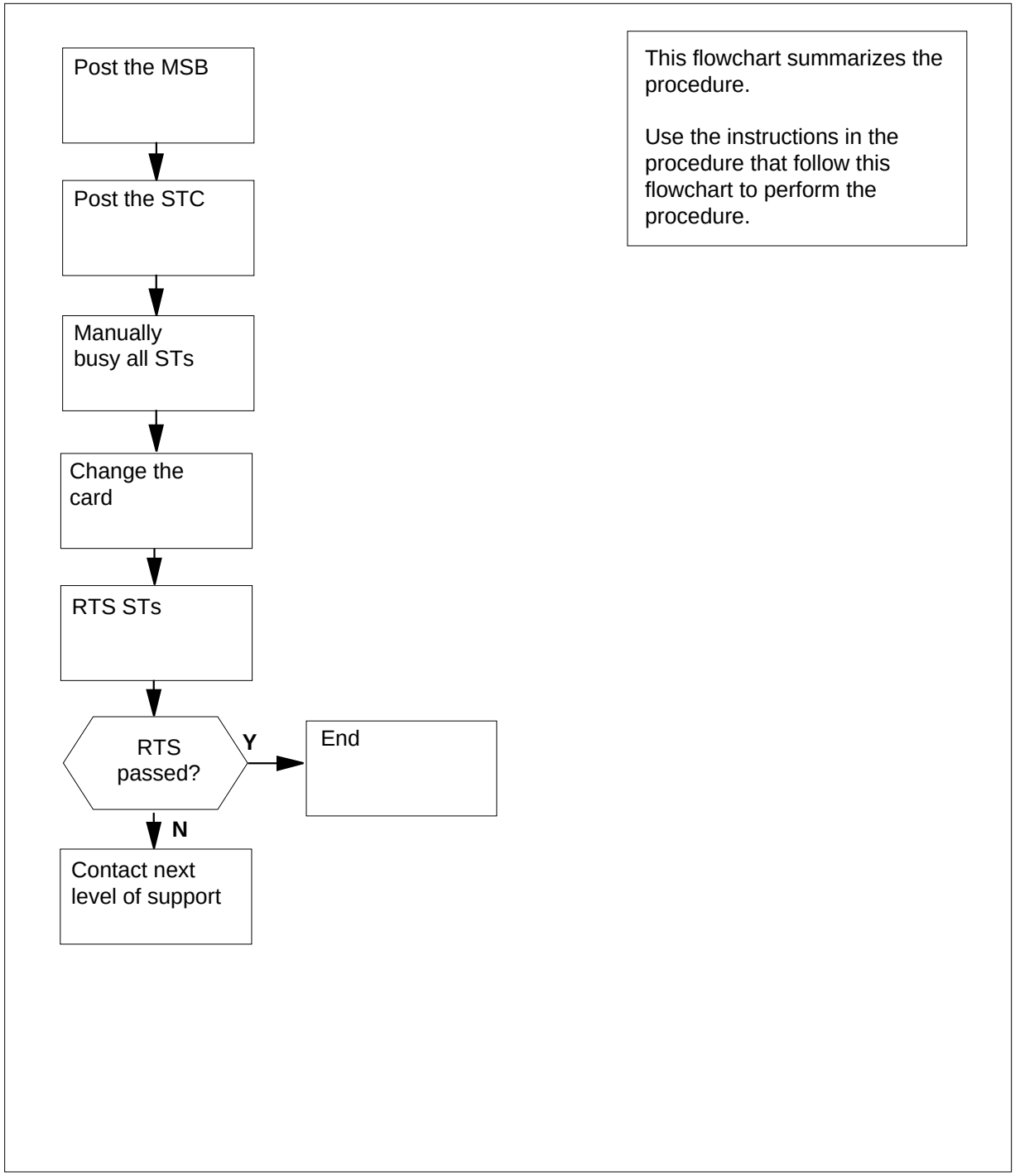
Do not go to the common procedure unless directed to do so in the step-action procedure.

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 busying 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:

```
                  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 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_OOS: 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_OOS: 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_OOS: 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

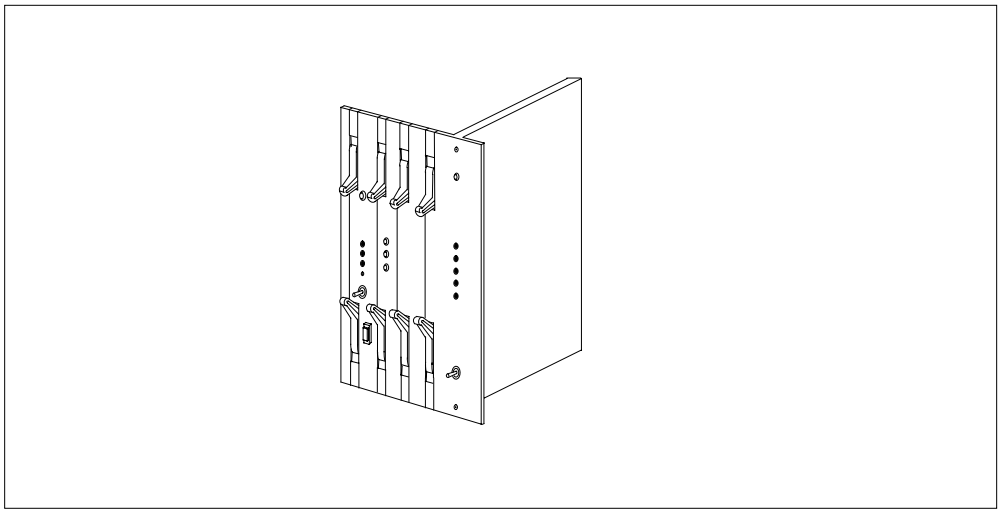
DANGER
Equipment damage
Take the following precautions when removing or inserting a card:

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.

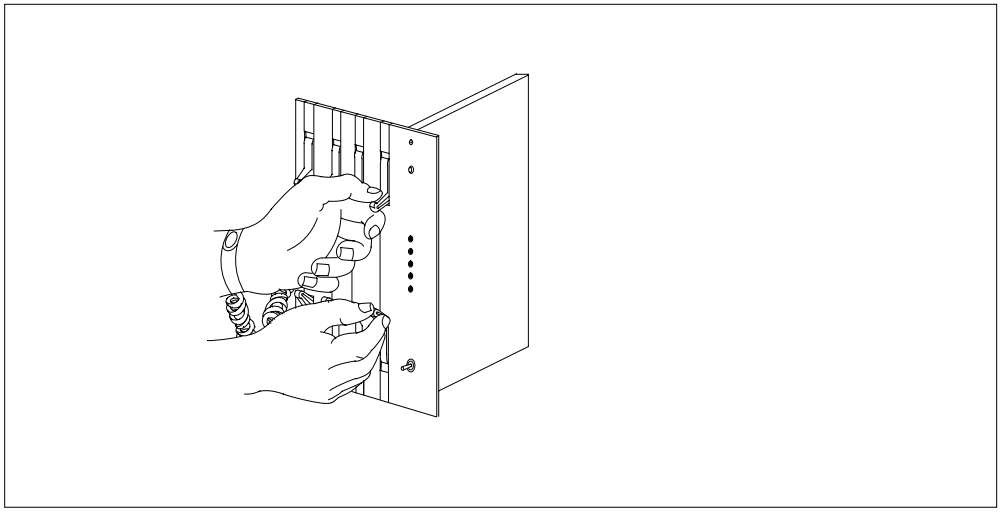
a Locate the card to be removed on the appropriate shelf.

NT2X70
in an ST7G or STCM (continued)



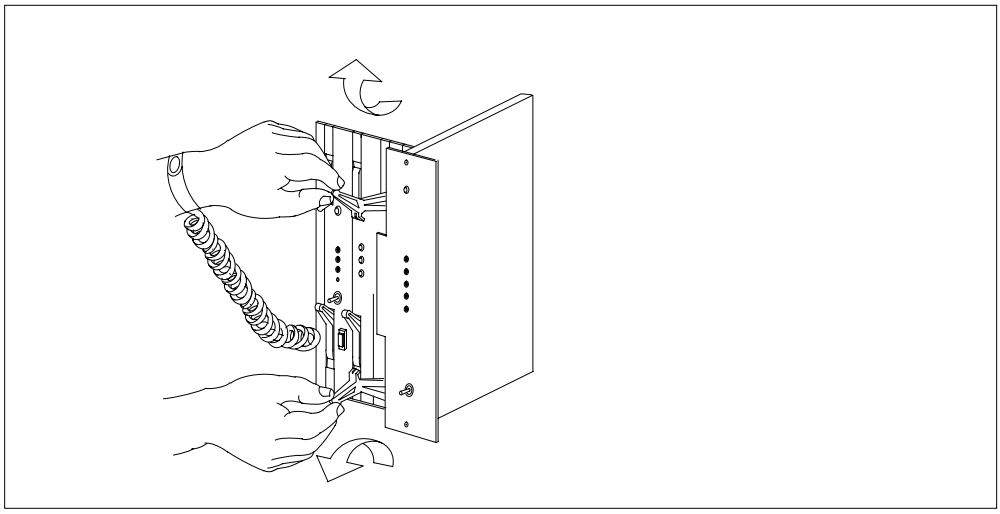
b If the card has an ENBL/DSBL switch, set the switch to the DSBL position.

c Grasp the top and the bottom latch assemblies.

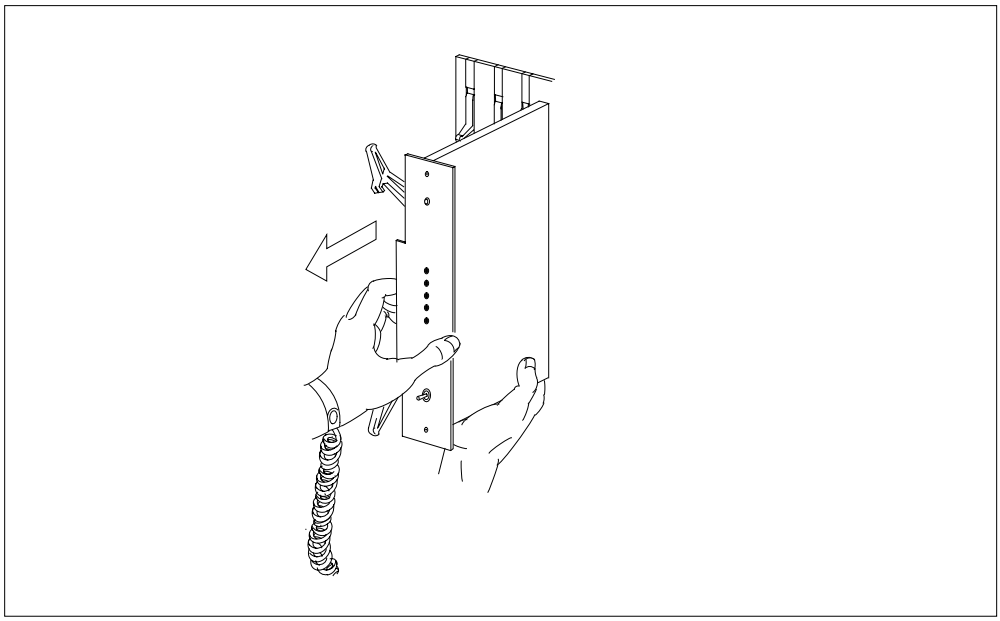


d Rotate the top latch up and the bottom latch down at the same time until the latches are in the horizontal position. This action will move the card 1/2 inch from the shelf backplane.

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:

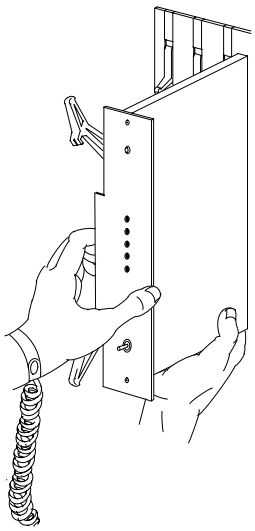
1. Do not apply direct pressure to the components.
2. Do not force the cards into the slots.

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.

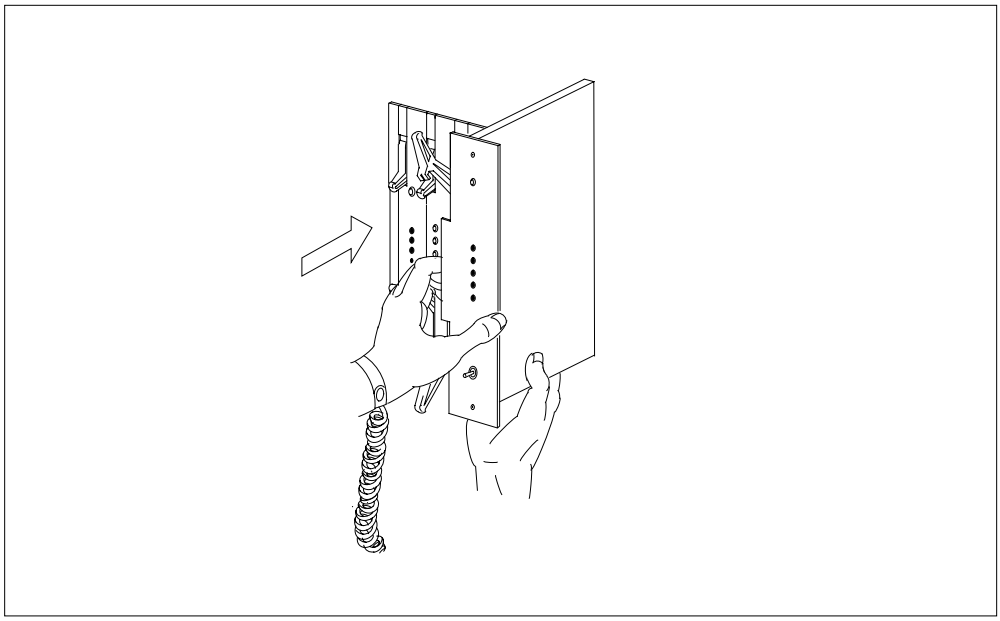
b If the card has an ENBL/DSBL switch, set the switch to the DSBL position.

c Place the back edge of the card into the upper and lower guides of the desired slot position on the shelf.



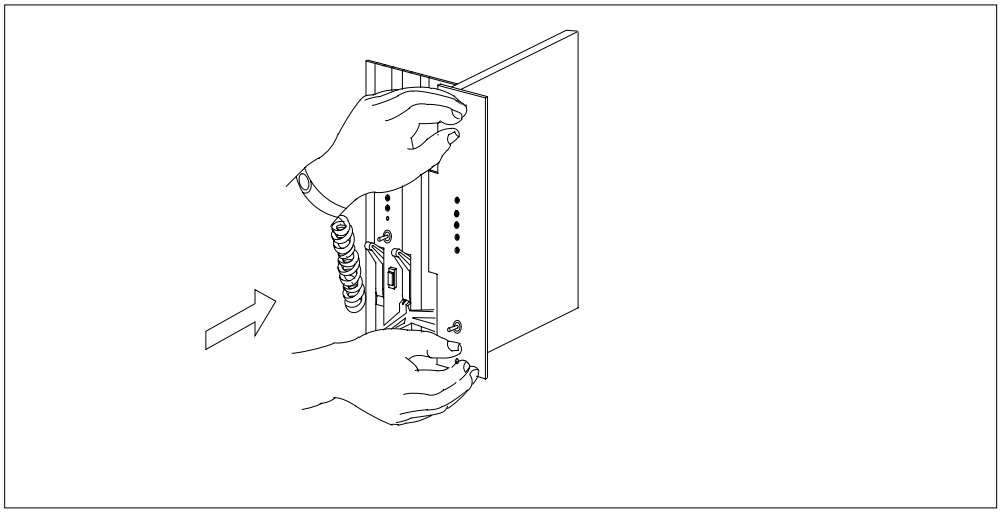
d Gently slide the card into the shelf.

NT2X70
in an ST7G or STCM (continued)



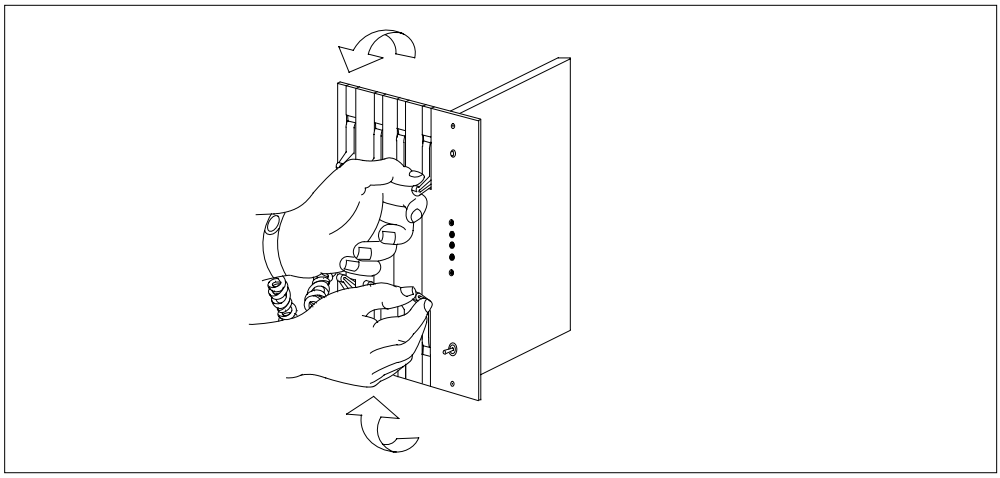
13 Seat and lock the card.

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.

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`

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, AC, BA	DS30 C-side interface 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)

Common procedures

This procedure refers to the following common procedures:

- *Manually busying Series II PM C-side links*
- *Replacing a card*

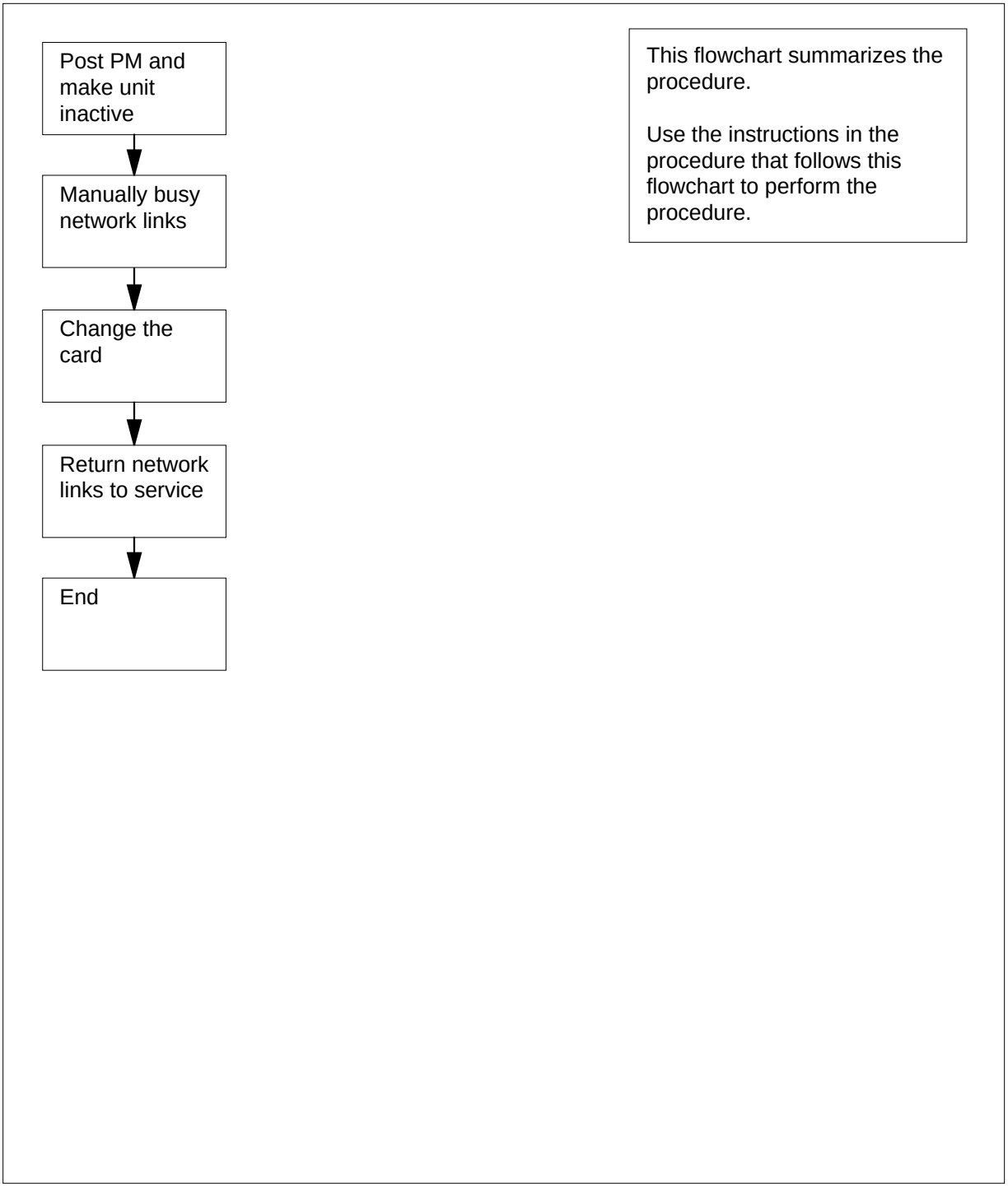
Do not go to the common procedure unless the step-action procedure directs you to go.

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



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. Unlesss 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:

```
                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
the PM type (MSB6 or MSB7)

PM_NO
is the PM 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_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
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

and press the Enter key.

where

plane_no
is the number of the plane (0 or 1) for the link

link_no
is the link number (0 to 63)

If the link	Do
returned to service and 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 suhmitted
Request to RTS ENET Surface:0 Shelf:00 Slot:32 Link:01 passed.
```

If the link	Do
returned to service	step 16
did not return to service	step 20

16 The next action depends on the reason you perfrom this procedure.

If a maintenance procedure	Do
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*.

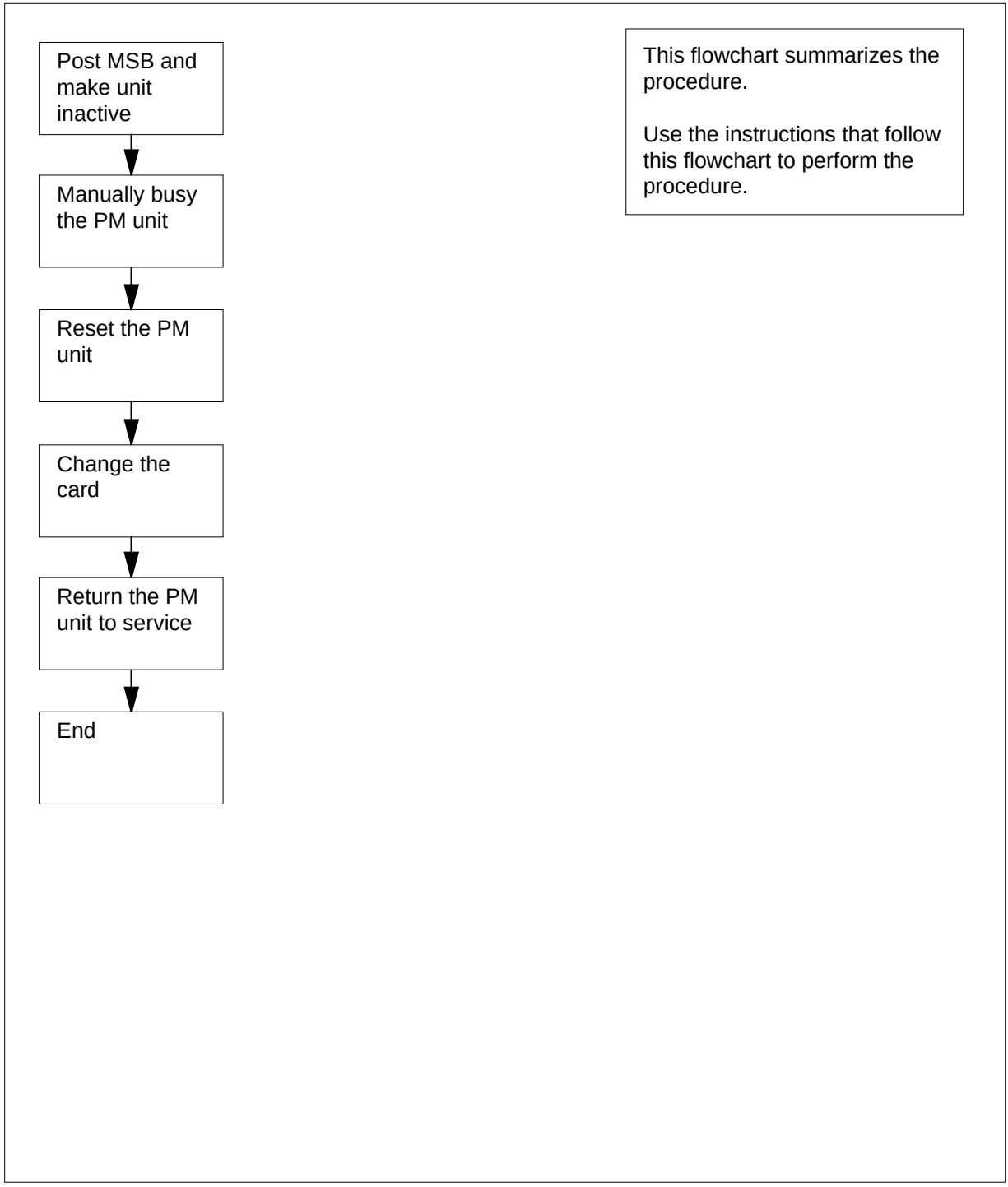
Do not go to the common procedure unless the step-action procedure directs you to go.

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_OOS: 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

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 17

8 To confirm the command, type

>YES

and press the Enter key.

Example of a MAP response:

```
Unit0:   Inact SysB  Mtce
Unit1:   Act   ISTbMSB7 0    SwAct Passed
```

If the MAP response	Do
is SWACT passed	step 9
is any other response	step 17

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:

NT6X68
in an MSB (continued)

```
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
```

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

If a maintenance procedure	Do
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 return the inactive PM unit to service, type

```
>RTS  INACTIVE
```

the Enter key.

If the RTS command	Do
passed	step 19
failed	step 18

16 Contact operating company personnel to determine why the component is offline. 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 the use of the SWACT command with the FORCE option, contact operating company personnel to determine if you must use the FORCE option.

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

19 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, AC, AD, AE, AF, BC, BD, 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, 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*

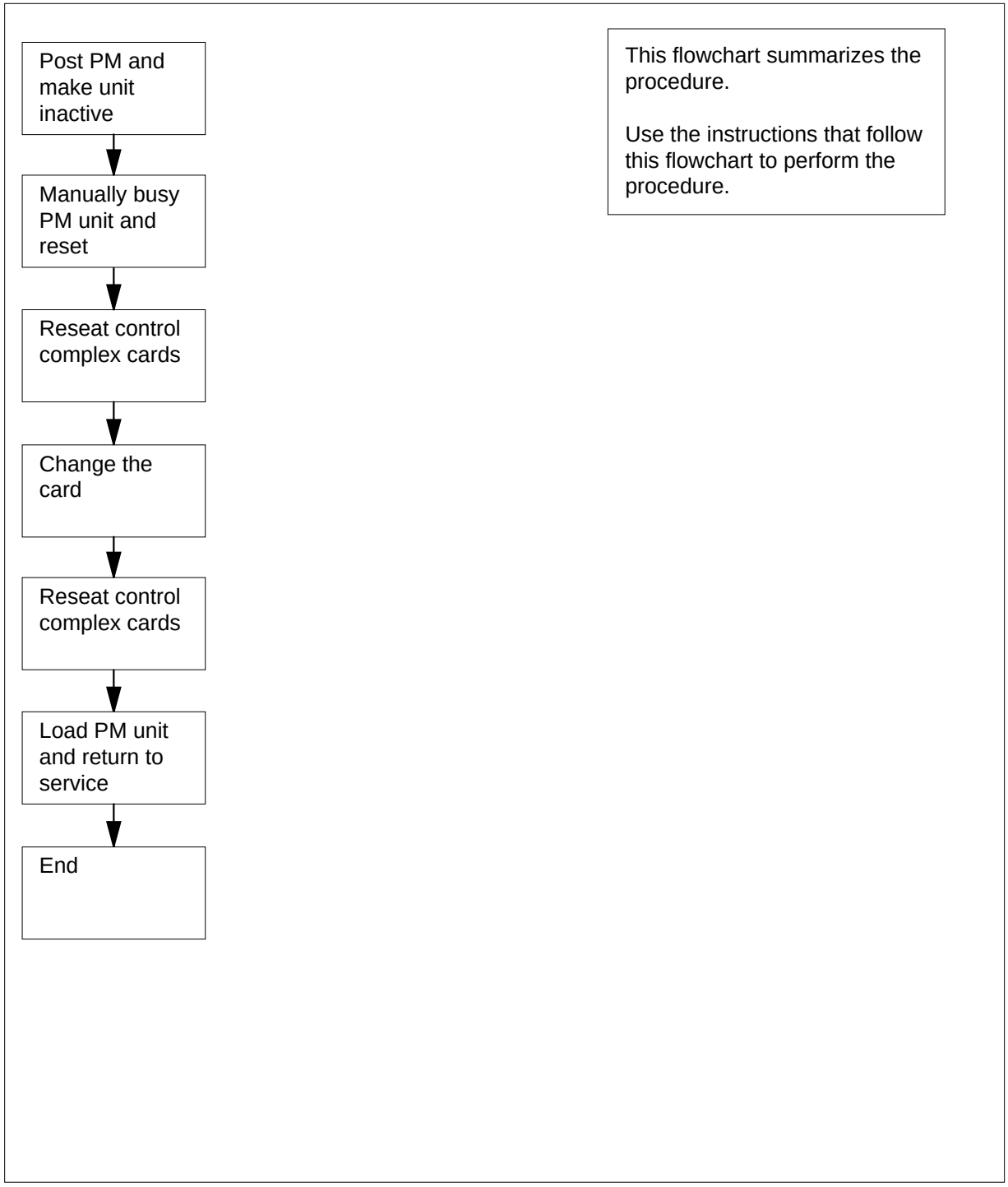
Do not go to the common procedure unless the step-action procedure directs you to go.

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)

```
                  SysB    ManB    OffL    Cbsy    ISTb    InSv
PM                   0       0       2       0      13      24
MSB7                 0       0       0       0       0       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 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_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 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 *Unseating cards in equipment shelves* 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 form 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 *Unseating cards in equipment shelves* 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 *Unseating cards in equipment shelves* 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 form 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*

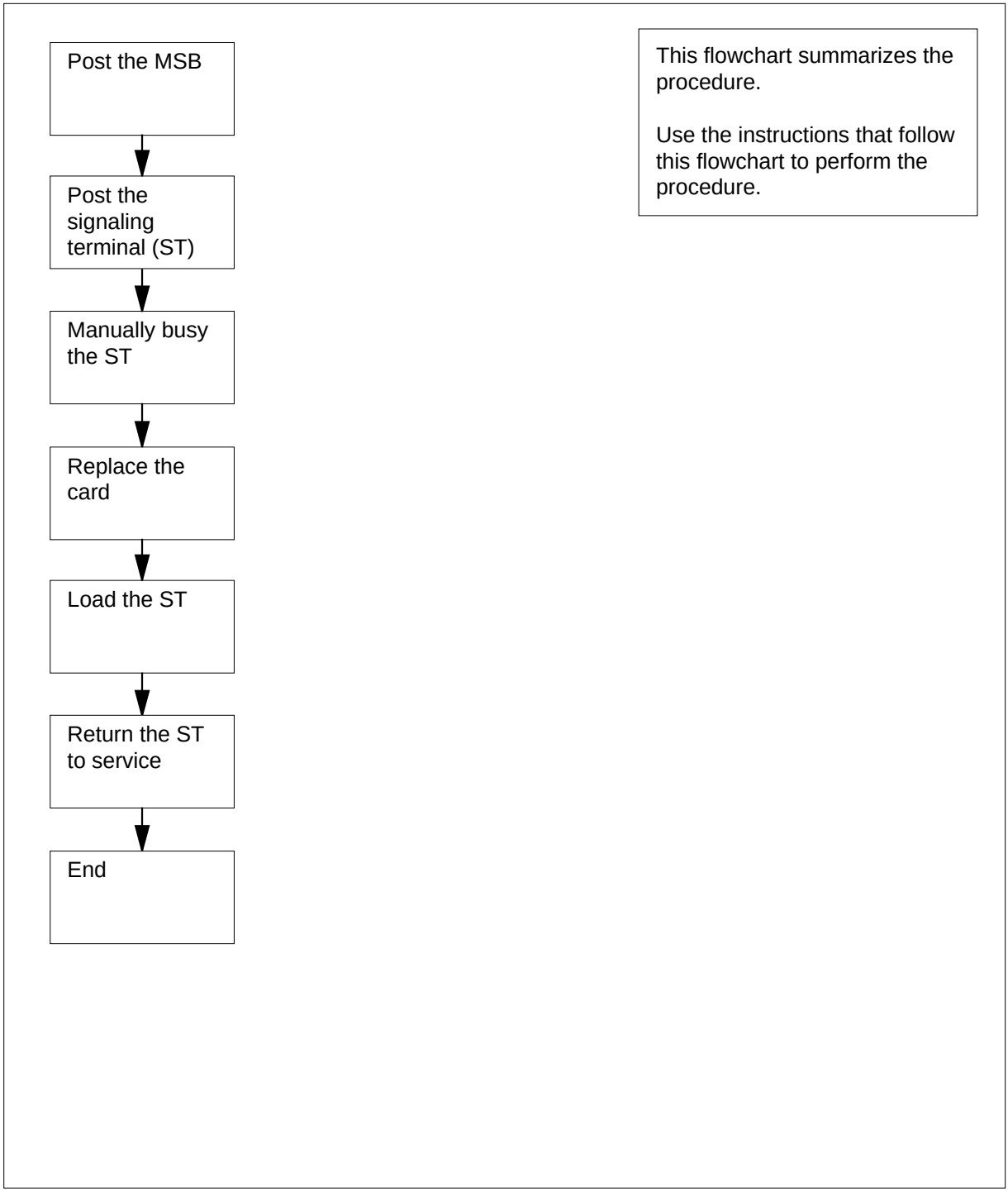
Do not go to the common procedure unless the step-action procedure directs you to go.

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:

```
                SysB    ManB    OffL    Cbsy    ISTb    InSv
PM                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)

```
                    SysB     ManB     OffL     Cbsy     ISTb     InSv
   PM                 12        0        2        0       13       24
   MSB7                0        0        0        0        0        3

MSB7    0 InSv  Links_OOS: 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:

```
                    SysB     ManB     OffL     Cbsy     ISTb     InSv
   PM                 12        0        2        0       13       24
   MSB7                0        0        0        0        1        2

MSB7    0 ISTb  Links_OOS: 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:

```
                    SysB     ManB     OffL     Cbsy     ISTb     InSv
   PM                 12        0        2        0       13       24
   MSB7                0        0        0        0        1        2

MSB7    1 ISTb  Links_OOS: 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.

8 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:

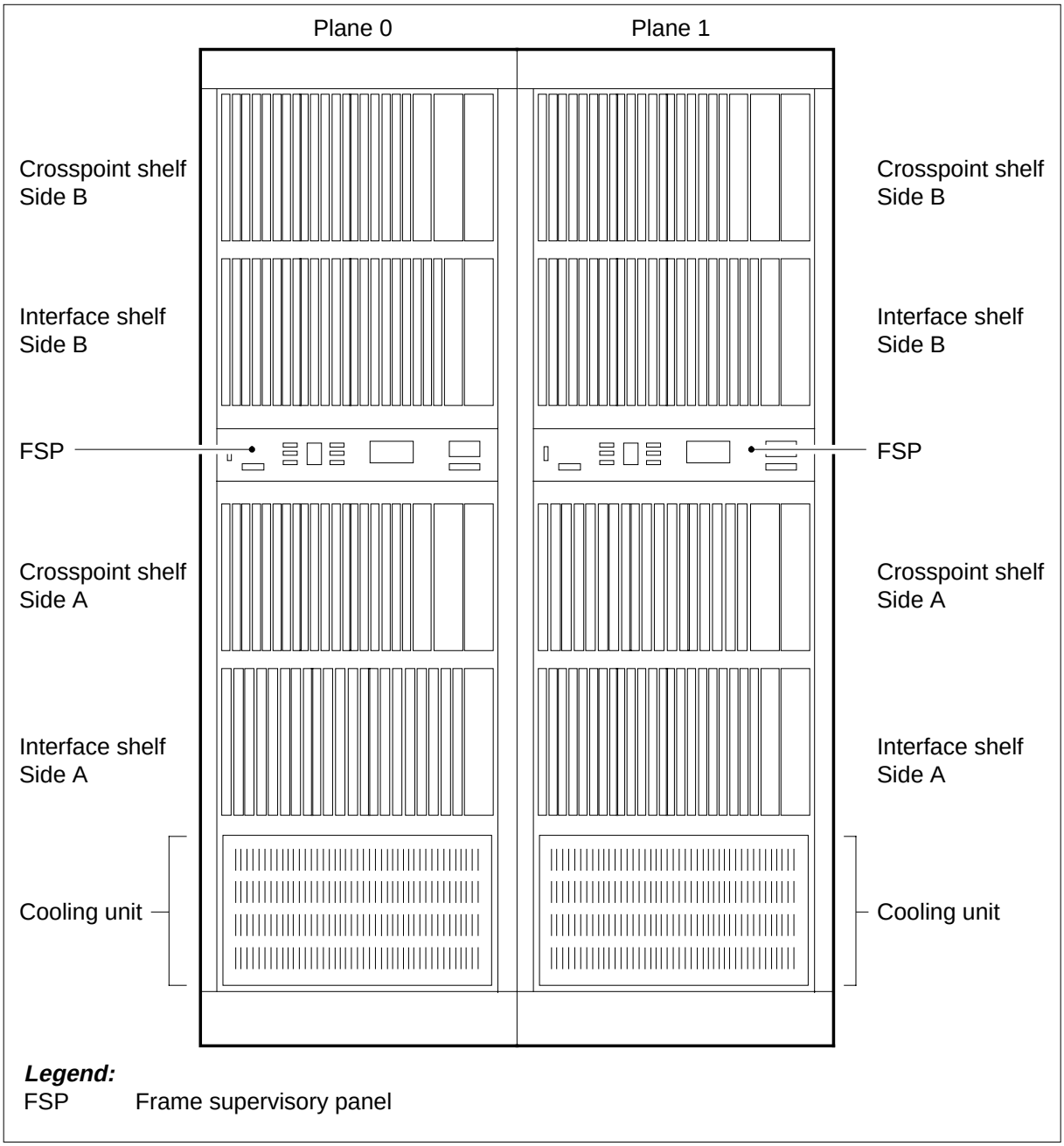
- NT0X48 (single-bay network-NET)
- NT5X13 (combined single-bay network-NETC)
- NT8X11 (dual-shelf network-DSN)
- SuperNode enhanced network (ENET) for 64k
- SuperNode ENET for 128k

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

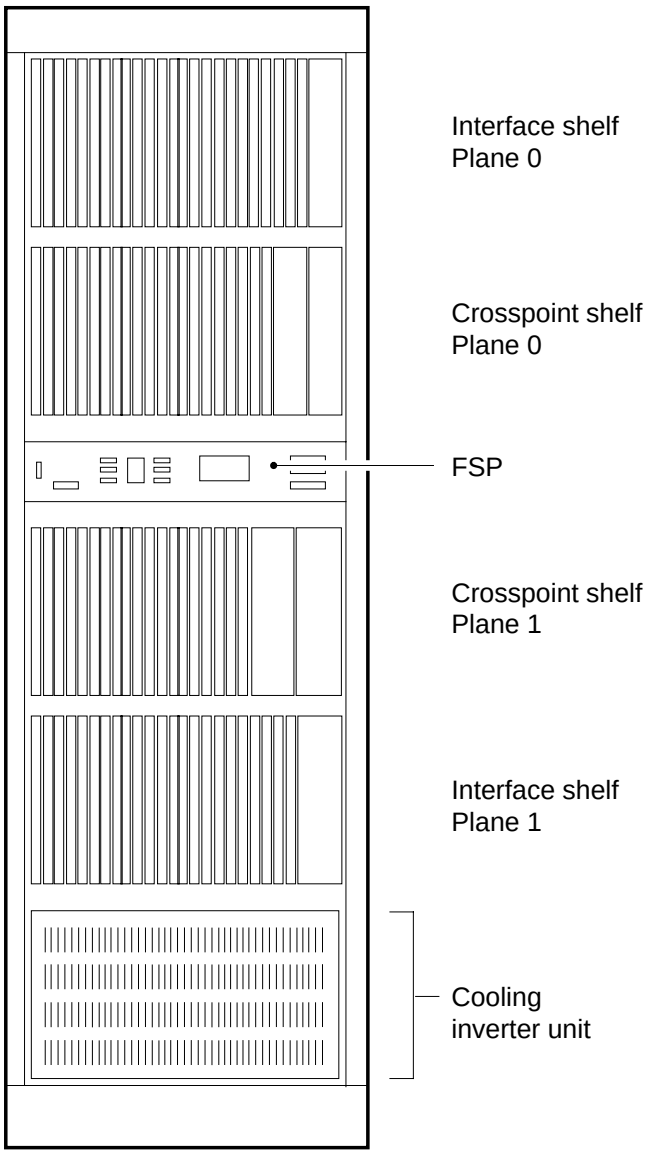
Network shelf layouts (continued)

Figure NT0X48AG single-bay network (NET) equipment frame, in dual-bay configuration



Network shelf layouts (continued)

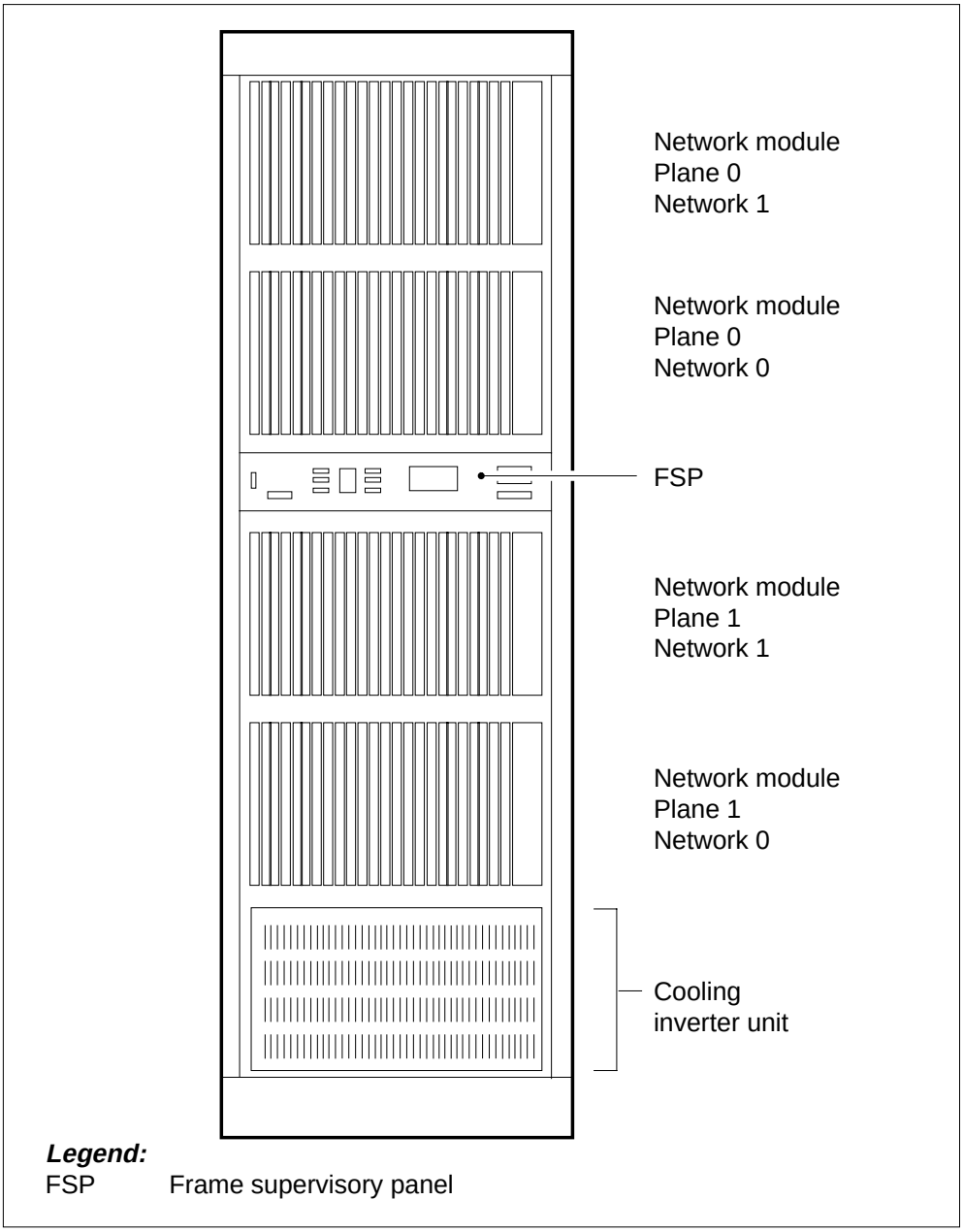
Figure NT5X13 combined single-bay network (NETC) equipment frame



Legend:
FSP Frame supervisory panel

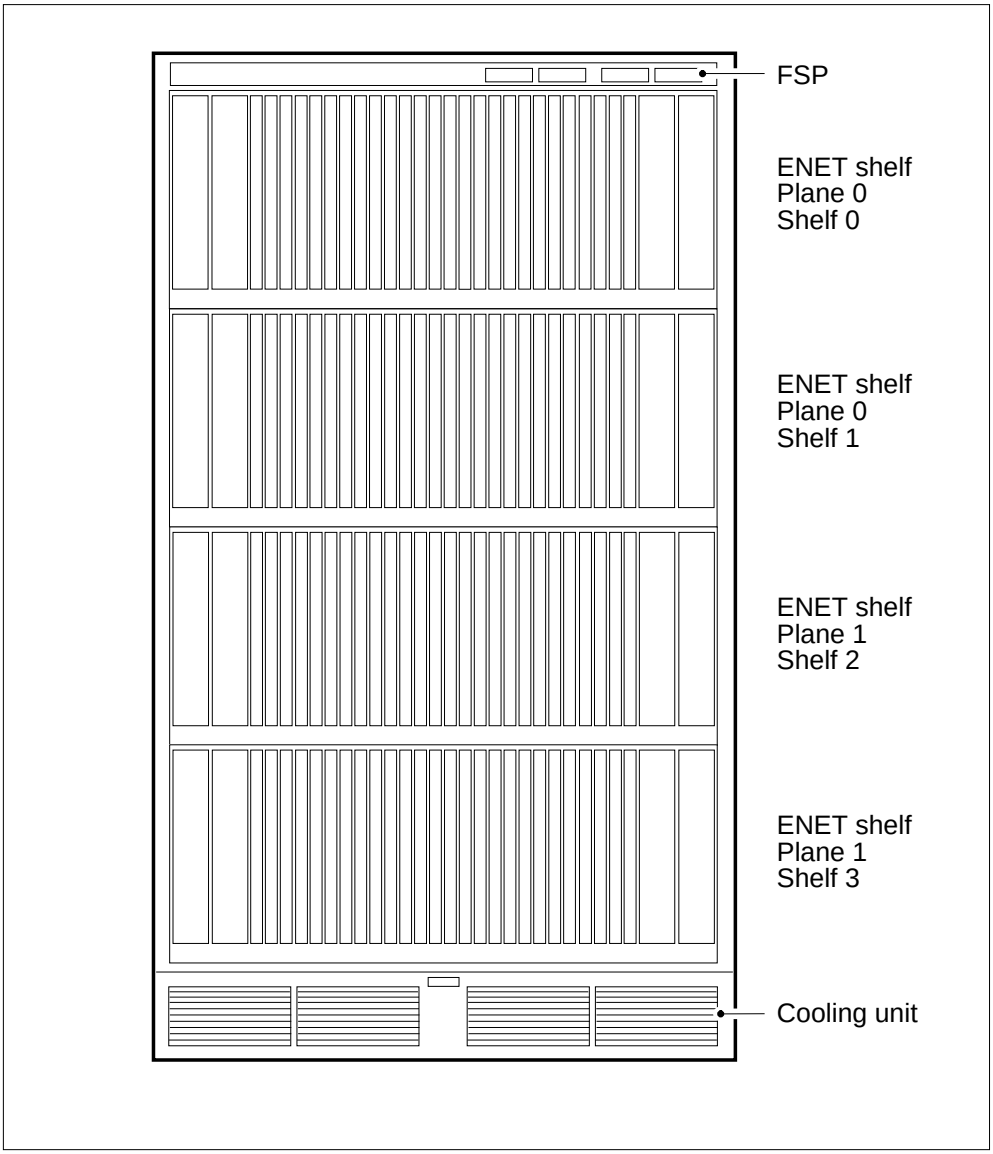
Network shelf layouts (continued)

Figure NT8X11 dual-shelf network (DSN) equipment frame



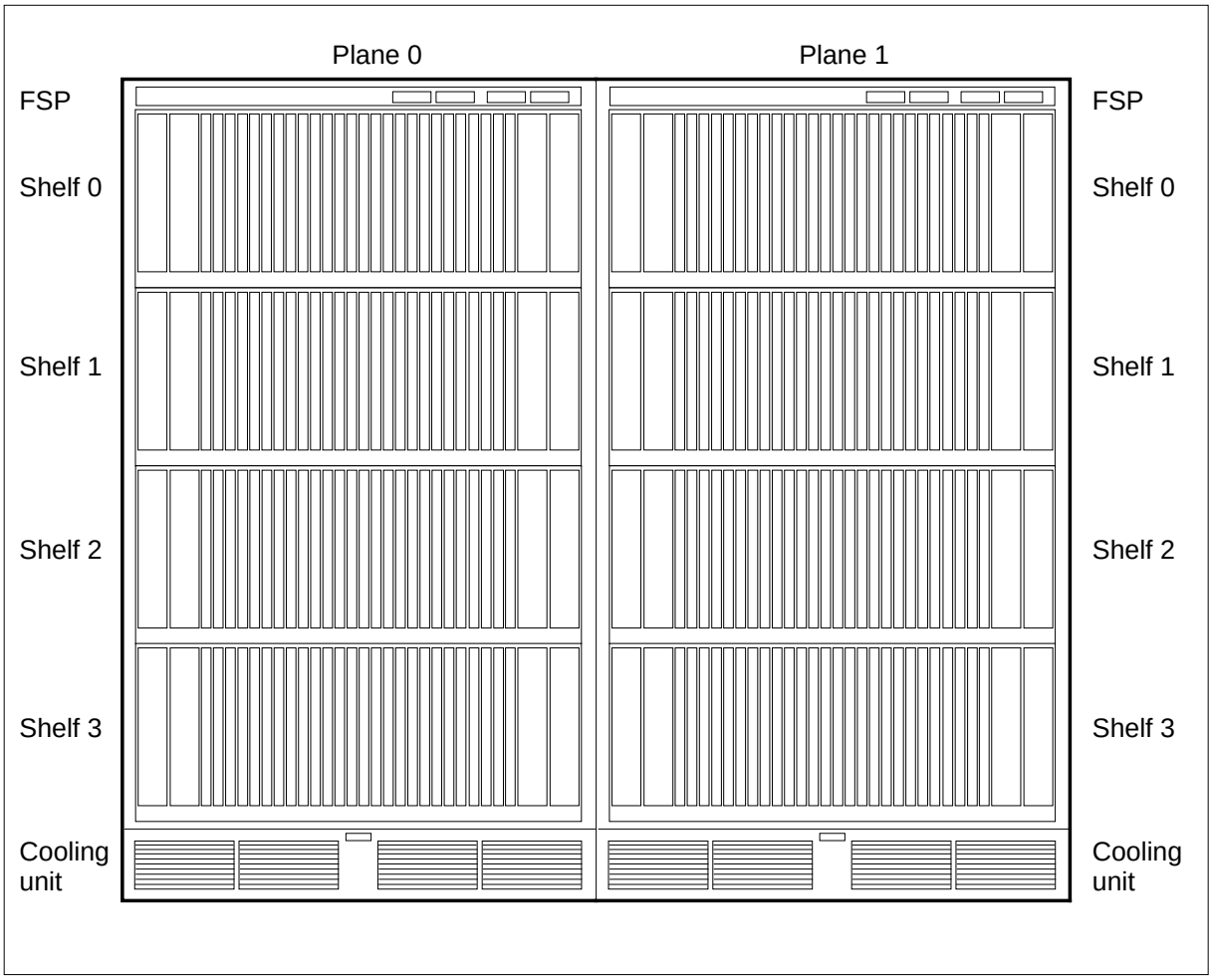
Network shelf layouts (continued)

Figure SuperNode 64k ENET cabinet



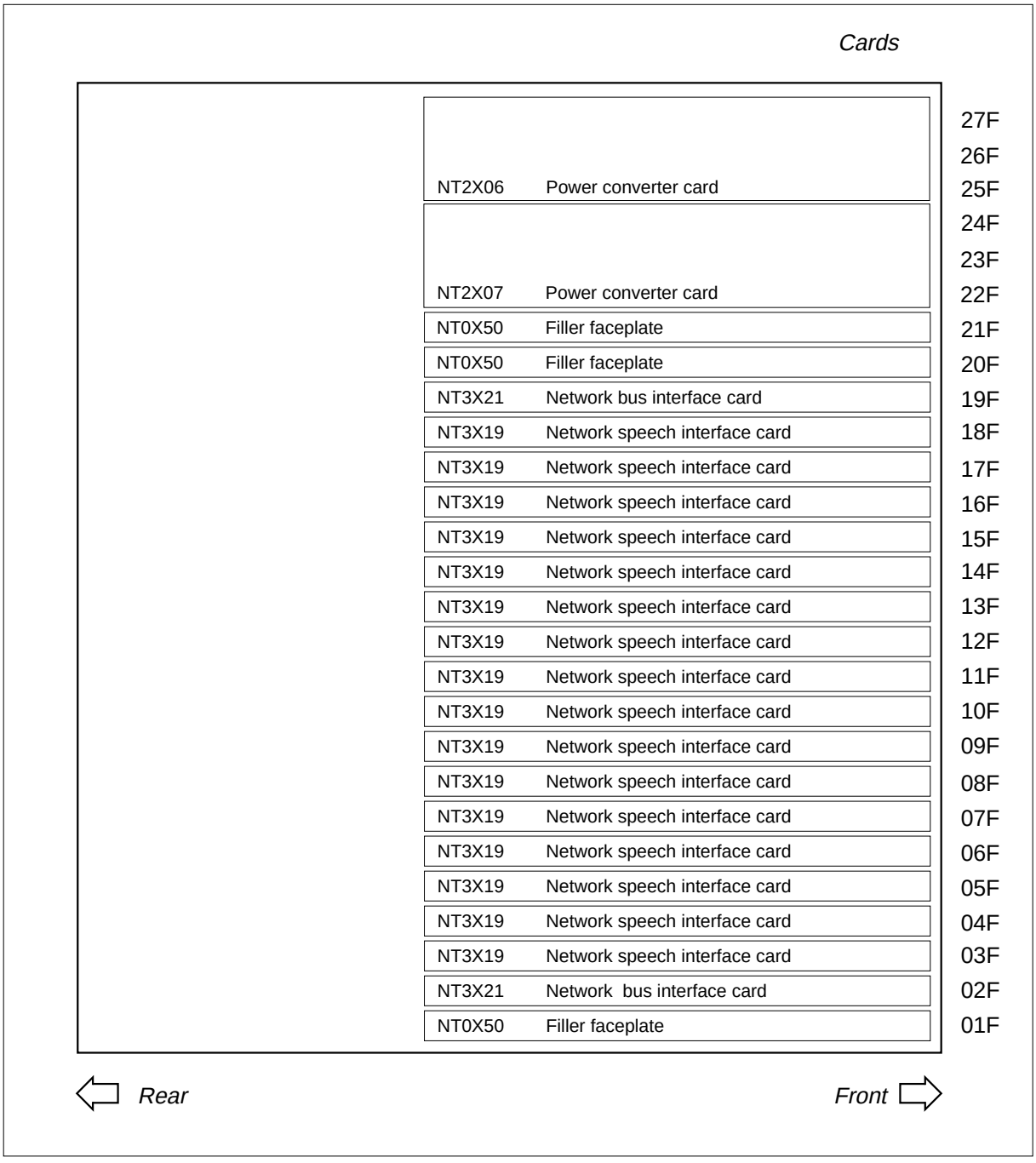
Network shelf layouts (continued)

Figure SuperNode 128k ENET cabinet



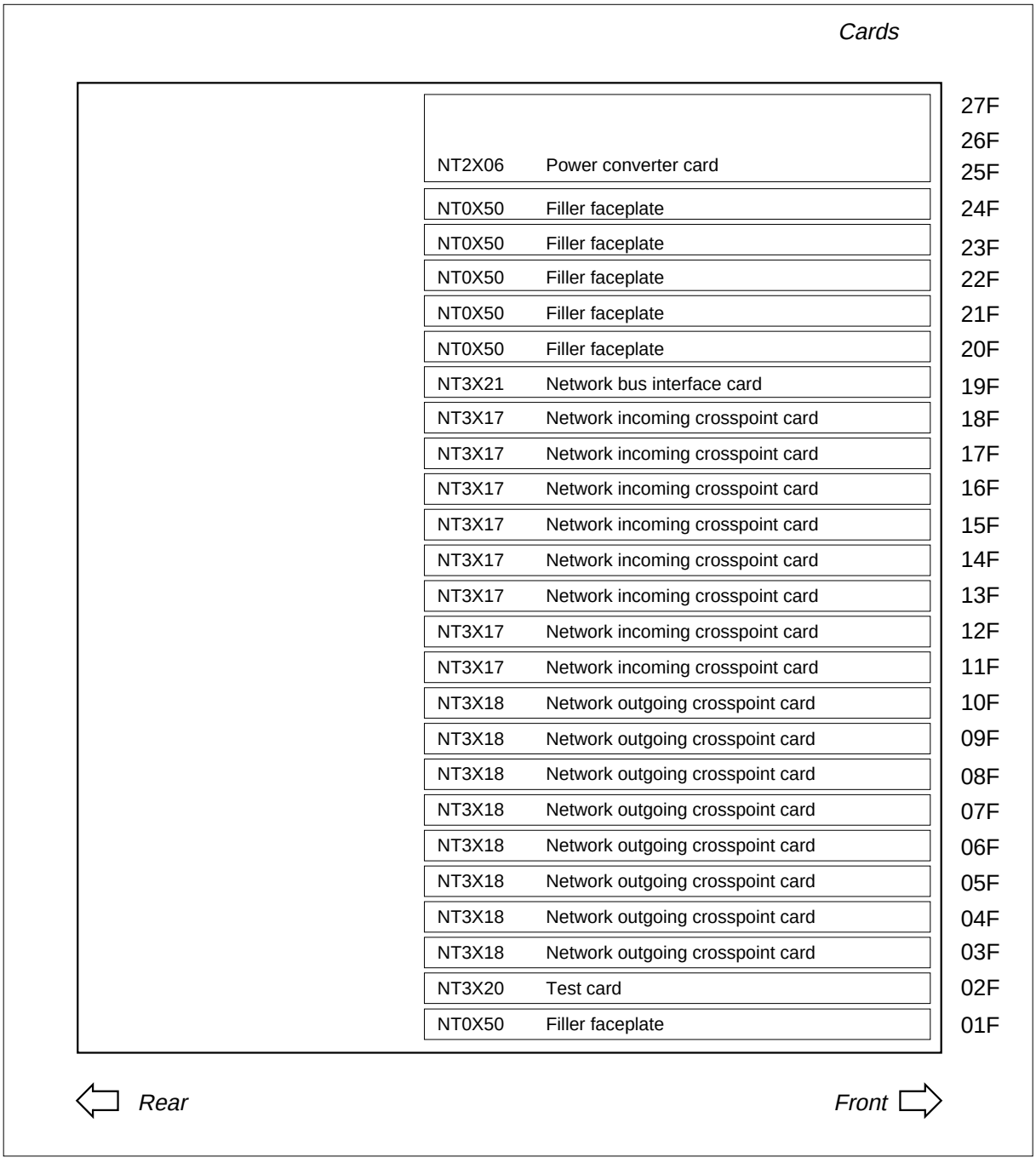
Network shelf layouts (continued)

Figure NET interface shelf



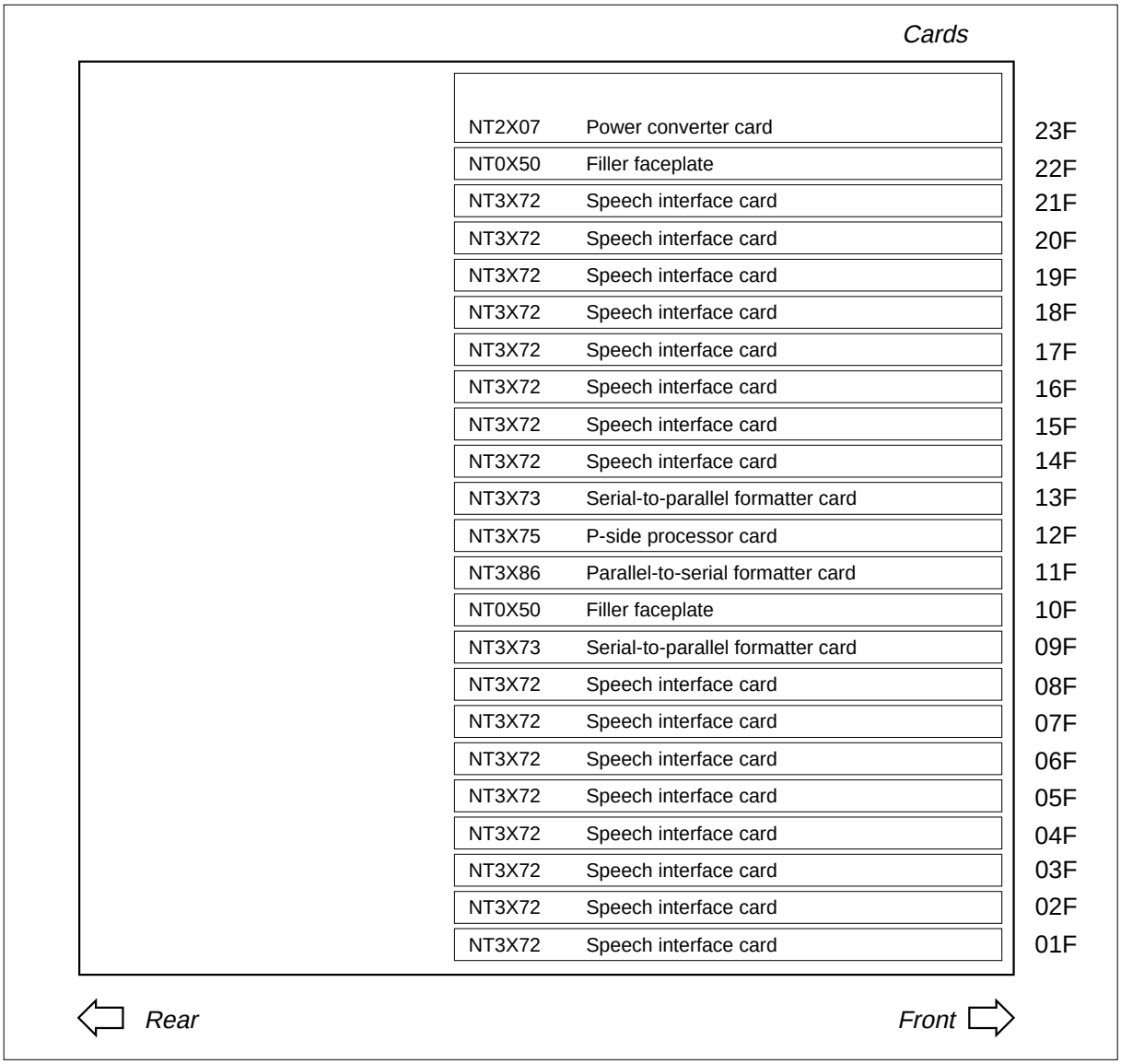
Network shelf layouts (continued)

Figure NET crosspoint shelf



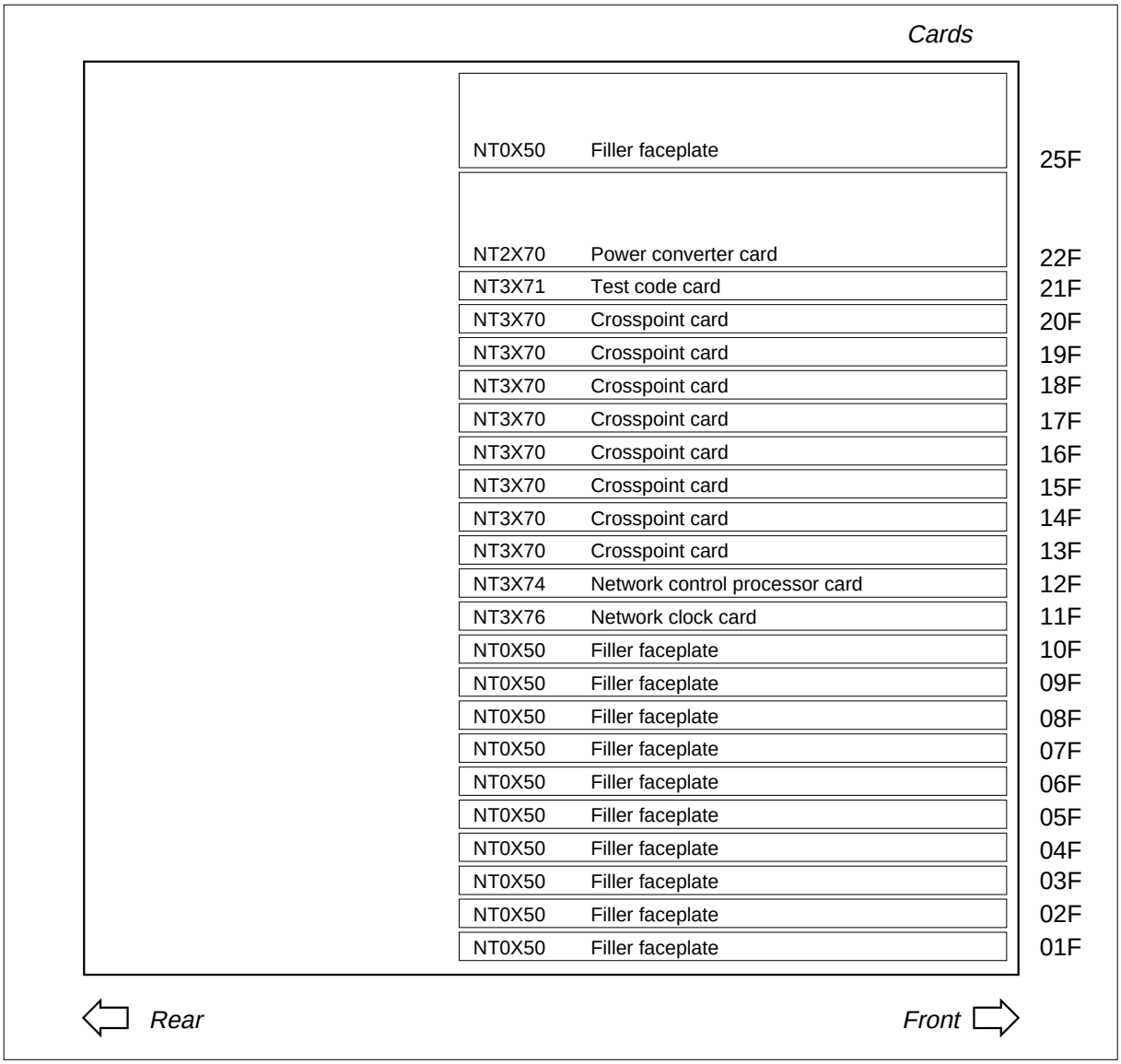
Network shelf layouts (continued)

Figure NETC interface shelf



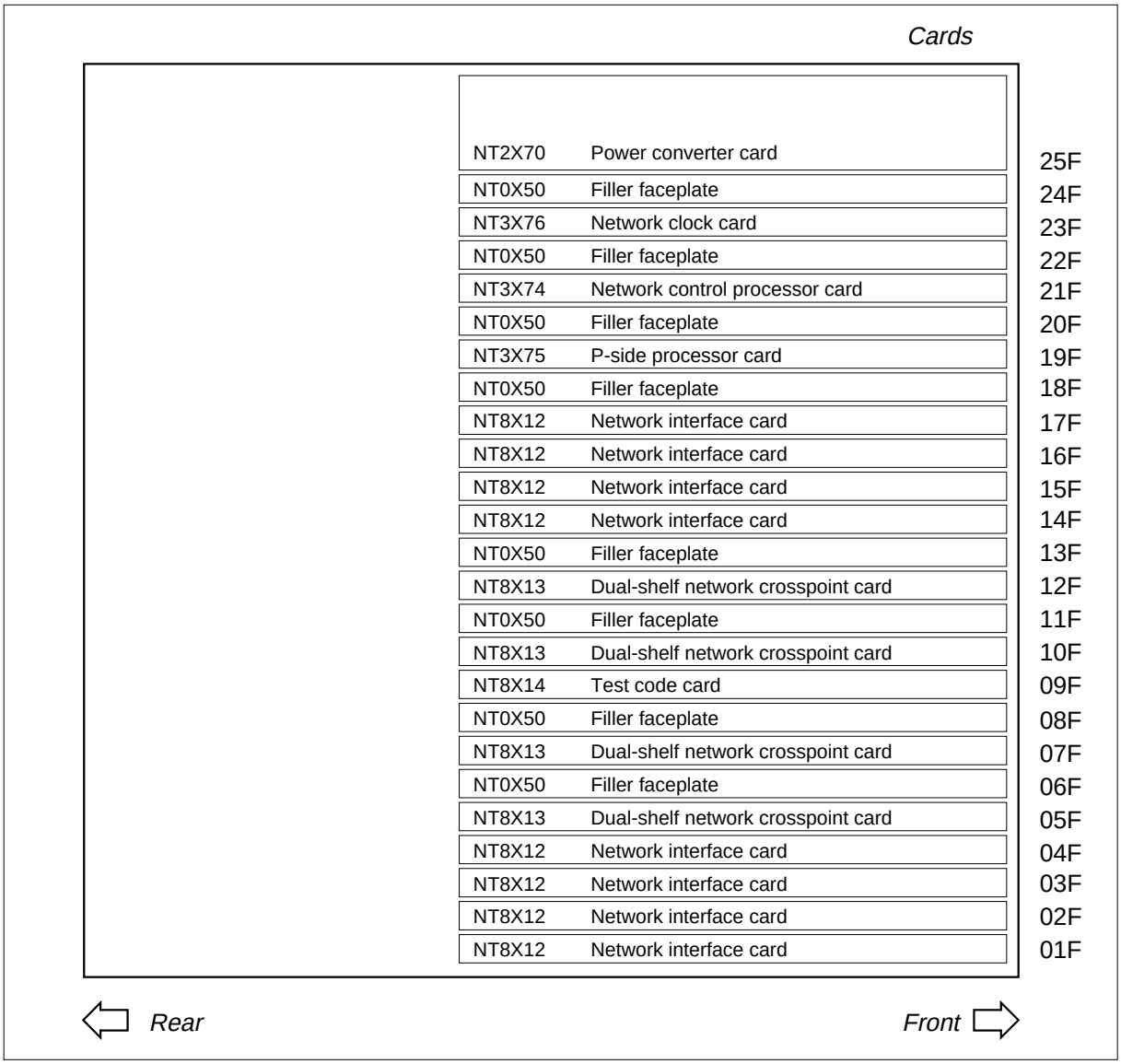
Network shelf layouts (continued)

Figure NETC crosspoint shelf



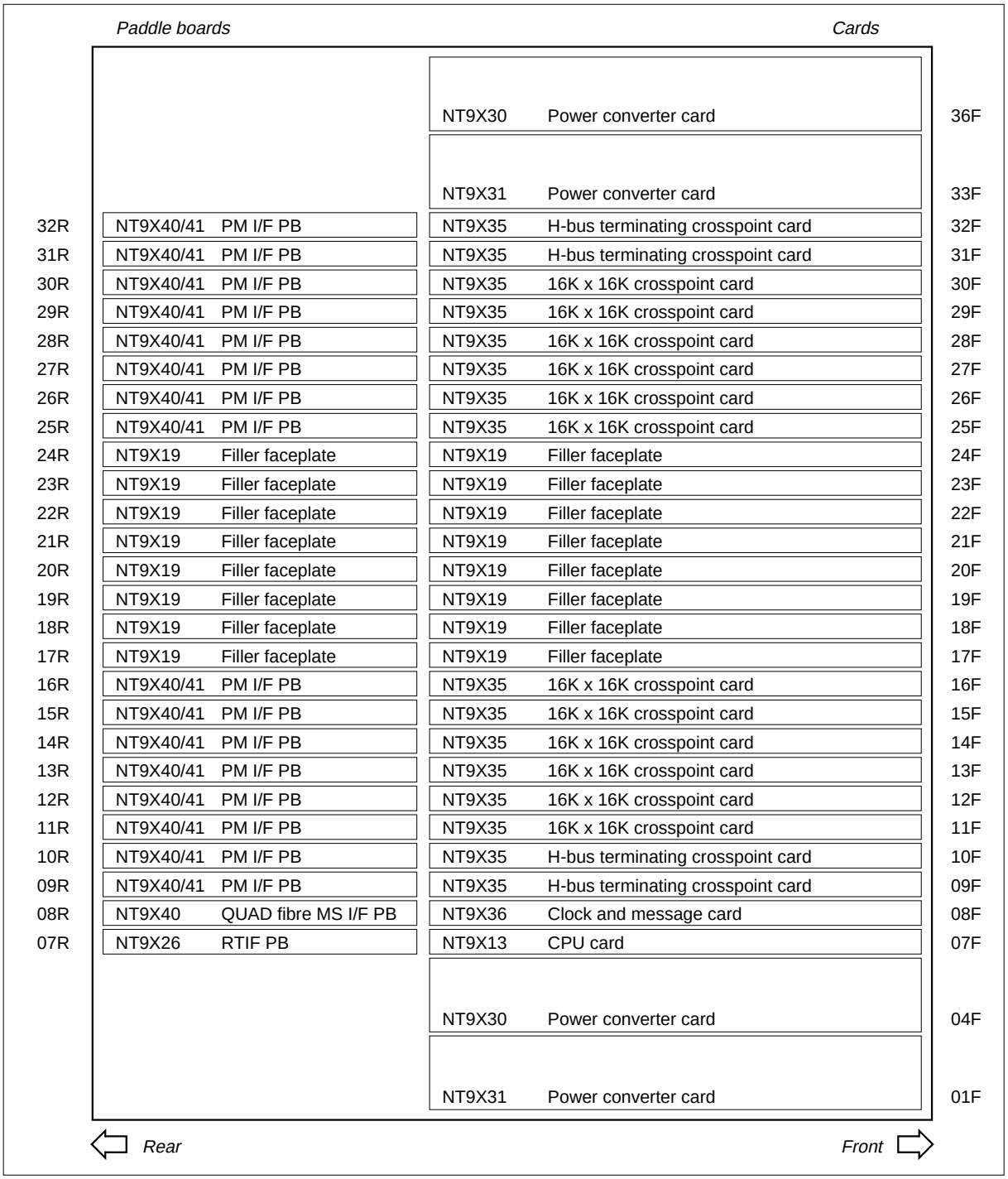
Network shelf layouts (continued)

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 ENETslots10 to 16 and 25 to 32
NT9X40	BB	ENET quad fiber interface paddle board (for International and North America)	64k ENET, 128k ENETslots10 to 16 and 25 to 32
NT9X40	DA	ENET quad fiber interface paddle board	64k ENET, 128k ENETslots10 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)

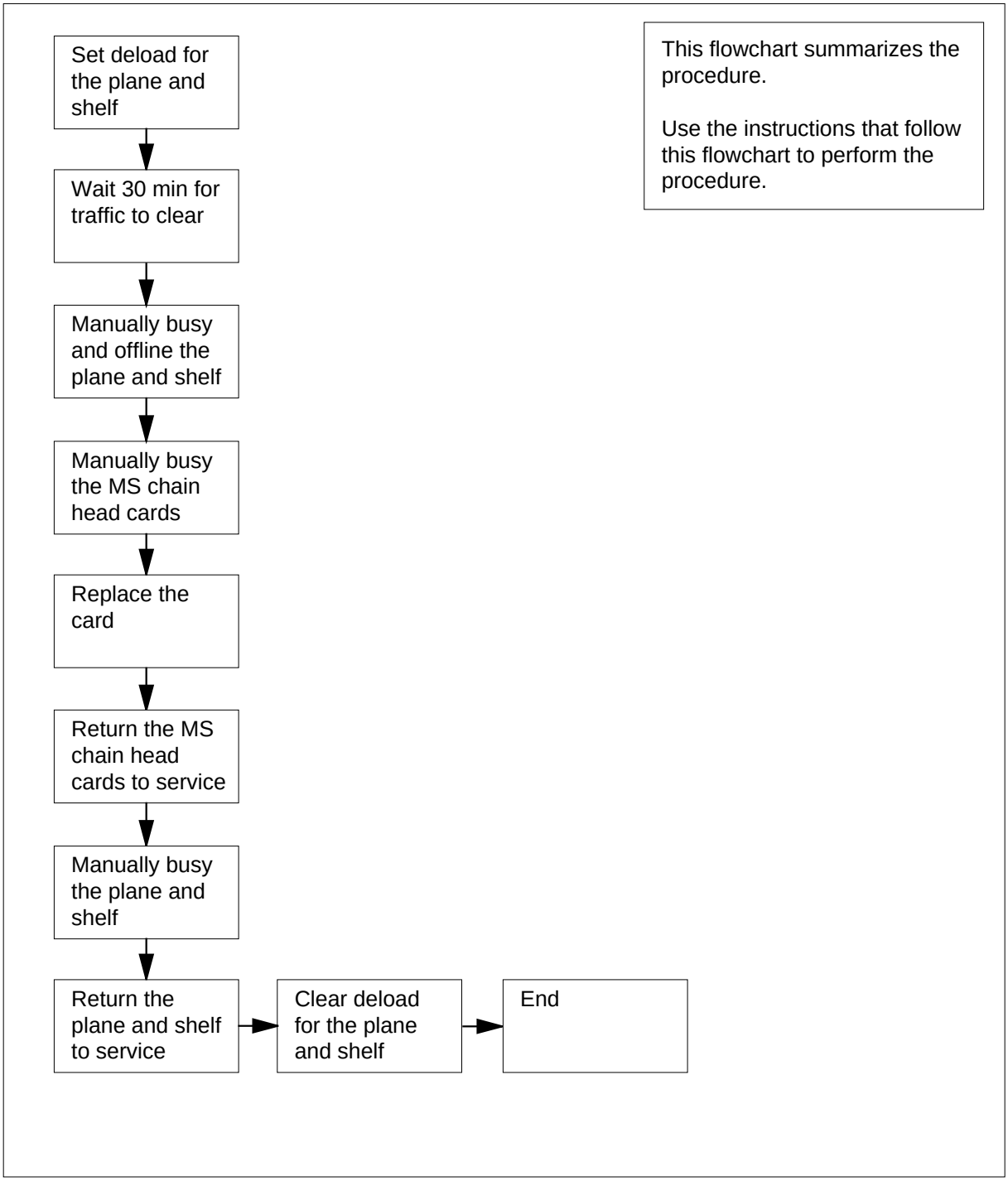
Do not go to the common procedure unless the step-action procedure directs you to go.

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      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 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.

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

>DELOAD plane_no shelf_no QUERY

and press the Enter key.

where

plane_no
is the ENET plane number (0 or 1) of 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: 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

>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

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

`>DELOAD plane_no shelf_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)

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)

If the response is	Do
WARNING: This action will abort ENET dump.Please confirm ("YES", "Y","NO, or "N"): 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.	step 12

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

>YES

and press the Enter key.

IfResponding to the message	Do
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

>YES

and press the Enter key.

14 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:

```
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 15
failed	step 58

15 To locate the chain head card of the message switch (MS) that associates with the ENET plane involved, type

>TRNSL plane_no shelf_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)

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 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.

If you must	Do
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)

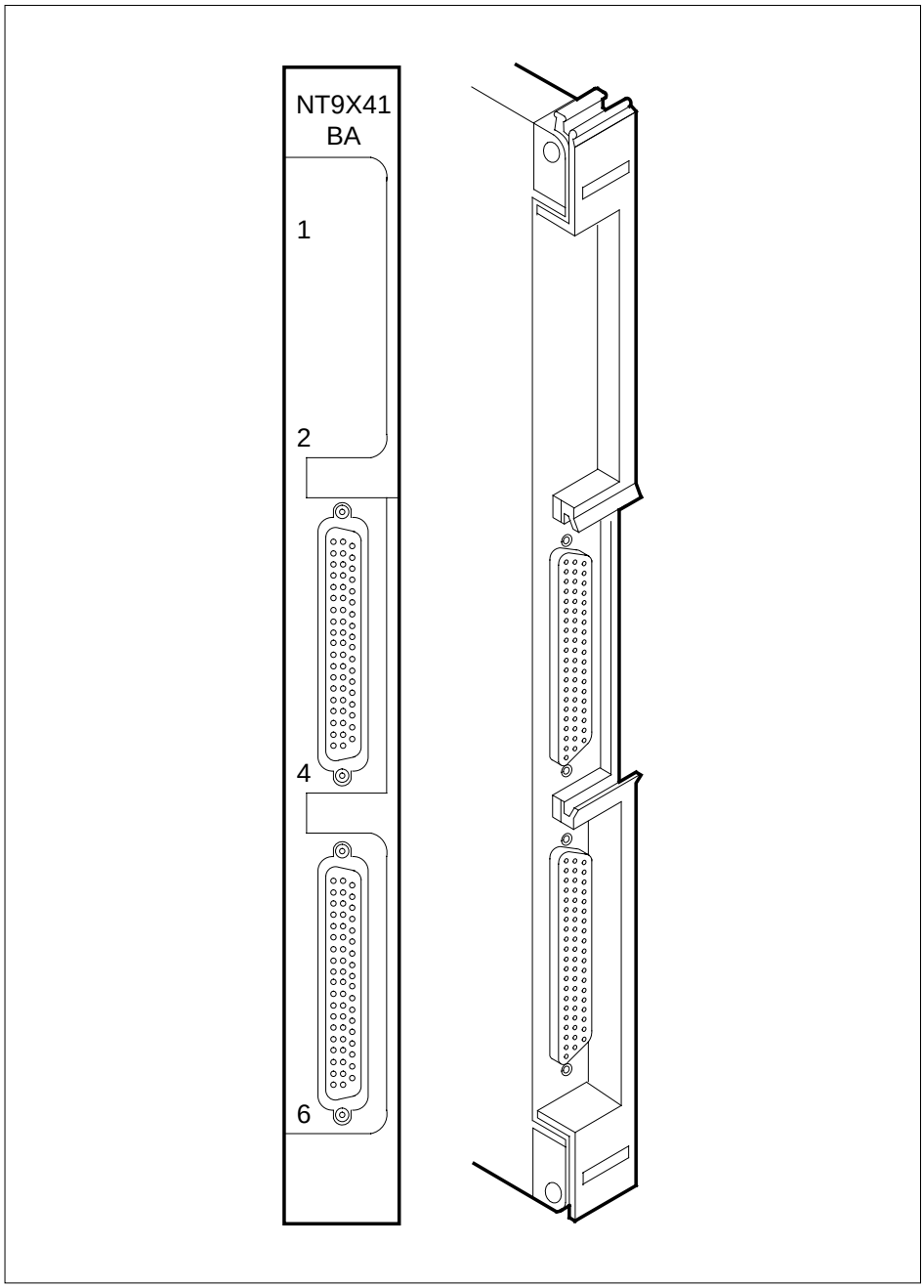
25 Use the procedure *Replacing a card* in this document to replace the card. Complete the procedure and return to this point.

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 toFigure , "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

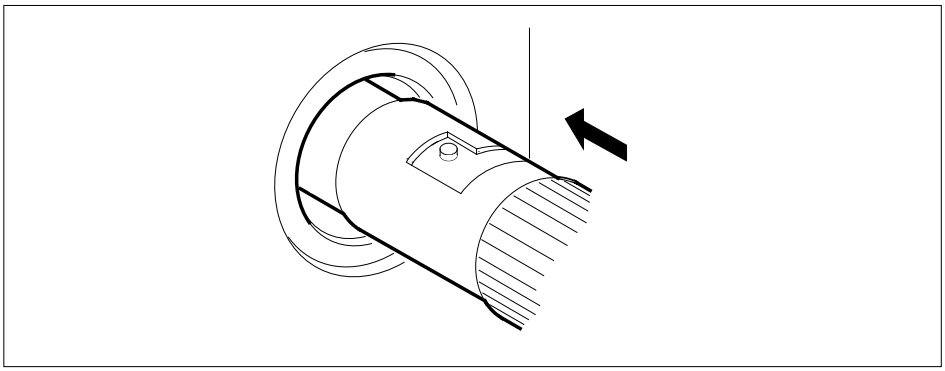
Exercise care in handling fiber cables. Do not crimp fiber cables or bend fiber cables to a radius of less than 3 cm (1.180 in.).

Disconnect the transmit and receive connectors for each fiber cable.

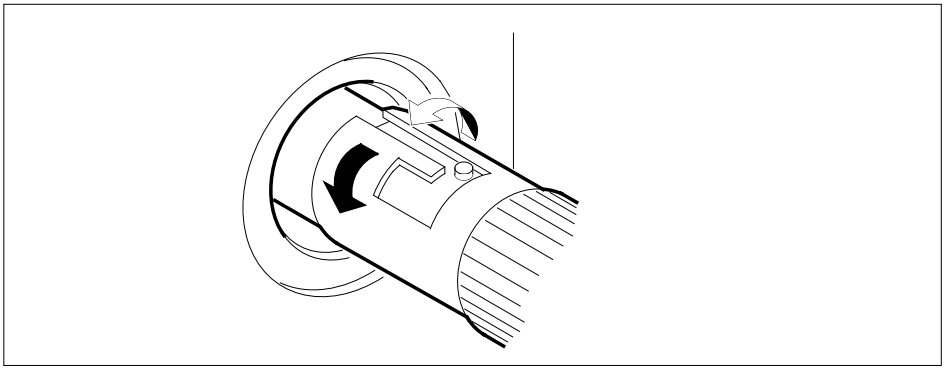
Note: Place dust caps on the ends of the connectors as you disconnect them.

a Grasp the sleeve with two fingers and gently push the sleeve toward the frame.

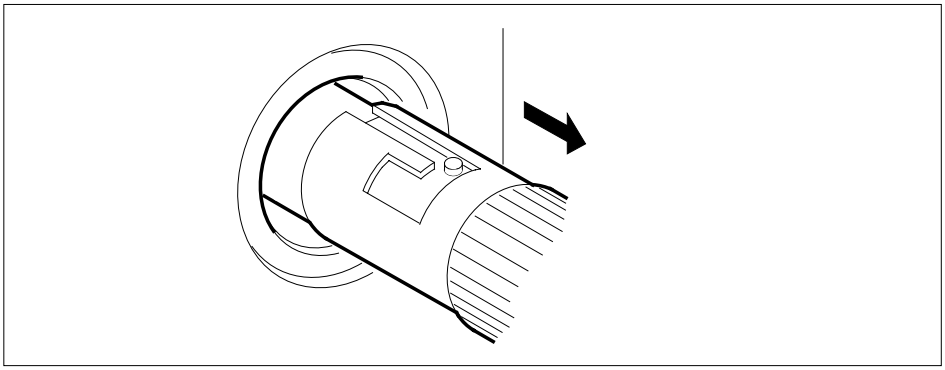
Crosspoint and interface cards in a 64k or 128k ENET (continued)



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.

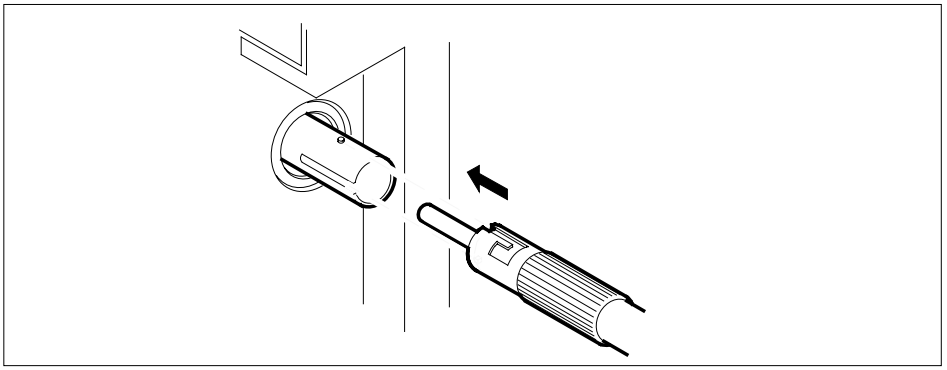
35 Use the procedure *Replacing a card* in this document to replace the card. Complete the procedure and return to this point.

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.

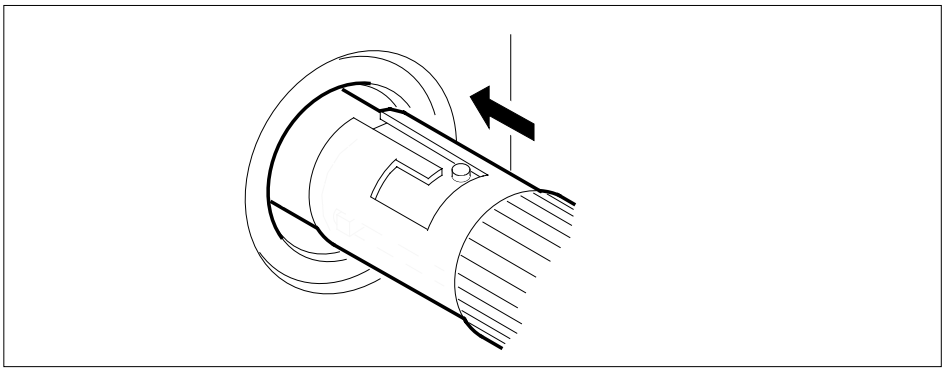
Reconnect the transmit and receive connectors for each fiber cable as follows:

a Align the connector pin and slot with the receptacle slot and pin, as shown.

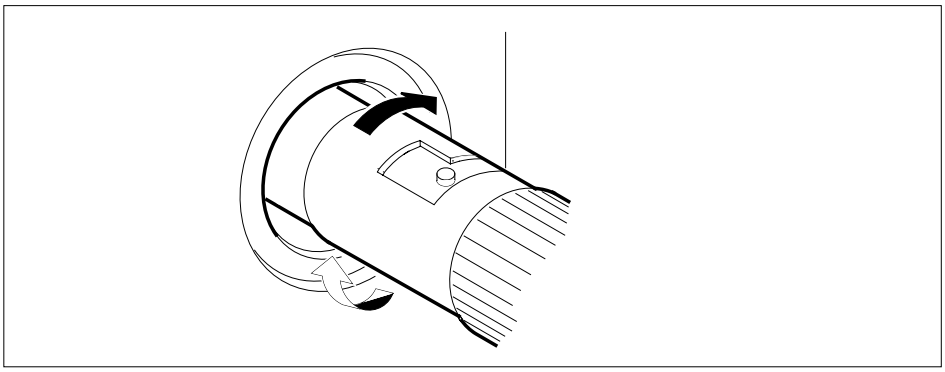


b Carefully slide the connector into the receptacle.

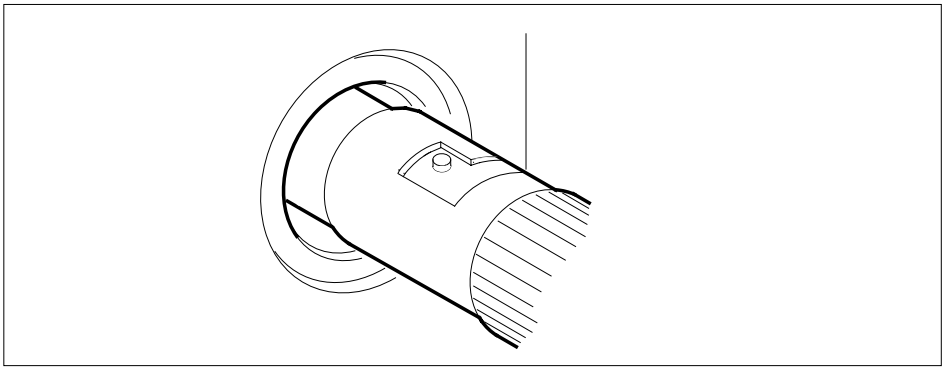
Crosspoint and interface cards in a 64k or 128k ENET (continued)



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

38 Connect the DS30 connectors again.

a Plug the connectors into the card.

b Tighten the connector retaining screws.

At the MAP terminal

39 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 16

40 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 16

Example of a MAP response:

```
Request to RTS MS: 0 shelf: 0 chain:16 submitted.
Request to RTS MS: 0     shelf: 0 chain:16 passed.
```

If the RTS command	Do
passed	step 41
failed	step 58

41 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 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

>NET;SYSTEM

and press the Enter key.

43 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)

If the BSY command	Do
passed	step 44
failed	step 58

44 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 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 Acess the ENET system level of the MAP display by typing

>SYSTEM

and pressing the Enter key.

Go to Step 11

50 To acess 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 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.

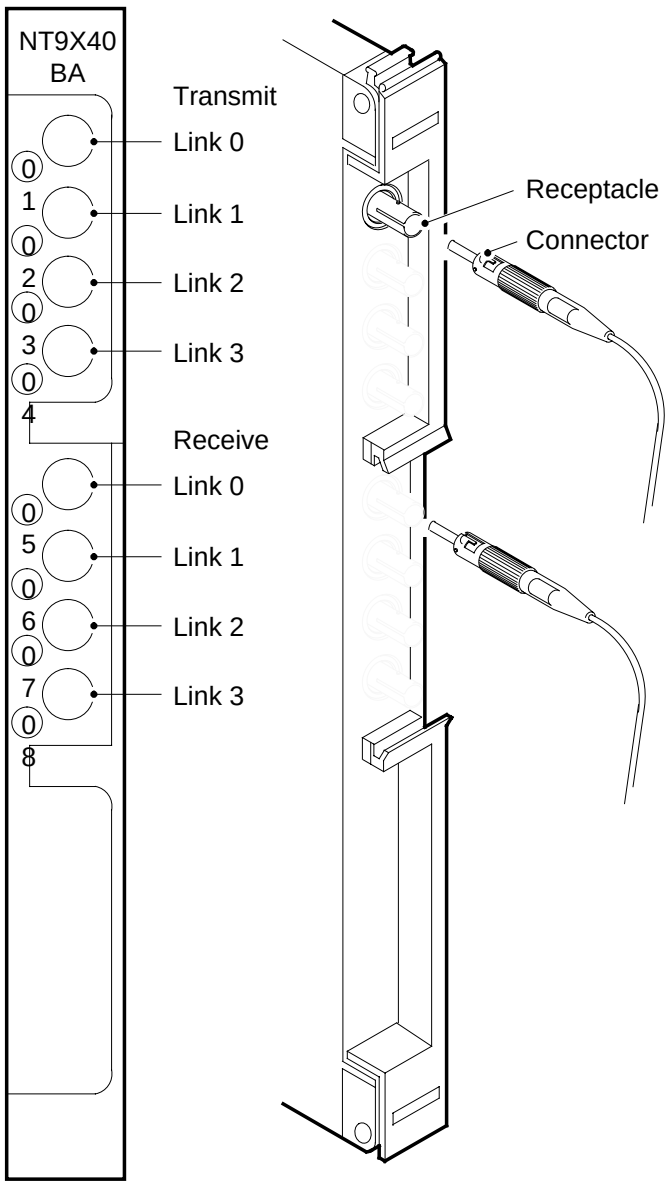
BSY request has been aborted, ENET dump is continuing.

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)

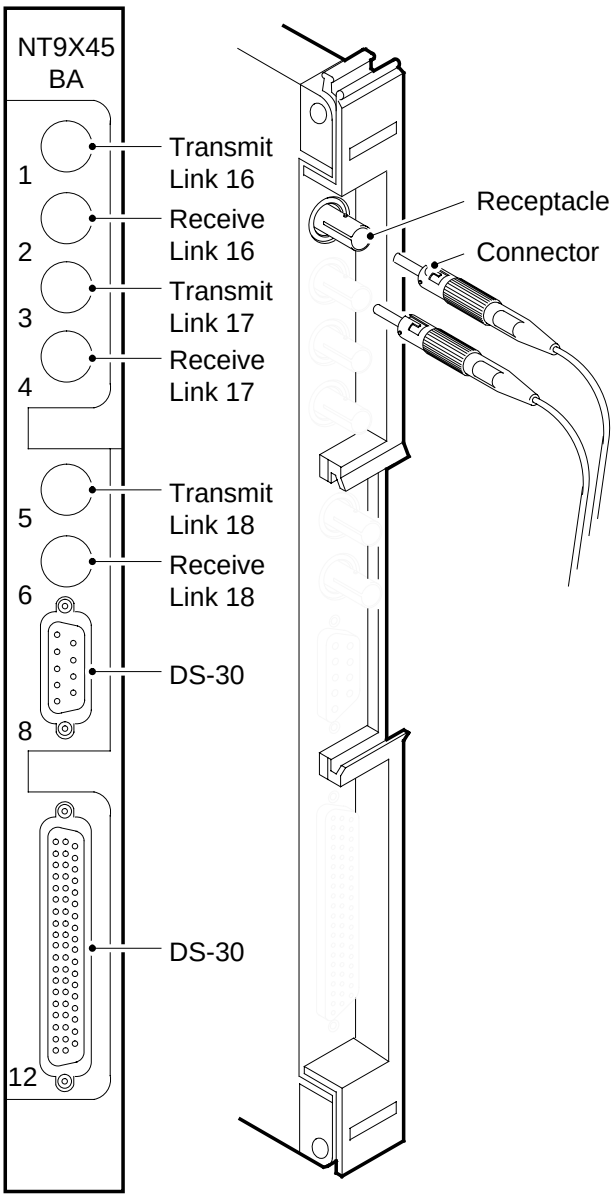
NT9X40BA/BB connector zone numbers



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

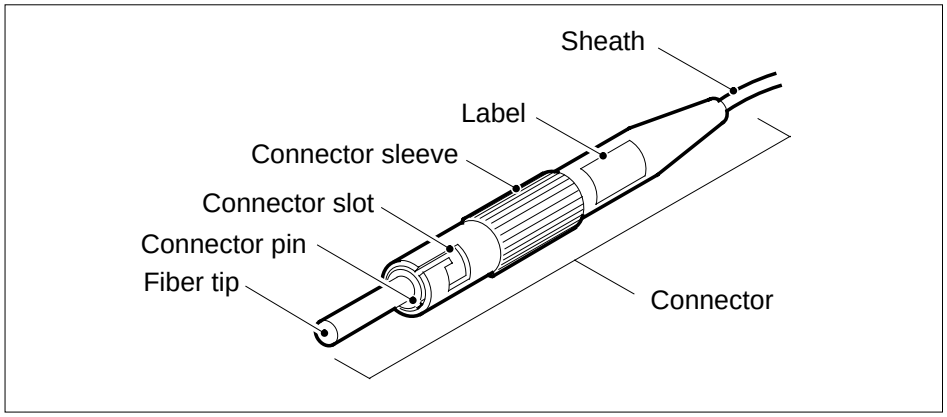


The figure relates the zone numbers and the link numbers. The zone numbers (1 to 12) appear on the face of the card. The link numbers appear on the MAP display for the NT9X45BA interface card. Note that the figure shows only fiber connections. Note the zone designations for transmit and receive.

Crosspoint and interface cards in a 64k or 128k ENET (end)

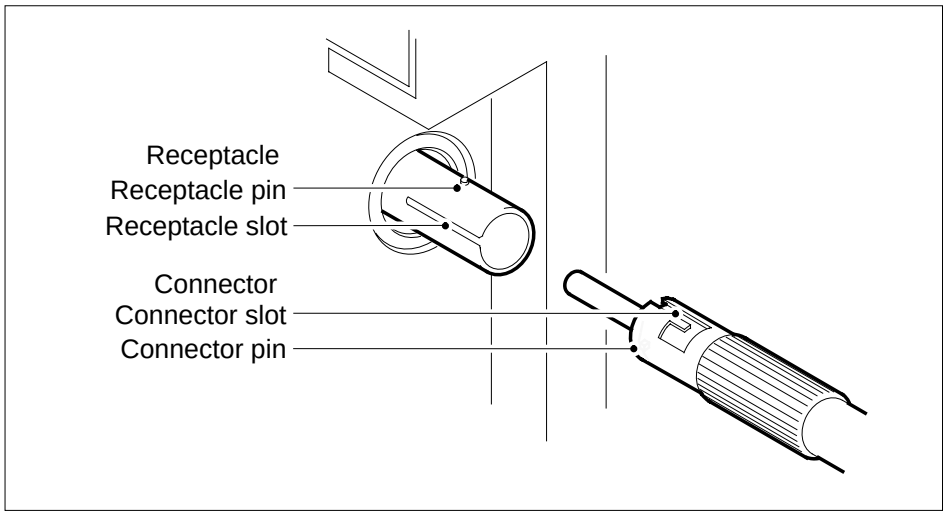
This diagram shows the type of connector for fiber connections to an NT9X40 or NT9X45 paddle board.

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*.

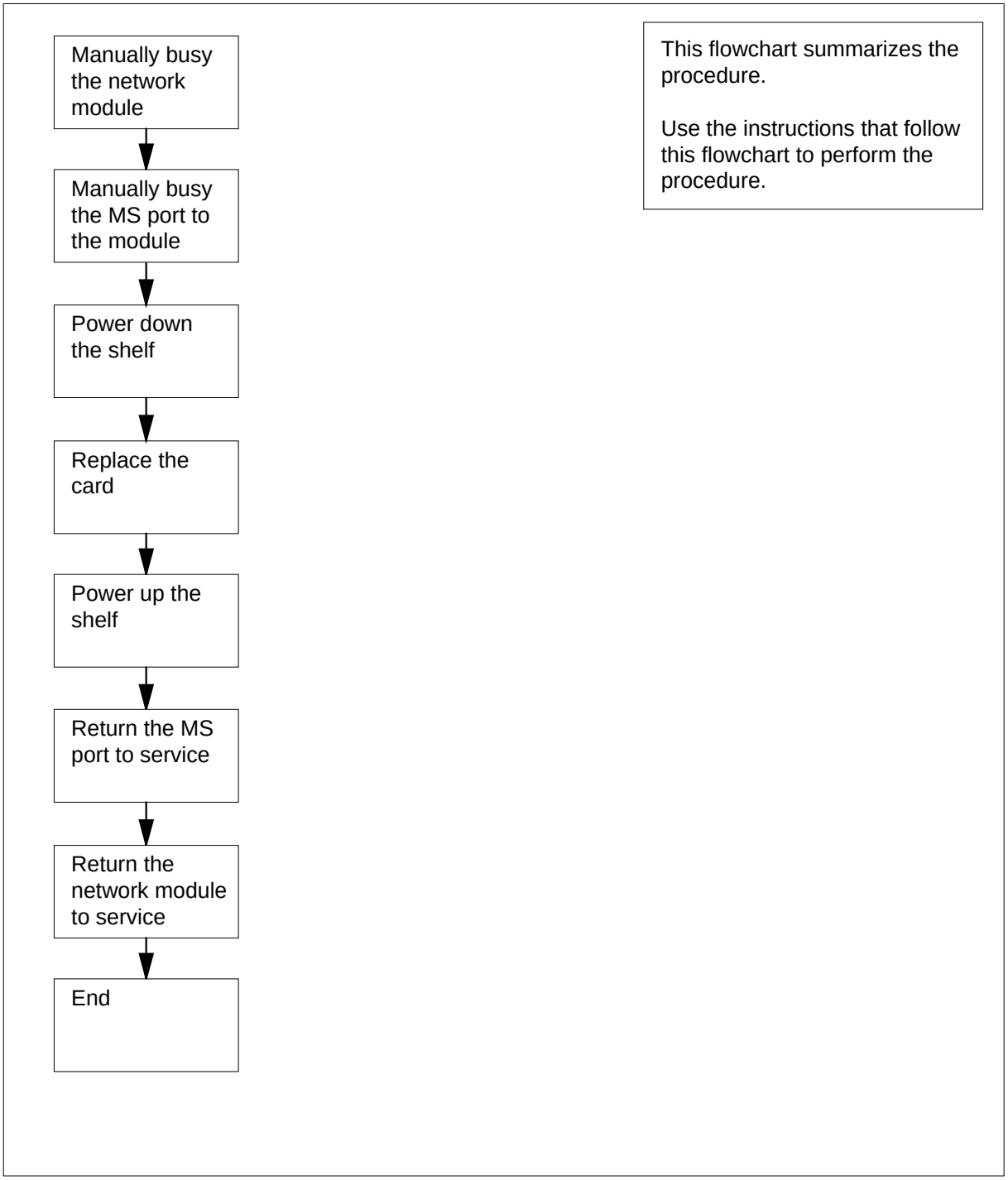
Do not go to the common procedure unless the step-action procedure directs you to go.

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  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 To manually busy the network module that contains the card you want to replace, type

>BSY plane_no pair_no

and press the Enter key.

where

plane_no
is the number of the network plane (0 to 1)

pair_no
is the number of the network plane pair (0 to 31)

Example of a MAP response:

```
bsy 0 0
OK
```

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 To obtain information on the link to the message switch (MS), type

>TRNSL plane_no pair_no

and press the Enter key.

where

plane_no
is the number of the network plane (0 to 1)

pair_no
is the number of the network plane pair (0 to 31)

Example of a MAP response:

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                 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  . . 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                 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  . . 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 thecard you replace

Power converter cards in JNET shelves (end)

pair_no
is the number of the network plane pair (0 to 31) associatedwith the card you replace

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 26
failed	step 30

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 31

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

28 Consult the next level of support to determine if you can proceed to manually busy the network plane and pair. Continue as directed.

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

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

31 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.

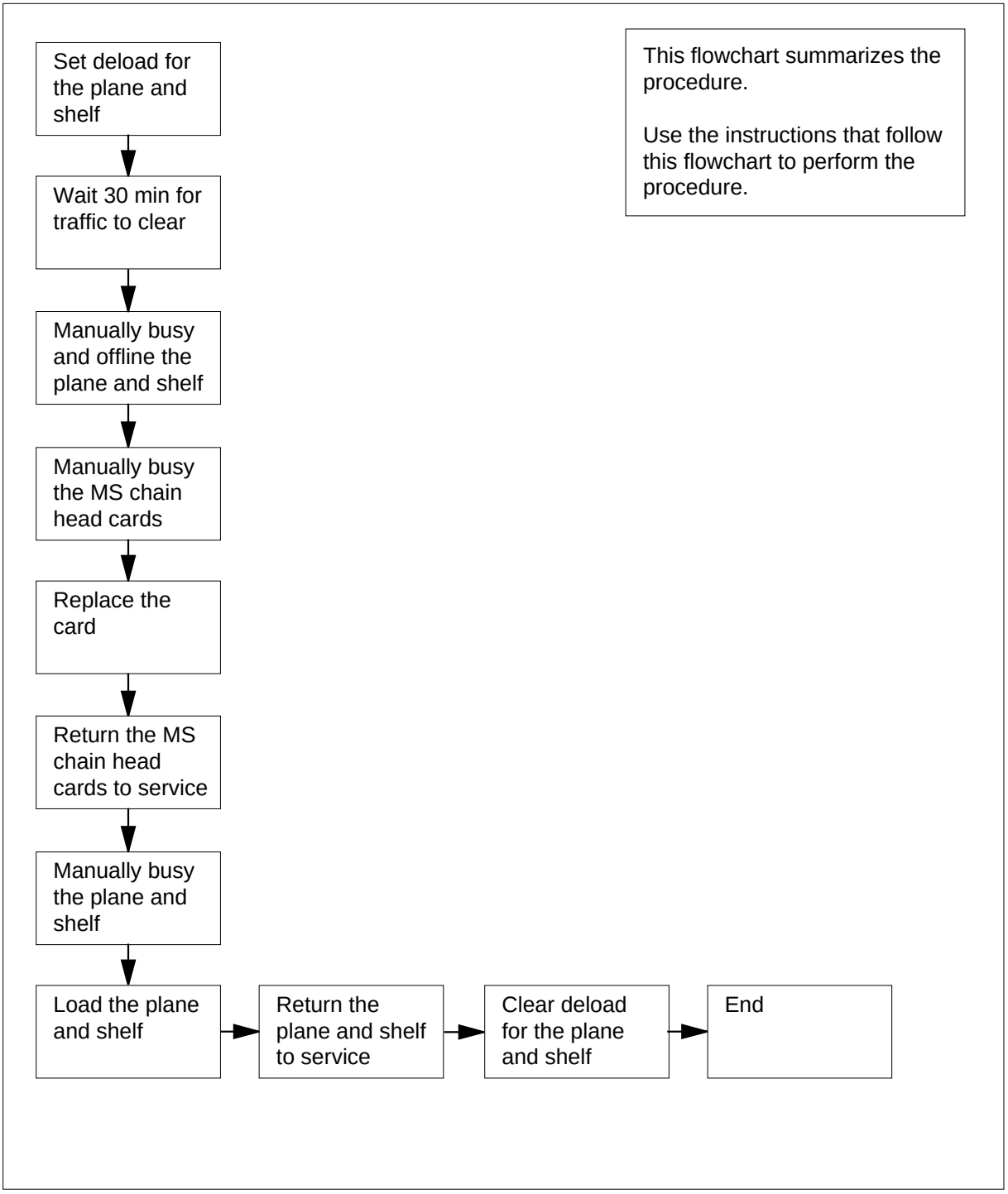
System cards in a 64k or 128k ENET (continued)

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

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 333333
            123456 78 90123456 78901234 56789012 345678
 Plane 0    O  O   OO CCCCCCCC -------- CCCCCCCC O  O
 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    O          O
 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 *How to unseat cards in equipment shelves* in this NTP. When you complete the procedure, wait 20 s and return to this point.

25 Use the procedure *How to reseat cards in equipment shelves* in this NTP to reseat the NT9X36 card. When you complete the procedure, wait 20 s and return to this point.

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.

Note: 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.

Note: 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

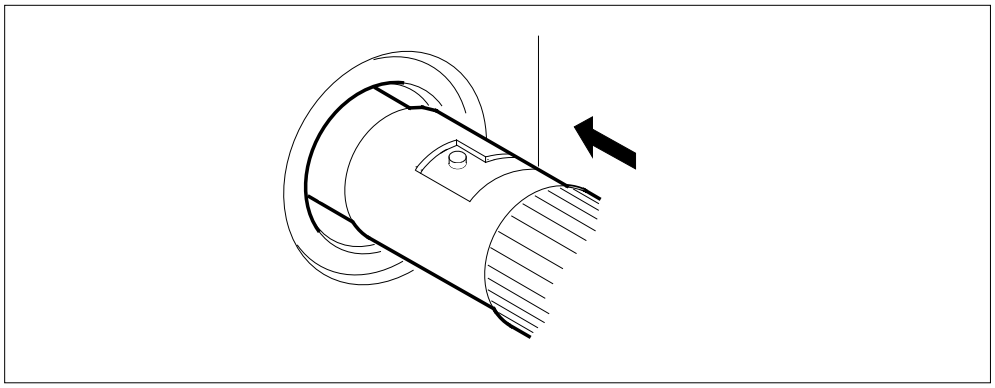
Exercise care in handling fiber cables. Do not crimp fiber cables or bend fiber cables to a radius of less than 3 cm (1.180 in.).

Disconnect the transmit and receive connectors for each fiber cable, as follows:

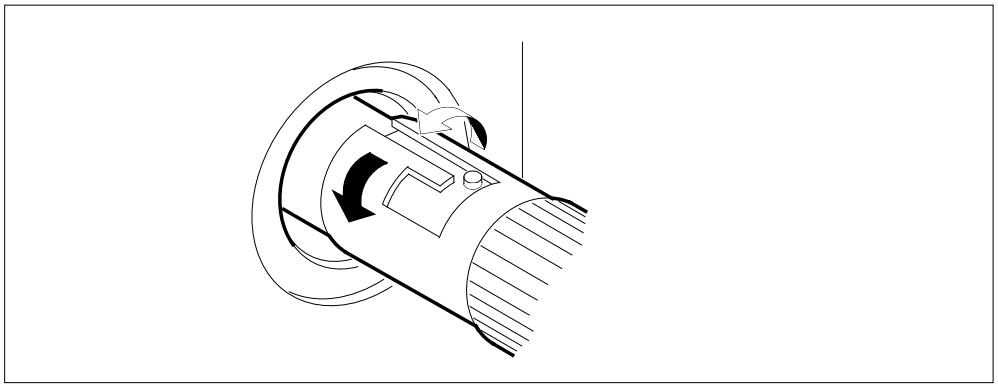
Note: As you disconnect the connectors place dust caps on the ends of the connectors.

a Grasp the sleeve with two fingers and gently push the sleeve towards the frame.

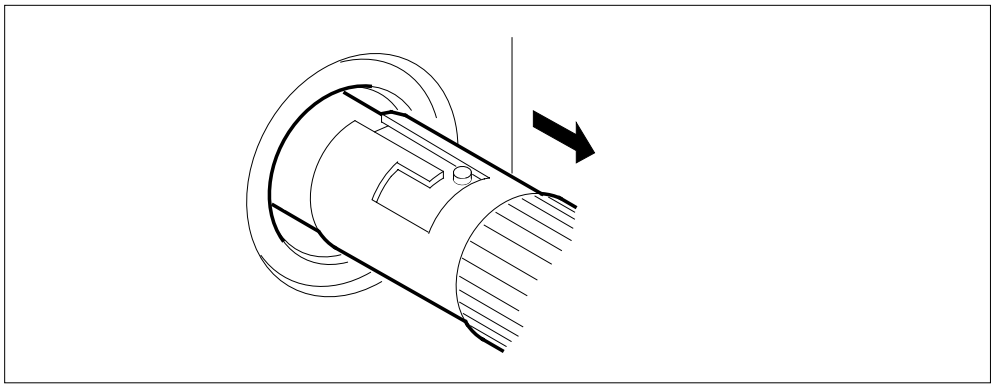
System cards in a 64k or 128k ENET (continued)



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 correctlly 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.

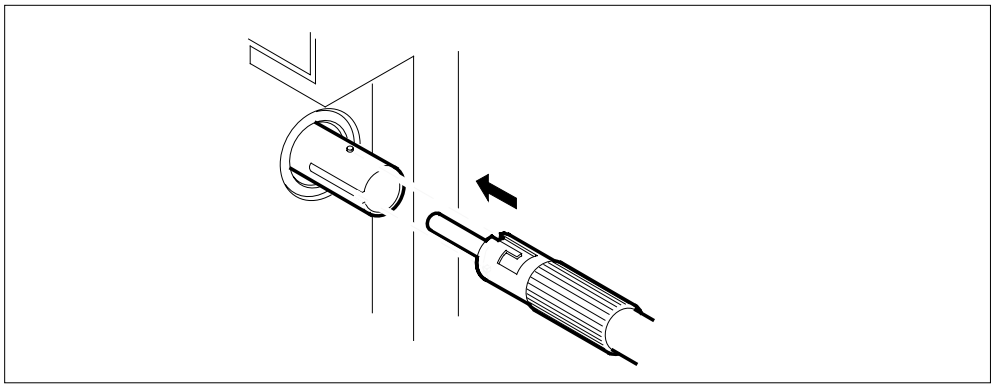
If the CONVERTER OFF LED	Do
is not lit	step 38
is lit	step 60

35 Remove the dust caps on the transmit and receive connectors as you reconnect them to the new card.

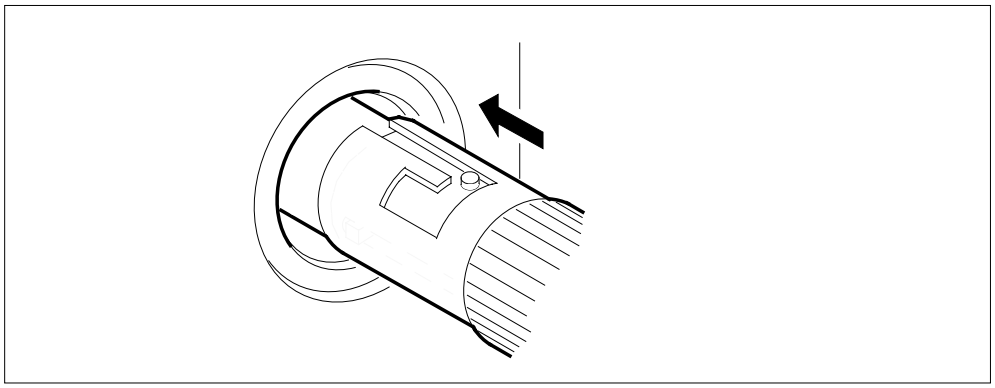
Reconnect the transmit and receive connectors for each fiber cable, as follows:

a Align the connector pin and slot with the receptacle slot and pin, as shown.

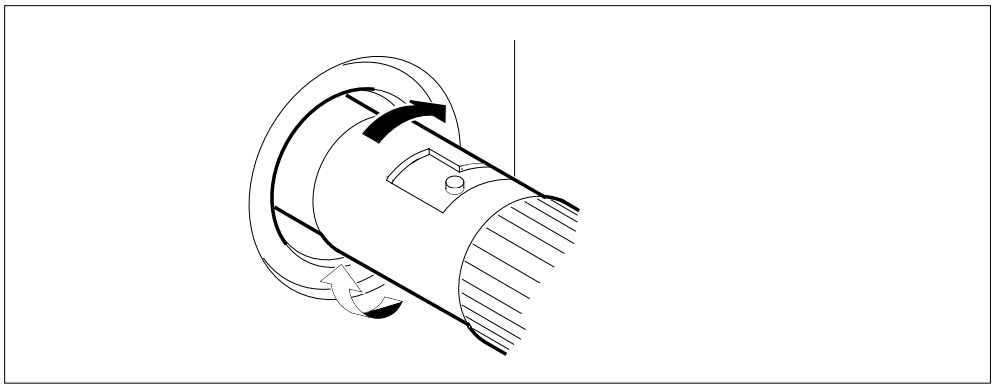
System cards in a 64k or 128k ENET (continued)



b Carefully slide the connector into the receptacle.

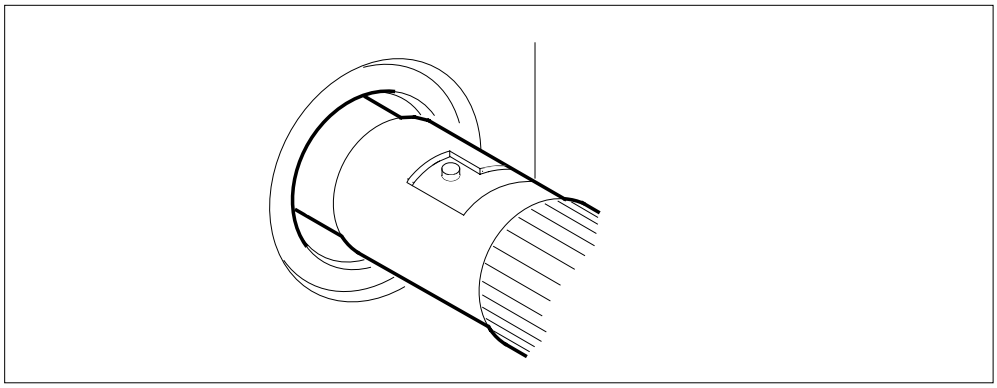


c Turn the connector clockwise to lock the connector in place.



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 PMLOADS 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 O R I O       FILE     NUM OF   MAX    FILE NAME
MODIFY CODE R E T P       SIZE    RECORDS   REC
  DATE      G C O E         IN         IN   LEN
              C N     BLOCKS       FILE
-----------------------------------------------------------------
760128    0 O F            277       3219    44 EDRMAC07
941101    0 I F Y         9494       4747  1020 RAPC03AW_1101_MS
760104    0 O V            651        162  2048 MPC402BX
760104    0 O F             63        424    76 TDCMPA01
760104    0 O 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 O F            784        392  1024 MPCX33AB
930427    0 O 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 youare 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 128kENET)

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.

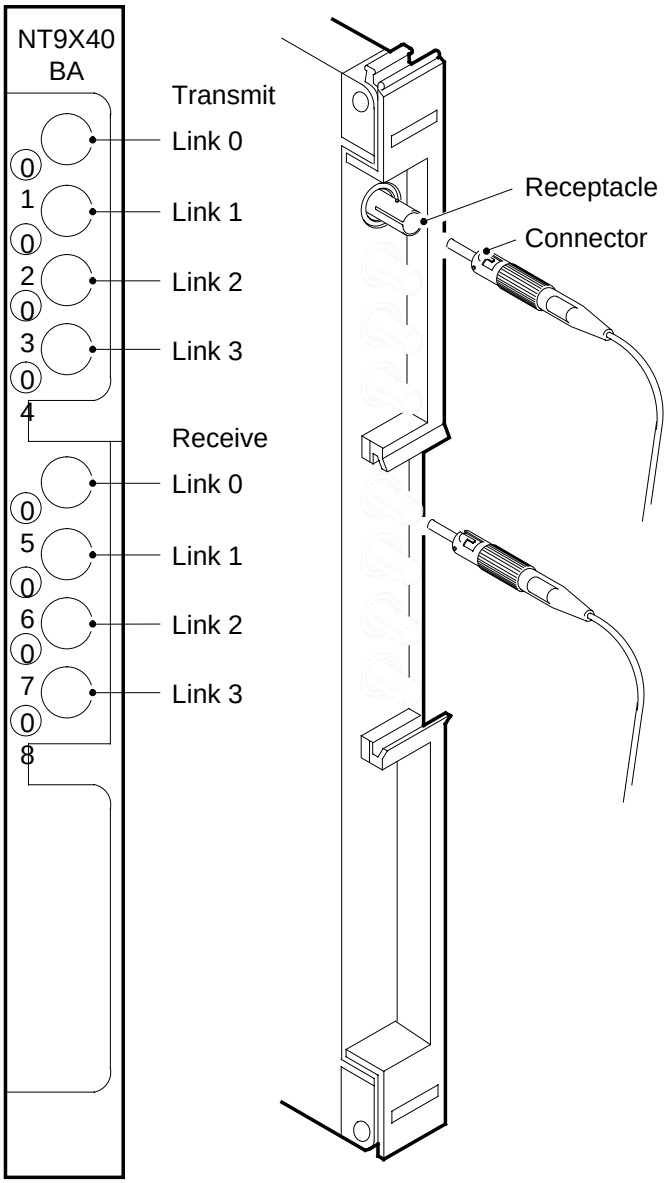
59 This procedure instructs you to deload and manually busy a node. Do not continue with this procedure except under special conditions because the mate node has deloaded cards. Consult operating company personnel or the next level of support. Continue as directed by operating company personnel or the 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

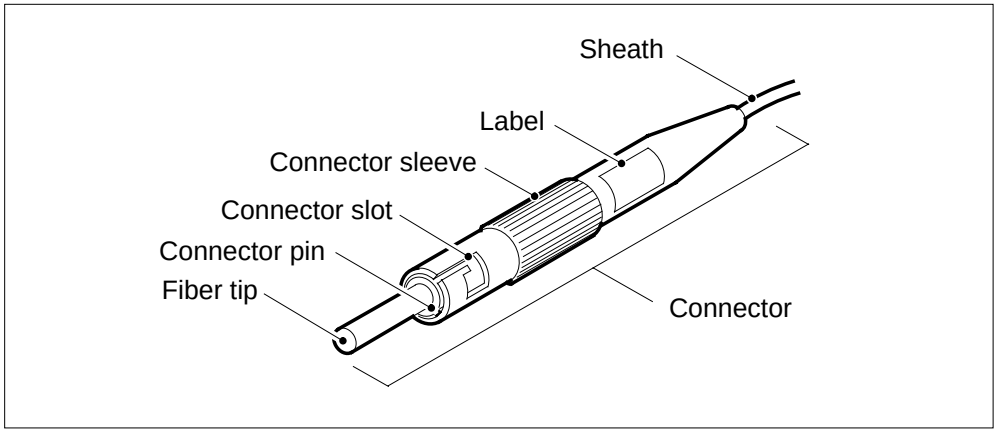


The figure correlates the zone numbers (1 to 8) that appear on the face of the card to the link numbers that appear on the MAP display for the NT9X40BA or NT9X40BB interface card. Note that only fiber connections are shown. Pay careful attention to the zone designations for transmit and receive.

This diagram shows the type of connector used for fiber connections to an NT9X40 or NT9X45 paddle board.

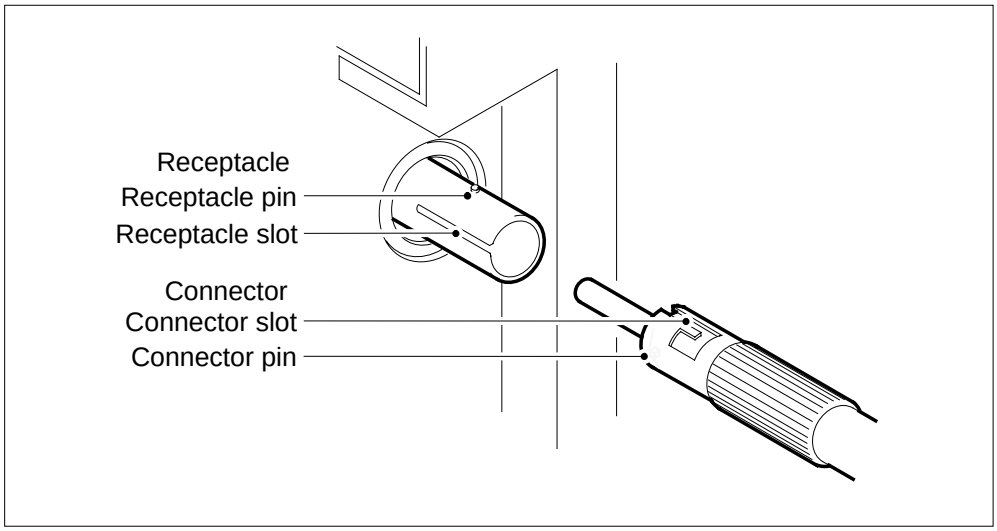
System cards in a 64k or 128k ENET (end)

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.*

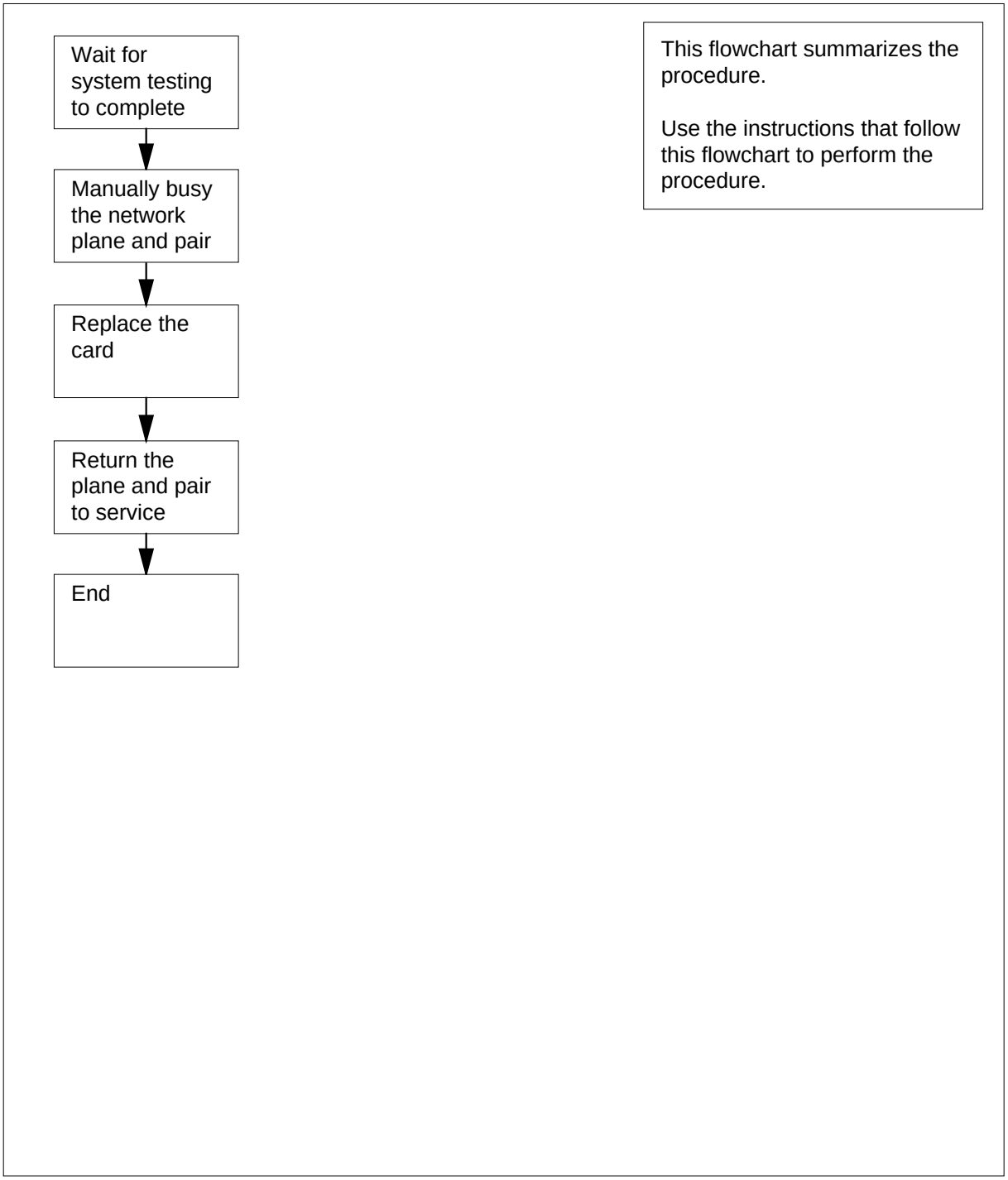
Do not go to the common procedure unless the step-action procedure directs you to go.

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  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 To manually busy the network module that contains the card to be replaced, type

`>BSY 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:

```
bsy 0 0OK
```

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.

9 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

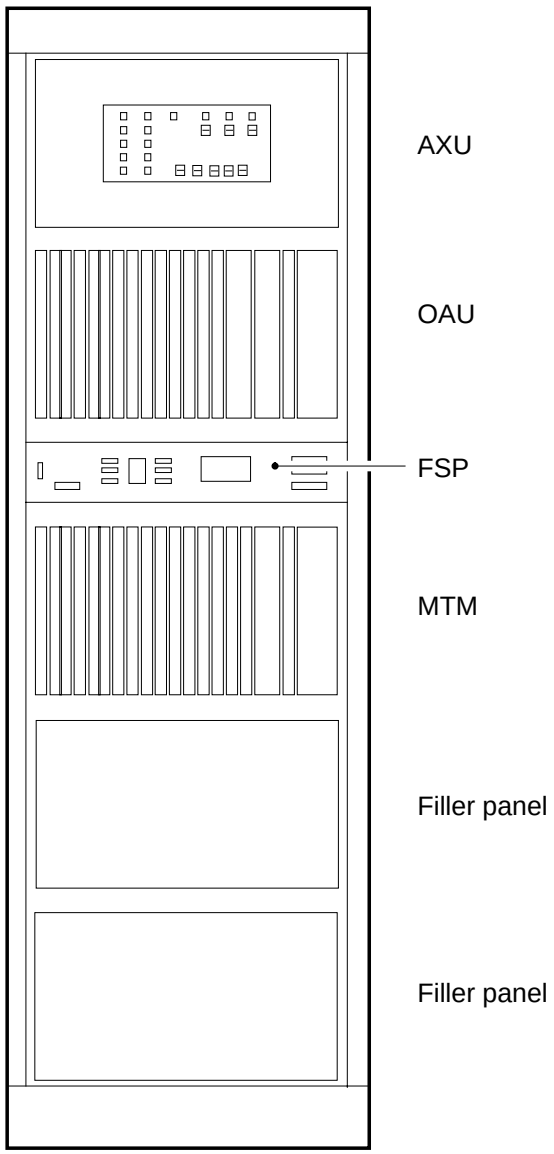
This section shows a frame layout diagram for the trunk module equipment (TME) frame that contains the office alarm unit (OAU). It also shows shelf diagrams for the OAU shelf.

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



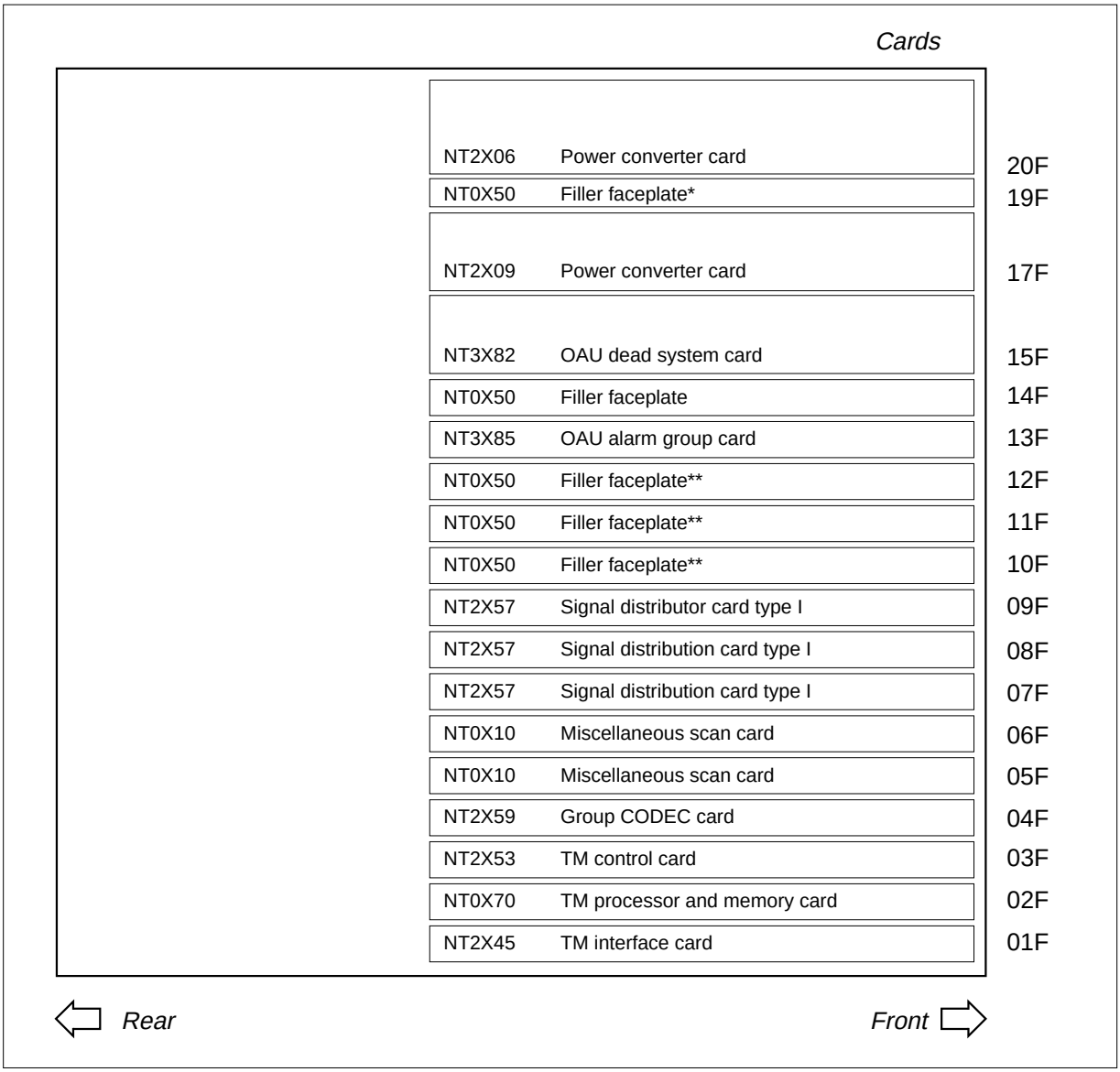
Legend:

AXU	Alarm crosspoint unit
FSP	Frame supervisory panel
MTM	Maintenance trunk module
OAU	Office alarm unit

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

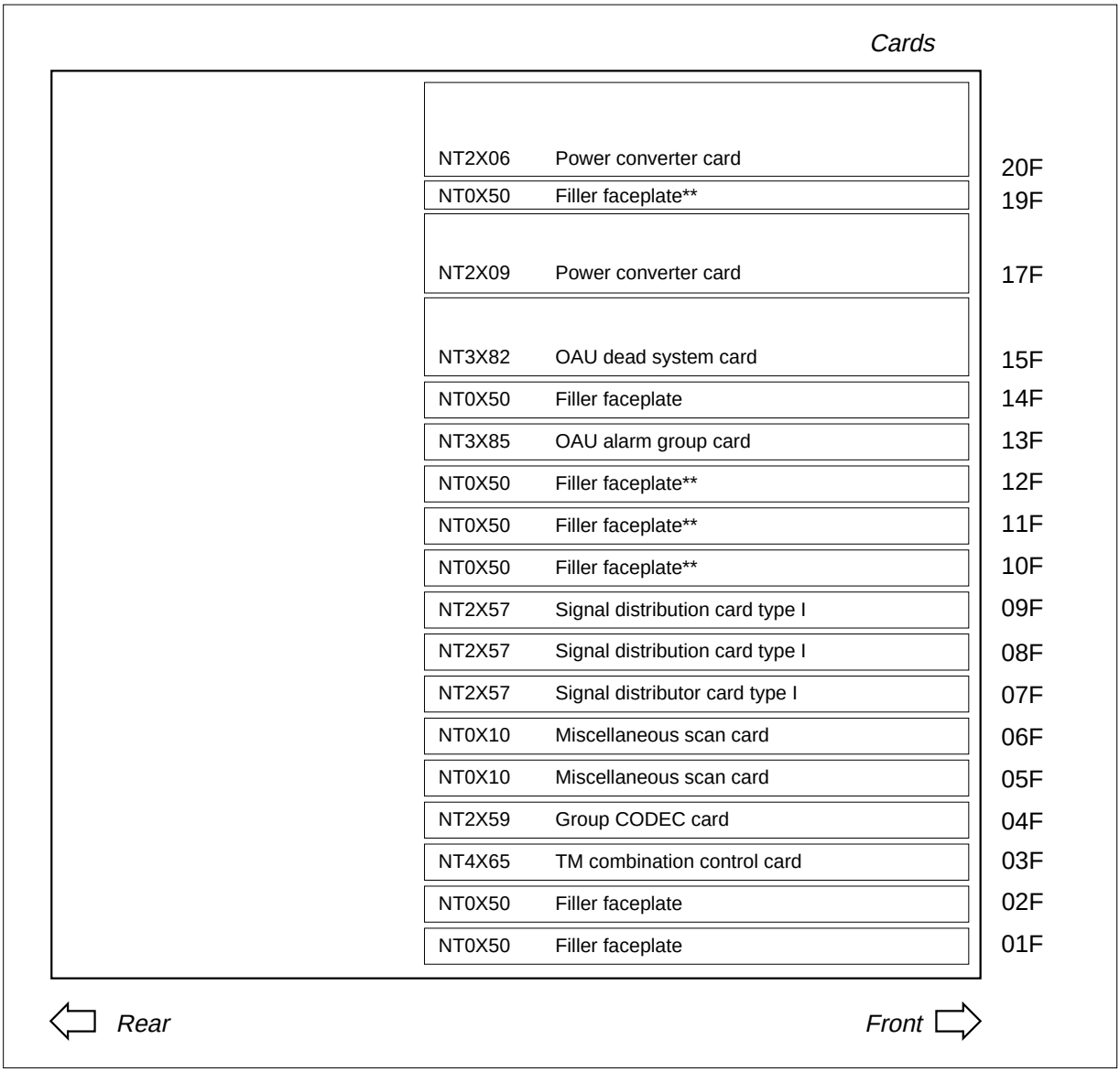


Note 1: Slots marked with double asterisk (**) are available for service circuit or alarm cards.

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*

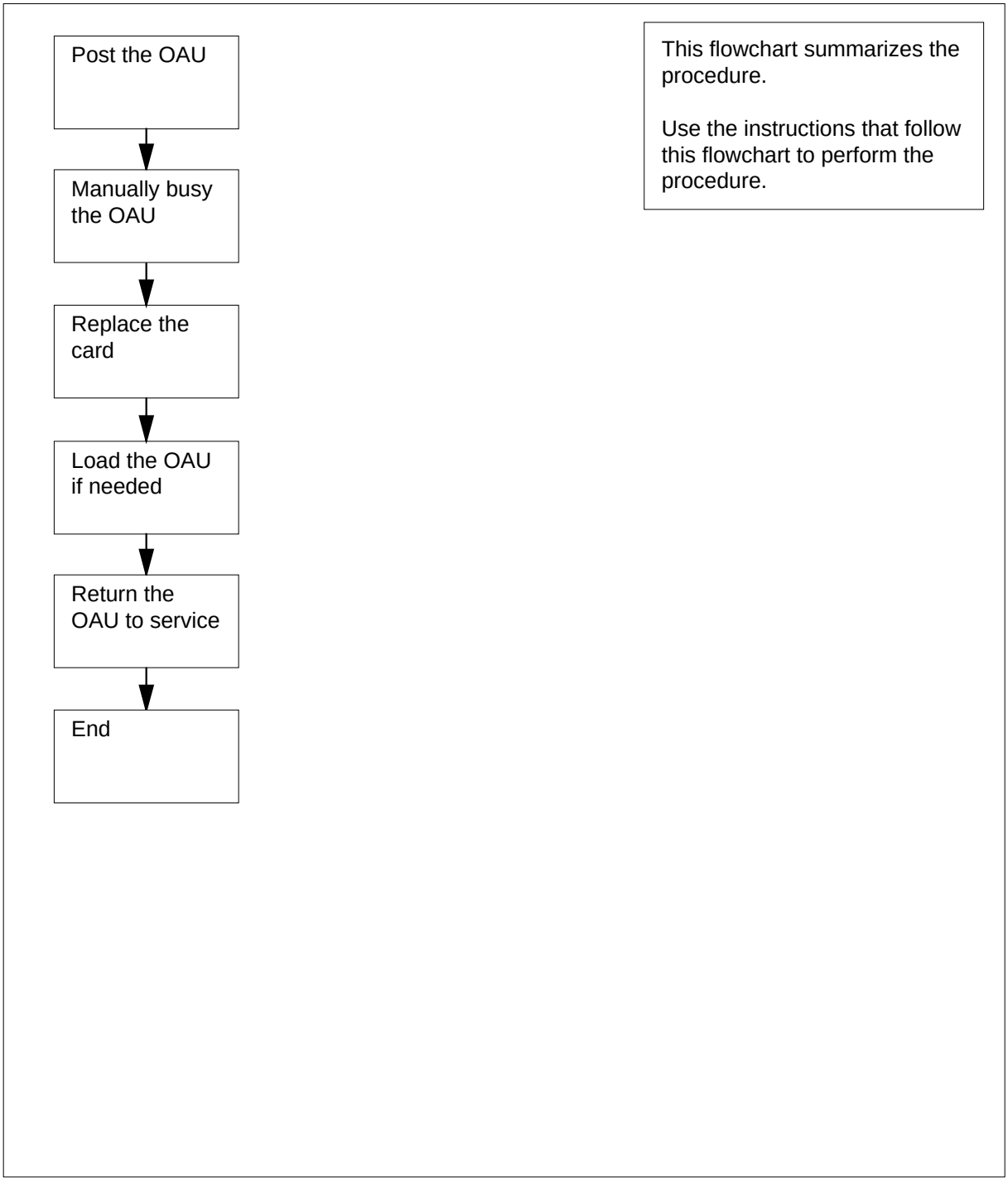
Do not go to the common procedure unless the step-action procedure directs you to go.

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)

If the RTS command	Do
failed	step 14

13 Consult operating company personnel to determine why the component is offline. Continue as directed.

14 For additional help contact the next level of support.

15 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*

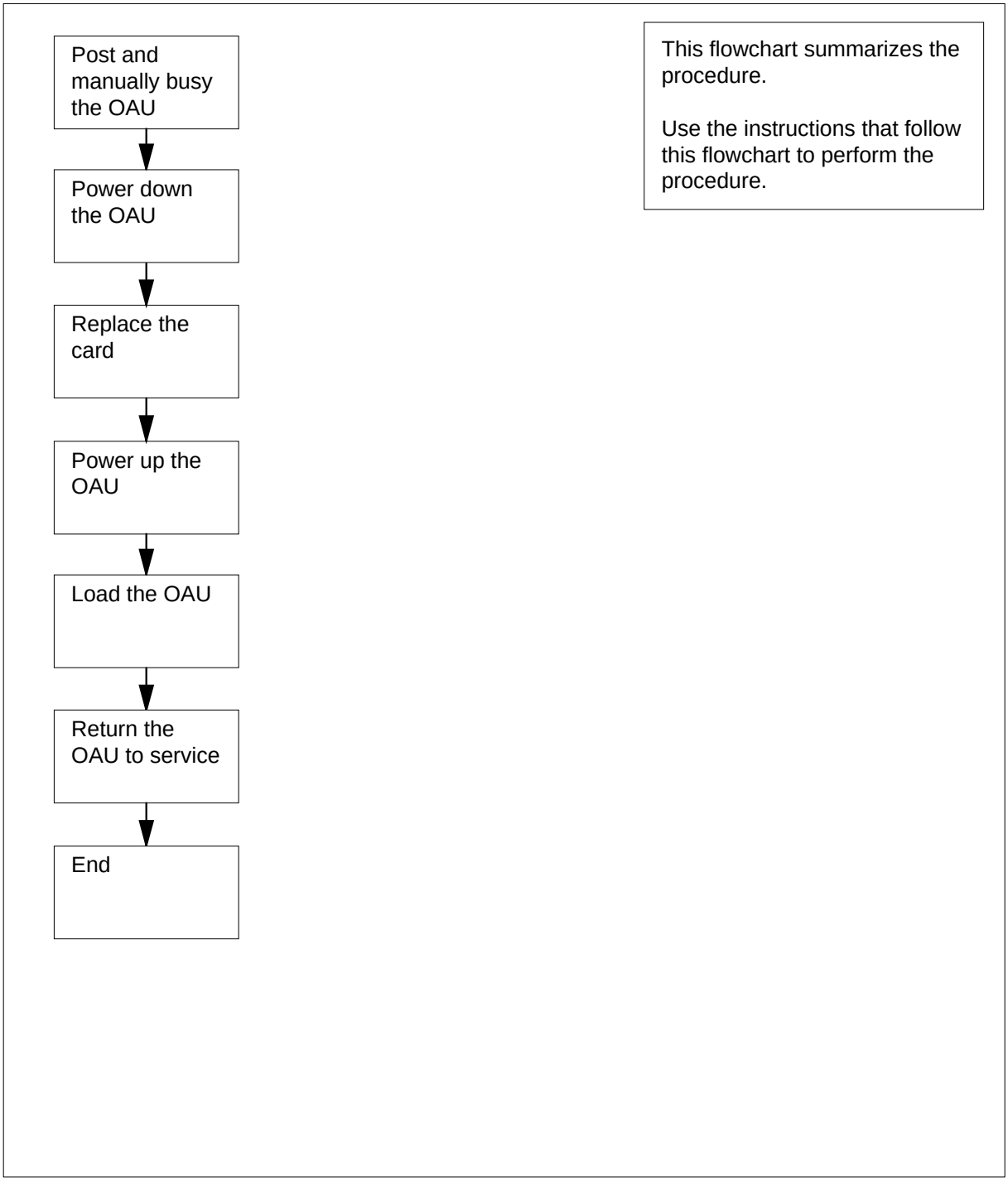
Do not go to the common procedure unless the step-action procedure directs you to go.

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.

If the FSP or MSP	Do
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.

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 OAU, type

>LOADPM

and press the Enter key.

Example of a MAP response:

```
OAU 0 Load PM  Passed
```

If the LOADPM command	Do
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
```

If the RTS command	Do
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.

10 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

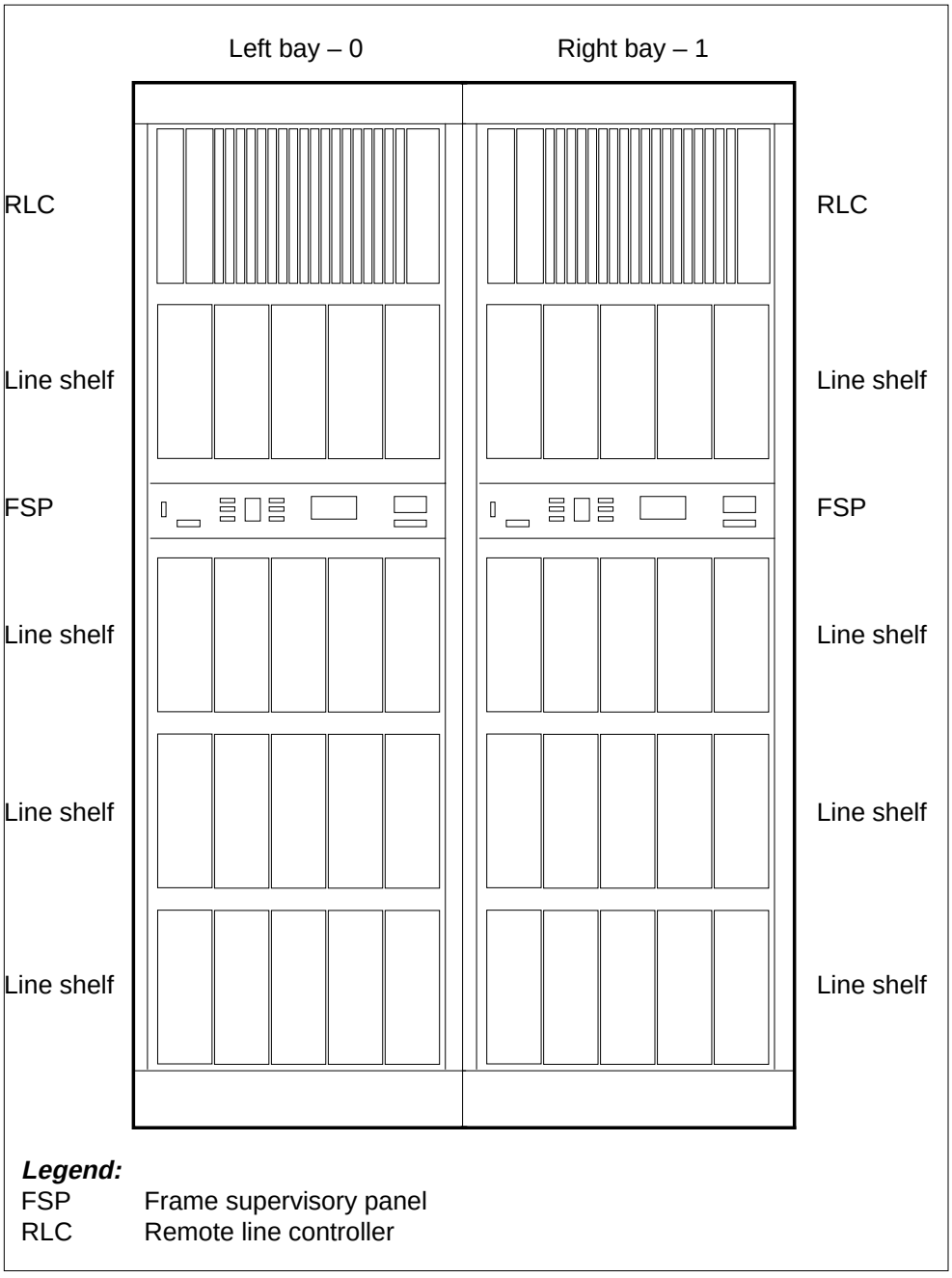
This module provides a frame layout for the remote line module (RLM) frame. The RLM frame contains line drawers and the remote line controller (RLC). The module provides shelf diagrams for the following:

- 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.

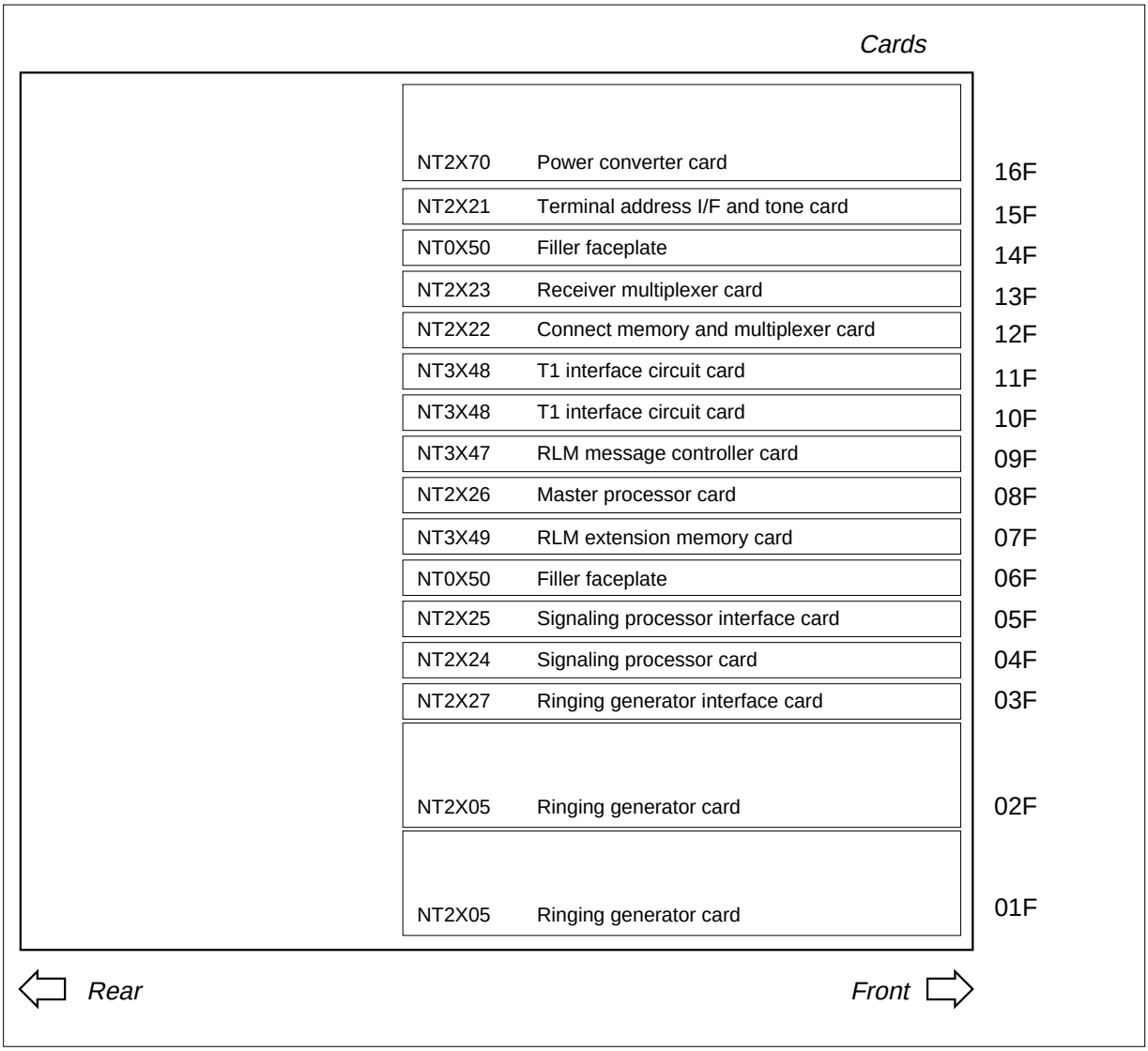
RLM shelf layouts (continued)

Remote line module frame (double bay)



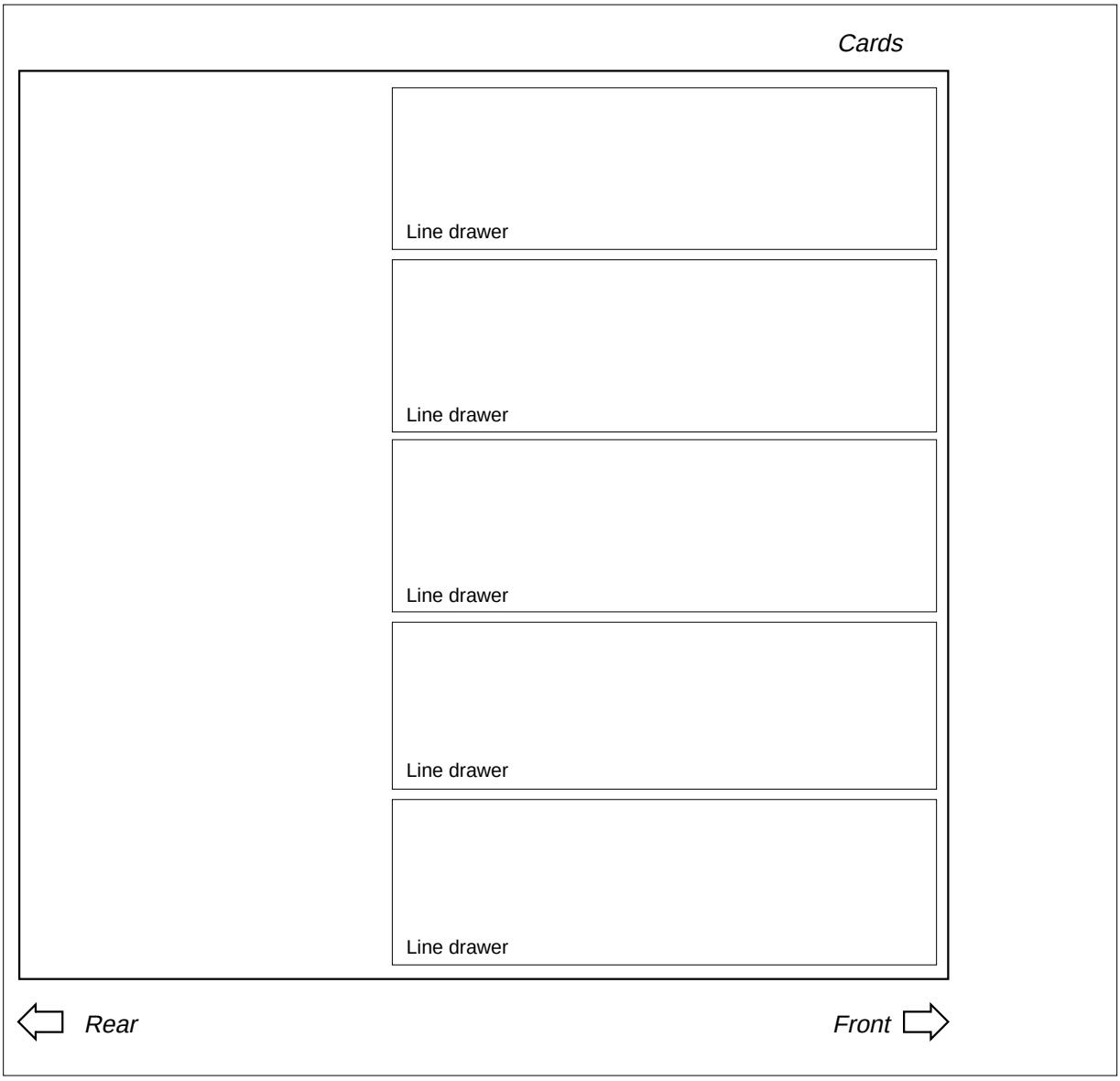
RLM shelf layouts (continued)

Remote line controller



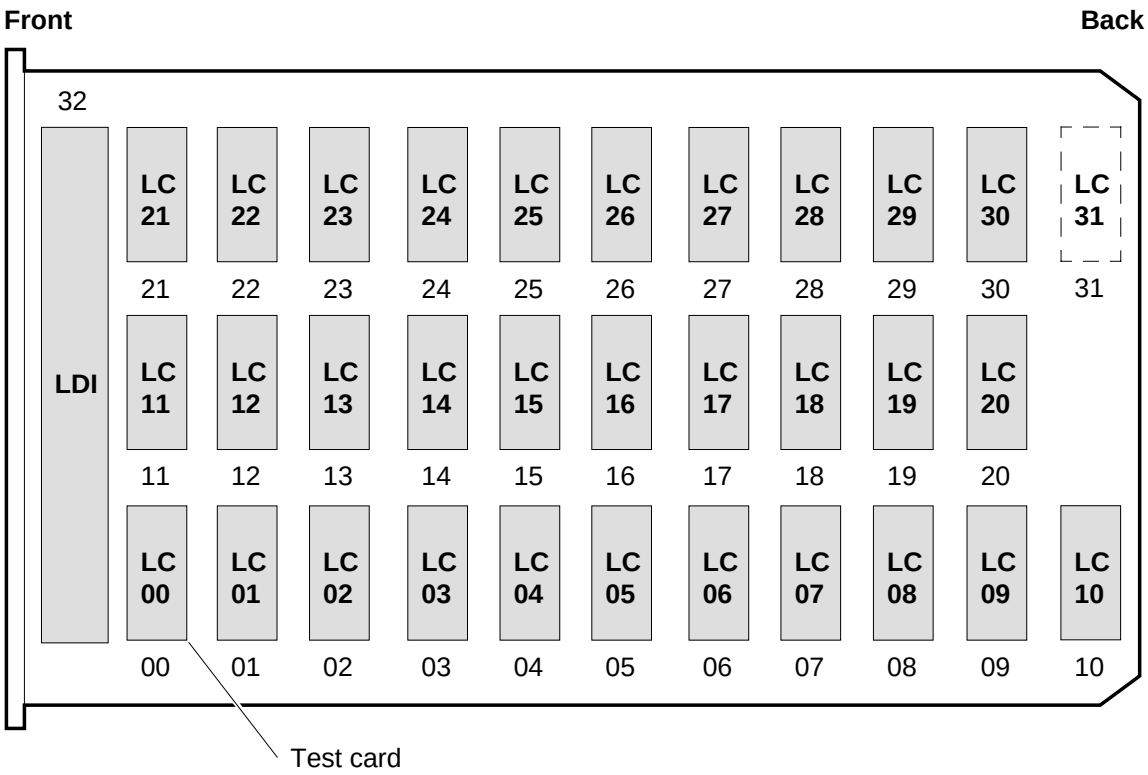
RLM shelf layouts (continued)

Line drawer shelf



RLM shelf layouts (continued)

Line drawer design (plastic)

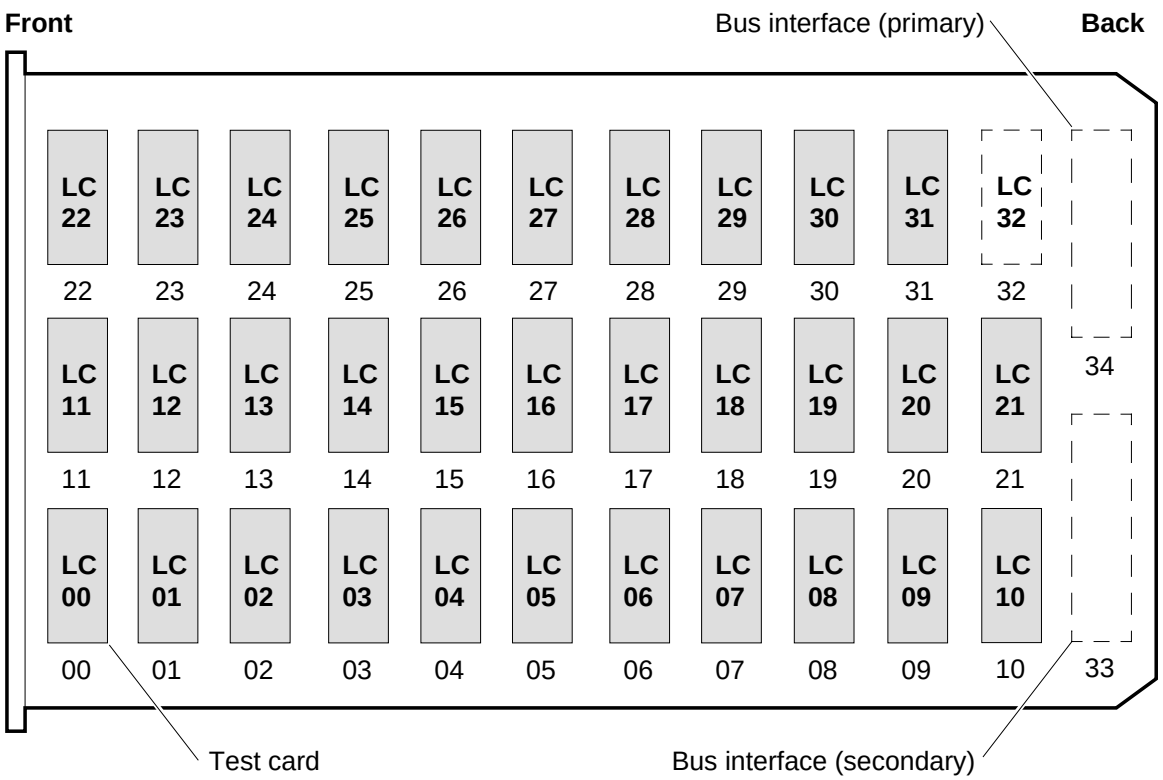


Legend:
LC Line card
LDI Line drawer interface

Note: Card position 31 is optionally assignable to a +48V power converter card instead of a line circuit.

RLM shelf layouts (end)

Line drawer design (metal)



Legend:
LC Line card

Note: Card position 32 is optionally assignable to a +48V power converter card instead of a line circuit.

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	Ringing generator interface - 20Hz Bell system card	RLC
NT2X27	AB	Ringing generator interface decimonic multifrequency ringing card	RLC
NT2X27	AC	Ringing generator interface harmonic multifrequency ringing card	RLC
NT2X27	AD	Ringing 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*

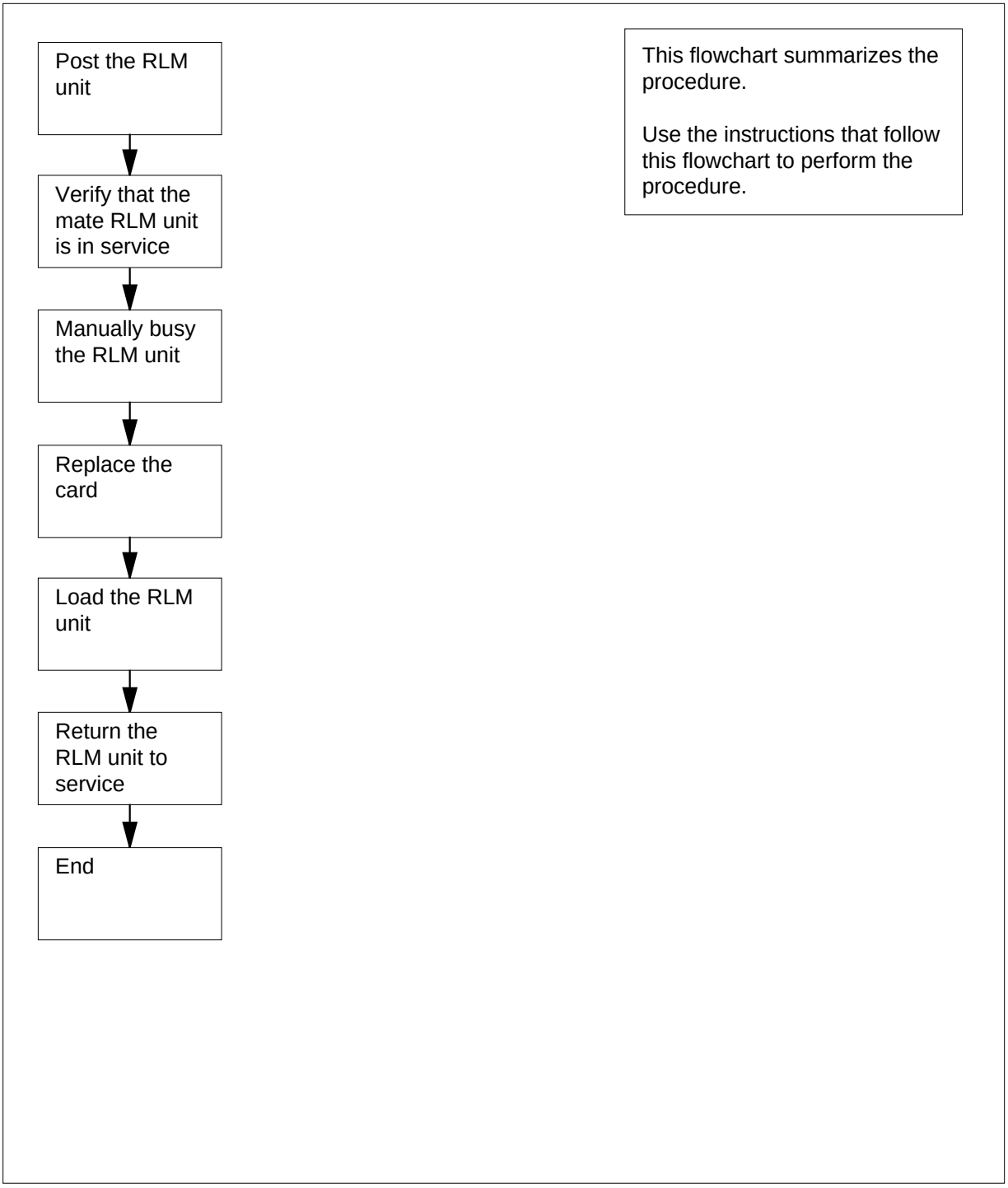
Do not go to the common procedure unless the step-action procedure directs you to go.

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 busying 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 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, AC, AD, UK	Line circuit card type A	RLM line drawer
NT2X18	AA, AC, AD, AE, AF, AG	Line circuit card type B	RLM line drawer

Common procedures

This procedure refers to *Replacing a line card.*

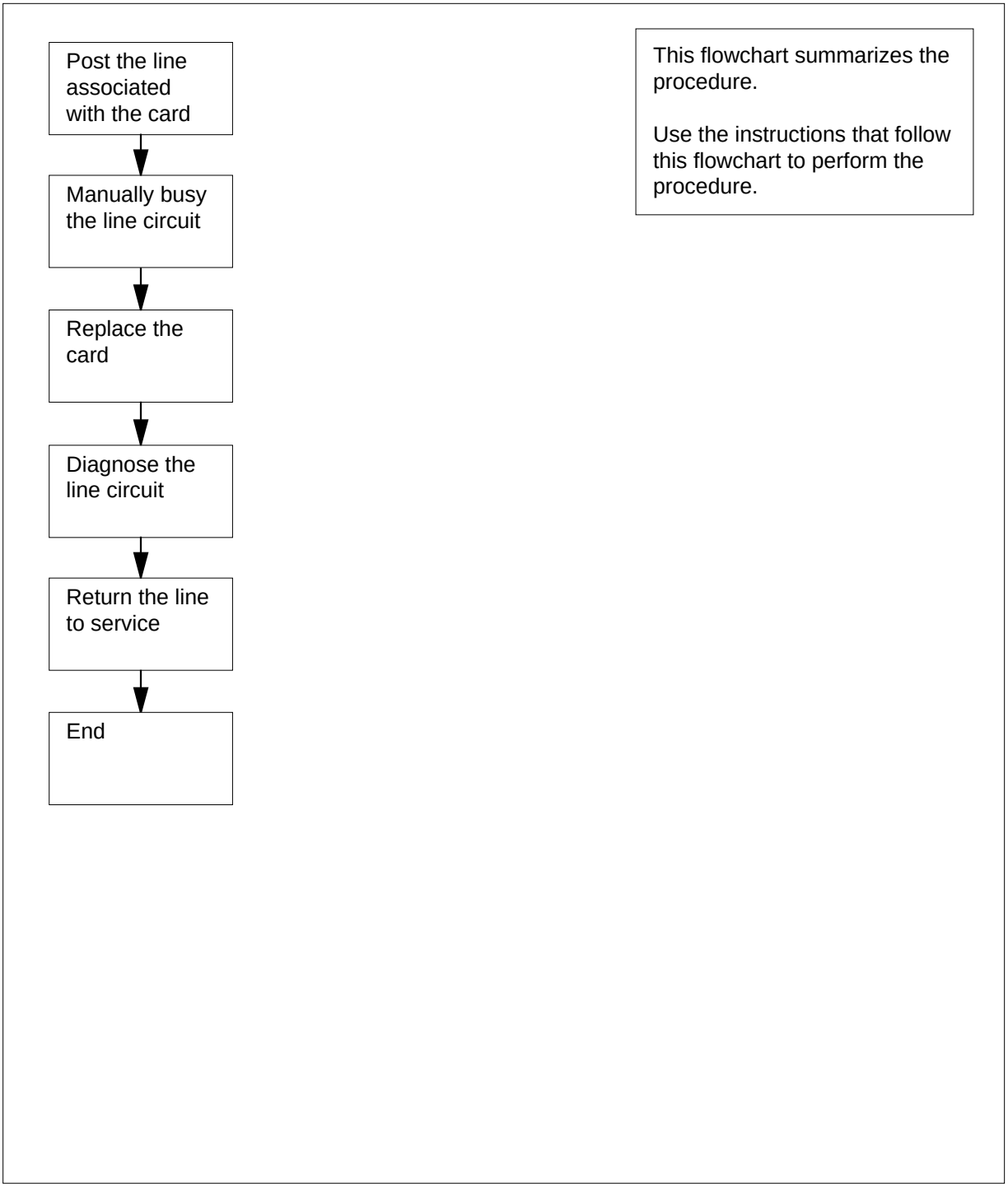
Do not go to the common procedure unless the step-action procedure directs you to go.

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.

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 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
```

If the DIAG command	Do
passed	step 11
failed	step 13

Line cards in an RLM 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 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 +24V card	RLC

Note: This procedure refers to the NT2X05 as a ringing generator (RG).

Common procedures

This procedure refers to *Replacing a card.*

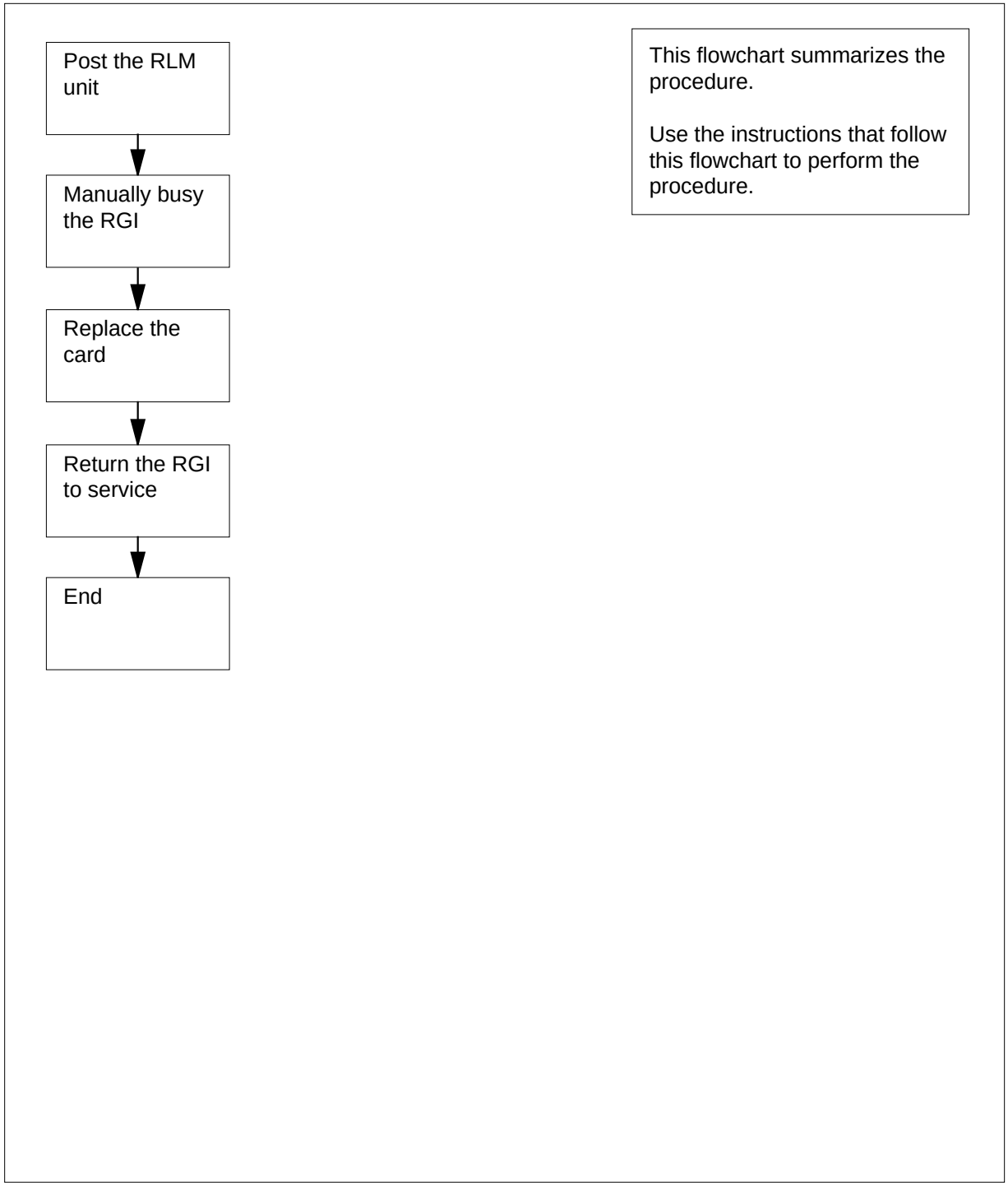
Do not go to the common procedure unless the step-action procedure directs you to go.

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.

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 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*

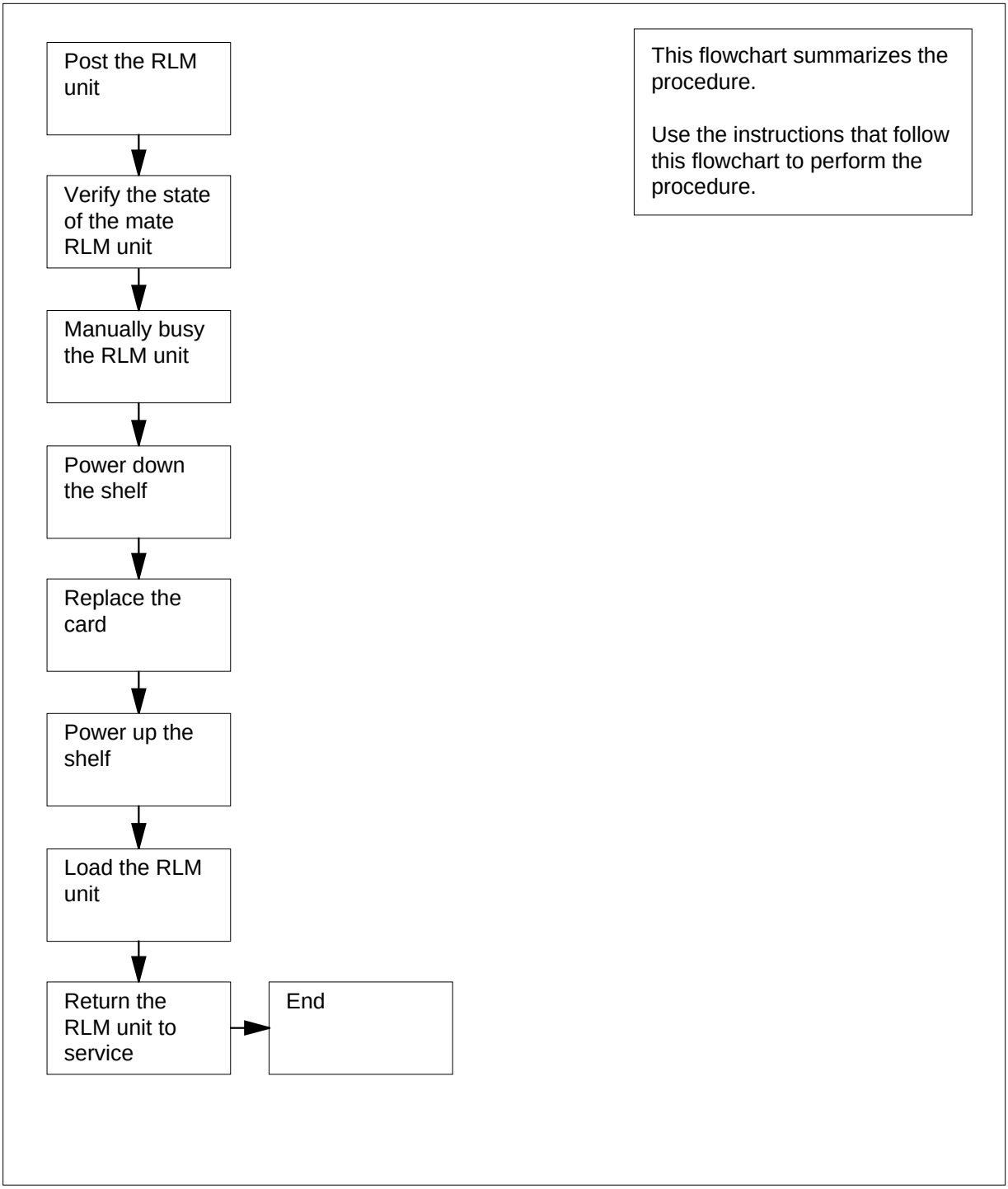
Do not go to the common procedure unless the step-action procedure directs you to go.

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 busying 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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