
Meridian 1

Hardware Replacement

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December 1995

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July 1995

Standard 10.00. This document is reissued to include international information to create a global Nortel Networks technical publication (NTP), Meridian 1 Option 81C, and minor text edits. Changes to technical content are noted by revision bars in the margins.

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Standard 5.0. New information and changes to technical content are noted by revision bars in the margins.

December 1992

Standard 4.0. New information and changes to technical content are noted by revision bars in the margins.

December 1991

Standard 3.0. This document is reissued to include technical content updates. Due to the extent of the changes, revision bars are omitted.

July 1990

Standard 2.0.

January 1990

Standard 1.0.

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About this document

This document applies to Meridian 1 Internet Enabled systems.

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described is supported in your area.

This document tells you how to replace hardware in Meridian 1 systems.

Who should use this document

This document is intended for individuals responsible for system maintenance.

How this document is organized

In this manual, “replacing hardware” means removing a faulty piece of equipment and installing identical operating equipment. The procedures in this document are based on the assumption that the system is properly installed (for example, all card locations, option switch settings, and cable connections are correct) and was fully operational before the hardware fault.

To use this document, you should have a basic knowledge of Meridian 1 maintenance procedures. Generally, only common tools (such as socket wrenches, screwdrivers, and pliers) are required to perform these procedures.

This document does not provide procedures for locating and clearing faults. See *Fault Clearing* (553-3001-510) to locate and clear faults.

Accessing the system

Content list

The following are the topics in this section:

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Reference list

The following are the references in this section:

- *Administration* (553-3001-311)
- *System Management Applications* (553-3001-301)

When you replace equipment, you often send commands to the system software in order to disable faulty equipment and to enable and test newly installed equipment.

You send maintenance commands to the system through the system terminal or the maintenance telephone. This section gives the procedures for accessing the system through these devices.

Note: The Multi User Login feature, available with software Release 19 and later, allows more than one device to interact with the Meridian 1. Refer to *System Management Applications* (553-3001-301) for details on using this feature.

Access through the system terminal

You can send maintenance commands and receive system messages by accessing the CPU through an RS-232 device, such as a video display terminal (VDT) or teletypewriter (TTY).

When you access the system through a system terminal, a login procedure is required (see Procedure 1 on page 10). All system passwords are initially set as 0000, but you can change passwords in the Configuration Record (LD 17).

Note: If a sysload occurs before you save a new password in a data dump, the last active password remains valid.

Each system has two levels of passwords: level 1 is for general use, level 2 is for administrative use. Either password is accepted in the login procedure.

Procedure 1 Access through the system terminal

- 1 Press the return key.
 - a) If the response is a period (.), you are ready to log into the system.
 - b) If the response is **OVL111 nn TTY x** or **OVL111 nn SL1** someone else is logged into the system. When they have logged off, press return and go to Step 2 on page 10.
 - c) If the response is **OVL111 nn IDLE** or **OVL111 nn BKGD** you are ready to log into the system. Go to Step 2 on page 10.
 - d) If the response is **OVL000 >** you are already logged into the system. Go to Step 5 on page 11.

- Note:* Responses vary with different Background Terminal packages.

- 2 Log into the system by entering **LOGI** then press the return key.

- 3 The normal response is
PASS?
If there is any other response, see *Administration* (553-3001-311).
- 4 Enter either the level 1 or level 2 password and press the return key.
If the password is correct, the system responds with the prompt **>**.
- 5 Load a program by entering
LD xx “xx” represents the number of the program
- 6 Perform tasks.
- 7 End the program by entering
END or ********
- 8 Always end the login session with
LOGO
Background routines are then loaded automatically.

Access through the maintenance telephone

A telephone functions as a maintenance telephone when you define the class-of-service as MTA (maintenance set allowed) in the Multi-line Telephone Administration program (LD 11). A maintenance telephone allows you to send commands to the system through the following maintenance overlays: LD 30, LD 32, LD 33, LD 34, LD 35, LD 36, LD 37, LD 38, LD 41, LD 42, LD 43, LD 45, LD 46, LD 60, LD 61, and LD 62.

Note: The Core Common Equipment Diagnostic (LD 135) and Core I/O Diagnostic (LD 137) are among the overlays that cannot be accessed through a maintenance telephone.

You can test tones and outpulsing through the maintenance telephone. Specific commands for those tests are given in the Tone and Digit Switch and Digitone Receiver Diagnostic (LD 34).

To access the system using the maintenance telephone, see Procedure 2 on page 13. To enter commands, press the keys that correspond to the letters and numbers of the command (for example, to enter *LD 42 return*, key in *53#42##*). Table 1 on page 12 shows the translation from a terminal keyboard to a telephone dial pad.

Note: To use the maintenance telephone, the peripheral equipment loop for that telephone must be operating.

Table 1
Translation from keyboard to telephone dial pad

Keyboard			Dial pad	
			1	1
A	B	C	2	2
D	E	F	3	3
G	H	I	4	4
J	K	L	5	5
M	N	O	6	6
P	R	S	7	7
T	U	V	8	8
W	X	Y	9	9
			0	0
			Space or #	#
			Return	##

Note: There is no equivalent for Q or Z on a dial pad.

Procedure 2
Access through the maintenance telephone

- 1 Press the prime DN key.
- 2 Place the set in maintenance mode by entering
xxxx91 "xxxx" is the customer Special Prefix (SPRE) number. It is defined in the Customer Data Block and can be printed using LD 21. The SPRE number is typically "1" (which means you would enter 191).
- 3 Check for busy tone by entering "return"
##
 - a) If there is no busy tone, go to Step 5 on page 11.
 - b) If there is a busy tone, a program is active. To end an active program and access the system enter

- 4 Load a program by entering
53#xx## "xx" represents the number of the program
- 5 Perform tasks.
- 6 Enter ******** to exit the program and return the telephone to call processing mode. Background routines are then loaded automatically.

Hardware replacement guidelines

Content list

The following are the topics in this section:

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Precautions

To avoid personal injury and equipment damage, review the following guidelines before handling Meridian 1 equipment.

Power equipment

There are no user-repairable components in the power system. If a power supply fails, the complete unit must be replaced. Do *not* disassemble a power supply under any circumstances.



DANGER OF ELECTRIC SHOCK

To avoid the danger of electric shock, be very careful when you work with power equipment and connections. Warning notices on the equipment are displayed and must be heeded.

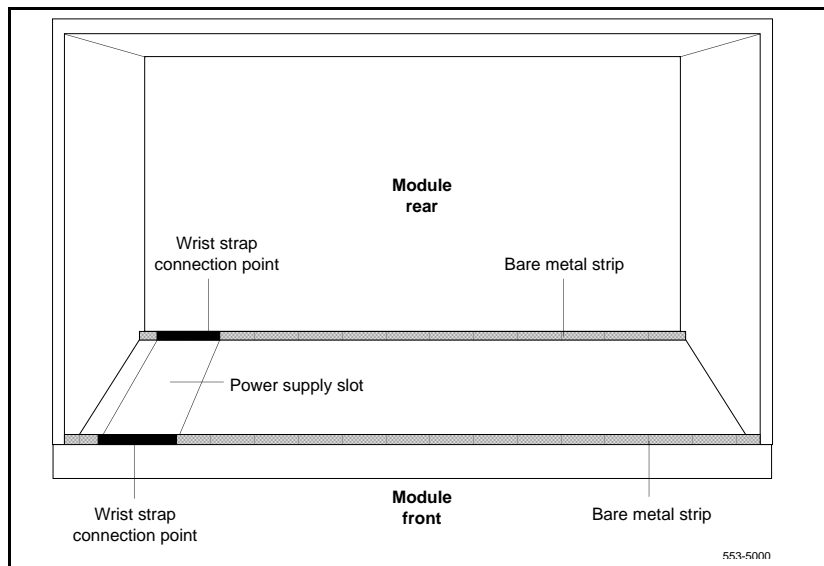
Circuit cards

Handle cards as follows:

- Unpack or handle cards away from electric motors, transformers, or similar machinery.
- Handle cards by the edges only. Do not touch the contacts or components.
- Set cards on a protective antistatic bag. If an antistatic bag is not available, hand-hold the card, or set it in a card cage unseated from the connectors.
- Store cards in protective packing. Do not stack cards on top of each other unless they are packaged.

To avoid card damage from static discharge, wear a properly connected antistatic wrist strap when you work on Meridian 1 equipment. If a wrist strap is not available, regularly touch one of the bare metal strips in a module to discharge static. Figure 1 on page 16 shows the recommended connection points for the wrist strap and the bare metal strips you should touch.

Figure 1
Static discharge points



During replacement procedures:

- Turn off the circuit breaker or switch for a module power supply before the power supply is removed or inserted.
- In AC-powered systems, capacitors in the power supply must discharge. Wait five full minutes between turning off the circuit breaker and removing the power supply from the module.
- Software disable cards, if applicable, before they are removed or inserted.
- Hardware disable cards, whenever there is an enable/disable switch, before they are removed or inserted.
- Return defective or heavily contaminated cards to a repair center. Do not try to repair or clean them.

Data disks

Follow the precautions below to avoid damaging disks:

- Handle only the hard surface; never touch the recording surface.
- Keep disks away from strong magnetic fields.
- Avoid exposing disks to extreme heat, rapid changes in temperature, or high humidity.
- Store disks in a suitable container.

To install a disk, make sure the arrow on the label is pointing up and the rounded corner is on the bottom on the right-hand side.



CAUTION

Damage to Equipment

The disk drive can be damaged if an upside-down disk is forced into the slot. If there is significant resistance when you try to insert a disk, remove the disk and check the position.

Options 51C, and 61C cable guidelines

To disconnect a cable from the Core/Network Module backplane, use the P0741489 Extraction Tool provided in the rear of the module (behind the I/O safety panel).



CAUTION

Damage to Equipment

You must use the P0741489 Extraction Tool to disconnect cables from the backplane shrouds in the NT5D21 Core/Network Module. Follow the procedure below to avoid bending or breaking pins when removing cable connectors from the backplane shrouds. Do not insert the extraction tool unless the cable connector is locked into the shroud. Do not force the extraction tool deeper than the detent on the cable connector.

- 1 Grasp the cable connector by the strain relief tab.
- 2 Center the longer flat edge on the angled end of the tool between the cable connector and the wall of the shroud on the right side of the cable connector.
Note: If the straight end of the tool is notched, use that end if the connector can be accessed straight-on. If you must angle the tool at all, use the angled end.
- 3 *Gently* insert the extraction tool and gradually apply pressure while gently rocking the cable connector up and down.
- 4 Stop applying pressure as soon as the detent of the cable connector comes loose from the shroud.
- 5 Slowly remove the extraction tool and the cable connector.

Before you connect cables to the backplane, visually inspect the backplane shroud connectors to make sure there are no bent pins. To connect cables:

- 1 Orient the cable connector so the strain relief paddle is to the right.
- 2 Partially insert the cable connector so its guides mate to the corresponding backplane connector.
- 3 Apply a small amount of pressure to push the cable connector straight into the backplane connector. You will feel a detent click when the connector seats.

**CAUTION****Damage to Equipment**

Pins may be bent or broken if you try to insert the cable connector at an angle. Do not push the connector in any further after you hear the detent click.

Replacing equipment

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Reference list

The following are the references in this section:

- *Software Conversion Procedures (553-2001-320)*
- *Networking Features and Services (553-2901-301)*
- *ISDN PRI: Maintenance (553-2901-501)*

- *Capacity Engineering* (553-3001-149)
- *System Installation Procedures* (553-3001-210)
- *Circuit Card: Installation and Testing* (553-3001-211)
- *Administration* (553-3001-311)
- *System Messages Guide* (553-3001-411)

Removing module covers and pedestal grills

Module covers

To remove the front and rear covers from a module:

- 1 With a flat-blade screwdriver, turn the lock clockwise on the two locking latches (see Figure 2 on page 25).
- 2 Simultaneously push the latches toward the center of the cover and pull the cover toward you while lifting it away from the module.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Pedestal grills

To remove the front and rear grills on the pedestal:

- 1 Loosen the two captive screws that secure the grill.
- 2 Pull the grill forward and lift it out of the base of the pedestal (see Figure 2 on page 25).

Removing UK air exhaust/intake grills

Use the following procedures to remove or replace the exhaust and intake grills on United Kingdom (UK) equipment.

Air exhaust grill

The front and rear air exhaust grills are secured by Southco fasteners located underneath the front edge of the grill. Use a #1 Phillips head screwdriver and turn the fasteners 1/4-turn to release or secure the grill (see Figure 2 on page 25).

Figure 2
Removing the pedestal grill

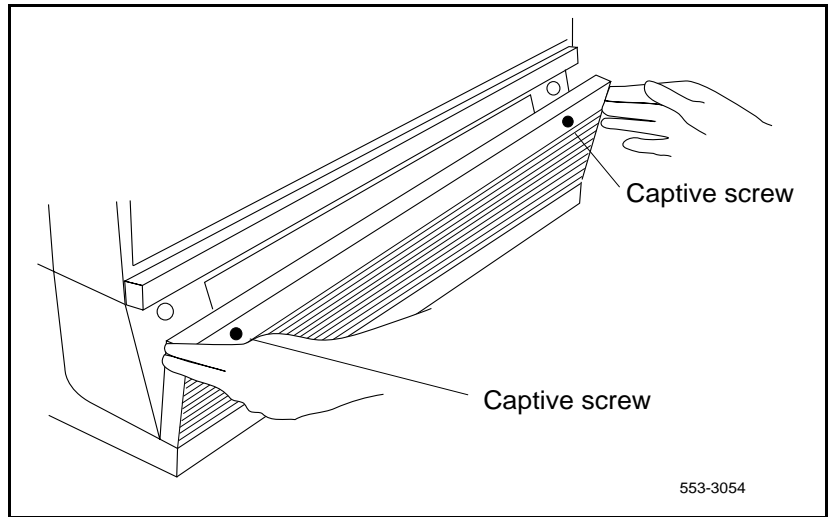
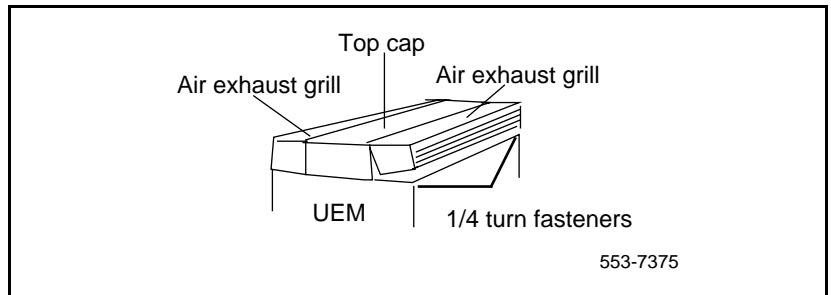


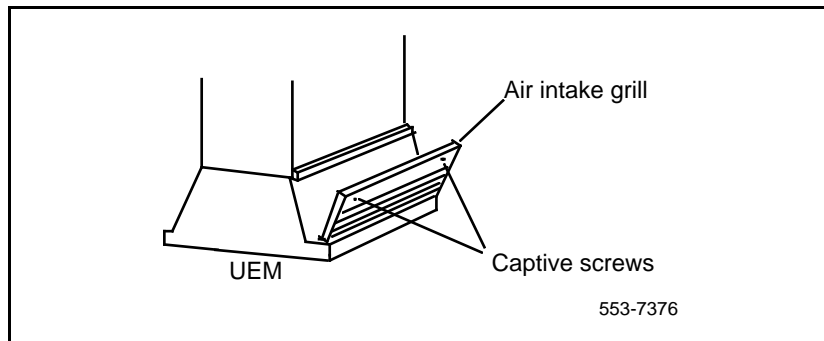
Figure 3
Removing air exhaust grill



Air intake grill

The front and rear air intake grills are secured by captive panel screws located in the face of the grill (see Figure 2 on page 25). Use a slotted screwdriver to release or secure the grill.


Figure 4
Removing air intake grill



NT1P61 Fibre Superloop Network Card

Use this procedure to replace an NT1P61 Fibre Superloop Network card.

- See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER
Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing and replacing a Fibre Superloop Network card

- 1 Disable the Fibre Superloop Network card by logging in to the system terminal, loading the Network and Peripheral Equipment Diagnostic Program LD 32, and executing **DIS loop**, where **loop** is the actual loop number of the Fibre Superloop Network card.
- 2 Set the ENB/DIS switch to DIS.

- 3 Disconnect all the fibre-optic patchcords and the SDI/System Monitor cable from the card faceplate.
- 4 Unlatch the card's locking devices by squeezing the tabs and pulling the upper locking device away from the card and pressing the lower locking device downward.
- 5 Pull the card out of the network module and place it into an antistatic bag away from the work area.
- 6 Check the replacement card and make sure that the Electro-optical packlets are already installed. If not installed, install the new packlets or remove the packlets from the faulty Fibre Superloop Network card and install them on the replacement card if you are sure that the packlets are not faulty.
- 7 Set the replacement card ENB/DIS switch to DIS.
- 8 Hold the replacement card by the card locking devices and insert it partially into the card guides in the module.
- 9 Pull the upper locking device away from the faceplate on the card and press the lower locking device downward and insert the card firmly into the backplane connector. Press the upper locking device firmly against the faceplate and press the lower locking device upwards to latch the card inside the module.
- 10 Set the ENB/DIS switch on the Fibre Superloop Network card to ENB. The Fibre Superloop Network card automatically starts the self-test.
- 11 Observe the red LED on the front panel during self-test. If it flashes three times and stays on, it has passed the test; go on to step 13. If it does not flash three times and then stays on, it has failed the test. Pull the card partially out of the module and reinsert it firmly into the module. If the problem persists, troubleshoot or replace the Fibre Superloop Network card.
- 12 Connect the SDI/System Monitor cable and the fibre-optic patchcords to the faceplate connectors of the replacement Fibre Superloop Network card.
- 13 Enable the Fibre Superloop Network card by logging in to the system terminal, loading the Network and Peripheral Equipment Diagnostic Program LD 32, and executing **ENLL loop**, where **loop** is the actual loop number of the Fibre Superloop Network card.
- 14 Tag the defective card(s) with a description of the problem and prepare them for shipment to your equipment supplier's repair depot.

NT1P62 Fibre Peripheral Controller Card

Use this procedure to replace a Fibre Peripheral Controller card.

- *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing and replacing a Fibre Peripheral Controller card

- 1 Load Network and Peripheral Equipment Diagnostic Program LD 32. At the > prompt, type **LD 32** and press the Enter key to access the program.
- 2 Type **DSXP x**, where **x** is the Fibre Peripheral Controller card, and press the Enter key to disable the card. The Fibre Peripheral Controller card is now disabled and you can remove it.
- 3 Disconnect all the fibre-optic patchcords from the card faceplate.
- 4 Unlatch the card's locking devices by squeezing the tabs and pulling the upper locking device away from the card and the lower locking device downwards.
- 5 Pull the card out of the IPE module or cabinet and place it in an antistatic bag away from the work area.
- 6 Check the replacement card and make sure that the Electro-optical packlets are already installed. If not installed, install the new packlets or remove the packlets from the faulty Fibre Peripheral Controller card and install them on the replacement card if you are sure the packlets are not faulty.
- 7 Hold the replacement card by the card locking devices and insert it partially into the card guides in the module.

- 8 Pull the upper locking device away from the faceplate on the card and the lower locking device downwards and insert the card firmly into the backplane connector. Press the upper locking device firmly against the faceplate and the lower locking device upwards to latch the card inside the module. The Fibre Peripheral Controller card automatically starts the self-test.
- 9 Observe the red LED on the front panel during self-test. If it flashes three times and stays on, it has passed the test. Go to step 11. If it does not flash three times and then stays on, it has failed the test. Pull the card partially out of the module and reinsert it firmly into the module. If the problem persists, troubleshoot or replace the Fibre Peripheral Controller card.
- 10 Connect the fibre-optic patchcords to the optical connectors of the Fibre Peripheral Controller card faceplate. For a wall-mounted Fibre Remote IPE, plug the fibre-optic span FC/PC optical connectors into the FC/PC optical connectors on the Fibre Peripheral Controller card faceplate.
- 11 At the prompt in the LD 32 program, type **ENXP x**, where **x** is the Fibre Peripheral Controller card, and press the Enter key to enable the card. If the uppermost red LED on the Fibre Peripheral Controller card faceplate turns off, the card is functioning correctly and is enabled. The outcome of self-test will also be indicated by LD 32 on the MMI terminal connected to the Fibre Peripheral Controller card. If the LED stays on, replace the card.
- 12 Tag the defective card(s) with a description of the problem and prepare them for shipment to your equipment supplier's repair depot.

NT4N43 cPCI Multi-Media Disk Unit

Core card replacement

All cards are factory installed. If you need to replace a card, follow the guidelines below.



CAUTION WITH ESDS DEVICES

To avoid card damage from static discharge, wear a properly connected antistatic wrist strap.

Review “Circuit cards” on page 16.

- 1 To remove a card, hold the card by the faceplate and gently pull it out of the slot.
- 2 To install a card, hold the card by the faceplate and gently push it into the slot until firmly seated and bolted into place.
- 3 Gently push forward to seat the card and lock it in place.
- 4 Never force the card into the slot. If the card gets stuck, remove it and try again.



Replacement procedures

Use “Procedure 1: Replace the NT4N43AA cPCI Multi-Media Disk Unit (MMDU) leaving the card cage in place” on page 30, if you have an I/O panel with an access panel and an interior cutout.

Use “Procedure 2: Replace the NT4N43AA cPCI Multi-Media Disk Unit (MMDU) by removing the card cage” on page 32, if you have an I/O panel with an access panel without an interior cutout or an I/O panel with solid metal on the left side

Use “Procedure 3: Replace the NT4N43BA cPCI Multi-Media Disk Unit (MMDU)” on page 36.

Procedure 1: Replace the NT4N43AA cPCI Multi-Media Disk Unit (MMDU) leaving the card cage in place

- 1 At the rear of the Call Processor PII (CP PII) module, remove the three cables connected to the back of the MMDU (see Figure on last page):
 - a. On the bottom cable, the CD-ROM and Hard Drive Data Cable (NT4N92AA), push up the tabs and disconnect the cable.
 - b. On the middle cable, the Floppy Data Cable (NT4N93AA), push up tabs and disconnect the cable.

- c. On the top cable, the Floppy, CD-ROM and Hard Drive Power Cable (NT4N95AA), squeeze the tabs, top and bottom, and release the cable.
- 2 At the front of the module, use a slotted or Phillips screwdriver to unscrew the screws on the top and bottom center of the MMDU.
Note: Some systems have MMDU screws which are captive; some systems have MMDU screws which can be removed.
- 3 Use the MMDU handle to slowly pull the MMDU forward, bringing the attached cables with it.
- 4 Remove the MMDU unit (with the cables attached) from the card cage.
- 5 Remove the cables and reattach them to the new MMDU.
- 6 From the front of the module, bundle and feed the cables attached to the MMDU into the MMDU slot.

**CAUTION****Damage to Equipment**

When you feed the cables into the MMDU slot, be very careful that the cables do not pinch or snag on either side.

- 7 Slowly slide the MMDU three-quarters of the way into the shelf until it is supported in the shelf.
- 8 At the rear of the module, gently pull the attached cables through to clear the backplane edge.

**CAUTION****Damage to Equipment**

Be careful not to pull any cables too hard or you may dislodge them from the unit. If any cables become dislodged, remove the MMDU from the front of the module and reattach the cables.

- 9 Connect the three MMDU cables:
 - a. Connect the longer of the two ribbon cables to the connector labeled Floppy Drive.

- b. Connect the shorter of the two ribbon cables to the slot (below the Floppy Drive) labeled IDE Secondary Channel.
 - c. Open the tabs and push the connector to attach the third cable to the top cable connection labeled +12, GND, GND, VCC.
- 10 From the front of the module, carefully slide the MMDU the remainder of the way into its slot.
- 11 Use a slotted or Phillips screwdriver to secure the screws on the top and bottom center of the MMDU.

**Procedure 2:
Replace the NT4N43AA cPCI Multi-Media Disk Unit (MMDU) by
removing the card cage**

- 1 Power down the shelf containing the card cage.
- 2 Disconnect the card cage cables:
 - a. Label and disconnect all cables to the front of the module. Tape over the contacts to avoid grounding. Tape or tie all cables to the sides so the working area in front of the card cage is totally clear.
 - b. If there is an I/O safety panel, remove it by turning the screws on each side. Set the cover aside.
 - c. Tag and disconnect all cables from the backplane to the interior of the I/O assembly.
 - d. Tag and disconnect all plugs, wires, and cables to the backplane.
- 3 Remove the card cage:

Note 1: Use two people to remove the Core/Net card cage because of the weight.

 - a. Remove the two mounting screws at the bottom rear of the card cage that secure the card cage to the module casting. You need a 1/4" nut driver to remove the screws. It is recommended that you use a magnetized screwdriver to avoid dropping the screws into the base of the UEM module.
 - b. Remove the front trim panels on both sides of the card cage.
 - c. Remove the three mounting screws that secure the front of the card cage to the bottom of the module. Save the screws for use with the CP PII card cage.
 - d. Pull the card cage forward until it is halfway out of the module.

- e. Remove the logic return (LTRN) (orange) wire from the backplane bolt.
Be careful; do not drop the nut or lock washer into the pedestal.
- f. Remove the wire from the frame ground bolt on the module.
- g. Label and disconnect the module power connectors. These are small orange connectors plugged into the module power distribution unit (MPDU) in an AC-powered system, or connected to each other in a DC-powered system.
- h. Label and disconnect the system monitor ribbon cables from J1 and J2.
- i. Remove the card cage from the module. Set it on a table to allow front and back access to the MMDU.

**CAUTION****Damage to Equipment**

Be sure to perform the following step. If you do not tape the EMI shield in position, you will not be able to install the card cage in the module correctly.

- j. Reposition the EMI shield (it looks like a brass grill) in the base of the module. Tape over the front mounting tabs to hold the shield in position. You will remove the tape later.

**CAUTION****Damage to Equipment**

Check for and remove any debris (such as screws) that may have fallen into the base of the UEM module.

- 4 Remove cables attached to the MMDU:
 - a. At the rear of the card cage, remove the three cables connected to the back of the MMDU (see Figure on last page):(NT4N92AA), push up the tabs and disconnect the cable.
 - b. On the middle cable, the Floppy Data Cable (NT4N93AA), push up tabs and disconnect the cable.
 - c. On the top cable, the Floppy, CD-ROM and Hard Drive Power Cable (NT4N95AA), squeeze the tabs, top and bottom, and release the cable.

- 5 At the front of the module, use a slotted or Phillips screwdriver to unscrew the screws on the top and bottom center of the MMDU.
Note: Some systems have MMDU screws which are captive; some systems have MMDU screws which may be removed.
- 6 Use the MMDU handle to slowly pull the MMDU forward, bringing the attached cables with it.
- 7 Remove the MMDU unit (with the cables attached) from the card cage.
- 8 Remove the cables and reattach them to the new MMDU.
- 9 From the front of the module, bundle and feed the cables attached to the MMDU into the MMDU slot.



CAUTION
Damage to Equipment

When you feed the cables into the MMDU slot, be very careful that the cables do not pinch or snag on either side.

- 10 Slowly slide the MMDU three-quarters of the way into the shelf until it is supported in the shelf.
- 11 At the rear of the module, gently pull the attached cables through to clear the backplane edge.



CAUTION
Damage to Equipment

Be careful not to pull any cables too hard or you may dislodge them from the unit. If any cables become dislodged, remove the MMDU from the front of the module and reattach the cables.

- 12 Connect the three MMDU cables:
 - a. Connect the longer of the two ribbon cables to the connector labeled Floppy Drive.
 - b. Connect the shorter of the two ribbon cables to the slot (below the Floppy Drive) labeled IDE Secondary Channel.
 - c. Open the tabs and push the connector to attach the third cable to the top cable connection labeled +12, GND,GND,VCC.

- 13 From the front of the module, carefully slide the MMDU the remainder of the way into its slot.
- 14 Use a slotted or Phillips screwdriver to secure the screws on the top and bottom center of the MMDU.
- 15 Replace the card cage:
 - a. Check that the power harness at the right rear corner of the card cage is attached card cage
 - b. Slide the CP PII card cage halfway into the module.
- 16 Reconnect the card cage cables.

Hold the card cage firmly and make the following connections at the rear of the module.

 - a. In **AC** powered systems, connect the remaining module power connectors to J2 on the MPDU.

In **DC** powered systems, connect the module power connectors to each other.
 - b. Attach the **system monitor** ribbon cables:
 - Connect the ribbon cable that goes down to the pedestal to connector **J1** on the backplane.
 - Connect the ribbon cable that goes up the column to **J2** on the backplane.
 - c. Attach the green ground wire to the frame ground bolt on the module. Use a 11/32" socket wrench to attach the wire. Remove the nut and the lock washer at the top of the bolt. Put the frame ground wire terminal over the bolt. Reinstall the top lock washer and the nut, then tighten down the nut.
 - d. Attach the orange logic return wire. Remove one nut and the lock washer from the LRTN blot at the rear of the card cage. Put the wire terminal over the bolt, reinstall the lock washer and nut, then tighten down the nut. Use a 1/4" or 2/8" socket wrench.
- 17 Slide the card cage all the way into the module.
- 18 Check the position of the EMI shield. If the EMI shield has shifted, reposition it. Remove the tape holding the EMI shield.
- 19 Pre-route cables NT4N88AA, NT4N88BA and NT4N90AA before you secure the card cage.

- a. Route cable **NT4N88AA** from **COM1** on the CP PII faceplate to **J25** on the I/O panel. (NT4N88AA is used to connect a terminal.)
- b. Route cable **NT4N88BA** from **COM2** on the CP PII faceplate to **J21** on the I/O panel. (NT4N88BA is used to connect a modem.)
- c. Route cable **NT4N90AA** from **LAN 1** on the CP PII faceplate to **J31 (top)** of the I/O panel
- d. Secure the card cage to the module with the three short screws in the front and the two long screws in the rear.

Note: You need a minimum 12" long, 3/8" hex head nut driver for the two screws in the rear of the card cage.

- 20 Replace the trim panels on both sides of the card cage.
- 21 Install the screws at the back of the card cage.
- 22 Reconnect the LAN 1, COM1 and COM2 cables.
- 23 Reconnect cables, plugs, and wires to the backplane:
 - a. Reconnect all plugs, wires, and cables to the backplane. Cables include 3PE to cCNI Transition cables; D and E intermodule cable; and the intermodule power harness.
 - b. Position the I/O safety panel. Tighten the screws.

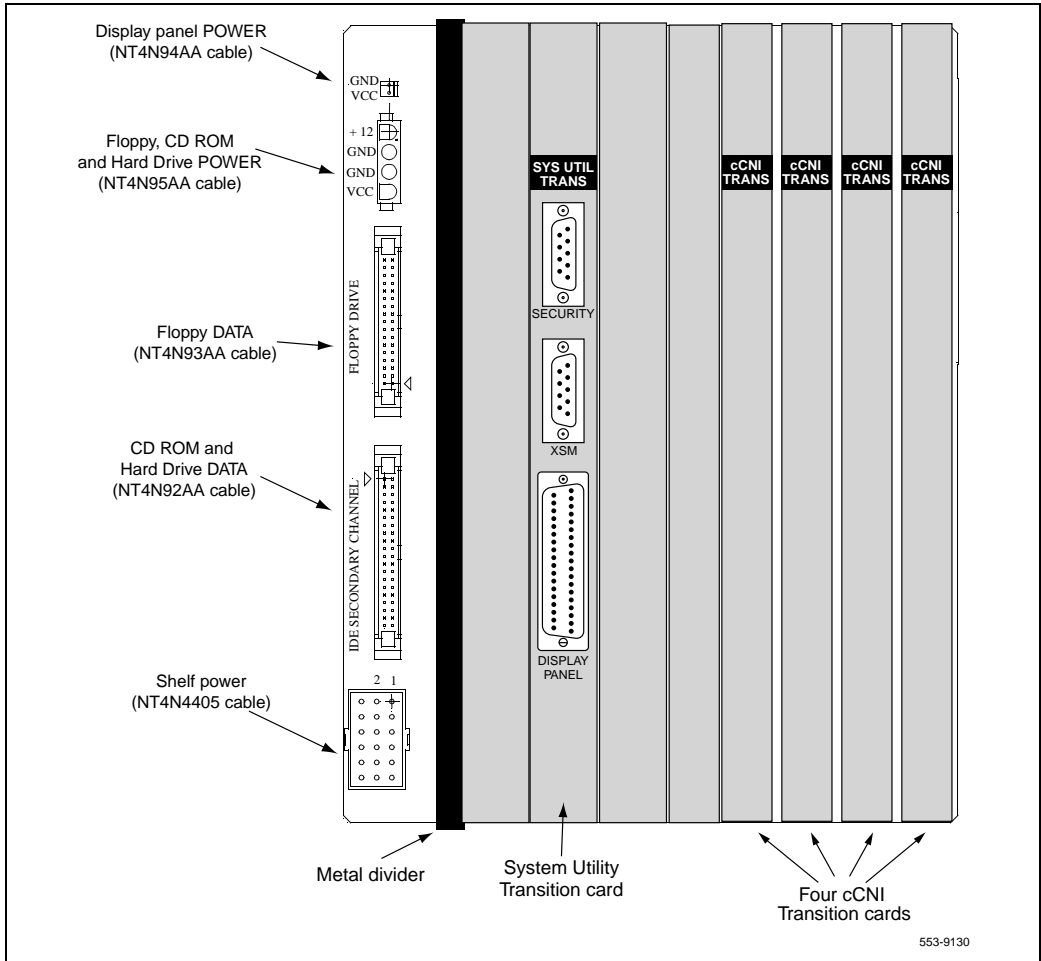
Procedure 3:
Replace the NT4N43BA cPCI Multi-Media Disk Unit (MMDU)

- 1 Make sure the CPU is idle.
- 2 Issue the split command.
- 3 Unscrew the screws that hold the MMDU in place.
- 4 Carefully slide the MMDU until just out of the shelf, turn the front of the MMDU to the left while supporting it with a hand.
- 5 At the rear of the MMDU remove the 3 cables in the following order:
 - a. Disconnect the NT4N95BA power cable.
 - b. Disconnect the NT4N93BA cable from the floppy.
 - c. Disconnect the NT4N92BA from the CD and HD.

- 6** Replace the MMDU and attach the 3 cable in the reverse order as follows:
 - a.** Attach the NT4N92BA to the CD and HD on the new MMDU.
 - b.** Attach the NT4N93BA to the Floppy on the new MMDU.
 - c.** Attach the NT4N95BA power cable.
- 7** Carefully slide the MMDU into the shelf.
- 8** Replace the screws.
- 9** Install Operating Software from Install Disk (*Software Conversion Procedures* (553-2001-320)).
- 10** Issue the Join CPU command (will initiate a disk to disk copy of software).

Note: If you replace a NT4N43AA with a NT4N43BA, use the cables that come with the NT4N43BA.

Figure 5
Location of cable connections on MMDU



NT4N65, and NT4N66 cPCI Core Network Interface Cards

This section describes how to replace:

- NT4N65 cPCI Core Network Interface Cards.
See “Procedure 1: Replace the NT4N65 cPCI Core Network Interface (cCNI) card” on page 39.
- NT4N66 cPCI Core Network Interface Transition Cards.
See “Procedure 2: Replace the NT4N66 cPCI Core Network Interface (cCNI) Transition Card” on page 40.

Procedure 1:

Replace the NT4N65 cPCI Core Network Interface (cCNI) card

- 1 Check that the Core containing the cCNI card to be replaced is inactive:
 - a. The LCD/LED display panel across the top of the Core/Net module core cards has two rows of LEDs.
If either of the LEDs (top = red or bottom = green) is on for any of the cards, that side is in a test or idle state.
 - b. If the Core containing the cCNI is active, switch cores in LD 135:

LD 135	To load the program.
SCPU	Switch.Core (if necessary).

- 2 In LD 135, software disable the cCNI card:


DIS CNI c s p Disable the cCNI card, where:

 - c = Core number (0 or 1)
 - s = Slot number (9 - 12)
 - p = Port number (0, 1)

This software disables both the cCNI card and its associated cCNI Transition card.

- 3 Hardware disable the cCNI card: set the faceplate switch to DIS.
- 4 Use a small-bladed screwdriver to remove the screws from the cCNI card.
- 5 To remove the card, hold the card by the faceplate latches and gently pull it out of the slot.

- 6 To install the replacement card, hold the card by the faceplate latches and gently push it into the slot until the connectors make contact with the backplane.
- 7 Gently push the latches forward to set the card and lock it in place.

	<p>CAUTION Damage to Equipment Never force the card into the slot. If the card gets stuck, remove it and try again.</p>
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- 8 Use a small-bladed screwdriver to replace the screws on the card.
- 9 Hardware enable the cCNI card: set the faceplate switch to ENB.
- 10 Software enable the cCNI card:

LD 135 To load the program.
ENL CNI c s Enable the cCNI card, where:
P c = Core number (0 or 1)
s = Slot number (9 - 12)
p = Port number (0, 1)

This software enables both the cCNI card and its associated cCNI Transition card.


Procedure 2:
Replace the NT4N66 cPCI Core Network Interface (cCNI) Transition Card

To replace a cCNI Transition Card, you must software and hardware disable the NT4N65 cCNI card associated with the NT4N66 cCNI Transition Card. You must disable the cCNI from the **inactive** core.

- 1 Check that the Core containing the cCNI card to be replaced is inactive:
 - a. The LCD/LED display panel across the top of the Core/Net module core cards has two rows of LEDs. If either of the LEDs (top = red or bottom = green) is on for any of the cards, that side is in a test or idle state.

- b. If the Core containing the cCNI Transition card is active, make the other Core active:
SCPU Switch.Core (if necessary).
- 2 In LD 135, software disable the cCNI card:
DIS CNI c s p Disable the cCNI card, where:
c = Core number (0 or 1)
s = Slot number (9 - 12)
p = Port number (0, 1)
This software disables both the cCNI card and its associated cCNI Transition card.
- 3 At the front of the module, hardware disable the NT4N65 cCNI card: set the faceplate switch to DIS.
- 4 At the back of the module, use a small-bladed screwdriver to remove the screws, located on the top and bottom of the cCNI Transition cards. Be careful not to drop the screws into the Pedestal. Refer to Figure 6 on page 43.
Note: cCNI Transition card replacement is more effective when all the cards are removed as a group, the card changed, and the card group replaced.
- 5 Remove the four screws that fasten the 3PE Termination Panel to its mounting bracket. Refer to Figure 7 on page 44.
- 6 Move the 3PE Termination Panel carefully to the left and out of its mounting bracket.
- 7 Press the card faceplate latches and unseat each card. (The cables are part of the NT4N66 cCNI Transition card assembly.)
- 8 Remove the NT4N66 cCNI Transition cards, cables, and 3PE Termination panel as an assembly.
- 9 Disconnect the cCNI Transition Card cable(s) to be replaced from the 3PE Termination panel.
Note: If you remove more than one cable, label the cables to correctly reconnect them later.
- 10 Install the NT4N66 cCNI Transition cards, cables, and 3PE Termination panel as an assembly.

- 11 Gently push the latches forward to set the card and lock it in place

	<p>CAUTION Damage to Equipment Never force the card into the slot. If the card gets stuck, remove it and try again.</p>
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- 12 Place the 3PE Termination Panel into its mounting bracket.
- 13 Install the four screws that fasten the 3PE Termination Panel to its mounting bracket.
- 14 Use a small-bladed screwdriver to replace the screws on the cCNI Transition cards.
- 15 At the front of the module, hardware enable the NT4N65 cCNI card: set the faceplate switch to ENB.
- 16 Software enable the NT4N65 cCNI card:

LD 135 To load the program.

ENL CNI c s Enable the cCNI card, where:

p c = Core number (0 or 1)

s = Slot number (9 - 12)

p = Port number (0, 1)

This software enables both the cCNI card and its associated cCNI Transition card.

Figure 6
Core/Net backplane

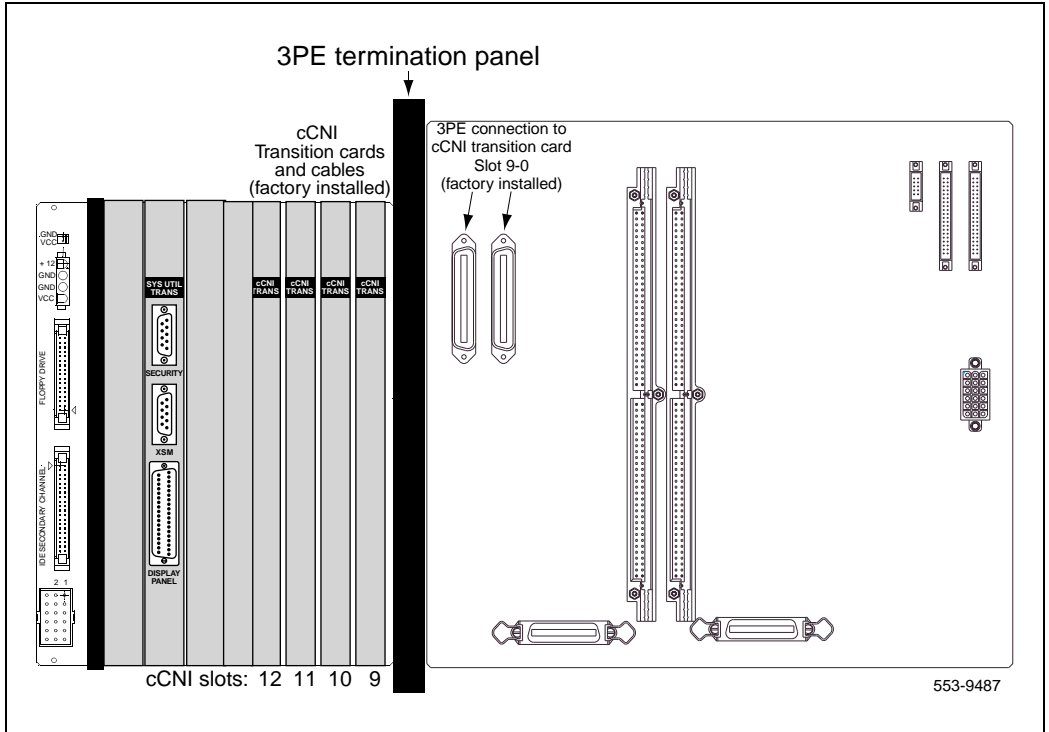
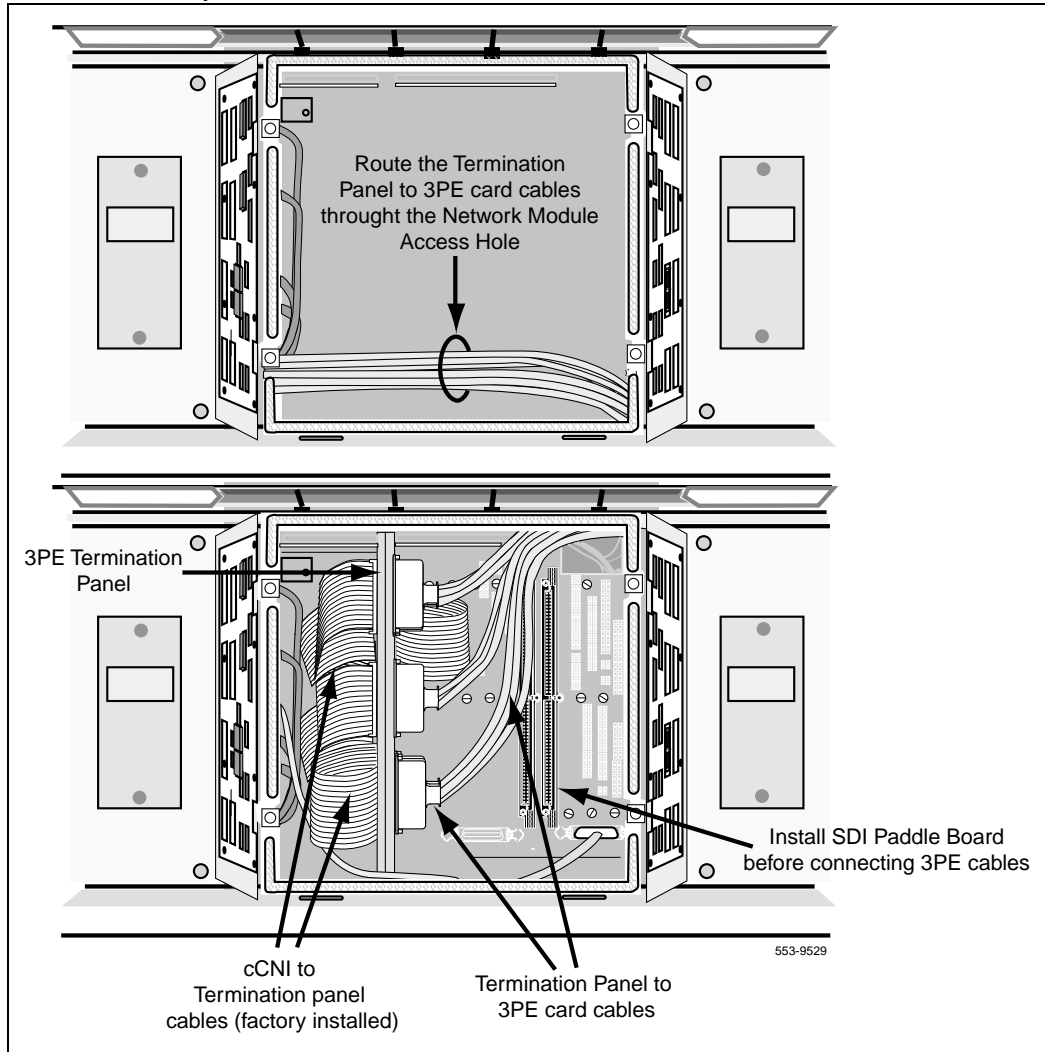


Figure 7
3PE Termination panel



NT4N67 and NT4N68 System Utility cards

This section describes how to replace:

- NT4N67 cPCI System Utility Cards.
See “Procedure 1: Replace the NT4N67 cPCI System Utility (SYS UTIL) card” on page 45.
- NT4N68 cPCI System Utility Transition Cards.
See “Procedure 2: Replace the NT4N68 cPCI System Utility Transition (SYS UTILTRANS) card” on page 47.

Procedure 1:

Replace the NT4N67 cPCI System Utility (SYS UTIL) card

- 1 Check that the Core containing the SYS UTIL card to be replaced is inactive:
 - a. The LCD/LED display panel across the top of the Core/Net module core cards has two rows of LEDs.
If either of the LEDs (top = red or bottom = green) is on for any of the cards, that side is in a test or idle state.
 - b. If the Core containing the SYS UTIL is active, switch cores in LD 135:

LD 135	To load the program.
SCPU	Switch.Core (if necessary).
- 2 In LD 135, split the CPU Cores:
SPLIT
- 3 In LD 135, on the inactive CP, software disable the SYS UTIL card:

DIS SUTL c	Disable the SYS UTIL card, where:
15	c = Core number (0 or 1)

This software disables both the cPCI System Utility card and its associated cPCI System Utility Transition card.
- 4 Hardware disable the SYS UTIL card: set the faceplate switch to DIS.
- 5 Use a small-bladed screwdriver to remove the screws from the SYS UTI card.

- 6 To remove the card, hold the card by the faceplate latches and gently pull it out of the slot.
- 7 To install the replacement card, hold the card by the faceplate latches and gently push it into the slot until the connectors make contact with the backplane.
- 8 Gently push the latches forward to set the card and lock it in place.



CAUTION

Damage to Equipment

Never force the card into the slot. If the card gets stuck, remove it and try again.

- 9 Use a small-bladed screwdriver to replace the screws on the card.
- 10 Hardware enable the SYS UTIL card: set the faceplate switch to ENB.
- 11 In LD 135, software enable the SYS UTIL card:
ENL SUTL c Enable the SYS UTIL card, where:
15 c = Core number (0 or 1)
This software enables both the cCPI System Utility card and its associated cCPI System Utility Transition card.
- 12 In LD 135, check status:
STAT SUTL c This checks the status SYS UTIL status where:
15 c = Core number (0 or 1)
This checks the status of both the cCPI System Utility card and its associated cCPI System Utility Transition card.
- 13 In LD 135, on the active CP, rejoin the two CP PII cards:
JOIN

Procedure 2: Replace the NT4N68 cPCI System Utility Transition (SYS UTILTRANS) card

To replace a System Utility Transition Card, you must software and hardware disable the NT4N67 System Utility card associated with the NT4N68 System Utility Transition Card. You must disable the System Utility card from the **inactive** core.

- 1 Check that the Core containing the SYS UTIL TRANS card to be replaced is inactive:
 - a. The LCD/LED display panel across the top of the Core/Net module core cards has two rows of LEDs. If either of the LEDs (top = red or bottom = green) is on for any of the cards, that side is in a test or idle state.
 - b. If the Core containing the SYS UTIL TRANS card is active, make the other Core active:

LD 135	To load the program.
SCPU	Switch.Core (if necessary).

- 2 In LD 135, split the CPU Cores:
SPLIT

- 3 In LD 135, on the inactive CP, software disable the SYS UTIL card:

DIS SUTL c	Disable the SYS UTIL card, where:
15	c = Core number (0 or 1)
	This software disables both the cCPI System Utility card and its associated cCPI System Utility Transition card.

- 4 At the front of the module, hardware disable the NT4N67 SYS UTIL card: set the faceplate switch to DIS.
- 5 Unseat the SYS UTIL card.
- 6 Remove the two cables, and the security device holder from the faceplate of the SYS UTIL TRANS card.
- 7 At the back of the module, use a small-bladed screwdriver to remove the screws, located on the top and bottom of the SYS UTIL TRANS card cards. Be careful not to drop the screws into the Pedestal. Refer to Figure 6 on page 43.

- 8 Install the replaced NT4N68 SYS UTIL TRANS card.
- 9 Gently push the latches forward to set the card and lock it in place



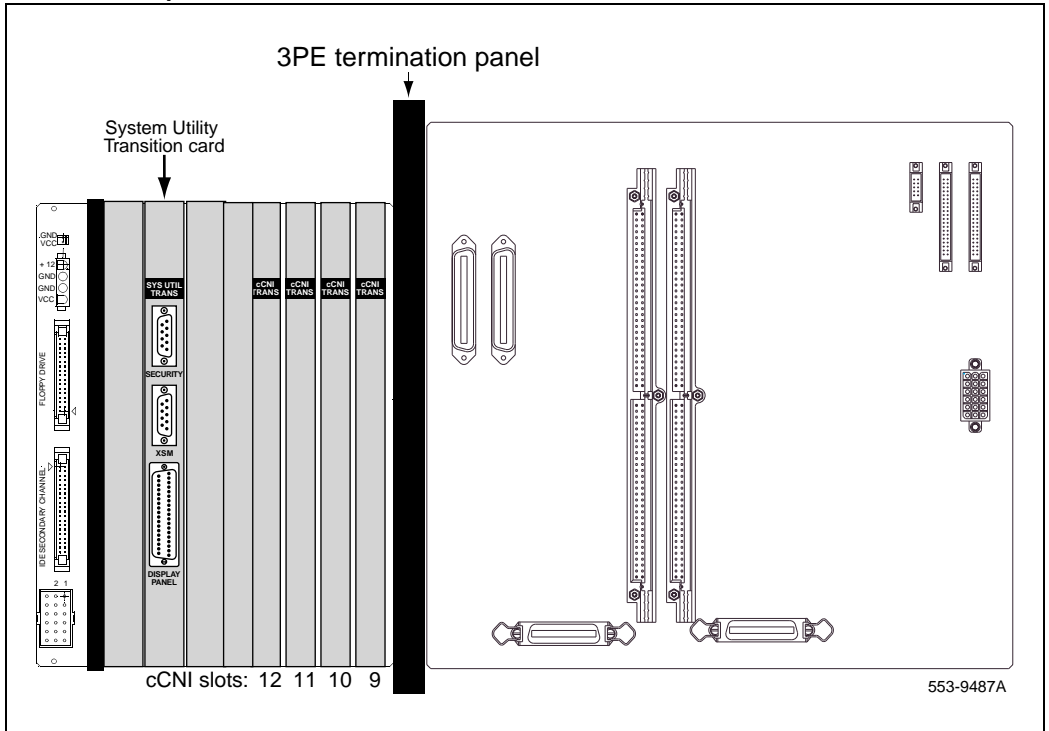
CAUTION

Damage to Equipment

Never force the card into the slot. If the card gets stuck, remove it and try again.

- 10 Use a small-bladed screwdriver to replace the screws on the SYS UTIL TRANS cards.
- 11 Replace the cables and security device connections to the faceplate of the SYS UTIL TRANS card.
- 12 Reseat the SYS UTIL card and push the latches to set the card into the backplane connector.
- 13 At the front of the module, hardware enable the NT4N67 System Utility card: set the faceplate switch to ENB.
- 14 In LD 135, on the inactive CP, software disable the SYS UTIL card:
ENL SUTL c Enable the SYS UTIL card, where:
15 c = Core number (0 or 1)
This software enables both the cCPI System Utility card and its associated cCPI System Utility Transition card.
- 15 In LD 135, on the inactive CP, check the SYS UTIL card status:
STAT SUTL c Disable the SYS UTIL card, where:
15 c = Core number (0 or 1)
This checks the status of both the cCPI System Utility card and its associated cCPI System Utility Transition card.
- 16 On the active CP, rejoin the two CP PII cards:
LD 135 To load the program.
JOIN

Figure 8
Core/Net backplane



NT4N64, and A0810496 Call Processor (CP PII) card


This section describes how to replace the NT4N64, or the A0810496 Call Processor CP PII cards.

**Procedure 1:
Replace the NT4N64, or the A0810496 Call Processor (CP PII)
card**

- 1 Check that the Core containing the CP PII card to be replaced is inactive:
 - a. The LCD/LED display panel across the top of the Core/Net module core cards has two rows of LEDs.
If either of the LEDs (top = red or bottom = green) is on for any of the cards, that side is in a test or idle state.
 - b. If the Core containing the CP PII card is active, switch cores in LD 135:
LD 135 To load the program.
SCPU Switch.Core (if necessary).

- 2 In LD 135, split the CPU Cores:
SPLIT

- 3 Remove all cables connected to the CPU being replaced.
- 4 Use a small-bladed screwdriver to remove the screws from the CP PII card.
- 5 To remove the card, hold the card by the faceplate latches and gently pull it out of the slot.
- 6 To install the replacement card, hold the card by the faceplate latches and gently push it into the slot until the connectors make contact with the backplane.
- 7 Gently push the latches forward to set the card and lock it in place.

	<p>CAUTION Damage to Equipment Never force the card into the slot. If the card gets stuck, remove it and try again.</p>
-------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------

- 8 Use a small-bladed screwdriver to replace the screws on the card.
- 9 Replace all cables on the replaced CP PII card.

- 10 After the inactive CP reloads, and in LD 135, check status:
STAT CPU
- 11 In LD 135, on the active CP, rejoin the two CP PII cards:
JOIN
- 12 After the disk sync and memory sync completes, and in LD 135,:
STAT CPU To check for normal system operation.
- 13 In LD 135, verify that the replaced CP PII card can control call processing:
SCPU To check replaced CP PII.

Note: Switch CPU back, if necessary.

NT5D10 68060 Call Processor (CP) Card

Use this procedure to replace an NT5D10 68060 Call Processor (CP) card.



CAUTION

Service Interruption

Replacing the CP card in a nonredundant system, such as 51C, will disrupt system operation. If possible, schedule the replacement at the lowest traffic time.

Administration (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpretation of system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



CAUTION

Service Interruption

At some point in this procedure, you will be required to warm start your system, causing a momentary interruption in call processing.

Removing equipment

- 1 To access the Core during the replacement procedure, connect a terminal to the J25 port on the I/O panel in the Core Module or Core/Network Module for the CP card you are replacing. To communicate with the processor, you must use the following settings on the terminal:

9600 baud, 7 data, space parity, 1 stop bit, full duplex, XOFF

Note: If you are using only one terminal or a switch box, switch the connection from Core to Core as needed.

- 2 The CP card you are replacing must be in the inactive Core. Check the status of the NT5D10 Call Processor cards:

LD 135

STAT CPU determine which CP card is active

If necessary, switch Cores:

SCPU switch Cores

******** exit LD 135

- 3 Set the NORM/MAINT switch on the NT5D10 Call Processor card to MAINT on the *active* Core.
- 4 Set the ENB/DIS switch on all CNI cards on the *inactive* Core to DIS.
- 5 Perform the following three steps on the *inactive* Core in an uninterrupted sequence:
 - a. Press and hold down the MAN RST button on the CP card on the inactive Core.
 - b. Set the NORM/MAINT switch to MAINT.

- c. Release the MAN RST button.

The system is now in split mode where each Core is functioning independently and the automatic switchover has been disabled.

Installing equipment

- 1 Set the NORM/MAINT switch to MAINT on the replacement card.
- 2 Insert the Install Program diskette which corresponds with the NT5D10 Call Processor.
- 3 Remove the current CP card and put it in a static bag and box.
- 4 Insert the CP replacement card into its vacated slot and hook the locking devices.
- 5 Press the MAN RST button on the replacement CP card.
- 6 When the NT Logo Screen appears on the terminal, press <CR>.
- 7 Enter the date and time.
- 8 When the Main Menu appears, select <u> to go to the Install Menu.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
                M A I N   M E N U

The Software Installation Tool will install or upgrade Meridian-1
System Software, Database and the PE-ROM (both CP and IOP ROM).
You will be prompted throughout the installation and given the
opportunity to quit at any time.

Please enter:
<CR>--> <u> - To Install menu.
         <t> - To Tools menu.
         <q> - Quit.

Enter choice > u
    
```

553-7780

- 9 Insert the Keycode diskette when prompted and select **<a>** to continue with the keycode validation.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----
Please insert the diskette with the keycode file into the floppy
drive.

Please enter:
<CR>--> <a> - Continue with the keycode validation
        (the keycode diskette is in the floppy drive).
        <q> - Quit.

Enter Choice > a
```

553-7729

- 10 Select the following options in sequence from the Install Menu:

<g> to reinstall CP software
<y> to start installation
<a> to continue ROM upgrade
<cr> to return to the Install Menu

- 11 When the Install Menu appears, select the following options in sequence

<e> to install CP-BOOTROM
<y> to start installation
<a> to continue with the upgrade

- 12 A Status Summary is displayed indicating what was installed. Press <CR> to return to the Install Menu.

- 13 **Remove the diskette** from the IODU/C.

14 Select the following options to quit the Install Tool:

- | | |
|-----|-----------------------|
| <q> | to quit |
| <y> | to confirm quit |
| <a> | to reboot the system. |

Note: The system will reboot. Wait for the “INI” and “DONE” messages to display before continuing. It will take at least 70 seconds between the “DONE” and “INI” messages.

After the system initialization has finished (INI messages are no longer displayed on the system terminal), check for dial tone on a telephone set.

Following a successful dial tone test, perform the following basic sanity tests:

- a. Make sure calls can be placed.
- b. Check for error messages, line noise, chatter, or other problems. Track sources and resolve problems as necessary.

To place the system back in the redundant (normal) mode with automatic switchover capability. Perform the following five steps in uninterrupted sequence on the *inactive* Core (the Core with the replaced CP card):

- 15** Press and hold down the MAN RST button on the CP card of the *inactive* Core.
- 16** While holding down the MAN RST button, set the NORM/MAINT switch on the same CP card to NORM.
- 17** Enable all CNI switches in the inactive Core.
- 18** Release the MAN RST button.
- 19** Set the CP card in the active Core to NORM.

After several minutes, an “HWI533” message is issued by the *active* Core indicating that the *inactive* Core memory is being synchronized with the *active* Core memory.

20 Log into the system through the terminal, then check the status of the replacement CP card from the active side:

- | | |
|-----------------|-----------------------|
| LD 135 | load LD 135 |
| STAT CPU | obtain the CPU status |

- 21 If there are CCED messages generated by the STAT CPU command on the replacement CP card, set the NORM/MAINT switch to MAINT, press the reload (MAN RST) button, and set the NORM/MAINT switch back to NORM. (It may take 2 to 4 minutes for memory synchronization to take place.)

After the HWI0533 message is displayed, test the replacement CP card from the active CPU:

TEST CPU the test causes a cold start on the inactive CPU

If the test results in:

CCED014 "Test failed because unable to enter SPLIT mode"

On the active CP card set the NORM/MAINT switch to NORM, and from the active side enter:

TEST CPU to test the CP card

- 22 Set the NORM/MAINT switch to NORM on the active CP card (if not already set).

- 23 Check the status of the CPUs:

STAT CPU

- 24 Test the CPU.

TEST CPU

- 25 Check the status of the CNIs:

STAT CNI

- 26 Switch Cores and exit the program:

SCPU

**** exit LD 135

- 27 The CP card you are replacing must be in the inactive Core. Check the status of the NT5D10 Call Processor cards:

LD 135

STAT CPU determine which CP card is active

If necessary, switch Cores:

SCPU switch Cores

**** exit LD 135

- 28 Set the NORM/MAINT switch on the NT5D10 Call Processor card to MAINT on the *active* Core.
- 29 Set the ENB/DIS switch on all CNI cards on the *inactive* Core to DIS.
- 30 Perform the following three steps on the *inactive* Core in an uninterrupted sequence:
 - a. Press and hold down the MAN RST button on the CP card on the inactive Core.
 - b. Set the NORM/MAINT switch to MAINT.
 - c. Release the MAN RST button.

The system is now in split mode where each Core is functioning independently and the automatic switchover has been disabled.

Installing equipment

- 1 Set the NORM/MAINT switch to MAINT on the replacement card.
- 2 Insert disk A1 into the IOP/CMDU or CMDU.
- 3 Remove the current CP card and put it in a static bag and box.
- 4 Ensure the NORM/MAINT switch is set to MAINT, and insert the CP replacement card into its vacated slot and hook the locking devices.
- 5 Press the MAN RST button on the replacement CP card.
- 6 Select the following options in sequence from the Install Menu:

<g>	to reinstall CP software
<y>	to start installation
<y>	to continue installation
<a>	to continue with ROM upgrade
<cr>	to return to the Install Menu
- 7 At the Install Menu, select the following options in sequence:

<e>	to install CP-BOOTROM
<y>	to start installation
<y>	to continue installation
<a>	to continue with ROM upgrade
<cr>	to return to the Install Menu
- 8 **Remove the diskette** from the IOP/CMDU or CMDU.

- 9 Select the following options to quit:
- | | |
|-----|-----------------------|
| <q> | to quit |
| <y> | to confirm quit |
| <a> | to reboot the system. |

Note: The system will reboot. Wait for the “INI” and “DONE” messages to display before continuing. It will take at least 70 seconds between the “DONE” and “INI” messages.

After the system initialization has finished (INI messages are no longer displayed on the system terminal), check for dial tone on a telephone set.

- 10 Following a successful dial tone test, perform the following basic sanity tests:
- a. Make sure calls can be placed.
 - b. Check for error messages, line noise, chatter, or other problems. Track sources and resolve problems as necessary.

To place the system back in the redundant (normal) mode with automatic switchover capability. Perform the following five steps in uninterrupted sequence on the *inactive* Core (the Core with the replaced CP card):

- 11 Press and hold down the MAN RST button on the CP card of the *inactive* Core.
- 12 While holding down the MAN RST button, set the NORM/MAINT switch on the same CP card to NORM.
- 13 Enable all CNI switches in the inactive Core.
- 14 Release the MAN RST button.
- 15 Set the CP card in the active Core to NORM.

After several minutes, an “HWI533” message is issued by the *active* Core indicating that the *inactive* Core memory is being synchronized with the *active* Core memory.

- 16 Log into the system through the terminal, then check the status of the replacement CP card from the active side:
- | | |
|-----------------|-----------------------|
| LD 135 | load LD 135 |
| STAT CPU | obtain the CPU status |

- 17** If there are CCED messages generated by the STAT CPU command on the replacement CP card, set the NORM/MAINT switch to MAINT, press the reload (MAN RST) button, and set the NORM/MAINT switch back to NORM. (It may take two to four minutes for memory synchronization to take place.)

After the HWI0533 message is displayed, test the replacement CP card from the active CPU:

TEST CPU the test causes a cold start on the inactive CPU

If the test results in:

CCED014 “Test failed because unable to enter SPLIT mode”

On the active CP card set the NORM/MAINT switch to NORM, and from the active side enter:

TEST CPU to test the CP card

- 18** Set the NORM/MAINT switch to NORM on the active CP card (if not already set).

- 19** Check the status of the CPUs:

STAT CPU

- 20** Test the CPU.

TEST CPU

- 21** Check the status of the CNIs:

STAT CNI

- 22** Switch Cores and exit the program:

SCPU

**** exit LD 135

NT5D12AA Dual DTI/PRI (DDP)

Use this procedure to replace an NT5D12AA DDP card. See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



CAUTION WITH ESDS DEVICES


The static discharge bracelet located inside the cabinet must be worn before handling circuit cards. Failure to wear the bracelet can result in damage to the circuit cards.

Removing the DDP card

- 1 Determine the cabinet and shelf location of the DDP card to be removed.
- 2 Disable Network Loop using Overlay 60. The command is DISL “loop number”.

The associated DCHI may have to be disabled first. The faceplate switch S1 should not be disabled until both PRI loops are disabled first.
- 3 If the DDP card is being completely removed, not replaced, remove data from memory. See *Networking Features and Services* (553-2901-301).
- 4 Remove cross connections at the MDF to the wall-mounted cross-connect terminal.
- 5 Tag and disconnect cables from the card.

- 6 Rearrange Clock Controller cables, if required.

	<p>CAUTION System Failure</p> <p>Do not route Clock Controller cables connecting the Clock Controller and DDP card through the center of the cabinet past the power harness. Instead, route them around the outside of the equipment shelves.</p>
-----------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

- 7 In the other circuit of a DDP card is in use, DO NOT remove the card.
- 8 Remove the DDP card if both loops are disabled. Switch S1 (faceplate switch) must be in the OFF (DIS) position before you remove the card.
- 9 Package and store the DDP card and cables.

Installing the DDP card

Set the option switches on the DDP circuit card before installation; see Table 2 below, where bold font indicates factory settings.

Table 2
DDP general purpose switch settings

Switch	Description	S9/S15 Switch Setting
1	Framing mode	off = ESF on = SF
2	Yellow alarm method	off = FDL on = Digit2
3	Zero code suppression mode	off = B8ZS on = AMI
4	Unused	off

Note: SW1 (faceplate switch) must be off (DIS) when installing the DDP.SW1 on the DDP corresponds to the faceplate switch on the QPC414 Network card.

- 10 Run and connect the DDP cables.



CAUTION
System Failure

Do not route Clock Controller cables connecting the Clock Controller and DDP card through the center of the cabinet past the power harness. Instead, route them around the outside of the equipment shelves.

- 11 Enable faceplate switch S1. This is the “Loop Enable” switch.
The faceplate LEDs should light for four seconds, then go out, and the OOS, DIS, and ACT LEDs should light again and stay lit.
If DDCH is installed, the DCH LED should flash 3 times.
- 12 Run PRI/DTI Verification Test. Refer to the *ISDN PRI: Maintenance* (553-2901-501).
- 13 Run PRI status check. Refer to the *ISDN PRI: Maintenance* (553-2901-501) for the PRI verification tests, DDP self-test, PRI status check, and PRI start-up test.

NT5D20 IOP/CMDU cards or NT6D63 IOP and NT6D64 CMDU cards replaced with NT5D61 IODU/C cards

This procedure replaces NT5D20 IOP/CMDU cards or NT6D63 IOP and NT6D64 CMDU cards on Options 51C/61C with NT5D61 IODU/C cards. This procedure installs Release 23 software. Before performing this procedure you must be running Release 21 or later software. See *Software Conversion Procedures* (553-2001-320) for converting software to software Release 21. The replacement procedure differs for a:

- redundant system
- single CPU system (procedure begins on page 87)

Note: IOP/CMDU or IOP and CMDU cards cannot be mixed with IODU/C cards in the same system.

**CAUTION****Service Interruption**

Performing this procedure in a nonredundant system, such as 51C, will disrupt system operation. If possible, schedule the replacement at the lowest traffic time.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.

**DANGER**

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

**CAUTION****Service Interruption**

At some point in this procedure, you will be required to warm start your system, causing a momentary interruption in call processing.

Replacement procedures for redundant systems (Options 61C)

To perform this procedure the following is required:

- an Install Program diskette specific to your CP type
- a CD-ROM containing generic system software
- one Keycode diskette
- Database diskette(s)

- two NT5D61 IODU/C cards
- two IODU/C Security Devices
- a Database Transfer Utility diskette to archive the IOP/CMDU database on 2MB floppy diskettes.

Note: The diskettes in the Software Install Kit are write protected. Ensure that you unprotect the disks before installation.

Performing a data dump

Before starting this procedure, make a backup copy of the customer database on a 4MB diskette using the data dump routine:

- 1 Log into the system
- 2 Load the Equipment Data Dump Program (LD 43). At the prompt, enter **LD 43** to load the program
- 3 When "EDD000" appears on the terminal, enter **EDD** to begin the data dump
- 4 When "DATADUMP COMPLETE" and "DATABASE BACKUP COMPLETE" appear on the terminal, enter ******** to exit the program



CAUTION System Failure

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

- 5 To access the Core during the replacement procedure, connect a terminal to the J25 port on the I/O panel in the *inactive* Core Module or Core/Network Module. To communicate with the processor, you must use the following settings on the terminal:

9600 baud, 7 data, space parity, 1 stop bit, full duplex, XOFF

If you are using only one terminal or a switch box, switch the connection from Core to Core as needed.

Splitting the cores

- 1 Verify that the disk drives are synchronized:
 - LD 137** to load the program
 - STAT** to get the status of the disk drives

 - 2 If the disks are synchronized, proceed with Step 3 on page 65. If they are not synchronized, execute the SYNC command:
 - SYNC** to synchronize the drives
 - ****** to exit the program

 - 3 Verify that clock controller 0 is active. If it is not, switch to clock controller 0:
 - LD 60** to load the program
 - SCK 0** to get the status of clock controller 0
 - SWCK** to switch to clock controller 0 (if necessary)
 - ****** to exit the program

 - 4 Verify that Core 0 is the active Core:
 - LD 135** to load the program
 - STAT CPU** to check CPU status
 - TEST CPU** to test the CPU
- If Core 0 is active, proceed with Step 5 on page 65. If Core 0 is not the active CPU, swap Cores and verify again:
- SCPU** to swap CPUs
 - STAT CPU** to check CPU status
- 5 Verify that CMDU 0 is active. You may need to switch CMDUs.
 - LD 137** to load the program
 - STAT** Get the status of CMDU and IOP.
 - SWAP** Switch CMDUs (if necessary).

 - 6 Set the MAINT/NORM switch on the CP card in Core 0 to MAINT.

 - 7 Set the ENB/DIS switch on all CNI cards in Core 1 to DIS.

 - 8 Insert the **Database Transfer Utility** diskette which corresponds to your Call Processor card into the IOP/CMDU or CMDU in Core 1.

- 9 Perform the following three steps in uninterrupted sequence:
 - a. press and hold the MAN RST button on the CP card in Core 1
 - b. set the MAINT/NORM switch on the CP card in Core 1 to MAINT
 - c. release the MAN RST button

Transferring the database to 2MB


- 1 When the NT Logo Screen appears on the terminal, the Database Transfer Utility has loaded. Press <CR> to continue.

```
NT Meridian - 1 Software/Database/PEROM INSTALL Tool (x11)
=====
                                     * *
                                   * * *
* * * *           * *           * * * *
* * * *           * * * * *       * * * * * * * * *
* * * *           * * * * * * *   * * * * * * * * *
* * * * * * * * * * * * * * * * * * * * * * * * * *
* * * *           * * * *           * * * *
* * * *           * * * *           * * * *           Northern Telecom — Meridian 1
* * * *           * * * *           * * * *           Install Tool (x11)
* * * *           * * * *           * * * *
* * * *           * * * * * * * * * * * * * * * * *
* * * *           * * * * * *       * * * * * *
* * * *           * * *           * * *
                                     * * *

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Please press <CR> when ready . . .
```

553-7790



CAUTION
System Failure
When using the Database Transfer Utility, only select option <t> *Tools Menu* and <s> *To archive existing database*. Selecting any other option can result in operating system corruption.

- 2 At the Database Transfer Utility Install menu, select <t> to go to the Tools Menu.

NT Meridian - 1 Software/Database/PEROM INSTALL Tool (x11)

== == == == == == == == == == == == == == == == == == == == == ==

I N S T A L L M E N U

The Software Installation Tool will install or upgrade Meridian-1 System Software, Database and the PE-ROM (both CP and IOP ROM). You will be prompted throughout the installation and given the opportunity to quit at any time.

Please enter:

- <CR>--> <a> - To install Software, CP-BOOTROM, IOP-ROM.
 - To install Software, Database, CP-BOOTROM, IOP-ROM.
<c> - To install Software only.
<d> - To install Database only.
<e> - To install CP-BOOTROM only.
<f> - To install IOP-ROM only.
<g> - To reinstall CP-Software.
<t> - To go to the Tools menu.
<q> - Quit.

Enter choice > t

553-7791

- 3 At the Database Transfer Utility Tools menu select **<s>** to archive the database on one or more 2MB diskettes.

```
NT Meridian - 1 Software/Database/PEROM INSTALL Tool (x11)
-----
                                T O O L S   M E N U

This is the Tools Menu for Install. You can select the tool that
is appropriate. Please select one of the options below.

Please enter:
<CR>--> <a> - To set the system date and time.
         <b> - To partition the hard disk.
         <c> - To display the partition size of hard disk.
         <d> - To regenerate PDT Password.
         <s> - To archive existing database.
         <e> - To install CP software at a specified slot.
         <m> - To go back to the Main Menu

Enter choice > s
```

553-7792

- 4 When the number of 2MB diskettes required is displayed, select **<a>**.

```
* * *   NT Meridian - 1 Database ARCHIVE Tool   * * *
-----
The Total Size of the backup files: XXXX KBytes
Estimated number of 2MB floppy diskettes: X

<CR>--> Please enter:
         <a> - Continue.
         <q> - Quit.

Enter choice >
```

553-7776

- 5 When prompted, insert the database diskette and select **<a>** to continue.

- 6 The message "Database backup complete!" will be displayed, and the Tools menu will reappear.
- 7 Remove the 2MB diskette from the IOP/CMDU, but *do not* reboot the system at this point.

Upgrading Core 1

- 1 **In systems equipped with an NT6D63 IOP and NT6D64 CMDU**, perform the following two steps to remove these cards:
To remove the IOP:
 - a. Set the ENB/DIS switch to DIS on the IOP being upgraded.
 - b. Remove the IOP.To remove the CMDU:
 - a. If there is a floppy disk in the CMDU you are upgrading, remove the floppy disk.
 - b. Set the power switch on the front of the CMDU, if present, to OFF (down).
 - c. Wait at least 10 seconds, then unhook the locking devices on the CMDU and gently pull the unit out of the card cage.
- 2 **In system equipped with an NT5D20 IOP/CMDU**, perform the following two steps to remove this card:
 - a. Set the ENB/DIS switch on the IOP/CMDU to DIS.
 - b. Unhook the locking devices and remove the IOP/CMDU.
- 3 Locate the round 1/2" diameter IODU/C Security Device.
- 4 Make sure the 8-digit code on the keycode diskette matches the 8-digit code on the Security Device.
- 5 With the Nortel side facing upward, slide the Security Device between the black round security device holder on the top right hand corner of the IODU/C card and the holder clip. Do not bend the clip more than necessary when inserting the Security Device. Ensure that the Security Device is securely in place.
Note: The next step installs the NT5D61AA vintage IODU/C card in Core 1. The AA vintage card has a CD-ROM drive which is required for software installation on Core 1.

- 6 Ensure that the ENB/DIS switch on the NT5D61AA IODU/C you will install is set to DIS.
 - 7 Insert the NT5D61AA IODU/C into the following slots:
 - For NT5D21 Core/Net Modules, insert the IODU/C in slots 17, 18, and 19.
 - For NT9D11 Core/Network Modules and NT6D60 Core Modules, insert the IODU/C into slots 16, 17, and 18.
 - 8 Lock the locking devices by pushing them gently towards the faceplate. Set the ENB/DIS switch to ENB.
- A blinking letter "E" and number "5" displayed indicates that a failure occurred. In that case, reseal the Security Device in its holder and reinsert the card.
- 9 Insert the Install diskette that corresponds to your CP type (68030, 68040, 68060) into the IODU/C on Core 1.
 - 10 Install the CD-ROM disk into the CD-ROM drive. To install the CD-ROM:
 - a. press the button on the CD-ROM drive to open the CD-ROM disk holder
 - b. place the CD-ROM disk into the holder with the disk label showing
 - c. use the tabs to secure the CD-ROM in the disk holder
 - d. press the button again to close the CD-ROM disk holder (don't push the holder in by hand)
 - 11 Press the MAN RST button on the CP card.
 - 12 When the NT Logo screen appears, press <CR> to continue.
 - 13 Enter the date and time.

- 14 When the Main Menu appears, select <u> to go to the Install menu.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----
                M A I N   M E N U

The Software Installation Tool will install or upgrade Meridian-1
System Software, Database and the PE-ROM (both CP and IOP ROM).
You will be prompted throughout the installation and given the
opportunity to quit at any time.

Please enter:
<CR>--> <u> - To Install menu.
         <t> - To Tools menu.
         <q> - Quit.

Enter choice > u
                                         553-7780

```

- 15 Insert the Keycode diskette when prompted and select <a> to continue with the keycode validation.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----

Please insert the diskette with the keycode file into the floppy
drive.

Please enter:
<CR>--> <a> - Continue with the keycode validation
         (the keycode diskette is in the floppy drive).
         <q> - Quit.

Enter Choice > a
                                         553-7729

```

Once the keycode is validated against the Security Device, the Install menu is displayed.

- 16 At the Install menu, select **** to install software, database, CP-BOOTROM, and IOP-ROM.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
                I N S T A L L   M E N U

The Software Installation Tool will install or upgrade Meridian-1
System Software, Database and the PE-ROM (both CP and IOP ROM).
You will be prompted throughout the installation and given the
opportunity to quit at any time.

Please enter:
<CR>--> <a> - To install Software, CP-BOOTROM, IOP-ROM.
        <b> - To install Software, Database, CP-BOOTROM, IOP-ROM.
        <c> - To install Software only.
        <d> - To install Database only.
        <e> - To install CP-BOOTROM only.
        <f> - To install IOP-ROM only.
        <g> - To reinstall CP-Software.
        <o> - To copy System Software from the other Core.
        <t> - To go to the Tools menu.
        <k> - To install Keycode only.
           For Feature Expansion, use OVL143.
        <q> - Quit.

                                           553-7783

Enter choice > b
```

The Install Tool displays the software release to be installed and prompts you to confirm that the CD-ROM containing the software has been inserted.

17 Select <a> to continue with the software upgrade.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

Install Utility will install x1123xx software for s/w for software generic xxxx
(Call Processor, System Type) on your system.
Please insert the installation CDROM into the drive on Core 1.

The labeled side of the CDROM should be side up in the CDROM tray.

Please enter:

<CR>--> <a> - CDROM is now in drive.

Continue with installation.

<q> - Quit.

Enter Choice > a

553-7732

- 18 A Status Summary is displayed indicating what will be installed. Select <y> to confirm the start of installation.

INSTALLATION STATUS SUMMARY

Option	Choice	Status	Comment
SW: CD to disk	yes		from xxxx to xxxx
SW: disk to ROM	yes		
Database	yes		
CP-BOOTROM	yes		
IOP-ROM	yes		

Please enter:
<CR> -> <y> - Yes, start Installation.
<n> - No, stop Installation. Return to the Main Menu.

Enter Choice> **y**

553-7731

The terminal displays information about the software upgrade.

19 Select **<a>** to continue with software installation.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

=====

You selected to upgrade the system from release: xxxx to release: xxxx.

This will erase all old system files.

Database files will NOT be erased. You may continue installing the software or quit now and leave your system unchanged.

Please enter:

<CR>--> <a> - Continue with Upgrade.

<q> - Quit.

Enter Choice > **a**

553-7733

20 Select **<a>** to continue with the ROM upgrade.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

=====

You have chosen to Upgrade CP-software in card slot xx from the context: x11xxxx to the context: x11xxxx.

This will replace old CP-software with the ROM image files: "/p/os/flashos,/p/sl1/sl1res,/p/sl1/ovlres,/p/os/flashfs".

You may Continue with ROM upgrade or Quit now and leave ROM unchanged.

Please enter:

<CR>--> <a> - Continue with ROM Upgrade.

<q> - Quit.

Enter Choice > **a**

553-7734

21 At the Database Menu, insert the first 2MB Database diskette in the IODU/C.

22 Select **<a>** to install the customer database.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

You will now perform the database installation.

Note: If you are installing the Database from a floppy disk,
please insert the correct disk now.

Please enter:

<CR>--> <a> - Install CUSTOMER Database

(the customer database diskette must be in the Core 1 disk drive).

 - Install DEFAULT Database

(the installation CDROM must be in the Core 1 disk drive).

<d> - Copy Database from the redundant disk.

<e> - Check the Database that exists on the hard disk.

<q> - Quit.

Enter Choice > a

553-7779

23 Select **<y>** to start installation.

24 Select **<a>** to continue the database installation.

25 Select **<a>** to confirm that the database disk is in the drive.

26 Select **<y>** to load the database.

27 If the database does not fit on one diskette, you will be prompted to
insert additional diskettes.

28 Press **<CR>** to delete the hardware infrastructure database files from
the hard disk.

29 Select <a> to continue with the ROM upgrade.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----
Please insert the DATABASE disk into the floppy drive.

Please enter:

<a> - DATABASE disk is now in the floppy drive.
<q> - Quit.

Enter Choice> a
```

553-8057

30 Select <y> to continue with the ROM upgrade.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----

You have chosen to Upgrade CP-BOOTROM in card slot xx from
the context: xxxxx to the context: xxxxx.

This will replace old CP-BOOTROM with the ROM image files:
"/p/os/cprom".

You may Continue with ROM upgrade or Quit now and leave ROM
unchanged.

Please enter:

<CR>--> <a> - Continue with ROM Upgrade.
<q> - Quit.

Enter Choice > a
```

553-7738

31 Select <y> to begin installation of IOP-ROM upgrade.

32 Select <a> to continue with the IOP-ROM upgrade

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

You have chosen to Upgrade IOP-ROM in card slot xx from the context: x11xxxx to the context: x11xxxx.

This will replace old IOP-ROM with the ROM image files: "/p/os/ioprom".

You may Continue with ROM upgrade or Quit now and leave ROM unchanged.

Please enter:

<CR>--> <a> - Continue with ROM Upgrade.

<q> - Quit.

Enter choice > a

553-7787

33 When the Status Summary screen appears, press <CR>.

34 When the Install Menu appears, select <q> to quit the Software Install Tool.

35 Select <y> to confirm quit

36 **Remove the diskette** from the floppy drive.

37 Select <a> to reboot the system.

The system will reboot. Wait for the "INI" and "DONE" messages to display before continuing. It will take at least 70 seconds between the "DONE" and "INI" messages.

Switch call processing from Core 0 to Core 1



CAUTION

Service Interruption

Perform the next steps carefully. This is the point at which your service is interrupted. Calls in progress will be interrupted, especially if Peripheral Software Download takes place.

Perform the next 4 steps in succession. Call processing will be switched from Core 0 to Core 1.

- 1 In Core 0, set the DIS/ENB faceplate switch on the IOP or IOP/CMDU card to DIS.
- 2 In Core 0, disable the NT6D65 CNI cards by setting the ENB/DIS faceplate switches to DIS.
- 3 In Core 1, enable the NT6D65 CNI cards by setting the ENB/DIS faceplate to ENB.
- 4 In Core 1, press the MAN INT button.

After the system initialization has finished (INI messages are no longer displayed on the system terminal), check for dial tone on a telephone set.

- 5 Following a successful dial tone test, perform the following basic sanity tests:
 - a. Make sure calls can be placed.
 - b. Check for error messages, line noise, chatter, or other problems. Track sources and resolve problems as necessary.

Upgrading Core 0

- 1 Move the terminal cable to the J25 port on the I/O panel of the other Core or Core/Network Module, and continue with the following steps for the replacement of the second IOP/CMDU card.
- 2 **In systems equipped with an NT6D63 IOP and NT6D64 CMDU,** perform the following two steps to remove these cards:

To remove the IOP:

 - a. Set the ENB/DIS switch to DIS on the IOP being upgraded.

- b. Remove the IOP.

To remove the CMDU:

- a. If there is a floppy disk in the CMDU you are upgrading, remove the floppy disk.
- b. Set the power switch on the front of the CMDU, if present, to OFF (down).
- c. Wait at least 10 seconds, then unhook the locking devices on the CMDU and gently pull the unit out of the card cage.
- d. Continue with Step 4 on page 80.

- 3 **In system equipped with an NT5D20 IOP/CMDU**, perform the following steps to remove this card:

- a. Set the ENB/DIS switch on the IOP/CMDU to DIS.
- b. Unhook the locking devices and remove the IOP/CMDU.
- c. Continue with Step 4 on page 80.

- 4 Locate the round 1/2" diameter IODU/C Security Device.

- 5 Make sure that the 8-digit code on the Keycode diskette matches the 8-digit code on the Security Device.

- 6 With the Nortel side facing upward, slide the Security Device between the black round security device holder on the top right hand corner of the IODU/C card and the holder clip. Do not bend the clip more than necessary when inserting the Security Device. Ensure that the Security Device is securely in place.

- 7 Ensure that the ENB/DIS switch on the IODU/C you will install is set to DIS.

- 8 Insert the IODU/C into the following slots:

- For NT5D21 Core/Net Modules, insert the IODU/C in slots 17, 18, and 19.
- For NT9D11 Core/Network Modules and NT6D60 Core Modules, insert the IODU/C into slots 16, 17, and 18.

- 9 Lock the locking devices by pushing them gently towards the faceplate. Set the ENB/DIS switch to ENB.

A blinking letter "E" and number "5" displayed indicates that a failure occurred. In that case, reseal the Security Device in its holder and reinsert the card.

- 10 Insert the Install diskette that corresponds to your CP type into the IODU/C on Core 0.
- 11 Press the MAN RST button on the CP card.
- 12 When the NT Logo screen appears, press <CR> to continue.
- 13 Enter the date and time.
- 14 When the Main Menu appears, select <u> to go to the Install Menu.

=====
Nortel Meridian - 1 Software/Database/PEROM CDRom INSTALL Tool (x11)
=====

M A I N M E N U

The Software Installation Tool will install or upgrade Meridian-1 System Software, Database and the PE-ROM (both CP and IOP ROM). You will be prompted throughout the installation and given the opportunity to quit at any time.

Please enter:

<CR>--> <u> - To Install menu.

<t> - To Tools menu.

<q> - Quit.

Enter choice > **u**

553-7780

- 15 Insert the Keycode diskette when prompted and select **<a>** to continue with the keycode validation.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----

Please insert the diskette with the keycode file into the floppy
drive.

Please enter:
<CR>--> <a> - Continue with the keycode validation
        (the keycode diskette is in the floppy drive).
        <q> - Quit.

Enter Choice > a
```

553-7729

Once the keycode is validated against the Security Device, the Install menu is displayed.

- 16 At the Install menu, select <o> to copy the software from Core 1 to Core 0.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

INSTALL MENU

The Software Installation Tool will install or upgrade Meridian-1 System Software, Database and the PE-ROM (both CP and IOP ROM). You will be prompted throughout the installation and given the opportunity to quit at any time.

Please enter:

- <CR>--> <a> - To install Software, CP-BOOTROM, IOP-ROM.
 - To install Software, Database, CP-BOOTROM, IOP-ROM.
<c> - To install Software only.
<d> - To install Database only.
<e> - To install CP-BOOTROM only.
<f> - To install IOP-ROM only.
<g> - To reinstall CP-Software.
<o> - To copy System Software from the other Core.
<t> - To go to the Tools menu.
<k> - To install Keycode only.

For Feature Expansion, use OVL143.

<q> - Quit.

553-7784

Enter choice > o

17 Select **<a>** to copy /p partition from Core 1 to Core 0.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

You selected to copy the hard disk /p partition from IODU on Core 1 to IODU on Core 0.

60 MB of disk will be copied.

This will erase old system files, Database files will NOT be erased.

Note that ERASED FILES CANNOT BE RECOVERED.

NOTE: Copy progress will be indicated by ... , one '.' per MB.

You may Continue with the copy operation or Quit now and leave your system unchanged.

Please enter:

<CR>--> <a> -Copy /p partition from one Core 1 to Core 0.

<q> - Quit.

Enter Choice > **a**

553-7739

18 Select **<a>** to continue with the upgrade.

19 When the software is installed successfully, press **<CR>** to install CP-software from the hard disk to Flash EEPROM, and install CP-BOOT ROM.

20 Select **<a>** to continue with ROM upgrade.

21 Select **<a>** to continue with ROM upgrade.

22 When the Status Summary appears, press **<CR>** to continue.

23 When the Install Menu appears, select **<f>** to install IOP-ROM.

24 Select **<a>** to continue with the IOP-ROM upgrade.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

You have chosen to Upgrade IOP-ROM in card slot xx from the context: x11xxxx to the context: x11xxxx.

This will replace old IOP-ROM with the ROM image files: "/p/os/ioprom".

You may Continue with ROM upgrade or Quit now and leave ROM unchanged.

Please enter:

<CR>--> <a> - Continue with ROM Upgrade.

<q> - Quit.

Enter choice > **a**

553-7787

- 25** When the Status Summary appears, press **<CR>** to continue.
- 26** When the Install Menu appears, select **<d>** to install the database.
- 27** Select **<d>** to copy the database from the redundant disk.
- 28** Select **<y>** to continue installation.
- 29** Select **<a>** to continue database copy.
- 30** When the Install Menu appears, select **<q>** to quit the system.
- 31** Select **<y>** to confirm quit
- 32** **Remove the diskette** from the floppy drive.
- 33** Select **<a>** to reboot the system.

The system will reboot. Wait for the "INI" and "DONE" messages to display before continuing. It will take at least 70 seconds between the "DONE" and "INI" messages.

Return the system to redundant mode

To place the system back in the redundant (normal) mode with automatic switchover capability, perform the following steps in uninterrupted sequence on the *inactive* Core:

- Press and release the MAN RST button on the CP card in the inactive Core. When SYS700 messages appear on the inactive CP LCD display, set the inactive CP NORM/MAINT switch to NORM.
- An HWI534 message on the active Core will be displayed indicating that memory synchronization has begun. An HWI533 message on the active Core indicates that memory synchronization is complete.
- In the inactive Core, enable the NT6D65 CNI cards by setting the ENB/DIS faceplate switches to ENB.
- Place the active CP NORM/MAINT faceplate switch to NORM.

Completing the upgrade

- 1 Perform a redundancy sanity test using the following sequence:

LD 135

STAT CNI	Get status of CNI cards.
STAT CPU	Get status of CPU and memories.
TEST CNI core slot	Test each inactive CNI card.

Note: Testing the CP and CNI cards and synchronizing memory takes up to 20 minutes for each test. When the CP test is complete, the memories are automatically synchronized.

- 2 Switch Cores, and test the other side.

TEST CPU	Test the standby (inactive) Core.
SCPU	Switch Cores.
TEST CNI core slot	Test each inactive CNI card.

Note: Testing the CP cards can take up to 20 minutes for each test. When the test is complete, the memories are automatically synchronized.

- 3 Clear the display, and minor alarms on both Cores.

CDSP	Clear the displays on the Cores.
CMAJ	Clear major alarm.
CMIN ALL	Clear minor alarm.

- 4 Get the status of the Cores, CNIs, and memories
- | | |
|-----------------|-----------------------------------------------------|
| STAT CPU | Get the status of both Cores. |
| STAT CNI | Get the status of all configured CNIs and memories. |
- 5 Load LD 137 and synchronize hard disks. Synchronization may take up to 50 minutes. To be sure that the contents of IODU/C 1 are copied to IODU/C 0, verify that IODU/C 0 is disabled.
- LD 137**
- | | |
|-------------|----------------------------------------------------------------------------------------------------------------------|
| STAT | Get the status of both IODU/Cs and redundancy. |
| SYNC | Enter “Yes” to synchronize disks.
Wait until the memory synchronization successfully completes before continuing. |
- 6 Get the status of the IODU/Cs and be sure IODU/C 0 is active. Switch if necessary.
- LD 137**
- | | |
|------------------|----------------------------------------------------------------------------|
| STAT | Get the status of the IODU/Cs. |
| SWAP | Switch IODU/C (if necessary). |
| STAT CMDU | Get the status of the IODU/Cs. Be sure the same IODU/C and CPU are active. |
- 7 Insert the database diskette into both IODU/Cs for backup. Load LD 43 and datadump. This creates a backup on the floppy disk in the active IODU/C.
- LD 43**
- EDD**
- Data dump complete (or database backup complete) is printed when the data dump has been successfully completed. Investigate any EDD messages. Refer to *Administration* (553-3001-311).
- 8 Evaluate the number of call registers and telephone buffers that are configured for the system. Refer to *Capacity Engineering* (553-3001-149).

The card replacement procedure is complete.

Replacement procedure for Option 51C systems

To perform this procedure, the following is required:

- an Install diskette specific to your CP type
- a CD-ROM containing system software

- Keycode diskette
- Database diskette(s)
- one NT5D61AA IODU/C card
- one IODU/C Security Device
- a Database Transfer Utility to archive the IOP/CMDU or CMDU database on 2MB floppy diskettes.

Performing a data dump

Before starting this procedure, make a backup copy of the customer database on a 4MB diskette using the data dump routine:

- 1 Log into the system
- 2 Load the Equipment Data Dump Program (LD 43). At the prompt, enter **LD 43** to load the program
- 3 When "EDD000" appears on the terminal, enter **EDD** to begin the data dump
- 4 When "DATADUMP COMPLETE" and "DATABASE BACKUP COMPLETE" appear on the terminal, enter ******** to exit the program



CAUTION

Service Interruption

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

To access the Core during the replacement procedure, connect a terminal to the J25 port on the I/O panel in the Core/Network Module. To communicate with the processor, you must use the following settings on the terminal:

9600 baud, 7 data, space parity, 1 stop bit, full duplex, XOFF

Upgrading the IOP/CMDU or IOP and CMDU to an IODU/C

- 1 Insert the **Database Transfer Utility** diskette which corresponds to your source (existing) Call Processor card into the IOP/CMDU or CMDU.
- 2 Press the MAN RST button on the CP card.
- 3 When the NT Logo Screen appears on the terminal, the Database Transfer Utility has loaded. Press <CR> to continue.

```


NT Meridian - 1 Software/Database/PEROM INSTALL Tool (x11)
=====
                * *
                * * *
* * * *          * *          * * * *
* * * *          * * * * *          * * * * * * * * * *
* * * *          * * * * * *          * * * * * * * * * *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
* * * *          * * * *          * * * *
* * * *          * * * *          * * * *          Northern Telecom — Meridian 1
* * * *          * * * *          * * * *          Install Tool (x11)
* * * *          * * * *          * * * *
* * * *          * * * * * * * * * * * * * * * * * * * *
* * * *          * * * * *          * * * * *
* * * *          * * *          * * *

```

Copyright 1992 - 1995 Nortthen Telecom, Inc.

Please press <CR> when ready . . .

553-7790



CAUTION
System Failure
 When using the Database Transfer Utility, only select options <t> *Tools Menu* and <s> *To archive existing database*. Selecting any other options can result in operating system corruption.

- 4 At the Database Transfer Utility Install menu, select <t> to go to the Tools Menu.

NT Meridian - 1 Software/Database/PEROM INSTALL Tool (x11)

INSTALL MENU

The Software Installation Tool will install or upgrade Meridian-1 System Software, Database and the PE-ROM (both CP and IOP ROM). You will be prompted throughout the installation and given the opportunity to quit at any time.

Please enter:

- <CR>--> <a> - To install Software, CP-BOOTROM, IOP-ROM.
 - To install Software, Database, CP-BOOTROM, IOP-ROM.
<c> - To install Software only.
<d> - To install Database only.
<e> - To install CP-BOOTROM only.
<f> - To install IOP-ROM only.
<g> - To reinstall CP-Software.
<t> - To go to the Tools menu.
<q> - Quit.

Enter choice > t

553-7791

- 5 At the Database Transfer Utility Tools menu select **<s>** to archive the database on one or more 2MB diskettes.

```

NT Meridian - 1 Software/Database/PEROM INSTALL Tool (x11)
-----
                T O O L S   M E N U

This is the Tools Menu for Install. You can select the tool that
is appropriate. Please select one of the options below.

Please enter:
<CR>--> <a> - To set the system date and time.
        <b> - To partition the hard disk.
        <c> - To display the partition size of hard disk.
        <d> - To regenerate PDT Password.
        <s> - To archive existing database.
        <e> - To install CP software at a specified slot.
        <m> - To go back to the Main Menu

Enter choice > s
                    553-7792
    
```

- 6 When the number of 2MB diskettes required is displayed, select **<a>**.

```

***      NT Meridian - 1 Database ARCHIVE Tool      ***
-----
The Total Size of the backup files: XXXX KBytes
Estimated number of 2MB floppy diskettes: X

<CR>--> Please enter:
        <a> - Continue.
        <q> - Quit.

Enter choice >
                    553-7776
    
```

- 7 Insert the first database diskette and select **<a>** to continue.

- 8 The message "Database backup complete!" will be displayed, and the Tools menu will reappear.
- 9 Remove the 2MB diskette from the IOP/CMDU, but *do not* reboot the system at this point.
- 10 Set the ENB/DIS switch on the IOP/CMDU to DIS.
- 11 Unhook the locking devices and remove the IOP/CMDU.
- 12 Locate the round 1/2" diameter IODU/C replacement Security Device.
- 13 Make sure the 8-digit code on the Keycode diskette matches the 8-digit code on the Security Device.
- 14 With the Nortel side facing upward, slide the Security Device between the black round security device holder on the top right hand corner of the IODU/C card and the holder clip. Do not bend the clip more than necessary when inserting the Security Device. Ensure that the Security Device is securely in place.
- 15 Ensure that the ENB/DIS switch on the IODU/C you will install is set to DIS.
- 16 Insert the IODU/C into slots 17, 18, and 19 in the NT9D11 Core/Network Module or NT5D21 Core/Net Module.
- 17 Lock the locking devices by pushing them gently towards the faceplate. Set the ENB/DIS switch to ENB.
- 18 A blinking letter "E" and number "5" displayed indicates that a failure occurred. In that case, reseal the Security Device in its holder and reinsert the card.
- 19 Insert the Install diskette that corresponds to your CP-type into the IODU/C.
- 20 Install the CD-ROM disk into the CD-ROM drive. To install the CD-ROM:
 - a. press the button on the CD-ROM drive to open the CD-ROM disk holder
 - b. place the CD-ROM disk into the holder with the disk label showing
 - c. use the four tabs to secure the CD-ROM in the disk holder
 - d. press the button again to close the CD-ROM disk holder (don't push the holder in by hand)
- 21 Press the MAN RST button on the CP card.

22 At the Main menu select **<u>** to go to the Install menu.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
                M A I N   M E N U

The Software Installation Tool will install or upgrade Meridian-1
System Software, Database and the PE-ROM (both CP and IOP ROM).
You will be prompted throughout the installation and given the
opportunity to quit at any time.

Please enter:
<CR>--> <u> - To Install menu.
         <t> - To Tools menu.
         <q> - Quit.

Enter choice > u
                                         553-7780
    
```

23 Insert the Keycode diskette when prompted and select **<a>** to continue with the keycode validation.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====

Please insert the diskette with the keycode file into the floppy
drive.

Please enter:
<CR>--> <a> - Continue with the keycode validation
         (the keycode diskette is in the floppy drive).
         <q> - Quit.

Enter Choice > a
                                         553-7729
    
```

Once the keycode is validated against the Security Device, the Install menu is displayed.

- 24 At the Install menu, select **** to install software, database, CP-BOOTROM, and IOP-ROM.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

INSTALL MENU

The Software Installation Tool will install or upgrade Meridian-1 System Software, Database and the PE-ROM (both CP and IOP ROM). You will be prompted throughout the installation and given the opportunity to quit at any time.

Please enter:

- <CR>--> <a> - To install Software, CP-BOOTROM, IOP-ROM.
 - To install Software, Database, CP-BOOTROM, IOP-ROM.
<c> - To install Software only.
<d> - To install Database only.
<e> - To install CP-BOOTROM only.
<f> - To install IOP-ROM only.
<g> - To reinstall CP-Software.
<o> - To copy System Software from the other Core.
<t> - To go to the Tools menu.
<k> - To install Keycode only.
For Feature Expansion, use OVL143.
<q> - Quit.

553-7783

Enter choice > **b**

The Install Tool displays the software release to be installed and prompts you to confirm that the CD-ROM containing the software has been inserted.

25 Select <a> to continue with the software upgrade.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

Install Utility will install x1123xx software for s/w for software generic xxxx
(Call Processor, System Type) on your system.
Please insert the installation CDROM into the drive on Core 1.

The labeled side of the CDROM should be side up in the CDROM tray.

Please enter:

<CR>--> <a> - CDROM is now in drive.

Continue with installation.

<q> - Quit.

Enter Choice > a

553-7732

- 26 A Status Summary is displayed indicating what will be installed. Select <y> to confirm the start of installation.

INSTALLATION STATUS SUMMARY

Option	Choice	Status	Comment
SW: CD to disk	yes		from xxxx to xxxx
SW: disk to ROM	yes		
Database	yes		
CP-BOOTROM	yes		
IOP-ROM	yes		

Please enter:
<CR> -> <y> - Yes, start Installation.
<n> - No, stop Installation. Return to the Main Menu.

Enter Choice> **y**

553-7731

The terminal displays information about the software upgrade.

27 Select **<a>** to continue with software installation.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
You selected to upgrade the system from release: xxxx to release: xxxx.

This will erase all old system files.
Database files will NOT be erased. You may continue installing
the software or quit now and leave your system unchanged.

Please enter:
<CR>--> <a> - Continue with Upgrade.
        <q> - Quit.

Enter Choice > a
    
```

553-7733

28 Select **<a>** to continue with the ROM upgrade.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
You have chosen to Upgrade CP-software in card slot xx from
the context: x11xxxx to the context: x11xxxx.

This will replace old CP-software with the ROM image files:
"/p/os/flashos,/p/sl1/sl1res,/p/sl1/ovlres,/p/os/flashfs".

You may Continue with ROM upgrade or Quit now and leave ROM
unchanged.

Please enter:
<CR>--> <a> - Continue with ROM Upgrade.
        <q> - Quit.

Enter Choice > a
    
```

553-7734

29 At the Database Menu, insert the first 2MB Database diskette in the IODU/C.

30 Select **<a>** to install the customer database.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

=====

You will now perform the database installation.

Note: If you are installing the Database from a floppy disk,
please insert the correct disk now.

Please enter:

<CR>--> <a> - Install CUSTOMER Database

(the customer database diskette must be in the Core 1 disk drive).

 - Install DEFAULT Database

(the installation CDROM must be in the Core 1 disk drive).

<d> - Copy Database from the redundant disk.

<e> - Check the Database that exists on the hard disk.

<q> - Quit.

Enter Choice > a

553-7779

31 Make sure the Database disk is inserted and select **<a>**:

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

=====

Please insert the DATABASE disk into the floppy drive.

Please enter:

<a> - DATABASE disk is now in the floppy drive.

<q> - Quit.

Enter Choice> a

553-8057

34 Select **<a>** to continue with the IOP-ROM upgrade

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

You have chosen to Upgrade IOP-ROM in card slot xx from the context: x11xxxx to the context: x11xxxx.

This will replace old IOP-ROM with the ROM image files: "/p/os/ioprom".

You may Continue with ROM upgrade or Quit now and leave ROM unchanged.

Please enter:

<CR>--> <a> - Continue with ROM Upgrade.

<q> - Quit.

Enter choice > **a**

553-7787

35 Select **<q>** to quit and reload the system.

36 Select **<y>** to confirm quit.

37 **Remove the diskette** from the floppy drive.

38 Select **<a>** to reboot the system.

The system will automatically perform a sysload and system initialization during which several messages will appear on the system terminal. Wait until initialization has finished (INI messages are no longer displayed on the system terminal) before continuing.

39 Verify that the "DONE" message appears on the system terminal.

Note: The SYSTEM INI message may take 70 seconds or more to appear.

Completing the upgrade

- 1 Log into the system.
- 2 Verify CPU and CNI functionality:
LD 135 to load the program
STAT CPU to check the CPU status
STAT CNI to verify CNI functionality
******** to exit the program

Make a backup of the customer database on 2MB diskettes:

- 3 Load the Equipment Data Dump Program (LD 43). At the prompt, enter
LD 43 to load the program
- 4 When "EDD000" appears on the terminal, enter
EDD to begin the data dump
- 5 When "DATADUMP COMPLETE" and "DATABASE BACKUP COMPLETE" appear on the terminal, enter
******** to exit the program



CAUTION **System Failure**

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

- 6 Evaluate the number of call registers and telephone buffers that are configured for the system. Refer to *Capacity Engineering* (553-3001-149).

The card replacement procedure is complete.

NT5D61 Input/Output Disk Unit with CD-ROM (IODU/C)

Use this procedure to replace a faulty IODU/C card with a new IODU/C card.



CAUTION

Service Interruption

Performing this procedure in a nonredundant system, such as 51C, will disrupt system operation. If possible, schedule the replacement at the lowest traffic time.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



CAUTION

Service Interruption

At some point in this procedure the system will warm start, causing a momentary interruption in call processing.

Performing a data dump

Before starting this procedure, make a backup copy of the customer database on a 4MB diskette using the data dump routine:

- 1 Log into the system
- 2 Load the Equipment Data Dump Program (LD 43). At the prompt, enter **LD 43** to load the program
- 3 When "EDD000" appears on the terminal, enter **EDD** to begin the data dump

- 4 When “DATADUMP COMPLETE” and “DATABASE BACKUP COMPLETE” appear on the terminal, enter
 **** to exit the program



CAUTION
System Failure

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

To access the Core during the replacement procedure, connect a terminal to the J25 port on the I/O panel in the *inactive* Core Module or Core/Network Module. To communicate with the processor, you must use the following settings on the terminal:

9600 baud, 7 data, space parity, 1 stop bit, full duplex, XOFF

If you are using only one terminal or a switch box, switch the connection from Core to Core as needed.

Splitting the Cores

- 1 Verify that the disk drives are synchronized:
LD 137 to load the program
STAT to get the status of the disk drives

If the disks are synchronized, proceed with Step 2 on page 103. If they are not synchronized, execute the SYNC command:

SYNC to synchronize the drives
 **** to exit the program

- 2 Verify that the clock controller associated with the faulty IODU/C is *inactive*. If it is not, switch clock controllers:
LD 60 to load the program
SSCK to get the status of the clock controllers
SWCK to switch clock controllers (if necessary)
 **** to exit the program

- 3 Verify that the IODU/C card you are replacing is on the *inactive* Core:

LD 135 to load the program
STAT CPU to check CPU status
TEST CPU to test the CPU

If the IODU/C you are replacing is on the *inactive* Core, proceed with Step 5 on page 104. If the IODU/C you are replacing is not on the *inactive* Core, swap Cores and verify again:

SCPU to swap CPUs
STAT CPU to check CPU status

- 4 Verify that the faulty IODU/C is *inactive*. You may need to switch IODU/Cs.

LD 137
STAT Get the status of IODU/C.
SWAP Switch IODU/Cs (if necessary).

- 5 Set the MAINT/NORM switch on the CP card to MAINT on the *active* Core.
- 6 Set the ENB/DIS switch on all CNI cards to DIS on the *inactive* Core.
- 7 Perform the following three steps in uninterrupted sequence:
- a. press and hold the MAN RST button on the CP card in the *inactive* Core
 - b. set the MAINT/NORM switch on the CP card in the *inactive* Core to MAINT
 - c. release the MAN RST button

Replacing the IODU/C in a redundant system

- 1 Set the ENB/DIS switch on the faulty IODU/C to DIS.
- 2 Unhook the locking devices and remove the IODU/C.
- 3 Remove the round 1/2" diameter IODU/C Security Device from the black round Security Device holder on the top right corner of the IODU/C card being replaced.
- 4 Put the IODU/C being replaced into a static bag and box.

- 5** With the Nortel side facing upward, slide the Security Device between the security device holder and the holder clip in the new IODU/C card. Do not bend the clip more than necessary when inserting the Security Device. Ensure that the Security Device is securely in place.
 - 6** Insert the new IODU/C into the following slots:
 - a.** For NT5D21 Core/Net Modules, insert the IODU/C in slots 17,18, and 19.
 - 7** Lock the locking devices by pushing them gently towards the faceplate. Set the ENB/DIS switch to ENB.
- A blinking letter "E" and number "5" displayed indicates that a failure occurred. In that case, reseal the Security Device in its holder and reinsert the card.
- 8** Press the MAN RST button on the CP card.

Once the keycode is validated against the Security Device, the Install menu is displayed.

- 9 At the Install menu, select <o> to copy the software from the active Core.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

INSTALL MENU

The Software Installation Tool will install or upgrade Meridian-1 System Software, Database and the PE-ROM (both CP and IOP ROM). You will be prompted throughout the installation and given the opportunity to quit at any time.

Please enter:

- <CR>--> <a> - To install Software, CP-BOOTROM, IOP-ROM.
 - To install Software, Database, CP-BOOTROM, IOP-ROM.
<c> - To install Software only.
<d> - To install Database only.
<e> - To install CP-BOOTROM only.
<f> - To install IOP-ROM only.
<g> - To reinstall CP-Software.
<o> - To copy System Software from the other Core.
<t> - To go to the Tools menu.
<k> - To install Keycode only.
For Feature Expansion, use OVL143.
<q> - Quit.

553-7784

Enter choice > o

10 Select <a> to confirm.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
You selected to copy the hard disk /p partition from IODU on Core 1
to IODU on Core 0.
60 MB of disk will be copied.
This will erase old system files, Database files will NOT be erased.
Note that ERASED FILES CANNOT BE RECOVERED.

NOTE: Copy progress will be indicated by ... , one '!' per MB.

You may Continue with the copy operation or Quit now
and leave your system unchanged.

Please enter:
<CR>--> <a> -Copy /p partition from one Core 1 to Core 0.
        <q> - Quit.

Enter Choice > a
    
```

553-7739

11 Select <a> to confirm the software release to be copied.

12 When the software is installed successfully, press <CR> to install CP-software from the hard disk to Flash EEPROM, and install CP-BOOT ROM. Follow the screen directions until the Main Menu returns.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
Release: xxxx was installed successfully into /p partition
on your side

NOTE: In order to complete the install you must install flash ROM
      In order to complete the install you must install CP BOOT ROM

Please press <CR> when ready...
    
```

553-7741

13 When the Main Menu returns, select <f> to install IOP-ROM.

- 14 Select **<a>** to continue with the IOP-ROM upgrade.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

You have chosen to Upgrade IOP-ROM in card slot xx from the context: x11xxxx to the context: x11xxxx.

This will replace old IOP-ROM with the ROM image files: "/p/os/ioprom".

You may Continue with ROM upgrade or Quit now and leave ROM unchanged.

Please enter:

<CR>--> <a> - Continue with ROM Upgrade.

<q> - Quit.

Enter choice > a

553-7787

- 15 At the Install Menu, select the following options in sequence to copy the customer database from the redundant disk.

<d> to go to the Database menu

<d> to copy the database from the redundant disk

<y> to confirm installation status summary

<a> to confirm database copy

- 16 **Remove the diskette** from the IODU/C and select **<q>** to quit and reload the system.

- 17 Select **<y>** to confirm quit

- 18 Select **<a>** to reboot the system.

The system will automatically perform a sysload and system initialization during which several messages will appear on the system terminal. Wait until initialization has finished (INI messages are no longer displayed on the system terminal) before continuing.

- 19 In the **inactive** Core, enable the NT6D65 CNI cards by setting the ENB/DIS faceplate switches to ENB.

- 20** In the **inactive** Core, perform the following steps in uninterrupted sequence:
- a.** press and release the MAN RST button
 - b.** when SYS700 messages appear on CP LCD display, set the MAINT/NORM switch to NORM.

Within 60 seconds, the LCD will display the following messages, confirming the process.

RUNNING ROM OS ENTERING CP VOTE

An "HWI534" message from the CPSI or SDI port indicates the start of memory synchronization. Within 10 minutes, an HWI533 message on the *inactive* Core CPSI or SDI TTY indicates the memory synchronization is taking place. Wait until the memory synchronization is complete.

- 21** Switch the NORM/MAINT switch on the **active** CP card to NORM.
- 22** Synchronize the disk drives:
- | | |
|---------------|---------------------------|
| LD 137 | to load the program |
| SYNC | to synchronize the drives |
| **** | to exit the program |

Note: Synchronization may take up to 50 minutes.

Replacing the IODU/C in an Option 51C

- 1** Perform a data dump in LD 43 (if possible).
- 2** Set the ENB/DIS switch on the faulty IODU/C to DIS.
- 3** Unhook the locking devices and remove the IODU/C.
- 4** Remove the round 1/2" diameter IODU/C Security Device from the black round Security Device holder on the top right corner of the IODU/C card being replaced.
- 5** Put the IODU/C being replaced into a static bag and box.
- 6** With the Nortel side facing upward, slide the Security Device between the security device holder and the holder clip in the new IODU/C card. Do not bend the clip more than necessary when inserting the Security Device. Ensure that the Security Device is securely in place.
- 7** Insert the new IODU/C into the following slots:

- a. For NT5D21 Core/Net Modules, insert the IODU/C in slots 17,18, and 19.
- 8 Lock the locking devices by pushing them gently towards the faceplate. Set the ENB/DIS switch to ENB.
A blinking letter "E" and number "5" displayed indicates that a failure occurred. In that case, reseal the Security Device in its holder and reinsert the card.
- 9 Activate the software installation tool by inserting the Install disk from the software package into the IODU/C.
- 10 Press the MAN RST button on the CP card in the Core containing the replacement IODU/C.
- 11 At the Main Menu select <u> to go to the Install Menu.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

M A I N M E N U

The Software Installation Tool will install or upgrade Meridian-1 System Software, Database and the PE-ROM (both CP and IOP ROM). You will be prompted throughout the installation and given the opportunity to quit at any time.

Please enter:

<CR>--> <u> - To Install menu.

<t> - To Tools menu.

<q> - Quit.

Enter choice > u

553-7780

- 12** Insert the Keycode diskette when prompted and select **<a>** to continue with the keycode validation.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----

Please insert the diskette with the keycode file into the floppy
drive.

Please enter:
<CR>--> <a> - Continue with the keycode validation
        (the keycode diskette is in the floppy drive).
        <q> - Quit.

Enter Choice > a
```

553-7729

Once the keycode is validated against the Security Device, the Install menu is displayed.

- 13 At the Install menu, select **** to install software, database, CP-BOOTROM, and IOP-ROM.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----
                I N S T A L L   M E N U

The Software Installation Tool will install or upgrade Meridian-1
System Software, Database and the PE-ROM (both CP and IOP ROM).
You will be prompted throughout the installation and given the
opportunity to quit at any time.

Please enter:
<CR>--> <a> - To install Software, CP-BOOTROM, IOP-ROM.
        <b> - To install Software, Database, CP-BOOTROM, IOP-ROM.
        <c> - To install Software only.
        <d> - To install Database only.
        <e> - To install CP-BOOTROM only.
        <f> - To install IOP-ROM only.
        <g> - To reinstall CP-Software.
        <o> - To copy System Software from the other Core.
        <t> - To go to the Tools menu.
        <k> - To install Keycode only.
            For Feature Expansion, use OVL143.
        <q> - Quit.

                                                553-7783

Enter choice > b
```

The Install Tool displays the software release to be installed and prompts you to confirm that the CD-ROM containing the software has been inserted.

14 Select **<a>** to continue with the software upgrade.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

=====

Install Utility will install x1123xx software for s/w for software generic xxxx
(Call Processor, System Type) on your system.
Please insert the installation CDROM into the drive on Core 1.

The labeled side of the CDROM should be side up in the CDROM tray.

Please enter:

<CR>--> <a> - CDROM is now in drive.

Continue with installation.

<q> - Quit.

Enter Choice > **a**

553-7732

- 15 A Status Summary is displayed indicating what will be installed. Select <y> to confirm the start of installation.

INSTALLATION STATUS SUMMARY

Option	Choice	Status	Comment
SW: CD to disk	yes		from xxxx to xxxx
SW: disk to ROM	yes		
Database	yes		
CP-BOOTROM	yes		
IOP-ROM	yes		

Please enter:
<CR> -> <y> - Yes, start Installation.
<n> - No, stop Installation. Return to the Main Menu.

Enter Choice> **y**

553-7731

The terminal displays information about the software upgrade.

16 Select <a> to continue with software installation.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----
You selected to upgrade the system from release: xxxx to release: xxxx.

This will erase all old system files.
Database files will NOT be erased. You may continue installing
the software or quit now and leave your system unchanged.

Please enter:
<CR>--> <a> - Continue with Upgrade.
        <q> - Quit.

Enter Choice > a
    
```

553-7733

17 Select <a> to confirm the software release to be installed.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----
Upgrading from release xxxx to release xxxx

Please enter:
<CR>--> <a> - Continue with upgrade.
        <q> - Quit.

Enter choice > a
    
```

553-7740

18 Select <a> to continue with the ROM upgrade.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

You have chosen to Upgrade CP-software in card slot xx from
the context: x11xxxx to the context: x11xxxx.

This will replace old CP-software with the ROM image files:
"/p/os/flashos,/p/sl1/sl1res,/p/sl1/ovlres,/p/os/flashfs".

You may Continue with ROM upgrade or Quit now and leave ROM
unchanged.

Please enter:

<CR>--> <a> - Continue with ROM Upgrade.

<q> - Quit.

Enter Choice > a

553-7734

19 At the Database Menu, insert the first 2MB Database diskette in the
IODU/C.

20 Select **<a>** to install the customer database.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

You will now perform the database installation.

Note: If you are installing the Database from a floppy disk,
please insert the correct disk now.

Please enter:

<CR>--> <a> - Install CUSTOMER Database

(the customer database diskette must be in the Core 1 disk drive).

 - Install DEFAULT Database

(the installation CDROM must be in the Core 1 disk drive).

<d> - Copy Database from the redundant disk.

<e> - Check the Database that exists on the hard disk.

<q> - Quit.

Enter Choice > **a**

553-7779

21 Follow all screen instructions regarding insertion of any additional Database diskettes.

22 Select **<a>** to continue with the CP-BOOTROM upgrade.

Nortel Meridian - 1 Software/Database/PEROM CDRom INSTALL Tool (x11)

You have chosen to Upgrade CP-BOOTROM in card slot xx from
the context: xxxxx to the context: xxxxx.

This will replace old CP-BOOTROM with the ROM image files:
"/p/os/cprom".

You may Continue with ROM upgrade or Quit now and leave ROM
unchanged.

Please enter:

<CR>--> <a> - Continue with ROM Upgrade.

<q> - Quit.

Enter Choice > **a**

553-7738

23 Select **<y>** to begin installation of IOP-ROM upgrade.

24 Select **<a>** to continue with the IOP-ROM upgrade

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

You have chosen to Upgrade IOP-ROM in card slot xx from
the context: x11xxxx to the context: x11xxxx.

This will replace old IOP-ROM with the ROM image files:
"/p/os/ioprom".

You may Continue with ROM upgrade or Quit now and leave ROM
unchanged.

Please enter:

<CR>--> <a> - Continue with ROM Upgrade.

<q> - Quit.

Enter choice > **a**

553-7787

25 Select **<q>** to quit and reload the system.**26** **Remove the diskette** from the IODU/C.**27** Select **<y>** to confirm quit.

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

You selected to Quit. Please confirm.

Please enter:

<CR>--> <y> - Yes, Quit.

<n> - No, DO NOT Quit.

Enter choice > **y**

553-7751

28 Select <a> to reboot the system.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----
You have selected to Quit the Software Installation Tool
You may reboot the system or return to the Main Menu.
Before rebooting the system, remove Install diskette from the floppy drive.

-----
DO NOT REBOOT USING BUTTON!!
-----

Please enter:
<a> - Reboot the system.
<m> - Return to the Main menu.
<CR>-->

Enter Choice > a
```

553-7752

The system will automatically perform a sysload and system initialization during which several messages will appear on the system terminal. Wait until initialization has finished (INI messages are no longer displayed on the system terminal) before continuing.

29 Verify that the "DONE" message appears on the system terminal.

Note: The SYSTEM INI message may take 70 seconds or more to appear.

Completing the upgrade

To complete the IODU/C card upgrade, verify CPU and CNI status.

1 Log into the system.

2 Verify CPU and CNI functionality:

LD 135	to load the overlay
STAT CPU	to check the CPU status
STAT CNI	to verify CNI functionality
****	to exit the program

- 3 Load the Equipment Data Dump Program (LD 43). At the prompt, enter
LD 43 to load the program
- 4 When "EDD000" appears on the terminal, enter
EDD to begin the data dump
- 5 When "DATADUMP COMPLETE" and "DATABASE BACKUP COMPLETE" appear on the terminal, enter
******** to exit the program
- 6 Evaluate the number of call registers and telephone buffers that are configured for the system. Refer to *Capacity Engineering* (553-3001-149).

The IODU/C card upgrade is complete.

NT5D61 IODU/C Security Device

Use this procedure to replace the Security Device on the NT5D61 Input/Output Disk Unit with CD-ROM (IODU/C) Card.

The Security Device is a field removable component and is located in the upper right corner of an IODU/C card. The device does not contain feature or software release specific information, but it has a unique custom program necessary for each customer. It is intended to serve the customer through numerous upgrade and feature changes.

The Security Device is replaced only if such a replacement is suggested by maintenance and/or diagnostic programs.



CAUTION

Service Interruption

Performing this procedure in a nonredundant system, such as a 51C, will disrupt system operation. If possible, schedule the replacement at the lowest traffic time.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



CAUTION

Service Interruption

At some point in this procedure the system will warm start, causing a momentary interruption in call processing.

Note: To replace the Security Device, a new Security Device and keycode are required. On redundant systems, the new keycode must validate against the new and existing Security Device.

Replacing the Security Device on a redundant system

The procedure begins with the validation of the new Keycode against the existing Security Device.

- 1 To access the Core during the replacement procedure, connect a terminal to the J25 port on the I/O panel in the *inactive* Core Module or Core/Network Module. To communicate with the processor, you must use the following settings on the terminal:

9600 baud, 7 data, space parity, 1 stop bit, full duplex, XOFF

Note: If you are using only one terminal or a switch box, switch the connection from Core to Core as needed.

- 2 Use LD 135 to switch to the Core which contains the non-faulty Security Device.

LD 135 to load the program

- SCPU** switch CPUs (if necessary)
******** exit LD 135
- 3** Insert the keycode diskette into the floppy drive on the IODU/C with the non-faulty Security Device.
- 4** In LD 143, print the pending keycode contents. Use “KSHO F0” if your keycode is on the diskette in the floppy drive on Core 0, or “KSHO F1” if your keycode is on the diskette in the floppy drive on Core 1:
- LD 143** to load the program
KSHO F0 print the contents of the candidate keycode
or
KSHO F1
- 5** Perform the KDIF command. Use “KDIF F0 REC” if the keycode diskette is inserted in the floppy drive on Core 0, or “KDIF F1 REC” if the keycode is inserted in the floppy drive on Core 1:
- KDIF F0 REC** to print the differences between the candidate and the current keycodes
or
KDIF F1 REC
******** to exit LD 143
- 6** Disable the inactive IODU/C:
- LD 137** to load the program
STAT to find the status of the IODU/Cs
DIS CMDU x to disable the CMDU part of the inactive IODU/C x
DIS IOP x to disable the IOP part of the inactive IODU/C x

Perform the following steps on the *inactive* Core.

- 7** Set the ENB/DIS switch on the IODU/C with the faulty Security Device to DIS.
- 8** Unhook the locking devices and remove the IODU/C.
- 9** Remove the round 1/2” diameter IODU/C Security Device from the black round Security Device holder on the top right corner of the IODU/C card.
- 10** Locate the round 1/2” diameter IODU/C replacement Security Device.
- 11** Make sure the 8-digit code on the Keycode diskette matches the 8-digit code on the replacement Security Device.

- 12 With the Nortel side facing upward, slide the replacement Security Device between the security device holder and the holder clip. Do not bend the clip more than necessary when inserting the Security Device. Ensure that the Security Device is securely in place.
- 13 Reinsert the IODU/C into the following slots:
 - For NT5D21 Core/Net Modules, insert the IODU/C in slots 17, 18, and 19.
- 14 Lock the locking devices by pushing them gently towards the faceplate. Set the ENB/DIS switch to ENB.

A blinking letter "E" and number "5" displayed indicates that a failure occurred. In that case, reseal the Security Device in its holder and reinsert the card.

- 15 Enable the IODU/C in LD 137:

```
STAT          to see the status of the IODU/Cs
ENL CMDU x    to enable the CMDU part of IODU/C x
ENL IOP x     to enable the IOP part of IODU/C x
STAT          to see the status of the IODU/Cs
****         to exit LD 137
```

- 16 Perform the KNEW command:

```
LD 143       to load the program
KNEW HD      to copy the keycode to the other Core
****         to exit the program
```

- 17 Reboot the system at a time that will minimize service impact. The new keycode will not take effect until the system reboots.

Replacing the Security Device on an Option 51C system



CAUTION

Service Interruption

Performing this procedure in a nonredundant system, such as 51C, will disrupt system operation. If possible, schedule the replacement at the lowest traffic time.

- 1 To access the Core during the replacement procedure, connect a terminal to the J25 port on the I/O panel in the Core Module or Core/Network Module. To communicate with the processor, you must use the following settings on the terminal:

9600 baud, 7 data, space parity, 1 stop bit, full duplex, XOFF

- 2 Set the ENB/DIS switch on the IODU/C with the faulty Security Device to DIS.
- 3 Unhook the locking devices and remove the IODU/C.
- 4 Remove the round 1/2" diameter Security Device from the black round Security Device holder on the top right corner of the IODU/C card.
- 5 Locate the round 1/2" diameter IODU/C replacement Security Device.
- 6 Make sure the 8-digit code on the Keycode diskette matches the 8-digit code on the replacement Security Device.
- 7 With the Nortel side facing upward, slide the replacement Security Device between the security device holder and the holder clip. Do not bend the clip more than necessary when inserting the Security Device. Ensure that the Security Device is securely in place.
- 8 Reinsert the IODU/C into the following slots:
 - For NT5D21 Core/Net Modules, insert the IODU/C in slots 17, 18, and 19.
- 9 Lock the locking devices by pushing them gently towards the faceplate. Set the ENB/DIS switch to ENB.

A blinking letter "E" and number "5" displayed indicates that a failure occurred. In that case, reseal the Security Device in its holder and reinsert the card.

- 10 Insert the Install diskette that corresponds to your CP card and press the MAN RST button on the CP card.

- 11 When the NT Logo Screen appears on the terminal, the Software Installation Tool has loaded. Press <CR> to go to the Install Menu.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
                                     * *
                                   * * *
* * * *           * *           * * * *
* * * *           * * * * *           * * * * * * * * * *
* * * *           * * * * * * *           * * * * * * * * * *
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* * * *           * * * *           * * * *           Nortel — Meridian 1
* * * *           * * * *           * * * *           Install Tool (x11)
* * * *           * * * *           * * * *
* * * *           * * * * * * * * * * * * * * * * * * * * * *
* * * *           * * * * * *           * * * * * * *
* * * *           * * *           * * *
                                     Copyright 1992 - 1997 Nortel, Inc.

Please press <CR> when ready . . .
                                     553-7728
```

12 At the Main menu select <u> to go to the Install menu.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
                M A I N   M E N U

The Software Installation Tool will install or upgrade Meridian-1
System Software, Database and the PE-ROM (both CP and IOP ROM).
You will be prompted throughout the installation and given the
opportunity to quit at any time.

Please enter:
<CR>--> <u> - To Install menu.
        <t> - To Tools menu.
        <q> - Quit.

Enter choice > u
                                                    553-7780
    
```

13 Insert the new Keycode diskette when prompted and select <a> to continue with the keycode validation.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====

Please insert the diskette with the keycode file into the floppy
drive.

Please enter:
<CR>--> <a> - Continue with the keycode validation
        (the keycode diskette is in the floppy drive).
        <q> - Quit.

Enter Choice > a
                                                    553-7729
    
```

Following keycode validation, the system erases all keycode files from the hard disk and replaces them with the new keycode.

- 14 At the Install menu select **<k>** - "To install Keycode only."

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
-----
                I N S T A L L   M E N U

The Software Installation Tool will install or upgrade Meridian-1
System Software, Database and the PE-ROM (both CP and IOP ROM).
You will be prompted throughout the installation and given the
opportunity to quit at any time.

Please enter:
<CR>--> <a> - To install Software, CP-BOOTROM, IOP-ROM.
        <b> - To install Software, Database, CP-BOOTROM, IOP-ROM.
        <c> - To install Software only.
        <d> - To install Database only.
        <e> - To install CP-BOOTROM only.
        <f> - To install IOP-ROM only.
        <g> - To reinstall CP-Software.
        <o> - To copy System Software from the other Core.
        <t> - To go to the Tools menu.
        <k> - To install Keycode only.
        <q> - Quit.

Enter choice > k
```

553-7793

- 15 **Remove the diskette** from the IODU/C.
- 16 Select **<q>** to quit and reload the system.

17 Select <y> to confirm quit.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
You selected to Quit. Please confirm.

Please enter:
<CR>--> <y> - Yes, Quit.
        <n> - No, DO NOT Quit.

Enter choice > y
                                                553-7751
    
```

18 Select <a> to reboot the system.

```

Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)
=====
You have selected to Quit the Software Installation Tool
You may reboot the system or return to the Main Menu.
Before rebooting the system, remove Install diskette from the floppy drive.

-----
DO NOT REBOOT USING BUTTON!!
-----

Please enter:
<a> - Reboot the system.
<CR>--> <m> - Return to the Main menu.

Enter Choice > a
                                                553-7752
    
```

The Security Device replacement procedure is complete.

NT5D2103 Core/Network Card Cage

To replace a defective backplane in an NT5D21 Core/Network Module, you must replace the card cage.



CAUTION

Service Interruption

The following procedures describe card cage replacement for redundant systems such as 61C, and 81C. A single-CPU system, such as 51C, must be shut down to replace the card cage.

Use this procedure to replace the card cage in a redundant system by maintaining system operation with the active CPU and replacing the card cage of the standby CPU. See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 To access the Cores during the replacement procedure, connect a terminal to the J25 port on the I/O panel in the rear of each Core/Network Module. You must use the following settings on the terminal:

9600 baud, 7 data, space parity, 1 stop bit, full duplex, XON

Note: If you are using only one terminal or a switch box, switch the connection from Core to Core as needed.

- 2 The Call Processor (CP) Card must be inactive in the card cage you are replacing.
 - a. Check the status of the CP cards:
 - LD 135**
 - STAT CPU** determine which CP card is activeIf necessary, switch Cores:

SCPU switch Cores
 **** exit LD 135

- b. Set the NORM/MAINT switch to MAINT on the now *active* CP card.
 - c. Connect the terminal to the port on the inactive Core.
- 3** Set the NORM/MAINT switch to MAINT on the CP card in the card cage you are replacing (the inactive Core). Wait 2 minutes for the system to initialize. (A series of INI messages will be seen on the terminal for the inactive Core.)

- 4** Disable the clock controller card and any QPC720 Primary Rate Interface or QPC472 Digital Trunk Interface (PRI/DTI) Cards in the card cage you are replacing.

- a. Check the status of the clock controller cards:

LD 60

SSCK x “x” is the Core (0 or 1)

If the clock controller card is active, switch to make it inactive:

SWCK

Disable the clock controller card:

DIS CC x “x” is the Core (0 or 1)

- b. Set the ENB/DIS switch to DIS on the clock controller card in the card cage you are replacing.
- c. Disable any PRI/DTI cards in the card cage you are replacing.

DISL loop disable the network loop and the card
 **** exit LD 60

Note: If the PRI/DTI cards service loops that cannot be out of service, move the cards to a different module and reenable them.

- 5** Set the ENB/DIS switch to DIS on all CNI cards and the IODV/C in the card cage you are replacing.
- 6** Follow the steps below to disconnect and remove the NT8D22 System Monitor (do *not* turn off the blower unit in the front of the pedestals):

- a. Load LD 37 and software disable the associated SDI port:

LD 37

DIS TTY x disable the device associated with the port
**** exit LD 37


- b. If the card cage you are removing is in the column with the master system monitor (should be column 0):

On the master system monitor (column 0), disconnect the RJ11 cable to J3, then the cable to J6, then pull the system monitor out of the slot.


- c. If the card cage you are removing is in the column with a slave system monitor (should be column 1):

On the master system monitor (column 0), disconnect the RJ11 cable to J3, then the cable to J6, then pull the system monitor out of the slot.

On column 1, disconnect the cables, then pull the system monitor out of the slot.

	<p>CAUTION Service Interruption If the system monitors are not removed, the system may shut down.</p>
-----------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------

- 7 Follow the appropriate step below to turn off power to the module:
 - a. With AC power, set the main circuit breaker for the column to OFF (down) in the rear of the pedestal.

	<p>DANGER OF ELECTRIC SHOCK Due to hazardous voltage in ac-powered systems, power to the entire column must be shut down. This shuts down all functions in the column including the network group in that column. Relocate essential services from this group before proceeding.</p>
-------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

- b. With DC power, set the switch on the NT6D41 CE Power Supply to OFF (down). Set the circuit breaker *for just this module* to OFF (down) in the rear of the pedestal. (All other modules in the column retain power.)

- 8** Follow the steps below to remove all cards from the module:
 - a.** Tag and disconnect all cables to the front of the module. Tape over the contacts to avoid grounding. Tape or tie all cables to the sides so the working area in front of the card cage is totally clear.
 - b.** Set the ENB/DIS switch to DIS on any cards that are not already set to disable.
 - c.** Tag the cards so they can be returned to the same slot in the replacement card cage. Remove the cards, including the bus terminating units (BTUs) between slots 4 and 5.

- 9** Follow the steps below to disconnect cables to the I/O panels and backplane at the rear of the module:
 - a.** Tag and disconnect cables from the I/O panels.
 - b.** Remove the I/O panels and the I/O safety panel over the backplane to access the rear backplane connectors.
 - c.** Use the P0741489 Extraction Tool to disconnect cables to the backplane connectors. (See “Options 51C, and 61C cable guidelines” on page 18.)

- 10** Follow the steps below to disengage the module:
 - a.** Remove the two mounting screws that secure the rear of the card cage to the module.
 - b.** Remove the front trim panels on each side of the card cage.
 - c.** Remove the three mounting screws that secure the front of the card cage to the bottom of the module.
 - d.** Pull the card cage halfway out of the module.

- 11** Follow the steps below to disconnect power and ground connections at the rear of the module:
 - a.** Disconnect the system monitor ribbon cables to J1 and J2.
 - b.** Disconnect the module power connectors. These are small orange connectors plugged into the module power distribution unit (MPDU) with AC power, or connected to each other with DC power.
 - c.** Disconnect the logic ground (orange) wire from the backplane bolt.

- d. Disconnect the frame ground (green) wire from the frame ground post.



CAUTION

Service Interruption

Do not disconnect the main power connectors (large orange connectors) at the top and bottom of the module.

- 12 Pull the card cage all the way out of the module.

Note: For AC-powered systems, after the card cage is out of the module you must remove the MPDU and reinstall it on the replacement card cage. The screw-heads for the MPDU are in the wall of the power supply slot.

- 13 Remove the floating power connector (the black connector) on the rear of the card cage. Using the same mounting screws and nuts, attach the connector to the new card cage.

Note: Check the orientation of the connector. Looking at it from the rear of the card cage, the upper left corner pin should be empty (no wire) and the lower right corner pin should have a wire installed. The green wire should be up.

Installing equipment

- 14 Set the backplane jumpers in the card cage for Core/Network 0 and Core/Network 1 in Options 61C and 81C, and Core/Network Module in Option 51C. The jumpers are located on the backplane, along the bottom of the front side (the side facing into the card cage assembly):
 - a. For Core/Network 0, verify that the jumper between card slots 14 and 15 is closed.
 - b. For Core/Network 1, verify that the jumper between card slots 14 and 15 is open.



CAUTION

System Failure

If the Core/Network Module jumpers are set incorrectly, the system will not load and operate correctly.

- 15** Reposition the EMI shield (it looks like a brass grill) in the base of the module. Tape over the front mounting tabs to hold the shield in position. The tape will be removed later.
- 16** Slide the new card cage about halfway into the module. Hold the card cage firmly while the ground and power connections are attached at the rear of the module:
 - a.** Attach the system monitor ribbon cables (J1 goes down to the pedestal, J2 goes up the column).
 - b.** Attach the frame ground (green) wire to the frame ground post on the module. (A 5/16" socket wrench is needed for this operation.) Remove the nut and the lockwasher at the top of the post. Put the frame ground connector over the post. Reinstall the top lockwasher and the nut, then tighten the nut down.
 - c.** Attach the logic ground (orange) wire. Remove one nut and the lockwasher. Put the connector over the post, reinstall the lockwasher and nut, then tighten the nut down. (A 3/8" socket wrench is needed for this operation.)
 - d.** Connect the module power connectors to the MPDU for AC power, or to each other for DC power.
- 17** Follow the steps below to install the new card cage in the module:
 - a.** Slide the card cage the remainder of the way into the module.
 - b.** Check the position of the EMI shield. If it has shifted, reposition it. Remove the tape holding the EMI shield.
 - c.** Secure the card cage to the module with the three screws in the front and the two screws in the rear.
- 18** Replace the trim panels on both sides of the card cage.
- 19** Install the module power supply in the slot labeled "CE pwr sup" in the Core/Network card cage. Perform a hardware sanity check:
 - a.** Turn on power to the module:

With AC power, set the main circuit breaker to ON (up) in the rear of the pedestal.

With DC power, set the breaker to ON (up) in the pedestal, then set the switch to ON (up) on the power supply in the module.

- b.** Check the LED pattern for the card cage you are installing:


- On the NT5D2103 card cage, the LEDs are on the front side of the backplane. The LEDs are in two vertical columns, one on either side of slot 12 (if necessary, remove the CNI card to view the LEDs). The LEDs on the right side of the slot apply to Core 0 and must be (from the top down) OFF-OFF-OFF-OFF. Those on the left side apply to Core 1 and must be ON-OFF-OFF-OFF.
- c. Shut down power to the module again.

With AC power, set the main breaker for the column to OFF (down).

With DC power, set the switch on the power supply and the pedestal breaker for the module to OFF (down).

20 Install the module power supply in the slot labeled “CE pwr sup” in the Core/Network card cage. Follow the steps below to reconnect cables to the backplane:

- a. Reconnect all cables to the backplane connectors.

	<p>CAUTION Damage to Equipment If you try to insert the cable connector at an angle, pins may be bent or broken.</p>
-----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------

- b. Route the NTND14 CNI to 3PE cables to the right side (facing the rear) of the module and tie-wrap them to the cable restraint bracket behind the I/O panel.
- c. Position and secure the I/O panels.
- d. Position and secure the I/O safety panel.

21 Reinstall the 3PE card. Set the ENB/DIS switch to ENB.

22 Set the ENB/DIS switch on the clock controller card to DIS. Seat the clock controller card; leave the ENB/DIS switch set to DIS and do not connect the faceplate cables.

23 Follow the appropriate step below to turn on power to the column or the module power supply:

- a. With AC power, set the main circuit breaker in the pedestal to ON (up).
- b. With DC power, set the breaker to ON (up) in the pedestal. Set the switch to ON (up) on the power supply in the module.

- 24** Follow the appropriate steps below to connect the clock controller cables:
- a.** For a QPC471 Clock Controller card, connect the NT8D79 cables from the primary or secondary reference to the faceplate of the clock controller card. For Options 81C, connect the NT8D74 cable from the NT8D36 InterGroup Module to the clock controller card.
 - b.** For QPC775 Clock Controller Cards in Options 81 and 81C, connect the NT8D74 cable from the junctor board to the faceplate of the clock controller card. Then connect the NT8D79 cables from the primary or secondary reference to the faceplate of the clock controller card.
 - c.** Leave the ENB/DIS switch set to DIS on QPC471 or QPC775 cards.

- 25** Reinstall the NT5D20 IOP/CMDU, then set the ENB/DIS switch to ENB.

As the card performs card-level power-up tests, watch the faceplate HEX display for flashing error codes. See *Administration* (553-3001-311) for an explanation of the codes.

- 26** Set the NORM/MAINT switch on the CP card to MAINT. (This will keep the system in split mode when the card is reinstalled.)
- 27** Reinstall the CP card. As the card performs card-level power-up tests, watch the LCD display and output from the CPSI port for error messages:
- a.** Following the "Selftest Complete" message, watch the LCD on the CP card for the message "IOP in Slot 16."
 - b.** Watch the LCD for the message "Loading Disk OS." As the system attempts to access the hard disk, watch the LCD for error messages.
 - c.** Watch for system reload (SYS) and initialization (INI) messages on the terminal.
- 28** Seat all CNI cards, but leave the ENB/DIS switches set to DIS.
- 29** Load LD 135 and check the status of all configured CNI cards:

LD 135

STAT CNI get the status of all configured CNIs

TEST CNI c s test each configured CNI on the inactive side
**** exit LD 135

- 30 Set the ENB/DIS switch to ENB on the clock controller card.
- 31 Set the ENB/DIS switch to ENB on all CNI cards.
- 32 Press and release the MAN RST button on the CP card in the new card cage. When SYS700 messages appear on the LCD display, set the NORM/MAINT switch to NORM. Within 60 seconds, the LCD will display the following messages, confirming the process:

RUNNING ROM OS
ENTERING CPU VOTE

By the active CPU, an HWI533 message from the CPSI or SDI port indicates the memory is shadowed.

Note 1: At this point, the other Core is still active and in split mode. The Core in the new card cage is the standby (inactive) side. The memories are shadowed (synchronized), but the hard disks are not synchronized (redundancy is disabled).

Note 2: A CNI port LED may not go out if a network loop corresponding to that port is disabled.

- 33 Set the NORM/MAINT switch to NORM on the CP card in the active Core and perform a redundancy sanity test:

LD 135

STAT CNI get the status of all configured CNIs
STAT CPU get the status of both Cores
TEST CPU test the inactive CP card and CP to CP cable
TEST CNI c s test each configured CNI on the inactive side

Note: Testing the CP and CNI cards can take 2 minutes or more for each test.

- 34 Switch Cores and test the other side:

SCPU switch to Core 0
TEST CPU test the inactive CP card and CP to CP cable

-
- 35** Get the status of the CP cards and memories, and of the CNIs:
- STAT CPU** get the status of both Cores
 - STAT CNI** get the status of all configured CNIs
 - ****** exit LD 135
- 36** Synchronize the disk drives:
- LD 137**
- SYNC** synchronize the hard disks
- Note:** Synchronization may take up to 50 minutes.
- 37** Test Core functions:
- LD 135**
- TEST CPU** test the inactive CP card and CP to CP cable
 - TEST IPB** test the backplane protocol on the inactive side
 - TEST CNI c s** test each configured CNI on the inactive side
- If all the tests pass, switch Cores and test the side that is now inactive:
- SCPU** switch to the other Core
 - TEST CPU** test the inactive CP card and CP to CP cable
 - TEST IPB** test the backplane protocol on the inactive side
 - TEST CNI c s** test each configured CNI on the inactive side
- 38** Clear displays, major alarms, and minor alarms:
- CDSP** clear the display
 - CMAJ** clear all major alarms
 - CMIN ALL** clear all minor alarms
 - SCPU** switch to the other Core
 - CDSP** clear the display
 - ****** exit LD 135
- 39** Software enable, from the active side, the clock controller and PRI/DTI cards:

- a. Enable the clock controller card:

LD 60

ENL CC x

TRCK aaa if necessary, set tracking

- b. Enable the PRI/DTI cards:

ENLL loop

******** exit LD 60

- 40** Follow the appropriate steps below to reinstall and check the system monitor:

- a. If you replaced the card cage in the column with the master system monitor:

Reconnect the RJ11 cable to J6, then the cable to J3. Reinstall the system monitor.

- b. If you replaced the card cage in the column with the slave system monitor:

Reinstall the system monitor in column 1 first.

On the master system monitor, reconnect the RJ11 cable to J6, then the cable to J3. Reinstall the system monitor.

- c. Enter:

LD 37

STAT XSM check the status of the system monitors

******** exit LD 37

- 41** Tag defective equipment with a description of the problem and package it for return to a repair center.

NT5K09 Quad Digitone Receiver

Use the following procedure to replace a defective Quad DIGITONE Receiver Card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.

**DANGER**

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

**CAUTION****Service Interruption**

Service is interrupted when a loop is disabled.

Removing equipment

- 1 Software disable the Quad DTMF Receiver by entering
LD 32
DISS I s
(“I s” represents loop and shelf number)
- 2 Remove the backplane access plate at the rear of the UEM by removing the screws on each side. Set the plate aside.
- 3 Unhook the locking devices on the card; pull it out of the card cage.

Installing equipment

- 1 Check that the plug P2 On the replacement card is oriented in the same way as the card being replaced.
- 2 Insert the replacement card into the vacated slot and hook the locking devices.
- 3 Position the backplane access plate. Replace the screws.
- 4 Software enable each loop on the card by entering
ENLS I s
- 5 End the session in LD 32 by entering

- 6 Test each loop on the card by entering
LD 30
LOOP I

If there is a problem, an NWS system message will be produced and the appropriate red LED will light on the faceplate of the card.

- 7 End the session in LD 30 by entering

- 8 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT5K10 Dual Loop Peripheral Buffer Card

Use this procedure to replace a defective Enhanced Dual Loop Peripheral Buffer (IDLB) card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



CAUTION

Service Interruption

Service is interrupted when a loop is disabled.

Removing equipment

- 1 Software disable the Dual Loop Peripheral Buffer by entering
LD 32
DISS I s
(“I s” represents loop and shelf number)
- 2 Remove the Backplane access plate at the rear of the UEM by removing the screws on each side. Set the plate aside.

- 3 Tag and disconnect cables to the card you are removing.
- 4 Unhook the locking devices on the card; pull it out of the card cage.

Installing equipment

- 1 Set option switches on the replacement card the same as on the card you removed.

To check switch settings, see *Circuit card installation and testing (553-Circuit Card: Installation and Testing (553-3001-211))* in the SL-1 installation and maintenance guide.

- 2 Insert the replacement card into the vacated slot and hook the locking devices.
- 3 Connect cables to the replacement card.
- 4 Position the backplane access plate. Replace the screws.
- 5 Software enable each loop on the card by entering
ENLS I s
- 6 End the session in LD 32 by entering

- 7 Test each loop on the card by entering
LD 30
LOOP I

If there is a problem, an NWS system message will be produced and the appropriate red LED will light on the faceplate of the card.

- 8 End the session in LD 30 by entering

- 9 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT5K1106 Enhanced Peripheral Equipment Card Cage

To replace a defective NT5K1102 Enhanced Peripheral Equipment Backplane in the NT5K11 EEPE UEM, you must replace the NT5K1106 Enhanced Peripheral Equipment Card Cage Assembly. Use this procedure to replace the unit.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

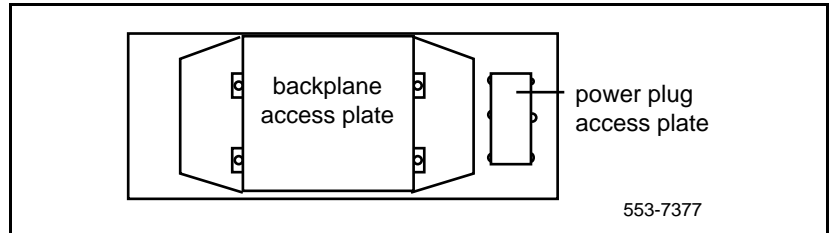
- 1 Disable the EEPE Enhanced Peripheral Equipment shelf by entering
LD 32
DISS I s
(“I s c” represents loop, shelf number)

If a second shelf is assigned to a loop, disable that shelf also by entering **DISSI 1 s**

- If the shelf is in single loop mode, two loops are disabled.
 - If the shelf is in dual loop mode, four loops are disabled.
- 2 Turn off power to the UEM power supply by setting the switch on the NT5K12 Enhanced Equipment power supply to OFF(left).
 - 3 Remove all cards from the shelf of the UEM:
 - a. Tag and disconnect cables to all faceplate connectors.
 - b. Tag cards so they can be returned to the same slot. Remove cards.
 - 4 Disconnect cables, plugs, and wires from the back of the UEM to the backplane:
 - a. Remove the Backplane access plate by removing the screws on each side (see Figure 9 on page 145). Set the panel aside.
 - b. Remove all cards from the back of the UEM.
 - c. Tag and disconnect cables to all faceplate connectors.
 - d. Tag cards so they can be returned to the same slot. Remove cards.
 - e. Tag and disconnect all cables from the backplane to the interior of the I/O assembly.

- f. Tag and disconnect all plugs, wires, and cables to the backplane.

Figure 9
EEPE access plates (rear view)



- 5 Remove the two mounting screws that secure the back of the card cage to the UEM assembly.
- 6 Remove the front cover plates on both sides of the card cage.
- 7 Remove the three mounting screws that secure the front of the card cage to the bottom of the UEM assembly. Pull the card cage out of the UEM.
- 8 Slide the replacement card cage into position in the UEM leaving approximately 3" clearance between the card cage and the backplane.
- 9 Reconnect cables, plugs, and wires from the UEM to the backplane:
 - a. Connect all cables from the interior of the I/O assembly to the backplane.
 - b. Position the backplane access plate. Replace the screws.
 - c. Connect all plugs, wires, and cables to the backplane.

Installing equipment

- 10 Slide the replacement card cage into position in the UEM taking care not to pinch the cables.
- 11 Install the three mounting screws that secure the front of the card cage to the bottom of the UEM assembly.
- 12 Replace the front cover plates on both sides of the card cage.
- 13 Install the mounting screws at the back of the card cage.
- 14 Reconnect cables, plugs, and wires from the UEM to the backplane:

- a. Connect all cables from the interior of the I/O assembly to the backplane.
 - b. Connect all plugs, wires, and cables to the backplane.
 - c. Position the power plug access plate. Replace the screws.
- 15 Return cards to their slots at the rear of the UEM. Reconnect all cables to connectors.
- 16 Position the backplane access plate. Replace the screws.
- 17 Return cards to their slots at the front of the UEM. Reconnect all cables to connectors.
- 18 Turn on power to the UEM power supply by setting the power supply switch to ON (right):
- 19 Enable the shelf by entering
ENLS I s

If a second shelf is assigned to a loop, enable that shelf also by entering
ENLS I s

End the session in LD 32 by entering

- 20 Test the shelf by testing each loop with
LD 30
LOOP I s

If there is a problem, an NWS system message will be produced.

- 21 End the session in LD 30 by entering

- 22 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT5K21AA Extended Multi - Frequency Compelled Sender/Receiver Card

Use this procedure to replace a NT5K21AA card in an IPE Modules.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Software disable the card:

LD 32

STAT I s c

DIS I s c

("I s c" represents loop, shelf, and card number)

You will see "NPR011" on the system terminal when the card is disabled. Busy channels will not be disabled until the call is disconnected.

You will see the LED light up when the card becomes disabled.

- 2 Unhook the locking devices on the card; pull it out of the card cage.

Installing equipment

- 1 Insert the replacement card into the vacated slot and hook the locking devices.

Note: When IPE cards are installed, the red LED on the faceplate remains lit for 2 to 5 seconds as a self-test runs. If the self-test completes successfully, the LED flashes three times and remains lit until the card is configured and enabled in software, then the LED turns off. If the LED does not follow the pattern described or operates in any other manner (such as continually flashing or remaining weakly lit), replace the card.

- 2 Software enable the card:

LD 32

ENLC I s c

When the process is complete, you will receive a system response

STAT I s c

Obtain the status of the card to ensure that the card is enabled

To exit the program

- 3 (Optional): Test the card:

LD 30

SHLF I s

("I s" represents loop, shelf number)

Note: This command tests every card on the designated shelf.

If there is a problem, an NWS system message is generated and the red LED(s) on the faceplate of the card will remain lit.

If there is no problem, exit LD 30.

- 4 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT6D40, NT6D41, NT6D42, Power Supply DC

Use this procedure to replace the following DC power supplies:

- NT6D40 PE Supply DC
- NT6D41 CE Power Supply DC

NT6D42 Ringing Generator DC



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Set the switch on the front of the power supply to OFF (down).
- 2 Unhook the locking devices on the power supply; pull it out of the card cage.

Installing equipment

- 1 Set the switch on the replacement power supply to OFF (down).
Note: On a replacement NT6D42, set option switches the same as on the one you removed. If there is a vintage change, be sure to check *Circuit Card: Installation and Testing* (553-3001-211) for any differences.
- 2 Insert the replacement power supply into the vacated slot and hook the locking devices.
- 3 Set the switch on the replacement power supply to ON (up). The green LED on the power supply should light and stay lit.
- 4 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT6D65 and NTRB34 Core to Network Interface Cards

Use this procedure to replace the Core to Network Interface (CNI) or Core to Network Interface 3 (CNI-3) card. See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



CAUTION

Service Interruption

Replacing the CNI card in a nonredundant system, such as 51C, will disrupt system operation. If possible, schedule the replacement at the lowest traffic time (after midnight).



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Before replacing a CNI or CNI-3 card, you can test it in an unused CNI slot (in case, for example, there is a bent pin on the backplane). If the card works correctly in the new slot, you can leave it there. To switch slots:

- 1 The Core associated with the CNI card must be inactive:
 - If you need to switch Cores:
 - LD 135**
 - SCPU**
 - a. Set the NORM/MAINT switch to MAINT on the *active* CP card.
- 2 Software disable the CNI card:
 - DIS CNI c s** “c” is the CPU (0 or 1), “s” is the card slot (8–12)
 - ****** exit LD 135

- 3 Software configure the new slot:
 - LD 17**
 - EXT x 3PE** “x” is the number (0–4) of the associated 3PE card(s)
 - CNI X s p** delete the group(s) associated slot
 - CNI s p g** add group(s) to new slot
 - **** exit LD 17
 - LD 43**
 - EDD** datadump the new configuration
 - **** exit LD 43

- 4 Insert the CNI card in the new slot. Move the cables to the shrouds on the backplane to the connectors for the new slot.

- 5 Enable the CNI card and switch the CP cards:
 - a. Set the NORM/MAINT switch to NORM on the *active* CP card.
 - b. **LD 135**
ENL CNI c s
SCPU

Use the following procedure to replace a CNI card.

Removing equipment

- 1 The Core associated with the CNI card must be inactive:
 - a. If you need to switch Cores:
 - LD 135**
SCPU
 - b. Set the NORM/MAINT switch to MAINT on the *active* CP card.
- 2 Set the ENB/DIS switch to DIS on the CNI card you are replacing.
- 3 Unhook the locking devices on the card; pull it out of the card cage.

Installing equipment

- 1 Set the ENB/DIS switch to DIS on the replacement card.
- 2 Insert the replacement card into the vacated slot and hook the locking devices.

- 3 Set the ENB/DIS switch to ENB on the replacement card.
- 4 Set the NORM/MAINT switch to NORM on the *active* CP card.
- 5 Software enable and test the CNI card and configured ports on the card:

```
ENL CNI c s    "c" is the CPU (0 or 1), "s" is the card slot (8-12)
TEST CNI c s
SCPU
****          exit LD 135
```

Note: Due to the need to reestablish memory shadowing and contents, the test command may take a minute or more depending on memory size. The LED on the CNI card flashes as the test runs.

If there is a problem, a CCED system message is generated (LEDs on the CNI cards stay lit on the inactive Core).

Note: If the network loop corresponding to a CNI port is not enabled, the LED for that port may not go out.

- 6 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT7D10 Power Distribution Unit DC

Use this procedure to replace the power distribution unit (PDU) for DC-powered systems.



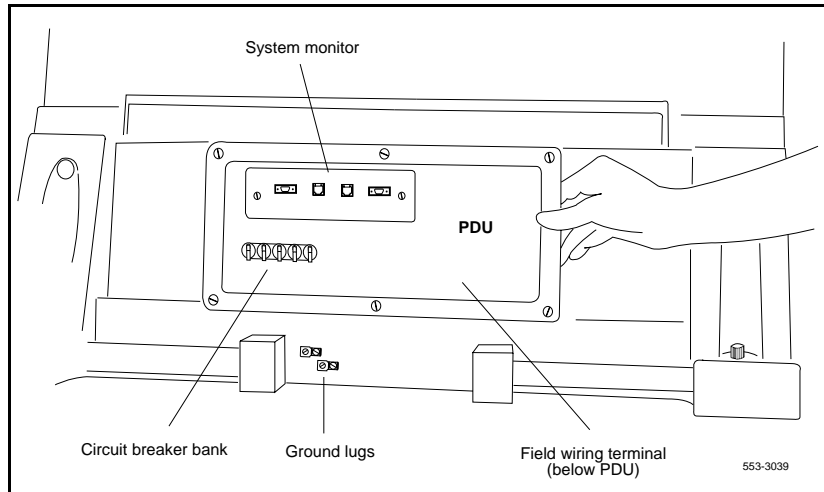
DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.


Removing equipment

- 1 Disconnect the DC power at the source (not at the PDU).
- 2 Remove the grill on the rear of the pedestal.
- 3 Set all five circuit breakers on the PDU to OFF (down). Figure 10 on page 152 shows the location of the PDU in the rear of the pedestal.
- 4 Unseat the blower unit in the front of the pedestal:

Figure 10
NT7D10 Power Distribution Unit DC



- a. Remove the grill on the front of the pedestal. Set the toggle switch on the front of the unit to OFF (left).
- b. Turn the screws on the front of the unit counterclockwise and pull the unit forward several inches so the connector on the rear disengages.

	<p>DANGER</p> <p>Do not pull the blower unit out of the pedestal. The unit is heavy and the blades on the blower may still be rotating up to two minutes after the power is turned off.</p>
------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

- 5 Disconnect cables that run between the module above the pedestal (module 0) and the top of the PDU:
 - a. Remove the rear cover on the module.
 - b. Remove the I/O safety panel over the backplane in the module.
 - c. Disconnect the system monitor ribbon cable from the PDU.

- d. Disconnect the large orange power connector (J1) from the PDU.

Note: To disconnect the power plug, you must press a latch trip on the front and rear of the plug. You may need to use a screwdriver blade against the latch trip on the front of the plug.

- 6 Tag and disconnect cables to the NT8D22 System Monitor. Loosen the two screws on the system monitor card and remove it from the PDU.
- 7 Remove the six screws that position the PDU. Carefully pull the unit straight forward and set it on the floor next to the pedestal (see Figure 11 on page 154).

**CAUTION****Damage to Equipment**

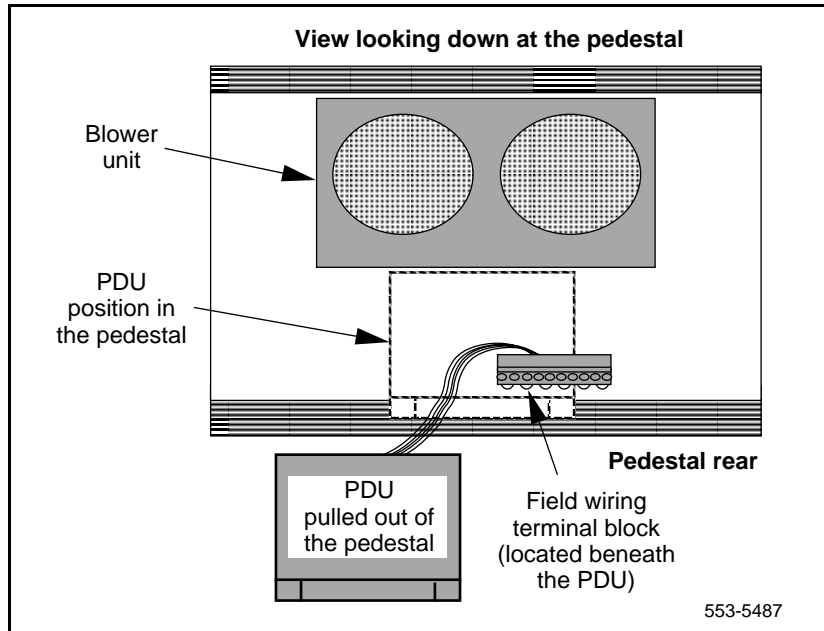
The PDU cannot be completely removed from the pedestal until cables to the field wiring terminal block are disconnected. Label wires carefully. Improper wiring can cause system damage.

- 8 Remove the field wiring terminal block:
 - a. Remove the cover over the field wiring terminal block.
 - b. Locate the frame ground wire that runs from the field wiring terminal block to the frame ground bolt inside the pedestal. Disconnect this wire at the terminal block.
 - c. Carefully tag and then disconnect all input wiring to the field wiring terminal block. Take special note of any jumper wires that might be installed. It is not necessary to disconnect wiring that runs from the terminal block to the PDU.
- 9 Remove the four screws that secure the terminal block in place and lift it out of the pedestal.

Installing equipment

- 1 Install the replacement field wiring terminal block:
 - a. Position the replacement PDU next to the rear of the pedestal.
 - b. Position the replacement field wiring terminal block and replace its mounting screws.

Figure 11
Cabling between the PDU and the field wiring terminal block



- c. Reconnect all wiring to the field wiring terminal block, including any jumpers that might have been present on the terminal block that was removed.
 - d. Reconnect the frame ground wire from the frame ground bolt inside the pedestal to the field wiring terminal block.
 - e. Replace the cover over the field wiring terminal block.
- 2** Gently push the PDU into the pedestal. Replace the screws on the PDU.
- Note:** Be sure you push the unit straight back so the connector on the rear will seat properly with the connector for the blower unit.
- 3** Reconnect cables from module 0 to the PDU:
- a. Attach power plug J1 and the system monitor cable.
 - b. Replace the I/O safety panel on the module.
 - c. Replace the rear cover on the module.

- 4 Reseat the blower unit:
 - a. Lift the unit slightly and slide it into the pedestal glides. Set the toggle switch to ON (right).
 - b. Tighten the screws on the front of the unit.
- 5 Insert the system monitor card into the PDU. Tighten the screws on the card. Reconnect cables to the system monitor faceplate.
- 6 Set all five circuit breakers on the PDU to OFF (down). Reconnect the source of DC power.
- 7 One at a time starting with the breaker for the blower unit, set the circuit breakers on the PDU to ON (up). Make sure the green LED lights on the power supply unit(s) in each module.

Note: On initial power up, the blower may rotate slower than expected. As the sensor detects heat, the blower will rotate more rapidly.
- 8 Replace the pedestal grills in the front and rear.
- 9 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT7D67CB Power Distribution Unit DC

Use this procedure to replace the power distribution unit (PDU) for DC-powered systems.




DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

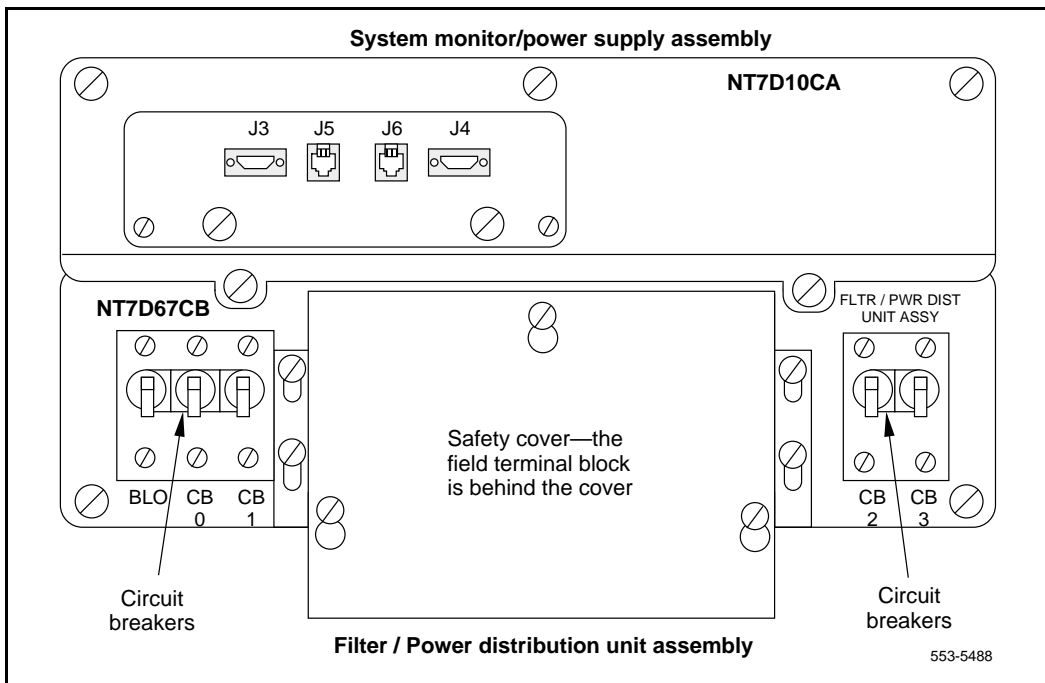
- 1 Disconnect the DC power at the source (not at the PDU).
- 2 Remove the grill on the rear of the pedestal.
- 3 In the rear of the pedestal, set all five circuit breakers on the PDU to OFF (down). Figure 12 on page 156 shows the PDU (labeled FLTR/PWR DIST UNIT ASSY on the equipment) and the NT7D10CA System Monitor/Power Supply Assembly (labeled XSM/PWR SUPPLY ASSY on the equipment).

- 4 Unseat the blower unit in the front of the pedestal:
 - a. Remove the grill on the front of the pedestal. Set the toggle switch on the front of the unit to OFF (left).
 - b. Turn the screws on the front of the unit counterclockwise and pull it forward several inches (you will see the L-bracket on the rear of the unit) until the connector disengages from the rear of the PDU.



DANGER
Do not pull the blower unit out of the pedestal. The unit is heavy and the blades on the blower may still be rotating up to two minutes after the power is turned off.

Figure 12
NT7D67CB Power Distribution Unit DC



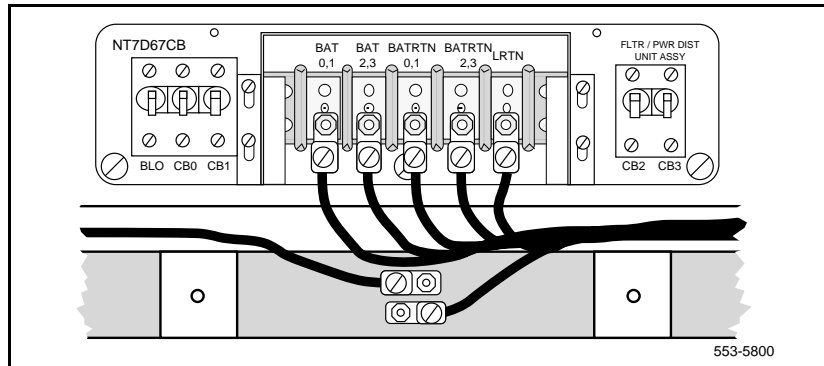
- 5 Disconnect cables that run between the module above the pedestal (module 0) and the PDU:
 - a. Remove the rear cover on the module.
 - b. Remove the I/O safety panel over the backplane in the module.
 - c. Disconnect the system monitor ribbon cable from module 0.
 - d. Disconnect the large orange power connector (J1) from the PDU.

Note: To disconnect the power plug, you must press a latch trip on the front and rear of the plug. You may need to use a screwdriver blade against the latch trip on the front of the plug.
- 6 Tag and disconnect cables to the NT8D22 System Monitor faceplate.
- 7 Loosen the five screws that secure the NT7D10CA system monitor assembly. Pull the assembly out of the pedestal far enough to disconnect the cables to the PDU:
 - a. Disconnect the small orange connectors (J2 on the PDU, P2 on the system monitor assembly) on the left side of the PDU.
 - b. Disconnect the flat white connector to the small circuit board (P1 on the PDU, J1 on the system monitor assembly) on the right side of the PDU.
- 8 Pull the system monitor assembly out of the pedestal along with the attached ribbon cable and set it aside until the replacement PDU is installed.
- 9 Remove the plastic safety cover over the terminal block on the PDU:
 - a. Loosen the three screws holding the cover.
 - b. Lift the cover up, then over the three mounting screws on the front panel of the cover.
- 10 Tag and disconnect all wiring to the field wiring terminal block on the PDU (see Figure 13 on page 158).

**CAUTION****Damage to Equipment**

Label wires carefully. Improper wiring can cause system damage.

Figure 13
Field wiring terminals in the NT7D67CB PDU



11 Remove the PDU:

Note: When a system is shipped, a set of screws secures the leveling bracket at the rear of the PDU to protect against vibration during transit. If the shipping screws were not removed during initial installation, you must remove them now to pull the PDU out of the pedestal. Pull the blower unit all the way out of the pedestal so you can access the shipping screws on the leveling bracket.

- a. Loosen the three screws that secure the PDU.
- b. Remove the two vertical screws located in the rear of the PDU that hold the L-bracket to the lower pedestal.
- c. Pull the PDU out of the pedestal, being careful to not chafe the cables against the pedestal.
- d. Disconnect the frame ground wire from the PDU at the frame ground bolt inside the pedestal.

Installing equipment

1 Install the replacement PDU:

- a. Connect the frame ground wire from the PDU to the frame ground bolt inside the pedestal.
- b. Guide the connector for the power cable through the hole in the top of the pedestal (do not allow the PDU to drop).

The safety ground/protective earth wires and all wiring to the block in the PDU must be neatly routed within the cable-tie saddles and under the cable restraint bar at the base of the pedestal. This ensures that there is room to install the PDU cover, safety cover, and rear grill.

- c. Connect the black BATRTN (48 V return) wires to the terminal block:
 - for modules 0 and 1 connect to the BATRTN 0,1 terminal
 - for modules 2 and 3 connect to the BATRTN 2,3 terminal
 - d. Connect the orange (or white) wire to the LRTN terminal.
- 6 Reinstall the plastic safety cover over the terminal block.
- 7 Reseat the blower unit:
 - a. Lift the unit slightly and slide it into the pedestal glides. Set the toggle switch to ON (right).
 - b. Tighten the screws on the front of the unit.
- 8 Reconnect cables to the system monitor faceplate.
- 9 Set all five circuit breakers on the PDU to OFF (down). Reconnect the source of DC power.
- 10 One at a time starting with the breaker for the blower unit, set the circuit breakers on the PDU to ON (up). Make sure the green LED lights on the power supply unit(s) in each module.

Note: On initial power up the blower may rotate slower than expected. As the sensor detects heat, the blower will rotate more rapidly.
- 11 Replace the pedestal grills in the front and rear.
- 12 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT7R51 Local Carrier Interface Card

Use this procedure to replace a Local Carrier Interface card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing and replacing a Local Carrier Interface card

- 1 Disable the Local Carrier Interface card by logging in to the system terminal, loading the Network and Peripheral Equipment Diagnostic Program LD 32, and executing **DISL loop**, where **loop** is the actual loop number of the Local Carrier Interface card.
- 2 Set the ENL/DIS switch to DIS.
- 3 Disconnect the cable from the Local Carrier Interface card faceplate.
- 4 Unlatch the card locking devices by squeezing the tabs and pulling the locking devices away from the card.
- 5 Pull the card out of the network module and place it into an antistatic bag away from the work area.
- 6 Set the replacement card ENL/DIS switch to DIS.
- 7 Hold the replacement card by the card locking devices and insert it partially into the card guides in the module.
- 8 Pull the upper and lower locking devices away from the faceplate on the card and insert the card firmly into the backplane connector. Press the card locking devices firmly against the faceplate to latch the card inside the module.
- 9 Set the replacement card ENL/DIS switch to ENL, the Local Carrier Interface card automatically starts the self-test

- 10 Observe the red LED on the front panel during self-test. If it flashes three times and stays on, it has passed the test. Go to step 11. If it does not flash three times and then stays on, it has failed the test. Pull the card partially out of the module and reinsert it firmly into the module. If the problem persists, troubleshoot or replace the Local Carrier Interface card.
- 11 Connect the cable to the Local Carrier Interface card faceplate connector.
- 12 Enable the Local Carrier Interface card. Load the Network and Peripheral Equipment Diagnostic Program LD 32, and executing **ENLL loop**, where **loop** is the actual loop number of the Local Carrier Interface card.r.
- 13 Tag the defective card(s) with a description of the problem and prepare them for shipment to your equipment suppliers' repair depot.

NT7R52 Remote Carrier Interface Card

Use this procedure to replace a Remote Carrier Interface card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing and replacing a Remote Carrier Interface card

- 1 Load Network and Peripheral Equipment Diagnostic Program LD 32. At the > prompt, type **LD 32** and press the Enter key to access the program.
- 2 Type **DSXP x**, where **x** is the Remote Carrier Interface card number, and press the Enter key to disable the card. The Remote Carrier Interface card is now disabled and you can remove it.
- 3 Unlatch the card locking devices by squeezing the tabs and pulling them away from the card.

- 4 Pull the card out of the IPE module or cabinet and place it into an antistatic bag away from the work area.
- 5 Hold the replacement card by the card locking devices and insert it partially into the card guides in the module.
- 6 Pull the upper and lower locking devices away from the faceplate on the card and insert the card firmly into the backplane connector. Press the card locking devices firmly against the faceplate to latch the card inside the module. The Remote Carrier Interface card automatically starts the self-test.
- 7 Observe the red LED on the front panel during self-test. If it flashes three times and stays on, it has passed the test. Go to step 8. If it does not flash three times and then stays on, it has failed the test. Pull the card partially out of the module and reinsert it firmly into the module. If the problem persists, troubleshoot or replace the Remote Carrier Interface card.
- 8 At the prompt in the LD 32 program, type **ENXP x**, where **x** is the Remote Carrier Interface card number, and press the Enter key to enable the card. If the upper most red LED on the Remote Carrier Interface card faceplate turns off, the card is functioning correctly and is enabled. The outcome of self-test will also be indicated by LD 32 on the MMI terminal connected to the Remote Carrier Interface card. If the LED stays on, replace the card.
- 9 Tag the defective card(s) with a description of the problem and prepare them for shipment to your equipment suppliers' repair depot.

NT8D01 Controller Card

Use this procedure to replace a controller card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Turn off power to the module:
 - With AC power, set the associated circuit breaker on the module power supply (MPDU) to OFF (down).

Note: If there are two circuit breakers on the MPDU, the top one is associated with the module power supply, the bottom one with the ringing generator.

 - With DC power, set the switch on the module power supply to OFF (down).
- 2 Software disable the controller card (and all cards connected to the controller):

LD 32

DSXP x “x” is the controller card number

- 3 Unhook the locking devices on the card; pull it out of the card cage.

Installing equipment

- 1 Insert the replacement card into the vacated slot and hook the locking devices.
- 2 Turn on power to the module:
 - With AC power, set the associated circuit breaker on the MPDU to ON (up).
 - With DC power, set the switch on the module power supply to ON (up).
- 3 Watch the controller card as it runs a series of self-tests:
 - During the tests, the maintenance display on the card shows the code for each test running (see “HEX” in the *System Messages Guide* (553-3001-411)). If the tests complete successfully, the display begins normal operation. If the card continuously fails a test, the code for that test is displayed.
 - When IPE cards are installed, the red LED on the faceplate remains lit for 2 to 5 seconds as a self-test runs. If the self-test completes successfully, the LED flashes three times and remains lit until the card is configured and enabled in software, then the LED goes out. If the LED does not follow the pattern described or operates in any other manner (such as continually flashing or remaining weakly lit), replace the card.

- 4 Software enable and test the controller card (and all cards connected to the controller):

ENXP x

- If there is a problem, an NPR, NWS, or SDL system message may be produced and the red LED lights on the controller card.
- If there is no problem, exit LD 32:

- 5 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT8D02, NT8D03, NT8D09, NT8D14, NT8D15, NT8D16 Intelligent Peripheral Equipment Card

Use this procedure to replace the following intelligent peripheral equipment (IPE) cards:

- NT5D11 Line Side T1
- NT5D60AA CLASS Modem Card
- NT5K02 Flexible Analog Line Card
- NT5K07 Universal Trunk Card
- NT5K17 Direct Dial Inward Trunk Card
- NT5K18 Central Office Trunk Card
- NT5K19 E&M Trunk Card
- NT5K20 Tone Detector Card
- NT5K36 Direct Inward/Direct Outward Dial Trunk Card
- NT5K48 Tone Detector Card
- NT5K70 Central Office Trunk Card
- NT5K71 Central Office Trunk Card
- NT5K72 E&M Trunk Card
- NT5K82 Central Office Trunk Card
- NT5K83 E&M Trunk Card
- NT5K84 Direct Inward Dial Trunk Card

- NT5K90 Central Office Trunk Card
- NT5K93 Central Office Trunk Card
- NT5K96 Analog Line Card
- NT5K99 Central Office Trunk Card
- NT8D02 Digital Line Card
- NT8D03 Analog Line Card
- NT8D09 Analog Message Waiting Line Card
- NT8D14 Universal Trunk Card
- NT8D15 E&M Trunk Card
- NT8D16 Digitone Receiver (DTR) Card

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Software disable the card:

LD 32

DISI l s c “l s c” are loop, shelf, and card numbers

You will see “NPR011” on the system terminal when the card is disabled. Busy channels will not be disabled until the call is disconnected.

- 2 Unhook the locking devices on the card; pull it out of the card cage.

Installing equipment

- 1 Set jumpers on the following replacement cards the same as on the card you removed:

NT8D14 Universal Trunk Card

NT8D15 E&M Trunk Card

To check settings, see *Circuit Card: Installation and Testing* (553-3001-211).

- 2 Insert the replacement card into the vacated slot and hook the locking devices.

Note: When IPE cards are installed, the red LED on the faceplate remains lit for 2 to 5 seconds as a self-test runs. If the self-test completes successfully, the LED flashes three times and remains lit until the card is configured and enabled in software, then the LED goes out. If the LED does not follow the pattern described or operates in any other manner (such as continually flashing or remaining weakly lit), replace the card.

- 3 Software enable the card:

ENLC 1 s c

- a. When the process is complete, you will receive a system response.

- b. Exit LD 32:

- 4 Test the card:

LD 30

SHLF 1 s

Note: This command tests every card on the designated shelf.

- a. If there is a problem, an NPR system message is generated and the red LED(s) on the faceplate of the card will remain lit.

- b. If there is no problem, exit LD 30:

- 5 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT8D04 Superloop Network Card, QPC414 Network Card

Use this procedure to replace a superloop network card or network card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



CAUTION

Service Interruption

All services on a loop are interrupted while the loop is disabled.

Removing equipment

- 1 Check the status of each loop on the network or superloop network card:

LD 32

STAT loop “loop” is a loop number

- If the response is **DSBL** for the loop(s), go to Step 2 on page 168.
- If there are responses other than **DSBL**, see “LD 32” in the *Administration* (553-3001-311) for an interpretation.

- 2 Set the ENB/DIS switch to DIS.
- 3 Tag and disconnect cables to the card you are removing.
- 4 Unhook the locking devices on the card; pull it out of the card cage.

Installing equipment

- 1 Set the ENB/DIS switch to DIS on the replacement card.
Note: On a replacement QPC414, set jumpers the same as on the card you removed. If there is a vintage change, be sure to check *Circuit Card: Installation and Testing* (553-3001-211) for any differences.
- 2 Insert the replacement card into the vacated slot and hook the locking devices.
- 3 Connect cables to the replacement card.
- 4 Set the ENB/DIS switch to ENB on the replacement card.
- 5 Software enable each loop on the card:

ENLL loop

- a. When the process is complete, you will receive a system response.
 - b. The card is tested automatically when all loops are enabled.
 - c. If there is a problem, an NWS system message is generated and the red LED on the faceplate of the card will flash (on the NT8D04) or be steadily lit (on the QPC414).
 - d. If there is no problem, exit LD 32:

- 6 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT8D06, NT8D21, NT8D29 Power Supply AC

Use this procedure to replace AC power supplies:

- NT8D06 PE Power Supply AC
- NT8D21 Ringing Generator AC
- NT8D29 CE Power Supply AC



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Turn off power to the module power supply:
 - If there is a Module Power Distribution Unit (MPDU), set the circuit breaker(s) on the associated MPDU to OFF (down).

Note: If there are two circuit breakers on the MPDU, the top one is associated with the module power supply, the bottom one with the ringing generator (see Figure 14 on page 171).

 - If there is no MPDU, set the switch on the power supply faceplate to OFF (down).
- 2 Unhook the locking devices on the power supply. Wait at least 5 minutes, then pull the power supply out of the card cage.



DANGER OF ELECTRIC SHOCK

Power must discharge. Wait five full minutes before you remove the power supply from the module.

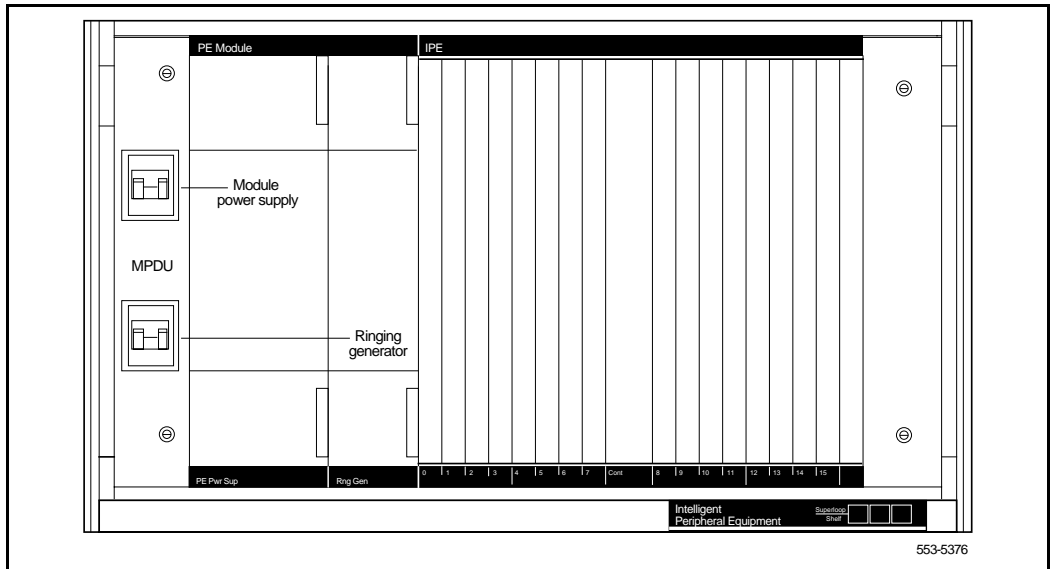
Installing equipment

- 1 Insert the replacement power supply into the vacated slot and hook the locking devices.

Note 1: If there is a switch on the power supply, set the switch to OFF (down) before you insert the power supply.

Note 2: On a replacement NT8D21, set option strapping the same as on the one you removed. If there is a vintage change, be sure to check *Circuit Card: Installation and Testing (553-3001-211)* for any differences.
- 2 Turn on power to the module power supply. The green LED on the power supply should light and stay lit:
 - If there is an MPDU, set the circuit breaker(s) to ON (up).
 - If there is no MPDU, set the power supply switch to ON (up).
- 3 Tag defective equipment with a description of the problem and package it for return to a repair center.

Figure 14
Dual circuit breaker and associated module power supplies



NT8D17 Conference/TDS Card

The conference/TDS card provides conference functions on one loop and both tone and digit switch (TDS) and multifrequency sender (MFS) functions on a second loop. Use this procedure to replace a conference/TDS card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Software disable the conference/TDS card:

LD 34 or LD 38 or LD 46

DISX loop In LD 38 “loop” is the conference loop that is the odd loop of the conference/TDS loop pair. In LD 34 and LD 46 “loop” is the TDS/MFS loop that is the even loop of the conference/TDS loop pair.

Note: You must use the command DISX to disable both loops and all hardware functions. Disabling loops with the command DISL prevents software from using the loops but does not disable the card.

- 2 Set the ENB/DIS switch to DIS.
- 3 Unhook the locking devices on the card; pull it out of the card cage.

Installing equipment

- 1 Set the ENB/DIS switch to DIS on the replacement card.
- 2 Set option switches and jumpers on the replacement card the same as on the card you removed. If there is a vintage change, be sure to check *Circuit Card: Installation and Testing* (553-3001-211) for any differences.
- 3 Insert the replacement card into the vacated slot and hook the locking devices. Both red LEDs should flash three times and remain lit if the card is good.
- 4 Set the ENB/DIS switch to ENB on the replacement card.
- 5 Software enable the card:

ENLX loop This prompt is available in LD 34, LD 38, and LD 46. Use the appropriate loop number (see Step 1 on page 172 in “Removing equipment” on page 172).

Note: You must enable the card with the command ENLX. Enabling the loops with the command ENLL does not enable the card.

- 6 Test each loop on the card (when each test completes, enter ****):

- a. Test TDS capability:
LD 34
TDS loop “loop” is an even loop number
 - b. Test Conference capability:
LD 38
CNFC loop “loop” is an odd loop number
 - c. Test MFS capability:
LD 46
MFS loop “loop” is an even loop number
 - d. If there is a problem, a TDS, CNF, or MFS system message is generated and the appropriate red LED lights on the card faceplate.
- 7 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT8D22 System Monitor

Use this procedure to replace the system monitor.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.

Removing equipment



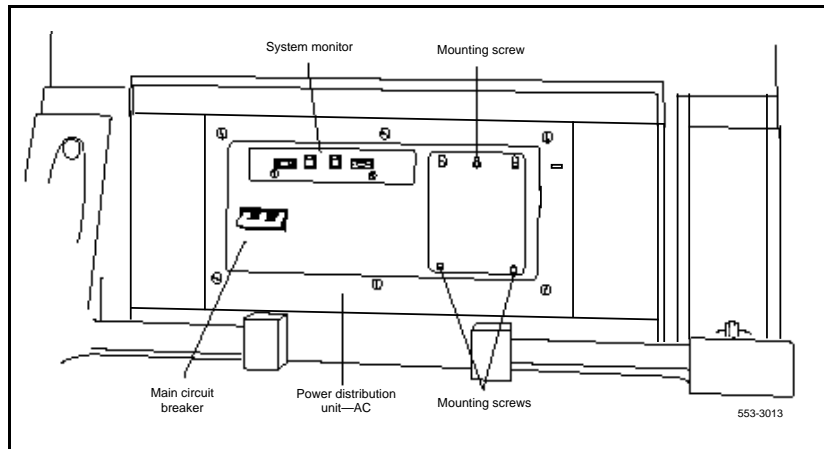
CAUTION

Service Interruption

Be sure to follow the steps in this procedure in the order shown. Removing the system monitor before disconnecting cables may result in loss of power and interruption of telephone service.

- 1 Remove the grill on the rear of the pedestal.
- 2 Tag and disconnect cables to the system monitor. Figure 15 on page 174 shows the location of the system monitor in the rear of an AC-power pedestal.

Figure 15
NT8D22 System Monitor in an AC-power pedestal



- 3 Loosen the two screws on the card and pull it out of the slot.

Note: If a slave is removed, the master considers that slave and all slaves with a higher address as disabled. For example, if the slave designated “XSM 2” is disabled, the master also reports slaves 3, 4, and up are disabled.

Installing equipment

- 1 Set option switches on the replacement card the same as on the card you removed. If there is a vintage change, be sure to check *System Installation Procedures* (553-3001-210) for any differences.
- 2 Insert the replacement card into the vacated slot and tighten the two screws on the front of the card.
- 3 Connect cables to the replacement card.
- 4 Replace the grill on the rear of the pedestal.
- 5 Test the system monitor:

LD 37 STAT XSM

- If a single or master system monitor was replaced successfully, you will receive system message “PWR000 XSMC 00 0 0.”

- If a slave was replaced successfully, you will receive “PWR053 XSMC xx 0 0” (“x” is the system monitor address).
- If there is a problem with a slave, you will receive system message “PWR013 XSMC xx 0 0.”
- If there is no problem, exit LD 37:

- 6 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT8D41 Dual or Quad Port Serial Data Interface card

The serial data interface (SDI) paddle board attaches to the rear of the backplane in an NT6D39 CPU/Network Module. Use this procedure to replace an SDI paddle board.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



CAUTION

Loss of Data

If the system terminal is assigned to the SDI being replaced, assign it to another port before this SDI is disabled.

Removing equipment

- 1 Software disable each port on the SDI paddle board:
LD 37
DIS TTY x “x” is the number of the interface device attached to the port
- 2 Remove the rear cover on the module.
- 3 Remove the I/O safety panel by turning the screws on each side. Set the cover aside.
- 4 Set the ENB/DIS switch to the disable position (down) on the paddle board.



CAUTION

Service Interruption

To avoid interrupting service, set ENB/DIS switches to DIS before disconnecting or connecting cables.

- 5 Tag and disconnect cables to the paddle board you are removing (connector J1 for port 1, connector J2 for port 2).
- 6 Pull the paddle board out of the connector on the backplane.

Installing equipment

- 1 Set the ENB/DIS switch to the disable position (down) on the replacement paddle board.
- 2 Set option switches on the replacement paddle board the same as on the board you removed. If there is a vintage change, be sure to check *Circuit Card: Installation and Testing (553-3001-211)* for any differences.
- 3 Plug the replacement paddle board into the vacated connector on the backplane.
- 4 Connect cables to the replacement paddle board.
- 5 Set the ENB/DIS switch to the enable position (up) on the replacement paddle board.
- 6 Replace the I/O safety panel. Replace the rear cover on the module.

- 7 Software enable and test each port on the paddle board:

ENL TTY x

TTY x

- If there is a problem, an IOD system message is generated and the red LED lights on the faceplate of the card.
- If there is no problem, exit LD 37:

- 8 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT8D46AC Thermostat Harness

Use this procedure to replace the thermostat harness located in the top cap of each column.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Disconnect the system monitor from the circuit breaker system:
 - a. Remove the grill on the rear of the column pedestal.
 - b. Loosen the two screws on the system monitor and pull it out a few inches.



CAUTION

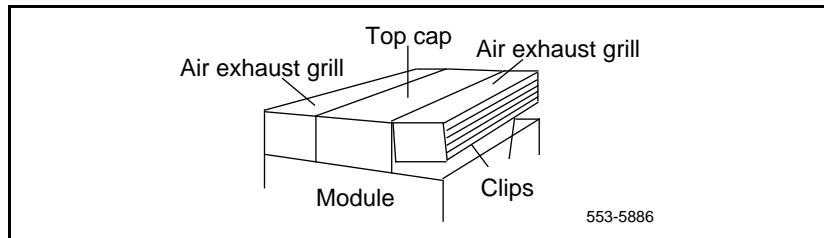
Service Interruption

If the system monitor is not unseated, column operation will shut down when the thermostat harness is disconnected.

- 2 Disconnect power to the top cap:
 - a. Remove the rear cover on the module below the top cap.
 - b. Remove the I/O safety panel over the backplane.

- c. At the top of the rear of the module, disconnect the connector from the module power harness.
 - d. Disconnect the pin headers on connector J2 on the backplane; disconnect the ribbon cable connector.
- 3 Remove the top cap:
- a. Remove air exhaust grills at the front and rear of the top cap (see Figure 16 on page 178). Pull forward on the two clips underneath the front edge of each grill and lift up to remove the grill.
 - b. Use a 5/16" socket wrench to remove the six bolts that secure the top cap and perforated panel (see Figure 17 on page 179). Lift off the top cap only.

Figure 16
Air exhaust grills on the top cap



- 4 Remove the thermostat harness:
- Note:** The column LED and LED wiring are part of the thermostat harness.
- a. Pull the LED ring away from the LED mounting bracket (see Figure 18 on page 179). You may need to loosen it with a standard screwdriver.
 - b. Push the LED back completely out of the collar on the LED mounting bracket.
 - c. Remove the LED ring by pulling it forward over the LED. Keep the ring handy; you will use it with the replacement equipment.
 - d. Remove the screw that secures the perforated panel at the LED mounting bracket.

Figure 17
Top cap assembly

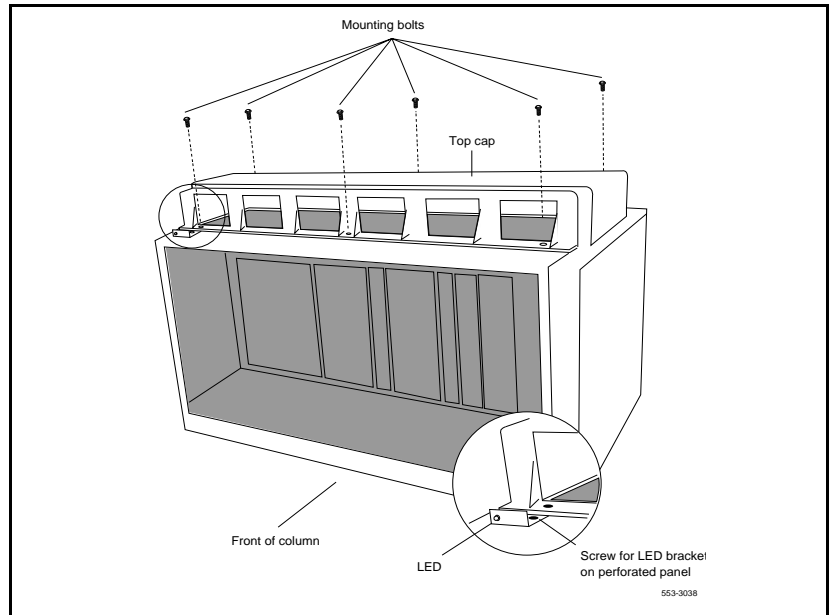
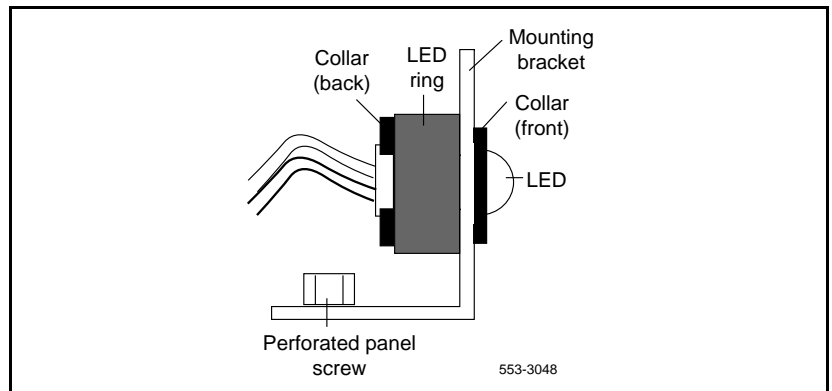


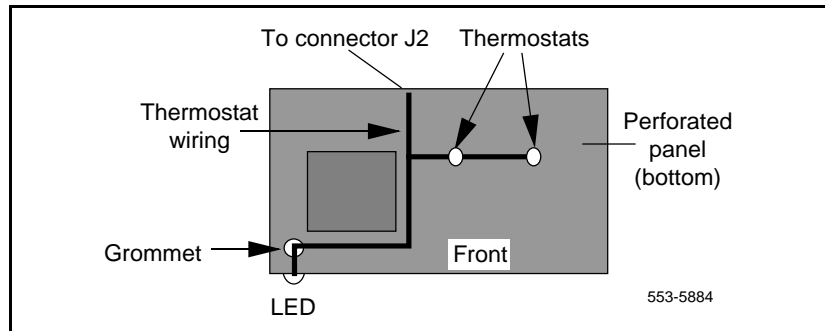
Figure 18
Mounting for the column LED



- e. Slide the perforated panel slightly to the left (looking at it from the rear of the column). Lift the panel and turn it over.

- f. Clip all cable ties that secure the thermostat harness. Be careful not to damage other wiring (such as the air probe harness).
- g. Pull the LED through the rubber grommet at the front of the perforated panel.
- h. Remove the screws (two each) that secure the thermostats. Remove the thermostats and wiring (see Figure 19 on page 180).

Figure 19
Thermostat harness



Installing equipment

- 1 Install the replacement thermostat harness:
 - a. Position the replacement thermostats and install the screws.
 - b. Push the LED through the rubber grommet.
 - c. Route the thermostat wiring on the perforated panel. At the rear edge of the panel, route the wires with wiring for the air probe harness. Secure loose wiring to the perforated panel with cable ties.
- 2 Turn the perforated panel over. Slide it slightly to the right (at the rear of the column) so it is in a secure position. Position wiring from the perforated panel so it rests in the cable well next to the orange connector at the rear of the module (see Figure 20 on page 181). Position the perforated panel and install the screw that secures it at the LED mounting bracket.
 - a. Slide the LED ring over the LED (see Figure 21 on page 181). The ring will hang loosely at this point.

- b. Gently push the LED forward completely through the collar on the LED mounting bracket.
- c. Push the LED ring into position over the back of the collar and tight against the LED mounting bracket.

Figure 20
Routing the thermostat harness from the top cap

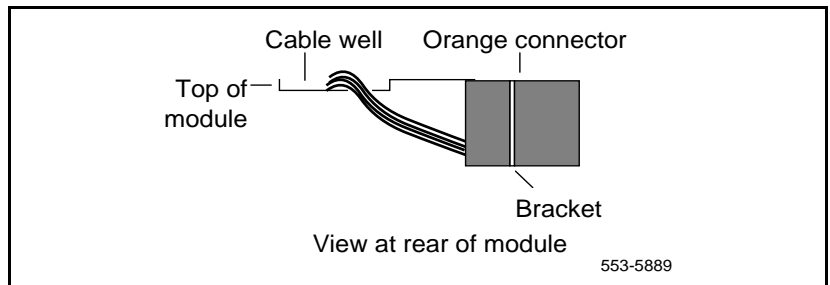
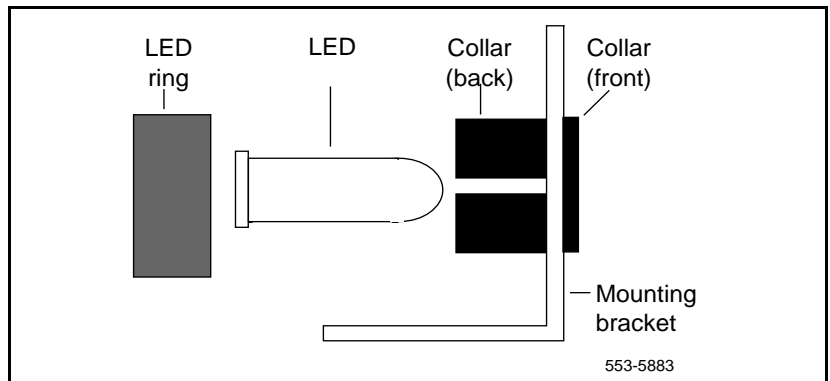


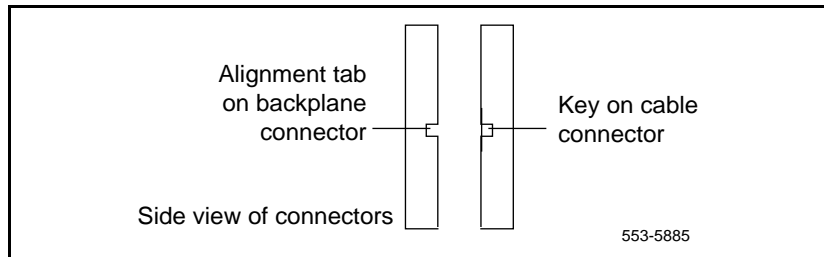
Figure 21
Installing the column LED



- 3 Install the top cap:
 - a. Position the top cap and install the six bolts that secure the top cap and perforated panel.
 - b. Install the air exhaust grills at the front and rear of the top cap.
- 4 Reconnect power to the top cap:

- a. Connect the ribbon cable connector to connector J2 on the backplane. Line up the alignment tab on the connector and snap on the pin headers to position the connector correctly (see Figure 22 on page 182).


Figure 22
Aligning the thermostat harness connector



- b. Connect the orange connector to the module power harness.
 - c. Replace the rear cover on the module.
- 5 Reconnect the system monitor to the circuit breaker system:
- a. Push the system monitor into position and tighten the screws.
 - b. Replace the grill on the pedestal.
- 6 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT8D46AM, NT8D46DC Air Probe Harness

Use this procedure to replace the air probe harness located in the top cap of each column.

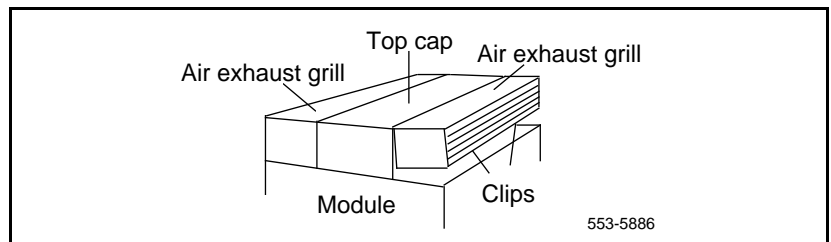
	<p>DANGER</p> <p>Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.</p>
-------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------

Removing equipment

- 1 Disconnect the air probe harness plug:
 - a. Remove the rear cover on the module below the top cap.

- b. Remove the I/O safety panel over the backplane.
 - c. At the top of the rear of the module, disconnect the orange connector from the module power harness.
- 2 Remove the top cap:
- a. Remove air exhaust grills at the front and rear of the top cap (see Figure 23 on page 183). Pull forward on the two clips underneath the front edge of each grill and lift up to remove the grill.
 - b. Use a 5/16" socket wrench to remove the six bolts that secure the top cap and perforated panel (see Figure 24 on page 184). Lift off the top cap.

Figure 23
Air exhaust grills in the top cap



- 3 Remove the air probe harness:
- a. Remove the screw that secures the perforated panel at the LED mounting bracket.
 - b. Slide the perforated panel slightly to the left (looking at it from the rear of the column). Lift the panel and turn it over.
 - c. Pull the air probe out of the clip holder (see Figure 25 on page 184).
 - d. Clip cable ties that secure the air probe wiring. Be careful not to damage other wiring (such as the thermostat harness).
 - e. Remove the orange connector from the right-angle bracket at the top of the module. Simultaneously push the four small snaps (two on each side) on the connector to release it from the bracket (see Figure 26 on page 185).

Figure 24
Top cap assembly

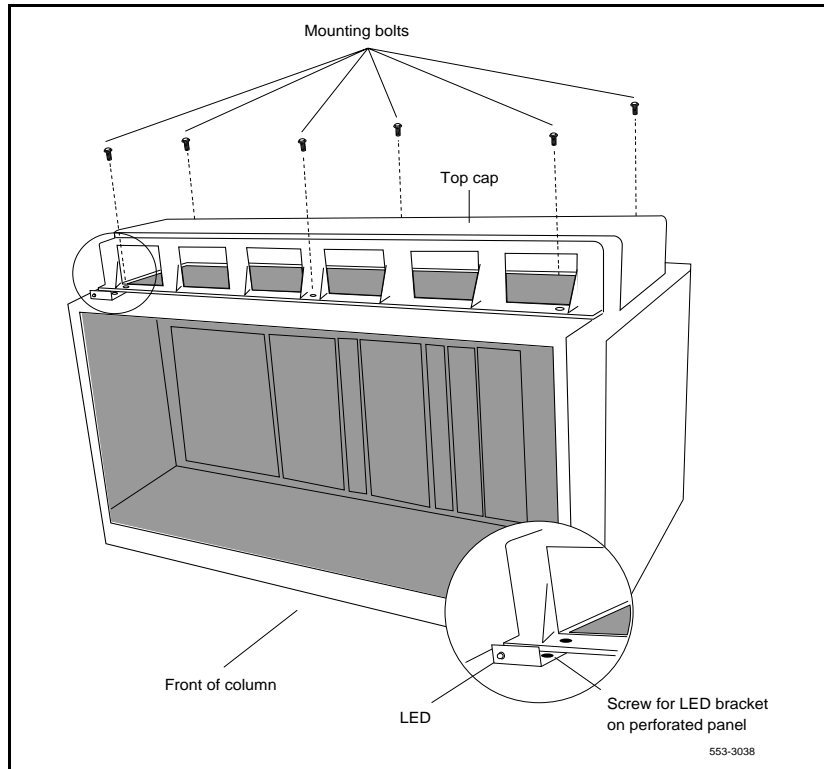


Figure 25
Air probe harness

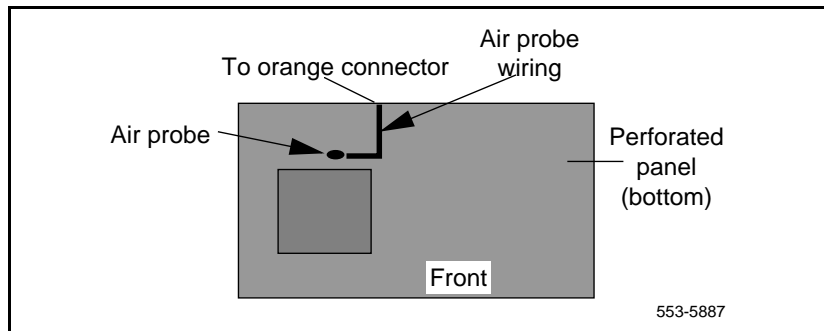
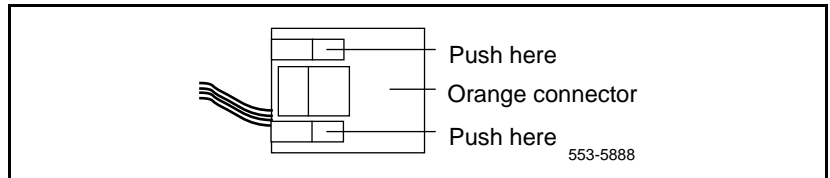


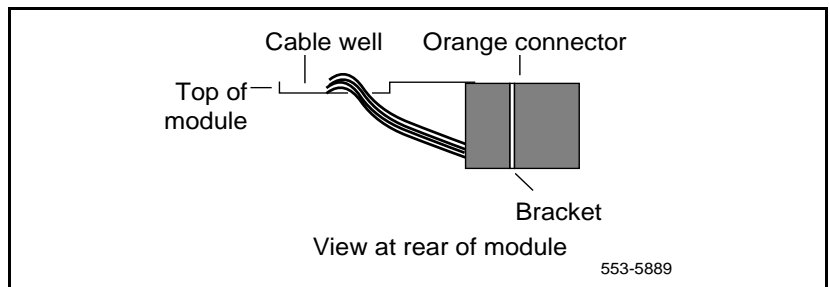
Figure 26
Connector for the air probe harness



Installing equipment

- 1 Install the replacement air probe harness:
 - a. Gently push the air probe into the clip holder.
 - b. Route the air probe wiring on the perforated panel. At the rear edge of the panel, route the wires with wiring for the thermostat harness. Secure loose cabling to the perforated panel with cable ties.
 - c. Turn the perforated panel over. Slide it slightly to the right (at the rear of the column) so it is in a secure position. Position wiring from the perforated panel so it rests in the cable well next to the orange connector at the rear of the module (see Figure 27 on page 185).

Figure 27
Routing the air probe harness from the top cap



- d. Insert the orange connector into the right-angle bracket at the top of the module. Simultaneously push the four small snaps on the connector to insert it.
- 2 Install the top cap and perforated panel:

- a. Position the perforated panel and install the screw that secures it at the LED bracket.
 - b. Position the top cap and install the six bolts that secure the top cap and perforated panel.
 - c. Install the air exhaust grills at the front and rear of the top cap.
- 3 Reconnect the air probe harness plug:
 - a. Connect the orange connector to the module power harness.
 - b. Replace the I/O safety panel.
 - c. Replace the rear cover on the module.
- 4 Tag defective equipment with a description of the problem and package it for return to a repair center.

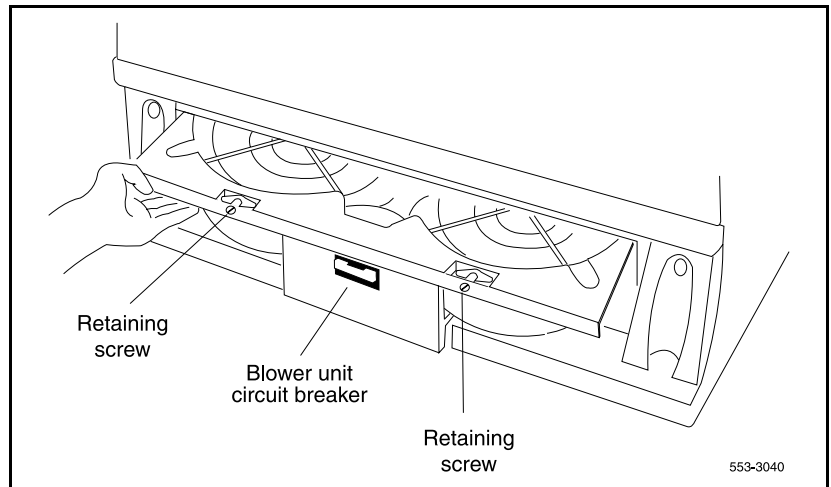
NT8D52AB, NT8D52DD Pedestal Blower Unit

Use this procedure to replace a blower unit.

Removing equipment

- 1 Remove the front pedestal grill and set it aside. Figure 28 on page 187 shows the blower unit and its location in the front of the pedestal.

Figure 28
NT8D52 Blower Unit



- 2 Turn off power to the blower unit:
 - With AC power, set the circuit breaker on the front of the unit to OFF (down).
 - With DC power, set the toggle switch on the front of the unit to OFF (left).



DANGER

Impellers in the blower unit do not stop instantly when the power is turned off. Wait two full minutes before you remove the unit.

- 3 Loosen the two screws on the front of the blower unit by turning them counterclockwise.

- 4 Grasp the lip at the top edge of the blower unit. Slide the unit out of the glides and onto the bottom ledge of the pedestal. Lift the unit out of the pedestal.

Note: Store the blower unit in an upright position.

Installing equipment

- 1 Set the replacement blower unit on the bottom ledge of the pedestal.
- 2 Tilt the back of the blower unit up slightly so it will slide into the pedestal glides (you may need to lift the unit). Gently push the unit into position.
- 3 Tighten the screws on the front of the unit.
- 4 Turn on power to the blower unit:
 - With AC power, set the circuit breaker to ON (up).
 - With DC power, set the toggle switch to ON (right).

Note: On initial power up the blower may rotate slower than expected. As the sensor detects heat, the blower will rotate more rapidly.

- 5 Fit the grill into the holes in the bottom ledge of the pedestal. Push the grill back into a locked position.
- 6 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT8D53CA Power Distribution Unit AC

Use this procedure to replace the power distribution unit (PDU) for AC-powered systems.



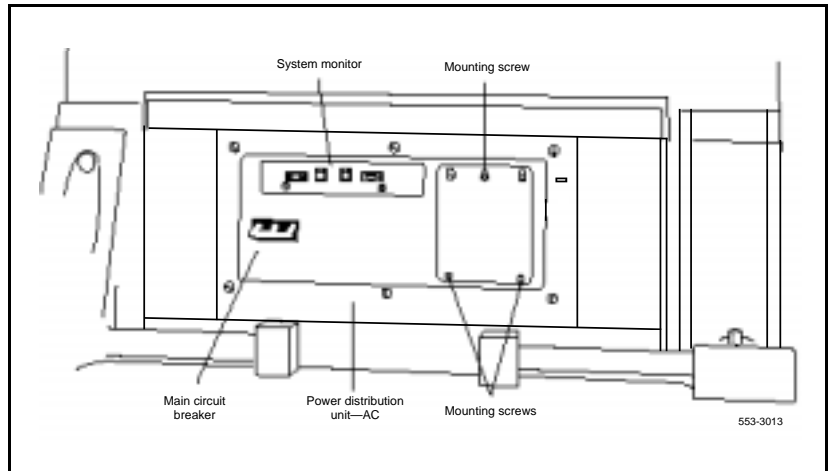
DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Turn off power at the distribution box. If the column is not hardwired, unplug the power cable.
- 2 Remove the grill on the rear of the pedestal. Figure 29 on page 189 shows the location of the unit in the rear of the pedestal.

Figure 29
NT8D53CA Power Distribution Unit AC



- 3 Loosen the three mounting screws that secure the field wiring access plate. Lift the plate over the screws and set it aside.
- 4 Tag and disconnect wiring to the LRTN, GND, L2, and L1 connections on the right side of the field wiring terminal (see Figure 30 on page 190). Push all the wires down into the empty area under the pedestal



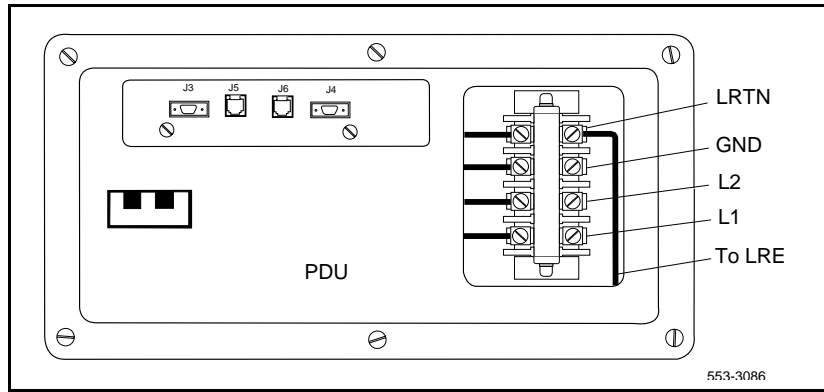
CAUTION

Damage to Equipment

Label wires carefully. They must be reconnected correctly or the system may be damaged.

- 5 Tag and disconnect cables to the NT8D22 System Monitor. Loosen the two retaining screws on the system monitor. Remove the card.
- 6 Disconnect cables to the module above the pedestal (module 0):
 - a. Remove the rear cover on the module.
 - b. Remove the I/O safety panel over the backplane in the module.

Figure 30
Connections at the field wiring terminal



- c. Disconnect the power plug (J1) and system monitor ribbon cable to the module.

Note: To disconnect the power plug, you must press a latch trip on the front and rear of the plug. You may need to use a screwdriver blade against the latch trip on the front of the plug.

- 7 Remove the six screws that position the PDU. Carefully pull the unit straight forward out of the pedestal.

Installing equipment

- 1 Set the main circuit breaker on the replacement PDU to OFF (down).
- 2 Position the replacement PDU and gently push it into the pedestal.

Note: Be sure you push the unit straight back, so the connector on the rear will seat properly with the blower unit connector. It may be easier to position the PDU if you temporarily pull the blower unit out several inches.

- 3 Reconnect cables to module 0:
 - a. Attach power plug J1 and the system monitor cable.
 - b. Replace the I/O safety panel.
 - c. Replace the rear cover.
- 4 Insert the system monitor. Tighten the screws on the card. Reconnect cables to the system monitor faceplate.

- 5 Connect wiring to the right side of the field wiring terminal.
- 6 Position the field wiring access plate over the three mounting screws. Tighten the screws.
- 7 Turn on power at the distribution box or plug in the power cable.
- 8 Set the main circuit breaker to ON (up).
- 9 Replace the pedestal grill.
- 10 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT8D56AA, NT8D56AC, NT8D57 Module Power Distribution Unit

Use this procedure to replace the following module power distribution units (MPDUs):

- NT8D56AA single-breaker MPDU for the NT8D29 CE Power Supply AC
- NT8D56AC single-breaker MPDU for the NT7D14 CE/PE Power Supply AC
- NT8D57 dual-breaker MPDU for the NT8D06 PE Power Supply AC and NT8D21 Ringing Generator AC



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Remove the rear grill on the column pedestal. Set the main circuit breaker to OFF (down).



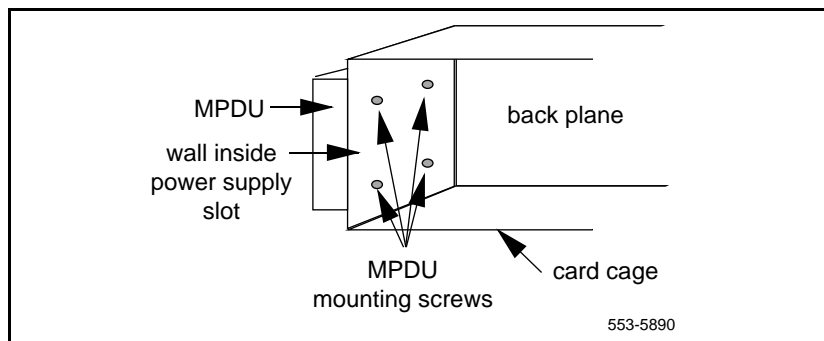
CAUTION

Service Interruption

Shutting off the main circuit breaker disables the entire column.

- 2 Remove the I/O safety panel over the backplane.
- 3 Tag and disconnect the power plugs to the MPDU.
- 4 Remove the metal plate covering the MPDU in the front of the module by removing the mounting screw in each corner.
- 5 Unhook the locking devices on the power supply next to the MPDU. Pull the power supply out of the card cage.
- 6 Remove the mounting screws for the MPDU; the screw-heads are in the wall of the power supply slot (see Figure 31 on page 192). (Be careful—do not let the screws fall into the module below.) Lift the unit out of the module.

Figure 31
Mounting screws for the MPDU



Installing equipment

- 1 Set the circuit breaker(s) on the replacement MPDU to OFF (down).
- 2 Position the replacement MPDU in the module. Install the mounting screws through the wall of the power supply slot.
- 3 Reinsert the power supply and hook the locking devices.
- 4 Position the metal plate in front of the MPDU and install the mounting screw in each corner.
- 5 Connect the power plugs to the rear of the MPDU.
- 6 Position the I/O safety panel. Tighten the screws.
- 7 Set the circuit breaker(s) on the replacement MPDU to ON (up).
- 8 Reset the main circuit breaker in the column pedestal to ON (up) and replace the pedestal grill.
- 9 Tag defective equipment with a description of the problem and package it for return to a repair center.

NT8D3503/NT8D3507 Network Module Card Cage

The NT8D3503 Network Module Card Cage uses BTUs, however, the NT8D3507 Network Module Card Cage does not use BTUs, it uses hybrid terminators that are an integral part of the backplane. To replace a defective backplane in an NT8D35 Network Module, you must replace the card cage. Use this procedure to replace the Network Module card cage.



DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Connect groups 1 through 7: shelf 0 to shelf 1

On the back of each Network module backplane are five connectors: A, B, C, D and E. See Figure 32 on page 195. The connectors from shelf 0 of each Network group 1 through 7 must be connected to the connectors in shelf 1 of the same Network group.

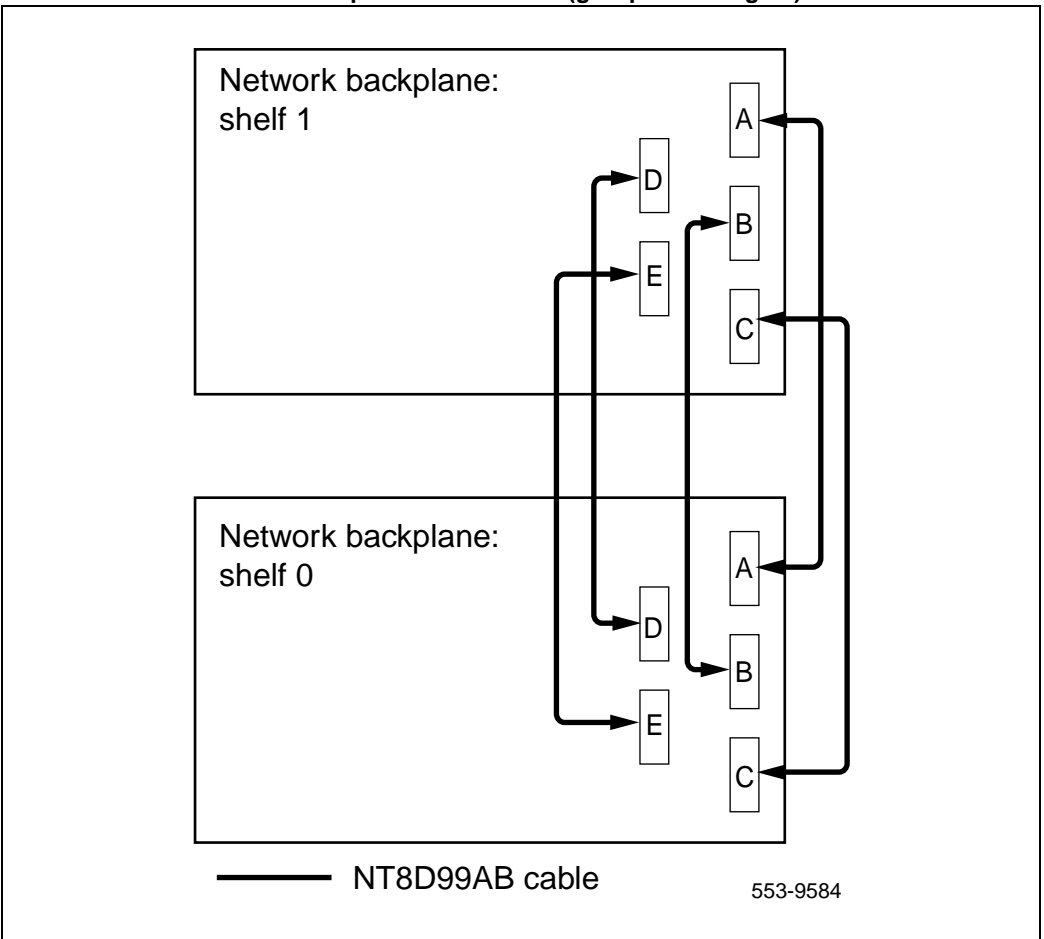
Note: In North American systems, these connections are made in the factory. In shipments outside North America, the Network shelves are shipped separately. These connections must be made in the field

This connection is NOT made for Network group 0 in the Core/Net modules.

- 1 Connect an NT8D99AB cable from the **A** connector in shelf 0 of Network group 1 to the **A** connector in shelf 1 Network group 1.
- 2 Connect the **B** connector in shelf 0 to the **B** connector in shelf 1.
- 3 Connect the **C** connector in shelf 0 to the **C** connector in shelf 1.
- 4 Connect the **D** connector in shelf 0 to the **D** connector in shelf 1.
- 5 Connect the **E** connector in shelf 0 to the **E** connector in shelf 1.
- 6 Connect the A, B, C, D, and E connectors between shelf 0 and shelf 1 for all other Network groups in the system (except group 0)

Note: All connections are made with an NT8D99AB cable.

Figure 32
Network shelf 0 to shelf 1 backplane connections (groups 1 through 7)

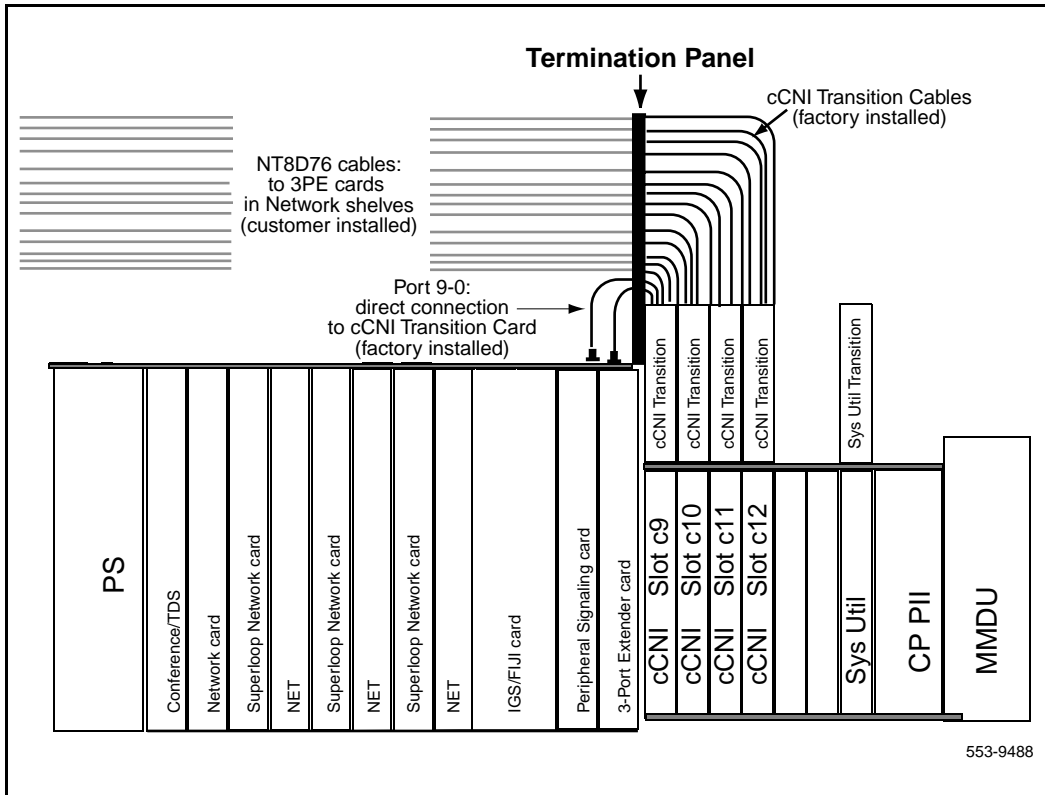


Connect the Network modules to the Core/Net modules

Each Network shelf contains one 3PE card. These 3PE cards are connected to the Termination Panel in the back of the Core/Net shelves.

Figure 33 on page 196, Figure 34 on page 197 and Figure 34 on page 197 show the location of the Termination Panel and 3PE cables on the Core/Net backplane.

Figure 33
3PE Termination Panel in the Core/Net module (top view)



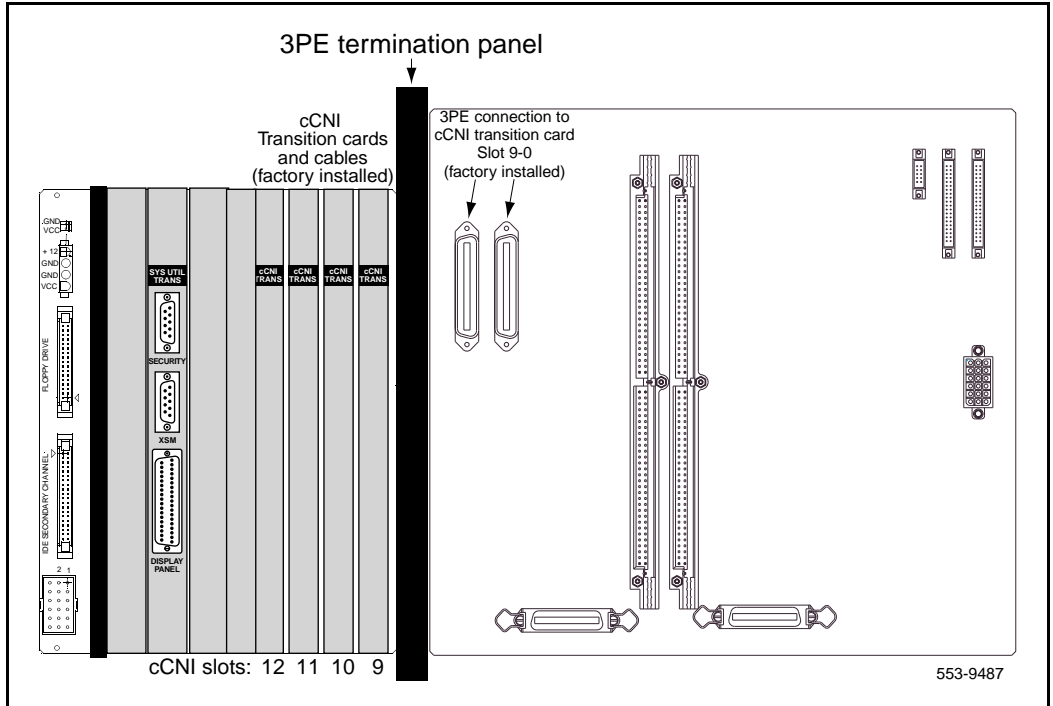
cCNI slot and port assignments

Each system contains a minimum of one and a maximum of four CNI cards. Each cCNI card contains two ports to support up to two Network groups.

cCNI cards are identified by slot and port. Each port is assigned in software to a specific Network group. Use the System Layout Plan to determine the connections for your system.

- Each 3PE card has two faceplate connections: J3 and J4. Two cables are used for each card.

Figure 34
Core/Net backplane (rear view)



- 3PE cards in Network shelves “0” are connected to the 3PE Termination Panel in Core/Net 0.
- 3PE cards in Network shelves “1” are connected to the 3PE Termination Panel in Core/Net 1.

Figure 35
3PE Termination Panel (rear module view)

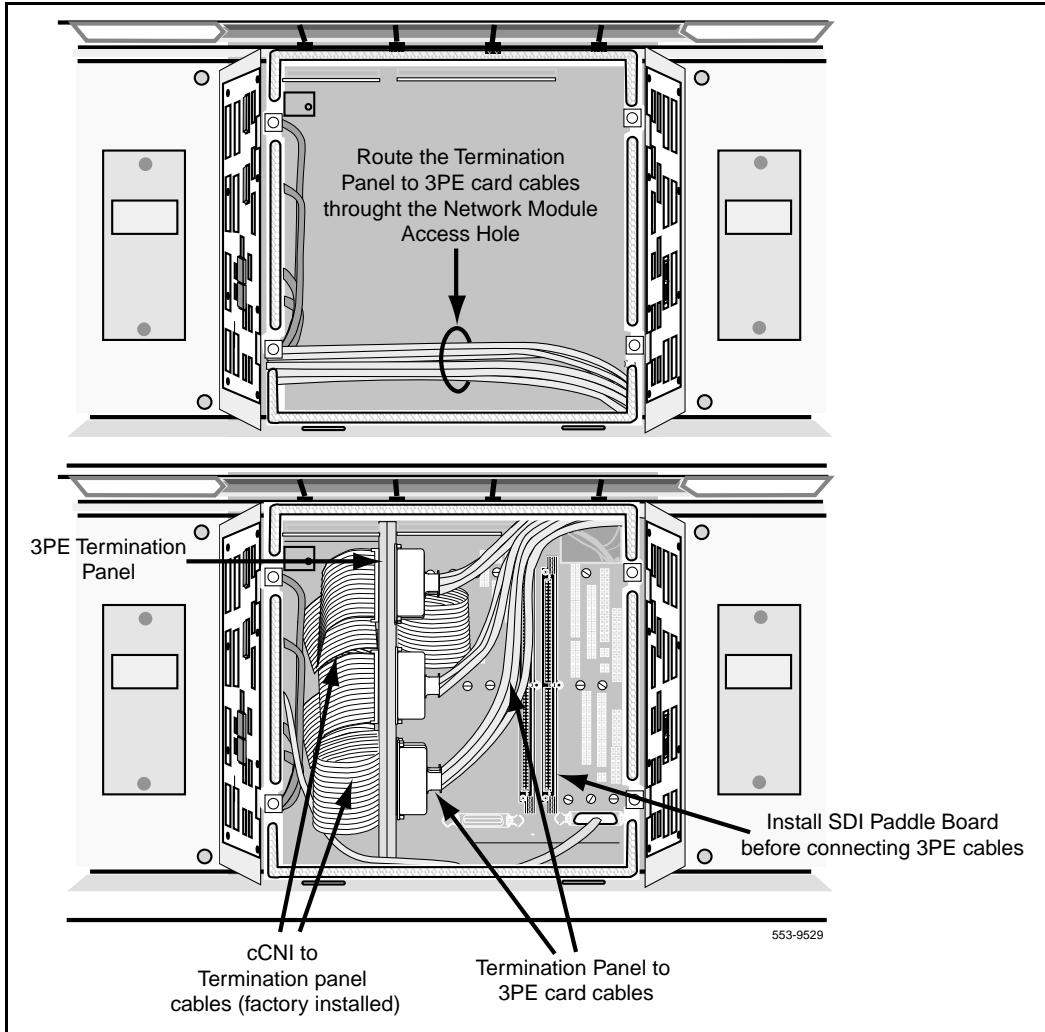


Table 3 on page 199 specifies the default Network group assignments for each cCNI slot and port. These designations can be changed in software if necessary.

Table 3
cCNI Network group designations

cCNI card slot	cCNI card port	3PE Termination Panel label	Connected to Network group
c9	0	N/A (factory installed directly to the Core/Net backplane)	0
c9	1	Port 9-1	1
c10	0	Port 10-0	2
c10	1	Port 10-1	3
c11	0	Port 11-0	4
c11	1	Port 11-1	5
c12	0	Port 12-0	6
c12	1	Port 12-1	7

cCNI to 3PE Termination Panel cable connections

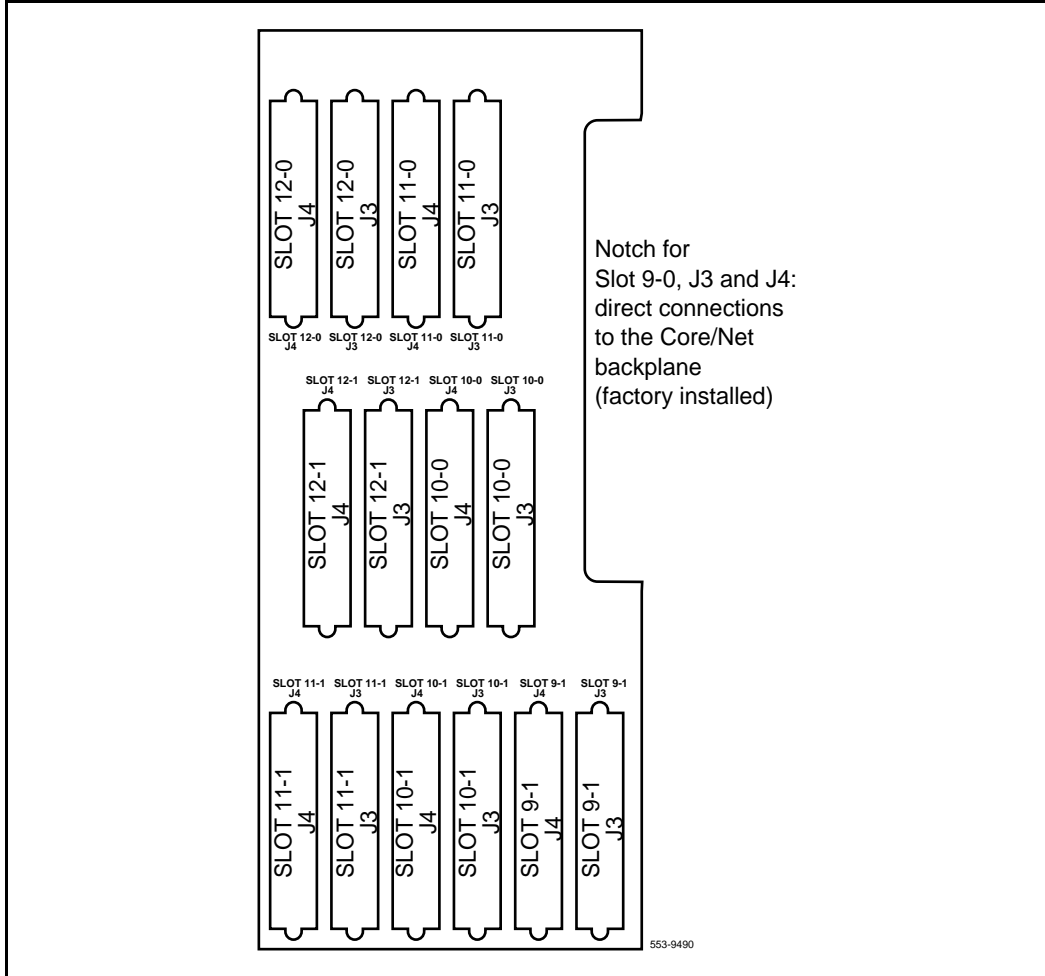
The cCNI slot and port connections are labeled on the 3PE Termination Panel. See Figure 36 on page 200. Each 3PE card is connected with two cables: one to J3 and one to J4. Table 3 on page 199 specifies the Network group that connects to each slot.

Connect the 3PE cables to the 3PE Termination Panels

Two NT8D76 cables connect from J3 and J4 of each 3PE faceplate to the 3PE Termination Panel. See Figure 37 on page 202.

Refer to Table 3 on page 199 for cCNI port and slot assignments. Connect shelf 0 3PE cards to the Core/Net 0 panel; connect shelf 1 3PE cards to the Core/Net 1 panel. The 3PE cables for Network group 0 are factory installed.

Figure 36
3PE Termination Panel (Core/Net module)



Connect the Network shelf 0 3PE cards to Core/Net 0

- 1 Connect a NT8D76 cable of the appropriate length from J3 on the 3PE card faceplate in **Network group 1, shelf 0** to the **Port 9-1, J3** connection on the 3PE Termination Panel in **Core/Net 0**.
- 2 Connect a NT8D76 cable of the appropriate length from J4 on the 3PE card faceplate in **Network group 1, shelf 0** to the **Port 9-1, J4** connection on the 3PE Termination Panel in **Core/Net 0**.
- 3 Connect a NT8D76 cable of the appropriate length from J3 on the 3PE card faceplate in **Network group 2, shelf 0** to the **Port 10-0, J3** connection on the 3PE Termination Panel in **Core/Net 0**.
- 4 Connect a NT8D76 cable of the appropriate length from J4 on the 3PE card faceplate in **Network group 2, shelf 0** to the **Port 10-0, J4** connection on the 3PE Termination Panel in **Core/Net 0**.
- 5 Install the remaining cables according to the assignments in Table 3 on page 199.

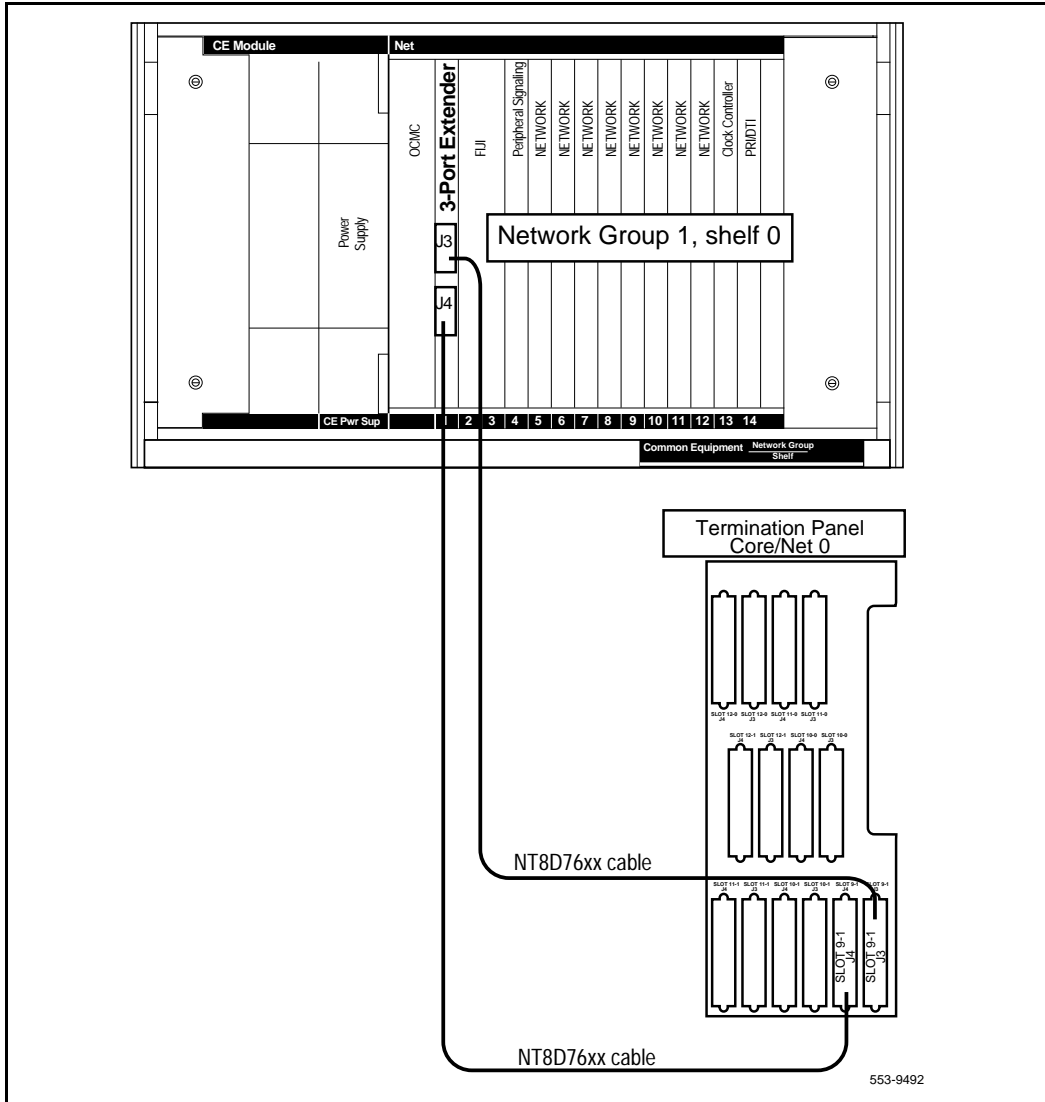
Connect the Network shelf 1 3PE cards to Core/Net 1

- 1 Connect a NT8D76 cable of the appropriate length from J3 on the 3PE card faceplate in **Network group 1, shelf 1** to the **Port 9-1, J3** connection on the 3PE Termination Panel in **Core/Net 1**.
- 2 Connect a NT8D76 cable of the appropriate length from J4 on the 3PE card faceplate in **Network group 1, shelf 1** to the **Port 9-1, J4** connection on the 3PE Termination Panel in **Core/Net 1**.
- 3 Connect a NT8D76 cable of the appropriate length from J3 on the 3PE card faceplate in **Network group 2, shelf 1** to the **Port 10-0, J3** connection on the 3PE Termination Panel in **Core/Net 1**.
- 4 Connect a NT8D76 cable of the appropriate length from J4 on the 3PE card faceplate in **Network group 2, shelf 1** to the **Port 10-0, J4** connection on the 3PE Termination Panel in **Core/Net 1**.
- 5 Install the remaining cables according to the assignments in Table 3 on page 199.

NT8D3703 IPE Module Card Cage

To replace a defective backplane in an NT8D37 IPE Module, you must replace the card cage. Use this procedure to replace the IPE Module card cage.

Figure 37
Example of 3PE faceplate to 3PE Termination Panel connection



See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.

**DANGER**

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

Removing equipment

- 1 Software disable the controller card (and all cards connected to the controller):

LD 32

DSXP x “x” is the controller card number

- 2 Turn off power to the column or the module power supply and ringing generator (if equipped):

- With AC power, set the main circuit breaker for the column to OFF (down) in the rear of the pedestal.

**DANGER OF ELECTRIC SHOCK**

Due to hazardous voltage in AC-powered systems, power to the entire column must be shut down. This shuts down all functions in the column.

- With DC power, set the switch on the NT6D40 PE Power Supply and NT6D42 Ringing Generator to OFF (down). Set the circuit breaker *for just this module* to OFF (down) in the rear of the pedestal. (All other modules in the column retain power.)

- 3 Remove the NT8D22 System Monitor in the rear of the pedestal. (Do *not* turn off the blower unit in the front of the pedestal.)

Note: If this is the master system monitor, disconnect the RJ11 cables before you pull the system monitor out of the pedestal.



CAUTION

Service Interruption

If the system monitor is not removed, the system may shut down.

- 4 Remove all cards from the module:
 - a. Tag and disconnect cables to all faceplate connectors.
 - b. Tag cards so they can be returned to the same slot. Remove cards.
- 5 Disconnect cables, plugs, and wires from the rear of the module to the backplane:
 - a. Remove the I/O safety panel by turning the screws on each side. Set the cover aside.
 - b. Tag and disconnect all cables from the backplane to the interior of the I/O assembly.
 - c. Tag and disconnect all plugs, wires, and cables to the backplane.
- 6 Remove the two mounting screws that secure the rear of the card cage to the module.
- 7 Remove the front cover plates on both sides of the card cage.
- 8 Remove the three mounting screws that secure the front of the card cage to the bottom of the module. Pull the card cage out of the module.

Installing equipment

- 1 Slide the replacement card cage into position in the module. Install the mounting screws at the front of the card cage.
- 2 Replace the front cover plates on both sides of the card cage.
- 3 Install the mounting screws at the rear of the card cage.
- 4 Reconnect cables, plugs, and wires from the rear of the module to the backplane:

- a. Connect all cables from the interior of the I/O assembly to the backplane.
 - b. Connect all plugs, wires, and cables to the backplane.
 - c. Position the I/O safety panel. Tighten the screws.
- 5** Return cards to their slots. Reconnect all cables to faceplate connectors.
- 6** Reinstall the system monitor. If this is the master system monitor, reconnect the RJ11 cables after it is installed.
- 7** Turn on power to the column or the module power supply and ringing generator:
- With AC power, set the main circuit breaker in the pedestal to ON (up).
 - With DC power, set the breaker to ON (up) in the pedestal. Set the switch to ON (up) on the power supply and the ringing generator in the module.
- 8** Software enable and test the controller card (and all cards connected to the controller):
- ```
ENXP x "x" is the controller card number
**** exit LD 32
```
- 9** Test the shelf by testing each loop:
- ```
LD 30
SHLF 1 s    "1 s" are the loop and shelf numbers
```
- If there is a problem, an NWS system message is generated.
 - If there is no problem, exit LD 30:
- ```

```
- 10** Tag defective equipment with a description of the problem and package it for return to a repair center.

## **NT9D19 68040 Call Processor (CP) Card replacement in systems equipped with NT5D61 IODU/C cards**

Use this procedure to replace an NT9D19 68040 Call Processor (CP) card in systems equipped with NT5D61 IODU/C cards.

**Note:** This procedure may also be used to replace a 64 MB NT9D19 CP card with a 96 MB NT9D19 CP card.



**CAUTION**

**Service Interruption**

Replacing the CP card in a nonredundant system, such as 51C, will disrupt system operation. If possible, schedule the replacement at the lowest traffic time.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpretation of system messages.



**DANGER**

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



**CAUTION**

**Service Interruption**

At some point in this procedure, you will be required to warm start your system, causing a momentary interruption in call processing.

### Removing equipment

- 1 To access the Core during the replacement procedure, connect a terminal to the J25 port on the I/O panel in the Core Module or Core/Network Module for the CP card you are replacing. To communicate with the processor, you must use the following settings on the terminal:

**9600 baud, 7 data, space parity, 1 stop bit, full duplex, XOFF**

**Note:** If you are using only one terminal or a switch box, switch the connection from Core to Core as needed.

- 2 The CP card you are replacing must be in the inactive Core. Check the status of the NT9D19 Call Processor cards:

**LD 135**

**STAT CPU** determine which CP card is active

If necessary, switch Cores:

**SCPU** switch Cores

**\*\*\*\*** exit LD 135

- 3 Set the NORM/MAINT switch on the NT9D19 Call Processor card to MAINT on the *active* Core.
- 4 Set the ENB/DIS switch on all CNI cards on the *inactive* Core to DIS.
- 5 Perform the following three steps on the *inactive* Core in an uninterrupted sequence:
  - a. Press and hold down the MAN RST button on the CP card on the inactive Core.
  - b. Set the NORM/MAINT switch to MAINT.
  - c. Release the MAN RST button.

The system is now in split mode where each Core is functioning independently and the automatic switchover has been disabled.

**Installing equipment**

- 1 Set the NORM/MAINT switch to MAINT on the replacement card.
- 2 Insert the Install Program diskette which corresponds with the NT9D19 (68040) Call Processor card.
- 3 Remove the current CP card and put it in a static bag and box.
- 4 Insert the CP replacement card into its vacated slot and hook the locking devices.
- 5 Press the MAN RST button on the replacement CP card.

6 At the Main Menu select <u> to go to the Install Menu.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

 M A I N M E N U

The Software Installation Tool will install or upgrade Meridian-1
System Software, Database and the PE-ROM (both CP and IOP ROM).
You will be prompted throughout the installation and given the
opportunity to quit at any time.

Please enter:
<CR>--> <u> - To Install menu.
 <t> - To Tools menu.
 <q> - Quit.

Enter choice > u
```

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— Insert the Keycode diskette when prompted and select <a> to continue with the keycode validation.

```
Nortel Meridian - 1 Software/Database/PEROM CDROM INSTALL Tool (x11)

Please insert the diskette with the keycode file into the floppy
drive.

Please enter:
<CR>--> <a> - Continue with the keycode validation
 (the keycode diskette is in the floppy drive).
 <q> - Quit.

Enter Choice > a
```

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7 Select the following options in sequence from the Install Menu:

- <g> to reinstall CP software
- <y> to start installation



<y> to continue installation  
<a> to continue with ROM upgrade  
<cr> to return to the Install Menu

**8** At the Install Menu, select the following options in sequence

<e> to install CP-BOOTROM  
<y> to start installation  
<y> to continue installation  
<a> to continue with ROM upgrade  
<cr> to return to the Install Menu

**9** **Remove the diskette** from the IODU/C.

**10** Select the following options to quit:

<q> to quit  
<y> to confirm quit  
<a> to reboot the system.

**Note:** The system will reboot. Wait for the “INI” and “DONE” messages to display before continuing. It will take at least 70 seconds between the “DONE” and “INI” messages.

After the system initialization has finished (INI messages are no longer displayed on the system terminal), check for dial tone on a telephone set.

**11** Following a successful dial tone test, perform the following basic sanity tests:

- a.** Make sure calls can be placed.
- b.** Check for error messages, line noise, chatter, or other problems. Track sources and resolve problems as necessary.

**12** To place the system back in the redundant (normal) mode with automatic switchover capability. Perform the following five steps in uninterrupted sequence on the *inactive* Core (the Core with the replaced CP card):

**13** Press and hold down the MAN RST button on the CP card of the *inactive* Core.

**14** While holding down the MAN RST button, set the NORM/MAINT switch on the same CP card to NORM.

- 15 Enable all CNI switches in the inactive Core.
- 16 Release the MAN RST button.
- 17 Set the CP card in the active Core to NORM.

After several minutes, an “HWI533” message is issued by the *active* Core indicating that the *inactive* Core memory is being synchronized with the *active* Core memory.

- 18 Log into the system through the terminal, then check the status of the replacement CP card from the active side:

- LD 135** load LD 135
  - STAT CPU** obtain the CPU status

- 19 If there are CCED messages generated by the STAT CPU command on the replacement CP card, set the NORM/MAINT switch to MAINT, press the reload (MAN RST) button, and set the NORM/MAINT switch back to NORM. (It may take 2 to 4 minutes for memory synchronization to take place.)

After the HWI0533 message is displayed, test the replacement CP card from the active CPU:

- TEST CPU** the test causes a cold start on the inactive CPU

If the test results in:

- CCED014** “Test failed because unable to enter SPLIT mode”

On the active CP card set the NORM/MAINT switch to NORM, and from the active side enter:

- TEST CPU** to test the CP card

- 20 Set the NORM/MAINT switch to NORM on the active CP card (if not already set).
- 21 Check the status of the CPUs:
  - STAT CPU**
- 22 Test the CPU.
  - TEST CPU**
- 23 Check the status of the CNIs:
  - STAT CNI**

- 24 Switch Cores and exit the program:

SCPU

\*\*\*\*

exit LD 135

## NTAG26 Extended Multi-frequency receiver

Use the following procedure to replace a defective NTAG26 Multi-frequency Receiver Card (XMFR) in the IPE module.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



### DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



### CAUTION

#### Service Interruption

Service is interrupted when a loop is disabled.

### Removing equipment

- 1 Software disable the XMFR by entering  
**LD 32**  
**DISS I s**  
(“I s” represents loop and shelf number)
- 2 Unhook the locking devices on the card; pull it out of the card cage.

### Installing equipment

- 1 Insert the replacement card into the vacated slot and hook the locking devices.
- 2 Software enable the loop on the card by entering  
**ENLS I s**

3 End the session in LD 32 by entering  
\*\*\*\*

4 Test the loop on the card by entering  
**LD 30**  
**LOOP I**

If there is a problem, an NWS system message will be produced and the appropriate red LED will light on the faceplate of the card.

5 End the session in LD 30 by entering  
\*\*\*\*

6 Tag defective equipment with a description of the problem and package it for return to a repair center.

## NTBK51AA Downloadable D-Channel Daughterboard

Use this procedure to replace the Downloadable D-Channel Daughterboard (DDCH).

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



### **DANGER**

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



### **CAUTION WITH ESDS DEVICES**

The static discharge bracelet located inside the cabinet must be worn before handling circuit cards. Failure to wear the bracelet can result in damage to the circuit cards.

## Removing the DDCH Daughterboard

- 1 The DDCH can only be removed when it is disabled in software.
- 2 Both ports of the associated DDP circuit card must be disabled.

- 3 Disable the faceplate switch on the DDP.
- 4 Remove the DDP and DDCH.

## Installing the DDCH Daughterboard

**Note 1:** Test procedures require a 24-hour minimum bit error-rate testing before being used. Refer to the Nortel Networks technical publication (NTP), *ISDN PRI Description and Administration* (553-2901-100) for these procedures.

**Note 2:** Dual DTI/PRI loops must be configured in software before defining DCH links.

Set the address for the DDCH; refer to Table 4 on page 213 for DCH mode and address select switch settings. If a DDCH is present on a DDP card then an external D-Channel should NOT be connected to JC. If a DDCH is present, the LED “DCH” will light up.

**Table 4**  
DCH mode and address select switch settings

| Switch | Description                     | S3 switch setting                                          |
|--------|---------------------------------|------------------------------------------------------------|
| 1-4    | D-Channel Daughterboard Address | See Table 5 on page 214.                                   |
| 5-7    | For future use                  | off                                                        |
| 8      | External DCH or Onboard DDCH    | off - MSDL or DCHI card<br>on - Onboard DDCH Daughterboard |

- 1 The DDCH can be mounted on any DDP card.
- 2 Unpack and inspect the DDCH daughterboard.
- 3 Push the four stand-offs on the DDCH daughterboard into the four corresponding mounting holes on the DDP.

**Note:** The DDCH daughterboard mounts to mate correctly with P2 and P3 on the DDP motherboard.

**Table 5**  
**DDCH daughterboard address select switch settings**

| Device Addr. <sup>1</sup> |     | Switch Setting |     |     |
|---------------------------|-----|----------------|-----|-----|
| 0 <sup>2</sup>            | OFF | OFF            | OFF | OFF |
| 1                         | ON  | OFF            | OFF | OFF |
| 2                         | OFF | ON             | OFF | OFF |
| 3                         | ON  | ON             | OFF | OFF |
| 4                         | OFF | OFF            | ON  | OFF |
| 5                         | ON  | OFF            | ON  | OFF |
| 6                         | OFF | ON             | ON  | OFF |
| 7                         | ON  | ON             | ON  | OFF |
| 8                         | OFF | OFF            | OFF | ON  |
| 9                         | ON  | OFF            | OFF | ON  |
| 10                        | OFF | ON             | OFF | ON  |
| 11                        | ON  | ON             | OFF | ON  |
| 12                        | OFF | OFF            | ON  | ON  |
| 13                        | ON  | OFF            | ON  | ON  |
| 14                        | OFF | ON             | ON  | ON  |
| 15                        | ON  | ON             | ON  | ON  |

**Note 1:** The maximum number of DCHI, MSDL, and DDCH devices in the system is 16. The Device Addresses are equivalent to the MSDL DNUM designations. For programming information on the MSDL, refer to the Nortel Networks technical publications (NTPs) *Multi-purpose Serial Data Link description 553-3001-195* and *X11 input/output guide*.

**Note 2:** Device address 0 is commonly assigned to the System Monitor.

## NTRB33 Fiber Junctor Interface card

Use this procedure to replace a Fiber Junctor Interface (FIJI) card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



### DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

### Remove equipment

- 1 Ensure the associated CPU is inactive. Switch CPUs, if required:  
**LD 135**  
**SCPU** to switch CPUs  
**\*\*\*\*** to exit
- 2 Software disable the FIJI card:  
**LD 39**  
**DIS FIJI xx** “xx” is the FIJI group and shelf number, which is displayed on the FIJI front panel.
- 3 Set the ENB/DIS switch to DIS.



### CAUTION

#### Service Interruption

To avoid interrupting service, set ENB/DIS switches to DIS before disconnecting or connecting cables.

- 4 Tag and disconnect cables to the card you are removing.
- 5 Unhook the locking devices on the card; pull it out of the card cage.

### Install equipment

- 1 Set the ENB/DIS switch to DIS on the replacement card.
- 2 Insert the replacement card into the vacated slot and hook the locking devices.
- 3 Connect cables to the replacement card.
- 4 Set the ENB/DIS switch to ENB on the replacement card.
- 5 Software enable and test the FIJI in LD 39:  
**ENL FIJI xx**      xx is the FIJI group and shelf number, which is displayed on the FIJI front panel.  
**STAT FIJI**      .

When the process is complete, you receive a system response.

If there is a problem, a FIJI system message is generated and the red LED lights on the faceplate of the card.

- 6 If there is no problem, exit LD 39:  
\*\*\*\*                      to exit the program
- 7 Test the FIJI cards:  
\*\*\*\*                      to exit the program

Tag defective equipment with a description of the problem and package it for return to a repair center.

## P0699798 Air Filter

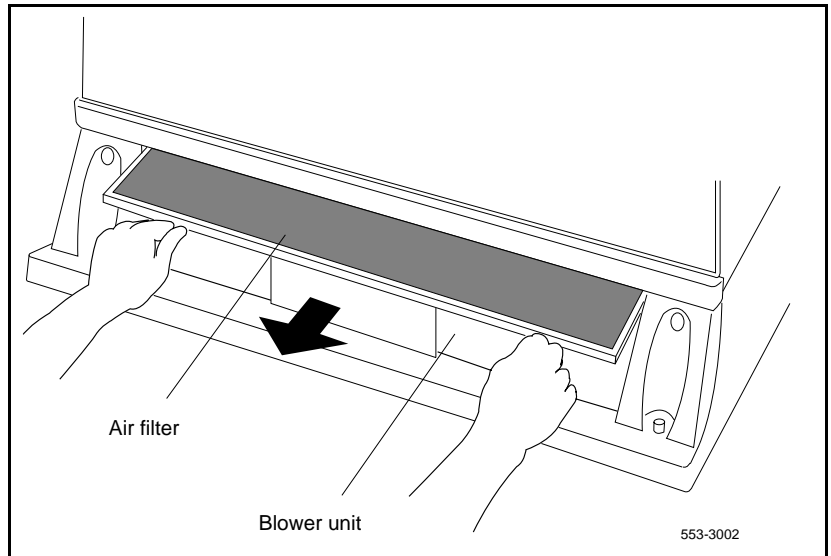
Use this procedure to replace the air filter in the pedestal.

**Note:** You do not need to power down the system to perform this procedure.

- 1 Remove the pedestal front grill and set it aside. The air filter is directly above the blower unit in a slot in the pedestal (see Figure 38 on page 217).
- 2 Grasp the plastic tabs on the front of the air filter. Pull the filter out of the pedestal.
- 3 To install a clean, dry air filter:

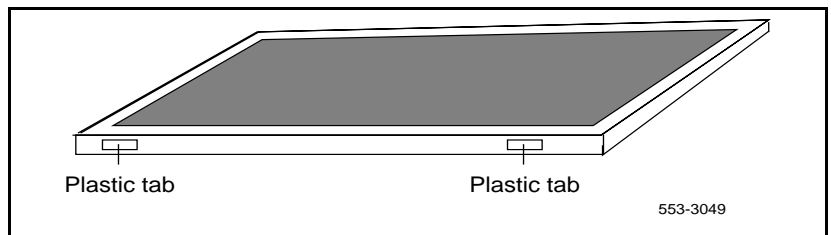


**Figure 38**  
Blower unit and air filter in the front of the pedestal



- a. Make sure the plastic tabs will be on the front of the filter (see Figure 39 on page 217).
- b. Gently push the filter into the pedestal slot until it seats fully in the back.

**Figure 39**  
Pull-tab locations on the air filter



- 4 To reinstall the pedestal grill:
  - a. Fit the bottom of the grill into the holes on the bottom edge of the pedestal.

- b. Push the grill into a locked position against the pedestal.
- c. If there are captive screws on the grill, tighten the screws.

## QPC43 Peripheral Signaling Card

Use this procedure to replace a peripheral signaling card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



### DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



### CAUTION

#### Service Interruption

Disabling or removing a peripheral signaling card from a network shelf disables all loops on that shelf.

## Removing equipment

- 1 Check the status of the peripheral signaling card:

**LD 32**

**STAT PER x** Table 6 on page 220 lists peripheral signaling card numbers specified by “x”

- a. If the response is **DSBL**, go to See “Set the ENB/DIS switch to DIS.” on page 218..
  - b. If the response is **ENBL**, enter **DSPS x** to disable the card, then go to Step 2 on page 218.
- 2 Set the ENB/DIS switch to DIS.
  - 3 Unhook the locking devices on the card; pull it out of the card cage.

**Installing equipment**

- 1 Set the ENB/DIS switch to DIS on the replacement card.
- 2 Set the jumper plug on the replacement card the same as on the card you removed. If there is a vintage change, be sure to check *Circuit Card: Installation and Testing* (553-3001-211) for any differences.
- 3 Insert the replacement card into the vacated slot and hook the locking devices.
- 4 Set the ENB/DIS switch to ENB on the replacement card.
- 5 Software enable the card and loops serviced by the card:

**ENPS x**

- a. When the process is complete, you will receive a system response.
- b. If there is a problem, an NPR system message is generated and the red LED lights on the faceplate of the card.
- c. If there is no problem, exit LD 32:

\*\*\*\*

- 6 Test each loop serviced by the peripheral signaling card:

**LD 30**

**LOOP loop** “loop” is a loop number (see Table 6 on page 220)

\*\*\*\* exit LD 30

- 7 Tag defective equipment with a description of the problem and package it for return to a repair center.

**Table 6**  
**Peripheral signaling card numbers**

| Group/<br>shelf | Peripheral<br>signaling card | Loops<br>disabled/enabled |   |     |  |
|-----------------|------------------------------|---------------------------|---|-----|--|
| 0 / 0           | 0                            | 0                         | – | 15  |  |
| 0 / 1           | 1                            | 16                        | – | 31  |  |
| 1 / 0           | 2                            | 32                        | – | 47  |  |
| 1 / 1           | 3                            | 48                        | – | 63  |  |
| 2 / 0           | 4                            | 64                        | – | 79  |  |
| 2 / 1           | 5                            | 80                        | – | 95  |  |
| 3 / 0           | 6                            | 96                        | – | 111 |  |
| 3 / 1           | 7                            | 112                       | – | 127 |  |
| 4 / 0           | 8                            | 128                       | – | 143 |  |
| 4 / 1           | 9                            | 144                       | – | 159 |  |
| 5 / 0           | 10                           | 160                       | – | 175 |  |
| 5 / 1           | 11                           | 176                       | – | 191 |  |
| 6 / 0           | 12                           | 192                       | – | 207 |  |
| 6 / 1           | 13                           | 208                       | – | 223 |  |
| 7 / 0           | 14                           | 224                       | – | 239 |  |
| 7 / 1           | 15                           | 240                       | – | 255 |  |

## QPC441 Three-Port Extender Card

Use this procedure to replace a three-port extender (3PE) card. To software disable the 3PE card:

- In Options 51C, 61C, and 81C, you must disable the associated NT6D65 Core to Network Interface (CNI) Card. Go to Step 1 on page 221.

**Note 1:** In any Network Module, before you hardware disable the 3PE card you must software disable the QPC43 Peripheral Signaling Card, the QPC412 Intergroup Switch (IGS) Card, and any serial data interface (SDI) cards in the card cage.

**Note 2:** In Options 51C, 61C, and 81C, if you are replacing the 3PE card in the Core/Network, before you hardware disable the 3PE card you must software disable the QPC471 or QPC775 Clock Controller Card on the same CPU. Make sure the replacement card is QPC441 vintage F or later.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



**DANGER**

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



**CAUTION**

**Service Interruption**

At some point in this procedure the system may initialize, causing a momentary interruption in call processing.

**Removing equipment**

- 1 Software disable the 3PE. The CPU associated with the CNI card must be inactive:
  - a. In Options 51C, 61C, and 81C, check the status of all configured CNI cards and the network group number of both ports on each CNI card:

**STAT CNI**

- 2 The CPU associated with the CNI card must become inactive. If you need to switch CPUs:

**LD 135**

**SCPU**

- 3 Disable the CNI port associated with the 3PE card:

**DIS CNI c s p** “c” is the CPU (0 or 1), “s” is the card slot (8–12), “p” is the port (0 or 1)

\*\*\*\* exit LD 135

- 4 In Options 51C, 61C, and 81C, if the 3PE card is in the Core/Network Module, you must disable the clock controller card in that module. Check the status of the clock:

**LD 60**

**SSCK x** "x" is the CPU (0 or 1)

- 5 If the clock is active, switch the clock to make it inactive:

**SWCK**

- 6 Disable the clock:

**DIS CC x**

\*\*\*\* exit LD 60

Go to Step 10 on page 224.

- 7 Software disable the associated peripheral signaling card:

**LD 32**

**DSPS x** Table 7 on page 223 lists peripheral signaling card numbers specified by "x"

\*\*\*\* exit LD 32

**Table 7**  
**Peripheral signaling card numbers**

| Group/<br>shelf | Peripheral<br>signaling card | Loops<br>disabled/enabled |   |     |
|-----------------|------------------------------|---------------------------|---|-----|
| 0 / 0           | 0                            | 0                         | – | 15  |
| 0 / 1           | 1                            | 16                        | – | 31  |
| 1 / 0           | 2                            | 32                        | – | 47  |
| 1 / 1           | 3                            | 48                        | – | 63  |
| 2 / 0           | 4                            | 64                        | – | 79  |
| 2 / 1           | 5                            | 80                        | – | 95  |
| 3 / 0           | 6                            | 96                        | – | 111 |
| 3 / 1           | 7                            | 112                       | – | 127 |
| 4 / 0           | 8                            | 128                       | – | 143 |
| 4 / 1           | 9                            | 144                       | – | 159 |
| 5 / 0           | 10                           | 160                       | – | 175 |
| 5 / 1           | 11                           | 176                       | – | 191 |
| 6 / 0           | 12                           | 192                       | – | 207 |
| 6 / 1           | 13                           | 208                       | – | 223 |
| 7 / 0           | 14                           | 224                       | – | 239 |
| 7 / 1           | 15                           | 240                       | – | 255 |

8 Software disable each port on any associated SDI cards:

**LD 37**

**DIS TTY x** “x” is the number of the interface device attached to a port

\*\*\*\* exit LD 37



**CAUTION**  
**Loss of Data**

If the system terminal is assigned to an SDI port that will be disabled, assign it to another port before the SDI is disabled.

9 Software disable the associated IGS cards:

**LD 39**

**DISI IGS x** “x” is the IGS card number—0 to 19

\*\*\*\* exit LD 39

You will see **ISR043** on the system terminal when the card is disabled. Busy channels will not be disabled until the call is disconnected.

- 10 Set the ENB/DIS switch on the 3PE to DIS.
- 11 Tag and disconnect cables to the 3PE.
- 12 Unhook the locking devices on the card; pull it out of the card cage.

### Installing equipment

- 1 Set the ENB/DIS switch to DIS on the replacement 3PE card.
- 2 Set option switches on the replacement card the same as on the card you removed. If there is a vintage change, be sure to check *Circuit Card: Installation and Testing* (553-3001-211) for any differences.
- 3 Insert the replacement card into the vacated slot and hook the locking devices.
- 4 Connect cables to the replacement card.
- 5 Set the ENB/DIS switch to ENB on the replacement card.
- 6 Enable cards.

In Options 51C, 61C, 81, and 81C, enable and test the CNI and 3PE cards:

#### LD 135

**ENL CNI c s p** CPU (0 or 1). Slot (8–10), port (0 or 1) for Option 81 and slot 12, port 0 for Options 51C, 61C, and 81C.

\*\*\*\* exit LD 135

If the LED on the 3PE card turns off, go to Step 7 on page 224. If the LED stays lit, press the Man Int button to initialize the system.

In Options 51C, 61C, and 81C, if the 3PE card is in the Core/Network, enable the clock controller card:

#### LD 60

**ENL CC x**

\*\*\*\* exit LD 60

If there is a problem, a CED or CCED system message is generated and the red LED lights on the faceplate of the appropriate card.

- 7 Check to see that all cards were enabled.



- 8 Check the status of the IGS card:  
**LD 39**  
**STAT IGS x** “x” is the IGS card number—0 to 19
- 9 If the card is still disabled, enable it:  
**ENL IGS xx**  
\*\*\*\* exit LD 39
- 10 Check the status of SDI ports:  
**LD 37**  
**STAT**
- 11 If any port still disabled, enable it:  
**ENL TTY x**  
\*\*\*\* exit LD 37
- 12 Check the status of the peripheral signaling card:  
**LD 32**  
**STAT PER x** Table 7 on page 223 lists peripheral signaling card numbers
- 13 If the card is still disabled, enable it:  
**ENPS x**  
\*\*\*\* exit LD 32
- 14 Tag defective equipment with a description of the problem and package it for return to a repair center.

## QPC471, QPC775 Clock Controller Card

Use this procedure to replace a clock controller (CC) card.

*Note:* The QPC775 Clock Controller is used in Canadian and International applications. QPC775 and QPC471 cards cannot be combined in one system.

See *Option 11C ISDN BRI Hardware Installation and Maintenance* (553-3011-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



**DANGER**

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

## Removing equipment

- 1 The clock controller card must be on the inactive CPU. If you need to switch the active CPU:

**LD 135** (for Options 51C, 61C, 81, and 81C)

**SCPU**

\*\*\*\*

- 2 Disable the clock controller card:

— The card you are removing must be inactive:

**LD 60**

— In a single-CPU system:  
Disable the clock controller card.

**DIS CC x** “x” is the card number—0 or 1

— In a dual-CPU system:  
Check the status of the clock controller card you are removing.

**SSCK x** “x” is the card number—0 or 1

If the clock is active, switch clocks.

**SWCK** switch system clock from active to standby

Make sure the card you are removing is disabled and the other clock controller card is active and in free run mode.

**SSCK x**

**TRCK FRUN**

Disable the clock controller card you are removing.

**DIS CC x** “x” is the card number—0 or 1

- 3 Set the ENB/DIS switch to DIS on the card you are removing.

**CAUTION****Service Interruption**

To avoid interrupting service, set ENB/DIS switches to DIS before disconnecting or connecting cables.

- 4 Tag and disconnect cables to the card you are removing.
- 5 Unhook the locking devices on the card; pull it out of the card cage.

**Installing equipment**

- 1 Set the ENB/DIS switch to DIS on the replacement card.
- 2 Set option switches on the replacement card. If there is a vintage change, be sure to check *Circuit Card: Installation and Testing* (553-3001-211) for any differences.
- 3 Insert the replacement card into the vacated slot and hook the locking devices.
- 4 Connect cables to the replacement card.
- 5 Set the ENB/DIS switch to ENB on the replacement card.
- 6 Software enable the card:

**ENL CC x**

**Note:** With a vintage H clock controller card, do not issue the tracking (TRCK) or status (SSCK) commands at this time. If you do issue these commands, the system may respond with an inaccurate error condition.

- In a single-CPU system, complete the replacement procedure by exiting LD 60:

\*\*\*\*

- In a dual-CPU system proceed with the following steps.

- 7 Switch CPUs:

**LD 135** (for Options 51C, 61C, 81, and 81C)

**SCPU**

\*\*\*\*

- 8 Activate the newly installed card and verify that it is active:  
**LD 60**  
**SWCK**  
**SSCK x**
- 9 If applicable, issue a tracking command:  
**TRCK aaa** “aaa” is PCK for track primary clock, SCLK for track secondary clock, or FRUN for free run mode  
  
**Note:** Set the clock source to the status it was in before the replacement procedure.
- 10 Verify clock switch-over and tracking:  
**SWCK**  
**SSCK x**  
**\*\*\*\*** exit LD 60
- 11 Tag defective equipment with a description of the problem and package it for return to a repair center.

## QPC477 Bus Terminating Unit

Use this procedure to replace a bus terminating unit (BTU).

**Note:** Check the codes on all replacement BTUs.

QPC477-A10 and QPC477-B10 BTUs are interchangeable in NT8D35 Network Modules.



### **DANGER**

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

- 1 Turn off power to the module:
  - With AC power, set the circuit breaker on the Module Power Distribution Unit (MPDU) to OFF (down).
  - With DC power, set the switch on the power supply to OFF (down).

- 2 Remove enough cards on both sides of the BTU to access the unit.

See *Circuit Card: Installation and Testing* (553-3001-211) for BTU slot locations.

- 3 Gently pull the BTU out of the card cage.
- 4 Insert the replacement BTU into the vacated slot.
- 5 Reinstall the cards on both sides of the BTU.
- 6 Turn on power to the module:
  - With AC power, set the MPDU circuit breaker to ON (up).
  - With DC power, set the power supply switch to ON (up).

**Note:** As necessary, software reenable cards in the module. See the appropriate replacement procedures in this document.

- 7 Tag defective equipment with a description of the problem and package it for return to a repair center.

## QPC659 Dual Loop Peripheral Buffer Card

Use this procedure to replace a dual loop peripheral buffer (DLB) card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and *System Messages Guide* (553-3001-411) for interpreting system messages.



### **DANGER**

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



### **CAUTION**

#### **Service Interruption**

Service is interrupted when a loop is disabled.

## Removing equipment

- 1 Software disable the dual loop peripheral buffer:  
**LD 32**  
**DISS 1 s** “1 s” are the loop and shelf numbers
- 2 Set the ENB/DIS switch to DIS.
- 3 Tag and disconnect cables to the card you are removing.
- 4 Unhook the locking devices on the card; pull it out of the card cage.

## Installing equipment

- 1 Set the ENB/DIS switch to DIS on the replacement card.
- 2 Set option switches on the replacement card the same as on the card you removed. If there is a vintage change, be sure to check *Circuit Card: Installation and Testing* (553-3001-211) for any differences.
- 3 Insert the replacement card into the vacated slot and hook the locking devices.
- 4 Connect cables to the replacement card.
- 5 Set the ENB/DIS switch to ENB on the replacement card.
- 6 Software enable the replacement card by enabling the shelf:

### ENLS 1 s

- When the process is complete, you will receive a system response.
- If there is no problem, exit LD 32:

\*\*\*\*

- 7 Test each shelf:

### LD 30

### SHLF 1 s

- If there is a problem, an NWS system message is generated and the appropriate red LED lights on the faceplate of the card.
- If there is no problem, exit LD 30:

\*\*\*\*

- 8 Tag defective equipment with a description of the problem and package it for return to a repair center.

## QPC841 Serial Data Interface Card

Use this procedure to replace a serial data interface (SDI) card.

See *Administration* (553-3001-311) for a description of all maintenance commands, and the *System Messages Guide* (553-3001-411) for interpreting system messages.



### DANGER

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.



### CAUTION

#### Loss of Data

If the system terminal is assigned to the SDI being replaced, assign it to another port before this SDI is disabled.

## Removing equipment

- 1 Software disable each port on the SDI:

**LD 37**

**DIS TTY x** "x" is the number of the interface device attached to a port

- 2 Set the ENB/DIS switch to DIS.



### CAUTION

#### Service Interruption

To avoid interrupting service, set ENB/DIS switches to DIS before disconnecting or connecting cables.

- 3 Tag and disconnect cables to the card you are removing.

- 4 Unhook the locking devices on the card; pull it out of the card cage.

### Installing equipment

- 1 Set the ENB/DIS switch to DIS on the replacement card.
- 2 Set option switches on the replacement card the same as on the card you removed. If there is a vintage change, be sure to check *Circuit Card: Installation and Testing* (553-3001-211) for any differences.
- 3 Insert the replacement card into the vacated slot and hook the locking devices.
- 4 Connect cables to the replacement card.
- 5 Set the ENB/DIS switch to ENB on the replacement card.
- 6 Software enable each port on the card:

#### ENL TTY x

- When the process is complete, you will receive a system response.
- If there is a problem, an IOD system message is generated and the red LED lights on the faceplate of the card.
- If there is no problem, exit LD 37:

\*\*\*\*

- 7 Tag defective equipment with a description of the problem and package it for return to a repair center.



---

## Replacing an NT7D10 PDU with an NT7D67CB PDU

---

Use this procedure to replace an NT7D10 PDU with an NT7D67CB PDU in DC-powered systems.

*Note 1:* The NT7D67CB PDU replaces the NT7D10 PDU. However, both PDUs can be used in a system.

*Note 2:* Conduit is not required with the NT7D67CB PDU but can be used.

Before you begin this procedure, prepare for the installation:

- Additional wire may be required (see Step 1 on page 234).
- An electric drill, fitted with a .234-in. metal bit must be available.
- A Rear Mount Conduit Kit (NT7D0902) must be available



**DANGER**

Module covers are not hinged; do not let go of the cover. Lift the cover away from the module and set it out of your work area.

## Removing equipment

- 1 Check the length of existing wire to the PDU. Due to the location of the field wiring terminal block on the NT7D67CB PDU, 6 to 9 inches more length is required to reach its terminals than is required to reach those on the NT7D10 PDU.

**Note 1:** The existing service loop where wire enters the pedestal may have enough excess length or enough slack wire may exist in the conduit path from the power plant to allow pulling a sufficient amount through to the pedestal. Figure 43 on page 240, located further on in this procedure, shows the location on the NT7D67CB PDU to which wiring must extend. If existing wiring will not reach, replace the entire wire run from the power plant. Do *not* splice short pieces of wire onto the end of existing wiring.

**Note 2:** If a QCAD321 or an NT6D53 junction box is installed on the power feed to the console, the wiring from the power plant may have to be altered as follows:

- If five #4 AWG wires are run from the power plant to the junction box (two BAT, two RTN, and one LRTN), then the junction box must *not* be used. The junction box must be removed and the entire wire run from the power plant to the pedestal must be replaced. Do *not* splice short pieces of wire onto the end of existing wiring.
- If nine #4 AWG wires are run from the power plant to the junction box (four BAT, four RTN, and one LRTN), then the junction box can be used. However, the #10 AWG wires from the junction box to the pedestal may have to be replaced to provide sufficient length. Do *not* splice short pieces of wire onto the end of existing wiring.

- 2 Disconnect DC power at the source (not at the PDU).



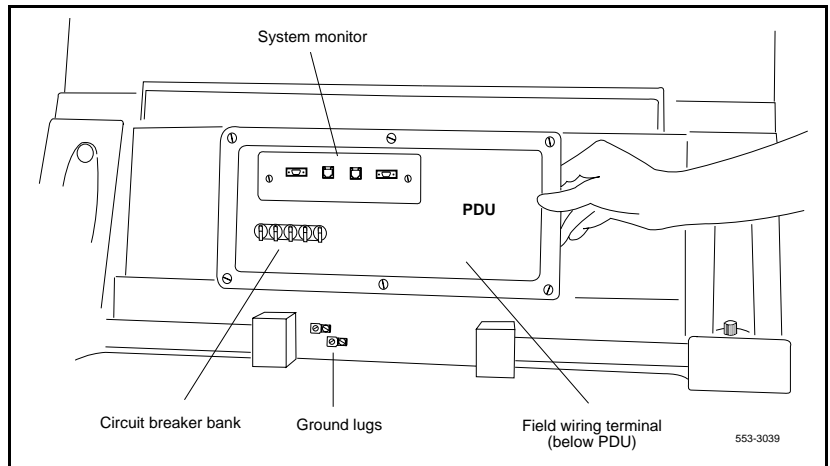
### **DANGER**

Before performing these procedures, disconnect the power at the source; simply turning off the circuit breakers does not shut off power to the system monitor.


- 3 Remove the grill on the rear of the pedestal.

- 4 Set all five circuit breakers on the PDU to OFF (down). Figure 40 on page 235 shows the NT7D10 PDU in the rear of the pedestal.

**Figure 40**  
**NT7D10 Power Distribution Unit DC**



- 5 Unseat the blower unit in the front of the pedestal:
  - a. Remove the grill on the front of the pedestal. Set the toggle switch on the front of the unit to OFF (left).
  - b. Turn the screws on the front of the unit counterclockwise and pull the unit out several inches so the connector on the rear disengages.



**DANGER**  
The unit is heavy and the blades on the blower may still be rotating up to two minutes after the power is turned off.

- 6 Disconnect cables to the module above the pedestal (module 0):
  - a. Remove the rear cover on the module.
  - b. Remove the I/O safety panel over the backplane in the module.

- c. Disconnect the system monitor ribbon cable from the PDU and from the module and set it aside for reconnection with the replacement NT7D67CB PDU.
- d. Disconnect the large orange power connector (J1) from the PDU.

**Note:** To disconnect the power plug, you must press a latch trip on the front and rear of the plug. You may need to use a screwdriver blade against the latch trip on the front of the plug.

- 7 Tag and disconnect cables to the NT8D22 System Monitor card. Loosen the two screws on the card faceplate and remove it.
- 8 Remove the six screws that position the NT7D10 PDU. Carefully pull the unit straight out and set it on the floor next to the pedestal (see Figure 41 on page 237)



**CAUTION**

**Damage to Equipment**

The PDU cannot be completely removed from the pedestal until wires to the field wiring terminal block are disconnected. Label wires carefully. Improper wiring can cause system damage.

- 9 Tag and then disconnect all wiring to the field wiring terminal block.
- 10 Locate the frame ground wire from the field wiring terminal block to the frame ground bolt inside the pedestal. Disconnect this wire at the ground bolt.
- 11 Remove the field wiring terminal block:
  - a. Remove the cover over the terminal block.
  - b. Remove the four screws that secure the terminal block and lift it out of the pedestal.
- 12 Move the NT7D10 PDU out of the work area.

## Installing equipment



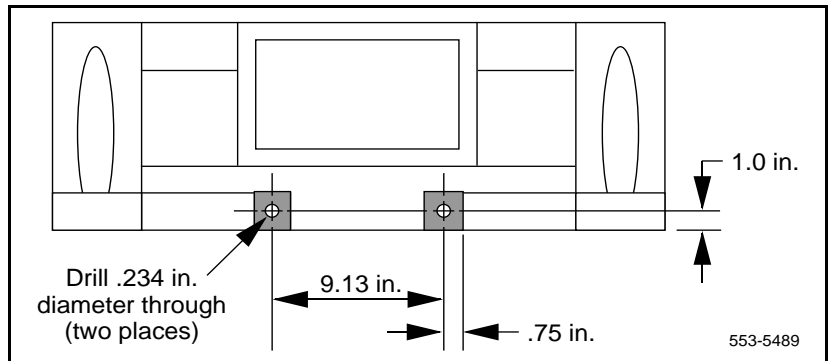
### DANGER

The NT7D67CB PDU is much heavier than the NT7D10 PDU.

**Note:** The conduit attachment plate provided in the NT7D0902 Rear Mount Conduit Kit must be installed as a safety cover and to restrain wiring to the terminal block.

- 1 Drill two .234-in. screw holes in the rear of the pedestal (see Figure 41 on page 237). The holes will be used to install the conduit attachment plate.

**Figure 41**  
Dimensions for drilling holes on the pedestal

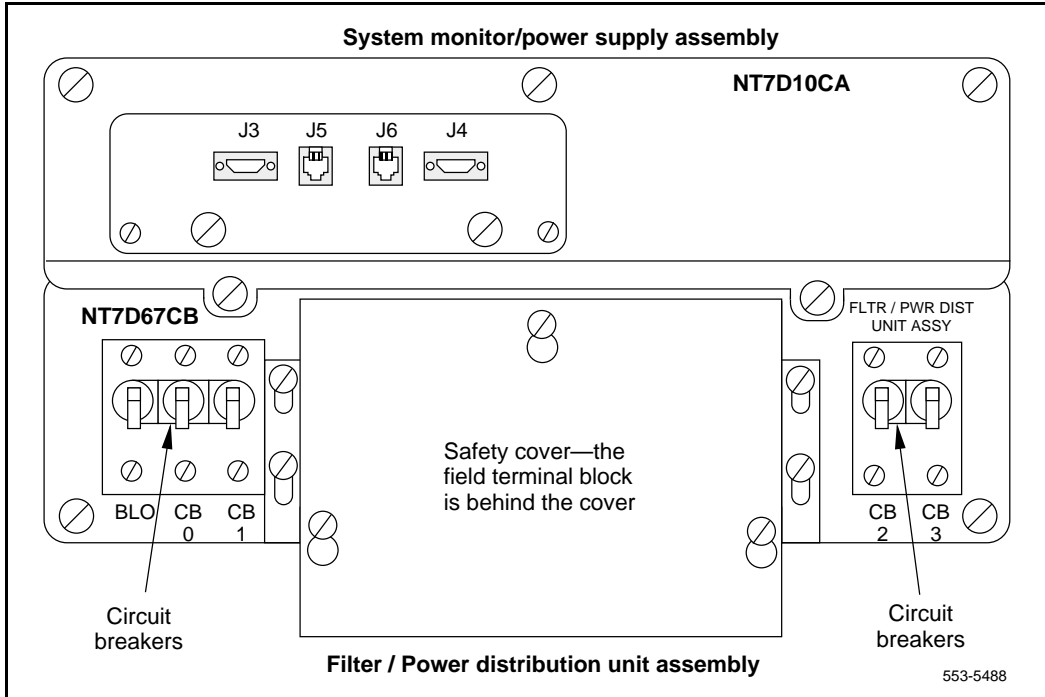


- 2 Place the NT7D67CB PDU next to the pedestal.


Figure 42 on page 238 shows the PDU (labeled FLTR/PWR DIST UNIT ASSY on the equipment) and the NT7D10CA System Monitor/Power Supply Assembly (labeled XSM/PWR SUPPLY ASSY on the equipment).

**Note:** The NT7D09CA Pedestal has a brace that supports a leveling bracket on the rear of the PDU. There is no room for the leveling bracket in the NT7D09AA Pedestal, so the bracket must be removed before the PDU is installed.

Figure 42  
NT7D67CB Power Distribution Unit DC



- 3 Remove the two screws that secure the leveling bracket on the rear of the PDU. Reinstall the screws to hold the rear cover on the PDU in place.



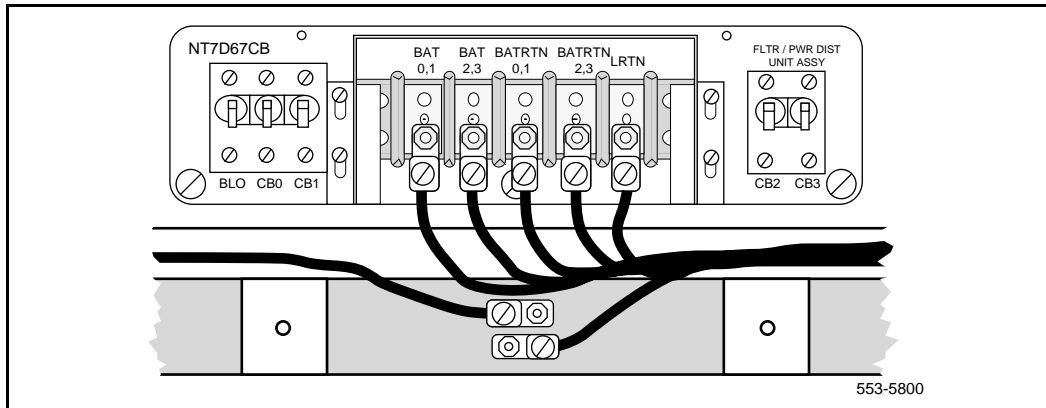
**DANGER**

You should support the PDU as far into the pedestal as you can without letting it drop to the bottom of the pedestal, but watch your hands! It becomes more difficult to support the PDU the further into the pedestal it is inserted. The PDU is held in its proper position only when the mounting screws on its faceplate are tightened.

- 4 Install the NT7D67CB PDU:

- a. Connect the green frame ground wire from the PDU to the frame ground bolt inside the pedestal.
    - b. Guide the power cable connector through the hole in the top of the pedestal. Set the PDU in the pedestal and tighten the three screws that secure it to the pedestal.
- 5 Install the NT7D10CA system monitor assembly:
  - a. Connect the small orange connectors (J2 on the PDU, P2 on the system monitor assembly) on the left side of the PDU.
  - b. Connect the flat white connector to the small circuit board (P1 on the PDU, J1 on the system monitor assembly) on the right side of the PDU.
  - c. Connect the ribbon cable (set aside when the NT7D10 PDU was removed) to the system monitor (J2). Guide the connector on the other end of the cable through the hole in the top of the pedestal and connect it to module 0.
  - d. Gently push the system monitor assembly into the pedestal.
- 6 Tighten the screws that secure the system monitor assembly.
- 7 Reconnect the cables from module 0:
  - a. Reconnect the large orange power connector (J1).
  - b. Replace the I/O safety panel.
  - c. Replace the rear cover on the module.
- 8 Reconnect all external wiring to the terminal block on the PDU (see Figure 43 on page 240):
  - a. Remove the plastic safety cover over the terminal block.
  - b. Connect the red BAT (-48 V) wires:
    - for modules 0 and 1 connect to the BAT 0,1 terminal
    - for modules 2 and 3 connect to the BAT 2,3 terminal
  - c. Connect the black BATRTN (48 V return) wires:
    - for modules 0 and 1 connect to the BATRTN 0,1 terminal
    - for modules 2 and 3 connect to the BATRTN 2,3 terminal
  - d. Connect the orange (or white) wire from the ground bus/LRE in the power plant to the LRTN terminal.

**Figure 43**  
**Field wiring terminals in the NT7D67CB PDU**



- 9 Position the conduit attachment plate on the rear of the pedestal (over the newly drilled holes) and secure it with two screws, nuts, and washers.
- 10 Reinstall the plastic safety cover over the terminal block.
- 11 Reseat the blower unit:
  - a. Lift the unit slightly and slide it into the pedestal glides. Set the toggle switch to ON (right).
  - b. Tighten the screws on the front of the unit.
  - c. Replace the front pedestal grill.
- 12 Insert the system monitor card. Tighten the screws on the card faceplate. Reconnect cables to the system monitor.
- 13 Set all five circuit breakers on the PDU to OFF (down). Reconnect the source of DC power.
- 14 One at a time, starting with the breaker for the blower unit, set the circuit breakers on the PDU to ON (up). Make sure the green LED lights on the power supply unit(s) in each module.
 

**Note:** On initial power up the blower may rotate slower than expected. As the sensor detects heat, the blower will rotate more rapidly.
- 15 Replace the rear pedestal grill.



- 16** Tag defective equipment with a description of the problem and package it for return to a repair center.



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## Meridian 1

# Hardware Replacement

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