Nortel Networks Multiservice Switch 7400

Hardware Installation, Maintenance, and Upgrade

NN10600-175

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General availability. Contains information on Nortel Networks Multiservice Switch 7400 for the PCR6.1 release.

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About this document

This document covers the initial hardware installation of Nortel Networks Nortel Networks Multiservice Switch 7400 series equipment, but focuses primarily on the maintenance and upgrade tasks.

The following topics are discussed in this section:

Who should read this document and why

This document is intended for anyone who installs or maintains Nortel Networks Multiservice Switch 7400 equipment.

What you need to know

Before performing the procedures in this guide, you should:

- understand Nortel Networks Multiservice Switch network architecture, products, and operation
- have basic UNIX knowledge
- be familiar with fundamental data communications and basic electronic concepts and terms.

- have one or two years experience installing data communications equipment. You must be familiar with general cabinet, shelf and processor card installation techniques and terminology
- be aware of all pertinent electrical and physical safety procedures and standards.

WARNING

Risk of radio interference

The Multiservice Switch 7400 series has class B compliant products provided you ensure that all power, function processor (FP), and control processor (CP) cabling is also class B compliant. Using non-class B compliant cabling may cause radio interference. Nortel Networks provides prefabricated interface cables and power cable kits with ferrite beads for B compliance.

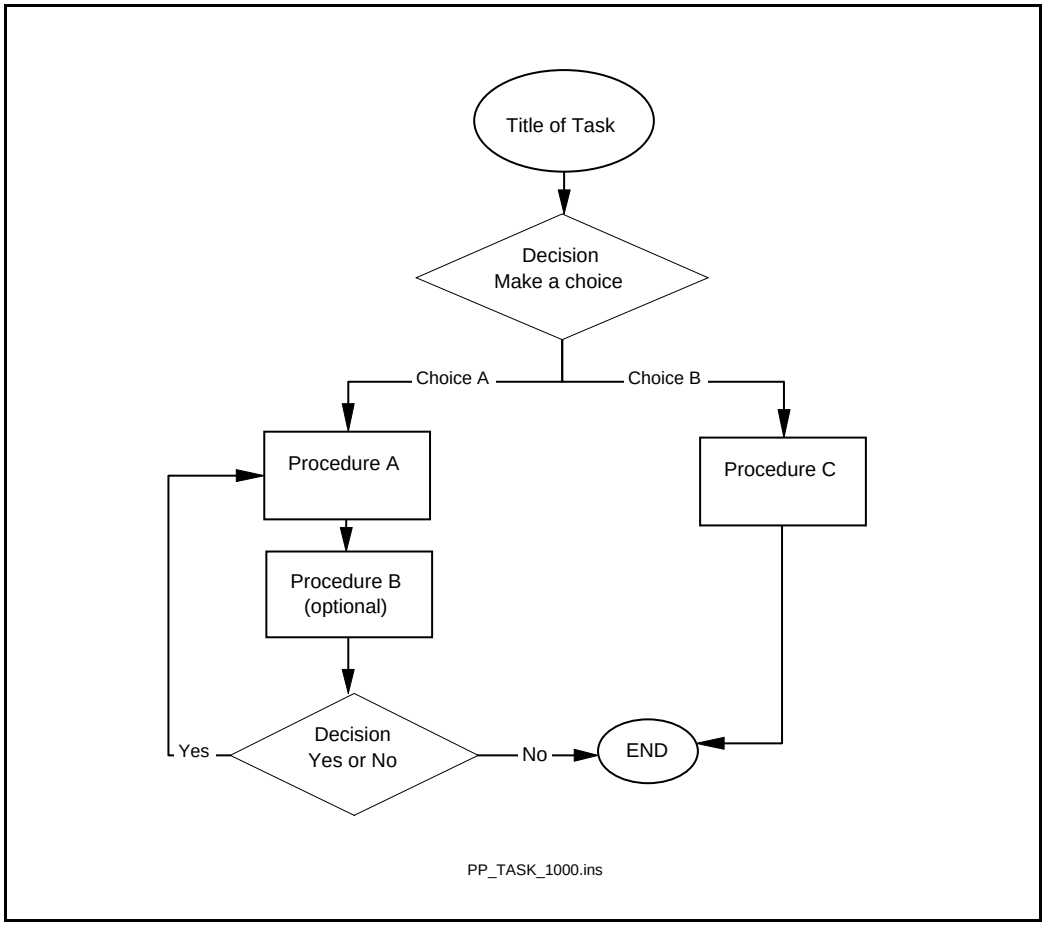
How this document is organized

This document contains common hardware tasks. Each chapter in this document represents an individual task. Each task involves a series of procedures. Flowchart figures provide a visual guide to help you navigate through a task by showing the sequence of all required or optional procedures. Immediately following each task flow figure is an alphabetical bulleted list of links to each procedures mentioned in the task flow.

Some of the procedures required by a task may be located in another document, for example software configuration procedures are found in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

The intention is that you will start by reading the high-level task and then navigate to the required procedures. See “Sample task flow” (page 27).

Figure 1
Sample task flow



Task flow navigation

- cross-reference to Procedure A
- cross reference to Procedure B
- Procedure C. See <name and number of another NTP>

What's new in this document

The following features were added to this document:

- "Multiservice Switch 7460" (page 30)
- "32-port DS1 and E1 MSA 1-slot FPs" (page 30)
- "32-port DS1 and E1 MSA 1-slot FPs" (page 30)
- "32-port DS1 and E1 MSA 1-slot FPs" (page 30)

Other changes made to this document include the following:

- The terms Passport and PVG have been rebranded in conjunction with the new Nortel Networks' brand simplified naming format. Passport is now referred to as the Nortel Networks Multiservice Switch, and PVG is now Media Gateway 7480/15000. For more information on the product rebranding, refer to NN10600-000 *Nortel Networks Multiservice Switch 7400/15000/20000 What's New in PCR6.1*.
- changed the Caution regarding the class B status of equipment in "What you need to know" (page 25)
- added Labelling Fp Cables With D-sub Connectors In "Prerequisites to card cable routing and labeling" (page 113).
- added to the figure "FP addition task flow: part 1" (page 154) where to go from decommissioning an FP when adding an FP.
- corrected the sequence of doing MSA32 sparing panel procedures in the figure "FP addition task flow: part 2" (page 155) and its navigation lists.
- added the procedure "Labeling a card cable connection" (page 372) and included it in the figure "Card cable routing and labeling task flow" (page 114)
- added the context of alarm 7054 0100 to the Prerequisites of:
  - "Failed function processor replacement" (page 147)
  - "Function processor upgrade" (page 163)
- referenced the procedure to verify when an installed FP mismatches the configuration of its slot in:
  - "Prerequisites to failed function processor replacement" (page 147)

  - — “Prerequisites to FP addition” (page 151)
  - — “Prerequisites to function processor upgrade” (page 163)
- added the FP PEC vintages to clarify the Caution regarding the quantity of power supplies when initially installing 32-port MSA 2-slot FPs in
  - — “Prerequisites to FP addition” (page 151)
  - — “Installing an FP” (page 321)
- revised the procedure “Installing FP cables” (page 349) to
  - — add to the Prerequisites that shielded interface cables are automatically grounded through Nortel Networks Multiservice Switch equipment
  - — clarify the differences between cabling a termination panel and a sparing panel
  - — change the method of cabling at the FP faceplate
- deleted the statement “if necessary in order to avoid ground loops, you can terminate the shield ground at one end only” from “Making customer equipment cables” (page 382) since the cable shields must be grounded at both ends of each connection
- amended the air filter replacement procedures to include tables for recording replacement frequency and a reminder that air filter replacement must occur regularly to ensure proper air flow and to validate processor card warranties. Affected procedures are:
  - — “Replacing the air filter in a Multiservice Switch 7440” (page 484)
  - — “Replacing the air filter in a Multiservice Switch 7460” (page 489)
  - — “Replacing the air filter in a Multiservice Switch 7480” (page 493)
- deleted all occurrences of cable cover NTPS07 since it is not supported
- changed all occurrences of “function processor addition” to “FP addition”

Multiservice Switch 7460

Nortel Networks Multiservice Switch 7400 series introduces the 8-slot Multiservice Switch 7460.

- added the procedure “Multiservice Switch 7460 installation” (page 57)
- added the procedure “Multiservice Switch 7460 replacement” (page 69)

32-port DS1 and E1 MSA 1-slot FPs

Nortel Networks Multiservice Switch 7400 series introduces the 32-port DS1 MSA 1-slot function processors (FPs) with PEC NTNQ94 and the 32-port E1 MSA 1-slot FPs with PEC NTNQ93. This document is changed by:

- adding what to do about labelling the fanout cables for the FPs in “Prerequisites to card cable routing and labeling” (page 113)
- updating the Prerequisites of the task flow “Failed function processor replacement” (page 147) to accommodate replacing an MSA 1-slot or 2-slot FP with a 1-slot FP
- updating the Prerequisites and the figure of the task flow “FP addition” (page 151) to accommodate adding a 1-slot (or 2-slot) FP
- updating the Prerequisites and the figure of the task flow “Function processor upgrade” (page 163) to accommodate upgrading a 2-slot FP to 1-slot FP
- updating the procedure “Installing FP cables” (page 349) to mention the split fanout cables and to include the fanout cable adapter NTPS39
- updating these procedures to include the 1-slot FP cable connection requirements to supply power to the sparing panels:
  - “Installing multiple MSA32 sparing panels (DB15 or BNC)” (page 356)
  - “Installing multiple MSA32 sparing panels (RJ-45)” (page 360)

8-port 10/100BaseT Ethernet FP

The 8-port 10/100BaseT Ethernet FP with PEC NTNQ92 and software name 8pEth100BaseT is introduced for any Multiservice Switch 7400, including the Multiservice Switch 7460. This FP is to be handled during an installation,

replacement, addition, or upgrade as indicated by the existing FP information in this document. None of the sections involving FPs require a change for this card.

4-port 10/100BaseT Ethernet FP

The 4-port 10/100BaseT Ethernet FP with PEC NTNQ95 and software name 4pEth100BaseT is introduced for any Multiservice Switch 7400, including the Multiservice Switch 7460. The 4pEth100BaseT FP is a low-cost, entry-level alternative for customers who don't need the port capacity of the 8pEth100BaseT FP. On an Ethernet service and 'per port' basis, this FP offers the same functionality as the 8pEth100BaseT FP. This FP is to be handled during an installation, replacement, addition, or upgrade as indicated by the existing FP information in this document. None of the sections involving FPs require a change for this card.

Notational conventions

The following are samples of caution and warning conventions used in this document.

WARNING

This warning informs you of risk of personal injury.

WARNUNG
Warnhinweis für das Bestehen möglicher Verletzungsgefahren.

WARNING

This warning informs you of risk of personal injury from electrical shock.

WARNUNG
Warnhinweis für das Bestehen der Gefahr eines elektrischen Schlags.

CAUTION

This caution informs you of risk of service interruption or equipment damage.

CAUTION
Risk of electrostatic damage
This caution alerts you to the need to wear a grounded antistatic wrist strap or equivalent protection to avoid damaging electronic parts.

Note: Personal injury warnings and cautions in this document appear in German. This is required for compliance with VDE (Verband Deutscher Elektrotechniker) requirements.

Related documents

See the following documents for related information:

- For information about Nortel Networks Multiservice Switch documentation suite, see NN10600-001 *Nortel Networks Multiservice Switch 7400/15000/20000 Basics: Using the Documentation*
- NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*
- For most of the software configuration procedures included in the task flows, see NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*

How to get more help

For information on training, problem reporting, and technical support, see "Nortel Networks support services" section in NN10600-030 *Nortel Networks Multiservice Switch 7400/15000/20000 Overview*.

Chapter 1
Multiservice Switch 7420 installation

Install a Nortel Networks Multiservice Switch 7420 in or beside a desk-top (desk-top or vertical-mount), or in a standard 19-inch rack or cabinet.

Prerequisites to Multiservice Switch 7420 installation

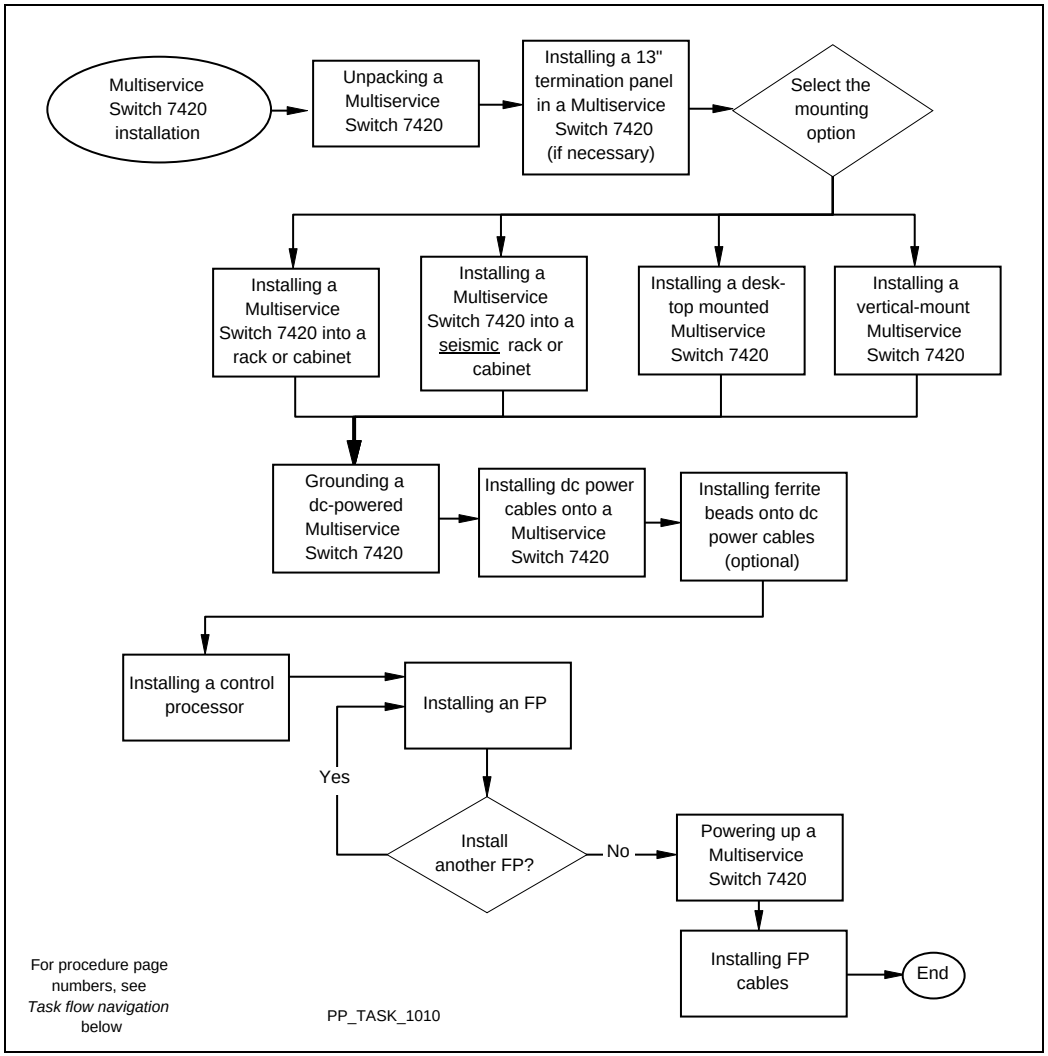
CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

- See "Unpacking a processor card" (page 539) for FP and CP handling instructions.
- Ensure that you have completed all site preparations. For more information, see "Multiservice Switch 7420 installation supporting information" (page 38).
- If you are installing Multiservice Switch equipment in a rack or cabinet, ensure that it has been properly installed and grounded. For more information, see "Cabinet installation" (page 105).

Multiservice Switch 7420 installation task flow

This task flow shows you the sequence of procedures you perform to install Nortel Networks Multiservice Switch 7420. To link to any procedure, go to “Task flow navigation” (page 37).

Figure 2
Multiservice Switch 7420 installation task flow



Task flow navigation

The following references are listed alphabetically:

- “Grounding a dc-powered Multiservice Switch 7420” (page 225)

- “Installing a Multiservice Switch 7420 into a rack or cabinet” (page 272)
- “Installing a Multiservice Switch 7420 into a seismic rack or cabinet” (page 275)
- “Installing a 13-inch termination panel on a Multiservice Switch 7420” (page 235)
- “Installing a control processor” (page 254)
- “Installing a desk-top mounted Multiservice Switch 7420” (page 264)
- “Installing an FP” (page 321)
- “Installing a vertical-mount Multiservice Switch 7420 or Multiservice Switch 7440” (page 308)
- “Installing dc power cables onto a Multiservice Switch 7420” (page 335)
- “Installing ferrite beads onto dc power cables” (page 346)
- “Installing FP cables” (page 349)
- “Powering up a Multiservice Switch 7420” (page 392)
- “Unpacking a Multiservice Switch 7420” (page 527)

Multiservice Switch 7420 installation supporting information

See the following sections:

- “Site preparation” (page 77)
- “Site preparation for free-standing Multiservice Switch equipment” (page 49)

Chapter 2
Multiservice Switch 7420 replacement

Replace a Nortel Networks Multiservice Switch 7420 if a non-replaceable component fails, for example, a fan failure or a failed power supply.

Prerequisites to Multiservice Switch 7420 replacement

CAUTION
Service loss due to outage
Replacing a device removes it from service for the duration of the replacement. Minimize the impact of the outage by rerouting traffic to other nodes in the network before powering down the device.

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

- Before you can replace a shelf, you must assemble enough anti-static packaging to protect the processor cards, and clear an area large enough to temporarily store them. You also need to have appropriate packaging materials so that you can store or ship the removed shelf. See “Unpacking a processor card” (page 539) for FP and CP handling instructions.
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

Multiservice Switch 7420 replacement task flow

This task flow shows you the sequence of procedures to perform to replace a Multiservice Switch 7420. To link to any procedure, go to “Task flow navigation” (page 42).

Figure 3
Multiservice Switch 7420 replacement task flow: part 1

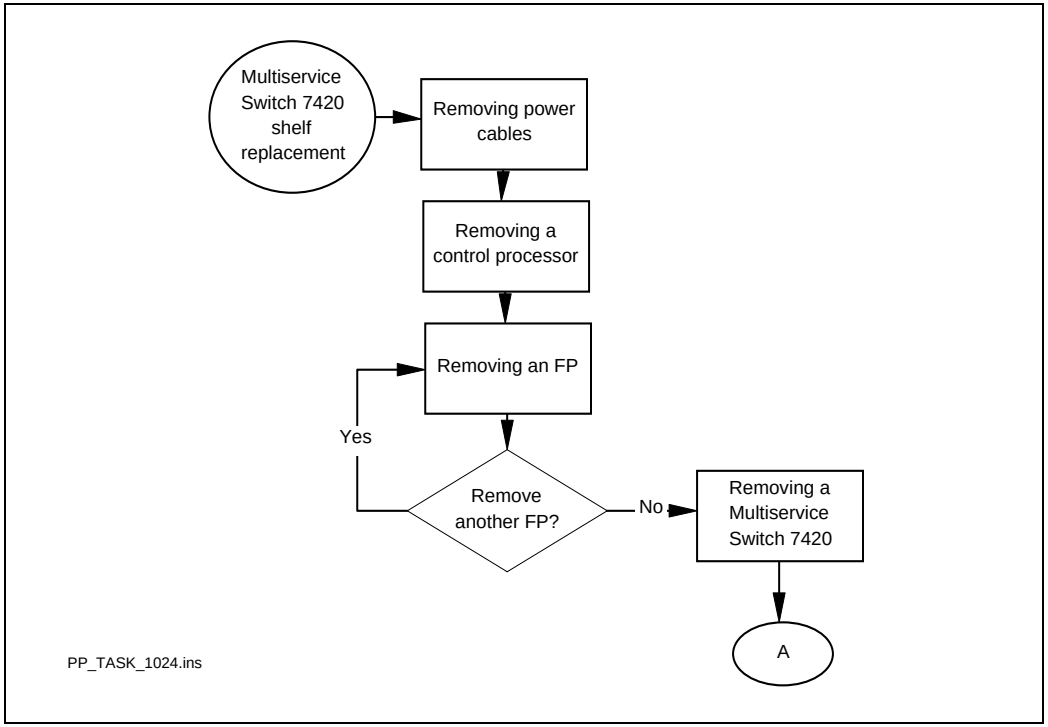
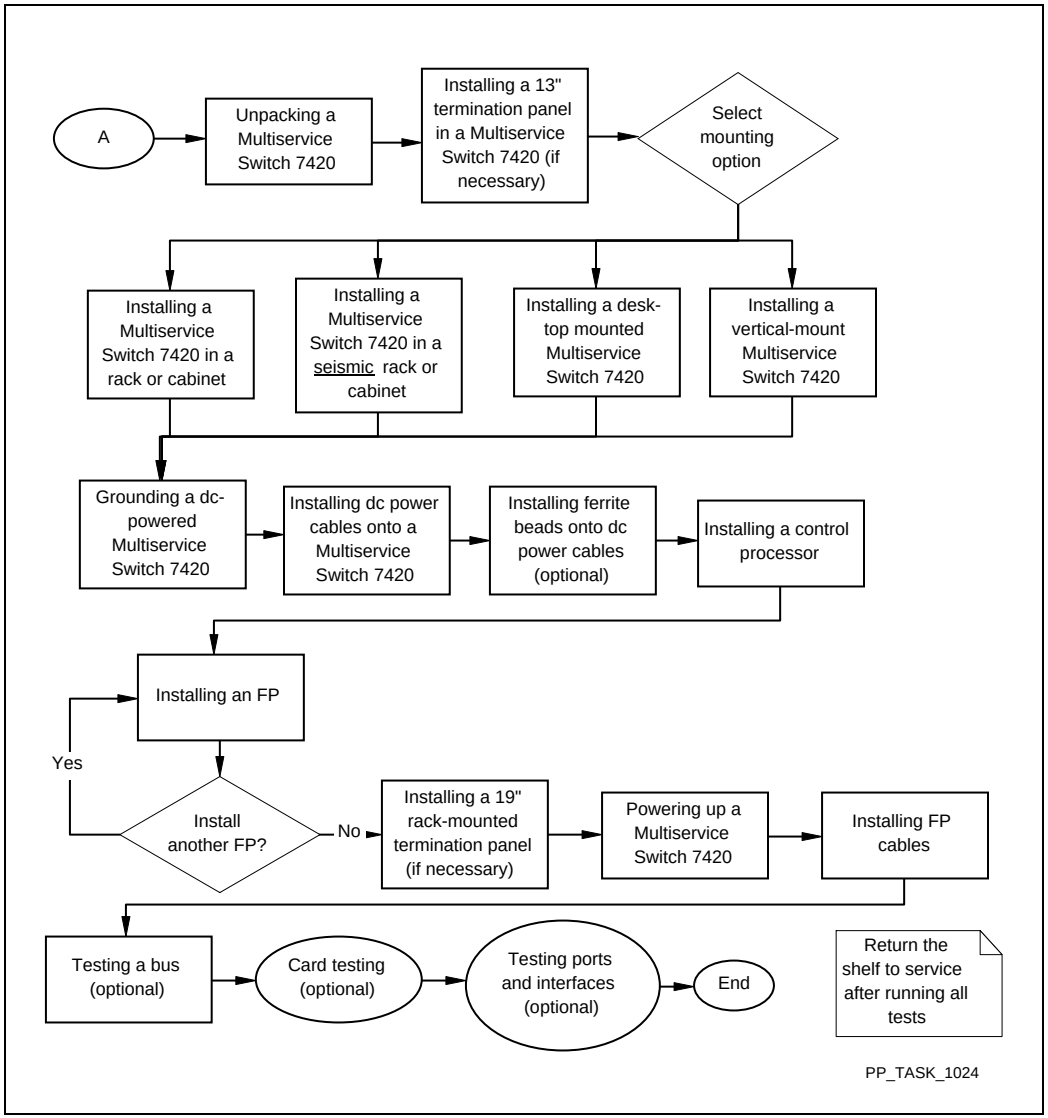


Figure 4
Multiservice Switch 7420 replacement task flow: part 2



Task flow navigation

The following references are listed alphabetically:

- "Card testing". See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- "Grounding a dc-powered Multiservice Switch 7420" (page 225)
- "Installing a 13-inch termination panel on a Multiservice Switch 7420" (page 235)
- "Installing a 19-inch rack-mounted termination panel" (page 240)
- "Installing a control processor" (page 254)
- "Installing a desk-top mounted Multiservice Switch 7420" (page 264)
- "Installing a Multiservice Switch 7420 into a rack or cabinet" (page 272)
- "Installing a Multiservice Switch 7420 into a seismic rack or cabinet" (page 275)
- "Installing a vertical-mount Multiservice Switch 7420 or Multiservice Switch 7440" (page 308)
- "Installing an FP" (page 321)
- "Installing dc power cables onto a Multiservice Switch 7420" (page 335)
- "Installing ferrite beads onto dc power cables" (page 346)
- "Installing FP cables" (page 349)
- "Powering up a Multiservice Switch 7420" (page 392)
- "Removing a Multiservice Switch 7420" (page 422)
- "Removing a control processor" (page 416)
- "Removing an FP" (page 441)
- "Removing power cables" (page 447)
- "Testing a bus". See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.

- “Testing ports and interfaces”. See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- “Unpacking a Multiservice Switch 7420” (page 527)

Chapter 3
Multiservice Switch 7440 installation

Install a Nortel Networks Multiservice Switch 7440 on the floor or in a rack or cabinet.

Prerequisites to Multiservice Switch 7440 installation

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

- See "Unpacking a processor card" (page 539) for FP and CP handling instructions.
- Ensure that you have completed all site preparations. For more information, see "Multiservice Switch 7440 installation supporting information" (page 49).
- If you are installing the device in a rack or cabinet, ensure that it has been properly installed and grounded. For more information, see "Cabinet installation" (page 105).

- If you are installing a 32-port E1 TDM FP you will need to install a multiport aggregate device. See “Installing a multiport aggregate device” (page 268).
- If you are installing a free-standing device with covers see “Installing covers for a Multiservice Switch 7440” (page 326).

Multiservice Switch 7440 installation task flow

This task flow shows you the sequence of procedures to perform to install a Nortel Networks Multiservice Switch 7440. To link to any procedure, go to “Task flow navigation” (page 48).

Figure 5
Multiservice Switch 7440 installation task flow: part 1

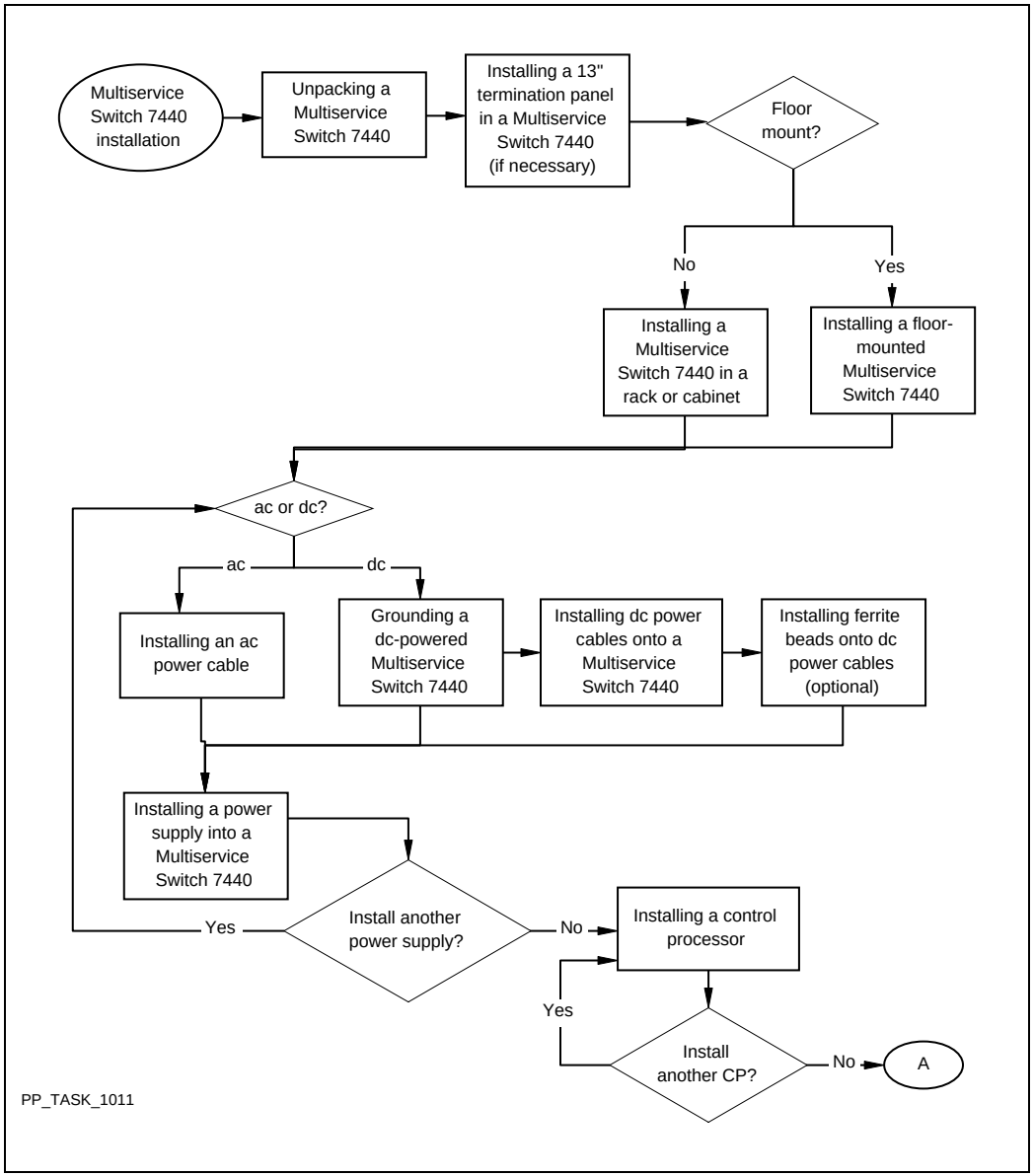
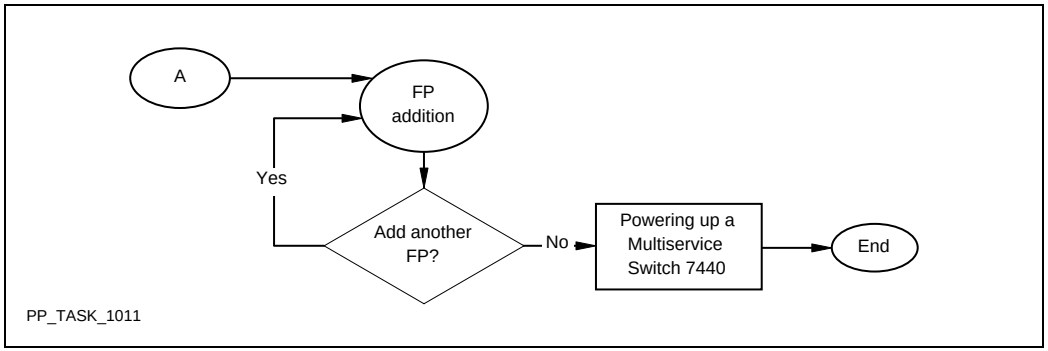


Figure 6
Multiservice Switch 7440 installation task flow: part 2



Task flow navigation

The following references are listed alphabetically:

- “FP addition” (page 151)
- “Grounding a dc-powered Multiservice Switch 7440” (page 227)
- “Installing a power supply into a Multiservice Switch 7440” (page 293)
- “Installing a 13-inch termination panel on a Multiservice Switch 7440” (page 238)
- “Installing a control processor” (page 254)
- “Installing a floor-mounted Multiservice Switch 7440” (page 267)
- “Installing a Multiservice Switch 7440 into a rack or cabinet” (page 279)
- “Installing an ac power cable” (page 311)
- “Installing dc power cables onto a Multiservice Switch 7440” (page 337)
- “Installing ferrite beads onto dc power cables” (page 346)
- “Installing FP cables” (page 349)
- “Powering up a Multiservice Switch 7440” (page 394)
- “Unpacking a Multiservice Switch 7440” (page 530)
- “Unpacking a processor card” (page 539)

Multiservice Switch 7440 installation supporting information

See the following sections:

- “Site preparation” (page 77)
- “Site preparation for free-standing Multiservice Switch equipment” (page 49)

Site preparation for free-standing Multiservice Switch equipment

Plan to run cables from the node to the nearest floor opening in a raised floor.

To accommodate the cables if you have a raised floor, you can cut an opening into the floor at any point near the node. Do not cut under the footprint of the unit. A 20.32 cm^2 (8 sq. in.) opening can accommodate the cables for a Nortel Networks Multiservice Switch 7420 or Multiservice Switch 7440.

Ensure that you will be installing the node on a sturdy, flat surface.

Chapter 4
Multiservice Switch 7440 replacement

Replace a Nortel Networks Multiservice Switch 7440 if a non-replaceable component breaks, for example, if you have bent pins on the backplane.

Prerequisites to Multiservice Switch 7440 replacement

CAUTION
Service loss due to an outage
Replacing a device removes it from service for the duration of the replacement. Minimize the impact of the outage by rerouting traffic to other nodes in the network before powering down the device.

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

- Before you can replace a device, you must assemble enough anti-static packaging for the processor cards, and clear an area large enough to temporarily store all of them. You also need to have appropriate

packaging materials so that you can store or ship the removed device. See "Unpacking a processor card" (page 539) for FP and CP handling instructions.

- If the Nortel Networks Multiservice Switch 7440 has covers, see "Removing the front cover from a Multiservice Switch 7440" (page 464) and "Removing the rear cover from a Multiservice Switch 7440" (page 478).
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

Multiservice Switch 7440 replacement task flow

This task flow shows you the sequence of procedures you do to replace a Nortel Networks Multiservice Switch 7440. To link to any procedure, go to "Task flow navigation" (page 55).

Figure 7
Multiservice Switch 7440 replacement task flow: part 1

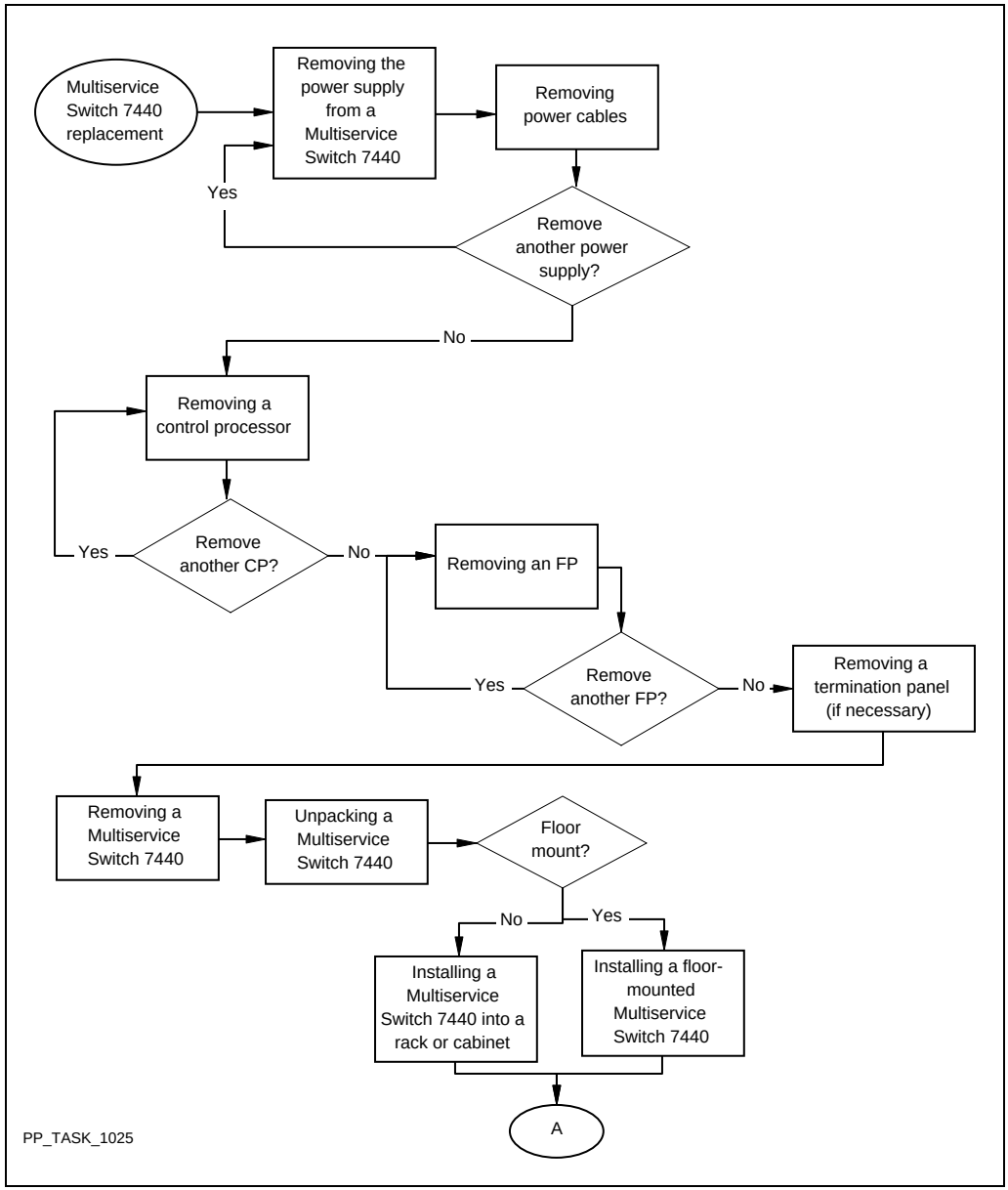
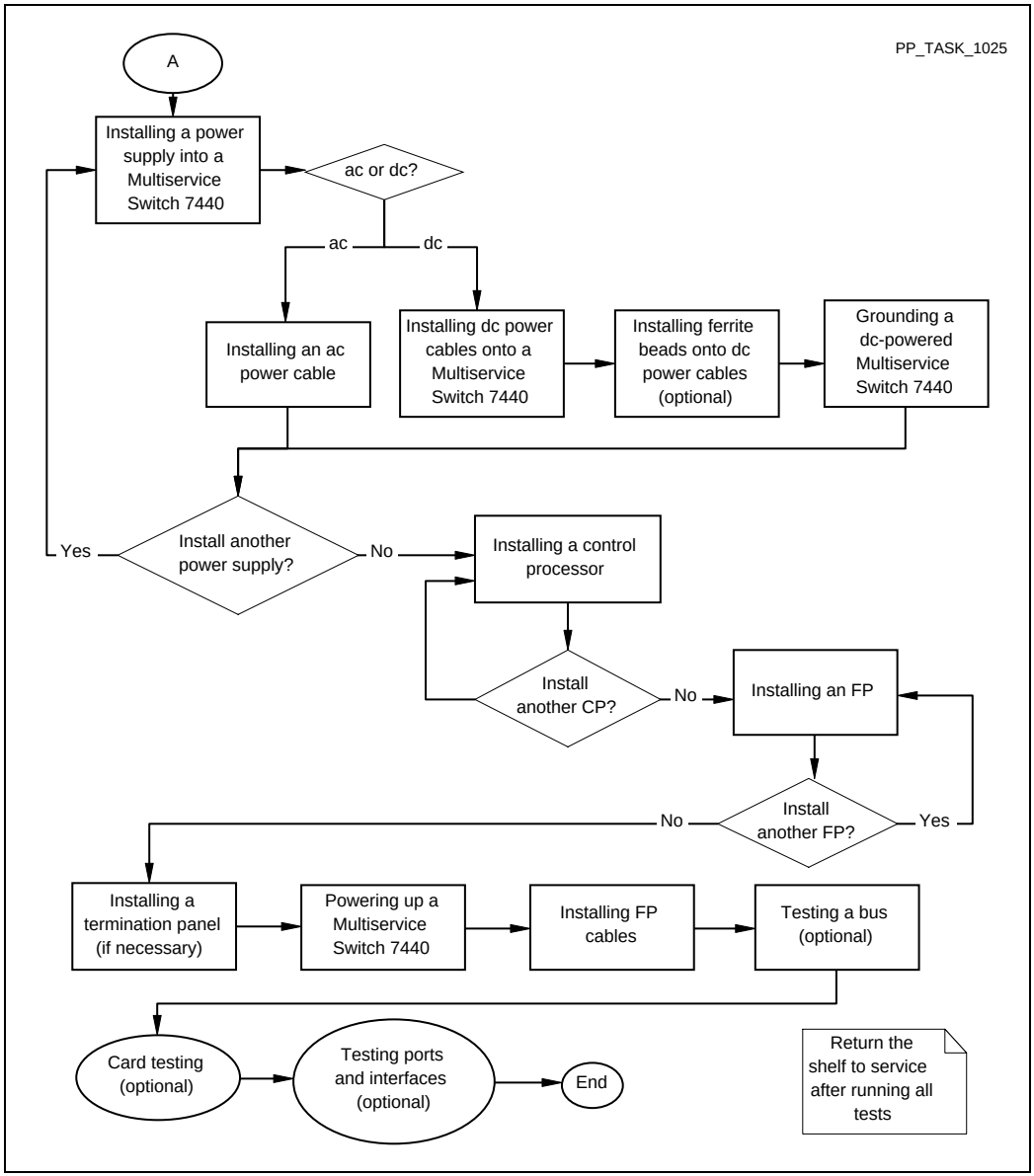


Figure 8
Multiservice Switch 7440 replacement task flow: part 2



Task flow navigation

The following references are listed alphabetically:

- “Card testing”. See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- “Grounding a dc-powered Multiservice Switch 7440” (page 227)
- “Installing a Multiservice Switch 7440 into a rack or cabinet” (page 279)
- “Installing a power supply into a Multiservice Switch 7440” (page 293)
- “Installing a 13-inch termination panel on a Multiservice Switch 7440” (page 238)
- “Installing a 19-inch rack-mounted termination panel” (page 240)
- “Installing a control processor” (page 254)
- “Installing a floor-mounted Multiservice Switch 7440” (page 267)
- “Installing an FP” (page 321)
- “Installing an ac power cable” (page 311)
- “Installing dc power cables onto a Multiservice Switch 7440” (page 337)
- “Installing ferrite beads onto dc power cables” (page 346)
- “Installing FP cables” (page 349)
- “Powering up a Multiservice Switch 7440” (page 394)
- “Removing the power supply from a Multiservice Switch 7440” (page 466)
- “Removing a Multiservice Switch 7440” (page 427)
- “Removing a 13-inch termination panel from a Multiservice Switch 7440” (page 408)
- “Removing a 19-inch rack-mounted termination panel” (page 410)
- “Removing a control processor” (page 416)
- “Removing an FP” (page 441)
- “Removing power cables” (page 447)

- "Testing a bus". See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- "Testing ports and interfaces". See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- "Unpacking a Multiservice Switch 7440" (page 530)

Chapter 5
Multiservice Switch 7460 installation

Install a Nortel Networks Multiservice Switch 7460 in a cabinet or standard 19-inch rack.

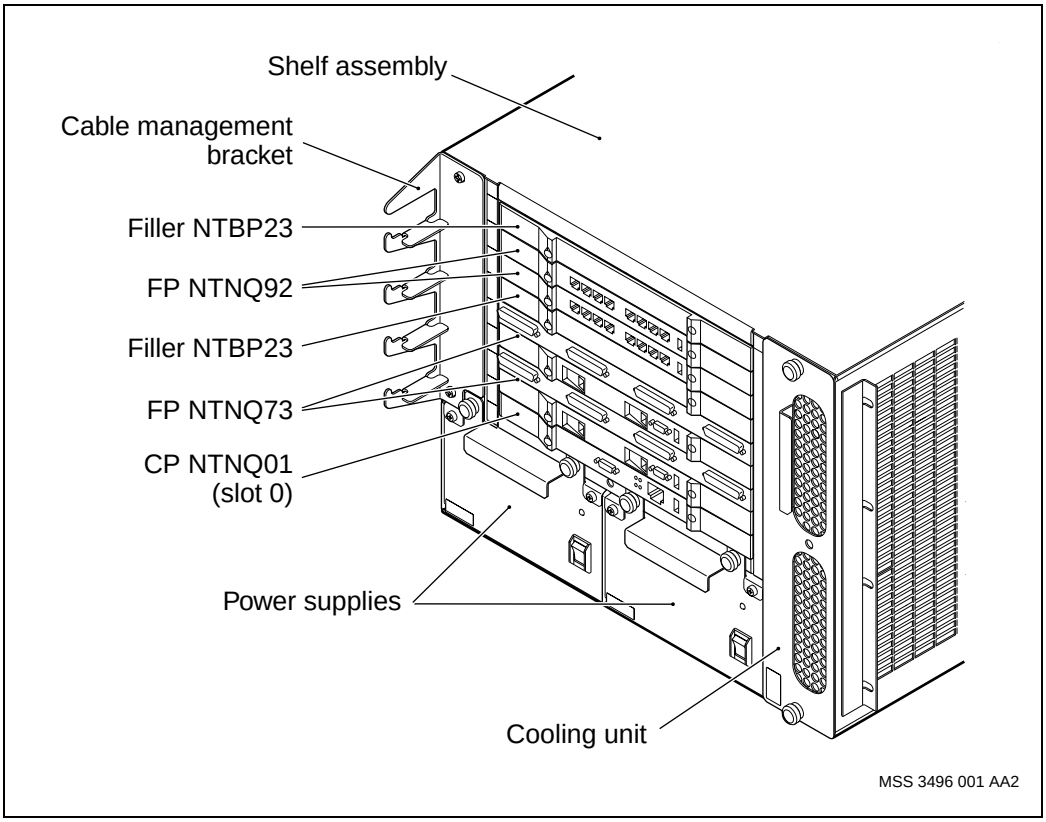
Prerequisites to Multiservice Switch 7460 installation

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

- See "Unpacking a processor card" (page 539) for FP and CP handling instructions.
- Ensure that you have completed all site preparations. For more information, see "Multiservice Switch 7460 installation supporting information" (page 62).
- Ensure that you have properly installed and grounded the cabinet or standard 19" rack as instructed in "Cabinet installation" (page 105).

- The completed installation of all hardware inside the shelf assembly should be similar to the parts shown in the figure “Processor cards installed in a Multiservice Switch 7460” (page 58).

Figure 9
Processor cards installed in a Multiservice Switch 7460



Multiservice Switch 7460 installation task flow

This task flow shows you the sequence of procedures to perform to install a Nortel Networks Multiservice Switch 7460. To link to any procedure, go to “Task flow navigation” (page 61).

Figure 10
Multiservice Switch 7460 installation task flow: part 1

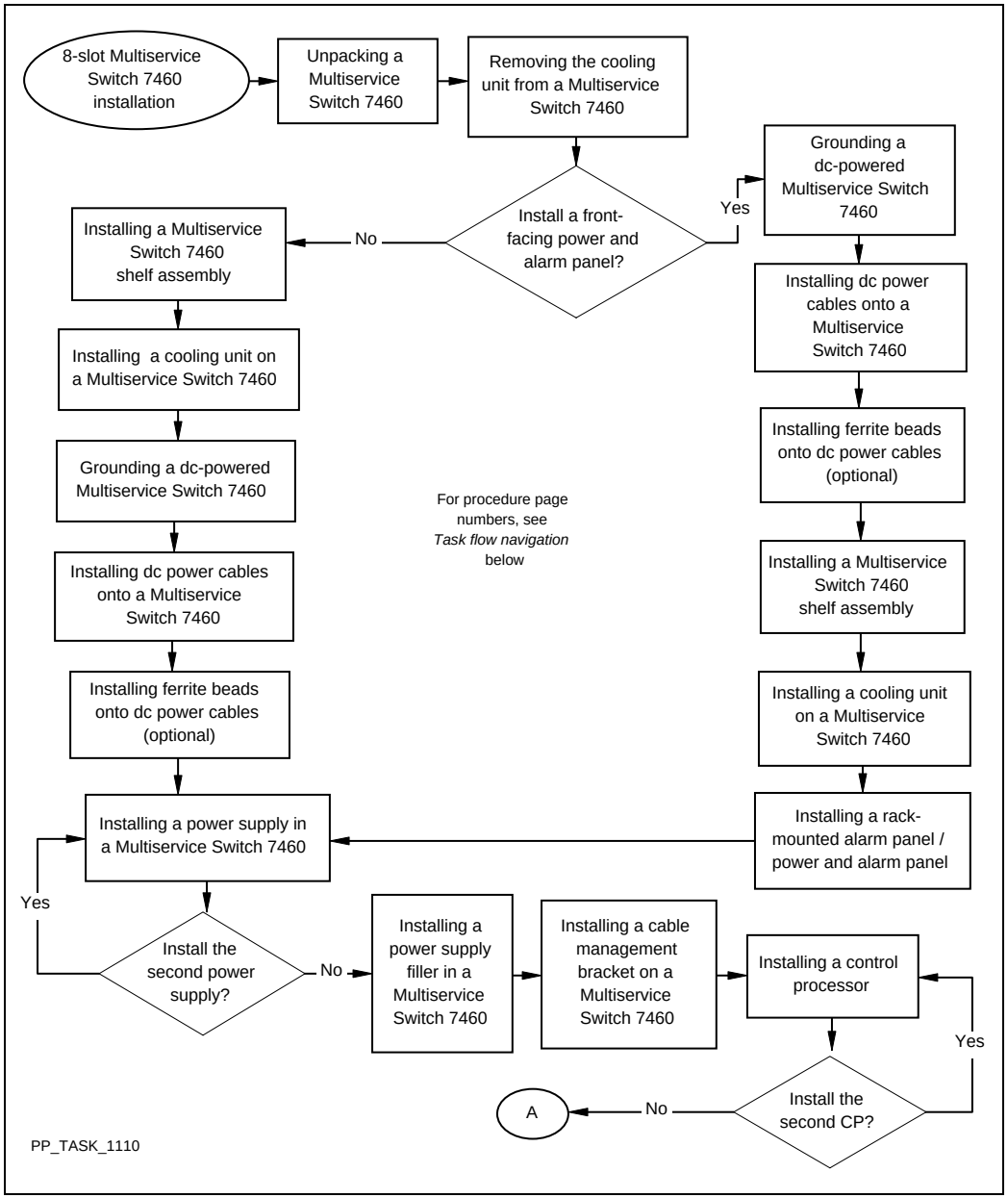


Figure 11
Multiservice Switch 7460 installation task flow: part 2

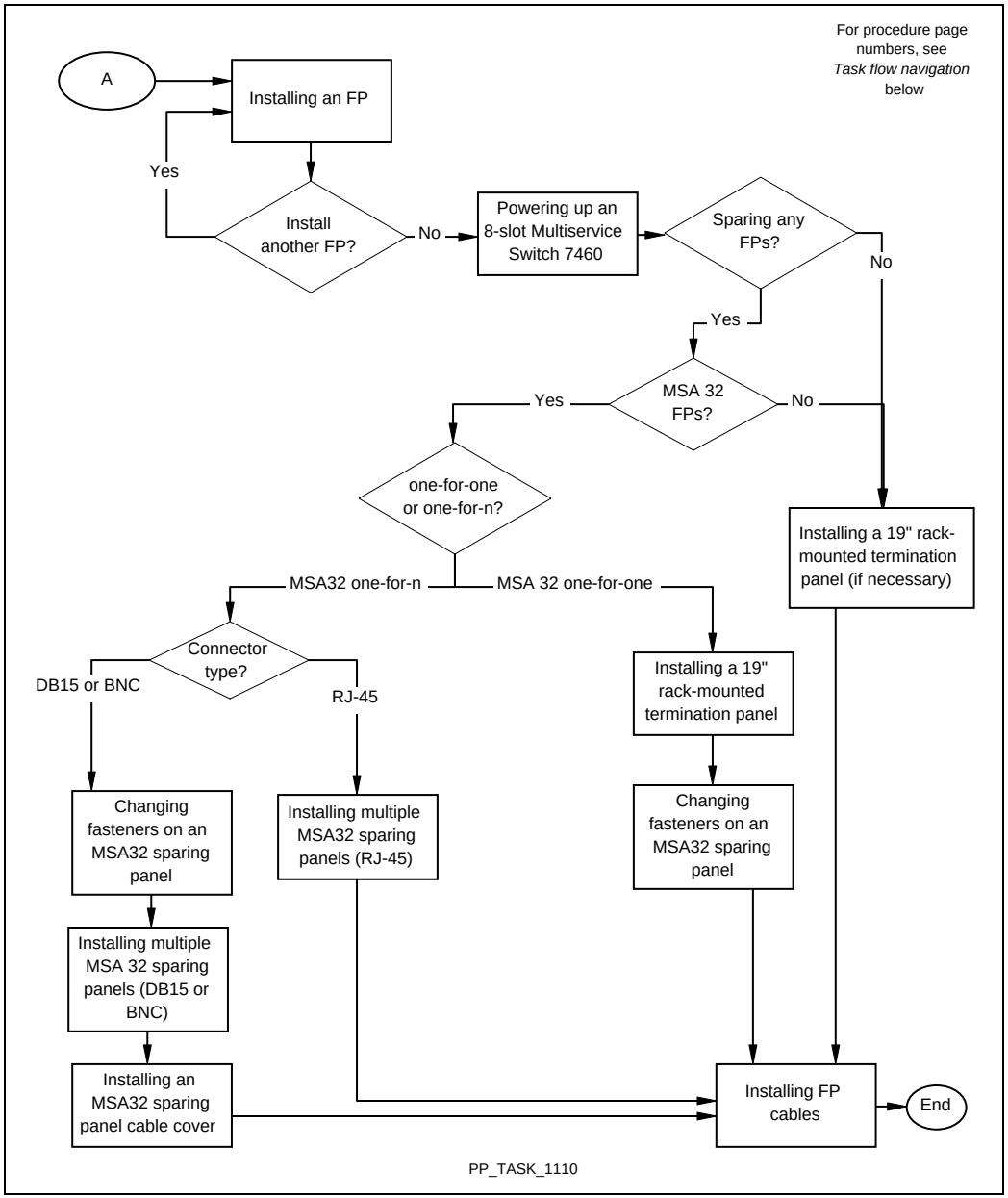
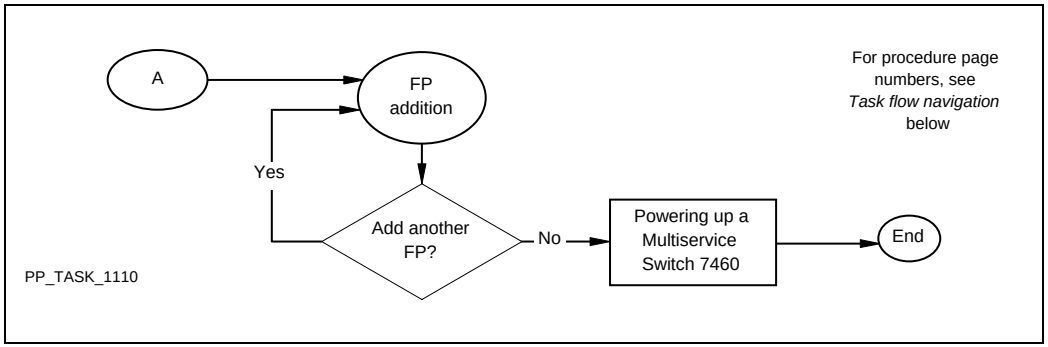


Figure 12
Multiservice Switch 7460 installation task flow: part 2



Task flow navigation

The following references are listed alphabetically:

- "FP addition" (page 151)
- "Grounding a dc-powered Multiservice Switch 7460" (page 229)
- "Installing a control processor" (page 254)
- "Installing a cable management bracket on a Multiservice Switch 7460" (page 251)
- "Installing a cooling unit into a Multiservice Switch 7460" (page 257)
- "Installing a power supply in a Multiservice Switch 7460" (page 296)
- "Installing a power supply filler in a Multiservice Switch 7460" (page 292)
- "Installing a Multiservice Switch 7460 shelf assembly" (page 282)
- "Installing a rack-mounted alarm panel / power and alarm panel" (page 304)
- "Installing dc power cables onto a Multiservice Switch 7460" (page 339)
- "Installing ferrite beads onto dc power cables" (page 346)
- "Installing FP cables" (page 349)
- "Powering up a Multiservice Switch 7460" (page 397)

- "Removing the cooling unit from a Multiservice Switch 7460" (page 458)
- "Unpacking a Multiservice Switch 7460" (page 533)

Multiservice Switch 7460 installation supporting information

Site preparation

Site preparation means planning ahead for the location of equipment, and preparing the site for anchoring a cabinet or rack. See the appropriate sections for more information.

- "Site preparations for all installations" (page 62)
- "Site preparation for a Multiservice Switch cabinet" (page 63)
- "Site preparation for a seismic cabinet" (page 65)
- "Site preparation for a 19-inch rack" (page 63)

Site preparations for all installations

As part of site preparation for installing Nortel Networks Multiservice Switch equipment, consider the following:

- Space and environmental requirements are outlined in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. Ensure that there is sufficient clearance around all equipment for ventilation and physical access. External cooling units may be required in rooms that contain a large number of other network equipment. The floor plan must also allow sufficient room for other necessary equipment, (for example, a local operator terminal, modem, or test equipment.
- Check your local building regulations and the technical specifications for the device, termination panels, cabinets, grounding, and so on, in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- Where there is a risk of tampering, ensure that you can lock the room.
- To satisfy safety requirements, you must connect ac grounds from all equipment (including cabinets, termination panel cabinets, and local operator terminal), and external dc grounds to a single distribution panel ground point.

- The maximum cable distance from a function processor (FP) to your equipment varies for each line type. For more information, see cable assembly specifications in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- If cable routing is overhead, install termination panels in the top portion of the rack; if cable routing is from the floor or a wall outlet, install termination panels in the bottom portion of the rack.
- Sharp edges can damage cables. Therefore, smooth any rough edges around cutouts.

Site preparation for a 19-inch rack

You can install a Nortel Networks Multiservice Switch 7460 in standard 19-inch rack, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Plan to run the cables to the nearest opening in a raised floor. A 20.32 cm^2 (8 sq. in.) opening can accommodate the cables for a Multiservice Switch 7420 or a Multiservice Switch 7440. A cutout 6.4 cm (2.5 in.) by 42 cm (16.6 in.) can accommodate all cables from a rack that contains four Multiservice Switch 7460 shelf assemblies or two fully configured Multiservice Switch 7480s. If the rack is already in place, you can run the cables through the same cutout you use for other equipment in the rack.

For detailed information about installing a 19-inch rack, see the information provided by the supplier of the rack.

Site preparation for a Multiservice Switch cabinet

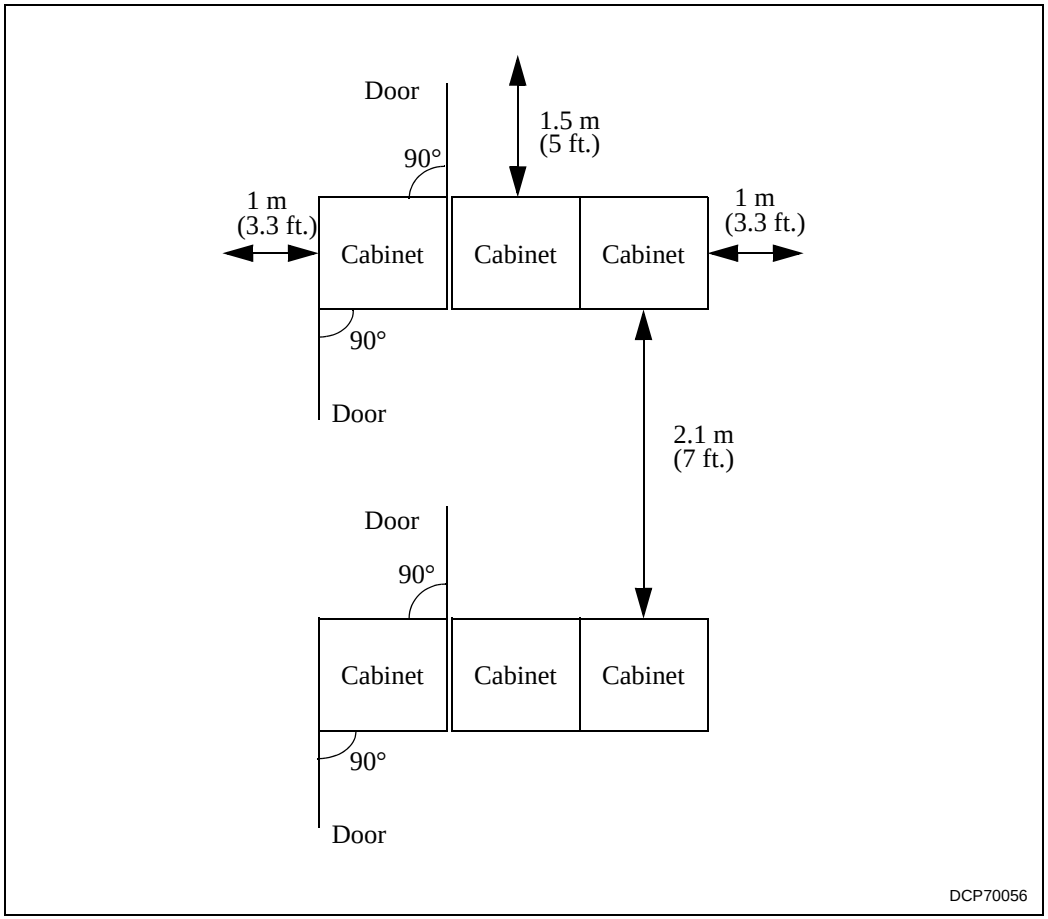
Your floor plan must conform to the required spacing shown in the figure "Floor space requirements for Multiservice Switch cabinets" (page 64). This figure also shows placement details for when termination panels are housed in a separate cabinet.

Plan to run cables from the device to the nearest floor opening in a raised floor. You can cut an opening into the floor for cables at any point near the device. Do not cut under the footprint of the unit. A 20.32 cm^2 (8 sq. in.) opening can accommodate the cables for a Multiservice Switch 7420 or a

Multiservice Switch 7440, even if you plan to mount termination panels in a separate rack. A 6.4 cm (2.5 in.) by 42 cm (16.6 in.) opening can accommodate the cables for a Multiservice Switch 7460.

Ensure that your plan conforms to the cable specifications for the function processors (FPs) in your device. For more information, see the cable assembly information in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Figure 13
Floor space requirements for Multiservice Switch cabinets



Site preparation for a seismic cabinet

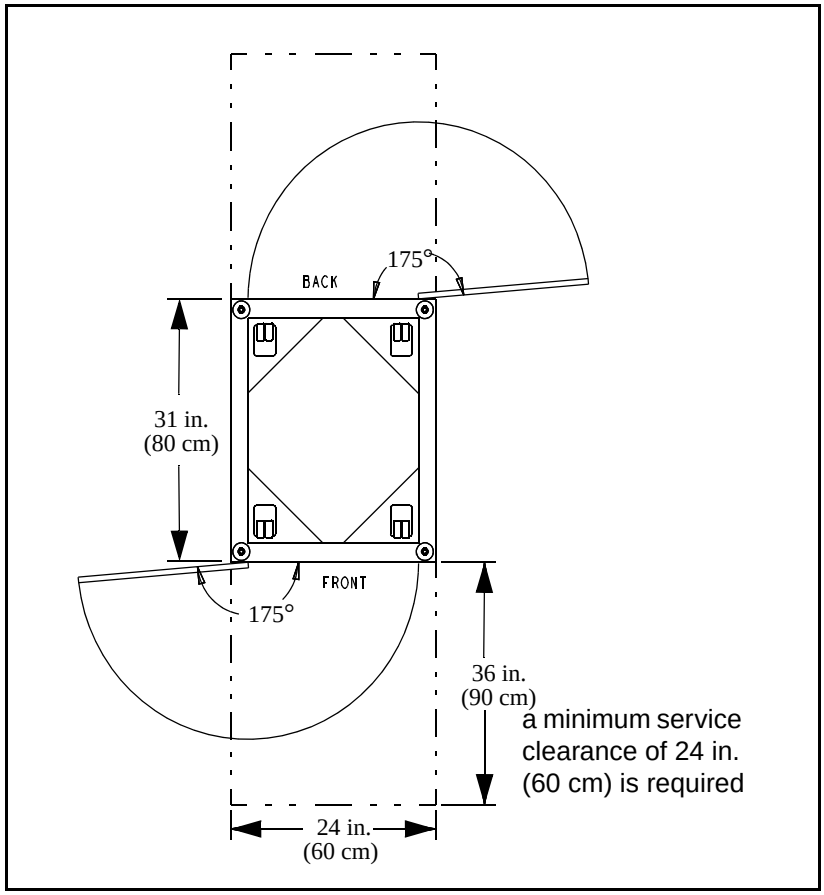
Your floor plan must conform to the required spacing shown in “Floor space requirements for a seismic cabinet” (page 66). You can install termination panels in the same cabinet as the chassis. Or, you can install termination panels in a separate cabinet or rack.

Position each cabinet to allow you to open both the front and rear doors 90 degrees (20 in. extension). The front and rear doors have a gate swing of 175 degrees.

Cabinets that contain a single device mounted in the top half must be anchored to the floor. To meet NEBS Zone 4 seismic requirements, you must anchor the cabinet to the floor using the equipment in one of the seismic anchoring kits. You cannot anchor a seismic cabinet for seismic protection on a raised floor.

For dc installations, the distance from the power cord attachment to each device must be correct for its wire gauge and voltage drop. See dc power input and wiring regulations in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Figure 14
Floor space requirements for a seismic cabinet



Seismic protection

Seismic protection features described in this section meet the Zone 4 seismic requirements of Telcordia NEBS GR-63-CORE.

To provide seismic protection for your device, you must anchor the cabinet to the floor using either an outside-mount anchoring kit or an inside-mount anchoring kit. You must also install seismic hardware inside the cabinet.

The inside-mount seismic anchoring kit requires you to attach two L-shaped brackets to the inside of the cabinet. You must then anchor the brackets to a concrete floor. The inside-mount anchoring kit fully isolates the seismic brackets from the ground. The outside-mount anchoring kit does not.

The outside-mount seismic anchoring kit requires you to attach two L-shaped brackets to the outside of the cabinet. You must then anchor the brackets to a concrete floor.

You cannot provide seismic protection for a cabinet on a raised floor.

Chapter 6
Multiservice Switch 7460 replacement

Replace a Nortel Networks Multiservice Switch 7460 to remove and install a new shelf chassis when a non-replaceable component fails, such as bent pins on the backplane.

Prerequisites to replacing a Multiservice Switch 7460

CAUTION
Service loss due to an outage
Replacing a device removes it from service for the duration of the replacement. Minimize the impact of the outage by rerouting traffic to other nodes in the network before powering down the device.

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

- Before you can replace a device you must assemble enough anti-static packaging for the processor cards, and clear an area large enough to temporarily store all of them. You also need to have appropriate

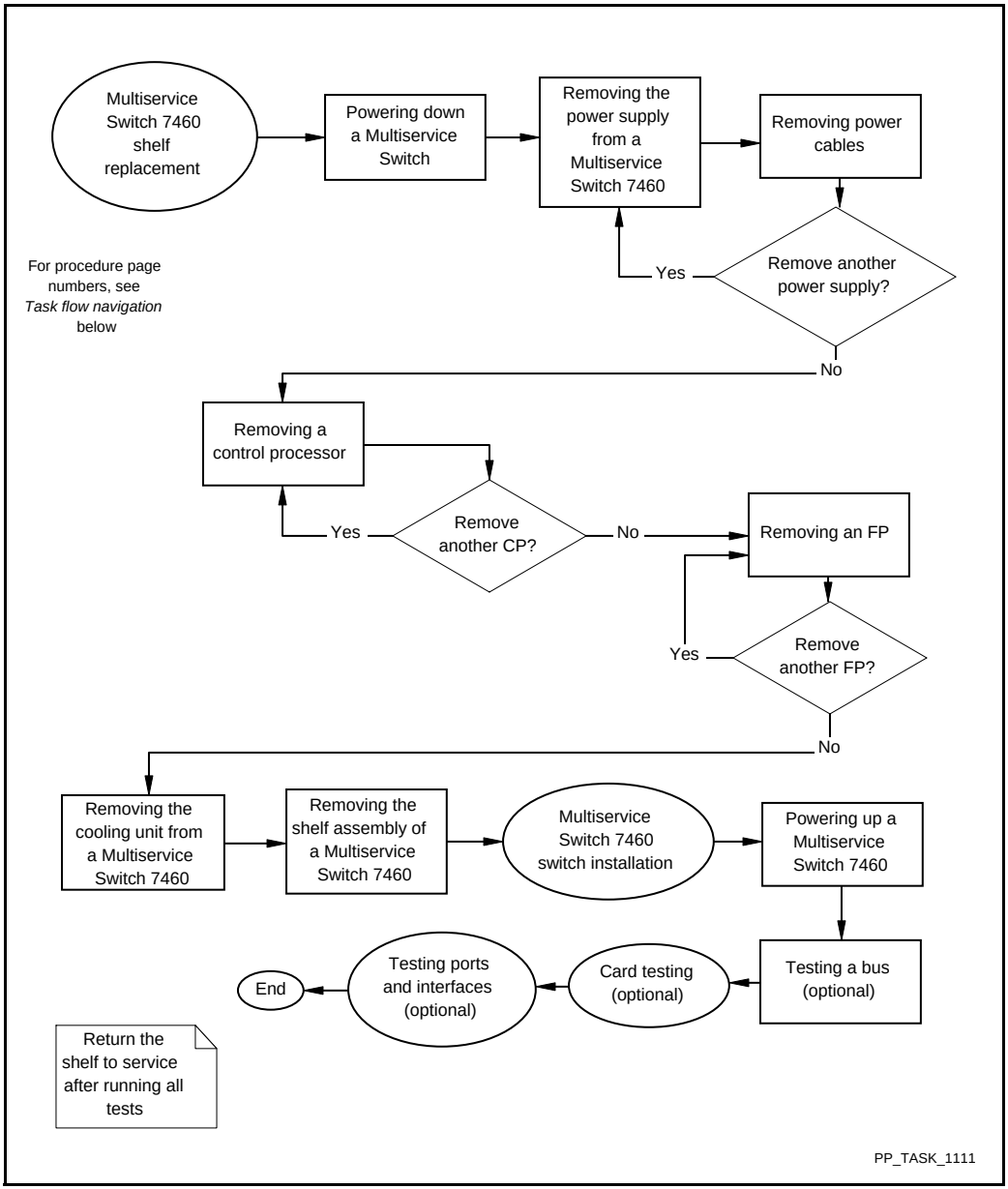
packaging materials so that you can store or ship the removed shelf. See "Unpacking a processor card" (page 539) for FP and CP handling instructions.

- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents, especially NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

Multiservice Switch 7460 replacement task flow

This task flow shows you the sequence of procedures to perform to replace a Nortel Networks Multiservice Switch 7460. To link to any procedure, go to "Task flow navigation" on page 72.

Figure 15
Multiservice Switch 7460 replacement task flow



Task flow navigation

The following references are listed alphabetically:

- "Card testing". See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- "Grounding a dc-powered Multiservice Switch 7460" (page 229)
- "Multiservice Switch 7460 installation" (page 57)
- "Powering down a Multiservice Switch" (page 391)
- "Powering up a Multiservice Switch 7460" (page 397)
- "Removing the cooling unit from a Multiservice Switch 7460" (page 458)
- "Removing the power supply from a Multiservice Switch 7460" (page 471)
- "Removing the shelf assembly of a Multiservice Switch 7460" (page 480)
- "Removing a control processor" (page 416)
- "Removing an FP" (page 441)
- "Removing a shelf interconnect cable" (page 439)
- "Removing power cables" (page 447)
- "Testing a bus". See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- "Testing ports and interfaces". See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- "Unpacking a Multiservice Switch 7460" (page 533)

Chapter 7
Multiservice Switch 7480 installation

Install a Nortel Networks Multiservice Switch 7480 in a cabinet or standard 19” rack.

Prerequisites to Multiservice Switch 7480 installation

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see “Avoiding damage from static electricity” (page 208).

- See “Unpacking a processor card” (page 539) for FP and CP handling instructions.
- Ensure that you have completed all site preparations. For more information, see “Multiservice Switch 7480 installation supporting information” (page 77).
- Ensure that you have properly installed and grounded the cabinet or standard 19” rack as instructed in “Cabinet installation” (page 105).

- If you are installing a 32-port E1 TDM FP you will need to install a multiport aggregate device. See “Installing a multiport aggregate device” (page 268).

Multiservice Switch 7480 installation task flow

This task flow shows you the sequence of procedures to perform a Nortel Networks Multiservice Switch 7480. To link to any procedure, go to “Task flow navigation” (page 76).

Figure 16
Multiservice Switch 7480 installation task flow: part 1

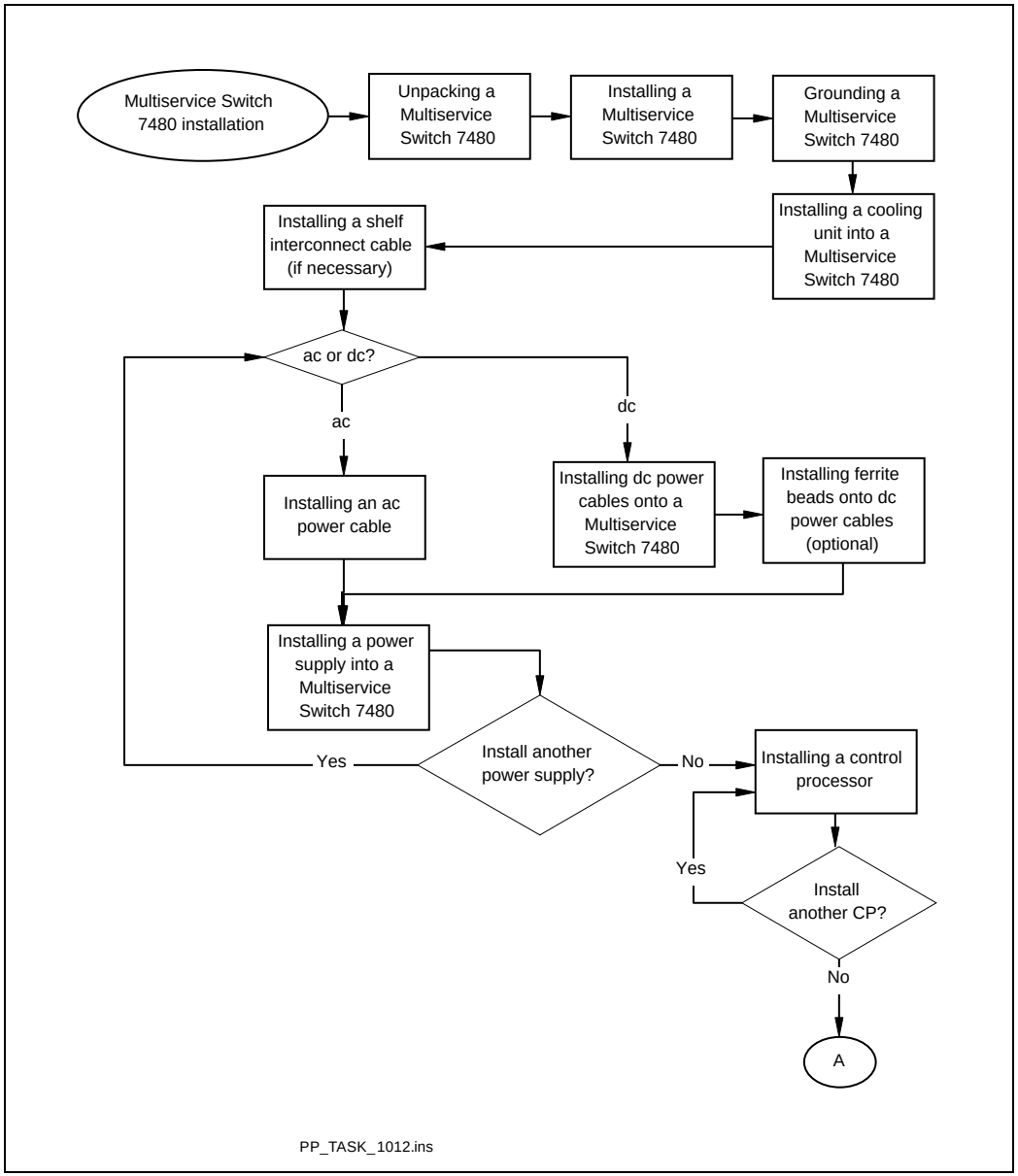
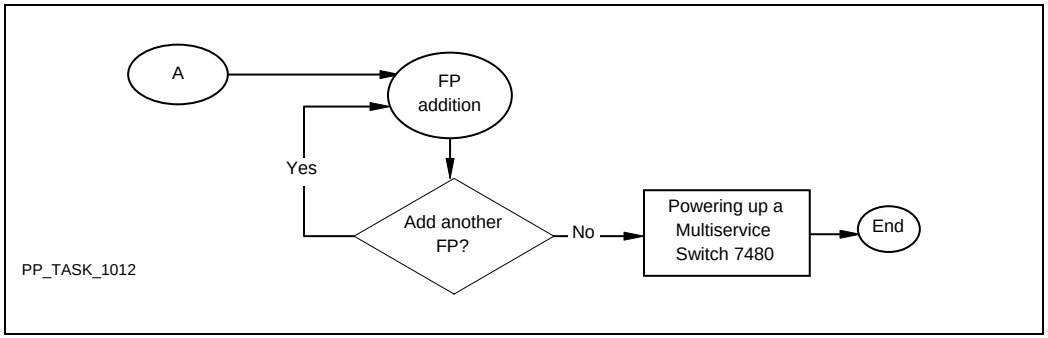


Figure 17
Multiservice Switch 7480 installation task flow: part 2



Task flow navigation

The following references are listed alphabetically:

- “FP addition” (page 151)
- “Grounding a Multiservice Switch 7480” (page 231)
- “Installing a cooling unit into a Multiservice Switch 7480” (page 260)
- “Installing a power supply into a Multiservice Switch 7480” (page 301)
- “Installing a Multiservice Switch 7480” (page 286)
- “Installing a control processor” (page 254)
- “Installing a shelf interconnect cable” (page 307)
- “Installing an ac power cable” (page 311)
- “Installing dc power cables onto a Multiservice Switch 7480” (page 343)
- “Installing ferrite beads onto dc power cables” (page 346)
- “Installing FP cables” (page 349)
- “Powering up a Multiservice Switch 7480” (page 399)
- “Unpacking a Multiservice Switch 7480” (page 536)

Multiservice Switch 7480 installation supporting information

Site preparation

Site preparation means planning ahead for the location of equipment, and preparing the site for anchoring a cabinet or rack. See the appropriate sections for more information.

- "Site preparations for all installations" (page 77)
- "Site preparation for a Multiservice Switch cabinet" (page 78)
- "Site preparation for a seismic cabinet" (page 80)
- "Site preparation for a 19-inch rack" (page 78)

Site preparations for all installations

As part of site preparation for installing a Nortel Networks Multiservice Switch 7480, consider the following:

- Space and environmental requirements as outlined in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. Ensure that there is sufficient clearance around all equipment for ventilation and physical access. External cooling units may be required in rooms that contain a large number of network equipment. The floor plan must also allow sufficient room for other necessary equipment, (for example, a local operator terminal, modem, or test equipment.
- Check your local building regulations and the technical specifications for the device, termination panels, cabinets, grounding, and so on, in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- Where there is a risk of tampering, ensure that you can lock the room.
- To satisfy safety requirements, you must connect ac grounds from all equipment (including cabinets, termination panel cabinets, and local operator terminal), and external dc grounds to a single distribution panel ground point. For Multiservice Switch ac powered devices, the ac power supply requires its own individually-fused electrical outlet. The power supply for each device must also be within 3 m (10 ft) of the electrical outlet. Do not use extension cords.

- The maximum cable distance from a function processor to your equipment varies for each line type. For more information, see cable assembly information in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- If cable routing is overhead, install termination panels in the top portion of the rack; if cable routing is from the floor or a wall outlet, install termination panels in the bottom portion of the rack.
- Sharp edges can damage cables. Therefore, smooth any rough edges around cutouts.

Site preparation for a 19-inch rack

You can install all Nortel Networks Multiservice Switch equipment in a standard 19-inch rack.

Plan to run the cables to the nearest opening in a raised floor. A 20.32 cm^2 (8 sq. in.) opening can accommodate the cables for a Multiservice Switch 7420 or Multiservice Switch 7440. A cutout 6.4 cm (2.5 in.) by 42 cm (16.6 in.) can accommodate all cables from a rack that contains two fully configured Multiservice Switch 7480s. If the rack is already in place, you can run the cables through the same cutout you use for other equipment in the rack.

For detailed information about installing a 19-inch rack, see the information provided by the supplier of the rack.

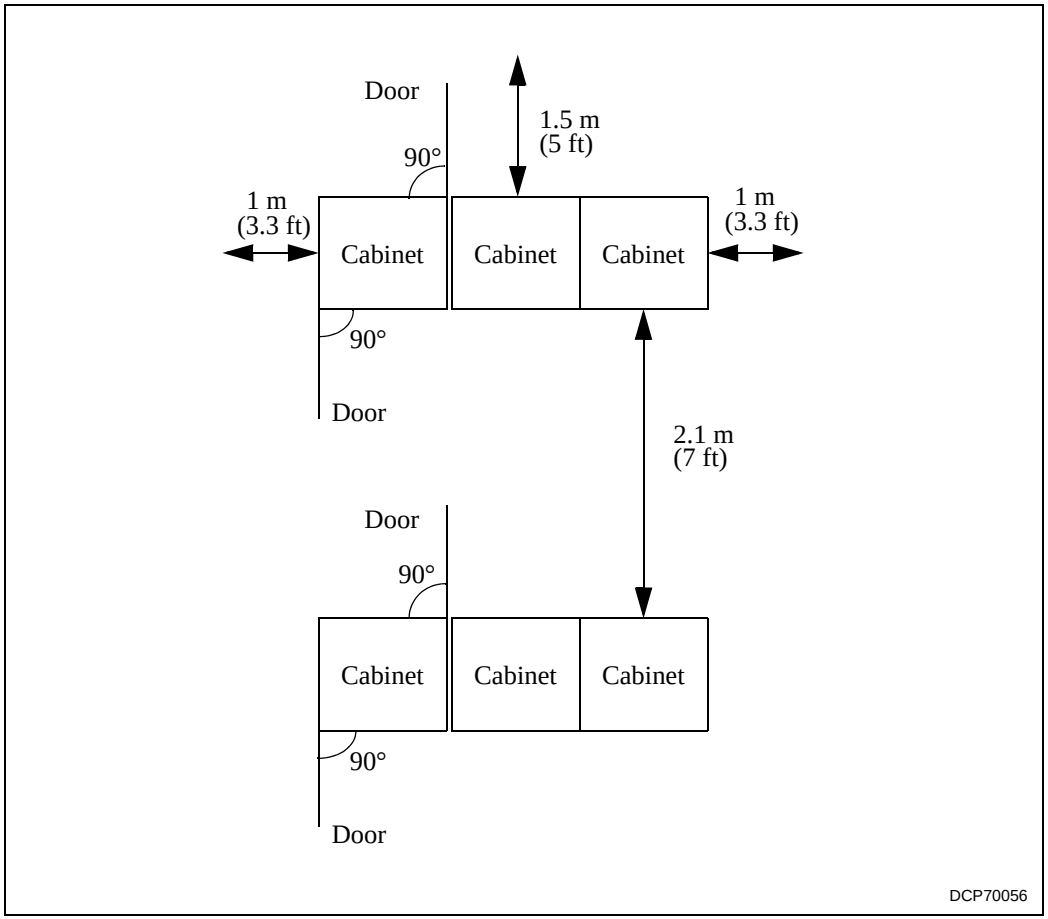
Site preparation for a Multiservice Switch cabinet

Your floor plan must conform to the required spacing shown in the figure "Floor space requirements for Multiservice Switch cabinets" (page 79). This figure also shows placement details for when termination panels are housed in a separate cabinet.

Plan to run cables from the device to the nearest floor opening in a raised floor. You can cut an opening into the floor for cables at any point near the device. Do not cut under the footprint of the unit. A 20.32 cm^2 (8 sq. in.) opening can accommodate the cables for a Nortel Networks Multiservice Switch 7420 or Multiservice Switch 7440, even if you plan to mount termination panels in a separate rack.

Ensure that you plan conforms to the cable specifications for the function processors in your device. For more information, see the cable assembly information in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Figure 18
Floor space requirements for Multiservice Switch cabinets



Site preparation for a seismic cabinet

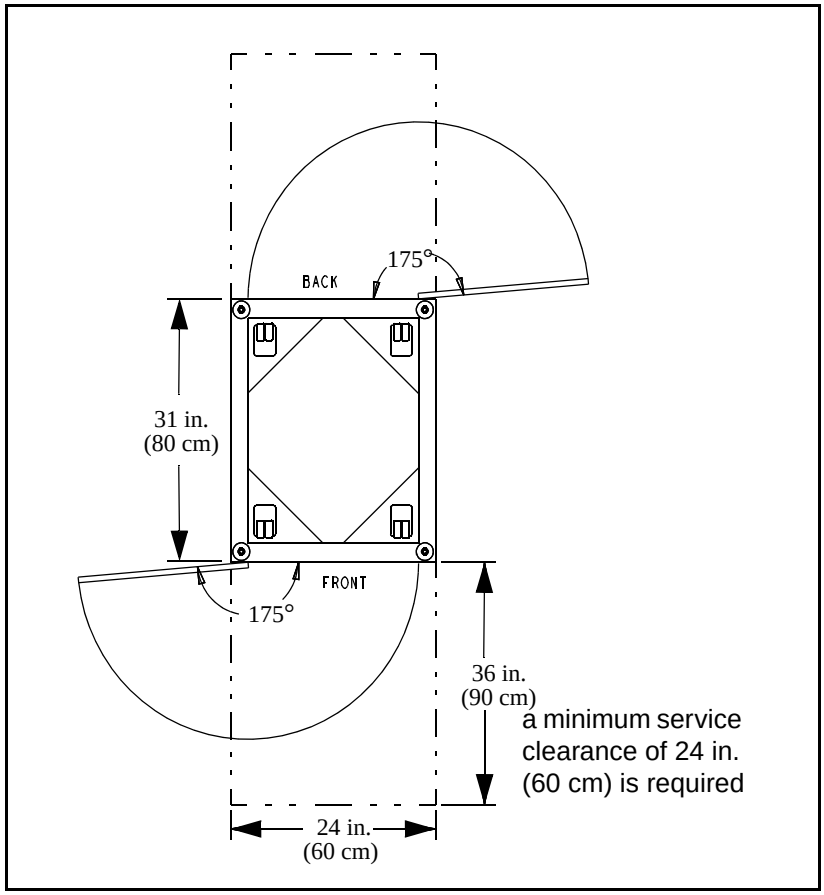
Your floor plan must conform to the required spacing shown in “Floor space requirements for a seismic cabinet” (page 81). You can install termination panels in the same cabinet as the chassis. Or, you can install termination panels in a separate cabinet or rack.

Position each cabinet to allow you to open both the front and rear doors 90° (20 in. extension). The front and rear doors have a gate swing of 175°.

Cabinets that contain a single device mounted in the top half must be anchored to the floor. To meet NEBS Zone 4 seismic requirements, you must anchor the cabinet to the floor using the equipment in one of the seismic anchoring kits. You cannot anchor a seismic cabinet for seismic protection on a raised floor.

For ac installations, the power cord attachment to each device must be within 1.5 m (5 ft) of the electrical outlet. Do not use extension cords. For dc installations, the distance from the power cord attachment to each device must be correct for its wire gauge and voltage drop. See dc power input and wiring regulations in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Figure 19
Floor space requirements for a seismic cabinet



Seismic protection

Seismic protection features described in this section meet the Zone 4 seismic requirements of Telcordia NEBS GR-63-CORE.

To provide seismic protection for your device, you must anchor the cabinet to the floor using either an outside-mount anchoring kit or an inside-mount anchoring kit. You must also install seismic hardware inside the cabinet.

The inside-mount seismic anchoring kit requires you to attach two L-shaped brackets to the inside of the cabinet. You must then anchor the brackets to a concrete floor. The inside-mount anchoring kit fully isolates the seismic brackets from the ground. The outside-mount anchoring kit does not.

The outside-mount seismic anchoring kit requires you to attach two L-shaped brackets to the outside of the cabinet. You must then anchor the brackets to a concrete floor.

You cannot provide seismic protection for a cabinet on a raised floor.

Chapter 8
Multiservice Switch 7480 replacement

Replace a Nortel Networks Multiservice Switch 7480 to remove and install a new shelf chassis when a non-replaceable component fails, such as bent pins on the backplane.

Prerequisites to replacing a Multiservice Switch 7480

CAUTION
Service loss due to an outage
Replacing a shelf removes it from service for the duration of the replacement. Minimize the impact of the outage by rerouting traffic to other nodes in the network before powering down the device.

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

- Before you can replace a shelf, you must assemble enough anti-static packaging for the processor cards, and clear an area large enough to temporarily store all them. You also need to have appropriate packaging materials so that you can store or ship the removed shelf. See “Unpacking a processor card” (page 539) for FP and CP handling instructions.
- Some of the procedures in this task are located in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*, so ensure that you have a copy of this document available.
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

Multiservice Switch 7480 replacement task flow

This task flow shows you the sequence of procedures you do to replace a Nortel Networks Multiservice Switch 7480. To link to any procedure, go to “Task flow navigation” on page 87.

Figure 20
Multiservice Switch 7480 replacement taskflow: part 1

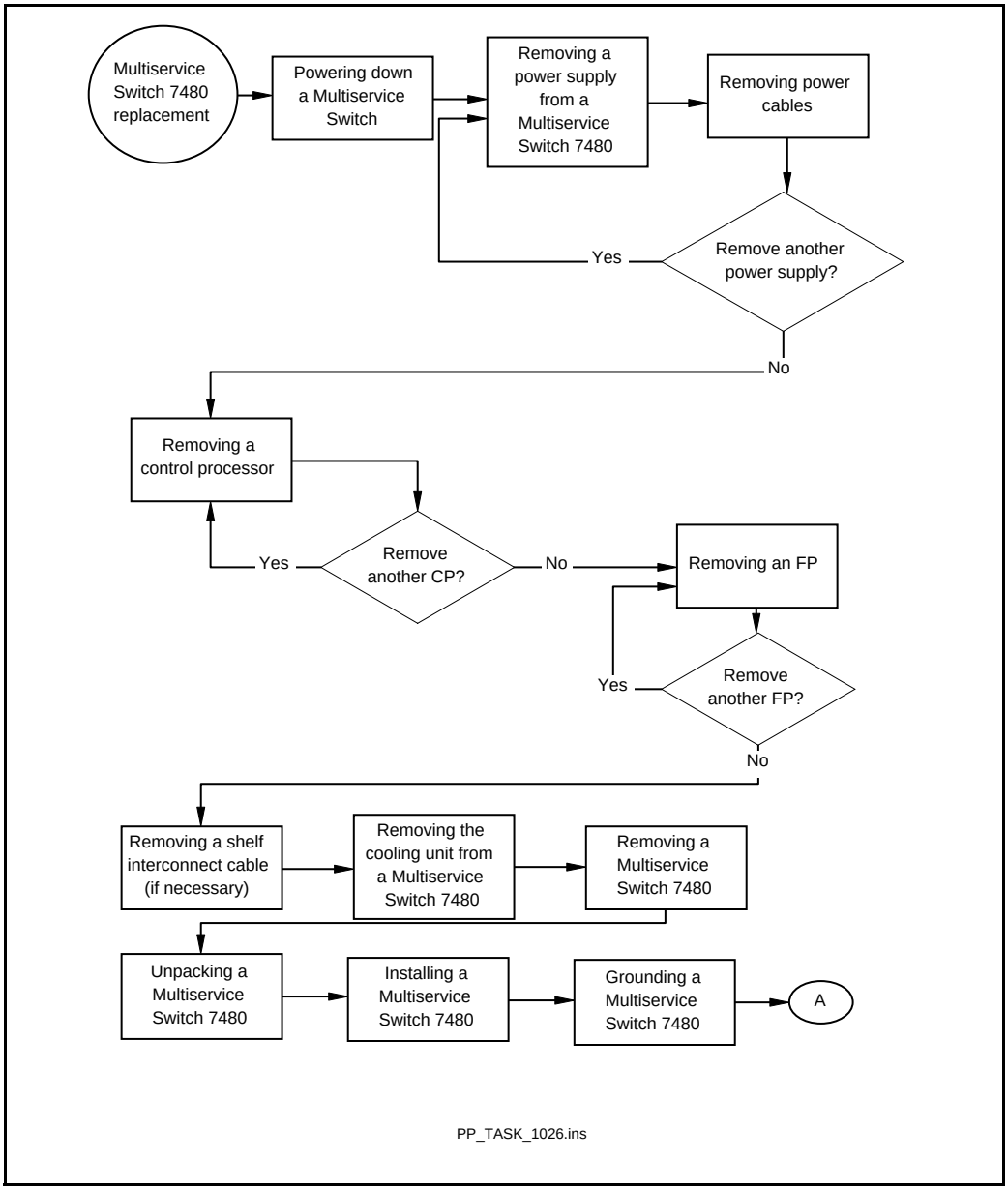
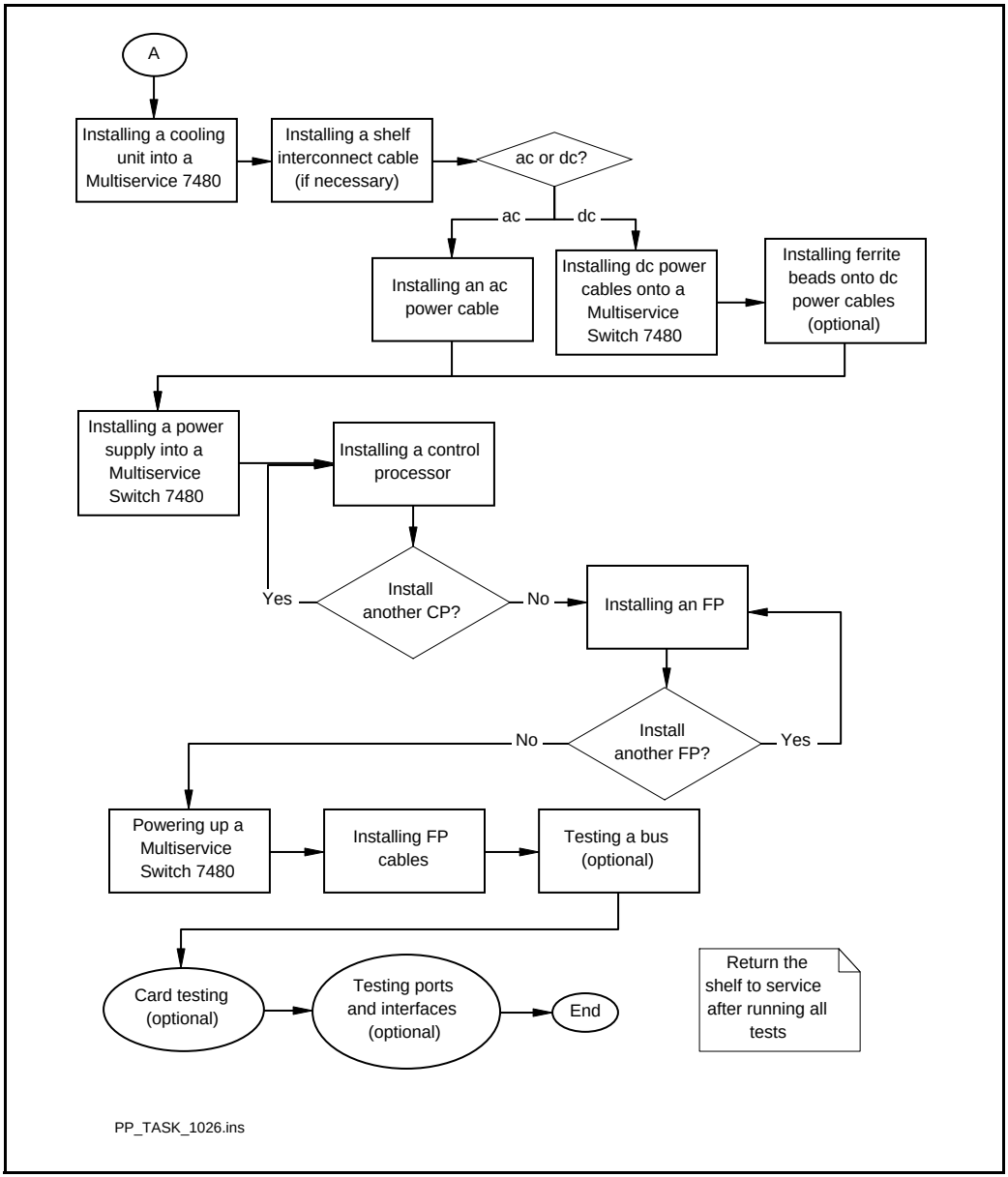


Figure 21
Multiservice Switch 7480 replacement taskflow: part 2



Task flow navigation

The following references are listed alphabetically:

- "Card testing". See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- "Grounding a Multiservice Switch 7480" (page 231)
- "Installing a Multiservice Switch 7480" (page 286)
- "Installing a cooling unit into a Multiservice Switch 7480" (page 260)
- "Installing a power supply into a Multiservice Switch 7480" (page 301)
- "Installing a control processor" (page 254)
- "Installing an FP" (page 321)
- "Installing a shelf interconnect cable" (page 307)
- "Installing an ac power cable" (page 311)
- "Installing dc power cables onto a Multiservice Switch 7480" (page 343)
- "Installing ferrite beads onto dc power cables" (page 346)
- "Installing FP cables" (page 349)
- "Powering down a Multiservice Switch" (page 391)
- "Powering up a Multiservice Switch 7480" (page 399)
- "Removing the cooling unit from a Multiservice Switch 7480" (page 461)
- "Removing the power supply from a Multiservice Switch 7480" (page 474)
- "Removing a Multiservice Switch 7480" (page 430)
- "Removing a control processor" (page 416)
- "Removing an FP" (page 441)
- "Removing a shelf interconnect cable" (page 439)
- "Removing power cables" (page 447)

- “Testing a bus”. See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- “Testing ports and interfaces”. See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- “Unpacking a Multiservice Switch 7480” (page 536)

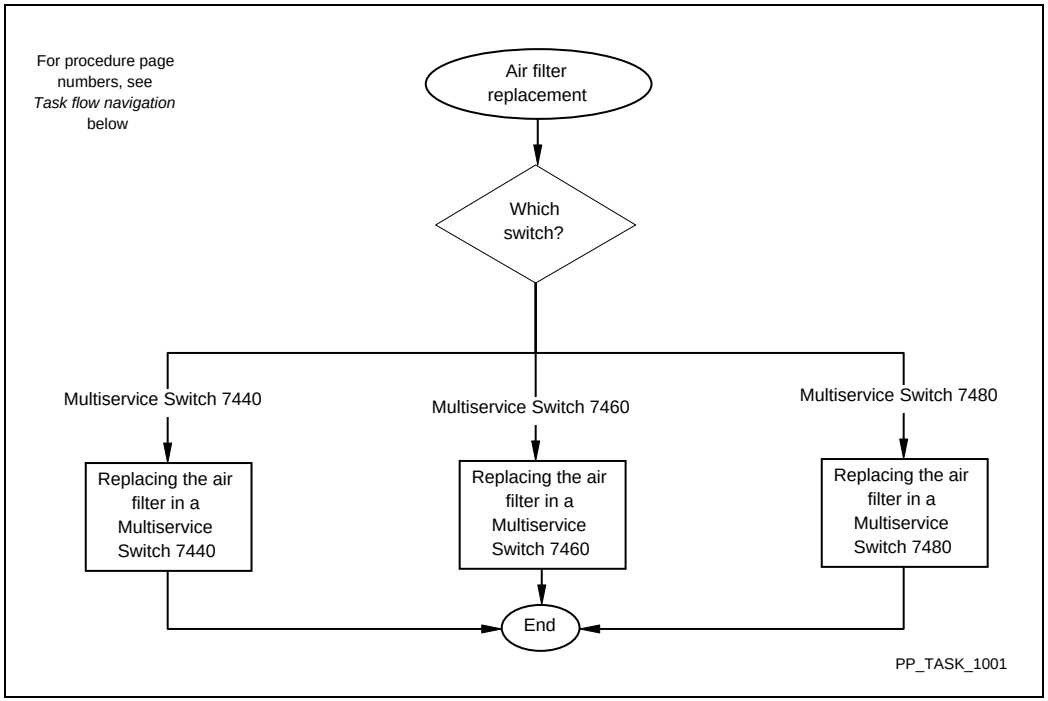
Chapter 9
Air filter replacement

Replace the air filter in Nortel Networks Multiservice Switch equipment every three months as part of regular maintenance.

Air filter replacement task flow

This task flow shows you the sequence of procedures you do to replace an air filter. To link to any procedure, go to “Task flow navigation” (page 90).

Figure 22
Air filter replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Replacing the air filter in a Multiservice Switch 7440” (page 484)
- “Replacing the air filter in a Multiservice Switch 7460” (page 489)
- “Replacing the air filter in a Multiservice Switch 7480” (page 493)

Chapter 10
Alarm hardware installation

Install alarm hardware on Nortel Networks Multiservice Switch equipment to monitor hardware-related alarms raised by the device, or by an external alarm.

- "Prerequisites to alarm hardware installation" (page 91)
- "Alarm hardware installation task flow" (page 91)

Prerequisites to alarm hardware installation

CAUTION

Risk of disabling alarm system

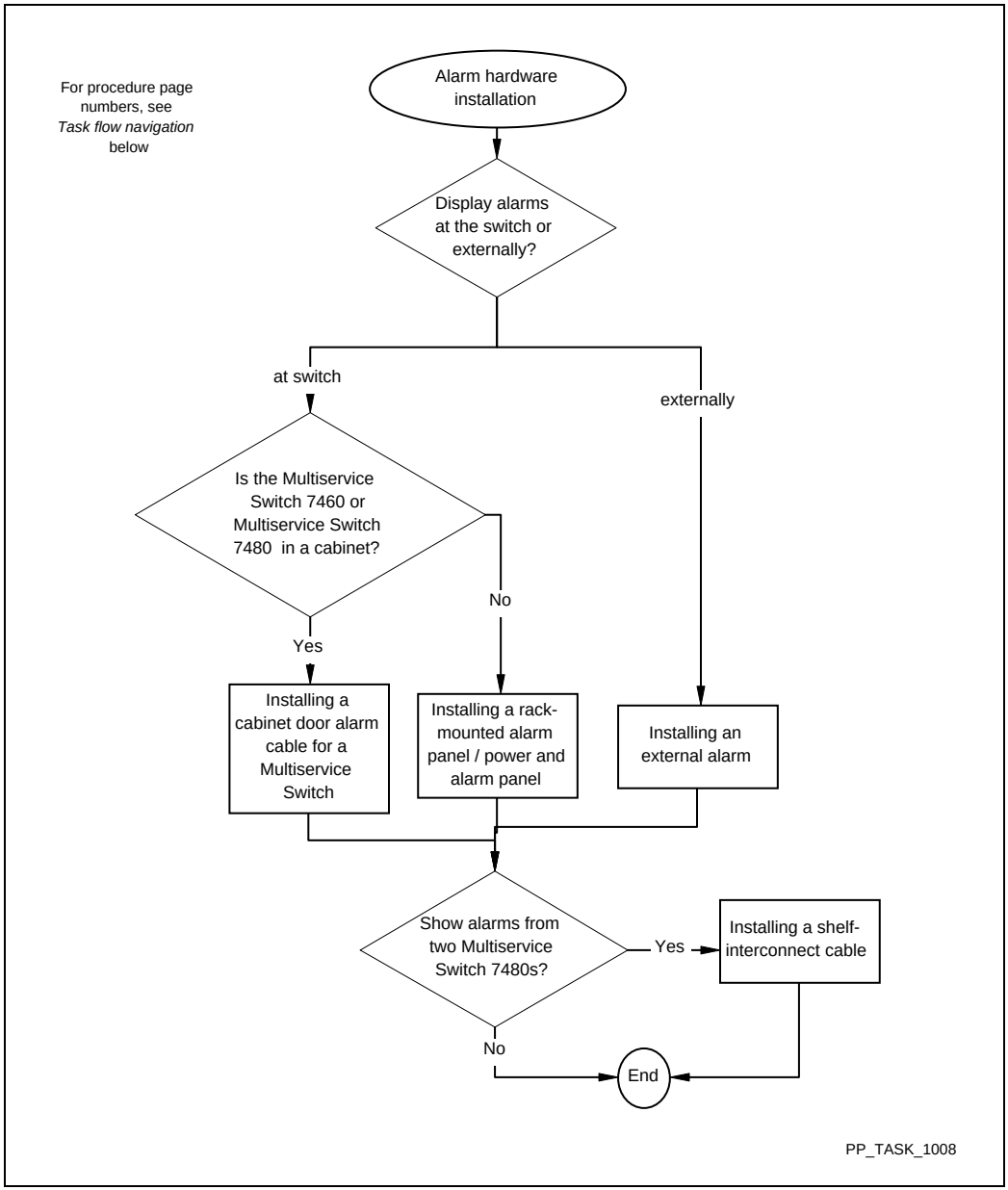
If you have inserted a switch between the alarm cable and your alarm system to isolate your alarm system from the Multiservice Switch alarm connector during repairs, set the alarm switch to ON when repairs are complete.

- Multiservice Switch 7460 shelves must not be daisy-chained for the external alarm connection that is labeled Alarm 1.

Alarm hardware installation task flow

This task flow shows you the sequence of procedures you do to install alarm hardware. To link to any procedure, go to "Task flow navigation" (page 93).

Figure 23
Alarm hardware installation task flow



Task flow navigation

The following references are listed alphabetically:

- “Installing a cabinet door alarm cable for a Multiservice Switch” (page 245)
- “Installing a rack-mounted alarm panel / power and alarm panel” (page 304)
- “Installing a shelf interconnect cable” (page 307)
- “Installing an external alarm cable” (page 317)

Chapter 11
Alarm hardware replacement

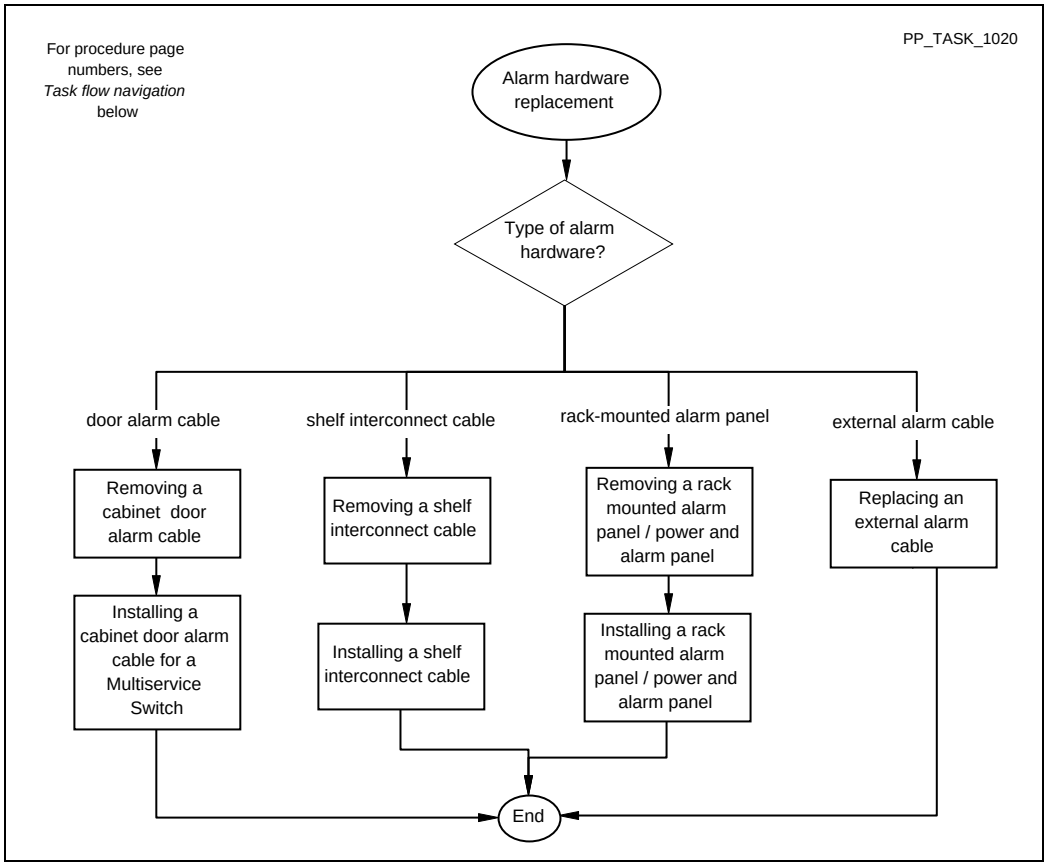
Replace failed alarm hardware to restore service to your door alarm, rack-mounted alarm panel, or external alarm.

- “Alarm hardware replacement task flow” (page 95)

Alarm hardware replacement task flow

This task flow shows you the sequence of procedures you do to replace alarm hardware. To link to any procedure, go to “Task flow navigation” (page 96).

Figure 24
Alarm hardware replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Installing a cabinet door alarm cable for a Multiservice Switch” (page 245)
- “Installing a rack-mounted alarm panel / power and alarm panel” (page 304)
- “Installing a shelf interconnect cable” (page 307)
- “Removing a cabinet door alarm cable” (page 413)

- “Removing a rack-mounted alarm panel / power and alarm panel” (page 437)
- “Removing a shelf interconnect cable” (page 439)
- “Replacing the external alarm cable” (page 502)

Chapter 12
BITS cable replacement

Replace a BITS cable on an CP if it is faulty or as part of a CP replacement procedure.

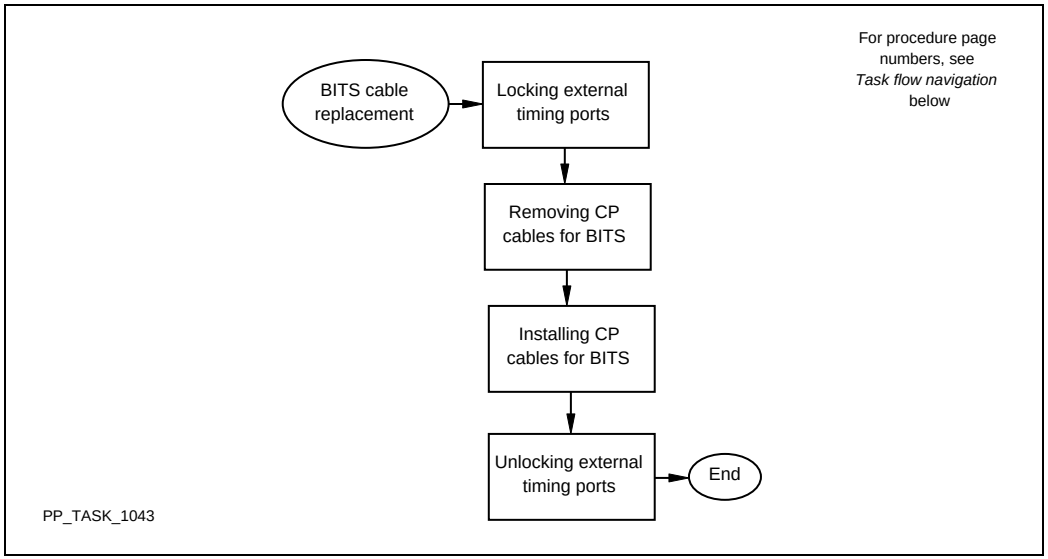
Prerequisites to BITS cable replacement

- Have an appropriate replacement cable present before beginning the procedure. For BITS cable product engineering codes (PECs) and lengths, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

BITS cable replacement task flow

This task flow shows you the sequence of procedures you do to replace a BITS cable. To link to any procedure, go to “Task flow navigation” (page 100).

Figure 25
BITS cable replacement task flow



Task flow navigation

The following references are listed alphabetically:

- "Installing CP cables for BITS" (page 329)
- "Locking external timing ports". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- "Removing CP cables for BITS" (page 444)
- "Unlocking external timing ports". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

Chapter 13
BITS termination panel replacement

Replace a BITS termination panel if it fails to maintain external timing capability.

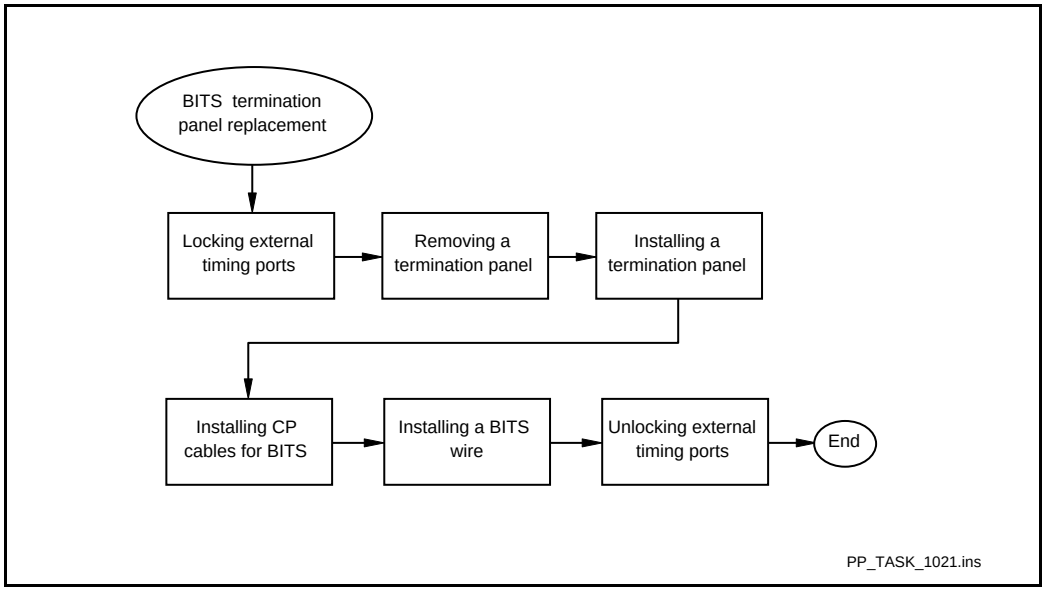
Prerequisites to BITS termination panel replacement

- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.
- A BITS termination panel is not modeled as a component and cannot be locked. To have minimal impact on the system, all external timing components must be locked before removing the BITS termination panel. This is the first procedure in the task flow.
- If the primary and secondary source are provisioned with external timing sources and the tertiary source is line-timed, the system will change to the tertiary source after the BITS termination panel is removed. If there is no tertiary source provisioned, the system will go into holdover.
- Replacement of the BITS termination panel does not require a shelf reset. Network synchronization will return to the BITS source automatically provided it is provisioned as the reference source.

BITS termination panel replacement task flow

This task flow shows you the sequence of procedures you do to replace a BITS termination panel. To link to any procedure, go to "Task flow navigation" (page 102).

Figure 26
BITS termination panel replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Installing a 13-inch termination panel on a Multiservice Switch 7420” (page 235)
- “Installing a 13-inch termination panel on a Multiservice Switch 7440” (page 238)
- “Installing a 19-inch rack-mounted termination panel” (page 240)
- “Installing a BITS wire” (page 242)
- “Installing CP cables for BITS” (page 329)
- “Locking external timing ports”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Removing a 13-inch termination panel from a Multiservice Switch 7420” (page 406)

- “Removing a 13-inch termination panel from a Multiservice Switch 7440” (page 408)
- “Removing a 19-inch rack-mounted termination panel” (page 410)
- “Unlocking external timing ports”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

Chapter 14
Cabinet installation

Install a cabinet to house one or more Nortel Networks Multiservice Switch devices, a Multiservice Switch 7460, or their associated termination panels.

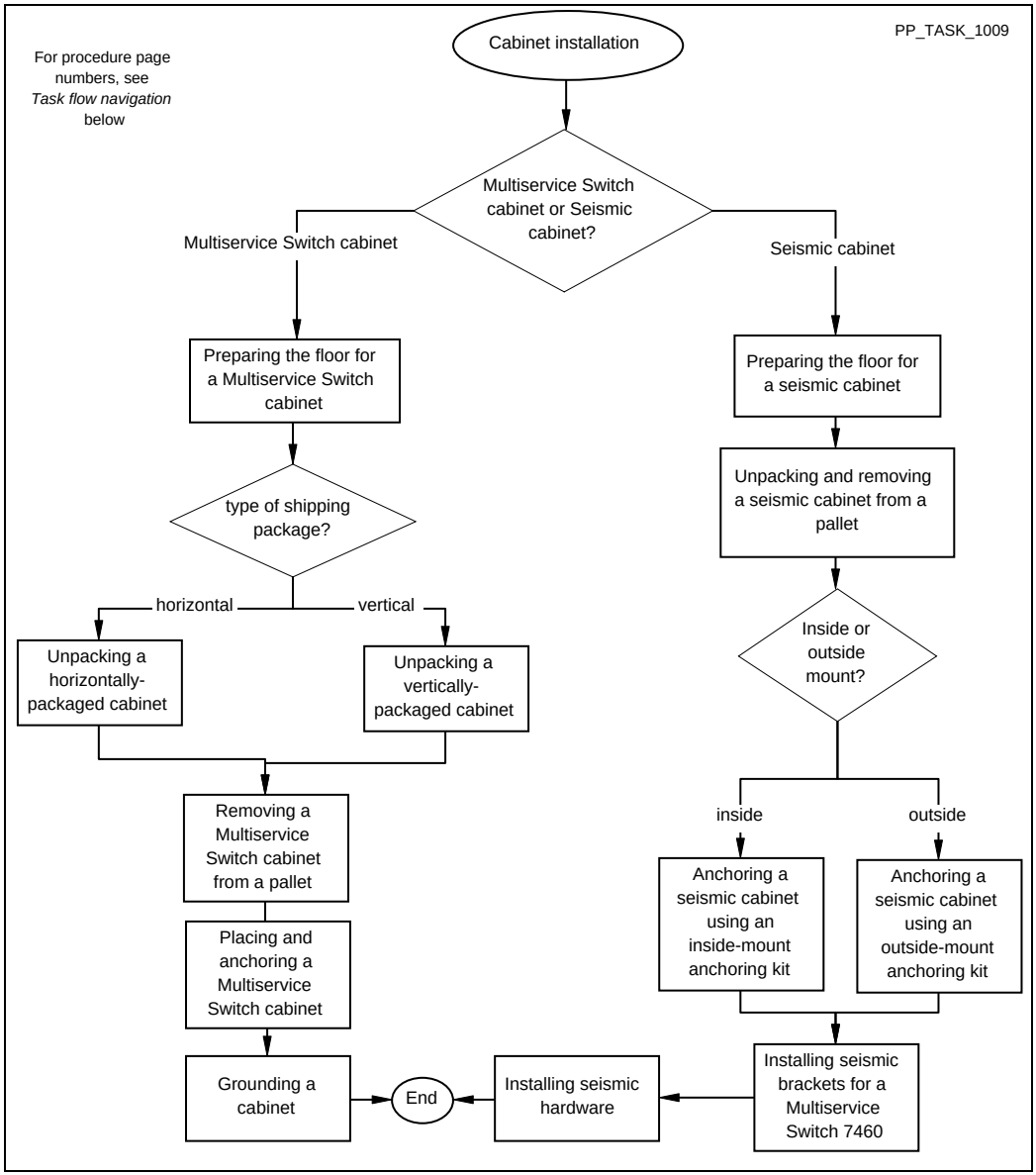
Prerequisites to cabinet installation

Complete site preparations as described in "Site preparation" (page 77).

Cabinet installation task flow

This task flow shows you the sequence of procedures you do to install a cabinet or rack. To link to any procedure, go to "Task flow navigation" (page 107).

Figure 27
Cabinet installation task flow



Task flow navigation

The following references are listed alphabetically:

- “Anchoring a seismic cabinet using an inside-mount anchoring kit” (page 203)
- “Anchoring a seismic cabinet using an outside-mount anchoring kit” (page 206)
- “Grounding a Multiservice Switch cabinet” (page 233)
- Installing seismic brackets for a Multiservice Switch 7460
- “Installing seismic hardware” (page 370)
- “Placing and anchoring a Multiservice Switch cabinet” (page 388)
- “Preparing the floor for a Multiservice Switch cabinet” (page 401)
- “Preparing the floor for a seismic cabinet” (page 404)
- “Removing a Multiservice Switch cabinet from a pallet” (page 432)
- “Unpacking a horizontally-packaged cabinet” (page 524)
- “Unpacking a vertically-packaged cabinet” (page 541)
- “Unpacking and removing a seismic cabinet from a pallet” (page 545)

Chapter 15
Cable replacement

Replace a faulty cable or upgrade a cable in order to restore service.

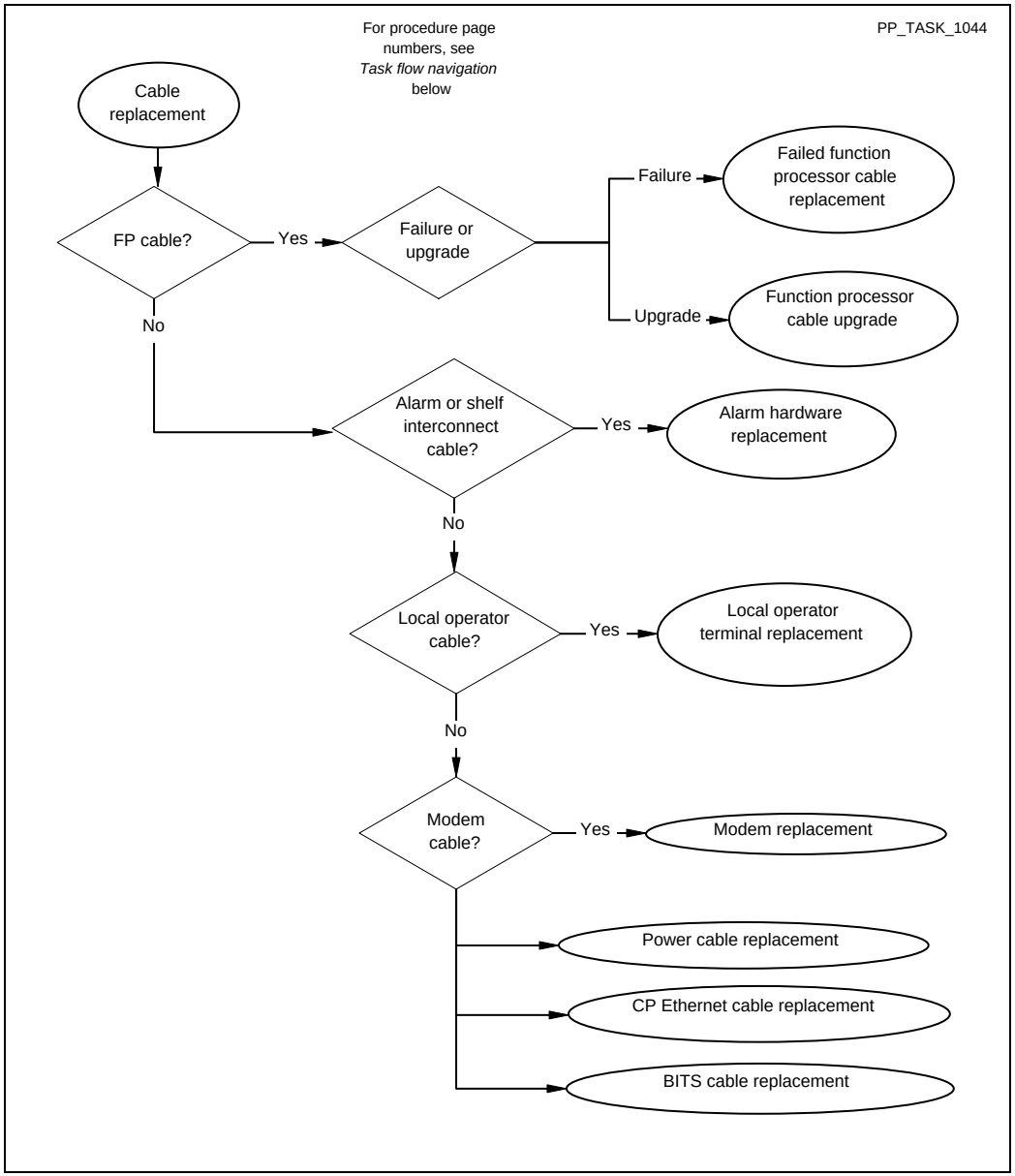
Prerequisites to cable replacement

- Ensure that replacement cables do not exceed maximum lengths as specified in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- Before removing a cable, route and label the replacement cable. For more information, see "Card cable routing and labeling" (page 113).

Cable replacement task flow

This task flow shows you the tasks that you must use to replace different types of cables. To link to any task flow, go to "Task flow navigation" (page 111).

Figure 28
Cable replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Alarm hardware replacement” (page 95)
- “BITS cable replacement” (page 99)
- “CP Ethernet cable replacement” (page 127)
- “Failed FP cable replacement” (page 135)
- “FP cable upgrade” (page 139)
- “Local operator terminal replacement” (page 171)
- “Modem replacement” (page 177)
- “Power cable replacement” (page 183)

Chapter 16
Card cable routing and labeling

Route and label cables prior to connecting the cables to the processor cards, termination panels, sparing panels, and far-end equipment to simplify your installation and replacement tasks.

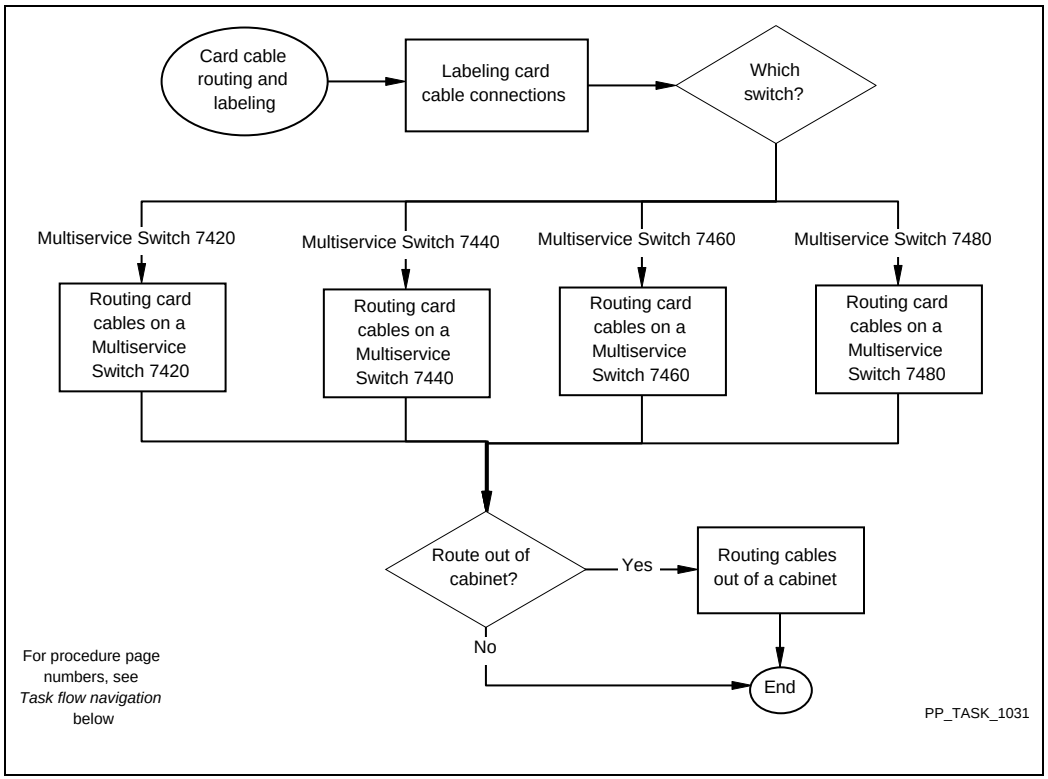
Prerequisites to card cable routing and labeling

- Ensure that all cables comply with the appropriate cable specifications. For more information about cable requirements, including pinouts, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- Before routing any processor card cables, measure the exact distance that the cables will follow and ensure that all cables are long enough, with minimal slack management. Also ensure that cables are routed away from anything that can damage the cable or affect its signals.
- An FP cable assembly with D-sub connectors at its ends typically has a series of multiple user ports going through it. The series is different when more than one cable is connected to the same FP. For example, each NTPS3x fanout cable for the 32-port DS1 or E1 MSA 1-slot FPs has a SACS connector at one end and is split into two D-subs at the other end, and the FP uses the same cable assembly twice for different sets of ports. Whenever you label a cable with D-sub connectors, ensure that you identify the appropriate series of ports that it handles at the FP, each cable junction, and the far end (for example, a termination or sparing panel).

Card cable routing and labeling task flow

This task flow shows you the sequence of procedures you do to route and label processor card cables. To link to any procedure, go to “Task flow navigation” (page 114).

Figure 29
Card cable routing and labeling task flow



Task flow navigation

The following references are listed alphabetically:

- “Labeling a card cable connection” (page 372)
- “Routing cables out of a cabinet” (page 508)
- “Routing card cables on a Multiservice Switch 7420” (page 510)

Chapter 17
Control processor addition

Add a control processor (CP) to a single-CP Nortel Networks Multiservice Switch device to provide redundancy.

- "Prerequisites to control processor addition" (page 117)
- "Control processor addition task flow" (page 117)

Prerequisites to control processor addition

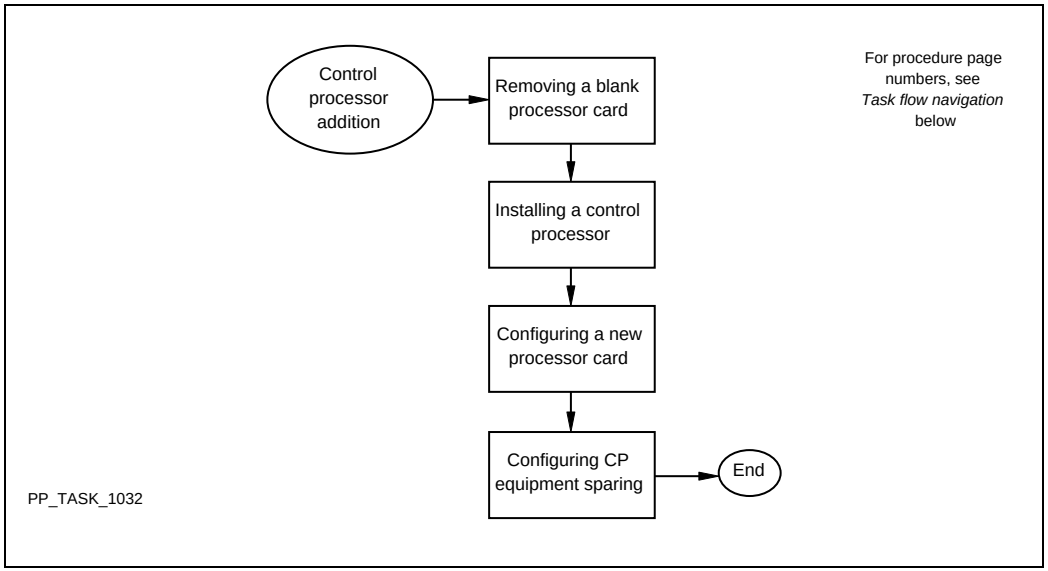
CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

- See "Unpacking a processor card" (page 539) for FP and CP handling instructions.
- Control processors must have matching product engineering codes (PECs) in order to act as spares for one another.
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

Control processor addition task flow

The following task flows show you the sequence of procedures you do to add a CP to a device. To link to any procedure, go to "Task flow navigation" (page 118).

Figure 30
Control processor addition task flow



Task flow navigation

The following references are listed alphabetically:

- "Configuring a new processor card". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- "Configuring CP equipment sparing". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- "Installing a control processor" (page 254)
- "Removing a blank processor card" (page 411)

Chapter 18
Control processor upgrade

Upgrade a control processor (CP) by replacing an existing CP with a different version, or upgrade a pair of matched CPs with a later version than the existing CPs.

Prerequisites to control processor upgrade

CAUTION
Traffic loss due to an outage
Upgrading a CP in a device that does not have redundant CPs results in traffic loss. The device will be out of service for the time it takes to perform the upgrade.

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

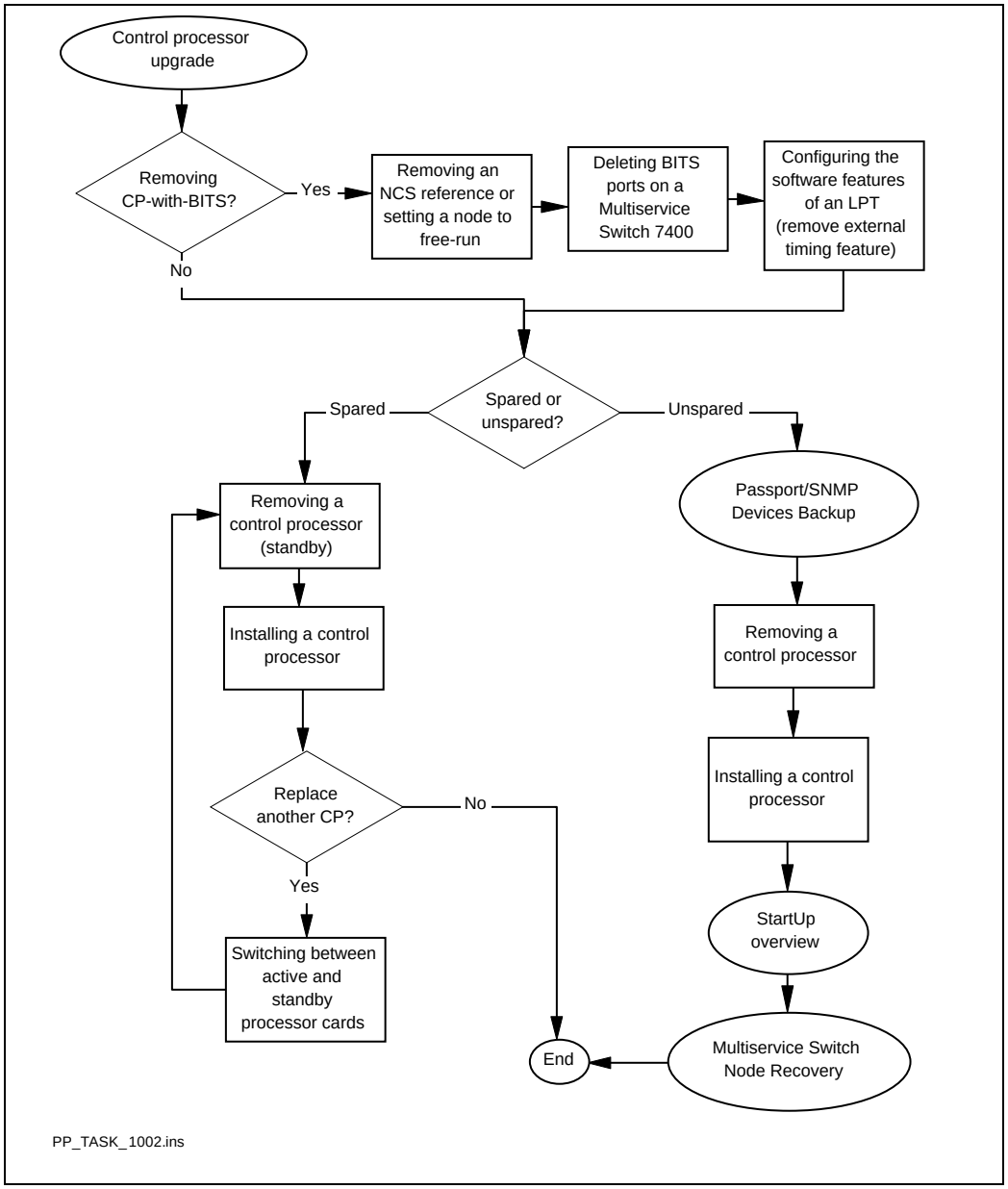
- See "Unpacking a processor card" (page 539) for FP and CP handling instructions.
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

- Ensure that the appropriate level of software is installed on the device for the CP features you require. For example, if you are installing a CP-with-BITS, you will require a minimum software release of PCR4.2; if you will use the external timing functionality (BITS) you will require a minimum software release of PCR5.1.
- If the replacement CP requires different cables, route, and label cables in advance.
- If you are removing a CP-with-BITS (NTNQ03) and replacing it with a regular CP (NTNQ01), you must remove the external timing feature, and BITS ports. If you do not, the system raises an alarm indicating the card does not support external timing and the BITS ports are disabled.
- If you are replacing a CP with one of the same version because of failure, see “Failed control processor replacement” (page 143).

Control processor upgrade task flow

The following task flows show you the sequence of procedures you do to upgrade a CP. To link to any procedure, go to “Task flow navigation” (page 122).

Figure 31
Control processor upgrade task flow



Task flow navigation

The following references are listed alphabetically:

- “Deleting BITS ports on a Multiservice Switch 7400”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures.*
- “Installing a control processor” (page 254)
- “Multiservice Switch Node Recovery”. See 241-6001-807 *Nortel Networks Multiservice Data Manager Network Backup and Restore*.
- “Passport/SNMP Devices Backup”. See 241-6001-807 *Nortel Networks Multiservice Data Manager Network Backup and Restore*.
- Remove the external timing feature. See “Configuring the software features of an LPT”.NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Removing a control processor” (page 416)
- “Removing an NCS reference or setting a node to free-run”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures.*
- “StartUp overview”. See NN10600-271 *Nortel Networks Multiservice Switch 7400/15000/20000 Network Management Connectivity*.
- “Switching between active and standby processor cards”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures.*

Chapter 19
Cooling unit replacement

Replace a cooling unit in a Nortel Networks Multiservice Switch device if the cooling unit or one of its fans fails.

- "Cooling unit replacement prerequisites" (page 123)
- "Cooling unit replacement task flow" (page 123)

Cooling unit replacement prerequisites

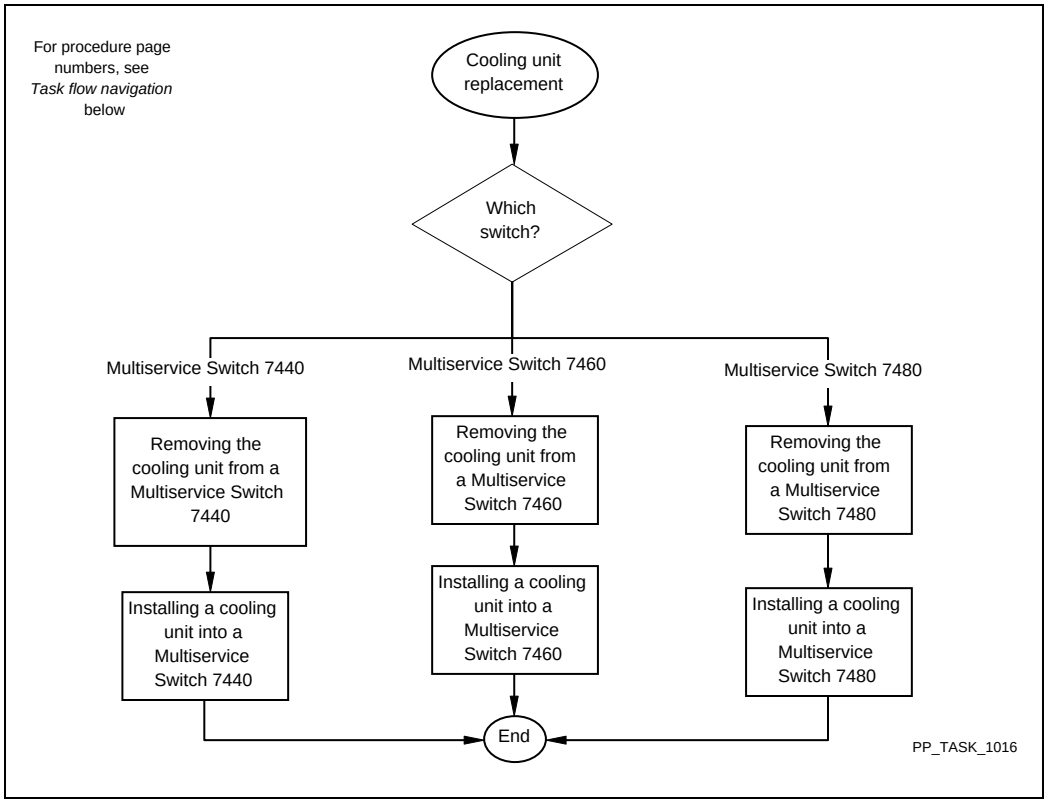
CAUTION
Risk of equipment damage
Remove and install cooling units in under 10 minutes. You can damage CPs and FPs and they can fail if the fans are off longer than 10 minutes.

- A fully provisioned Nortel Networks Multiservice Switch 7460 can operate with 4 of the 5 fans operational. The fifth fan is a redundant backup. To replace a failed fan means you must replace the entire cooing unit.

Cooling unit replacement task flow

This task flow show you the sequence of procedures you do to replace a cooling unit in a Nortel Networks Multiservice Switch 7480, Multiservice Switch 7440, or Multiservice Switch 7460. To link to any procedure, go to "Task flow navigation" (page 124).

Figure 32
Cooling unit replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Installing a cooling unit into a Multiservice Switch 7440” (page 256)
- “Installing a cooling unit into a Multiservice Switch 7460” (page 257)
- “Installing a cooling unit into a Multiservice Switch 7480” (page 260)
- “Removing the cooling unit from a Multiservice Switch 7440” (page 455)
- “Removing the cooling unit from a Multiservice Switch 7480” (page 461)

- “Removing the cooling unit from a Multiservice Switch 7460” (page 458)

Chapter 20
CP Ethernet cable replacement

Replace an ethernet cable on a CP if it is faulty or as part of a CP replacement procedure.

Prerequisites to CP Ethernet cable replacement

- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.
- Have an appropriate replacement cable present before beginning the procedure. For Ethernet cable product codes and lengths see the Appendix of NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. If you are making your own cable, match quality, ratings, length, and the connectors at both ends.

CAUTION
Risk of shelf reset by disconnecting an active cable
If the Ethernet cable is disconnected from the active CP, the shelf undergoes a reset or transfers activity to the spare CP provided the spare is in-service.

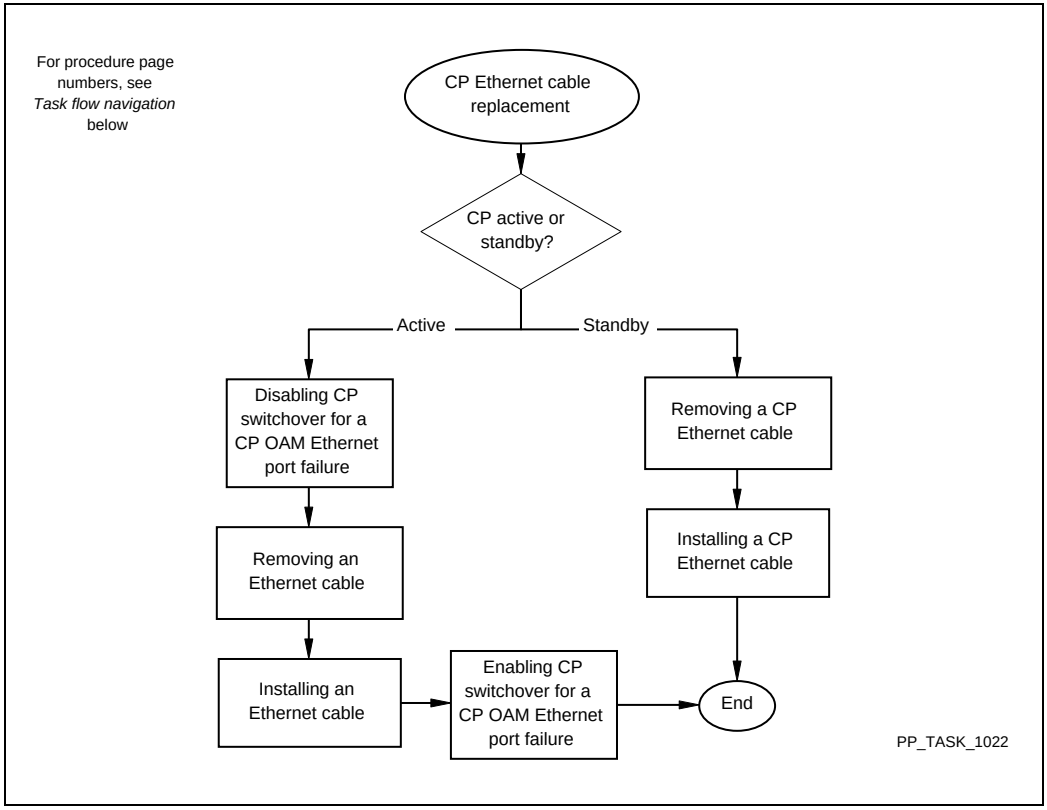
- Complete the cable replacement during a period of lowest traffic volumes and/or with minimum delays.
- If the cable is being used to connect to a Nortel Networks Multiservice Data Manager workstation, removing the cable drops communication unless both the active and standby CP Ethernet ports are connected to a

hub or IP router. See OAM Ethernet port sparing in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

CP Ethernet cable replacement task flow

This task flow shows you the sequence of procedures you do to replace a CP Ethernet cable. To link to any procedure, go to “Task flow navigation” (page 129).

Figure 33
Ethernet cable replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Disabling CP switchover for a CP OAM Ethernet port failure”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures.*
- “Enabling CP switchover for a CP OAM Ethernet port failure”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures.*
- “Installing a CP Ethernet cable” (page 262)
- “Removing a CP Ethernet cable” (page 420)

Chapter 21
External timing addition

Add external timing to improve the reliability and availability of timing distribution.

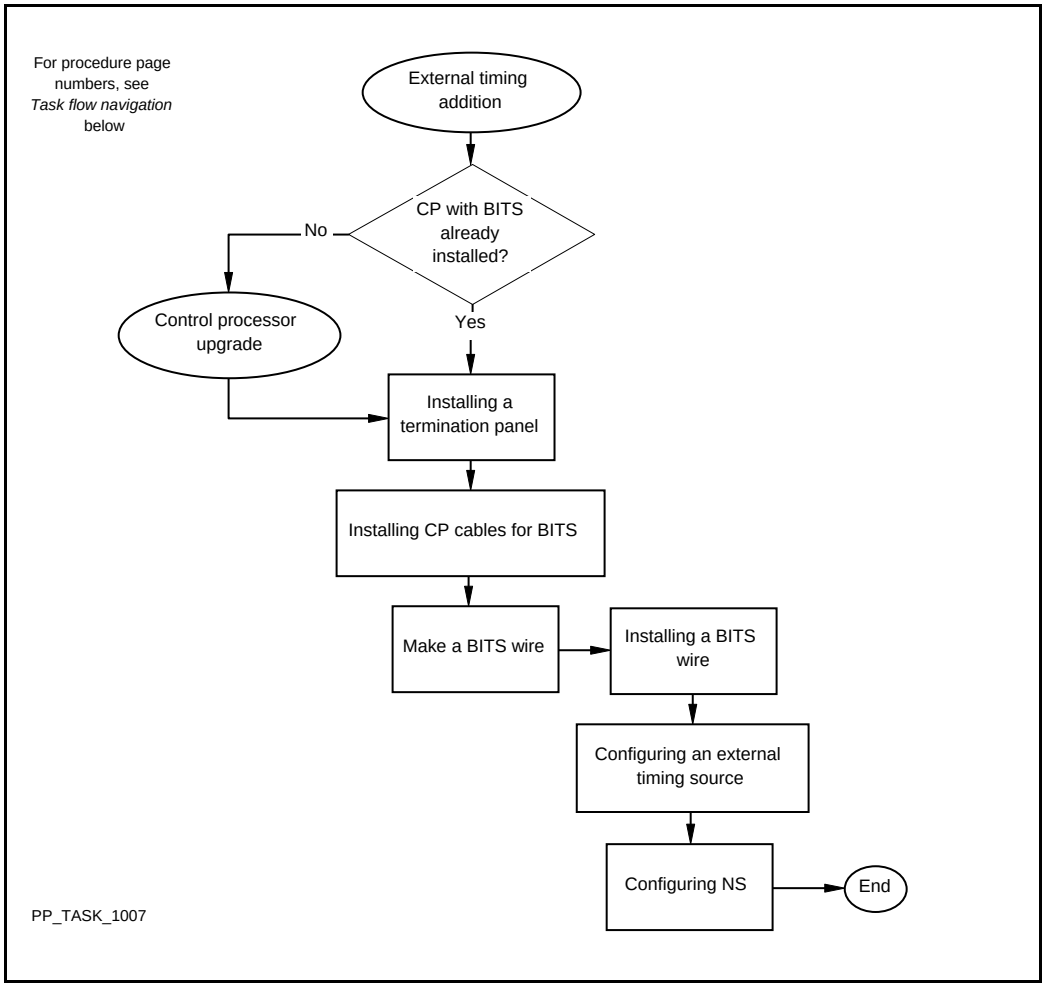
Prerequisites to external timing addition

- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.
- To add external timing functionality, you require one or two CP-with-BITS (NTNQ03), a BITS termination panel (NTPS13) and one or two BITS cables (NTPS18).
- Sparing is not supported between a CP and a CP-with-BITS when external timing is provisioned. Both CPs must be of the type, CP-with-BITS for sparing to be supported.
- Sparing is supported between a CP and CP-with-BITS if external timing is not provisioned.
- If you are replacing a CP with a CP-with-BITS, but will not enable the external timing functionality the replacement procedure is the same as for any CP upgrade. See "Control processor upgrade" (page 119).

External timing addition task flow

This task flow shows you the sequence of procedures you do to add external timing functionality. to link to any procedure, go to "Task flow navigation" (page 132).

Figure 34
External timing addition task flow



Task flow navigation

The following references are listed alphabetically:

- "Configuring an external timing source". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

- “Configuring NS” See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Control processor upgrade” (page 119)
- “Making a BITS wire” (page 375)
- “Installing a 13-inch termination panel on a Multiservice Switch 7420” (page 235)
- “Installing a 13-inch termination panel on a Multiservice Switch 7440” (page 238)
- “Installing a 19-inch rack-mounted termination panel” (page 240)
- “Installing a BITS wire” (page 242)
- “Installing CP cables for BITS” (page 329)

Chapter 22
Failed FP cable replacement

Replace a failed FP cable to either restore or ensure continued delivery of configured services.

Prerequisites to failed FP cable replacement

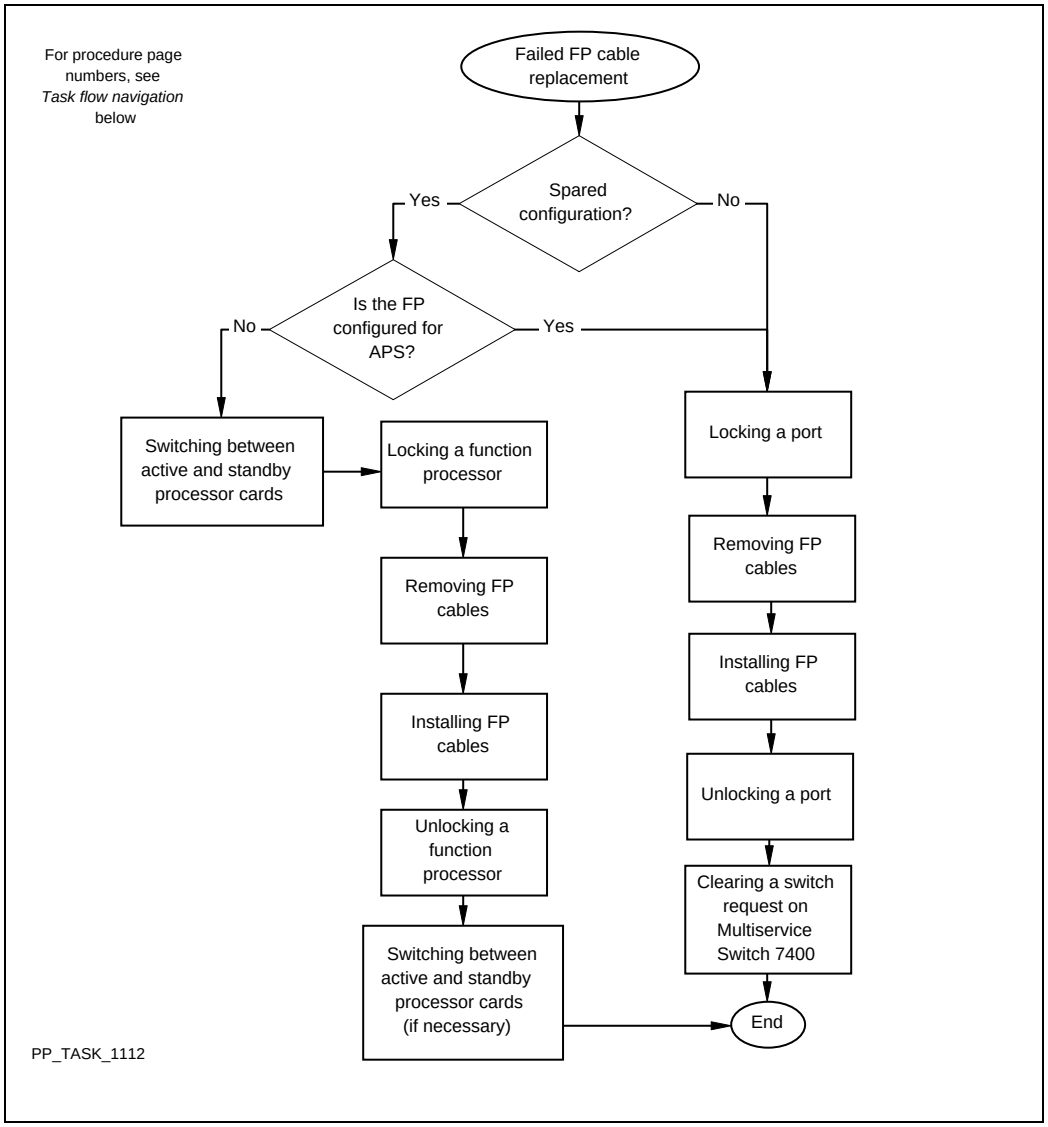
CAUTION
Risk of damage by electrostatic discharge (ESD)
When you handle processor cards, wear a grounded antistatic wrist strap or equivalent to protect electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

Failed FP cable replacement task flow

This task flow shows you the sequence of procedures you do to replace a cable connected to an FP or its related termination panel. To link to any procedure, go to "Task flow navigation" (page 137).

Figure 35
Failed FP cable replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Clearing a switch request on Multiservice Switch 7400”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures.*
- “Installing FP cables” (page 349)
- “Locking a function processor”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Locking a port”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Removing FP cables” (page 445)
- “Switching between active and standby processor cards”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures.*
- “Unlocking a function processor” See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Unlocking a port”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

Chapter 23
FP cable upgrade

Upgrade an FP cable as required, to ensure continued delivery of configured services.

Prerequisites to FP cable upgrade

CAUTION

Risk of damage by electrostatic discharge (ESD)

When you handle processor cards, wear a grounded antistatic wrist strap or equivalent to protect electronic parts. For more information, see “Avoiding damage from static electricity” (page 208).

CAUTION

Risk of service loss

Before performing an FP cable upgrade on an FP configured with intra-card APS (port-to-port sparing on the same FP), ensure that both the working and protection lines are not degraded.

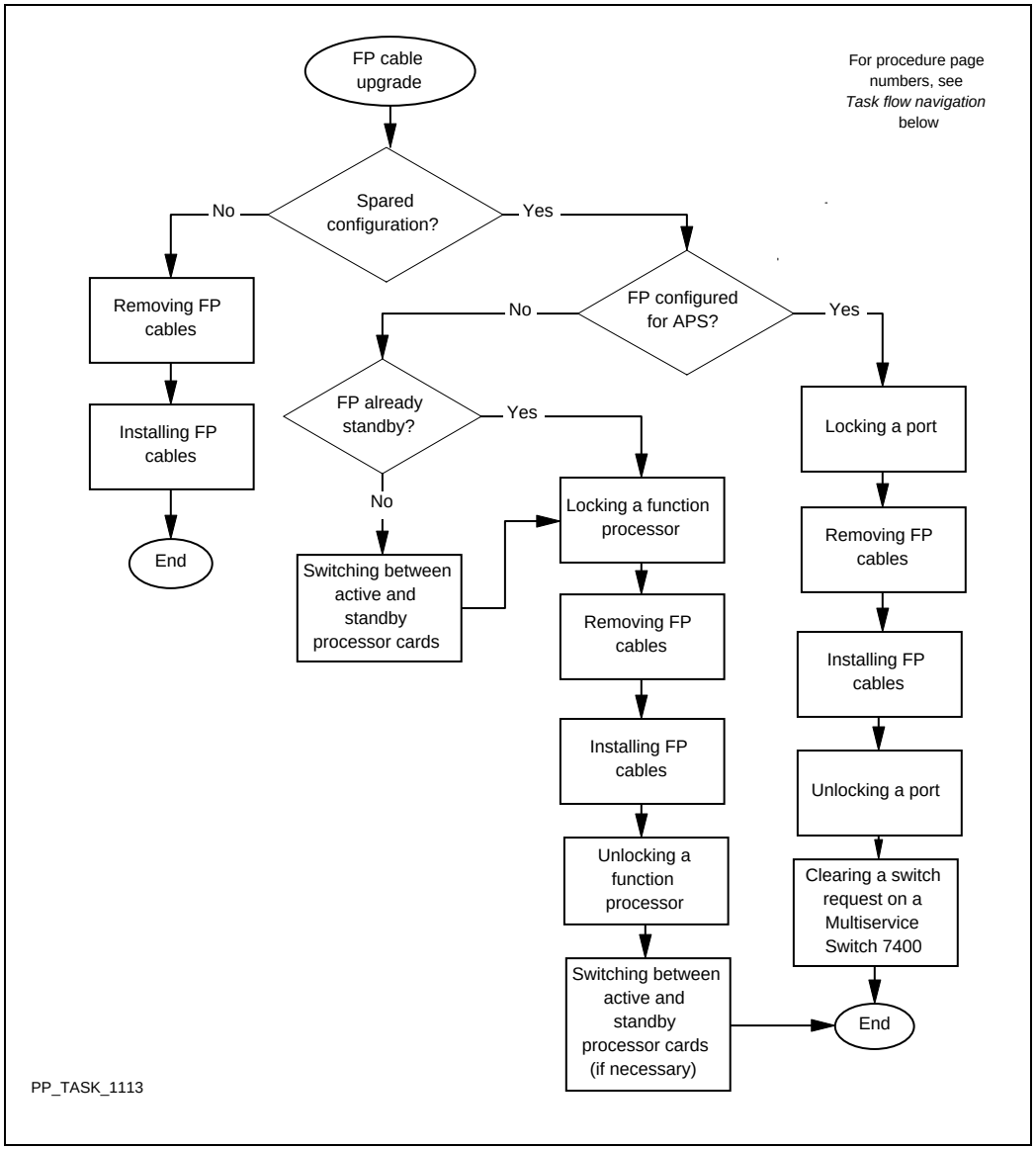
Locking a port configured with intra-card APS causes active lines to transfer traffic to the other port. During switchover, up to up to 50 milliseconds of traffic can be lost.

- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

FP cable upgrade task flow

This task flow shows you the sequence of procedures you do to upgrade a cable connected to an FP or its related termination panel. To link to any procedure, go to “Task flow navigation” (page 142).

Figure 36
FP cable upgrade task flow



Task flow navigation

The following references are listed alphabetically:

- “Clearing a switch request on a Multiservice Switch 7400.” See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures.*
- “Removing FP cables” (page 445)
- “Installing FP cables” (page 349)
- “Locking a function processor.” See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Locking a port.” See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Switching between active and standby processor cards.” See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures.*
- “Unlocking a function processor.” See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Unlocking a port.” See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

Chapter 24
Failed control processor replacement

Replace a failed control processor (CP) to restore or ensure continued service on a device.

- "Prerequisites to failed control processor replacement" (page 143)
- "Failed control processor replacement task flow" (page 144)

Prerequisites to failed control processor replacement

CAUTION
Risk of damage by electrostatic discharge (ESD)
When you handle processor cards, wear a grounded antistatic wrist strap or equivalent to protect electronic parts.

WARNING
Damage to equipment by electromagnetic interference
To meet EMI regulatory requirements and thermal specifications, all empty slots must be filled with a blank processor card (NTBP23).

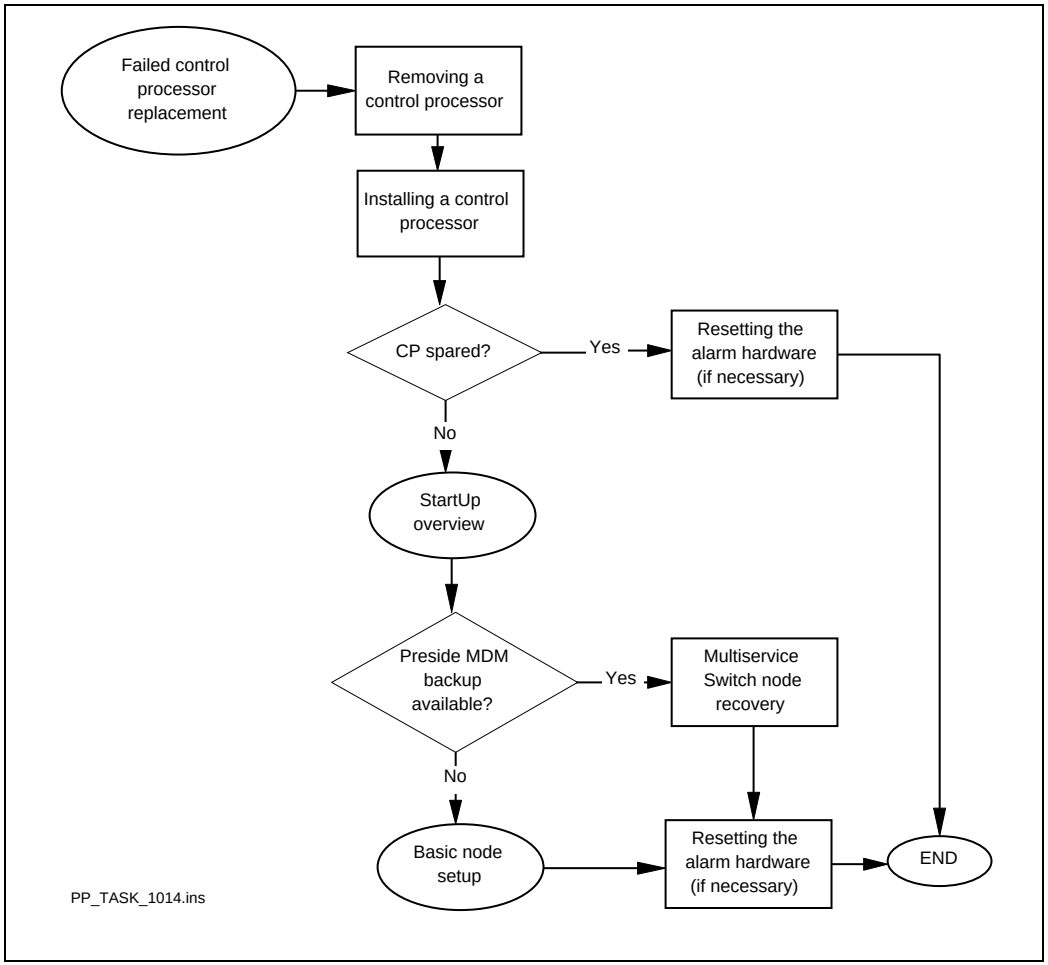
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.
- See "Unpacking a processor card" (page 539) for FP and CP handling instructions.

- Ensure that the replacement CP has the same product code or the same product code with a compatible vintage.
- If you are replacing a failed CP with an different version, follow the procedures in the section “Control processor upgrade” (page 119).
- The impact of CP failure depends on if there is a spare CP ready to take over traffic. If there is no spare CP all traffic will be dropped.

Failed control processor replacement task flow

This task flow shows you the sequence of procedures you do to replace a failed CP. To link to any procedure, go to “Task flow navigation” (page 145).

Figure 37
Failed control processor replacement task flow



Task flow navigation

The following references are listed alphabetically:

- "Basic node setup". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- "Installing a control processor" (page 254)

- “Multiservice Switch Node Recovery”. See 241-6001-807 *Nortel Networks Multiservice Data Manager Network Backup and Restore*.
- “Removing a control processor” (page 416)
- “Resetting the alarm hardware” (page 506)
- “StartUp overview”. See NN10600-271 *Nortel Networks Multiservice Switch 7400/15000/20000 Network Management Connectivity*.

Chapter 25
Failed function processor replacement

Replace a failed function processor (FP) to either restore or ensure continued delivery of configured services.

- "Prerequisites to failed function processor replacement" (page 147)
- "Failed function processor replacement task flow" (page 148)

Prerequisites to failed function processor replacement

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

CAUTION
Service loss on active ports
Unspared FPs, including FPs configured with intra-card APS (port-to-port sparing on a single FP), will experience a loss of service on any active ports for the time it takes to replace the FP.

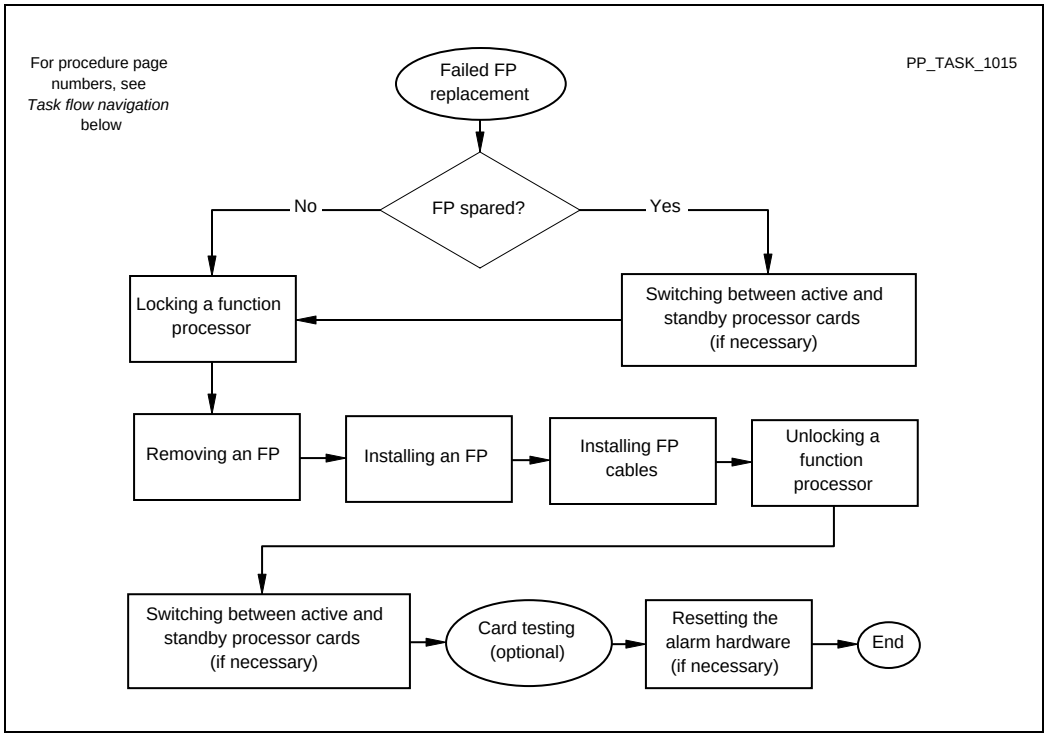
- In order to replace an FP, a software operator and hardware installer must coordinate their activities. Failure to do so can result in service interruptions. Whenever possible, schedule upgrades and replacements of spared FPs during maintenance windows.

- See “Unpacking a processor card” (page 539) for FP and CP handling instructions.
- Anytime you replace a failed FP with an FP of another vintage, you must follow the task flow for upgrading an FP.
- When replacing a failed 32-port DS1 or E1 MSA 2-slot FP with an equivalent 1-slot FP, follow “Function processor upgrade” (page 163). Refer to the tables of DS1 and E1 compatible replacements of 1-slot and 2-slot FPs in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- When replacing a 2-slot FP that has optical ports with a 1-slot FP, do this kind of task by following “Function processor upgrade” (page 163). The only difference in functionality between an MSA 1-slot and 2-slot FP of the same interface type (DS1 or E1) is whether the FP has optical ports. The 1-slot FPs do not have optical ports. You may need to alter the slot configuration.
- Alarm 7054 0100 is generated when at least one cable is disconnected at an FP or at its next equipment connection (an FP, termination panel, or sparing panel).
- When an FP is installed in a slot that is configured for a different card type, the FP does not operate and its status LED shows solid amber. If a replaced FP shows solid amber, use the procedure for comparing the card type of an inserted card and its configured slot in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

Failed function processor replacement task flow

This task flow shows you the sequence of procedures you do to replace a failed FP. To link to any procedure, go to “Task flow navigation” (page 149).

Figure 38
Failed function processor replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Activating configuration changes”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Card testing”. See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- “Configuring a new processor card”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Installing an FP” (page 321)

- “Installing FP cables” (page 349)
- “Locking a function processor”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Removing an FP” (page 441)
- “Resetting the alarm hardware” (page 506)
- “Switching between active and standby processor cards”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures.*
- “Unlocking a function processor”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

Chapter 26
FP addition

Add a function processor (FP) to an empty slot in an in-service shelf to enable a device to deliver more services.

Prerequisites to FP addition

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

- See "Unpacking a processor card" (page 539) for FP and CP handling instructions.
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.
- Some FPs are incompatible with FPs of the same type but different vintages. Some FPs are incompatible with FPs of a different type in the same shelf. The DS1 or E1 MSA 1-slot FPs can replace or spare the equivalent 2-slot FPs (or vice versa). Ensure that the FPs you are going to add do not conflict with other FPs already in service. For more

information about operational compatibilities, see NN10600-551 *Nortel Networks Multiservice Switch 7400/15000/20000 FP Configuration Reference* for the descriptions of your FP type.

- Since 32-port DS1 MSA 1-slot and 2-slot FPs with or without the optical ports can operate in the same sparing configuration, ensure that the added FP can be combined in the same sparing configuration. This also applies to the equivalent E1 MSA FPs. The combinations of main and spare MSA FPs are identified in the descriptions of the DS1 and E1 FPs in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- When an FP is added to a slot that is configured for a different card type, the FP does not operate and its status LED shows solid amber. If an added FP shows solid amber, use the procedure for comparing the card type of an inserted card and its configured slot in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- If a Nortel Networks Multiservice Switch 7480 does not have redundant power supplies, ensure that the power supply is sufficient to support the additional FP or FPs. For more information, see the table "Multiservice Switch 7480 minimum power supply requirements" (page 477).

CAUTION

Risk of service loss by inadequate power

Two power supplies must be installed before inserting an MSA32 FP. There is a risk of a shelf reset when installing an MSA32 FP in a shelf with only a single power supply. This risk does not apply if the MSA32 is already installed and one of two power supplies fails.

CAUTION

Risk of service loss by inadequate power

Two power supplies must be installed before inserting a 32-port MSA 2-slot FP with the PEC NTNQ69AA, NTNQ71AA, NTNQ73AA, NTNQ74AA, NTNQ76AA, or NTNQ78AA. There is a risk of a shelf reset when installing one of these FPs in a shelf with only one operating power supply unit. This risk does not apply when the FPs are already installed and one of two power supplies fails.

CAUTION

Risk of equipment damage from software

An incompatible software load can damage an FP beyond a field repair. Ensure that the software running on the device meets the minimum software requirement for an FP. Minimum software requirements are identified per FP in NN10600-551 *Nortel Networks Multiservice Switch 7400/15000/20000 FP Configuration Reference*.

CAUTION

Risk of service loss

Whenever you install an FP that uses a control cable in a sparing configuration, you must always insert the FP into a slot in the shelf before you connect the control cable. If you connect the control cable between the FP and the termination or sparing panel before you insert the FP in the shelf, you can disrupt service to the other FPs in the sparing configuration.

FP addition task flow

The following task flows show you the sequence of procedures you do to add an FP to a shelf. To link to any procedure, go to “Task flow navigation” (page 156).

Figure 39
FP addition task flow: part 1

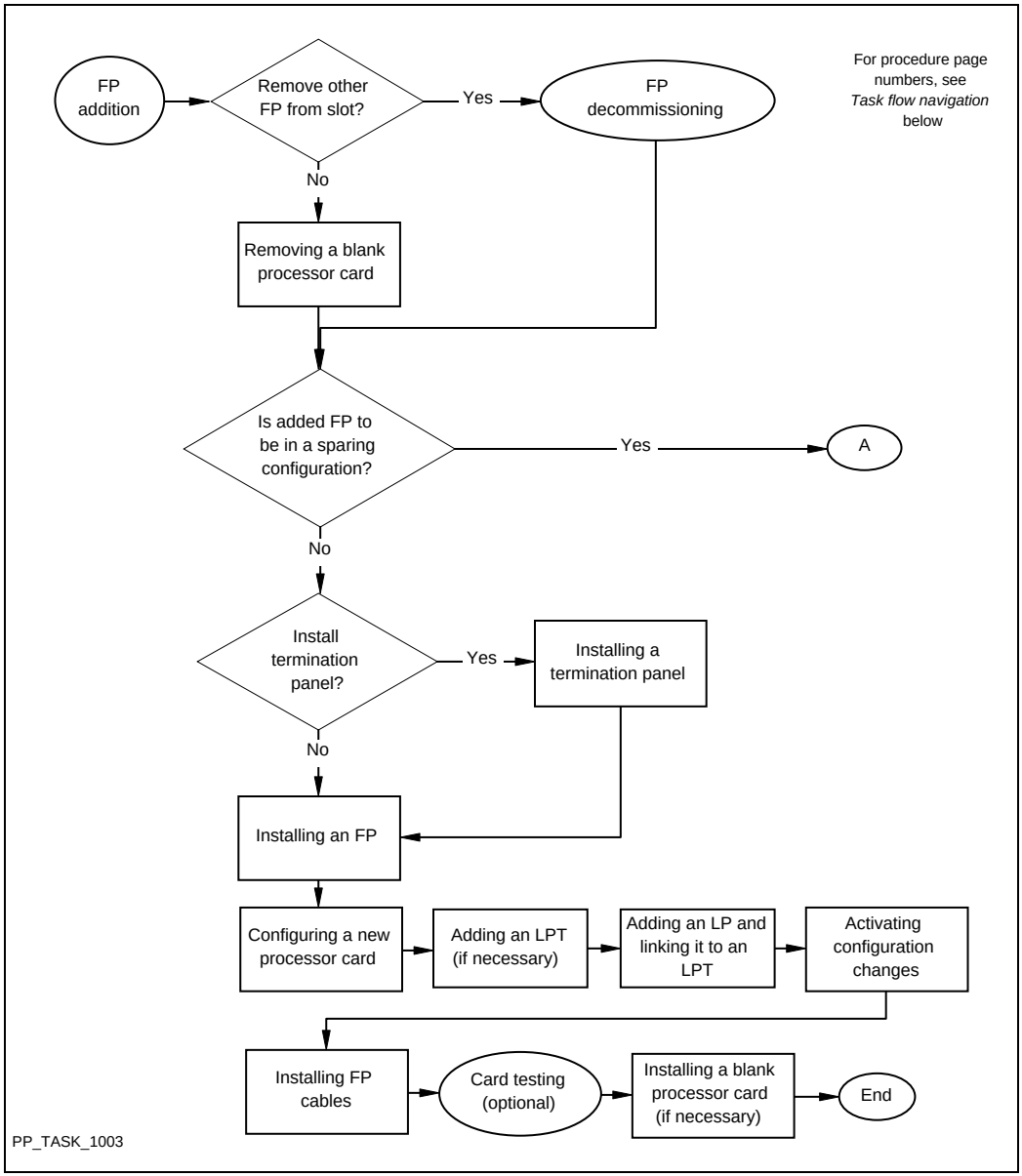
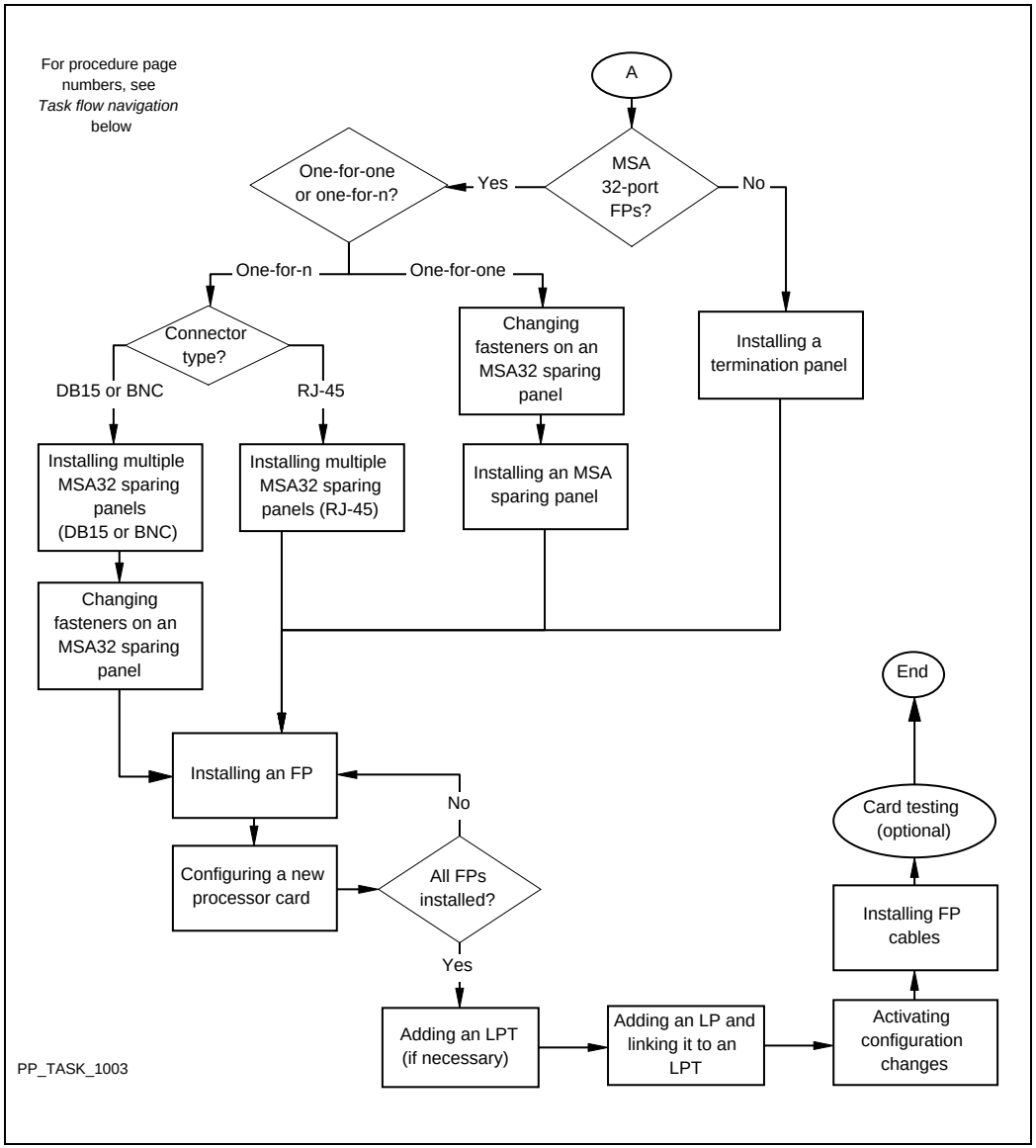


Figure 40
FP addition task flow: part 2



Task flow navigation

The following references are listed alphabetically:

- "Activating configuration changes". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- "Adding an LP and linking it to an LPT". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- "Adding an LPT". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- "Card testing". See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- "Changing fasteners on an MSA32 sparing panel" (page 213)
- "Configuring a new processor card". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- "FP decommissioning" (page 159)
- "Installing a blank processor card" (page 243)
- "Installing a termination panel": choose the appropriate procedure:
  - "Installing a 13-inch termination panel on a Multiservice Switch 7420" (page 235)
  - "Installing a 13-inch termination panel on a Multiservice Switch 7440" (page 238)
  - "Installing a 19-inch rack-mounted termination panel" (page 240)
- "Installing an MSA32 sparing panel":
  - "Installing multiple MSA32 sparing panels (DB15 or BNC)" (page 356)
  - "Installing multiple MSA32 sparing panels (RJ-45)" (page 360)
- "Installing an FP" (page 321)
- "Installing FP cables" (page 349)

- “Installing multiple MSA32 sparing panels (DB15 or BNC)” (page 356)
- “Installing multiple MSA32 sparing panels (RJ-45)” (page 360)
- “Removing a blank processor card” (page 411)

Chapter 27
FP decommissioning

Decommission a function processor (FP) if you want to install a different type of FP in its slot, or if the slot is no longer being used.

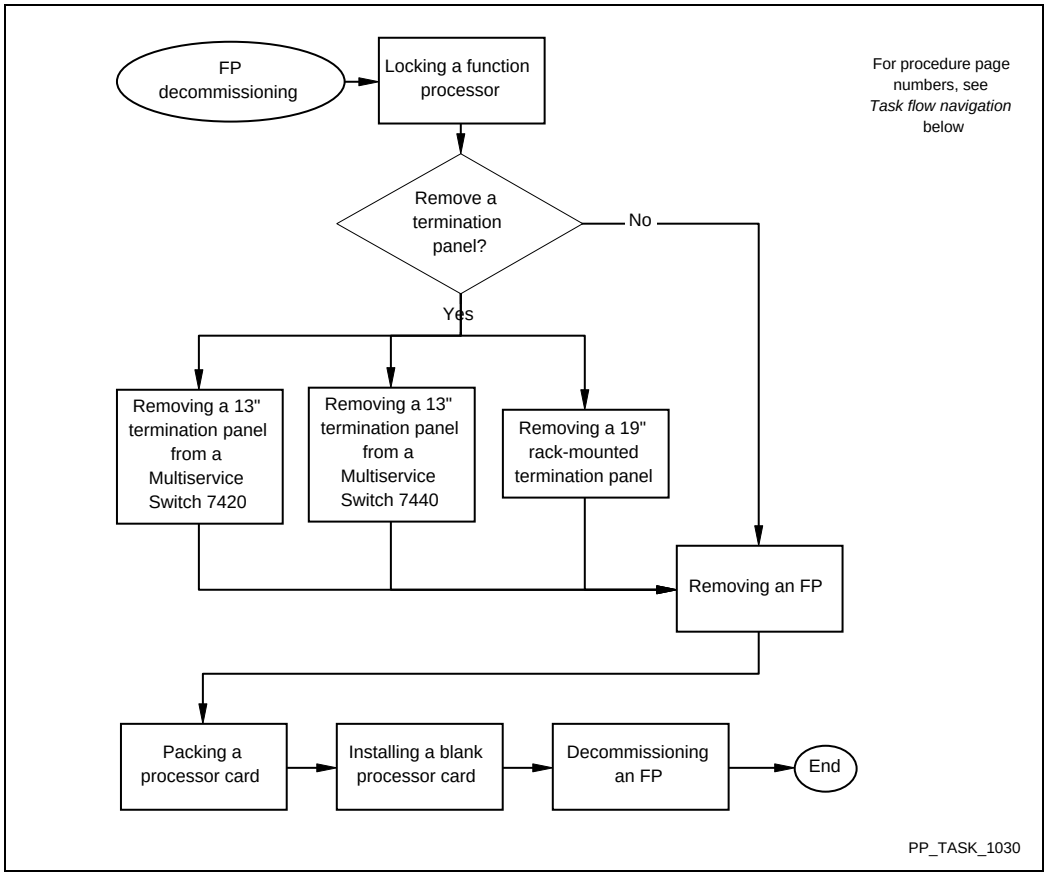
Prerequisites to FP decommissioning

- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

FP decommissioning task flow

This task flow shows you the sequence of procedures you do to decommission one or more FPs. To link to any procedure, go to "Task flow navigation" (page 160).

Figure 41
FP decommissioning task flow



Task flow navigation

The following references are listed alphabetically:

- "Decommissioning an FP". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- "Installing a blank processor card" (page 243)

- “Locking a function processor”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Packing a processor card” (page 386)
- “Removing a 13-inch termination panel from a Multiservice Switch 7420” (page 406)
- “Removing a 13-inch termination panel from a Multiservice Switch 7440” (page 408)
- “Removing a 19-inch rack-mounted termination panel” (page 410)
- “Removing an FP” (page 441)

Chapter 28
Function processor upgrade

Upgrade a function processor (FP) by replacing it with the same type of FP, but a later vintage, to introduce added functionality.

Prerequisites to function processor upgrade

CAUTION

Risk of electrostatic damage

When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

CAUTION

Service loss on active ports

Unspared FPs, including FPs configured with intra-card APS (port-to-port sparing on a single FP), will experience a loss of service on any active ports for the time it takes to replace the FP.

CAUTION

Risk of equipment damage from software

An incompatible software load can damage an FP beyond a field repair. Ensure that the software running on the device meets the minimum software requirement for an FP. For more information, see NN10600-551 *Nortel Networks Multiservice Switch 7400/15000/20000 FP Configuration Reference*.

CAUTION

Risk of service loss

Whenever you install an FP that uses a control cable in a sparing configuration, you must always insert the FP into a slot on the shelf before you connect the control cable. If you connect the control cable between the FP and the termination or sparing panel before you insert the FP in the shelf, you can disrupt service to the other FPs in the sparing configuration.

- See “Unpacking a processor card” (page 539) for FP and CP handling instructions.
- Some FPs are incompatible with FPs of the same type but different vintages. Some FPs are incompatible with FPs of a different type in the same shelf. The DS1 or E1 MSA 1-slot FPs can replace or spare the equivalent 2-slot FPs (or vice versa). Ensure that the FPs you are going to add do not conflict with other FPs already in service. For more information about operational compatibilities, see NN10600-551 *Nortel Networks Multiservice Switch 7400/15000/20000 FP Configuration Reference* for the descriptions of your FP selection.
- When an FP is in a sparing configuration, either replace the mate with the same vintage or ensure that the FP’s capabilities are compatible and preferably exceed those of the mate. A sparing configuration with mismatched versions operates with only the common shared functionality.

- Replacing a 32-port DS1 or E1 MSA 2-slot FP with an equivalent 1-slot FP is considered an upgrade because the functionality of the shelf has increased by making another card slot available. Refer to the tables of DS1 and E1 compatible replacements of 1-slot and 2-slot FPs in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- The combinations of main and spare 32-port DS1 or E1 MSA 1-slot and 2-slot FPs are listed in the descriptions of the MSA32 FPs in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- Replacing a 32-port DS1 or E1 MSA 2-slot FP that has optical ports with a 1-slot FP of the same card type is considered a downgrade because the 1-slot FPs do not have optical ports and these are configured in software. When doing this kind of replacement, you must reconfigure the left slot with the different card type and decommission the right slot. Configuration information for the card types is in NN10600-551 *Nortel Networks Multiservice Switch 7400/15000/20000 FP Configuration Reference*.
- When upgrading or downgrading a 2-slot FP with a 1-slot FP, you must decide to fill the second slot with either another FP or a blank processor card. (You can also replace a 1-slot FP with an equivalent 2-slot FP but this can be a downgrade if shelf capacity is diminished by removing an FP to occupy the second slot.)
- When an FP is installed in a slot that is configured for a different card type, the FP does not operate and its status LED shows solid amber. If an upgraded FP shows solid amber, use the procedure for comparing the card type of an inserted card and its configured slot in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- Alarm 7054 0100 is generated when at least one cable is disconnected at an FP or at its next equipment connection (an FP, termination panel, or sparing panel).
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.

Function processor upgrade task flow

This task flow shows you the sequence of procedures you do to upgrade an FP. To link to any procedure, go to “Task flow navigation” (page 169).

Figure 42
Function processor upgrade task flow: part 1

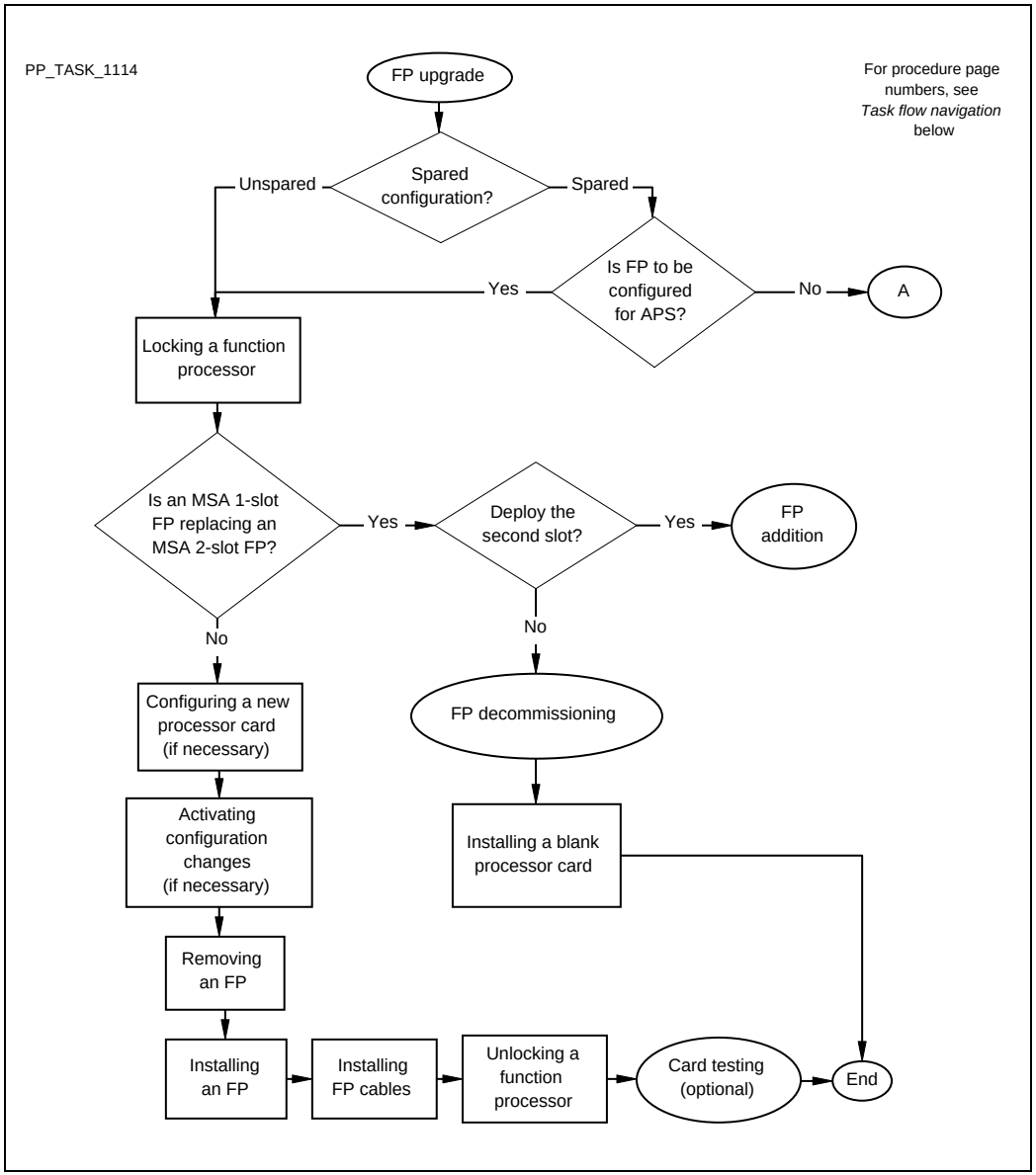
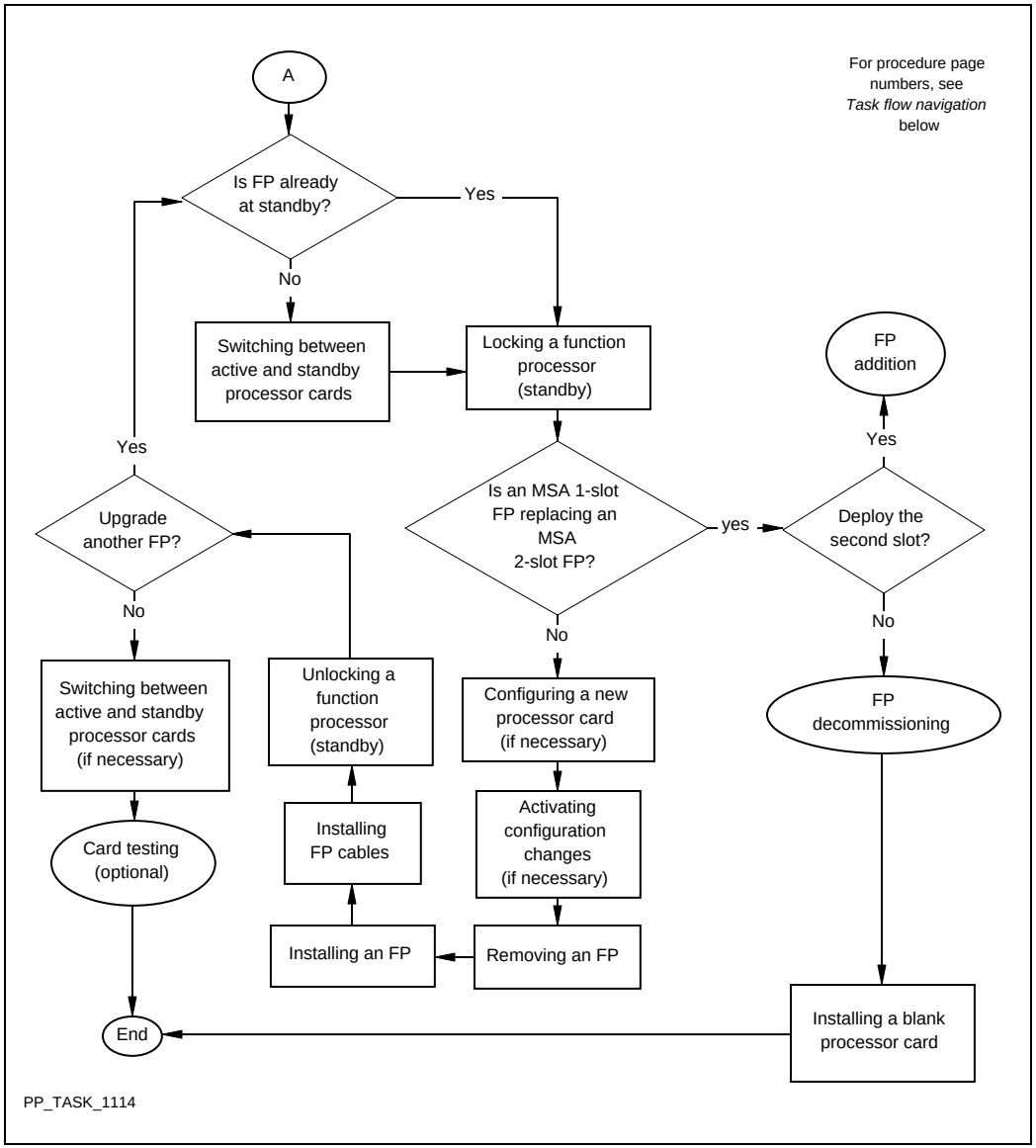


Figure 43
Function processor upgrade task flow: part 2



Task flow navigation

The following references are listed alphabetically:

- “Activating configuration changes”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Card testing”. See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- “Configuring a new processor card”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “FP decommissioning” (page 159)
- “Locking a function processor”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Installing an FP” (page 321)
- “Installing FP cables” (page 349)
- “Removing an FP” (page 441)
- “Switching between active and standby processor cards”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Unlocking a function processor”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

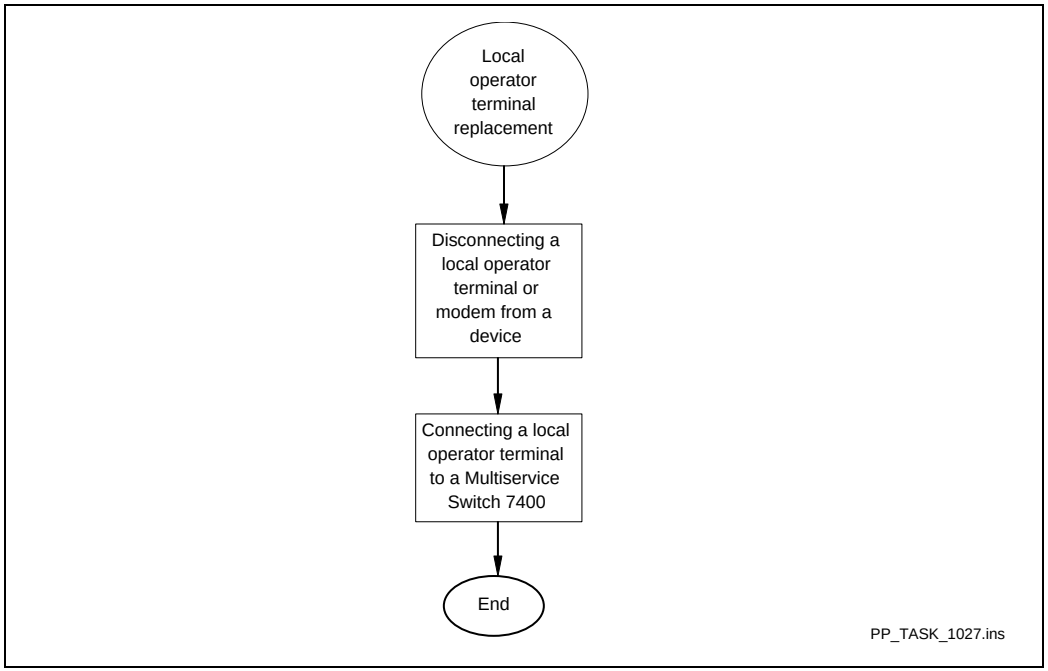
Chapter 29
Local operator terminal replacement

Replace a local operator terminal as a result of failure or to upgrade functionality.

Local operator terminal task flow

This task flow shows you the sequence of procedures you do to replace a local operator terminal. To link to any procedure, go to "Task flow navigation" (page 172).

Figure 44
Local operator terminal replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Connecting a local operator terminal to a Multiservice Switch 7400” (page 221)
- “Disconnecting a local operator terminal or modem from a device” (page 224)

Chapter 30
Modem installation

Install a modem to enable a remote user to connect to the device for entering and receiving local operator software commands.

Prerequisites to modem installation

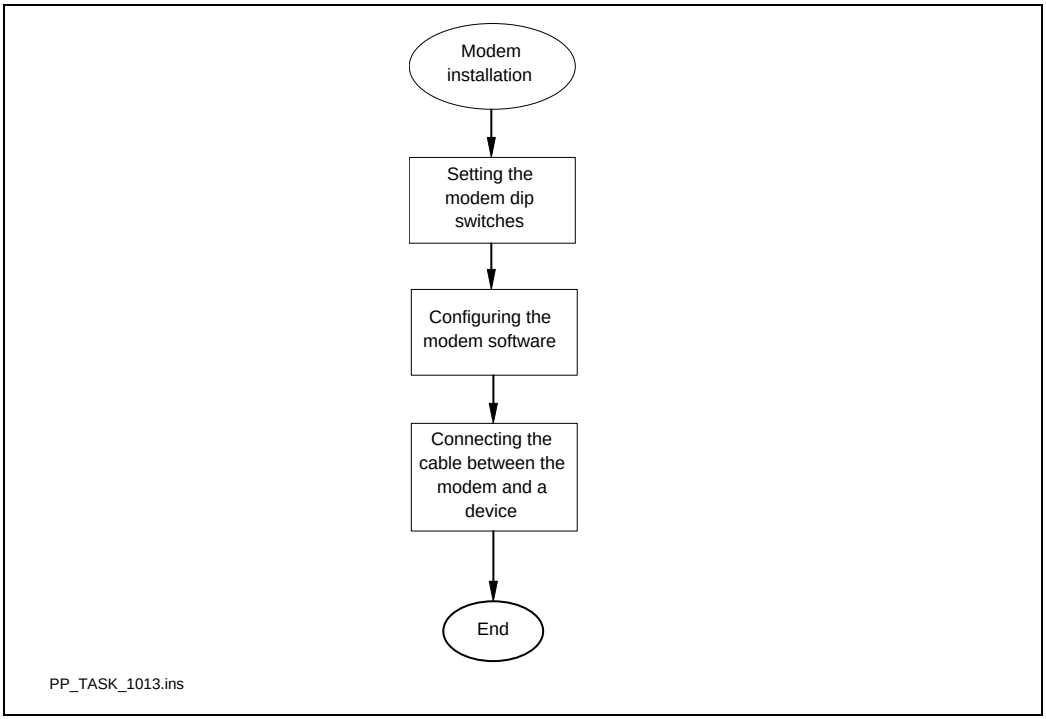
CAUTION
Risk of service loss by incorrectly setting a modem
Failure to either configure hardware and software settings properly or to use a cable that meets the specifications in "Modem cable specifications" (page 175) can cause the CP to crash and fail to reboot.

- Ensure you have a dedicated ac power outlet available to operate the modem while it is connected to the device.
- Also, ensure the modem you want to use supports all of the required settings. For more information, see "Modem selection" (page 175).

Modem installation task flow

This task flow shows you the sequence of procedures you do to install a modem. To link to any procedure, go to "Task flow navigation" (page 174).

Figure 45
Modem installation task flow



Task flow navigation

The following references are listed alphabetically:

- “Connecting a cable between a modem and a device” (page 219)
- “Configuring the modem software” (page 217)
- “Setting modem DIP switches” (page 522)

Modem installation supporting information

Modem selection

You do not need to configure any Nortel Networks Multiservice Switch software in order to connect a modem to the CP. However, you must be able to configure the modem and assemble the cable in accordance with the information contained in the following sections:

- “Setting modem DIP switches” (page 522)
- “Modem cable specifications” (page 175)
- “Configuring the modem software” (page 217)

The modem used as an example hookup is a 56K modem manufactured by US Robotics, which includes their older Sportster series modems. Choose a modem that supports the same dip switch settings and AT software commands. The modem must also support the dumb mode so that the Multiservice Switch device will not reconfigure the modem while it is on-hook.

Modem cable specifications

You cannot use the DCE V.24 cable assembly with product engineering code NTBP25 to connect a modem to the device’s CP port 1. The connector on the faceplate requires a customized DB-9 cable.

You need the following components in order to assemble the cable:

- a V.24 serial interface cable
- a male 25-pin D-sub connector to connect to the modem
- a male 9-pin D-sub connector to connect to port 1 on the faceplate of the CP in the device

If your device is in a cabinet, determine the length of cable required by measuring the distance from the faceplate of either CP through the cable management guide to the rear of the shelf. You can install the modem inside the cabinet and, optionally, fasten it to the cable management guides.

The cable and its connectors must be custom-made according to the table “Pinout for the DB 9-pin connecting to the modem DB 25-pin” (page 176).

Table 1
Pinout for the DB 9-pin connecting to the modem DB 25-pin

DB 9-pin	DB 25-pin	Signal name of the device to modem	Direction at the device
2	3	transmitted data [TXD] / received data (Rx)	input
3	2	received data [RXD] / transmitted data (Tx)	output
4	8	data terminal ready [DTR] / data carrier detect (CD)	input
5	7	signal ground [GND]	not applicable
6	20	data carrier detect [DCD] / data terminal ready (DTR)	output
7	5	request to send [RTS] / clear to send (CTS)	input
8	4	clear to send [CTS] / request to send (RTS)	output

Note: Text in square brackets [ ] indicates the signal terminology used in NTPs. Text in parenthesis ( ) indicates the signal terminology commonly used by modem venders.

Chapter 31
Modem replacement

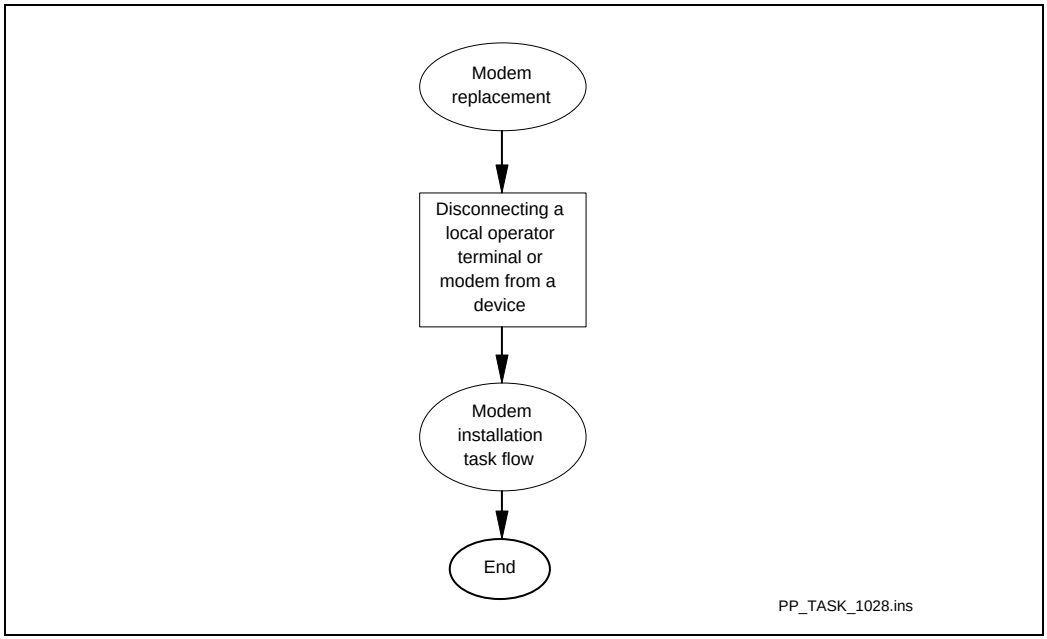
Replace a modem to enable remote dial-up access to a device.

- “Modem replacement task flow” (page 177)

Modem replacement task flow

This task flow shows you the sequence of procedures you do to replace a modem. To link to any procedure, go to “Task flow navigation” (page 178).

Figure 46
Modem replacement task flow



Task flow navigation

The following references are listed alphabetically:

- "Disconnecting a local operator terminal or modem from a device" (page 224)
- "Modem installation" (page 173)

Chapter 32
Multiport aggregate device replacement

Replace a multiport aggregate device to enable a 32-port E1 TDM FP to deliver configured services.

- “Prerequisites to multiport aggregate device replacement” (page 179)
- “Multiport aggregate device replacement task flow” (page 179)

Prerequisites to multiport aggregate device replacement

CAUTION

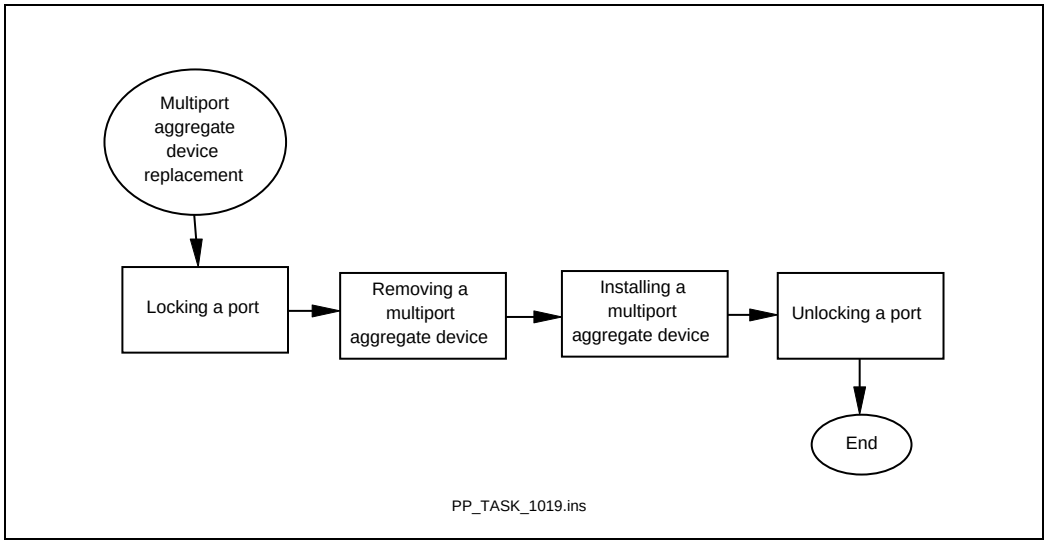
Service loss on active ports

Replacing a multiport aggregate device requires you to remove all the E1 ports connected to the device from service for the duration of the replacement. Minimize the impact of the outage by rerouting traffic to other nodes in the network before locking the ports.

Multiport aggregate device replacement task flow

This task flow shows you the sequence of procedures you do to replace a multiport aggregate device. To link to any procedure, go to “Task flow navigation” (page 180).

Figure 47
Multiport aggregate device replacement task flow



Task flow navigation

The following references are listed alphabetically:

- "Installing a multiport aggregate device" (page 268)
- "Locking a port". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- "Removing a multiport aggregate device" (page 421)
- "Unlocking a port". See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

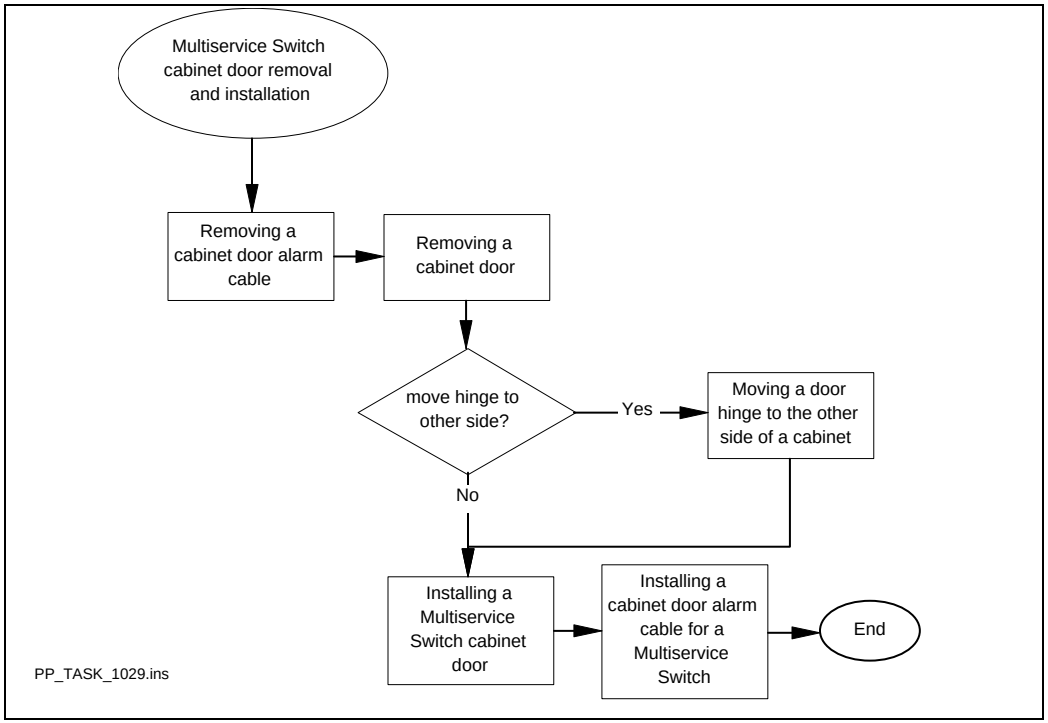
Chapter 33
Multiservice Switch cabinet door removal and installation

Remove and install a door on a Nortel Networks Multiservice Switch cabinet to allow to devices for performing maintenance tasks, to move the door hinge from one side to the other, or to repair or replace the cabinet door.

Cabinet door removal and installation task flow

This task flow shows you the sequence of procedures you do to remove and install a door on a cabinet. To link to any procedure, go to "Task flow navigation" (page 182).

Figure 48
Multiservice Switch cabinet door removal and installation task flow



Task flow navigation

The following references are listed alphabetically:

- “Installing a Multiservice Switch cabinet door” (page 291)
- “Installing a cabinet door alarm cable for a Multiservice Switch” (page 245)
- “Moving a door hinge to the other side of a cabinet” (page 383)
- “Removing a cabinet door” (page 412)
- “Removing a cabinet door alarm cable” (page 413)

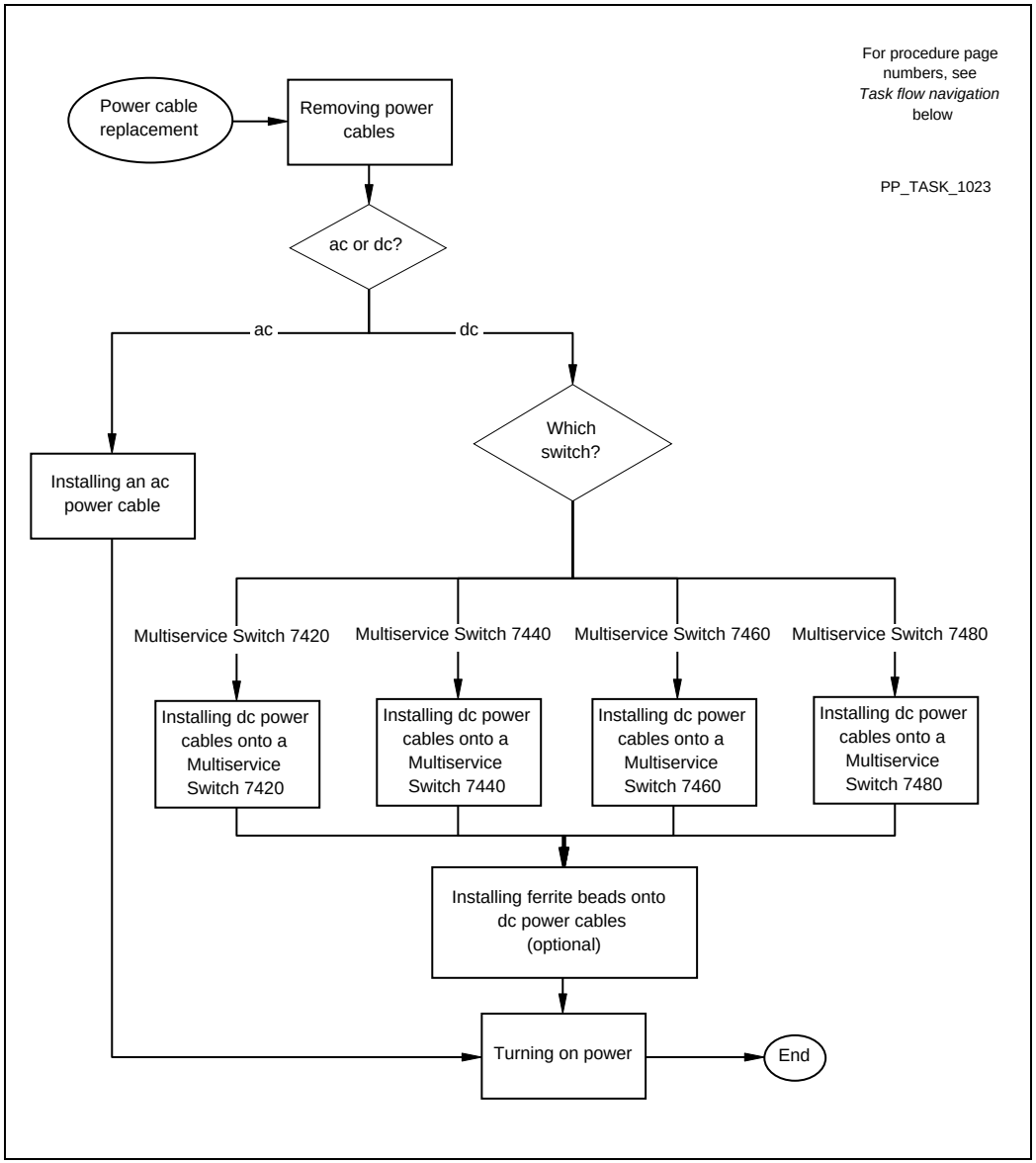
Chapter 34
Power cable replacement

Replace a faulty power cable to restore power to a device or to ensure power supply redundancy.

Power cable replacement task flow

This task flow shows you the sequence of procedures you do to replace a power cable. To link to any procedure, go to “Task flow navigation” (page 185).

Figure 49
Power cable replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Installing an ac power cable” (page 311)
- “Installing dc power cables onto a Multiservice Switch 7420” (page 335)
- “Installing dc power cables onto a Multiservice Switch 7440” (page 337)
- “Installing dc power cables onto a Multiservice Switch 7460” (page 339)
- “Installing dc power cables onto a Multiservice Switch 7480” (page 343)
- “Installing ferrite beads onto dc power cables” (page 346)
- “Removing power cables” (page 447)
- “Turning on power” (page 522)

Chapter 35
Power supply addition

Add a power supply to a device, to provide minimum or redundant power requirements.

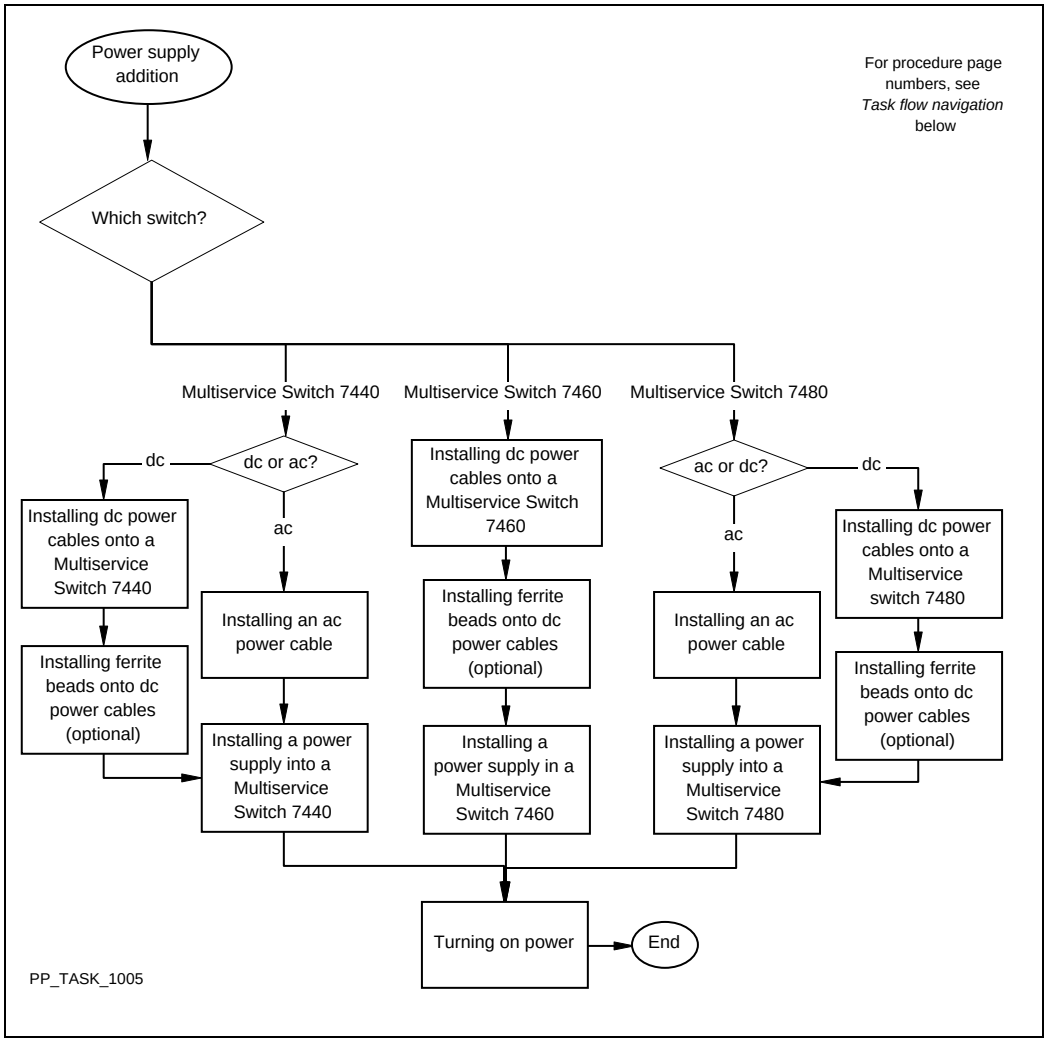
Prerequisites to power supply addition

CAUTION
Risk of equipment damage
You cannot install one ac power supply and one dc power supply in the same Multiservice Switch device.

Power supply addition task flow

This task flow shows you the sequence of procedures you do to add a power supply. To link to any procedure, go to "Task flow navigation" (page 188).

Figure 50
Power supply addition task flow



Task flow navigation

The following references are listed alphabetically:

- “Installing a power supply into a Multiservice Switch 7440” (page 293)
- “Installing a power supply into a Multiservice Switch 7480” (page 301)

- “Installing a power supply in a Multiservice Switch 7460” (page 296)
- “Installing an ac power cable” (page 311)
- “Installing dc power cables onto a Multiservice Switch 7440” (page 337)
- “Installing dc power cables onto a Multiservice Switch 7460” (page 339)
- “Installing dc power cables onto a Multiservice Switch 7480” (page 343)
- “Installing ferrite beads onto dc power cables” (page 346)
- “Turning on power” (page 522)

Chapter 36
Power supply replacement

Replace a failed power supply to restore power to a device, or to provide power supply redundancy.

Prerequisites to power supply replacement

WARNING
Risk of injury by electric shock
Never service the power supply. There are no serviceable parts. To avoid injury from potentially dangerous voltages, send the unit to Nortel Networks to be serviced.

WARNUNG
Verletzungsgefahr durch Elektroschock
Die Stromversorgungseinheit bedarf keiner Wartung, da darin keine wartungsbedürftigen Teile enthalten sind. Um Verletzungen durch potenziell gefährliche Stromspannungen zu vermeiden, sollten Sie die Stromversorgungseinheit zur Wartung an das Werk einschicken.

CAUTION

Risk of service loss

If a device does not have redundant power, a software operator must remove the device from service before a hardware installer removes a power cable or power supply. For information about minimum and redundant power configurations, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

CAUTION

Risk of equipment damage

You must not install one ac power supply and one dc power supply in the same Multiservice Switch device.

WARNING

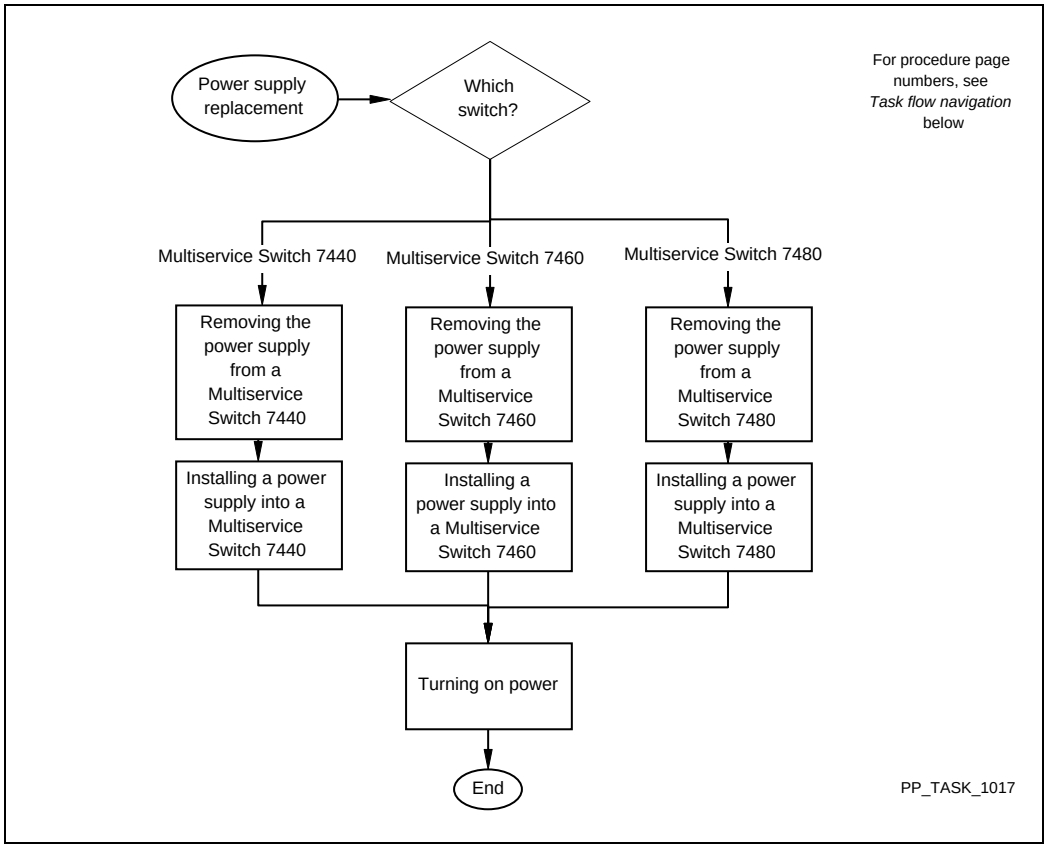
Damage to equipment by electromagnetic interference

Each empty power supply bay must be filled with a power supply filler (blank) in order to meet electromagnetic interference (EMI) regulatory requirements and thermal specifications. Power supply fillers are removed and installed using the same procedure as for power supplies.

Power supply replacement task flow

This task flow shows you the sequence of procedures you do to replace a power supply. To link to any procedure, go to “Task flow navigation” (page 193).

Figure 51
Power supply replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Installing a power supply into a Multiservice Switch 7440” (page 293)
- “Installing a power supply into a Multiservice Switch 7480” (page 301)
- “Installing a power supply in a Multiservice Switch 7460” (page 296)
- “Removing the power supply from a Multiservice Switch 7440” (page 466)

- “Removing the power supply from a Multiservice Switch 7480” (page 474)
- “Removing the power supply from a Multiservice Switch 7460” (page 471)
- “Turning on power” (page 522)

Chapter 37
Sparing addition

Add sparing by installing the required hardware (FPs and sparing panel) and configuring the software to enable redundant (backed up or spared) functionality.

Prerequisites to sparing addition

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see "Avoiding damage from static electricity" (page 208).

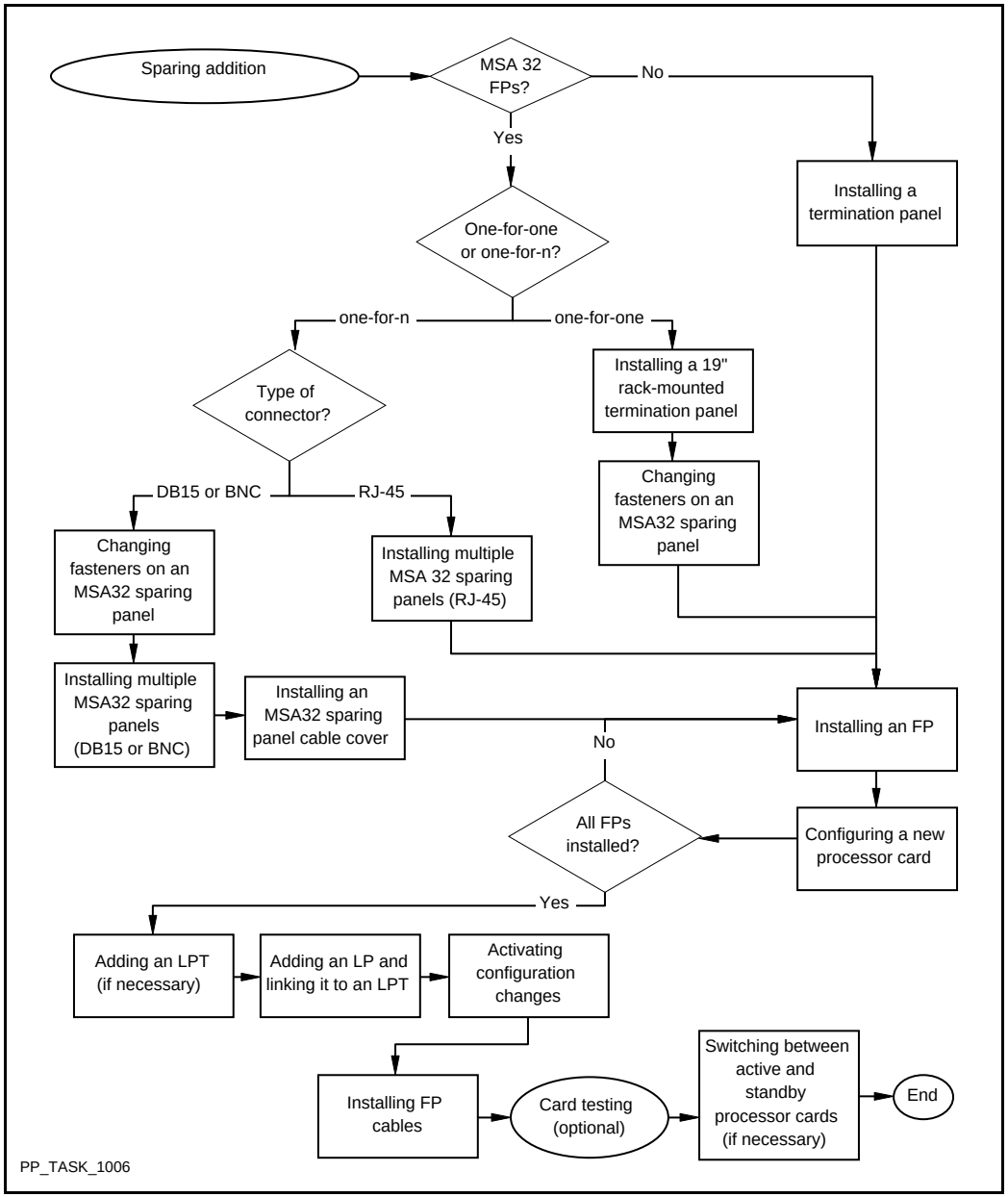
- See "Unpacking a processor card" (page 539) for FP and CP handling instructions.
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.
- There are two types of sparing panels, single and modular. Single sparing panels are used for sparing most types of FPs. Modular sparing panels are used for sparing 32-port multi-service access (MSA32) DS1 or E1 FPs.

- If you install termination panels in the back of a seismic cabinet containing Nortel Networks Multiservice Switch 7480s, leave some rack space between the termination panels for each device This space aids airflow through the cabinet and provides space for cables.
- Route and label appropriate cables before installing sparing panels.

Sparing addition task flow

This task flow shows you the sequence of procedures you do to add sparing capability. To link to any procedure, go to “Task flow navigation” (page 198)

Figure 52
Sparing addition task flow



Task flow navigation

The following references are listed alphabetically:

- “Activating configuration changes”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Adding an LP and linking it to an LPT”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Adding an LPT”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Card testing”. See NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting*.
- “Changing fasteners on an MSA32 sparing panel” (page 213)
- “Configuring a new processor card”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Installing a 13-inch termination panel on a Multiservice Switch 7440” (page 238)
- “Installing a 19-inch rack-mounted termination panel” (page 240)
- “Installing an FP” (page 321)
- “Installing FP cables” (page 349)
- “Installing multiple MSA32 sparing panels (DB15 or BNC)” (page 356)
- “Installing multiple MSA32 sparing panels (RJ-45)” (page 360)
- “Switching between active and standby processor cards”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

Chapter 38
Termination or sparing panel replacement

Replace a termination or sparing panel for failure or upgrade, to restore or maintain configured services or redundancy.

- "Prerequisites to termination or sparing panel replacement" (page 199)
- "Termination or sparing panel replacement task flow" (page 200)

Prerequisites to termination or sparing panel replacement

CAUTION
Service loss for sparing configuration
Non-MSA32 FPs will experience a loss of service on any active ports for the time it takes to replace the termination or sparing panel.

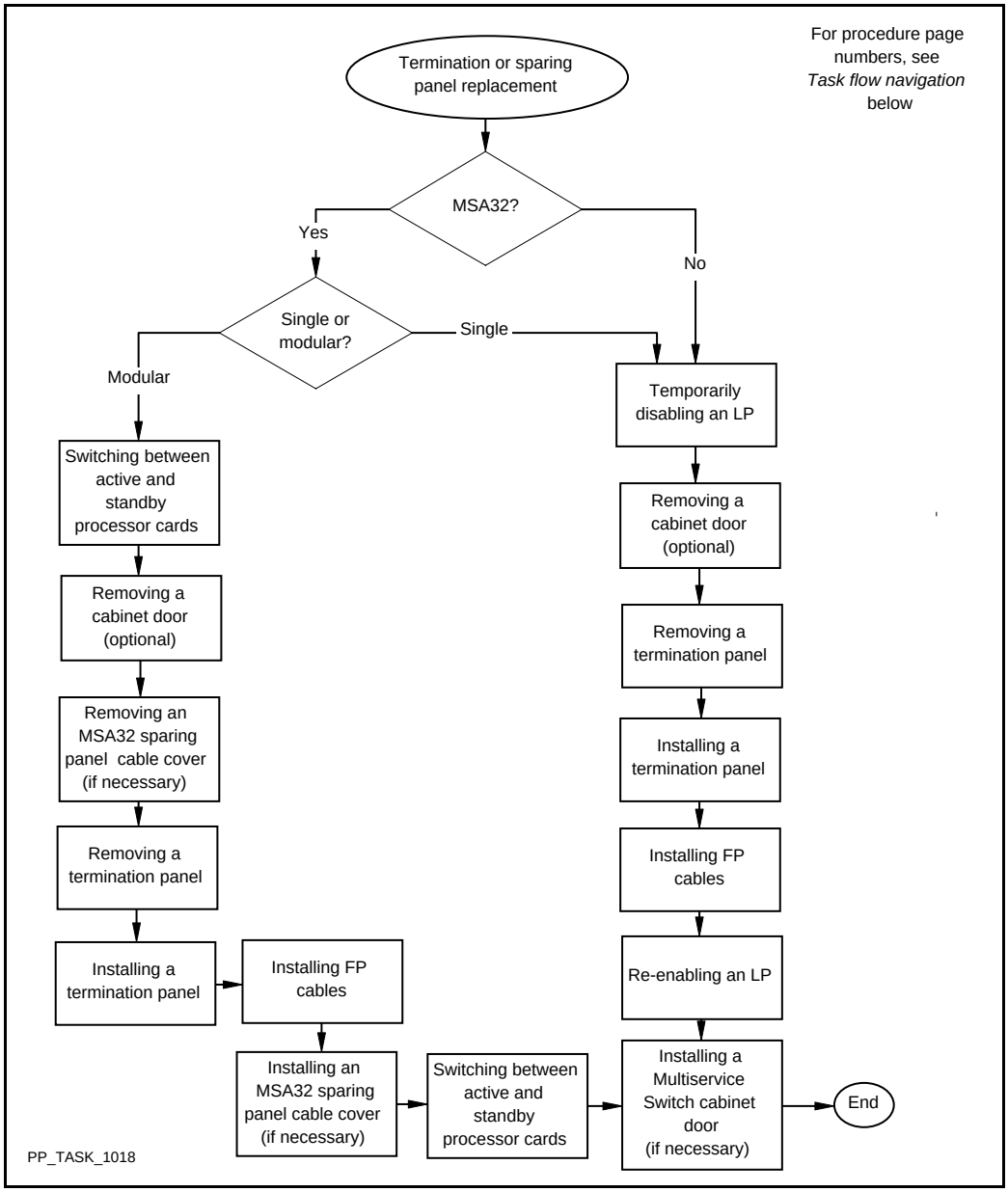
- Some of the procedures in this task are not located in this document. Ensure that you have access to the required documents.
- There are two types of sparing panels, single and modular. Single sparing panels are used for sparing most types of FPs. Modular sparing panels are used for sparing 32-port multi-service access (MSA32) DS1 or E1 FPs. When replacing a single sparing panel, traffic is disrupted for the time it takes to perform the procedure.
- If you replace termination or sparing panels in the back of a seismic cabinet containing Nortel Networks Multiservice Switch 7480s, leave some rack space between the termination panels for each device. This space aids airflow through the cabinet and provides space for cables.

- Before you start, ensure that each cable connected to the panel is labeled to indicate where it connects to the faceplate.
- If cables are connected incorrectly, the device raises one or more alarms.

Termination or sparing panel replacement task flow

This task flow shows you the sequence of procedures you do to replace a termination panel. To link to any procedure, go to “Task flow navigation” (page 202)

Figure 53
Termination or sparing panel replacement task flow



Task flow navigation

The following references are listed alphabetically:

- “Installing a 13-inch termination panel on a Multiservice Switch 7420” (page 235)
- “Installing a 13-inch termination panel on a Multiservice Switch 7440” (page 238)
- “Installing a 19-inch rack-mounted termination panel” (page 240)
- “Installing a Multiservice Switch cabinet door” (page 291)
- “Installing FP cables” (page 349)
- “Re-enabling an LP”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Removing a 13-inch termination panel from a Multiservice Switch 7420” (page 406)
- “Removing a 13-inch termination panel from a Multiservice Switch 7440” (page 408)
- “Removing a 19-inch rack-mounted termination panel” (page 410)
- “Removing a cabinet door” (page 412)
- “Switching between active and standby processor cards”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- “Temporarily disabling an LP”. See NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

Chapter 39
Hardware procedures

Anchoring a seismic cabinet using an inside-mount anchoring kit

Anchor a seismic cabinet using an inside-mount anchoring kit it to achieve NEBS compliance and to keep the brackets isolated from the floor for additional grounding protection.

Prerequisites

- You need an inside mount anchoring kit with PEC NTFN98.

Procedure steps

1. Drill the holes for each of the anchors. Use a roto hammer drill and 18 mm masonry drill bit to drill the holes. (The outside diameter of the anchor is 0.680 in.) Wear safety goggles when you drill the holes.
2. Clean each hole thoroughly with a vacuum cleaner.
3. Move the cabinet as close to its final position as possible.
4. Tip the cabinet and remove the casters and levellers from the bottom of the cabinet. You need at least one person to support the cabinet while another person removes the casters and levellers.
5. Bolt the brackets to the outside of the front and back of the cabinet using the eight bolts provided. See “Anchoring a seismic cabinet using an inside-mount anchoring kit” (page 205).

   Ensure that the brackets curve under the cabinet.
6. Carefully slide the cabinet into position.

7 Tip the cabinet again and place an isolator pad over each set of anchor holes. Ensure that each isolator pad mirrors the placement of each bracket.

8 Remove the nut, the flat washer, and the load indicating washer from the top of an anchor. Then, tap the anchor into a hole.

9 Place an isolation bushing and a plate washer over that anchor. Screw the flat washer and the load indicating washer onto the threaded rod of the anchor. Then, thread the nut back onto the anchor.

10 To tighten the anchor, insert a slot-head screwdriver in the top of the threaded rod and use an open-ended wrench to tighten the nut.

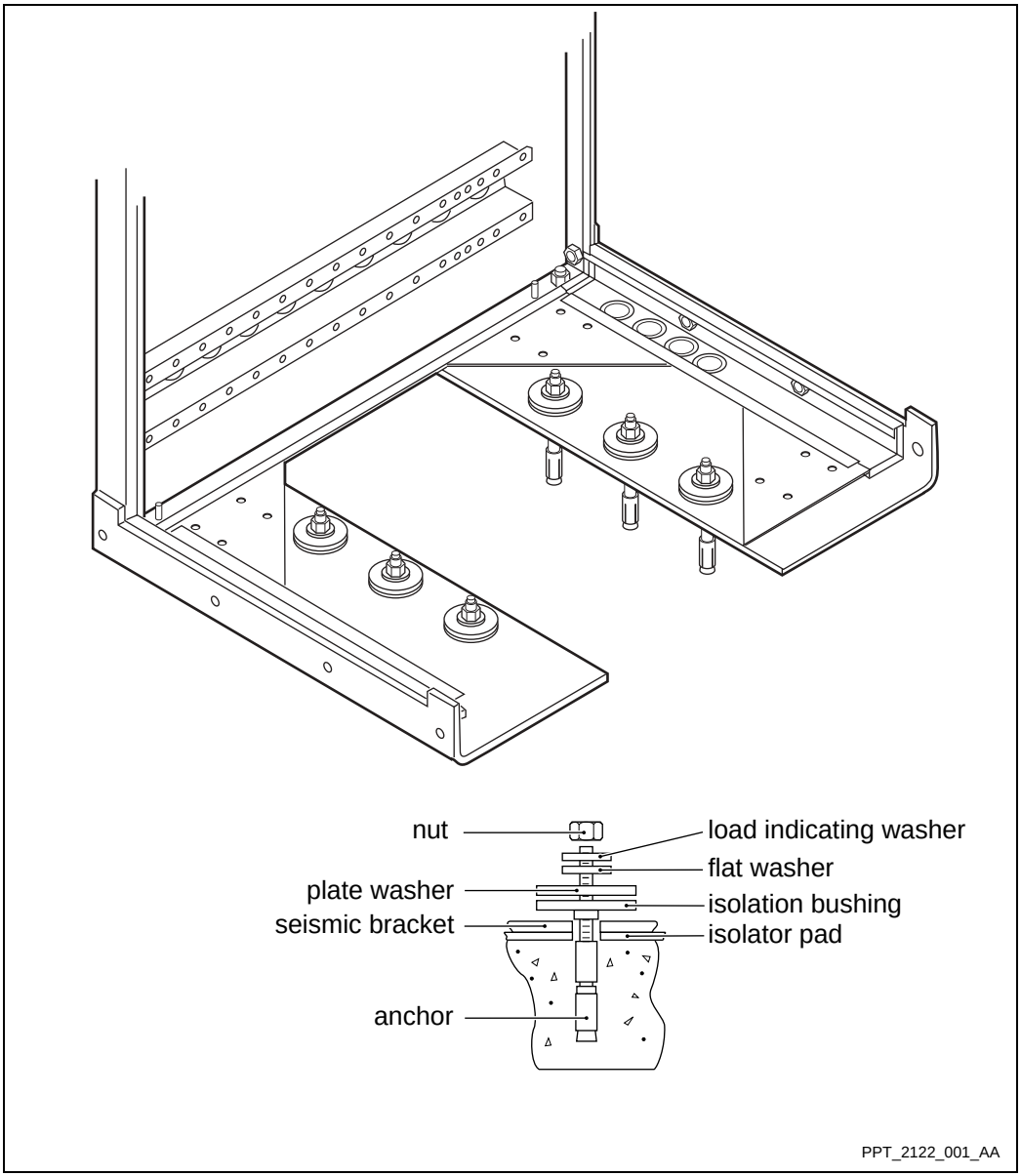
The slot-head screwdriver prevents the threaded rod from turning. As the anchor tightens, you will no longer need to use the slot-head screwdriver to hold the threaded rod. You must then fully tighten the anchor.

11 Torque the anchor to 50 ft-lb. using a socket wrench.

12 Repeat step 8 to step 11 for each anchor.

Procedure job aid

Figure 54
Anchoring a seismic cabinet using an inside-mount anchoring kit



Anchoring a seismic cabinet using an outside-mount anchoring kit

Anchor a seismic cabinet using an outside-mount anchoring kit to achieve NEBS compliance.

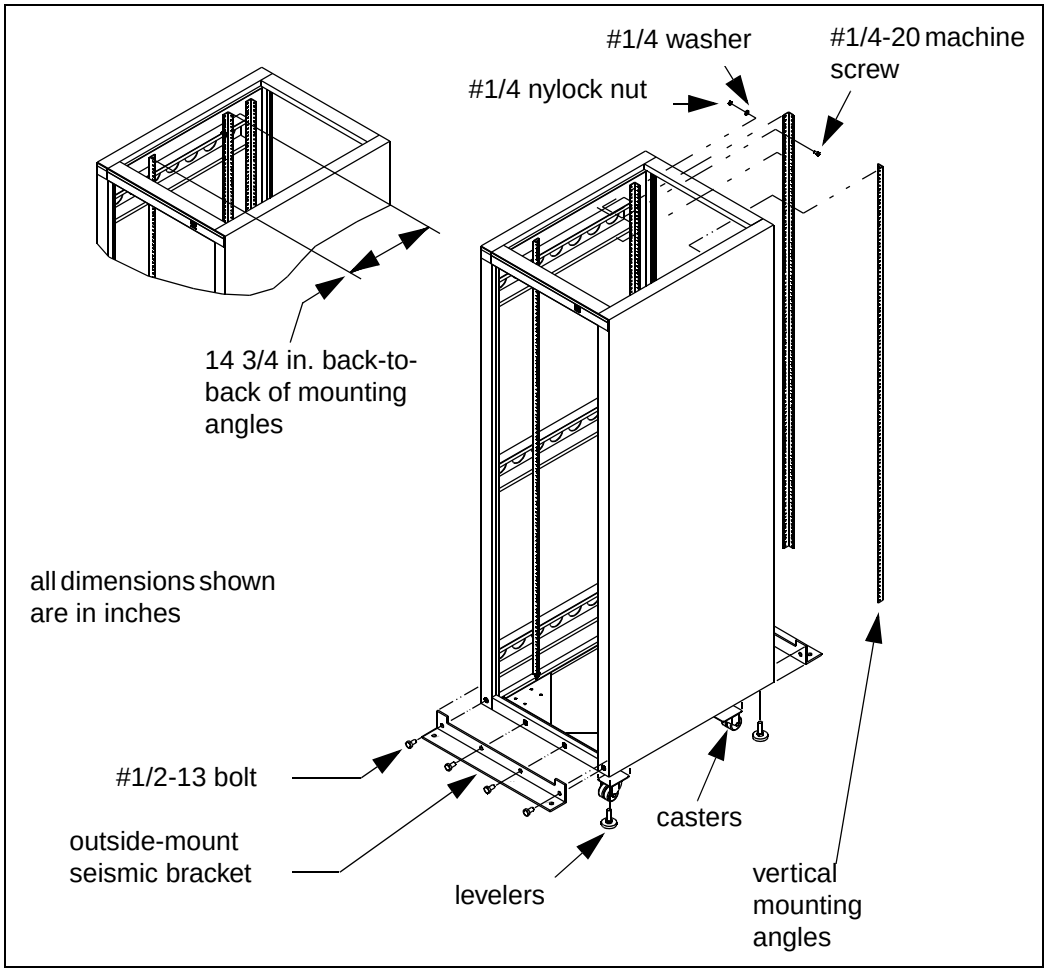
Prerequisites

- You need an outside-mount anchoring kit with PEC NTFN37.

Procedure steps

1. Drill the holes for each of the anchors. Use a roto hammer drill and 1/2” masonry drill bit to drill the holes. Wear safety goggles when you drill the holes.
2. Clean each hole thoroughly with a vacuum cleaner.
3. Tip the cabinet and remove the casters and levellers from the bottom of the cabinet. You need at least one person to support the cabinet while another person removes the casters and levellers.
4. Bolt the brackets to the front and back of the cabinet using the eight bolts provided. See “Seismic cabinet mounting—front view” (page 207).

Figure 55
Seismic cabinet mounting—front view



5 Carefully slide the cabinet into position.

6 Tap an anchor into each anchor hole.

7 Tighten each anchor using a socket wrench.

Avoiding damage from static electricity

To avoid static electricity damage, handle processor cards only when you use appropriate antistatic protection. Nortel Networks recommends using an antistatic wrist strap (PEC A0378999), conductive carpet, conductive shoes, or heel grounders.

If you wear an antistatic wrist strap, attach the cord to a ground. When a Nortel Networks Multiservice Switch cabinet is properly grounded, you can use the electrostatic discharge (ESD) jack on the shelf assembly. For ESD jack locations, see these figures

- “Multiservice Switch 7420 ESD jack location” (page 209)
- “Multiservice Switch 7440 ESD jack location” (page 210)
- “Multiservice Switch 7460 ESD jack location” (page 211)
- “Multiservice Switch 7480 ESD jack location” (page 212)

Nortel Networks provides an antistatic wrist strap with each device. If a device is installed in a cabinet or rack with another device that has an antistatic wrist strap attached to it, you do not need to install a second one.

Handle processor cards by the faceplate or stiffener. Do not touch electrical connections, pins, or soldered surfaces.

Procedure job aid

Figure 56
Multiservice Switch 7420 ESD jack location

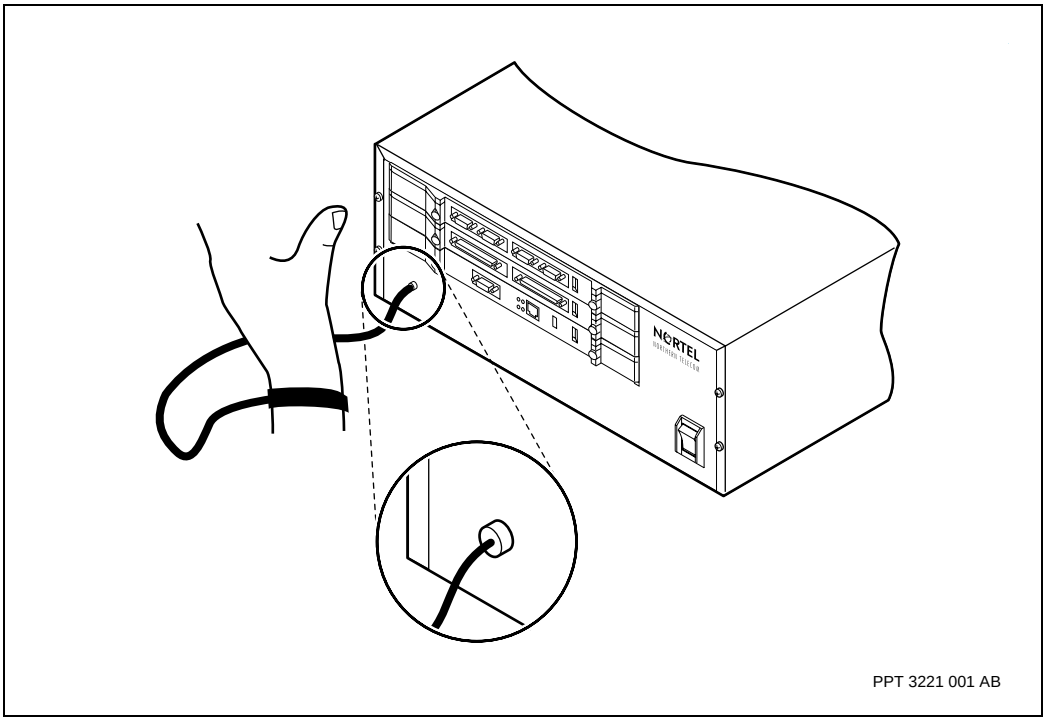


Figure 57
Multiservice Switch 7440 ESD jack location

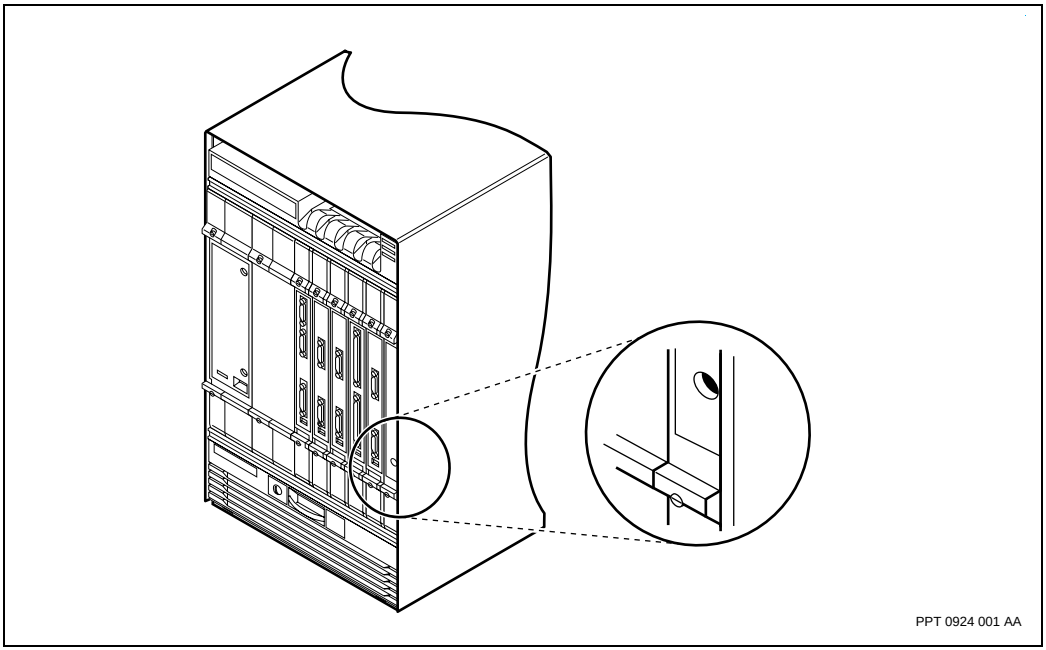


Figure 58
Multiservice Switch 7460 ESD jack location

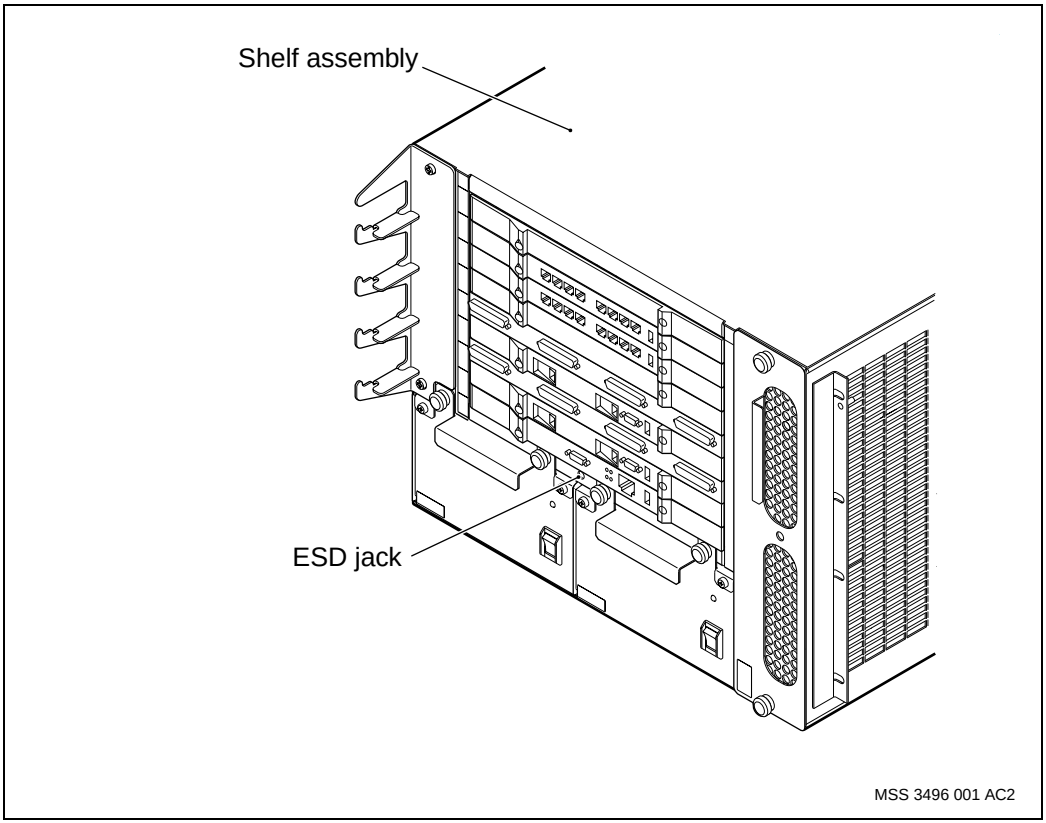
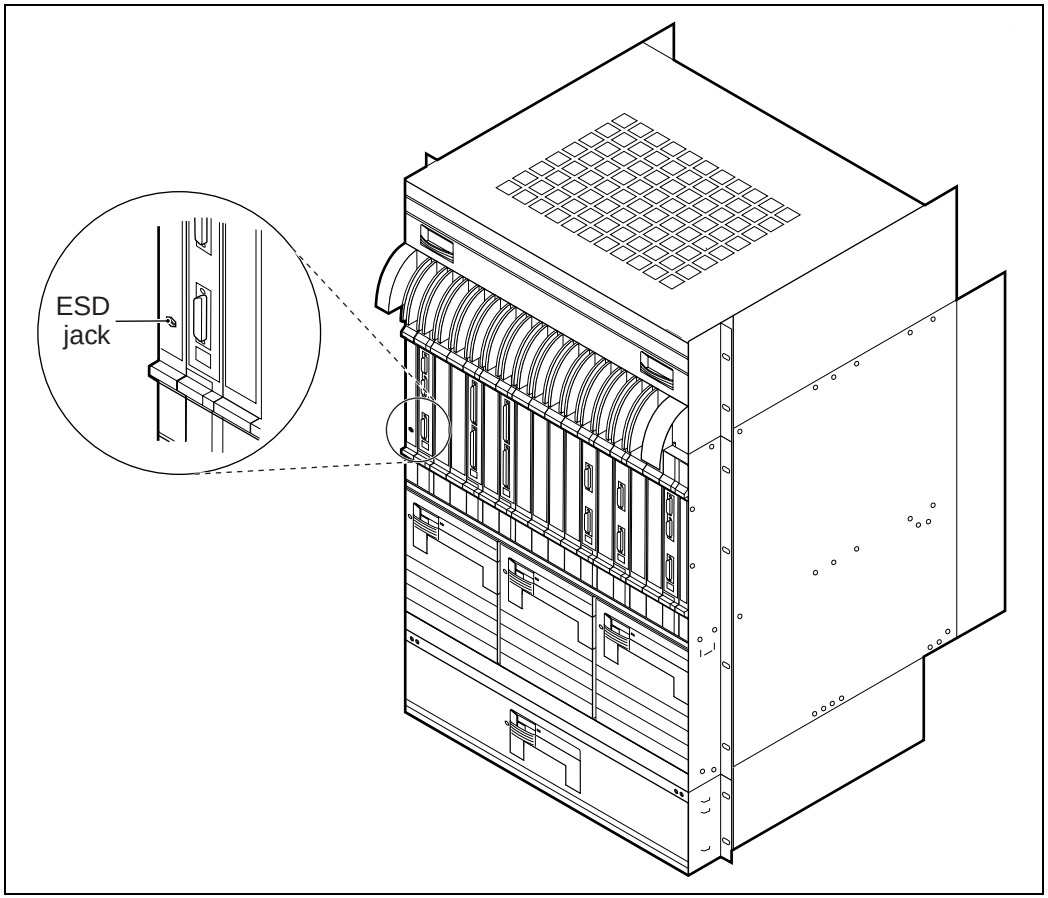


Figure 59
Multiservice Switch 7480 ESD jack location



Changing fasteners on an MSA32 sparing panel

Change the fasteners on the bottom of the following MSA32 sparing panels:

- the only panel in a single-panel BNC or DB15 setup
- the bottom most panel in a multi-panel BNC or DB15 setup
- the only panel in a single-panel RJ-45 setup

The connectors must be changed to D-sub hex screw fasteners to accommodate the FP interface cables which connect to the Main A sparing panel.

Prerequisites

- In a multi-panel RJ-45 setup the inter-panel flexi-cables provide the correct type of connectors for the FP interface cables, so there is no need to change the fasteners in this case.
- Fasteners are included in the installation kit.
- Fasteners are changed after the sparing panel is installed on the rack.

Procedure steps

1. Locate the sparing panel that is to be connected to the spare MSA32 FP, that is, the bottom panel in the 1:n series or the only panel in a 1:1 configuration. The single or bottom panel is the Main A panel.
2. Ensure that the Main A is mounted onto the cabinet, frame, or rack and it remains uncabled.
3. Locate the sparing connectors that are to have their D-sub fasteners changed. The sparing connectors are identified by the letters A, B, C, and D in the figures “Location of MSA32 connectors to have screws changed on a 1:1 configuration” (page 214) and “Location of MSA32 connectors to have screws changed on the bottom 1:n sparing panel” (page 215).
4. Remove the pairs of 11/64-inch (4.4-mm) D-sub stud fasteners from the faceplate of the panel at each identified sparing connector. Put the fasteners aside as spares. To distinguish the stud from hex fasteners, refer to the figure “MSA32 sparing panel cable connector screws” (page 216).
5. Where each stud fastener was removed, add an 11/64-inch (4.4-mm) hex fastener from the installation kit. Tighten each hex fastener to snug (no

extra turns) until the bottom of the hex shank is flush against the face of the panel.

Procedure job aid

Figure 60
Location of MSA32 connectors to have screws changed on a 1:1 configuration

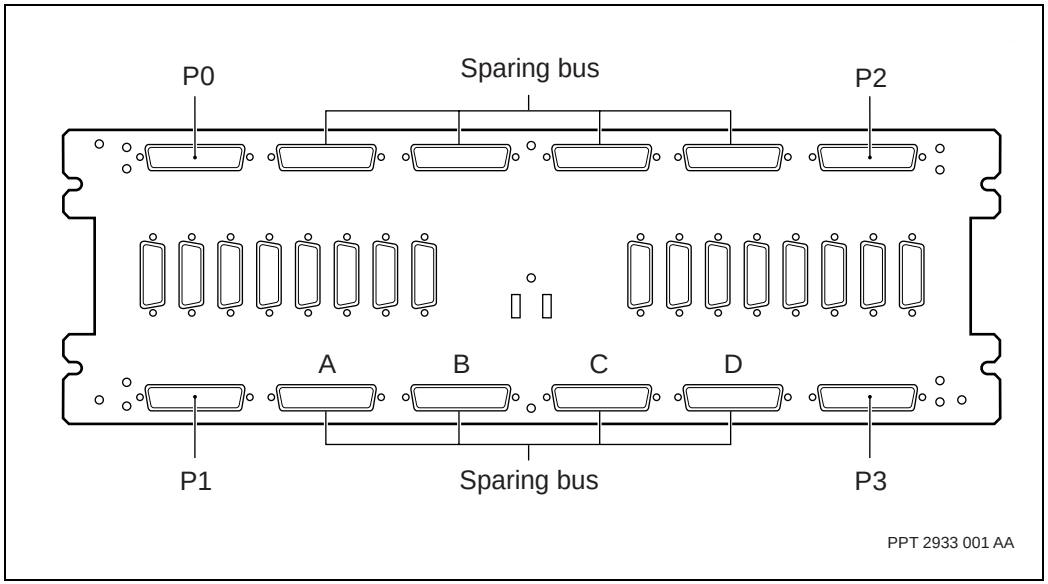


Figure 61
Location of MSA32 connectors to have screws changed on the bottom 1:n sparing panel

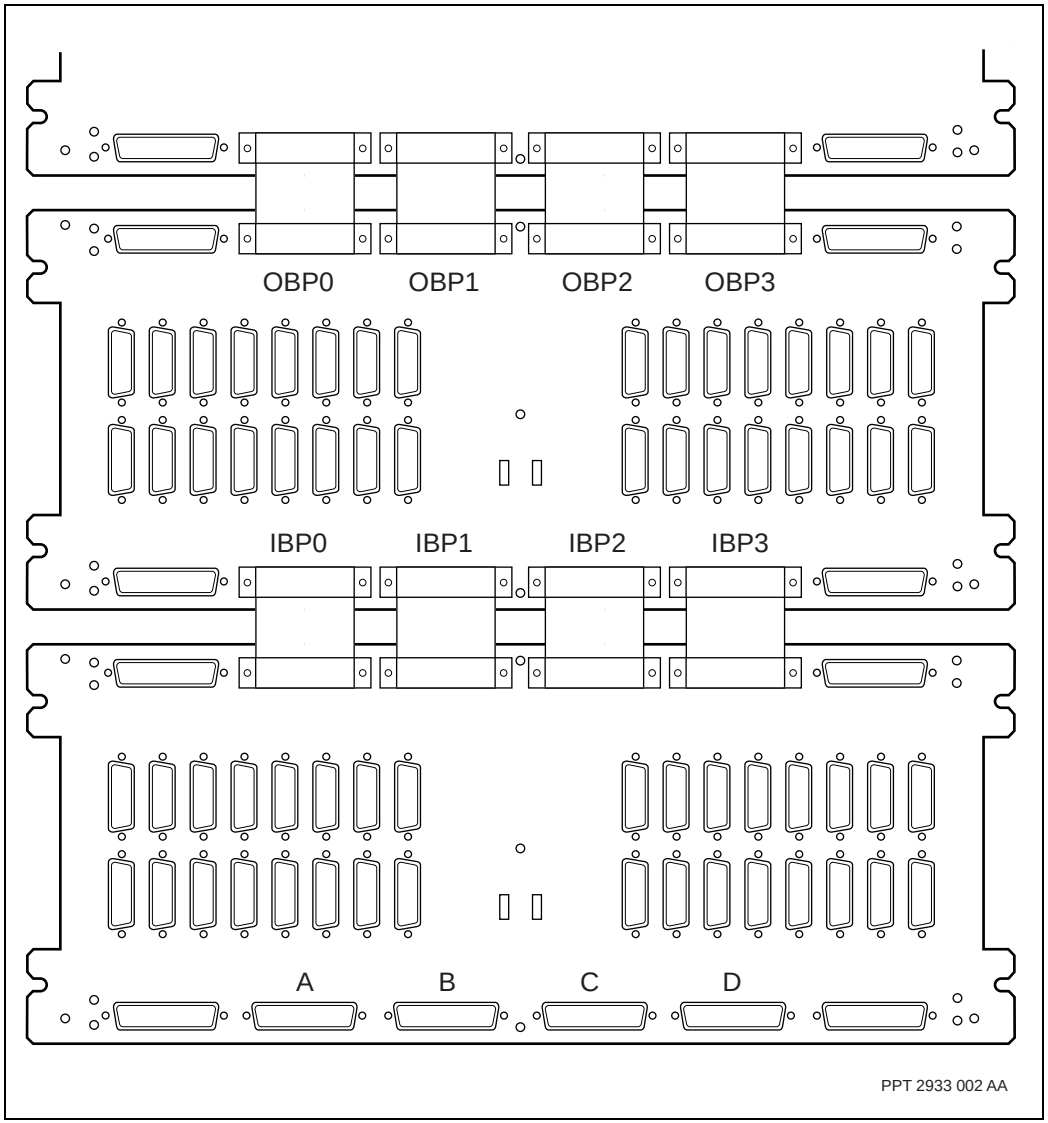
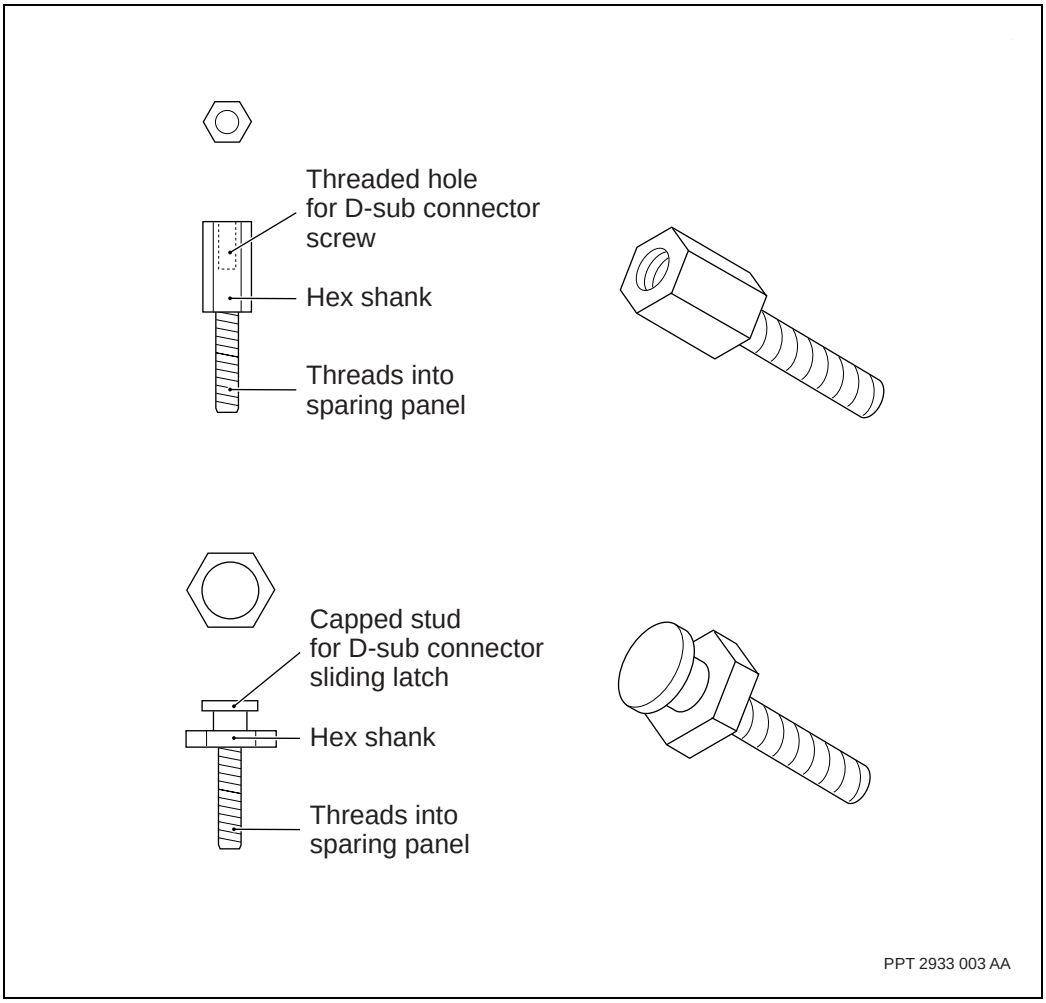


Figure 62
MSA32 sparing panel cable connector screws



Configuring the modem software

Configure the modem software after you set the modem DIP switches.

Prerequisites

Ensure that you have a computer or terminal with an RS-232 port that you can temporarily connect to the modem while you adjust the modem settings. The RS-232 port must be capable of running at 9600 BPS; otherwise, the modem will not be able to communicate with the local operator port on the device.

Procedure steps

1. On the modem, set DIP switch 8 for the smart mode to on (down).
2. Turn off the power to the modem, then turn it on again.
3. Set the computer or terminal to use software flow control, also referred to as the data leads only mode. Otherwise the modem may not be able to communicate with the computer or terminal.
4. Connect the modem to the RS-232 port of a computer or terminal using a standard straight-through serial cable. Typically, the cable has a 9-pin D-sub female connector at one end and a 25-pin D-sub male connector at the other end.

   Note: Do not use the V.24 DCE cable (PEC NTBP25xx) provided with the device. Also, do not use the cable you want to use to connect the modem to the CP.
5. Enter the following commands:
   - ATQ0 (with a zero, displays result codes so that the modem responds with OK after this command and whenever an attention command (AT) is entered)
   - ATZ4 (loads a generic hardware flow control configuration when the cable from “Modem cable specifications” (page 175) is to be used. Otherwise enter ATZ5. Some functionality will be disabled)
   - ATQ0 (with a zero, displays result codes and OK)
   - AT&M0 (optional command) (with a zero, disables error control; use only if the dialing modem does not support error control)
   - AT&W0 (with a zero, writes the current configuration to non-volatile memory, NVRAM 0)
   - ATY0 (with a zero, uses NVRAM 0 as the default configuration)
6. Disconnect the modem from the computer or terminal.

7 While the modem is still powered, return its operation to dumb mode by setting DIP switch 8 back to off (up).

8 Turn the modem off and on again to load the changes.

Connecting a cable between a modem and a device

Connect a cable between a modem and a device after you have configured the modem software.

Prerequisites

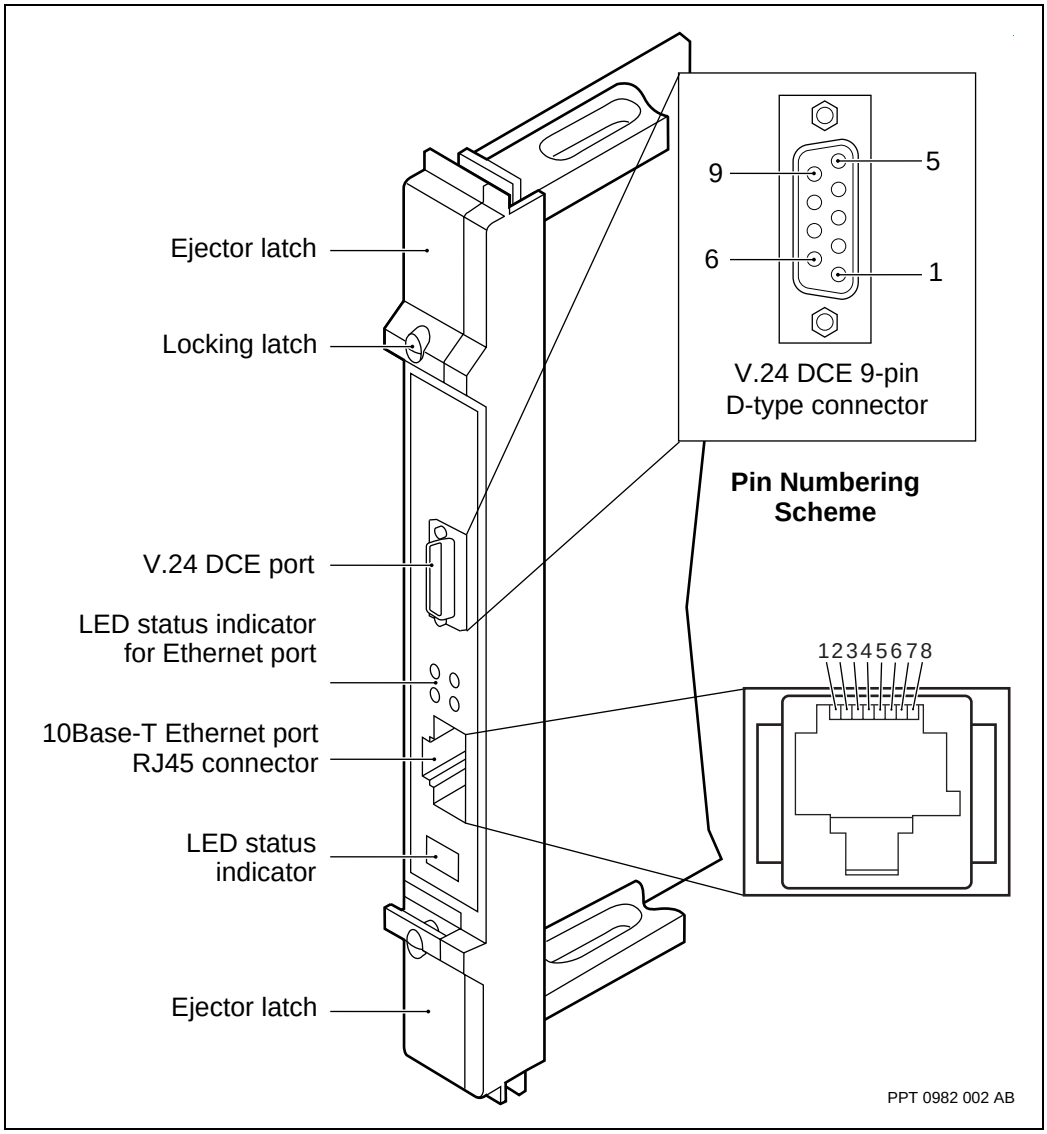
Ensure that the cable complies with all of the specifications contained in “Modem cable specifications” (page 175).

Procedure steps

1. Plug the 9-pin connector on the cable into the port 1 connector on the faceplate of the CP. See the figure “Control processor faceplate” (page 220).
2. Route the other end of the cable through the cable organizer to the rear of the device.
3. If the device is in a cabinet, place the modem at the rear of the device. Find a way to fasten it to the cable guide on the side that is nearest to where the cable passes over the top of the shelf.
4. Plug the modem into a dedicated power outlet. Follow the instructions provided by the manufacturer of the modem.
5. Plug the other end of the into the appropriate port on the modem. Follow the instructions provided by the manufacturer of the modem.

Procedure job aid

Figure 63
Control processor faceplate



Connecting a local operator terminal to a Multiservice Switch 7400

Connect a local operator terminal to a Nortel Networks Multiservice Switch 7400 to manage the node locally. During initial commissioning, use this terminal to set up a connection to your network management system.

Prerequisites

- The local operator terminal should be a VT100 or a device that emulates a VT100 terminal.
- Ensure that the local operator terminal settings match the settings for the V.24 DCE port (port 1) on the faceplate of the control processor: 9600 bit/s, 1 stop bit, no parity.
- Ensure that the 9-pin "D" type interface cable is a shielded cable and complies with the specifications contained in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. See "Making a braided shield" (page 379).
- If you want to print any alarms that appear on-screen, connect the local terminal to a printer before you connect the terminal to the Multiservice Switch 7400.

Procedure steps

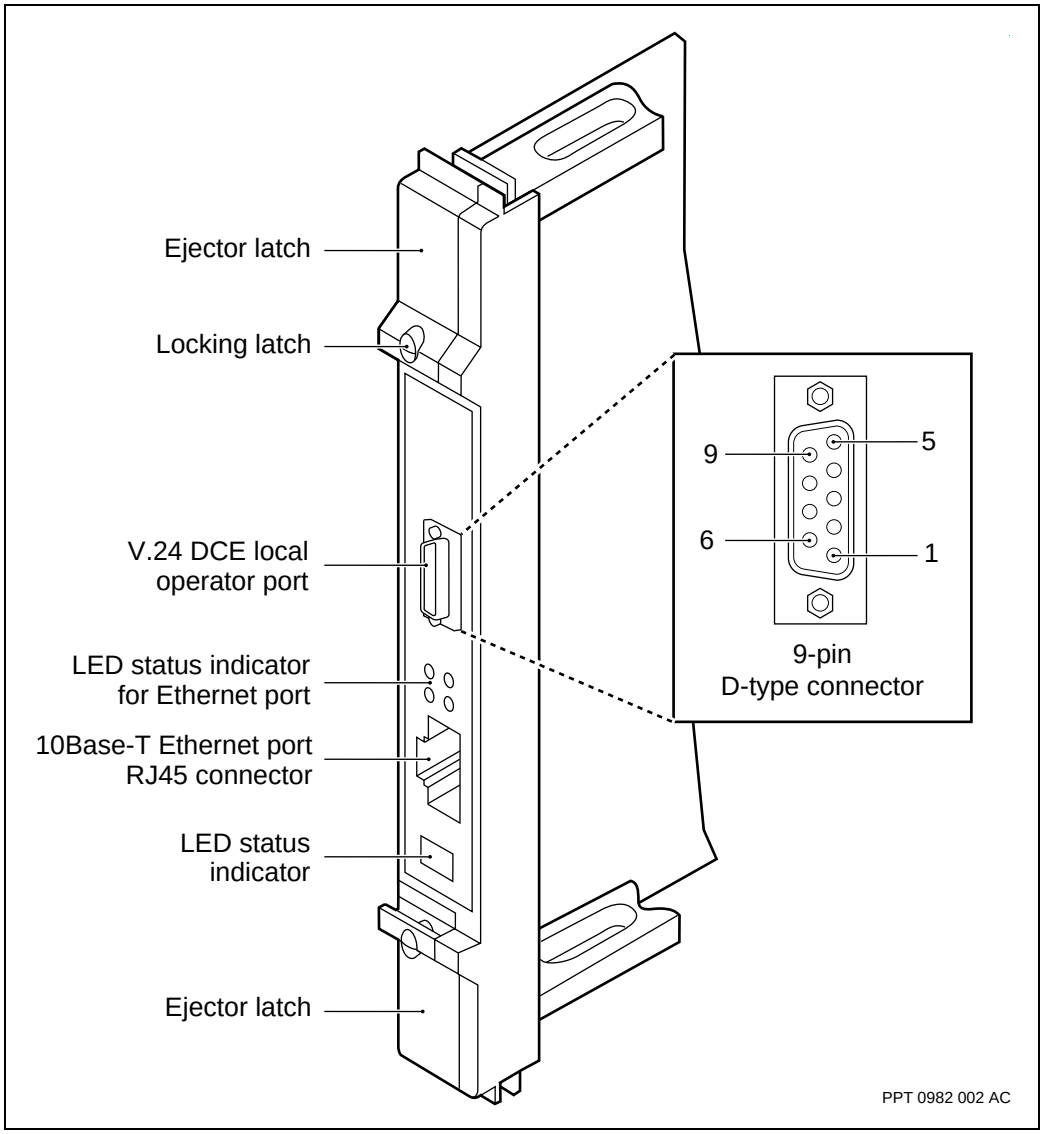
1. Route the V.24 terminal cable from your terminal to the device with enough length to reach the local operator port.
2. If you plan to keep the cable permanently attached, you can run the cable through the cable management assembly.
3. Label the cable for future reference.
4. Connect the terminal cable to the control processor V.24 DCE port (port 1). See Figure 64, "Local operator port on the CP faceplate," (page 223).
5. Secure the cable connector to the local operator port by tightening the screws. Use a 6 mm (1/4 in.) slot screwdriver to do this.

   You can now provision the device. If you plan to connect to a network management system, you need to access StartUp software. See NN10600-270 *Nortel Networks Multiservice Switch 7400/15000/20000 Software Installation*. StartUp software enables you to connect your device to the rest of your network.

If you do not plan to use a network management system, you can use your local operator terminal to provision the device.

Procedure job aid

Figure 64
Local operator port on the CP faceplate



Disconnecting a local operator terminal or modem from a device

Disconnect a local operator terminal or modem from a device if you no longer need to use the device or if you need to replace the cable.

Procedure steps

1. Disconnect the V.24 cable connected to port 1 on the faceplate of the CP by loosening the captive screws. See “Local operator port on the CP faceplate” (page 223).
2. Remove the cable. If the cable has been run through the cable management assembly, be careful not to disrupt other cables in the assembly.
3. If necessary, disconnect the other end of the cable from the terminal or modem.

Grounding a dc-powered Multiservice Switch 7420

Ground Nortel Networks Multiservice Switch equipment to protect both personnel and equipment.

Prerequisites

- Ensure that you have read and fully understand the grounding requirements. For more information, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. If you use a terminal in your installation, you must ground both the outlet that provides power to the terminal and the cabinet or rack to the same distribution panel.

Procedure steps

1 Connect the green/yellow ground cable (AWG #12 or #14) to the ground stud located at the bottom left of the rear housing. See the figure "Grounding a dc power supply for a Multiservice Switch 7420" (page 226).

This wire must be the only wire secured by the nut provided. If you require other grounds, attach the wires on top of the first ground nut and add another nut to secure them.

2 If the device is in a cabinet, connect the other end of the grounding cable to a grounding nut on the cabinet. See the figure "Multiservice Switch cabinet grounding points" (page 234).

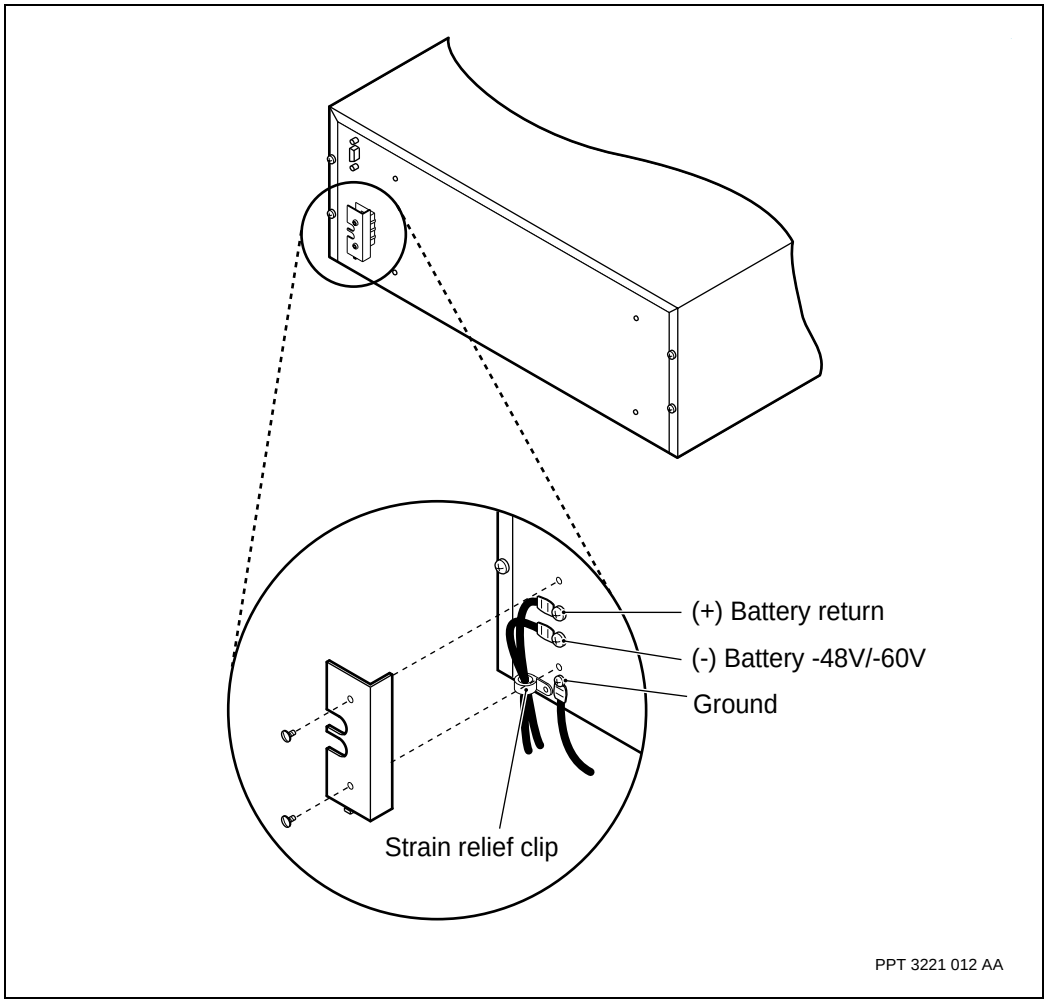
If the device is in a standard 19" rack, connect the other end of the grounding cable to a ground point on the frame.

If the device is desk-top or vertical mounted, connect the other end of the grounding cable to the site ground window.

After you ground the device, wear the antistatic wrist strap to protect the device and processor cards from electrostatic discharge.

Procedure job aid

Figure 65
Grounding a dc power supply for a Multiservice Switch 7420



Grounding a dc-powered Multiservice Switch 7440

Ground Nortel Networks Multiservice Switch devices to protect both personnel and equipment.

Prerequisites

- Ensure that you have read and fully understand the grounding requirements. For more information, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. If you use a terminal in your installation, you must ground both the outlet that provides power to the terminal and the cabinet or rack to the same distribution panel.
- The ac power cord grounds the ac-powered Multiservice Switch 7440 so you do not need to perform a separate grounding procedure.

Procedure steps

1 Connect the green/yellow ground lead to the ground stud located on the upper ground strip of rear housing. See the figure “Grounding a dc power supply for a Multiservice Switch 7440” (page 228).

This wire must be the only wire secured by the nut provided. If you require other grounds, attach the wires above the first ground nut and add another nut to secure them.

2 If the device is in a cabinet, connect the other end of the grounding lead to a grounding nut on the cabinet. See the figure “Multiservice Switch cabinet grounding points” (page 234).

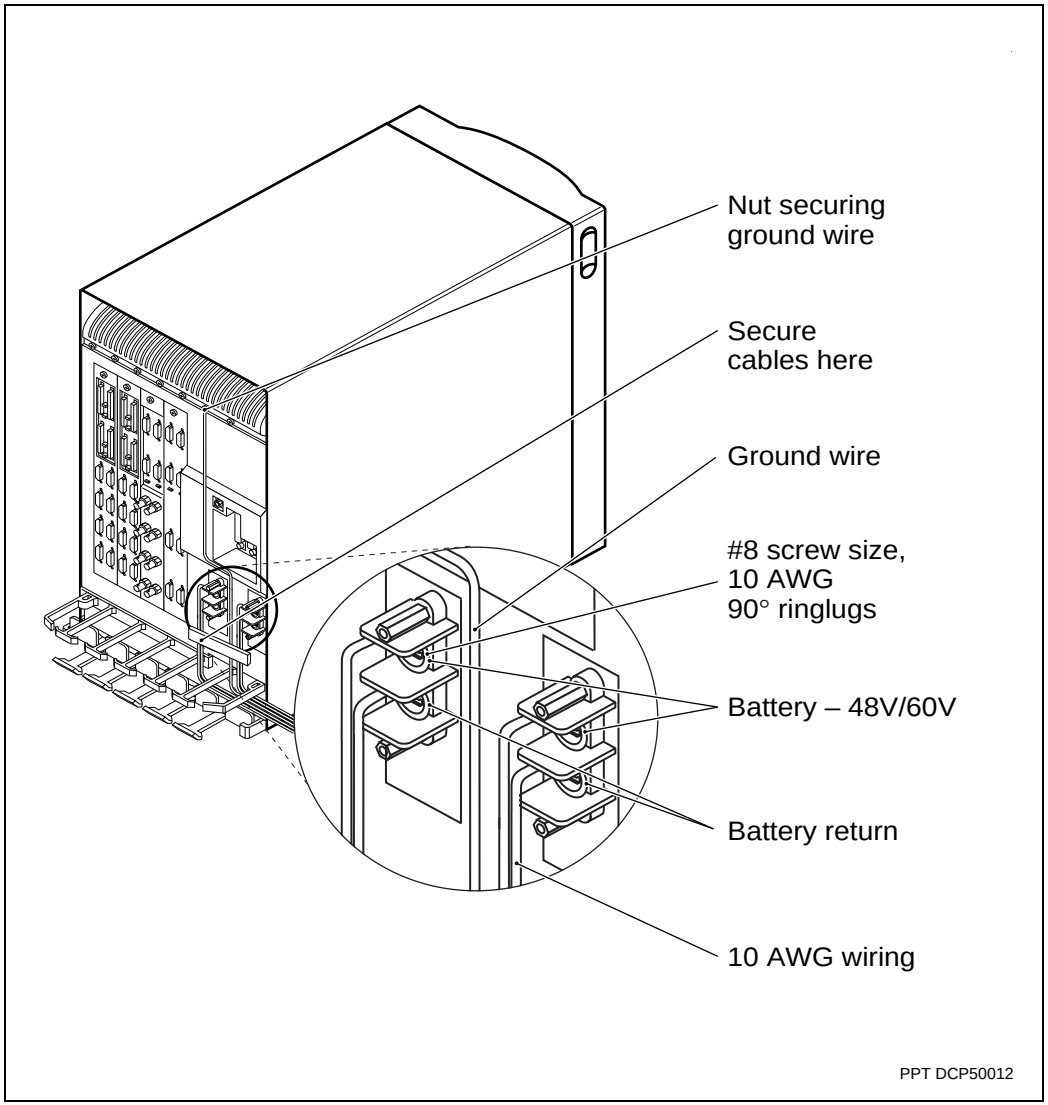
If the device is in a standard 19” rack, connect the other end of the grounding lead to a ground point on the frame.

If the device is desk-top mounted, connect the other end of the grounding lead to the site ground window.

After you ground your device, wear the antistatic wrist strap to protect the device and processor cards from electrostatic discharge.

Procedure job aid

Figure 66
Grounding a dc power supply for a Multiservice Switch 7440



Grounding a dc-powered Multiservice Switch 7460

Ground Nortel Networks Multiservice Switch equipment to protect both personnel and equipment.

Prerequisites

- Ensure that you have read and fully understood the grounding requirements, as described in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. If you use a terminal in your installation, you must ground both the outlet that provides power to the terminal and the cabinet or rack to the same distribution panel.
- The remote alarm panel and any termination panels (sparing panel or fanout panel) must share the same site ground window as the device.
- Have an antistatic wrist strap available so that it can be worn to protect processor cards as soon as the device is grounded.

Procedure steps

1 Connect the green/yellow ground lead (NTBP63) to the stud located beside the power input terminal block on the rear of the shelf assembly. The nut on the stud is a #8-32. See the figure “Grounding a dc-powered Multiservice Switch 7460” (page 229).

This wire must be the only wire secured by the nut provided. If you require other grounds, attach the wires above the first ground nut and add another nut to secure them.

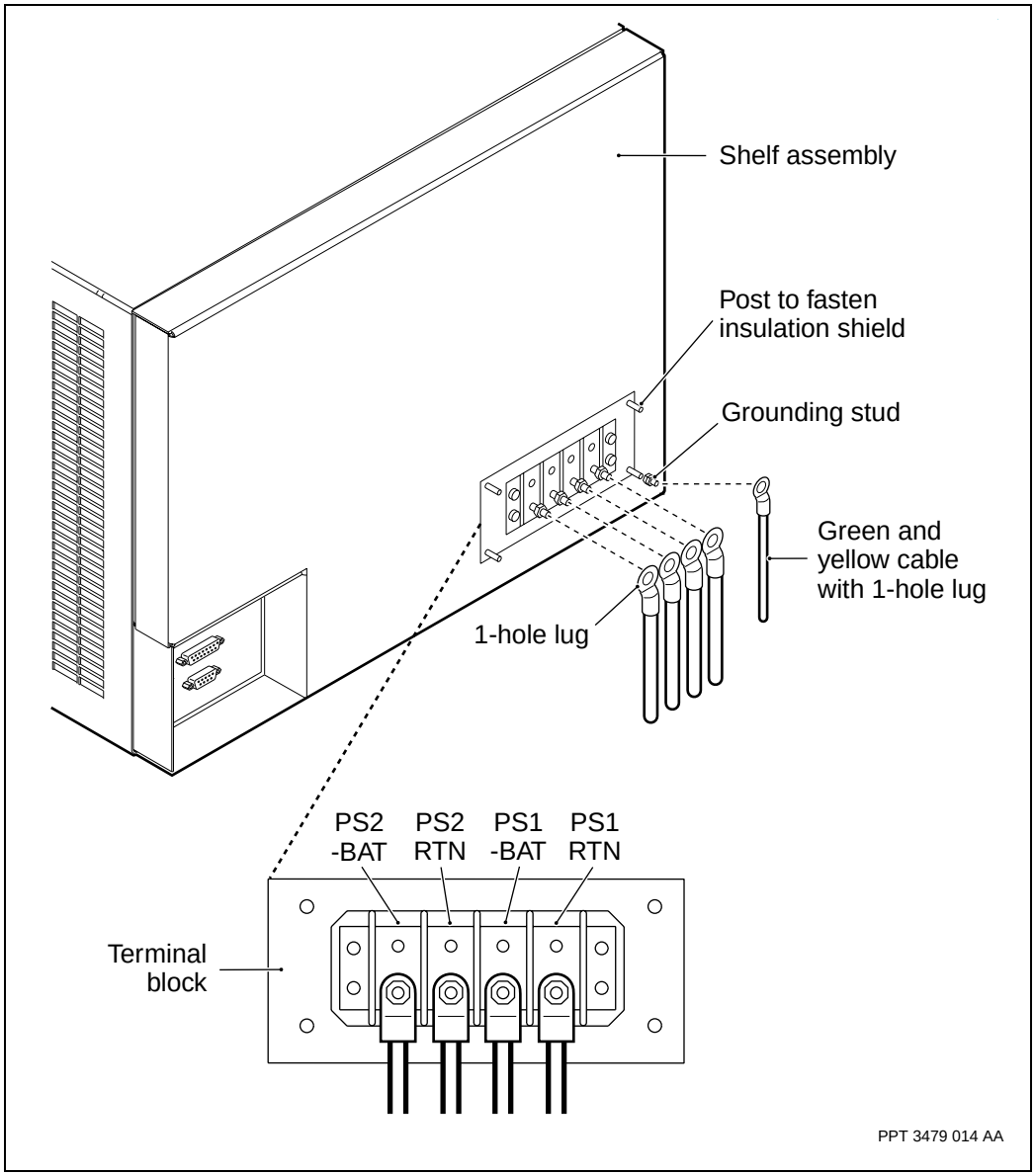
2 If the device is in a cabinet, connect the other end of the grounding lead to a grounding nut on the cabinet. See the figure “Grounding a Multiservice Switch 7460 to the site ground window” (page 230).

If the device is or will be in a standard 19” rack, connect the other end of the grounding lead to a ground point on the rack provided the rack is also grounded to the site’s dc ground window. Ensure that bare metal contacts the lug of the grounding cable.

3 Dress the cable with tie-wraps to keep it away from servicing equipment, for example, termination panels that are mounted at the rear of a cabinet.

Procedure job aid

Figure 67
Grounding a Multiservice Switch 7460 to the site ground window



Grounding a Multiservice Switch 7480

Ground Nortel Networks Multiservice Switch equipment to protect both personnel and equipment.

Prerequisites

- Ensure that you have read and fully understand the grounding requirements. For more information, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. If you use a terminal in your installation, you must ground both the outlet that provides power to the terminal and the cabinet or rack to the same distribution panel.

Procedure steps

1 Connect one end of the grounding cable to the ground on the shelf assembly using an 11/32-in. socket wrench. See the figure “Shelf assembly grounding stud” (page 232).

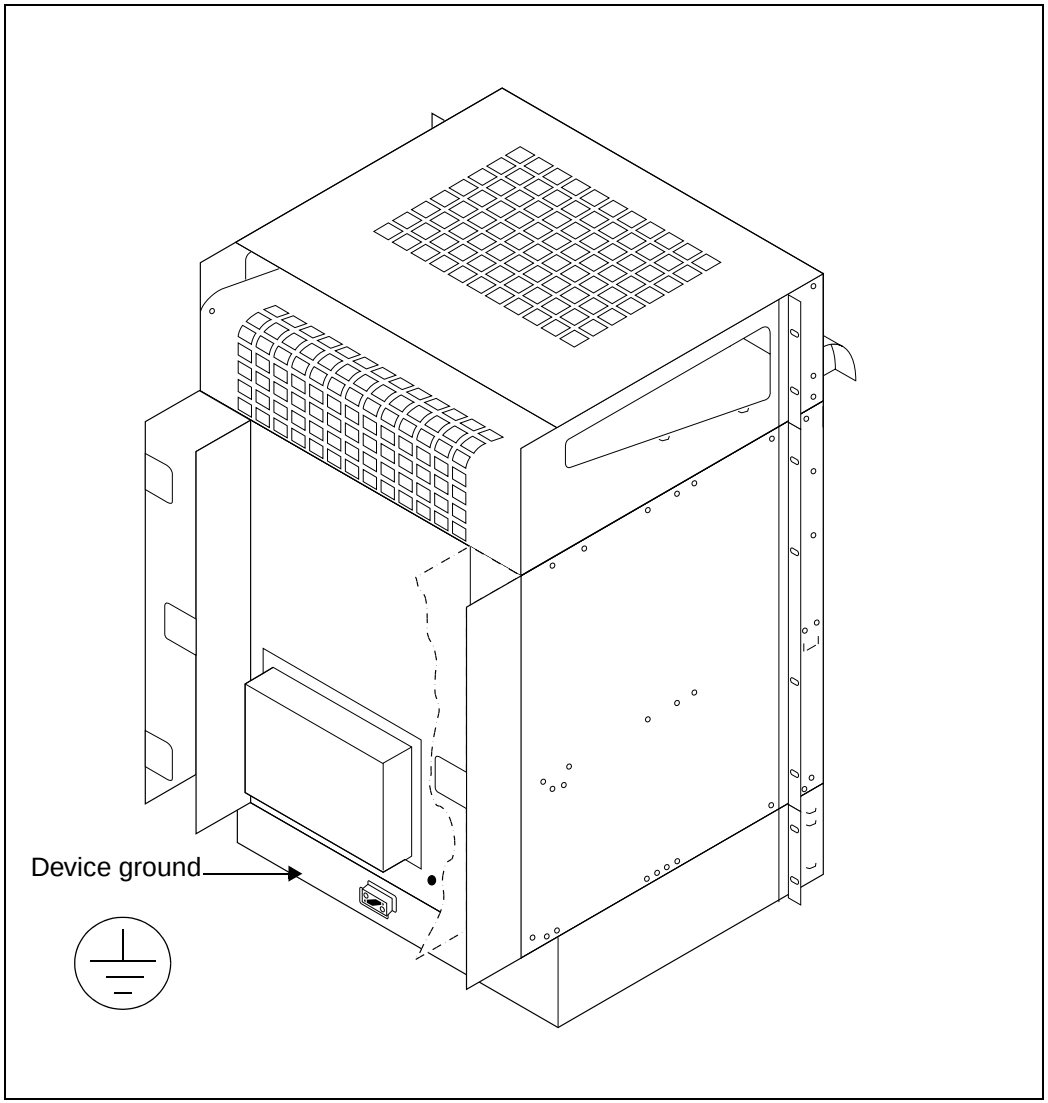
2 If the device is in a cabinet, connect the other end of the cable to the grounding nut on the cabinet frame. Use a 3/8-in. socket wrench to do this. The figure “Multiservice Switch cabinet grounding points” (page 234) shows the grounding points in a cabinet.

If the device is in a standard 19-in. rack, connect the other end of the cable to a ground point on the frame.

Some Multiservice Switch dc-powered devices have an extra lug on the right-hand side of the terminal block, labeled GND. Do not use this extra lug. It must remain unconnected.

Procedure job aid

Figure 68
Shelf assembly grounding stud



Grounding a Multiservice Switch cabinet

Ground a Nortel Networks Multiservice Switch cabinet to protect personnel and equipment.

Procedure steps

1 Use 6 gauge (.51 mm) wire with 1/8 in. lugs to connect the grounds from the cabinet and other equipment to the power distribution panel ground. For more information about grounding requirements, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

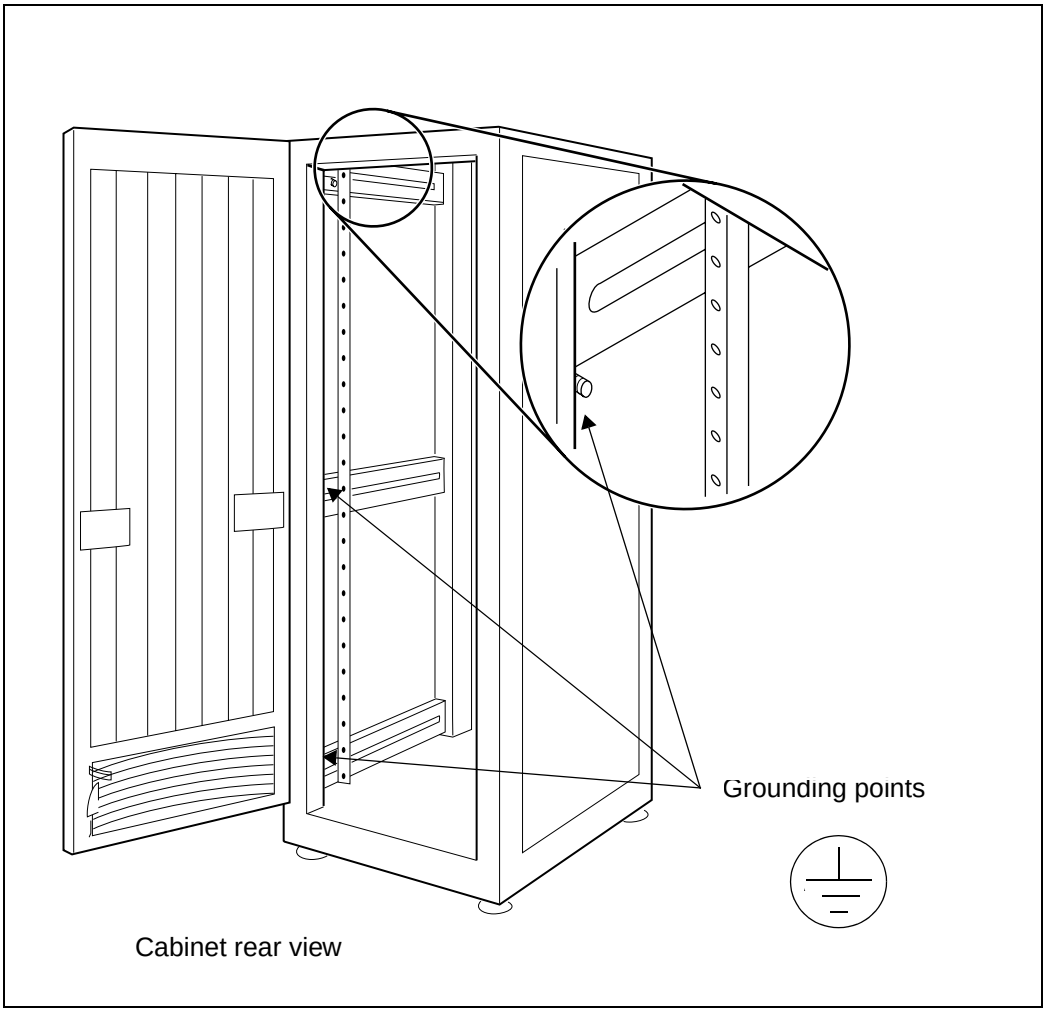
See the figure “Multiservice Switch cabinet grounding points” (page 234) for the location of the cabinet’s grounding points.

Multiservice Switch cabinet shelf assemblies are pre-grounded to the cabinet frame.

2 If the cabinet already contains a device, ensure that all power cords are connected to a properly grounded outlet.

Procedure job aid

Figure 69
Multiservice Switch cabinet grounding points



Installing a 13-inch termination panel on a Multiservice Switch 7420

Install a 13” termination panel on the rear of a Nortel Networks Multiservice Switch 7420 if you do not want to install the termination panels in a rack or cabinet.

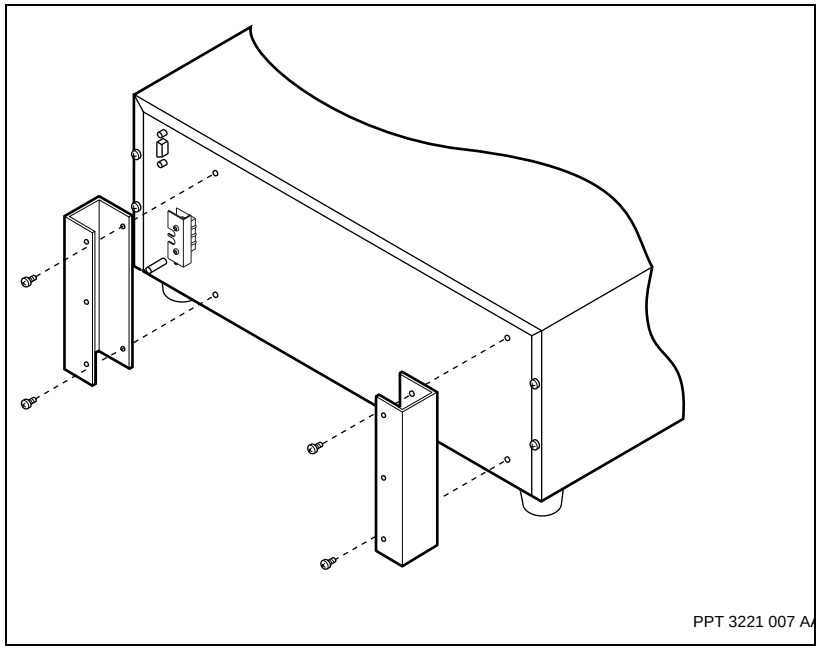
Prerequisites

- You need the mounting hardware in the termination panel kit (NTHQ09).
- Nortel Networks recommends that you install the 13” termination panels before you install the device in a rack.
- Ground yourself to an appropriate anti-static discharge apparatus while handling the shelf assembly (device).

Procedure steps

1 Attach the raised mounting brackets to the rear panel of the chassis as shown in the figure “Multiservice Switch 7420 termination panel mounting brackets” on page 236.

Figure 70
Multiservice Switch 7420 termination panel mounting brackets

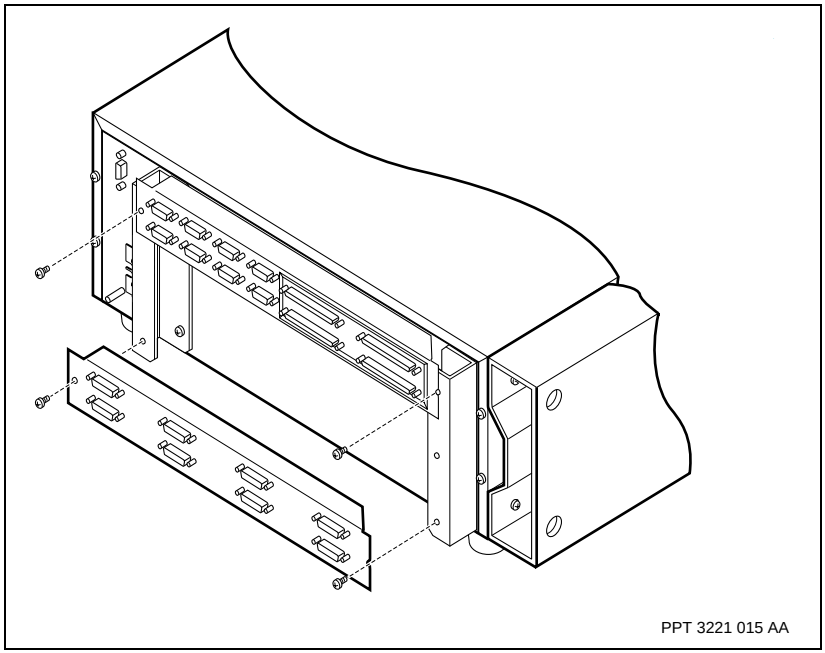


2 Position the termination panels so that the top most panel aligns with the top-most processor card. This arrangement simplifies cable routing.

3 Align the holes at the top and bottom of the termination panel with the holes on the raised mounting brackets.

4 Loosely fasten the screws to attach the termination panels to the brackets. See the figure “Multiservice Switch 7420 termination panel installation” on page 237.

Figure 71
Multiservice Switch 7420 termination panel installation



5 Repeat these steps for any remaining termination panels.

6 Securely tighten the mounting screws for each termination panel with a flat-blade screw driver. Do not over tighten.

Installing a 13-inch termination panel on a Multiservice Switch 7440

Install a 13” termination panel on the rear of a Nortel Networks Multiservice Switch 7440 if you do not want to install the termination panels in a rack or cabinet.

Prerequisites

CAUTION
Risk of equipment damage
To avoid damaging equipment when installing or removing a 13” termination panel, do not force the bottom of the termination panel against the cable manager.

- A mounting screw at the top of the rear housing of the device fastens 13” termination panels in place. The strip into which you insert this screw is connected to the frame ground. Properly installing a 13” termination panels automatically grounds it.
- Ground yourself to an appropriate anti-static discharge apparatus while handling the shelf assembly (device).

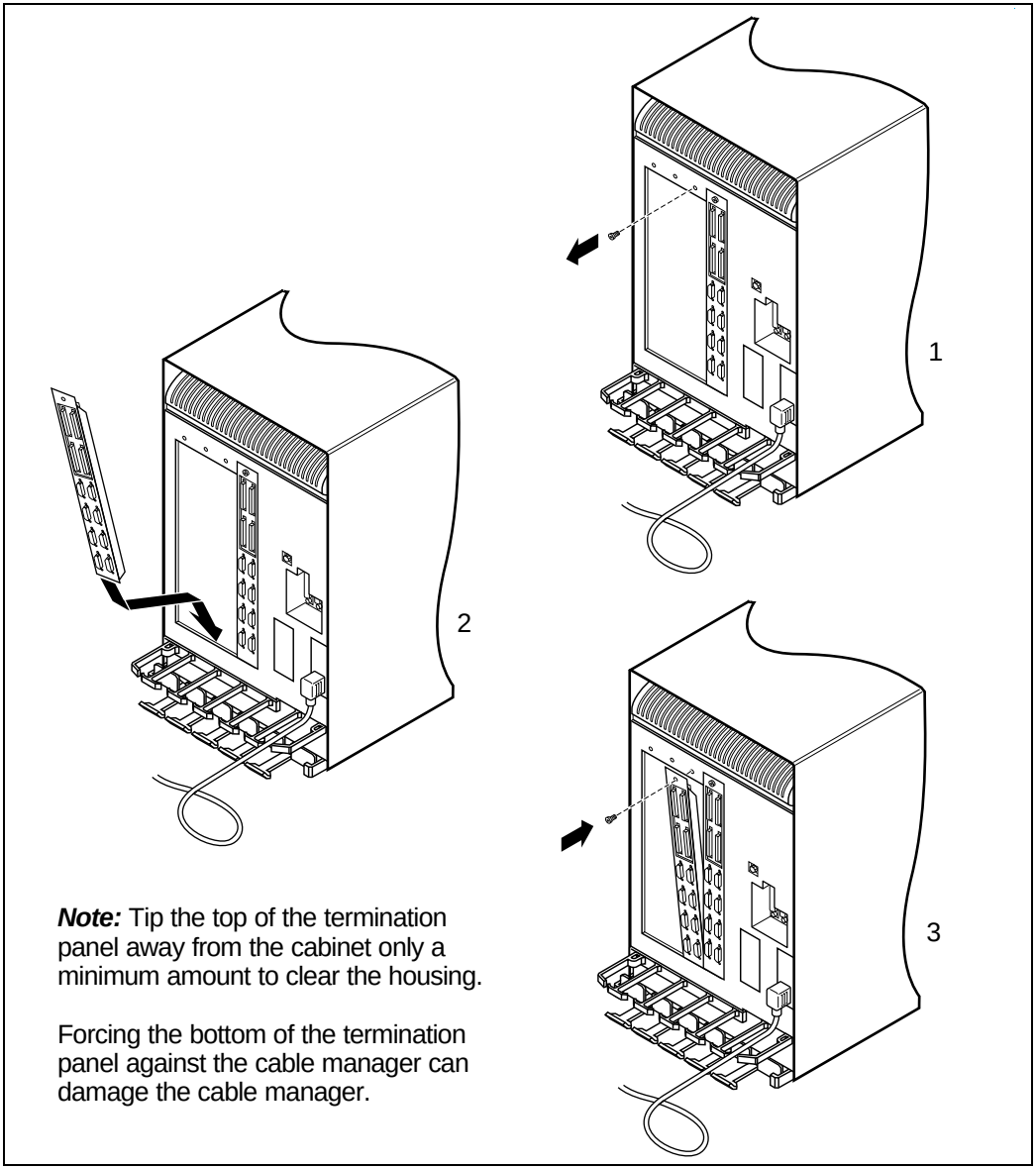
Procedure steps

1. Remove the mounting screw from the top of a termination panel slot on the back of the device. Put the screw aside for re-use.
2. Insert the lower corner of a termination panel into the bottom of the slot and tip it upwards, into place. Ensure that you insert the termination panel into the same slot as its associated FP on the opposite side of the device.

   Take care when inserting the termination panel. Tip the top of the termination panel away from the cabinet only enough to clear the housing. Do not pry the upper cable manager off the rear housing.
3. Secure the termination panel by replacing the mounting screw you removed in step 1.

Procedure job aid

Figure 72
Installing a 13” termination panel



Note: Tip the top of the termination panel away from the cabinet only a minimum amount to clear the housing.

Forcing the bottom of the termination panel against the cable manager can damage the cable manager.

Installing a 19-inch rack-mounted termination panel

Install a 19” rack-mounted termination panel if you want to install the termination panels in a rack or cabinet. You can use 19” termination panels with any Nortel Networks Multiservice Switch device.

Prerequisites

- Ground yourself to an appropriate anti-static discharge device while handling the termination panel.

Procedure steps

1 Make sure that there is bare metal on the rear portion of both ends of the termination panel.

2 If you are installing the first termination panel, connect the grounding lead (supplied separately by Nortel Networks) to the top right securing screw. See the figure “Grounding 19” termination panels” (page 241).

or

If you are installing the lowest termination panel in the rack, secure the bottom of the grounding strip and a ground wire to the rack with a screw.

3 Secure the termination panel to the frame with the 4 screws provided. Leave the bottom right screw loose.

4 Insert the grounding strip between the termination panel and the rack. See the figure “Grounding 19” termination panels” (page 241).

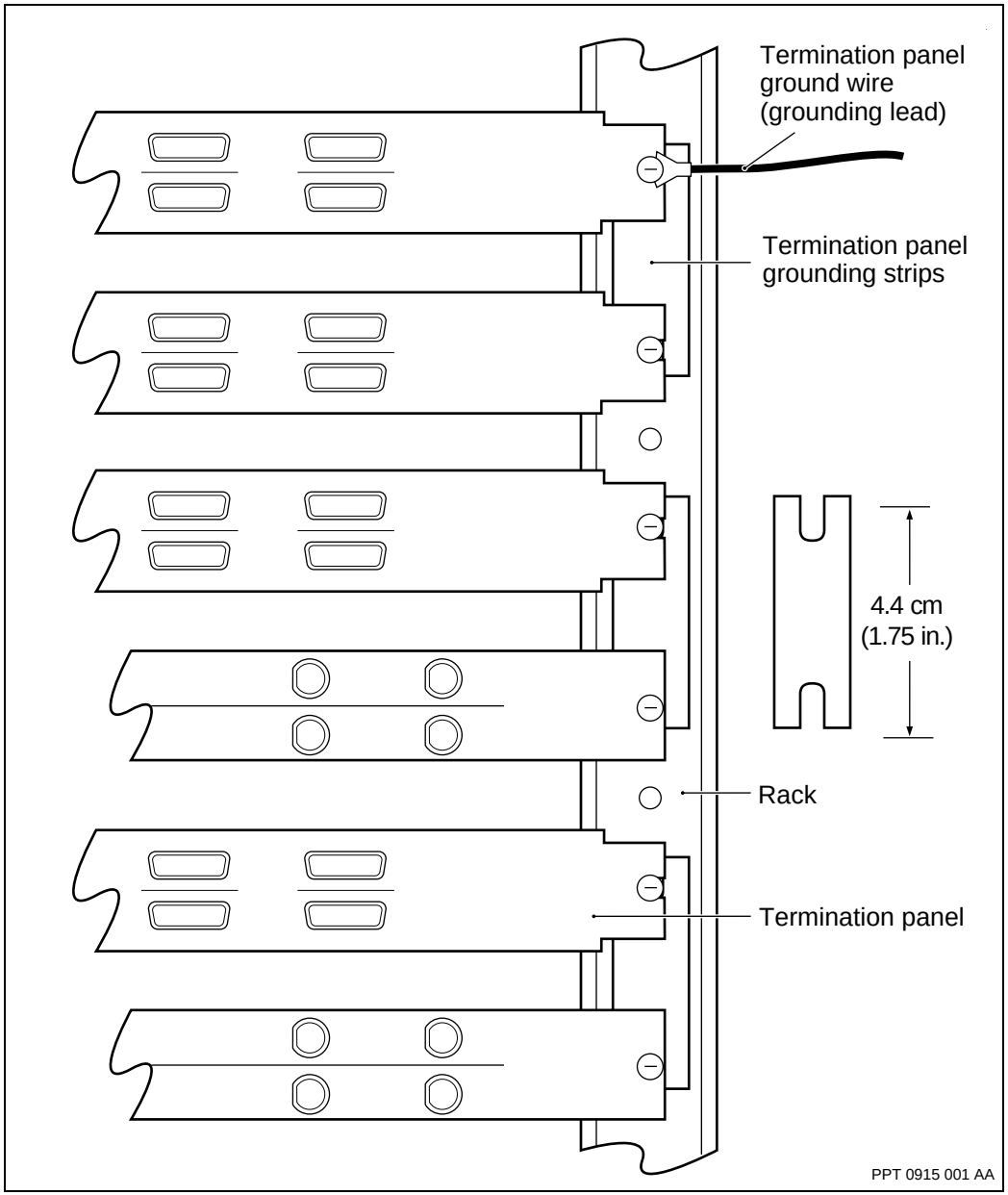
5 Tighten the bottom right screw. Ensure that the bottom notch of the grounding strip allows access to the next screw hole.

6 Secure the grounding lead to one of the frame grounding points.

7 If you are installing a subsequent termination panel, ensure that it is grounded to the previous one with a grounding strip.

If you are installing 1-unit-high termination panels, you must overlap the grounding strips along the frame of the cabinet before you attach the screw.

Figure 73
Grounding 19” termination panels



Installing a BITS wire

Install a BITS wire from the site timing source to the BITS termination panel.

Prerequisites

- Test the signal strength at the end of the connection from the site source before connecting. The signal strength must be within the range indicated in ITU-T G703 or ANSI TI.102.
- If the signal is not within the range, fix the problem between the point of test and the site source. Depending on the length of cable from the site source, you may need a thicker gauge cable to ensure that the signal strength.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. If they are not already connected, connect the BITS wires to the external timing source.
2. At the BITS termination panel plug the connector (D-sub or coax) of the timing wire (which you may have labeled as reference 0) into the connector beside the label BITS 0 Rx. This wire will correspond, in Multiservice Switch systems, to the BITS 0 source and will be associated with the EE1/0 or the EDS1/0 component.
3. For a redundant timing setup, plug the connector (D-sub or coax) of the timing wire (which you may have labeled as reference 1) into the connector beside the label BITS 1 Rx. This wire will correspond, in Multiservice Switch systems, to the BITS 1 source and will be associated with the EE1/1 or the EDS1/1 component.

Installing a blank processor card

Install a blank processor card into each empty slot on a shelf in order to meet electromagnetic interference (EMI) regulatory requirements and thermal specifications.

Prerequisites

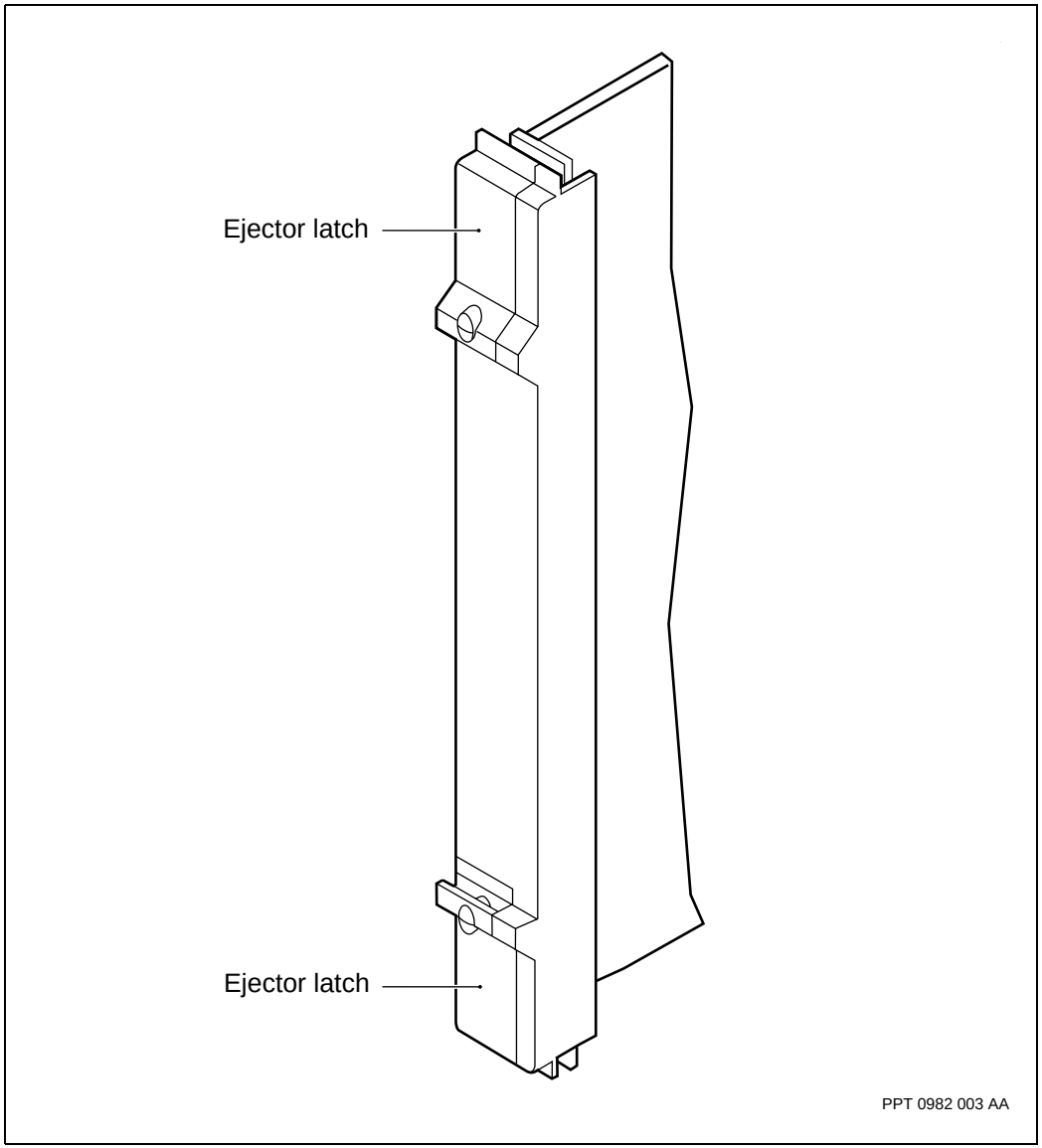
- You need a blank processor card with PEC NTBP23 as shown in the figure “Faceplate of a blank processor card” (page 244).
- Follow “Avoiding damage from static electricity” (page 208) to protect the card from damage by ESD.

Procedure steps

1. Unpack the blank processor card. Keep the packaging materials for future use.
2. Pull open the top and bottom latches of the blank processor card and slide it into the slot until the locking latches begin to close.
3. Ensure the latch lock is fully disengaged by turning it counterclockwise by a 1/4 turn.
4. Close and lock the latches. See the figure “Locking and unlocking processor card latches” (page 324).

Procedure job aid

Figure 74
Faceplate of a blank processor card



Installing a cabinet door alarm cable for a Multiservice Switch

Install a Nortel Networks Multiservice Switch cabinet alarm cable so that the LEDs on the door can display the alarm status of a Multiservice Switch 7460 or Multiservice Switch 7480.

Prerequisites

CAUTION
Risk of equipment damage
Do not use the door alarm connectors for any type of telephone equipment. Severe damage can result.

- You need a door alarm cable with PEC NTEP8027, as shown in the figure "Example of a door alarm cable" (page 246).
- Follow "Avoiding damage from static electricity" (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. Connect the door alarm cable to the connector on the inside of the cabinet door. See the figure "Door alarm connectors for a Multiservice Switch 7480" (page 249).

   The door connection is the same for the Multiservice Switch 7460.

2. Remove the grommet from the hole at the top of the cabinet frame, and install it on the other end of the door alarm cable.
3. Slide the cable through the hole about 15 cm (6 in.), and re-install the grommet on the frame.
4. Slide the cable the rest of the way through to the inside of the cabinet.
5. Route the cable around the top of the cabinet cross-member, and out into the cable trough.
6. Route the cable down to the shelf assembly and connect it to the door alarm connector on the back of the shelf assembly. See the figures
   - "Multiservice Switch 7480 alarm connectors" (page 248)

- “The door alarm connector for a Multiservice Switch 7460” (page 250)

Procedure job aid

Figure 75
Example of a door alarm cable

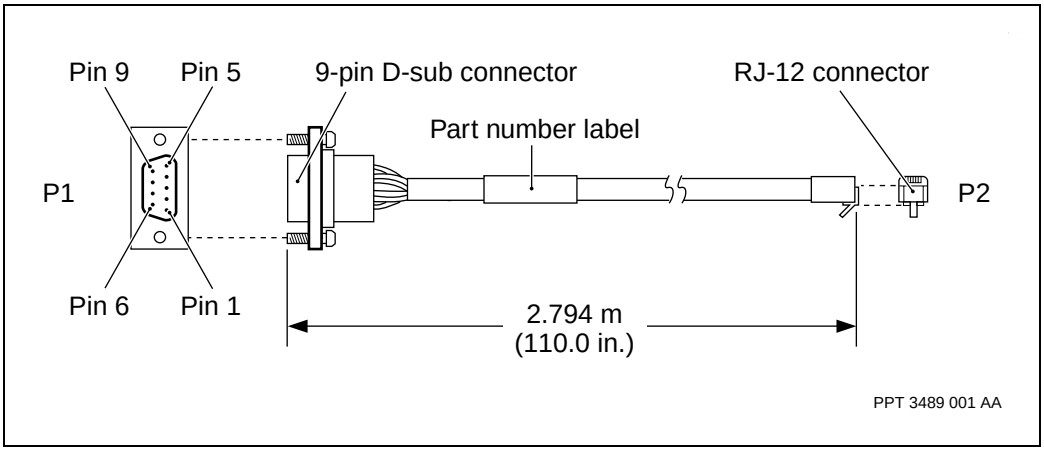


Figure 76
Cabinet door alarm connector

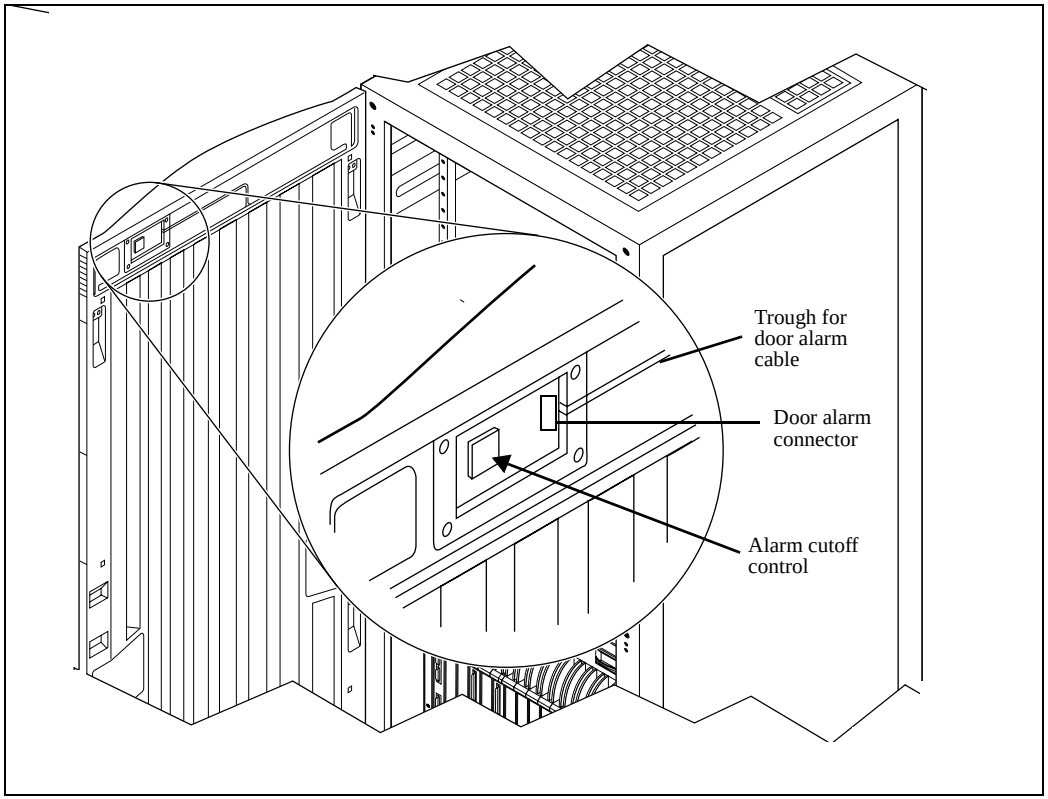


Figure 77
Multiservice Switch 7480 alarm connectors

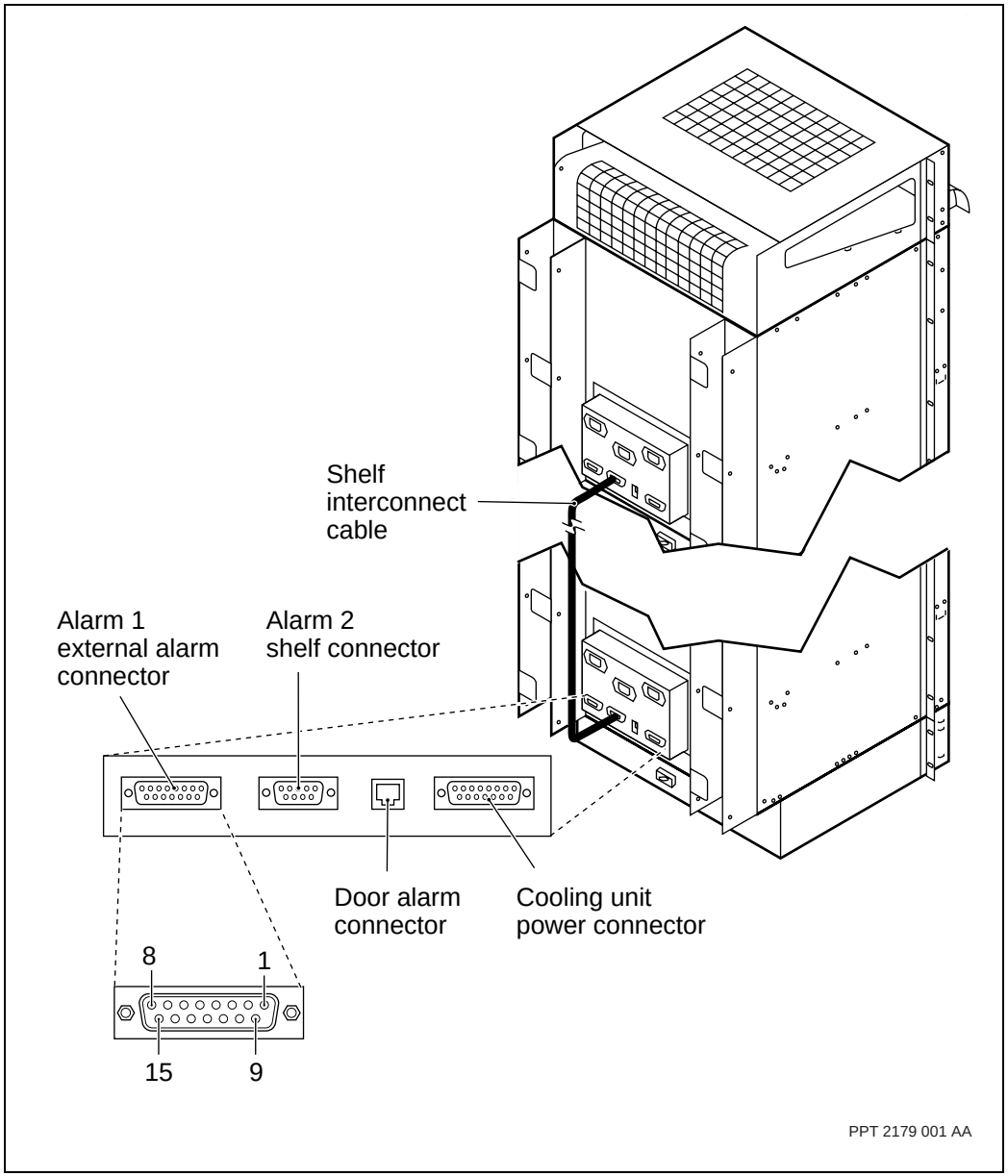


Figure 78
Door alarm connectors for a Multiservice Switch 7480

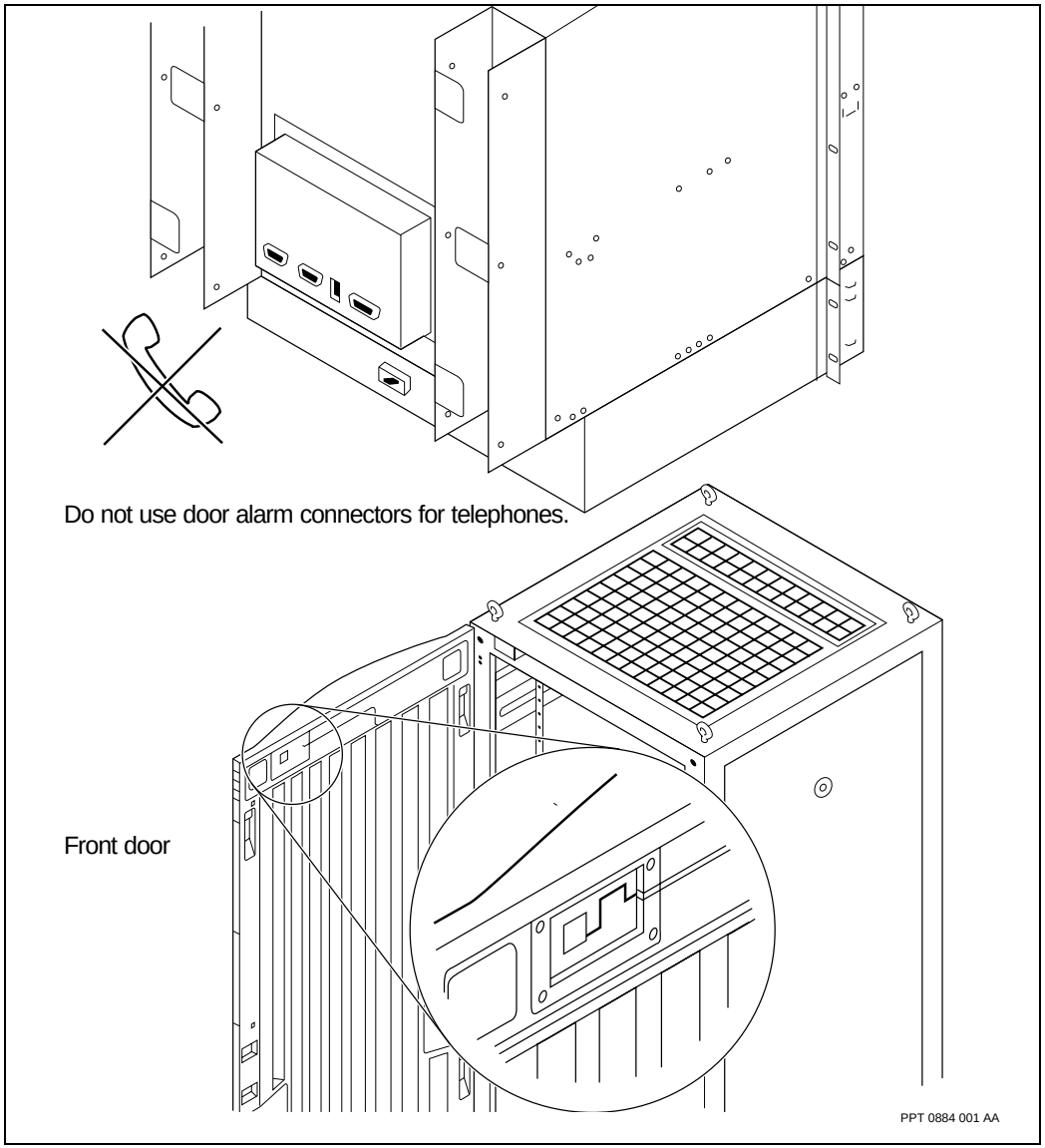
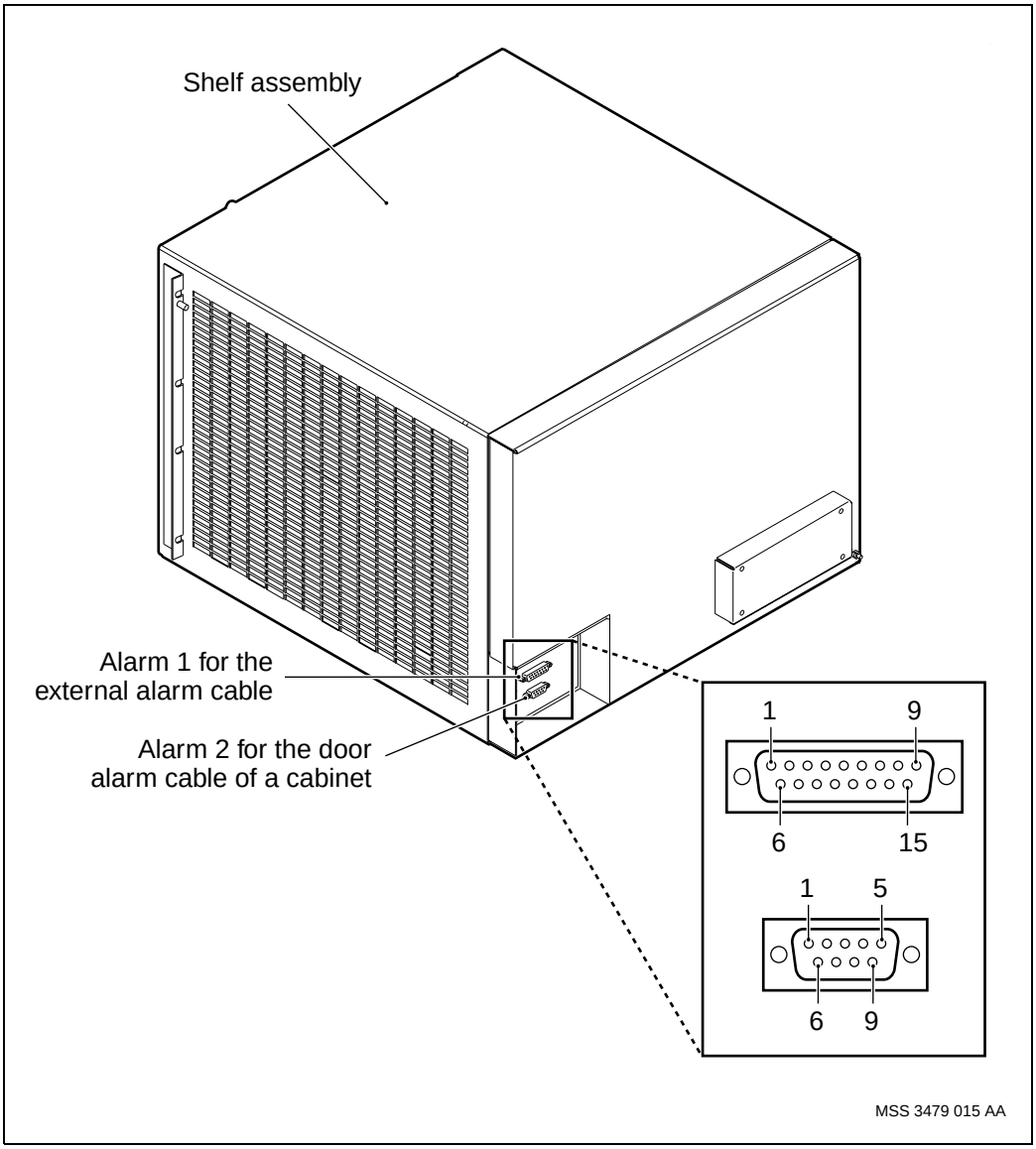


Figure 79
The door alarm connector for a Multiservice Switch 7460



Installing a cable management bracket on a Multiservice Switch 7460

Install an Nortel Networks Multiservice Switch 7480 before installing any processor cards or cables.

Prerequisites

- You need a cable management brackets with PEC NTPS21.
- The Multiservice Switch 7460 shelf assembly (NTEP80) must already be installed.
- Ensure that the rack or cabinet is installed and grounded.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1 Hold the cable management bracket so that the cable support arms are on the left side of the bracket, as shown in the figure “Cable management bracket for a Multiservice Switch 7460” (page 252).

The bracket mounts only in this orientation.

2 Align the cable management bracket against the front side of the device, lining up the bracket’s captive screws with the threaded holes, as shown in the figure “Exploded view of a cable management bracket for a Multiservice Switch 7460” (page 253).

3 Hand-tighten the 2 Phillips captive thumb screws into the threaded holes to snug plus a 1/4 turn. Do not overtighten. Do not use a power tool.

Procedure job aid

Figure 80
Cable management bracket for a Multiservice Switch 7460

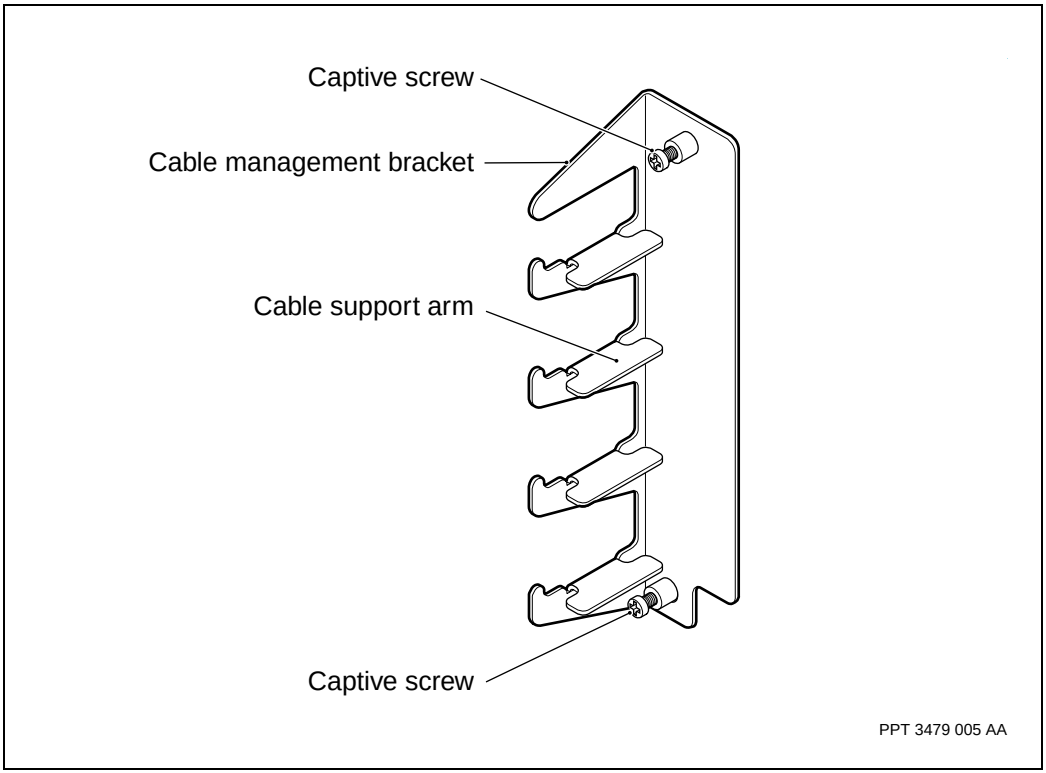
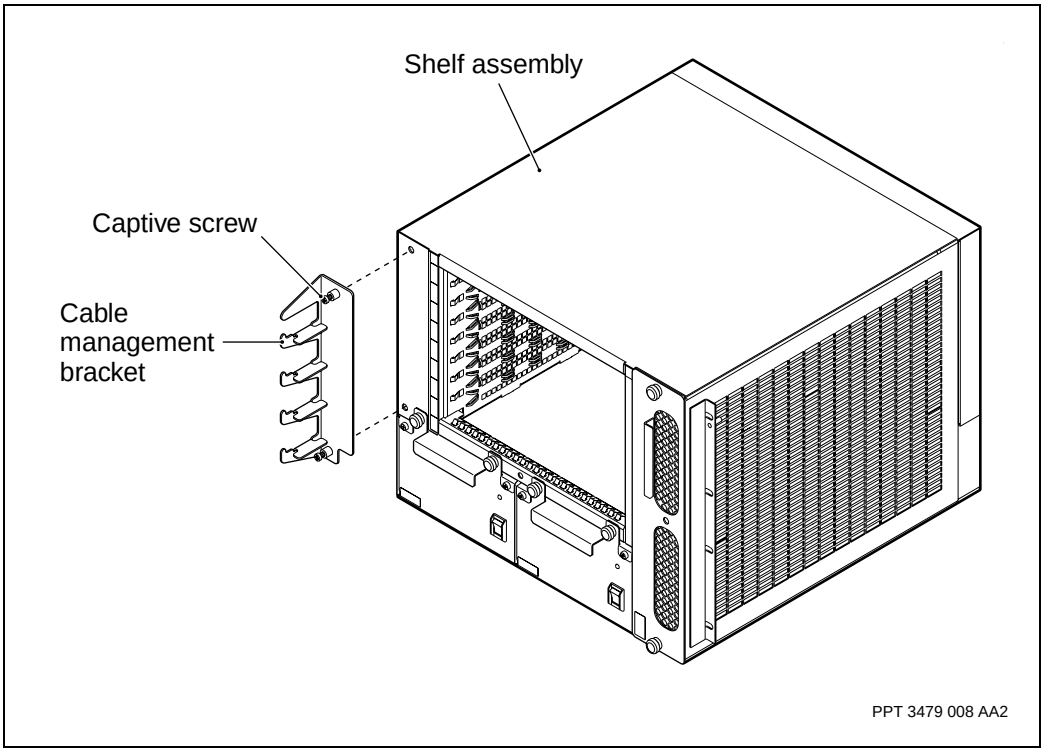


Figure 81
Exploded view of a cable management bracket for a Multiservice Switch 7460



Installing a control processor

Install a control processor in the appropriate slot in a Nortel Networks Multiservice Switch shelf as part of adding, replacing or upgrading a CP.

Prerequisites

CAUTION

Risk of service loss by signal noise

Inserting or removing a device processor card can cause noise on the backplane that causes loss of service. Therefore, minimize the time you take to insert or remove a processor card. Do not let a processor card sit in the shelf with a partial connection to the backplane.

- In general control processors must have matching PECs in order to act as spares for one another.
- Ensure that the appropriate level of software for the replacement CP is installed. For example, if you are installing a CP-with-BITS, you will require a minimum software release of PCR4.2; if you will use the external timing functionality you will require a minimum software release of PCR5.1.
- CPs are installed in specific slot numbers:
  Slot 0 in a Multiservice Switch 7420
  Slots 0 and 4 of a Multiservice Switch 7440
  Slots 0 and 7 of an Multiservice Switch 7460
  Slots 0 and 15 of a Multiservice Switch 7480

  In a rack mounted Multiservice Switch 7420 or Multiservice Switch 7440, slot 0 is the bottom slot. In any vertically mounted device, slot 0 is the left-most slot.C
- The bottom of a Multiservice Switch 7400 series FP is typically where the status LED is located.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. Unlock the latches on the CP. See the figure “Locking and unlocking processor card latches” (page 324).
2. Hold the CP in front of the shelf assembly so that:
   - you do not touch the copper-colored metal EMI gasket at the edge of the card
   - its faceplate faces you
   - it is parallel to the slot (vertically or horizontally)
   - its bottom is positioned next to the cooling unit when the shelf assembly is mounted vertically or horizontally
3. Carefully slide the processor card into the appropriate slot. If this is the first CP, then it goes into slot 0.

   If this is the second CP, then it goes into the slot at the opposite end of the shelf. For example, slot 7 in a Multiservice Switch 7460, or slot 15 in a Multiservice Switch 7480.
4. Pull open the top and bottom latches of the processor card and slide the card into the slot until the locking latches begin to close.
5. Close the latches to seat the processor card connectors in the backplane connectors and apply some additional pressure to the faceplate to ensure that the processor card is fully inserted in the shelf.
6. Lock the latches as shown the figure “Locking and unlocking processor card latches” (page 324).
7. If synchronization does not automatically begin, manually synchronize the inserted CP with the active CP. See the section on disk synchronization in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
8. Monitor the status of the processor card by observing the status LED as it lights throughout the initialization sequence. It can take several minutes for a new control processor to be synchronized. See “Processor card LED status display” (page 326).
9. Connect any CP cables as necessary. See “Connecting a local operator terminal to a Multiservice Switch 7400” (page 221); “Installing a CP Ethernet cable” (page 262); or “Installing CP cables for BITS” (page 329).

Installing a cooling unit into a Multiservice Switch 7440

Install a cooling unit into a Nortel Networks Multiservice Switch 7440 after you remove the failed unit.

Prerequisites

- You need a cooling unit with PEC NTEP14BA.
- Multiservice Switch 7440s have two kinds of cooling units. In older models, the fans connect when you push the cooling unit all the way into the back of the device. In newer models, you must plug each fan into a connector inside the cooling unit door.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. Insert the back edges of the cooling unit tray into the tracks. Push the cooling unit all the way into the device.

   If you have the newer model cooling unit, the wires that connect the fans to the device are at the front of the fan tray.

2. If you have the newer model, plug each wire into its connector and fasten the wires with a tie wrap.

   If you do not have the newer unit, continue to the next step.

3. Close the cooling unit door.

4. Lock the door: use a 1/4-in. slot-head screwdriver to turn the latch on the cooling unit door one-quarter turn clockwise.

Installing a cooling unit into a Multiservice Switch 7460

Install the cooling unit of an Nortel Networks Multiservice Switch 7460 to provide optimum airflow for the heat from the processor cards and power supplies.

Prerequisites

- The shelf assembly of an Multiservice Switch 7460 with PEC NTEP80 must already be installed.
- You need an Multiservice Switch 7460 cooling unit with PEC NTEP8023. The air filter is already installed in the unit.
- Ensure that the rack or cabinet is installed and grounded.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1 Hold the cooling unit so that:

- the cooling unit faceplate faces you
- the faceplate airflow grill is on the right-hand side of the front of the faceplate
- your right hand is holding the handle located beside the upper airflow grill
- your left hand is supporting the underside of the cooling unit

Refer to the figure “The cooling unit of a Multiservice Switch 7460 with its air filter” (page 258).

2 Gently insert the cooling unit into the front, right-hand side of the device as shown in the figure “Exploded view of the cooling unit and a Multiservice Switch 7460” (page 259). Stop pushing when the captive screws at the faceplate of the cooling unit contact their threaded holes.

3 Hand-tighten the 2 Phillips captive thumb screws to snug plus a 1/4 turn. Do not overtighten.

Procedure job aid

Figure 82
The cooling unit of a Multiservice Switch 7460 with its air filter

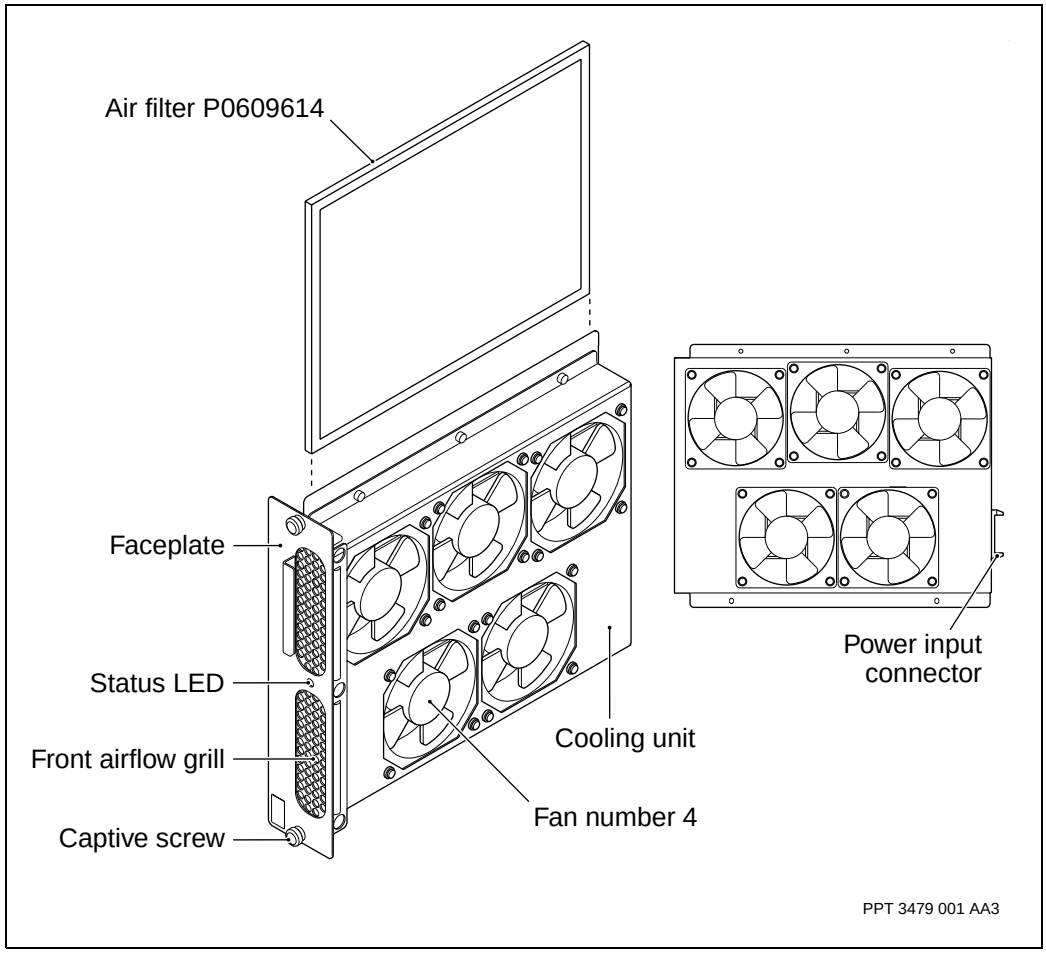
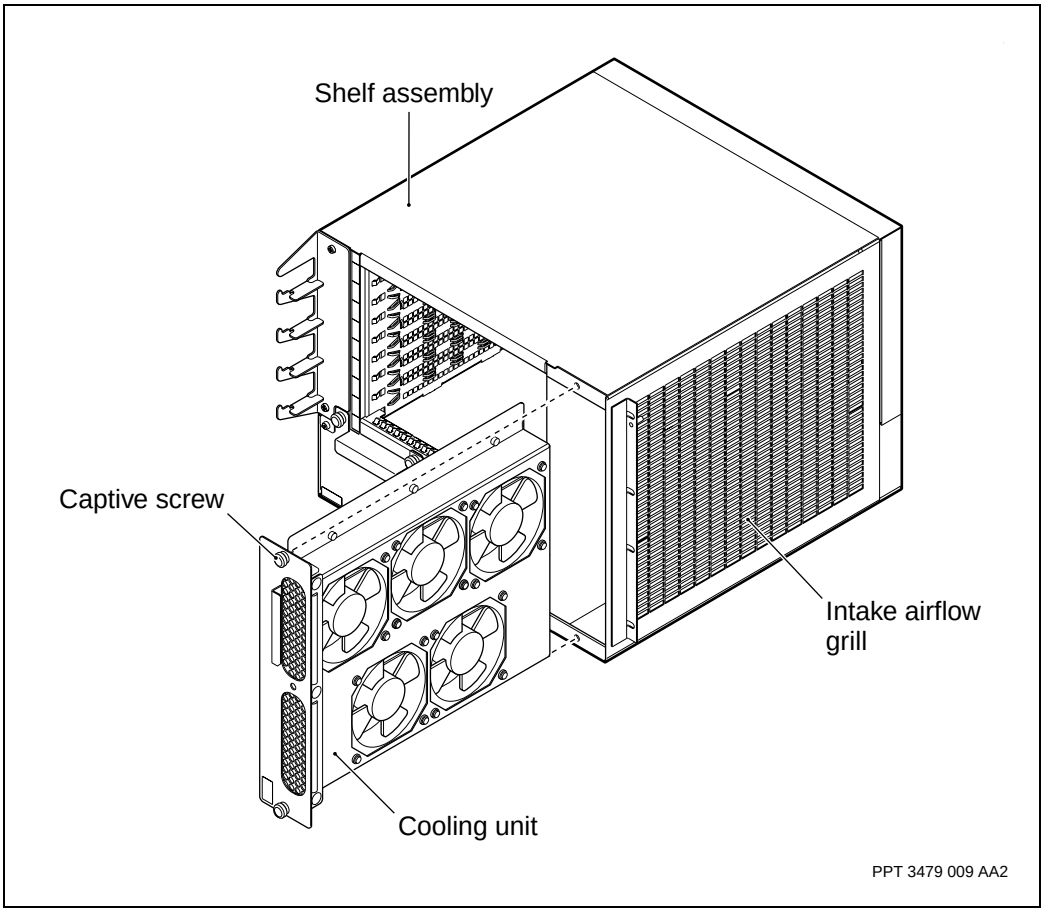


Figure 83
Exploded view of the cooling unit and a Multiservice Switch 7460



Installing a cooling unit into a Multiservice Switch 7480

Install a new cooling unit into a Nortel Networks Multiservice Switch 7480 no more than ten minutes after removing a cooling unit.

Prerequisites

- You need a cooling unit with PEC NTBP07.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

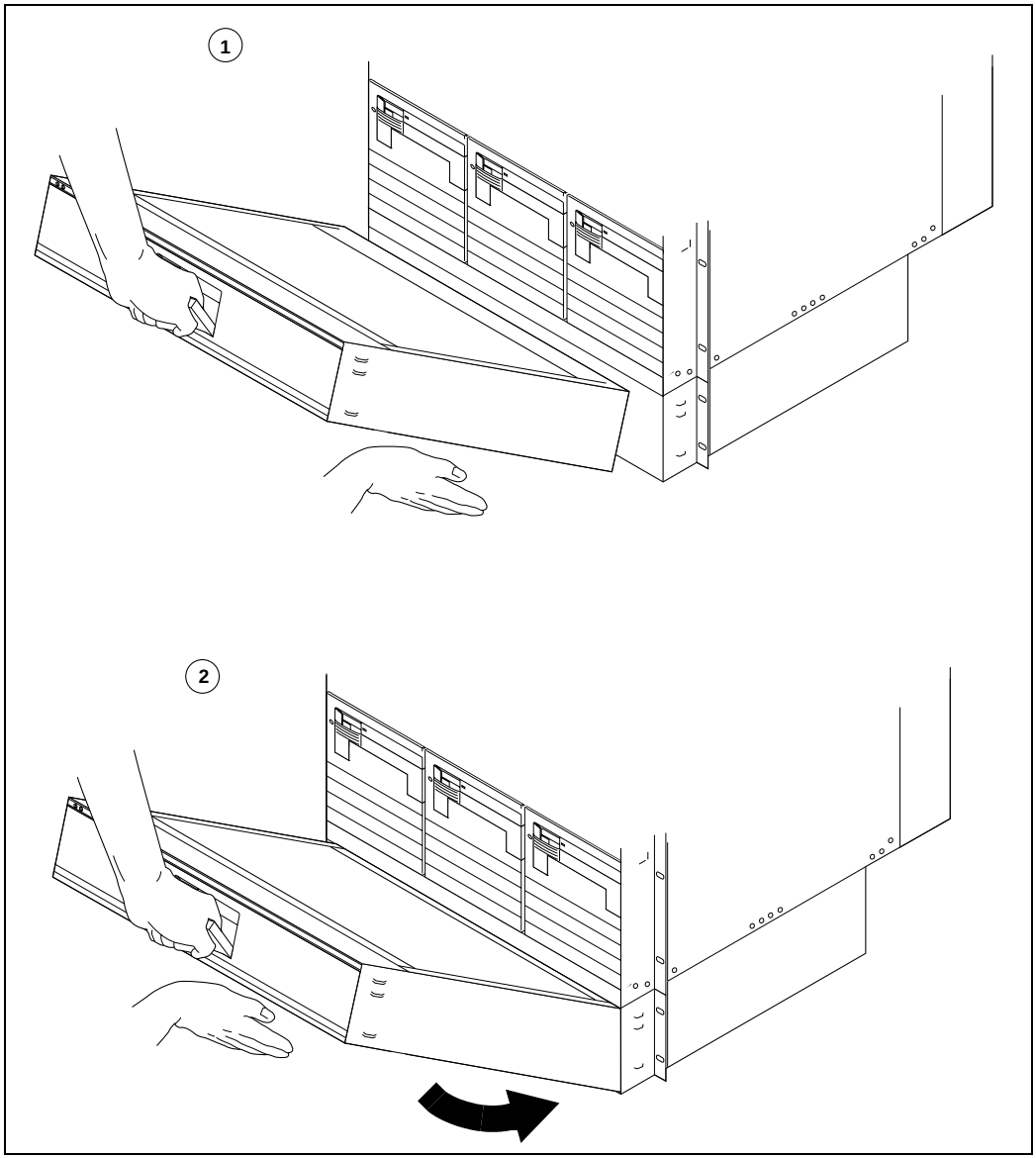
Procedure steps

1. Use the faceplate handle to carefully lift the cooling unit with one hand.
2. Push on the bottom of the cooling unit with your other hand to rotate it to a horizontal position.

   Support the weight of the cooling unit with one hand and grasp the faceplate handle with the other hand. See the figure “Installing a cooling unit” (page 261).
3. Insert the cooling unit into the cooling unit chassis at a 45-degree angle. Do not force it. Then, tilt the front of the unit down to an horizontal position.
4. Press on the cooling unit faceplate until it is inserted more than halfway into its slot. Release the handle. Then, press on the faceplate until you feel the connectors at the rear of the cooling unit engage. The faceplate handle snaps up into a vertical position when the cooling unit is fully engaged.
5. Lock the cooling unit. Use a 1/4-in. slot-head screwdriver to turn the handle locking screw 1/4 turn clockwise. See the figure “Cooling unit lock on a Multiservice Switch 7480” (page 462).

Procedure job aid

Figure 84
Installing a cooling unit



Installing a CP Ethernet cable

Install a CP Ethernet cable as part of replacing a control processor (CP) or to replace a faulty cable.

Prerequisites

- If the CP is spared, coordinate with the software network operator to remove the CP from service if it is still active and to notify you when to swap the cables. Alarms are generated when communication to a CP is stopped.
- If the CP is not spared, have the software operator disable the SwitchoveronFailure attribute as described in the section “Disabling CP switchover for a CP OAM Ethernet port failure” in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.
- Route and label cables.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

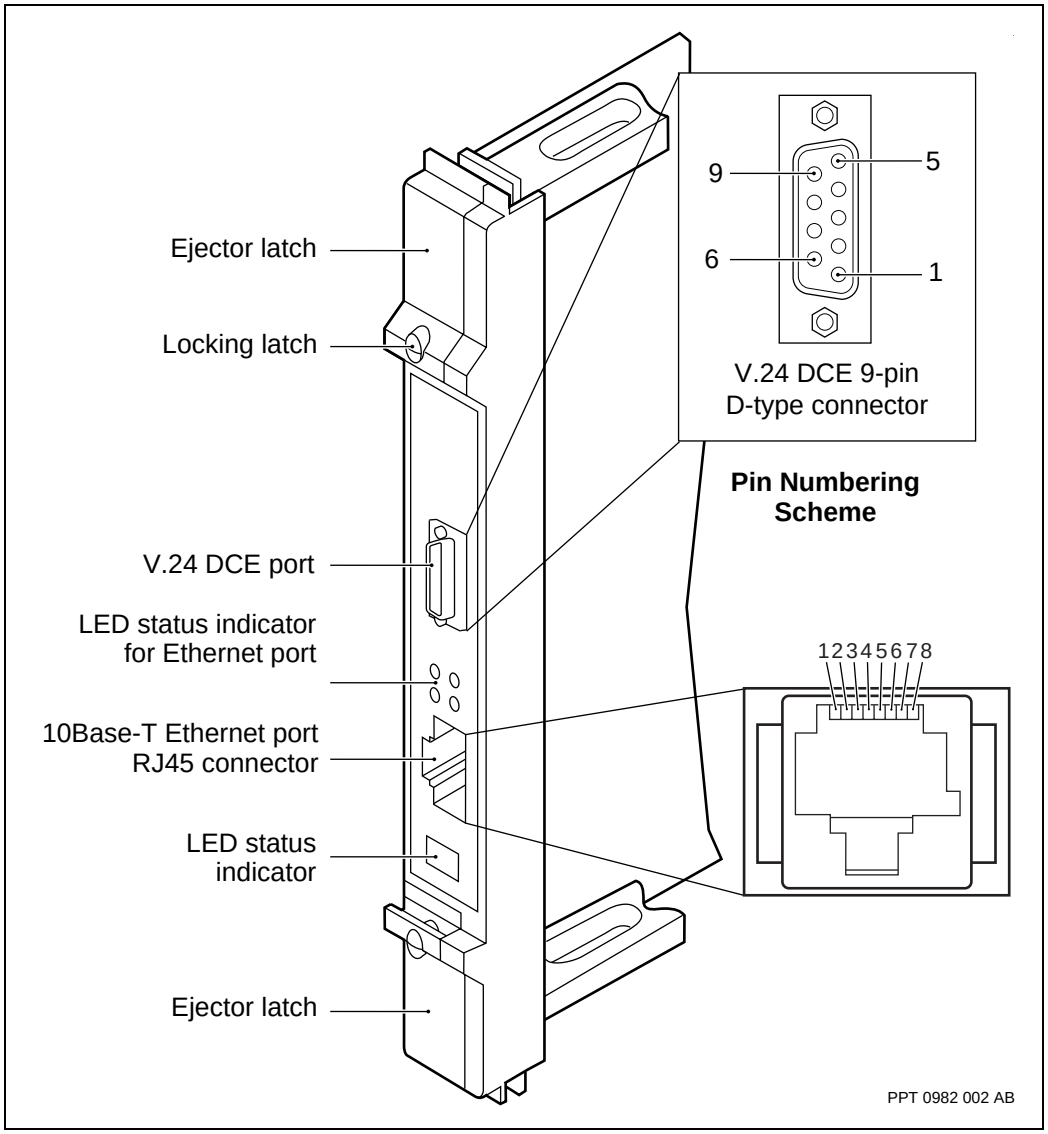
1 Refer to the figure “Example of a control processor faceplate” (page 263) to located the Ethernet connector on the CP faceplate.

2 Unplug the old cable at each end only when the CP is removed from service in software. Immediately plug in the new cable.

3 Cut the connectors off the end of the old cable. Tugging or pulling on the older cable can affect the operation of other cables. Unless it can be easily removed, leave the old cable in position.

Procedure job aid

Figure 85
Example of a control processor faceplate



Installing a desk-top mounted Multiservice Switch 7420

Install a desk-top mount Nortel Networks Multiservice Switch 7420 on any flat surface, preferably a sturdy desk or table.

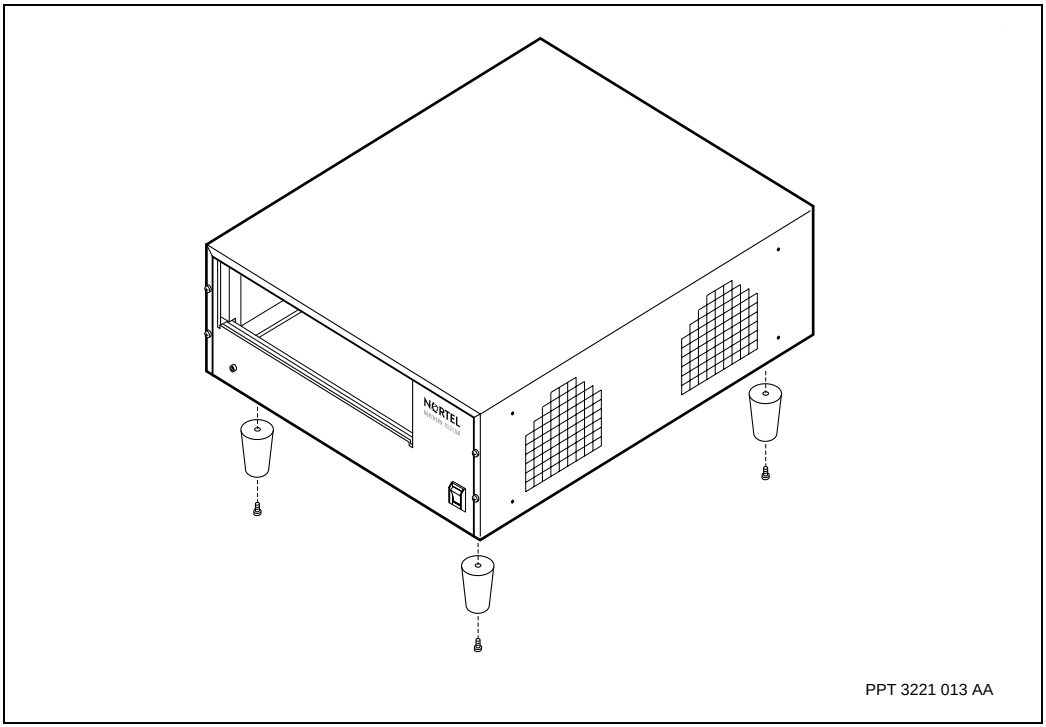
Prerequisites

- You need a desk mount kit with PEC NTHQ05.
- Ensure that your floor plan takes into consideration all of the information in “Site preparation for free-standing Multiservice Switch equipment” (page 49).
- Ground yourself to an appropriate anti-static discharge apparatus while handling the shelf assembly (device).

Procedure steps

1 Secure the feet using the screws provided as shown in “Securing the feet to a desk-top mounted Multiservice Switch 7420” (page 265).

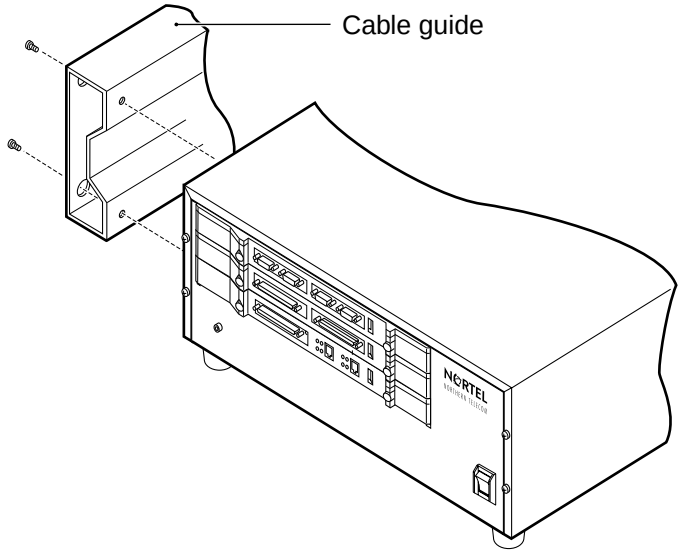
Figure 86
Securing the feet to a desk-top mounted Multiservice Switch 7420



2 Position the chassis according to the site plan.

3 Attach the cable guide to the fan-less side of the chassis using the hardware provided. See “Cable guide on desk-top mounted Multiservice Switch 7420” (page 266).

Figure 87
Cable guide on desk-top mounted Multiservice Switch 7420



4 Insert a blank processor card into each slot that does not have a processor card.

5 Ensure that there is sufficient clearance for data cables and power cable.

Installing a floor-mounted Multiservice Switch 7440

Install a floor-mounted Multiservice Switch 7440 using four feet to allow for adequate ventilation.

Prerequisites

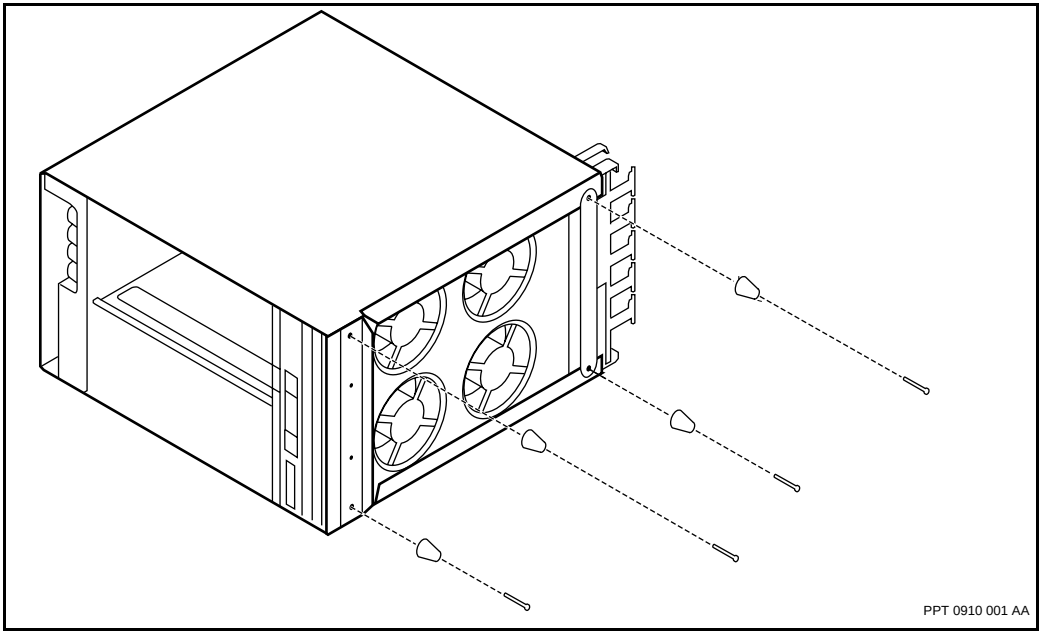
- You need a vertical mount kit with PEC NTHQ08.
- Ground yourself to an appropriate anti-static discharge apparatus while handling the shelf assembly (device).

Procedure steps

1 Tip the cabinet on its side.

2 Secure the feet with the 4 screws provided as shown in the figure “Securing the feet to the bottom of a floor-mounted device” (page 267).

Figure 88
Securing the feet to the bottom of a floor-mounted device



3 Move the device to the appropriate place and set it on its feet. You need 2 people to lift the device.

Installing a multiport aggregate device

Install a multiport aggregate device to break out the ports of a 32-port E1 TDM FP.

Prerequisites

WARNING

Risk of personal injury

Connect multiport aggregate device interfaces to Safety Extra-Low Voltage (SELV) circuits only. Connections to Telephone Network Voltage (TNV) circuits must be through an external device that provides current protection and isolation, such as an approved Channel Service Unit (CSU). All such devices must meet the equipment safety standards of the country of installation.

WARNUNG

Verletzungsgefahr

Schließen Sie ein Multiport-Aggregat nur an einer SELV-Schaltung (Schutzkleinspannung) an. Der Anschluss an einer TNV-Schaltung muss über ein externes Gerät erfolgen, das Stromschutz und -isolierung bietet, z.B. eine geprüfte Kanaldiensteinheit (CSU, Channel Service Unit). Alle Geräte müssen den Sicherheitsstandards des jeweiligen Landes entsprechen.

WARNING

Risk of injury by electricity

Before connecting cables or turning on power, ensure that the device is properly grounded. Failure to provide a proper ground may result in electrical shock causing equipment damage or personal injury. For information, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

WARNUNG

Verletzungsgefahr durch Stromschlag

Bevor Sie Kabel anschließen oder das Gerät einschalten, vergewissern Sie sich, dass das Gerät vorschriftsmäßig geerdet ist. Ist das Gerät nicht vorschriftsmäßig geerdet, besteht Verletzungsgefahr für das Bedienpersonal und das Risiko der Beschädigung des Geräts durch Stromschlag. Nähere Informationen finden Sie unter NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

- You need a multiport aggregate device with one of the following PECs:
  - NT0486 (balanced, dc-powered)
  - NT0420 (balanced, ac-powered)
  - NT0421 (unbalanced, dc-powered)
  - NT0422 (unbalanced, ac-powered)
- Before installing a multiport aggregate device, ensure that all cables, including the power cables, are disconnected from the unit.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. Fasten a bracket to each side of the multiport aggregate device using two of the screws and the flat washers provided. See the figure “Installing brackets on a multiport aggregate device” (page 271).
2. If you are installing the first panel on the rack, connect the grounding wire (supplied separately by Nortel Networks) to the top right securing screw. See the figure “Grounding 19” termination panels” (page 241).

   or

   If you are installing the lowest panel on the rack, secure the bottom of the grounding strip and a grounding wire to the rack with a screw.
3. Use a 5/16-inch socket wrench to secure the brackets to the cabinet or rack with four of the screws provided.

Allow at least 90 cm (36 in.) clearance in front of the device for operator access. Allow at least 10 cm (4 in.) clearance at the rear of the device for cable connections.

4. Attach the cable management panel to the cabinet or rack between the multiport aggregate device and other equipment using four of the screws provided.

   For proper cooling, you must also allow at least one vertical unit of space between the multiport aggregate device and other equipment. The cable management panel provides the required space. You can route cables through the panel as appropriate.

5. Connect the power cables. See “Installing dc power cables onto a multiport aggregate device” (page 332) or “Installing ac power cables on a multiport aggregate device” (page 310).

6. Attach the appropriate cables to the multiport aggregate device. See NN10600-172 *Nortel Networks Multiservice Switch 7400 FP Cabling Reference*.

7. At the rear of the device, toggle on the power control beside each power supply outlet.

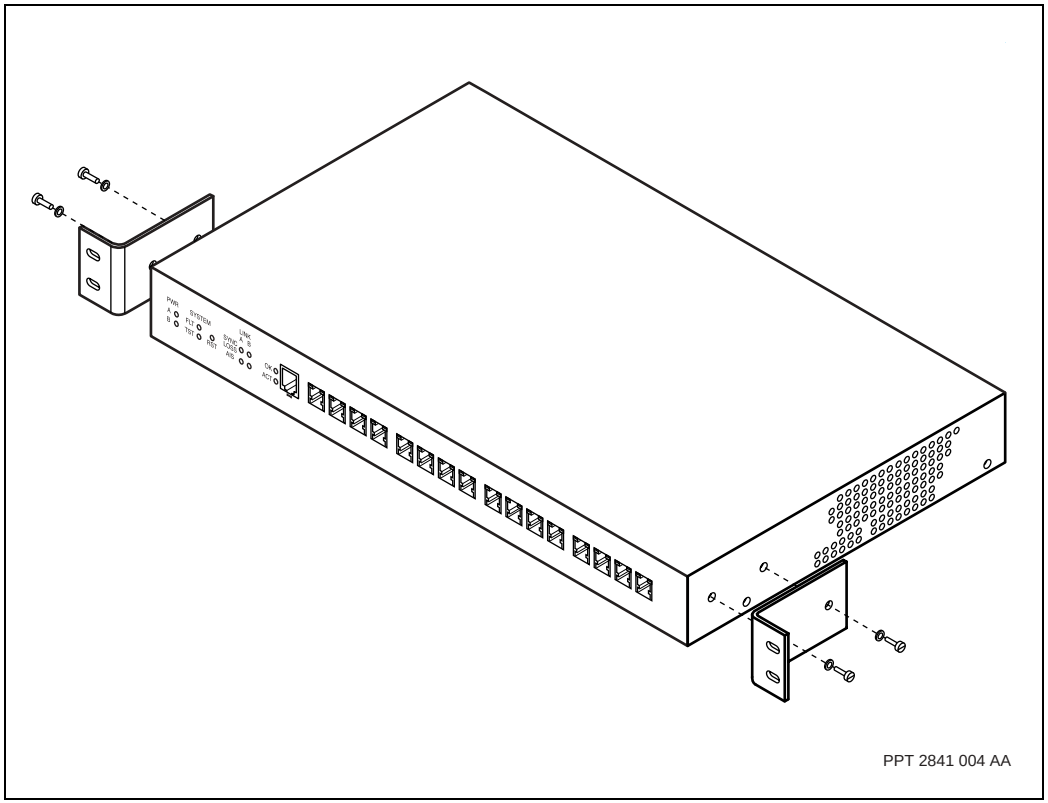
8. Verify the state of the LEDs. After self-tests the PWR A and B and SIG LEDs should be green. For more information, see the table “Multiport aggregate device LED status display” (page 270).

Table 2
Multiport aggregate device LED status display

LED	Status	Multiport aggregate device status
PWR A and B	Green	Power is reaching the device.
TST	Yellow	Power has just been turned on and the device is running a self test.
SIG for link A	Green	The device detects the receive signal. Cabling to FP or termination panel is installed and the device is powered.
PWR A and B	No color	No power is reaching the device.
FLT	Red	The device has failed the self test and must be replaced.
SYNC LOSS or AIS	Any color	Check the cabling. If necessary, run loopback tests to determine whether the problem is with an external device

Procedure job aid

Figure 89
Installing brackets on a multiport aggregate device



Installing a Multiservice Switch 7420 into a rack or cabinet

Install a Nortel Networks Multiservice Switch 7420 into a rack or cabinet, as an alternative to mounting the device on the floor or desktop.

Prerequisites

CAUTION
Risk of equipment damage
You need two people to install a Multiservice Switch 7420 in a rack or cabinet: one person must hold the chassis in place while a second person fastens the screws.

- If your device requires seismic protection, see “Installing a Multiservice Switch 7420 into a seismic rack or cabinet” (page 275)
- You need a rack-mount kit with PEC NTHQ04.
- The rack or cabinet must already be anchored and grounded. For more information, see “Cabinet installation” (page 105).
- If you plan to install the device in a cabinet, check the position and alignment of the vertical rails. Set the front rails 11.4cm (4.5 inches) from the front of the cabinet. Set the front and rear vertical rails 36.8 (14.5 inches) apart.
- Install 13” termination panels prior to installing the device in a rack or cabinet.
- Ground yourself to an appropriate anti-static discharge apparatus while handling the shelf assembly (device).

Procedure steps

1. Attach the rack mount brackets to each side of the chassis using a screwdriver. Attach the cable management bracket to the fan-less side of the chassis. See the figure “Securing the rack-mounting brackets to the Multiservice Switch 7420” (page 273)
2. Position the chassis in the rack or cabinet.
3. Fasten the front brackets to the rack’s front rails using the four screws provided. See the figure“Securing the rack-mounting brackets to the front vertical rails” (page 274)

Procedure job aid

Figure 90
Securing the rack-mounting brackets to the Multiservice Switch 7420

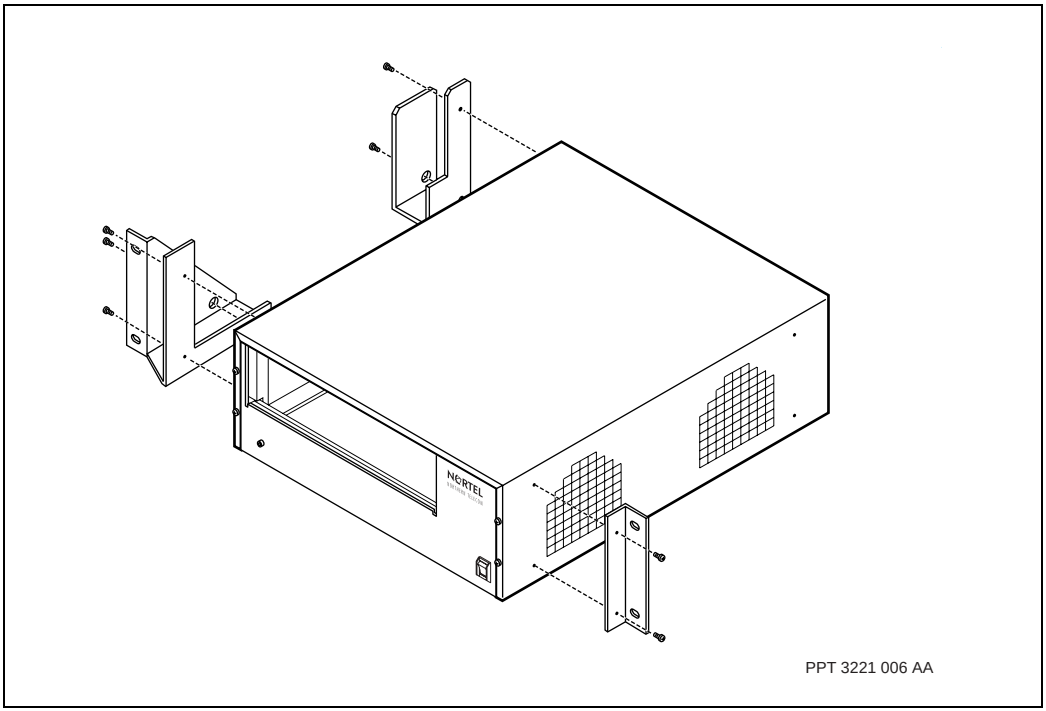
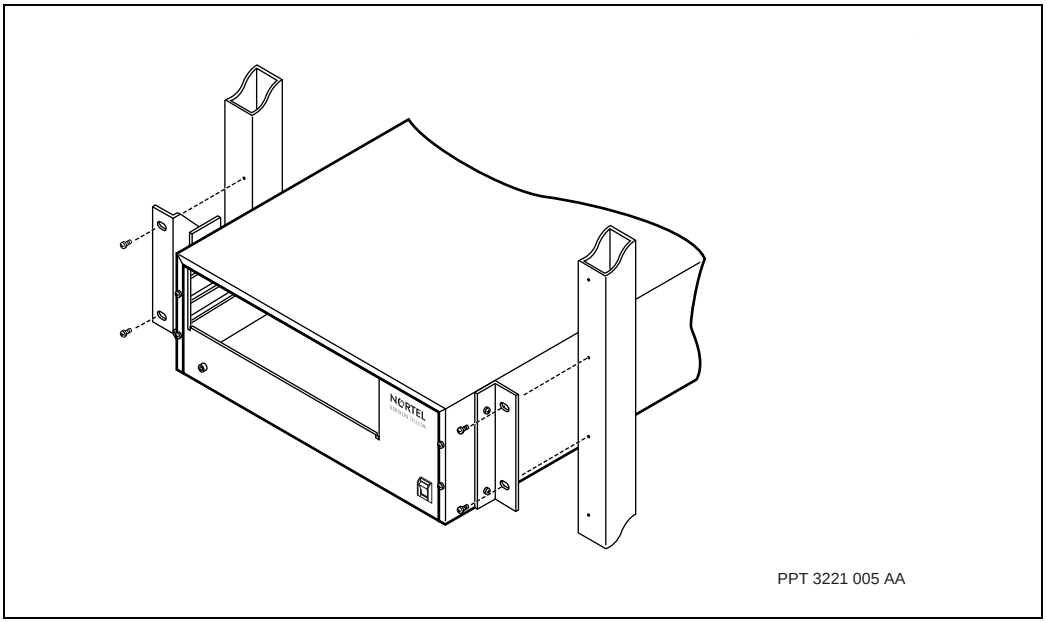


Figure 91
Securing the rack-mounting brackets to the front vertical rails



Installing a Multiservice Switch 7420 into a seismic rack or cabinet

Install a Nortel Networks Multiservice Switch 7420 into a seismic rack or cabinet if you are located in an earthquake zone.

Prerequisites

CAUTION
Risk of equipment damage
You need two people to a install Multiservice Switch 7420 in a rack or cabinet: one person must hold the chassis in place while a second person fastens the screws.

- You need a seismic rack-mount kit with PEC NTHQ20.
- The seismic rack or cabinet must already be anchored and grounded. For more information, see “Cabinet installation” (page 105).
- If you plan to install a in a cabinet, check the position and alignment of the vertical rails. Set the front rails 11.4cm (4.5 inches) from the front of the cabinet. Set the front and rear vertical rails 36.8 (14.5 inches) apart.
- Install 13” termination panels prior to installing a device in a rack or cabinet.
- Ground yourself to an appropriate anti-static discharge apparatus while handling the shelf assembly (device).

Procedure steps

1. Attach the two rear brackets to the frame as shown in “Securing the rear seismic brackets to the Multiservice Switch 7420” (page 276).
2. Attach the front rack mount brackets to either side of the chassis as shown in “Securing the rack-mounting brackets to the front vertical rails” (page 277)
3. From the front of the cabinet, slide the device into the rear brackets and attach the front brackets to the chassis with the screws provided. See the figure “Securing the rack-mounting brackets to the Multiservice Switch 7420” (page 273)

Procedure job aid

Figure 92
Securing the rear seismic brackets to the Multiservice Switch 7420

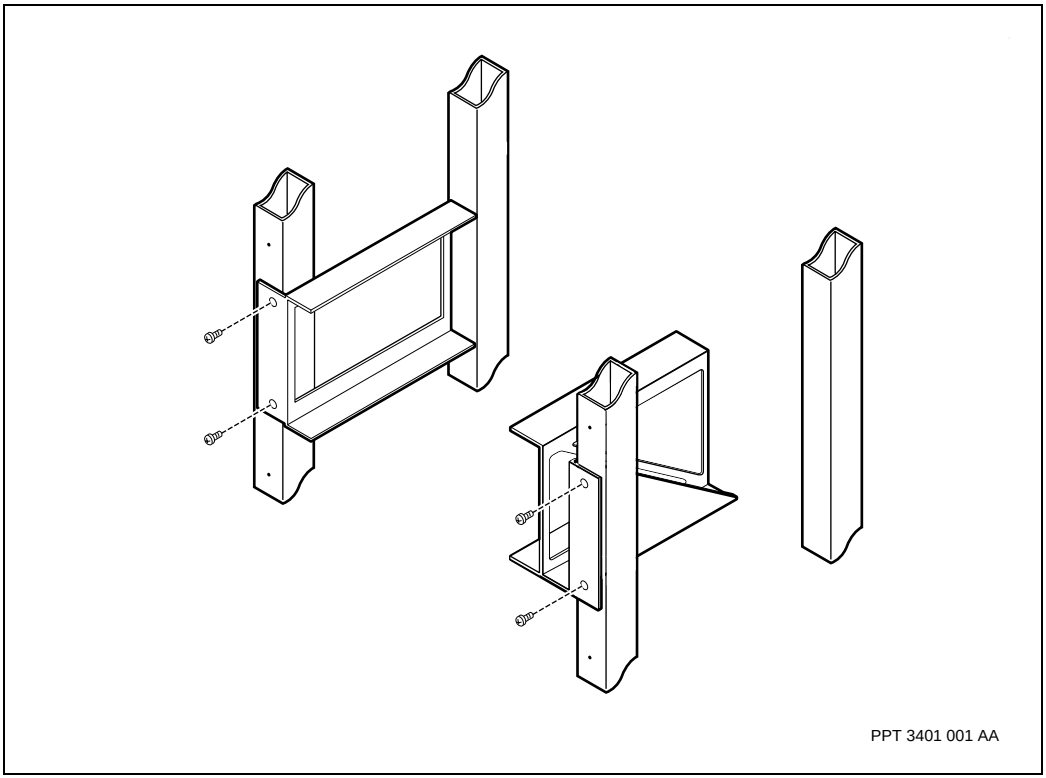


Figure 93
Securing the rack-mounting brackets to the front vertical rails

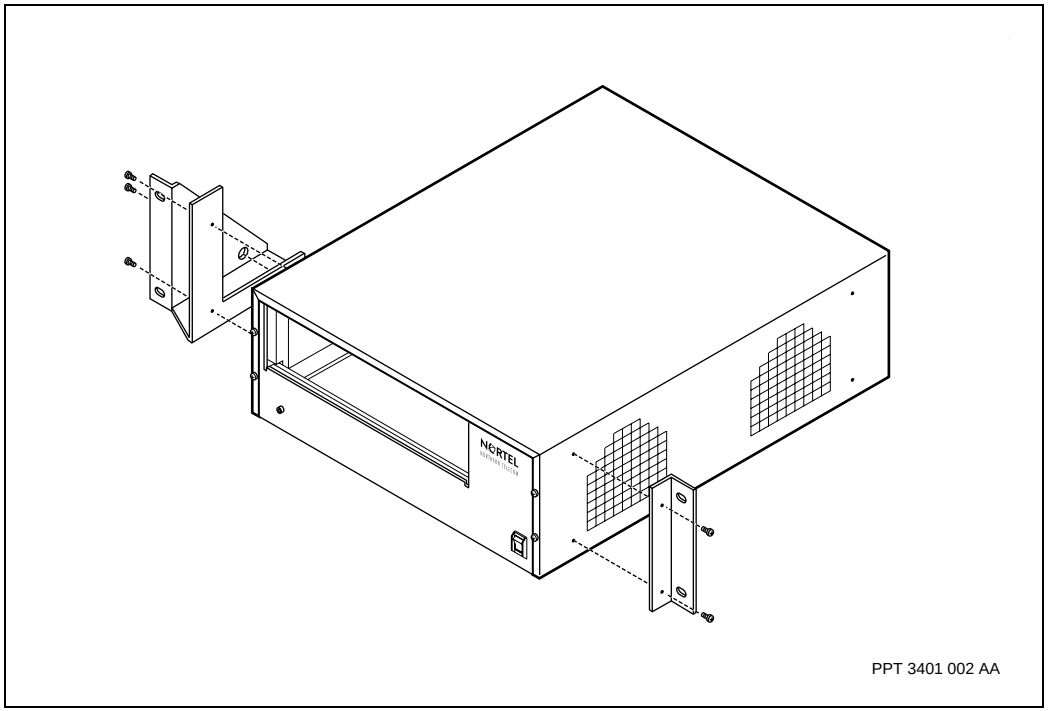
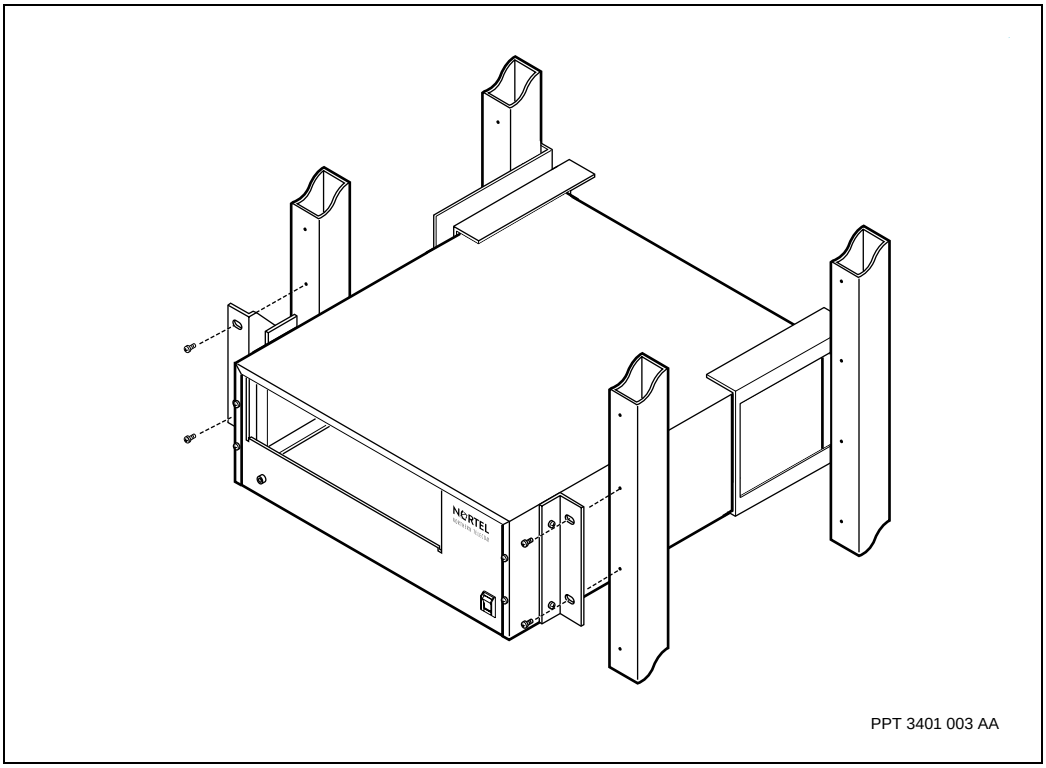


Figure 94
Securing the rack-mounting brackets to the front vertical rails



Installing a Multiservice Switch 7440 into a rack or cabinet

Install a Nortel Networks Multiservice Switch 7440 into a rack or cabinet. The mounting brackets bolt into the side rails of the rack or cabinet.

Prerequisites

- If you plan to install the device in a Nortel Networks Multiservice Switch cabinet, check the position of the uprights. You must set the front uprights back 11.4 cm (4.5 in.) from the front of the cabinet. The spacing between front and rear uprights must be 36.8 cm (14.5 in.).
- Install and ground the rack or cabinet before proceeding. For more information, see “Cabinet installation” (page 105).
- Ground yourself to an appropriate anti-static discharge apparatus while handling the shelf assembly (device).

Procedure steps

1. Secure the left and right rack-mounting brackets to the rack. Insert the 4 screws into the holes in each bracket and into the respective holes in the rack. Then, fasten the screws. See the figure “Securing the rack-mounting brackets to a rack” (page 280).
2. Secure the rack-mounting crossmember to the rear of the rack-mounting brackets with the 2 screws provided. See the figure “Securing the rack-mounting brackets to a rack” (page 280).
3. Place the device on the rack-mounting brackets. Use the two remaining screws to fasten the chassis to the right-hand bracket. Ensure that the rear of the device is fully seated on the rack-mount brackets. See the figure “Securing the chassis to a rack” (page 281).

Procedure job aid

Figure 95
Securing the rack-mounting brackets to a rack

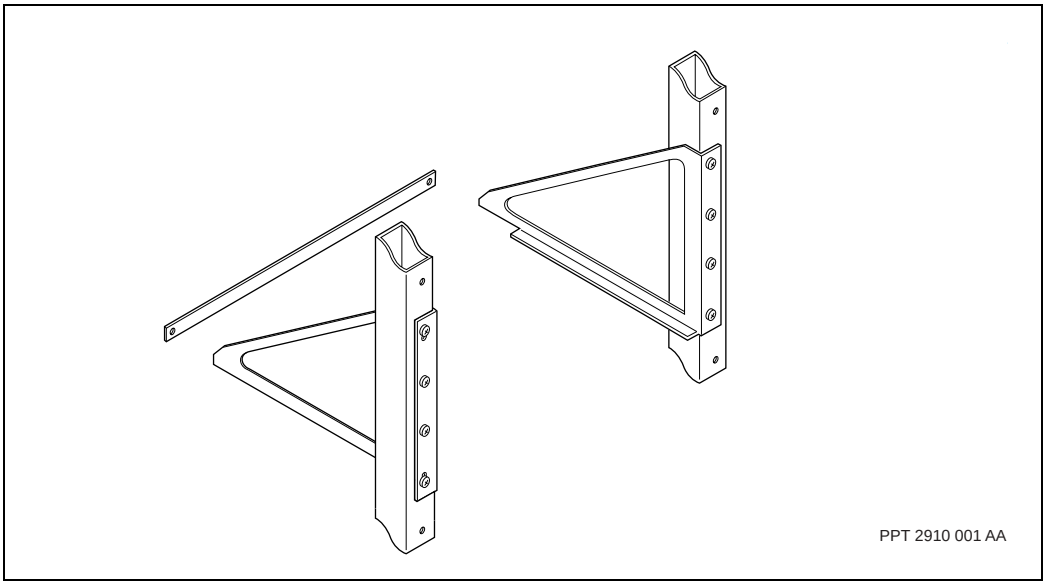
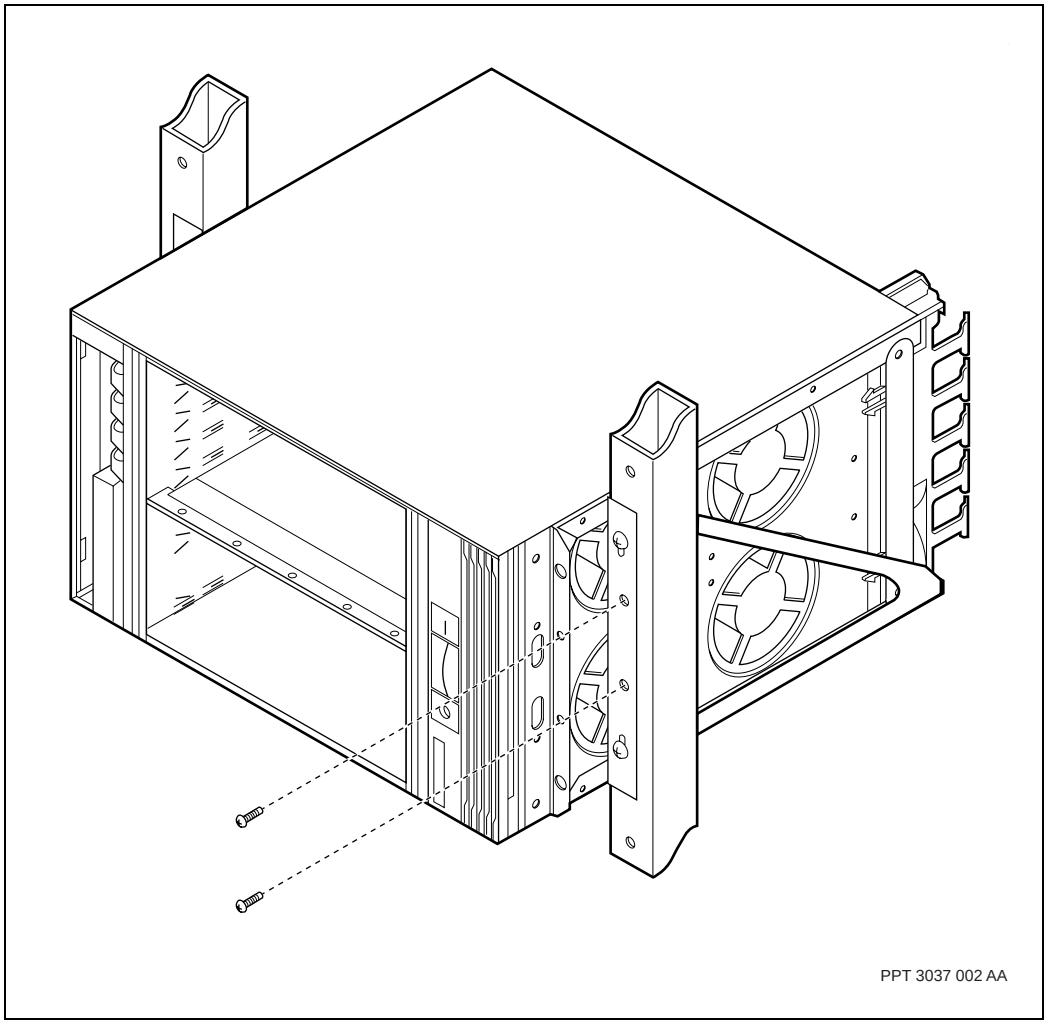


Figure 96
Securing the chassis to a rack



Installing a Multiservice Switch 7460 shelf assembly

Install a Nortel Networks Multiservice Switch 7460 in a rack or cabinet before installing any other parts.

Prerequisites

WARNING
Risk of injury
An empty shelf assembly weighs 18.9 kg (41.67 lbs.). You need two people to perform this procedure.

WARNUNG
Verletzungsgefahr
Die Regalkomponente wiegt 18.9 kg. Zur Montage sind zwei Personen erforderlich.

- You need a shelf assembly with PEC NTEP80 for a Multiservice Switch 7460. The cooling unit is already installed for an initial installation of device hardware.
- When you install a Multiservice Switch 7460 above another device, leave approximately 1 U (4.45 cm or 1.75 in.) between the two devices.
- Ensure that the rack or cabinet is installed and grounded as described in “Cabinet installation” (page 105).
- Ground yourself to appropriate anti-static discharge apparatus while handling the shelf assembly (device).

Procedure steps

1. Remove the 8 screws that are taped to the shelf assembly.

   Note: This must be done before positioning the shelf between the cabinet rails.

2. Lift the shelf assembly and align it with the cabinet rails or the rack uprights. Refer to the figure “A Multiservice Switch 7460 shelf assembly” (page 284).

Grip the shelf only by outside surfaces. Do not allow fingers to touch any part of the inside surfaces since you could damage EMI gaskets or get finger oil on surfaces that contact the EMI gaskets.

3 Pass the rear of the shelf assembly slowly between the cabinet rails or the rack uprights until the mounting ears are flush with the rails or uprights.

Before the mounting ears contact the front surface of the rails (or uprights), the rivets on the side of the assembly may contact the rails. If you push the shelf gently, one side at a time, the rivets will pass without needing to pry the rails apart. If it is a seismic cabinet, there is a second pair of rails to pass through.

4 Allow the guide pins (one on each mounting ear) to slide into the guide holes on the rack uprights, and continue holding the weight of the shelf firmly within the rack.

Note: The guide pins on the mounting ears are for alignment purposes only, and are not meant to support the shelf in the rack. Ensure you are always holding the shelf in the rack until it is properly screwed in.

5 Fasten the shelf assembly to the rails or rack using the 8 screws that are taped to the unit. See the figure “A Multiservice Switch 7460 shelf assembly” (page 284).

Procedure job aid

Figure 97
A Multiservice Switch 7460 shelf assembly

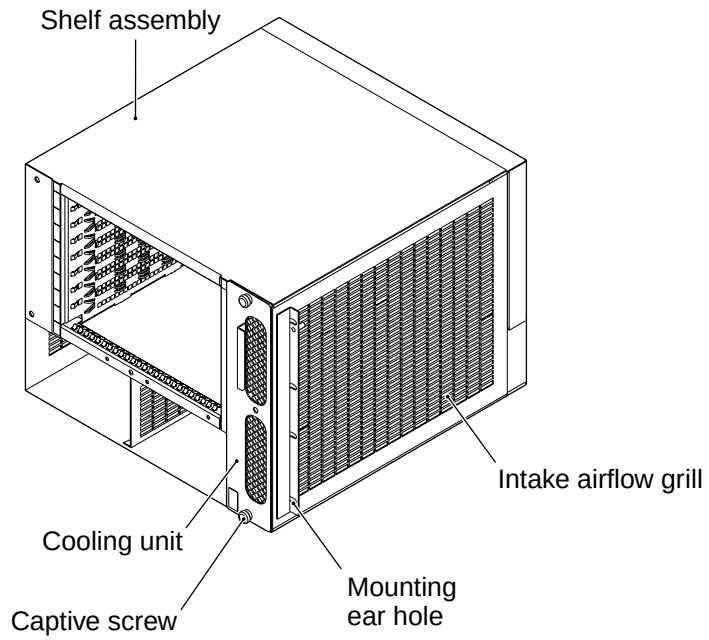
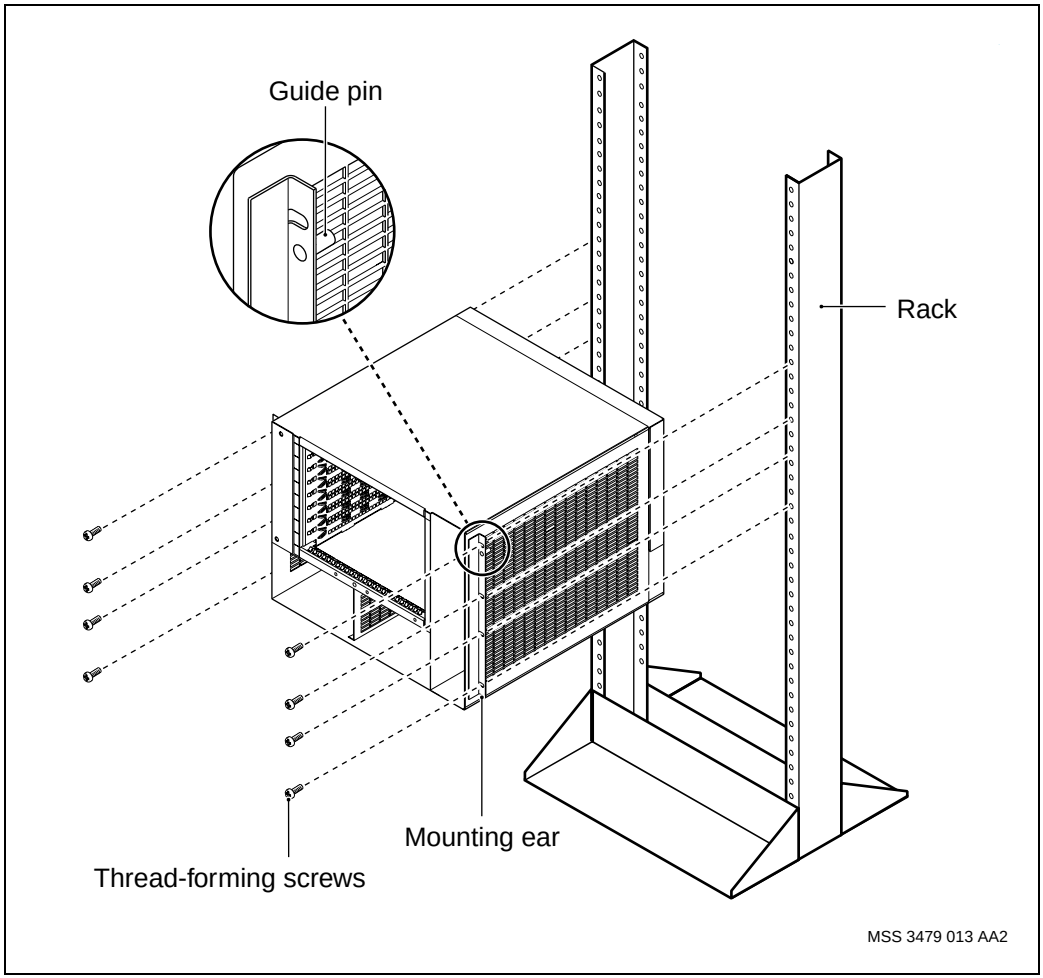


Figure 98
A Multiservice Switch 7460 shelf assembly to be installed in a rack



Installing a Multiservice Switch 7480

Install a Nortel Networks Multiservice Switch 7480 in a rack or cabinet before installing any processor cards or cables.

Prerequisites

WARNING
Risk of injury
The shelf assembly weighs 20.9 kg (46 lb). You need two people to perform this procedure.

WARNUNG
Verletzungsgefahr
Die Regalkomponente wiegt 20,9 kg. Zur Montage sind zwei Personen erforderlich.

- You need a device with PEC NTJS62 (ac-powered) or NTJS63 (dc-powered).
- Ensure that the rack or cabinet is installed and grounded. If you are installing a second device in a cabinet or rack, you must install the cooling unit for the second device directly above the cable management unit of the first device. For information about air flow requirements, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- Ground yourself to an appropriate anti-static discharge apparatus while handling the shelf assembly (device).

Procedure steps

1. Remove the cooling unit and the air filter from the cooling unit chassis.
2. Gently insert the cooling unit chassis into the cabinet or rack as shown in the figure “Multiservice Switch 7480 cooling unit chassis” (page 288)

   If you install this device above another device, leave approximately 5 cm (2 in.) between the 2 devices. Insert the lowest screw that secures the cooling unit chassis in the sixth available hole above the lower device.

3. Hold the chassis in place with one hand and use a 5/16-in. socket wrench to secure the unit to the frame. Use the 4 screws that are taped to the unit.
4. With the assistance of a second person, lift the shelf assembly and set it on top of the cooling unit chassis.
5. Use a 5/16-in. socket wrench to secure the assembly to the frame. Use the eight screws that are taped to the unit. See the figure “Multiservice Switch 7480 shelf assembly” (page 289).
6. Insert the cable management assembly into the cabinet frame and set it on top of the shelf assembly. See the figure “Multiservice Switch 7480 cable management assembly” (page 290).
7. Use a 5/16-in. socket wrench to secure the cable management unit to the frame. Use the four screws that are provided.
8. With the filter gate facing down, slide the air filter into its slot at the top of the cooling unit chassis. See the figure “Installing an air filter in a Multiservice Switch 7480” (page 498). Do not force the air filter into its slot.

   If the air filter assembly is spring loaded, gently press and release the center of the assembly to fasten it in place.
9. Connect the cooling unit power cord to the connector on the back of the shelf assembly that is labelled C.U. Power. Use a 1/8-in. screwdriver to tighten the 2 screws. See the figure “Cooling unit power cord” (page 501). The power cord is pre-connected to the cooling unit chassis.

Procedure job aid

Figure 99

Multiservice Switch 7480 cooling unit chassis

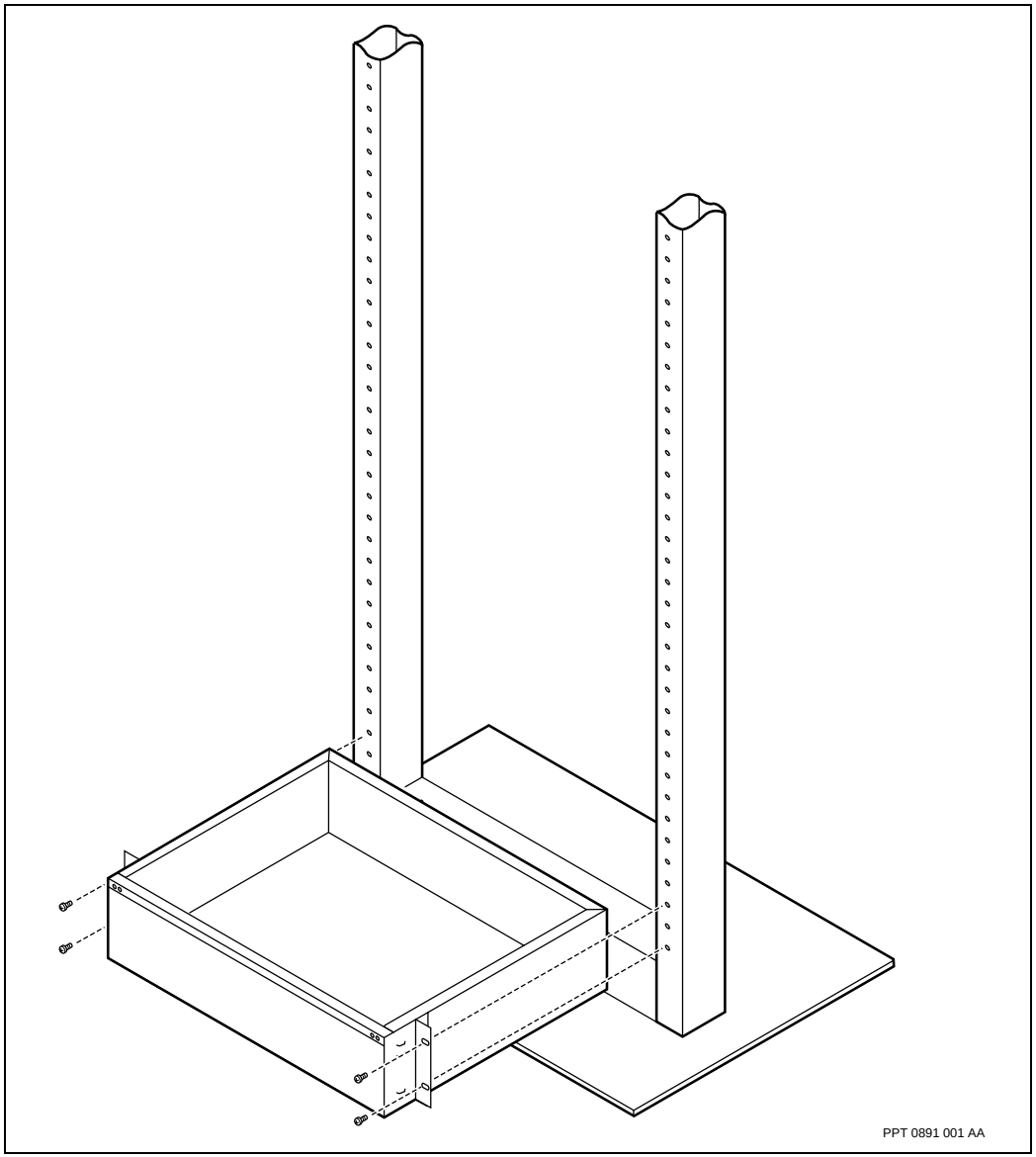


Figure 100
Multiservice Switch 7480 shelf assembly

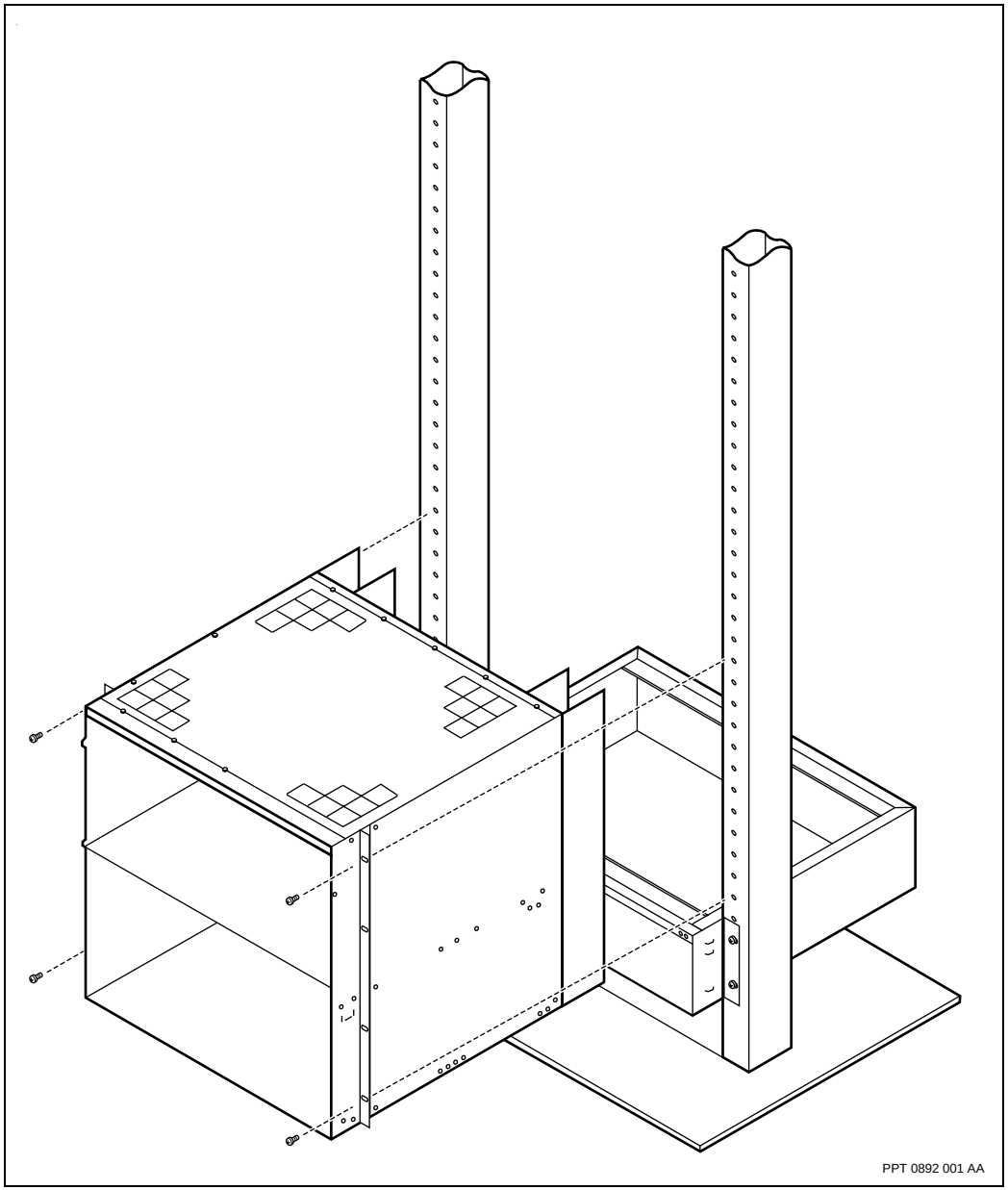
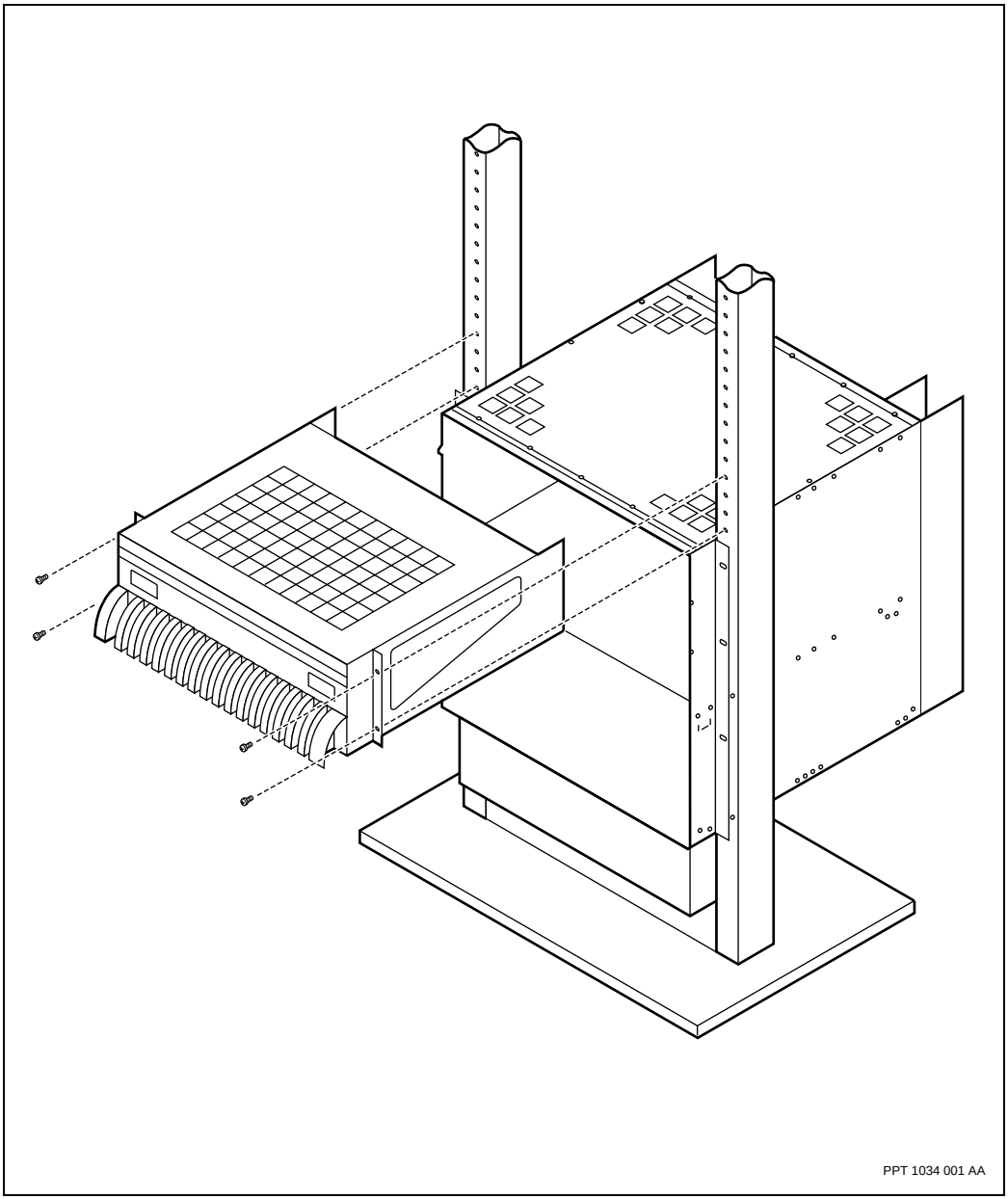


Figure 101
Multiservice Switch 7480 cable management assembly



Installing a Multiservice Switch cabinet door

Install Nortel Networks Multiservice Switch cabinet door so that you can restrict access to devices by locking the door.

Prerequisites

- You need a cabinet door kit with PEC NTJS56.
- Ensure that you have two people available to lift the door.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. Clear the area in front of the cabinet to access it while holding the door.
2. Lift the door by the grips and guide the bottom pin into the lower hinge. Then, slide the top into place.

Installing a power supply filler in a Multiservice Switch 7460

Install an Nortel Networks Multiservice Switch 7460 power supply filler to provide optimum cooling and EMI containment when only one power supply is used.

Prerequisites

- You need one power supply filler with the PEC NTPS22. Power supply fillers are typically not shipped installed in the shelf assembly.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. Hold the power supply filler so that:
   - the handle faces you
   - one hand is on the handle
   - the other hand supports it from underneath
2. Align the power supply filler with the open bay in the shelf assembly.
3. Slide the filler in. Tracks inside the bay align the power connectors at the rear of the power supply with the connectors at the rear of the bay. Stop pushing when you feel the connectors engage and the captive screws at the faceplate of the power supply contact their threaded holes.
4. Hand-tighten the 2 Phillips captive thumb screws to snug plus a 1/4 turn. Do not overtighten.

Installing a power supply into a Multiservice Switch 7440

Install a power supply into a Nortel Networks Multiservice Switch 7440 to provide power, or install a second power supply to provide redundancy.

Prerequisites

WARNING

Damage to equipment; safety hazard

Protect the power feeds to the dc power supply as described in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. Failure to protect the power feeds can damage the equipment and pose a safety hazard.

- A Nortel Networks Multiservice Switch 7440 requires a power supply unit with PEC NTEP26 (ac) or NTEP27 (dc).
- Ensure that the product engineering code (PEC) of the replacement power supply matches that of the power supply that was removed.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. If necessary remove the power supply filler (blank) from the power supply bay. Fillers are removed and installed using the same procedure as for power supplies.
2. Toggle to the standby position the power control on the power supply faceplate. See the figure “Multiservice Switch 7440 power supply” (page 396).
3. Use a 1/4-in. flat-head screwdriver to turn the locking screw on the power supply faceplate to the unlocked (vertical) position. See the figure “Inserting a power supply in a Multiservice Switch 7440” (page 295).
4. Insert the power supply into the vacant power supply slot. See the figure “Inserting a power supply in a Multiservice Switch 7440” (page 295).
5. Push in on the locking latches to secure the power supply in place.
6. Turn the locking latches one 1/4 turn counter-clockwise.

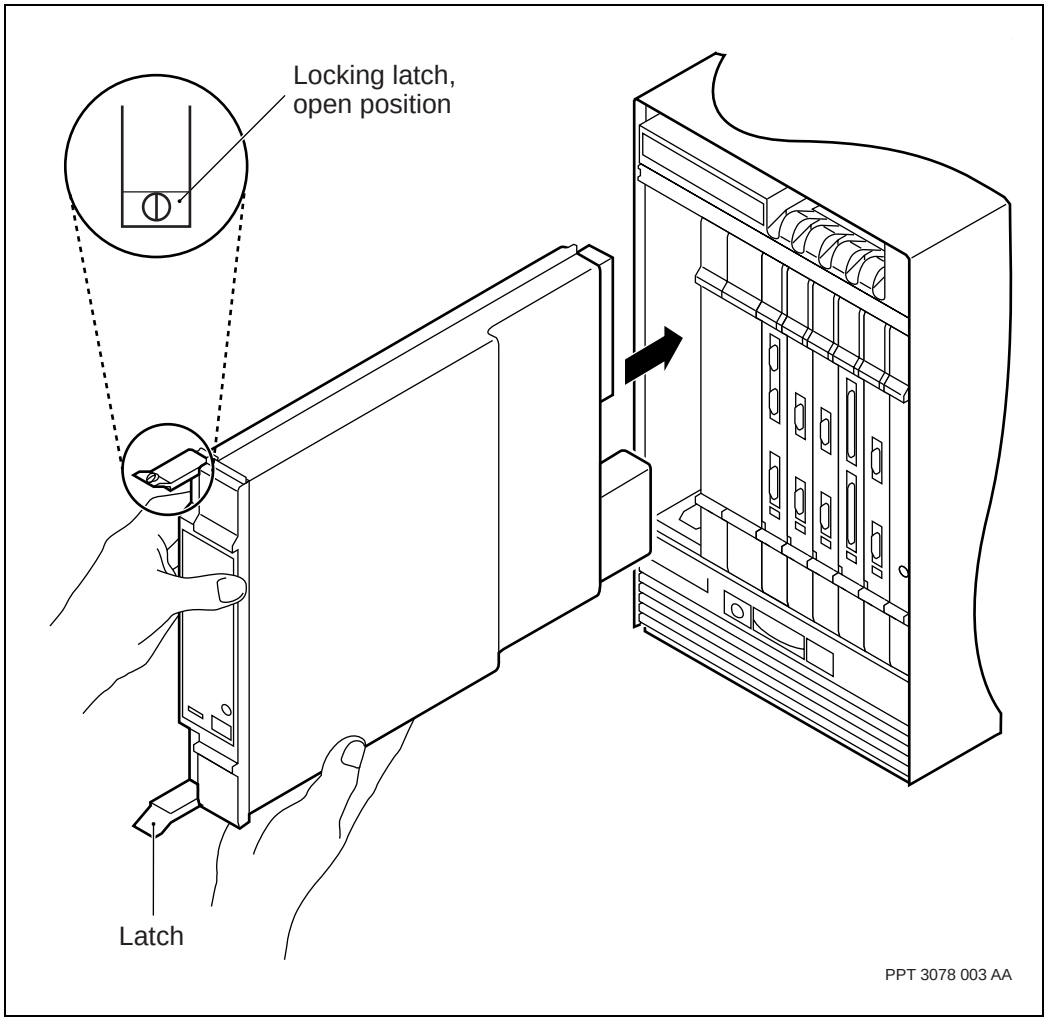
7 If you are installing a dc power supply, connect the battery wire, the battery return wire, and the ground wire to the terminal block. See the figure “Multiservice Switch 7440 dc wiring” (page 468).

or

If you are installing an ac power supply, insert the power cord connector into the appropriate power connector on the power input panel on the rear of the device. See the figure “Installing Multiservice Switch 7440 ac power cords” (page 314).

Procedure job aid

Figure 102
Inserting a power supply in a Multiservice Switch 7440



Installing a power supply in a Multiservice Switch 7460

Install a Nortel Networks Multiservice Switch 7460 power supply to provide minimum or redundant power to the shelf.

Prerequisites

WARNING
Risk of personal injury
Power supplies weigh 5.7 kg (12.57 lb.) each. Handle carefully and avoid dropping.

WARNUNG
Verletzungsgefahr
Die Stromversorgungsgeräte haben ein Gewicht von jeweils 5,7 kg. Seien Sie vorsichtig beim Umgang mit dem Gerät, und vermeiden Sie, es fallenzulassen.

- You need one or two power supplies with the PEC NTPS19. If you choose to operate the device with one power supply, you can use either bay provided the remaining bay has an NTPS22 installed in it.
- Once removed, power supply fillers (NTPS22) can be stored for re-use or re-deployed.
- The power supplies at the front of the shelf assembly and the power supply power cable input terminals at the rear of the shelf assembly are labeled PS1 and PS2 to ensure you can cable the appropriate bay or bays.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1 If present on the front of the shelf assembly, remove the power supply filler (blank) from the power supply bay by unfastening the 2 captive screws and pulling on the handle. Put the filler aside for re-use.

If both bays are protected by power supply fillers and you are installing only one power supply to run the device, remove the right-hand filler. This

maximizes heat dissipation inside the shelf when only one power supply is present.

2 Toggle to the standby position the power control on the power supply as shown in the figure “Power control for the power supply on a Multiservice Switch 7460” (page 298).

3 Hold the power supply so that:

- the handle and power control face you
- one hand is on the handle
- the other hand supports it from underneath

Refer to the figure “A power supply of a Multiservice Switch 7460” (page 299).

4 Align the power supply with the open bay in the shelf assembly as shown in the figure “Exploded view of the power supplies and a Multiservice Switch 7460” (page 300).

5 Slide the power supply in. Tracks inside the bay align the power connectors at the rear of the power supply with the connectors at the rear of the bay. Stop pushing when you feel the connectors engage and the captive screws at the faceplate of the power supply contact their threaded holes.

6 Hand-tighten the 2 Phillips captive thumb screws to snug plus a 1/4 turn. Do not overtighten.

Procedure job aid

Figure 103
Power control for the power supply on a Multiservice Switch 7460

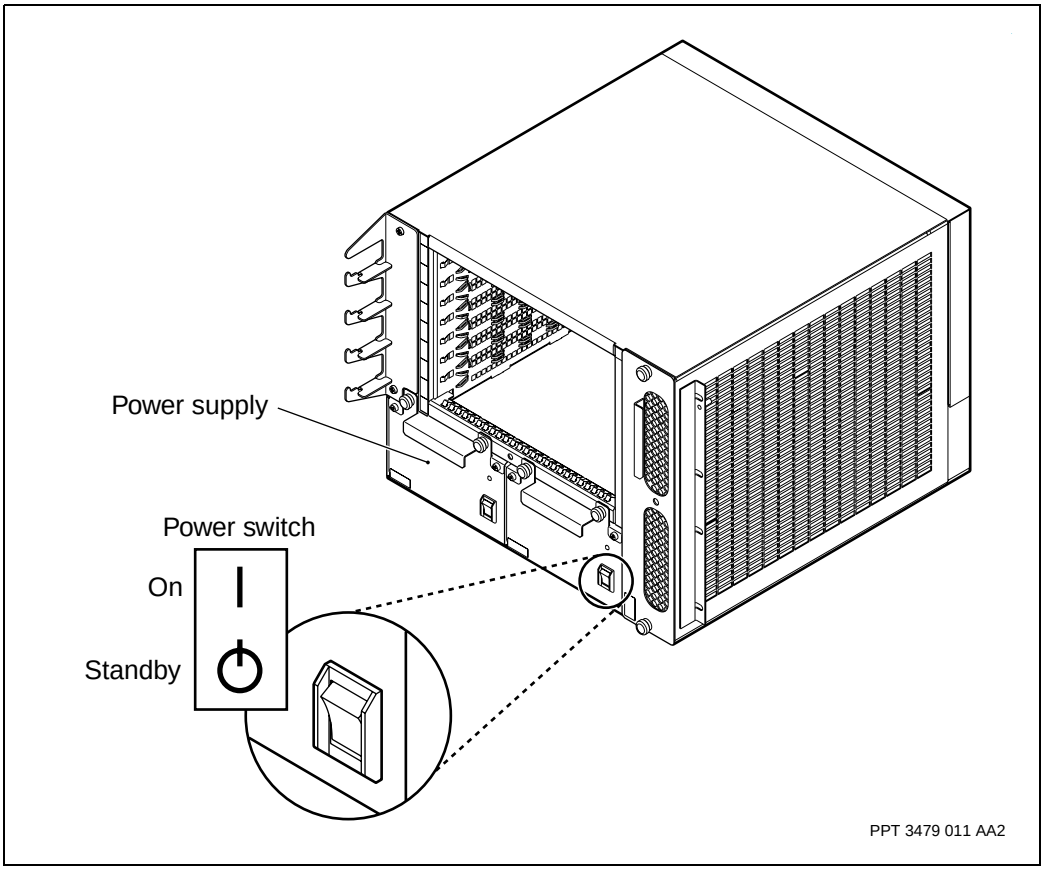


Figure 104
A power supply of a Multiservice Switch 7460

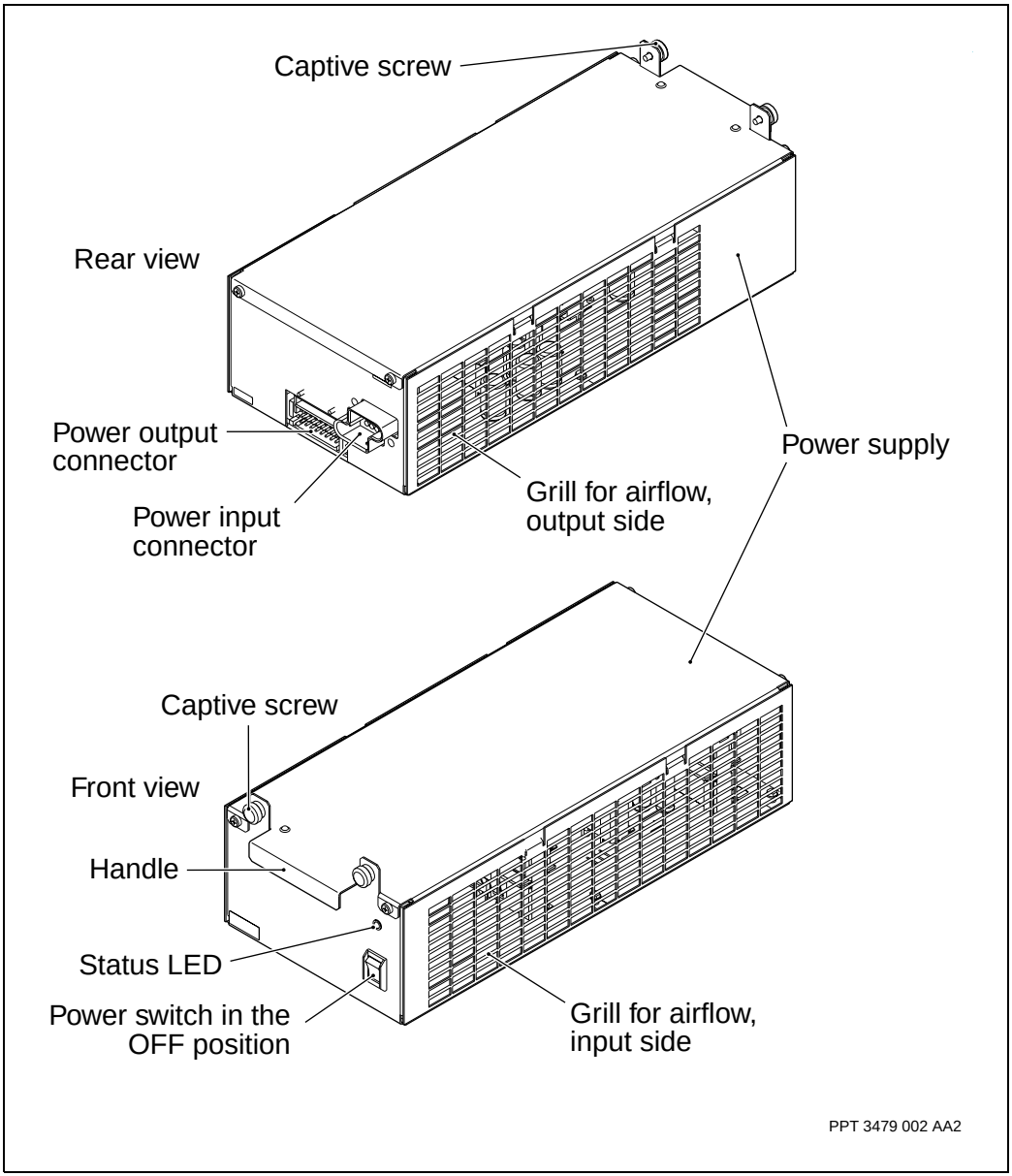
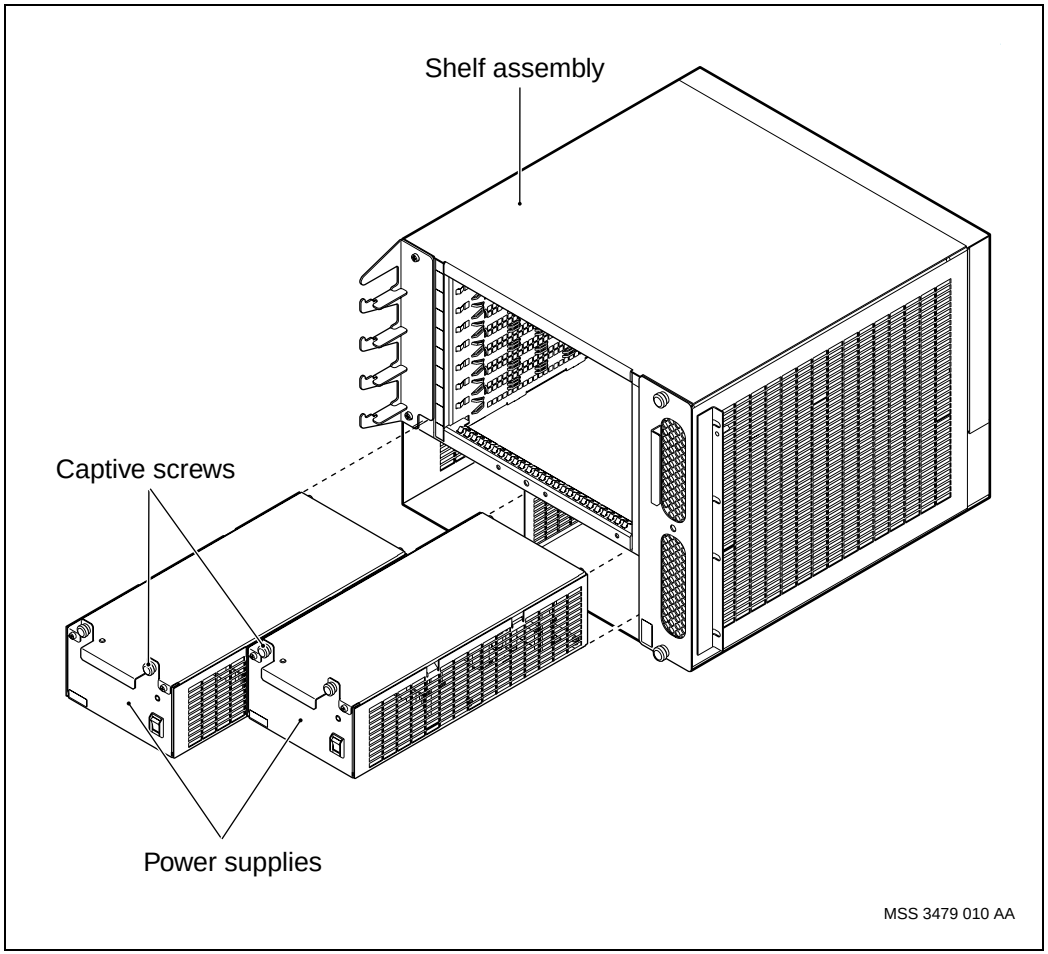


Figure 105
Exploded view of the power supplies and a Multiservice Switch 7460



Installing a power supply into a Multiservice Switch 7480

Install a power supply into a Nortel Networks Multiservice Switch 7480 to provide minimum or redundant power for the shelf.

Prerequisites

WARNING
Risk of personal injury
Power supplies weigh 6.6 kg (14.5 lb) each. Handle carefully and avoid dropping.

WARNUNG
Verletzungsgefahr
Die Stromversorgungsgeräte haben ein Gewicht von jeweils 6,6 kg. Seien Sie vorsichtig beim Umgang mit dem Gerät, und vermeiden Sie, es fallenzulassen.

- You need a power supply with one of the following PECs:
  - NTBP09
  - NTBO52
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

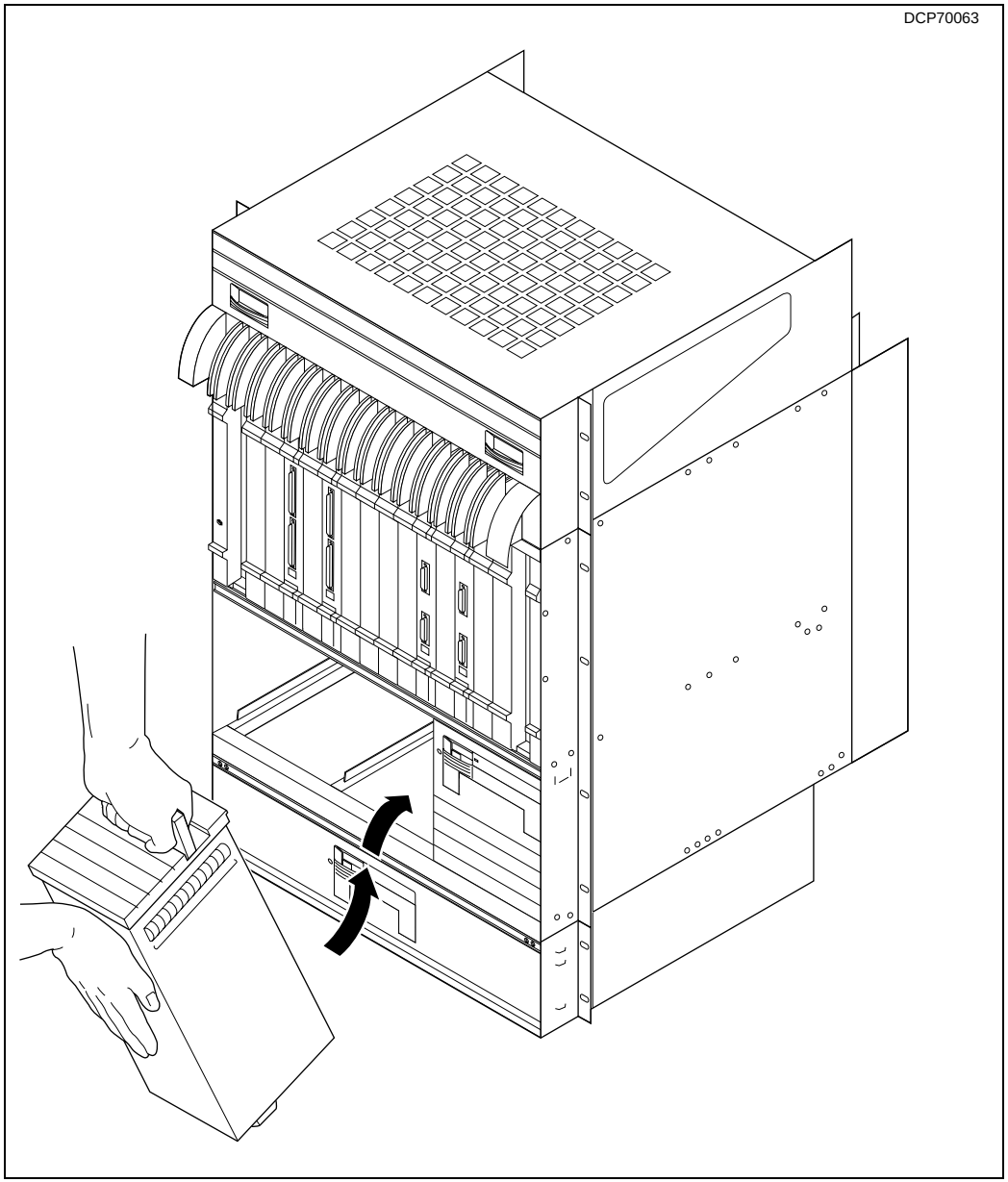
1. If necessary remove the power supply filler (blank) from the power supply bay. Fillers are removed and installed using the same procedure as for power supplies.
2. Toggle to the standby position the power control on the power supply faceplate. See the figure “Unlocked power supply on a Multiservice Switch 7480 with the power control in the standby position” (page 476).
3. Use a 1/4-in. flat-head screwdriver to turn the locking screw on the power supply faceplate to the unlocked (vertical) position.
4. Pull the faceplate handle down so that the handle is at a 90-degree angle to the faceplate.

5. Use both hands to lift the power supply. Grasp the handle and lift with one hand. Support the bottom of the power supply with the other hand. See the figure “Installing a power supply into a Multiservice Switch 7480” (page 303).
6. Insert the power supply into the vacant power supply bay and push it in halfway.
7. Hold the faceplate handle in the down position and slide the power supply the rest of the way in.

   The power supply clicks into place when the connectors are firmly seated.
8. Flip the faceplate handle up so that it is flush with the faceplate.
9. Use a 1/4-inch flat-head screwdriver to lock the handle into place. Turn the screw 90° clockwise.

Figure 106

Installing a power supply into a Multiservice Switch 7480



Installing a rack-mounted alarm panel / power and alarm panel

Install a rack-mounted alarm panel so that you can monitor the status of a Multiservice Switch 7460 or a Multiservice Switch 7480 if it is not installed in a cabinet.

Install a rack-mounted power and alarm panel so that you can monitor the status of a Multiservice Switch 7460 if it is not installed in a cabinet and connect power cabling to the front of a 19 in. rack.

Prerequisites

- You need an alarm panel kit / power and alarm panel kit with one of the following PECs:
  - NTJS74 for a Multiservice Switch 7480 (alarm panel)
  - NTPS20AA for a Multiservice Switch 7460 (alarm panel)
  - NTPS20BA for a Multiservice Switch 7460 (power and alarm panel)
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. Install the alarm panel by following the procedure “Installing a 19-inch rack-mounted termination panel” (page 240).
2. Connect the alarm panel cable to the alarm cable connector on the panel. See:
   - “Power and alarm panel for rack-mounted power and alarm panel kit NTPS20BA” (page 306)
   - “Power and alarm panel for rack-mounted power and alarm panel kit NTPS20BA” (page 306)
3. Route the cable down to the shelf assembly and connect it to the door alarm connector on the rear of the shelf. See the figure “Dual alarm shelf interconnection between two Multiservice Switch 7480s” (page 440).

Procedure job aid

Figure 107
Alarm panel for rack-mounted alarm panel kits NTPS20AA and NTJS74AA

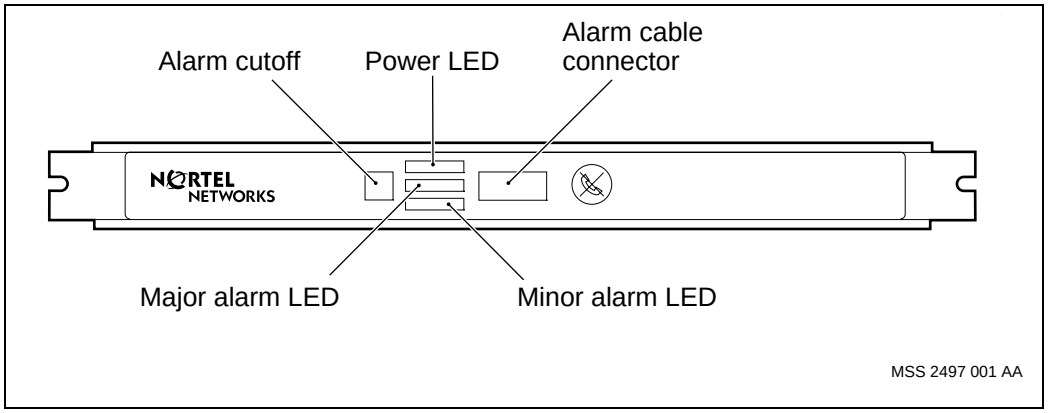
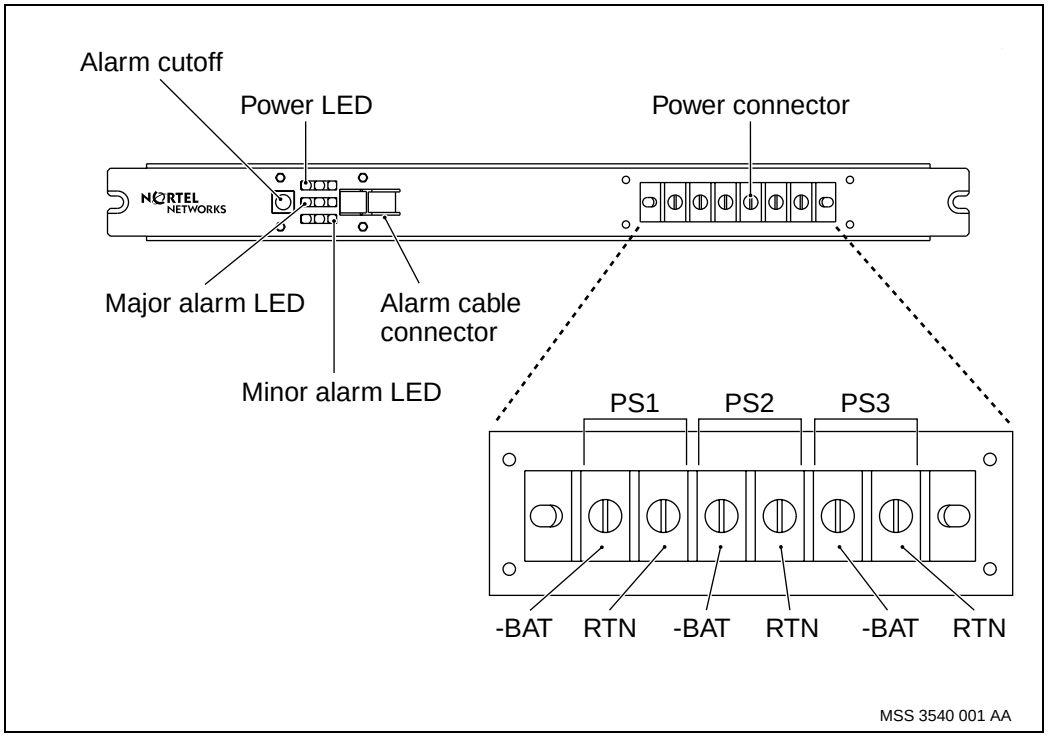


Figure 108
Power and alarm panel for rack-mounted power and alarm panel kit NTPS20BA



Installing a shelf interconnect cable

Install a shelf interconnect cable so that you can monitor the alarm status of two Nortel Networks Multiservice Switch 7480s using a single external alarm.

Prerequisites

- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1 Connect the interconnect cable to the Alarm 2 connector on the rear of each of the shelf assemblies as shown in the figure “Dual alarm shelf interconnection between two Multiservice Switch 7480s” (page 440).

If one or both shelves are already powered up when the cable is connected, any alarms that have been generated will be reported to the CP.

Installing a vertical-mount Multiservice Switch 7420 or Multiservice Switch 7440

Install a vertical-mount device under or beside a desk or table.

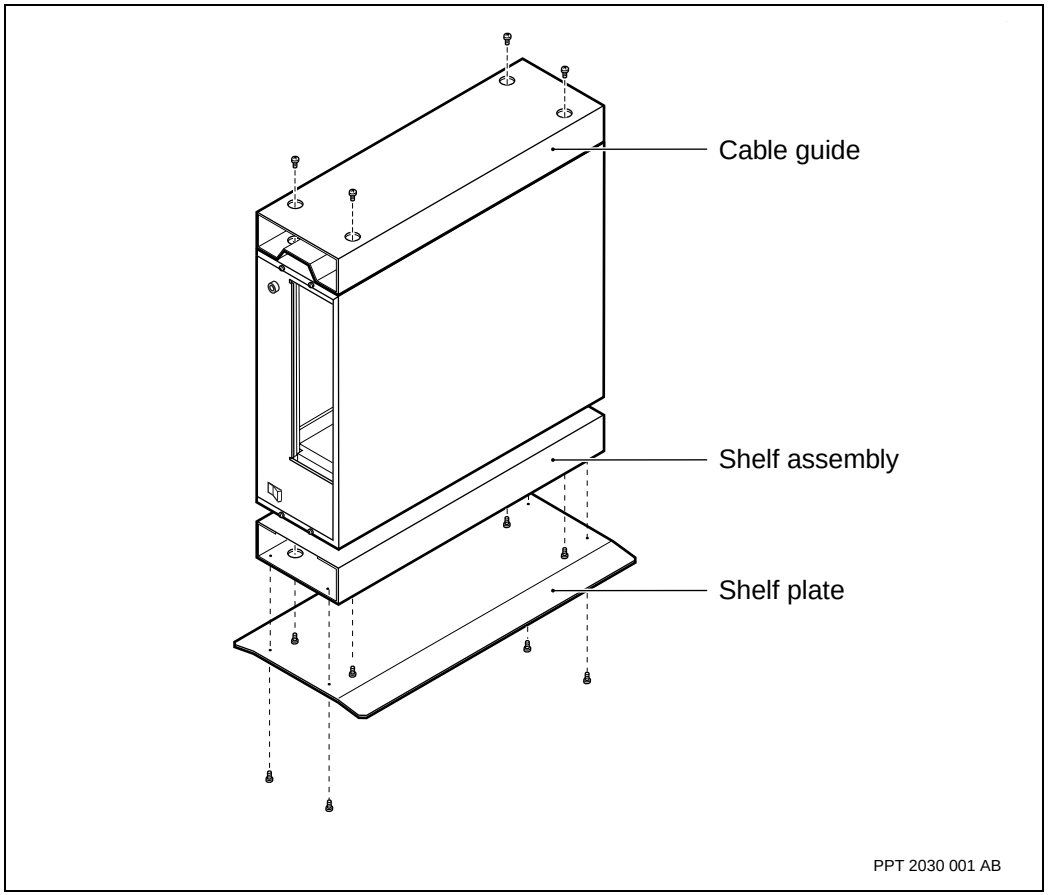
Prerequisites

- You need a vertical mount kit with PEC NTHQ08.
- Ensure that your floor plan takes into consideration all of the information in “Site preparation for free-standing Multiservice Switch equipment” (page 49).
- Ground yourself to an appropriate anti-static discharge apparatus while handling the shelf assembly (device).

Procedure steps

1. Set the chassis on a clear work surface.
2. Attach the cable guide to the fan-less side of the chassis using the hardware provided.
3. Attach the shelf assembly to the fan side of the chassis, and then attach the plate to the shelf assembly. See the figure “Attaching the plate to the shelf assembly” on page 309.

Figure 109
Attaching the plate to the shelf assembly



4 Tighten, but do not overtighten, all the screws.

5 Position the chassis according to the site plan.

6 Insert a blank processor card (NTBP23) into each slot that does not have a processor card.

7 Ensure that there is sufficient clearance for data cables and power cable.

Installing ac power cables on a multiport aggregate device

Install ac power cables on a multiport aggregate device after you install the device in a rack or cabinet.

Procedure steps

1. Plug an ac power cable into each power supply plug at the rear of the device.
2. Route the cable out of the rack or cabinet to the power outlet. Do not use extension cords.
3. Plug the power cords into the outlet.

Installing an ac power cable

Install an ac power cable if you need to replace a broken cable, or if you are adding another power supply to a device.

Prerequisites

WARNING

Risk of injury by electric shock

Before installing any cables, ensure that the circuit breaker at the power distribution panel is toggled off and that the outlet is void of primary power.

WARNUNG

Es besteht die Gefahr eines elektrischen Schlags.

Stellen Sie vor jeder Kabelinstallation sicher, dass der Leistungsschalter in der Stromverteilungseinheit abgeschaltet ist, und dass im Auslass kein Primärstrom mehr fließt.

WARNING

Risk of injury by electricity

Ensure that the ac power outlet to which the device is connected has been properly grounded, and that the ground pin on the ac power cord has not be modified in any way.

Failure to complete a proper ground at the ac power outlet may result in electrical shock causing equipment damage or personal injury.

WARNUNG

Verletzungsgefahr durch Stromschlag

Vergewissern Sie sich, dass die Wechselstrombuchse, an der Multiservice Switch-Switch angeschlossen ist, vorschriftsmäßig geerdet ist, und der Erdungsstift des Netzkabels nicht verändert wurde.

Eine nicht vorschriftsmäßig geerdete Steckdose erhöht die Verletzungsgefahr für das Bedienpersonal und das Risiko der Beschädigung des Geräts durch Stromschlag.

- Before you install a power cord, make sure you have met the appropriate power requirements. For information, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Procedure steps

1 Insert the power cord connector into the appropriate power connector on the power input panel on the rear of the device, as shown in either

- “Installing Multiservice Switch 7440 ac power cords” (page 314)
- “Installing Multiservice Switch 7480 ac power cords” (page 315)

Each ac power supply requires its own power cord. Do not use extension cords.

Multiservice Switch 7480s have three power connectors on the power input panel; one for each possible power supply. If your device contains fewer than three power supplies, ensure that you install the power cord into the power supply’s corresponding power connector.

2 Run the cord into the cable guide.

3 If your device is in a cabinet, you can route the cable through the floor or ceiling, with other cables. Remove the smaller grill cutout in either the top or the bottom of the cabinet with a 3/8-inch box wrench. Route the cord out of the cabinet through the appropriate cutout.

or

If your device is installed a standard 19-inch rack, route the cord out of the rack.

4 Run the cord to the power outlet.

5 Plug the cord into the power outlet.

The ac power cord grounds a Multiservice Switch 7440, so no additional grounding procedure is required.

Procedure job aid

Figure 110
Installing Multiservice Switch 7440 ac power cords

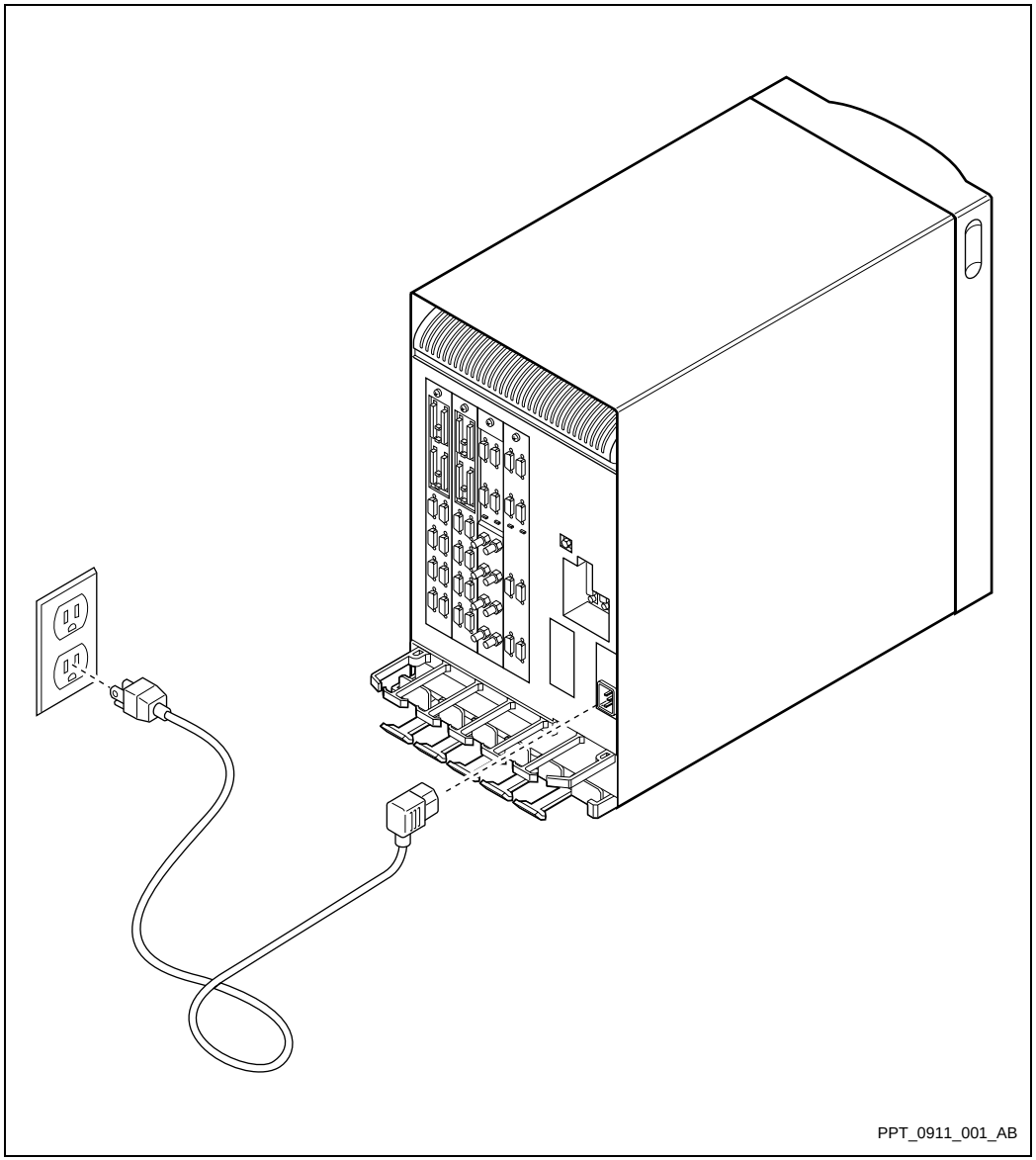
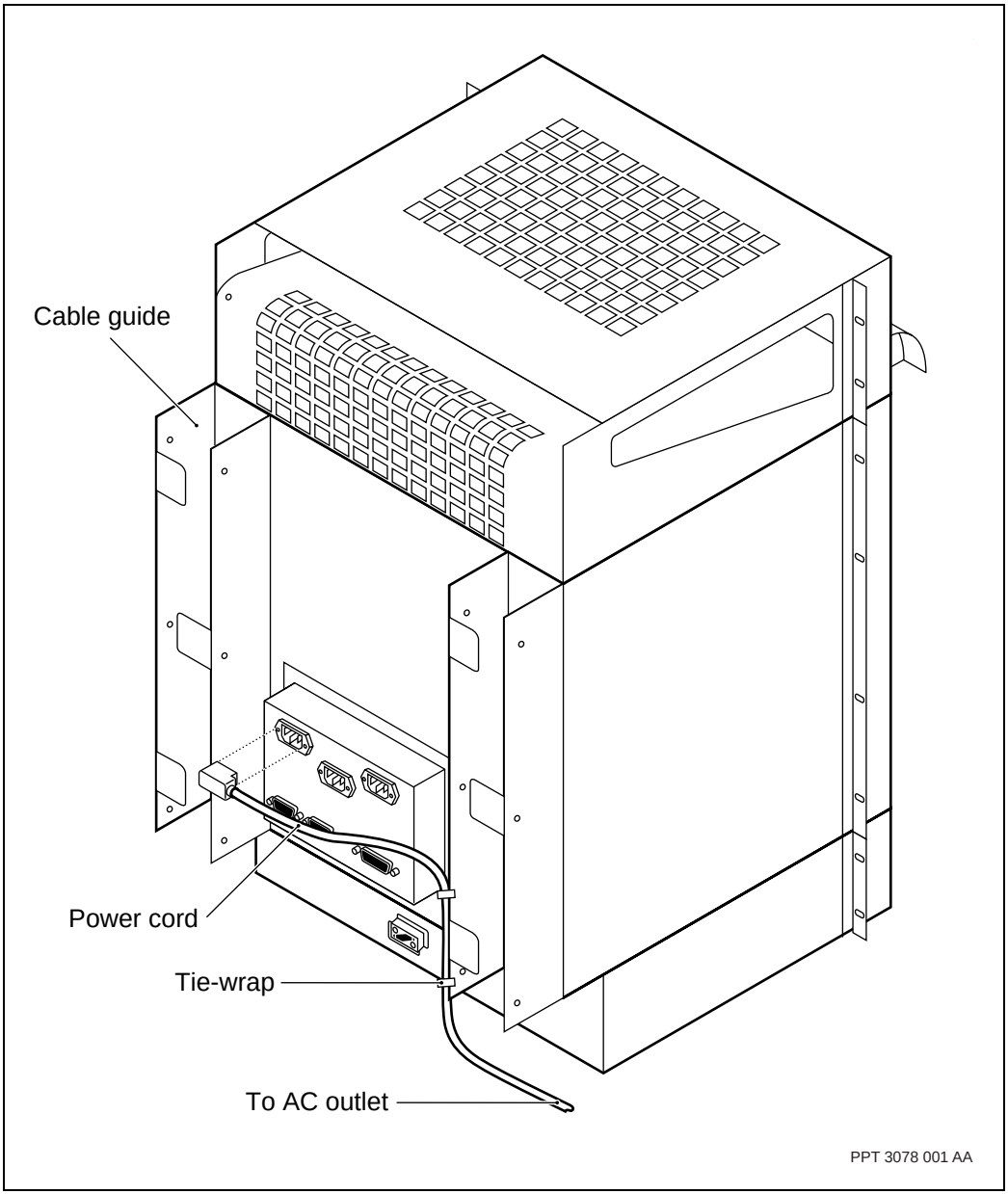


Figure 111
Installing Multiservice Switch 7480 ac power cords



Installing an alarm panel cable or cabinet door alarm cable

Install an alarm panel cable to connect alarm if you want alarms raised by device hardware to generate a light or sound in up to three different locations.

Prerequisites

- Ensure that you have made an alarm cable to suit your installation and in accordance with the connector pinout information in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. The alarm cable must be shielded to comply with electromagnetic interference (EMI) requirements. See "Making a braided shield" (page 379).
- If you are using long cables, ensure that your alarm system is not impeded by cable resistance or voltage drop.
- Follow "Avoiding damage from static electricity" (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1 If this is a Multiservice Switch 7480, connect the alarm cable to the Alarm 1 connector on the rear of the device. See the figure "Dual alarm shelf interconnection between two Multiservice Switch 7480s" (page 318).

or

If this is a Multiservice Switch 7440, connect the alarm cable to the external alarm connector on the rear of the device as shown in the figure "Multiservice Switch 7440 alarm connector and cutoff control" (page 319).

or

If this is a Multiservice Switch 7460, connect the 9-pin D-sub of the alarm cable to the alarm connector Alarm 2 on the rear of the device as shown in the figure "The external alarm connector of a Multiservice Switch 7460" (page 320).

2 Connect the other end of the cable to your remote alarm system.

Installing an external alarm cable

Install an external alarm if you want alarms raised by device hardware to generate a light or sound in up to three different locations.

Prerequisites

- Ensure that you have made an alarm cable to suit your installation and in accordance with the connector pinout information in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. The alarm cable must be shielded to comply with electromagnetic interference (EMI) requirements. See “Making a braided shield” (page 379).
- If you are using long cables, ensure that your alarm system is not impeded by cable resistance or voltage drop.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1 If this is a Multiservice Switch 7440, connect the alarm cable to the external alarm connector on the rear of the device as shown in the figure “Multiservice Switch 7440 alarm connector and cutoff control” (page 319).

or

If this is a Multiservice Switch 7460, connect the 15-pin D-sub of the alarm cable to the external alarm connector on the rear of the device at Alarm 2 as shown in the figure “The external alarm connector of a Multiservice Switch 7460” (page 320).

or

If this is a Multiservice Switch 7480, connect the alarm cable to the Alarm 2 connector on the rear of the device. See the figure “Dual alarm shelf interconnection between two Multiservice Switch 7480s” (page 318).

2 Connect the other end of the cable to your remote alarm device.

Procedure job aid

Figure 112
Dual alarm shelf interconnection between two Multiservice Switch 7480s

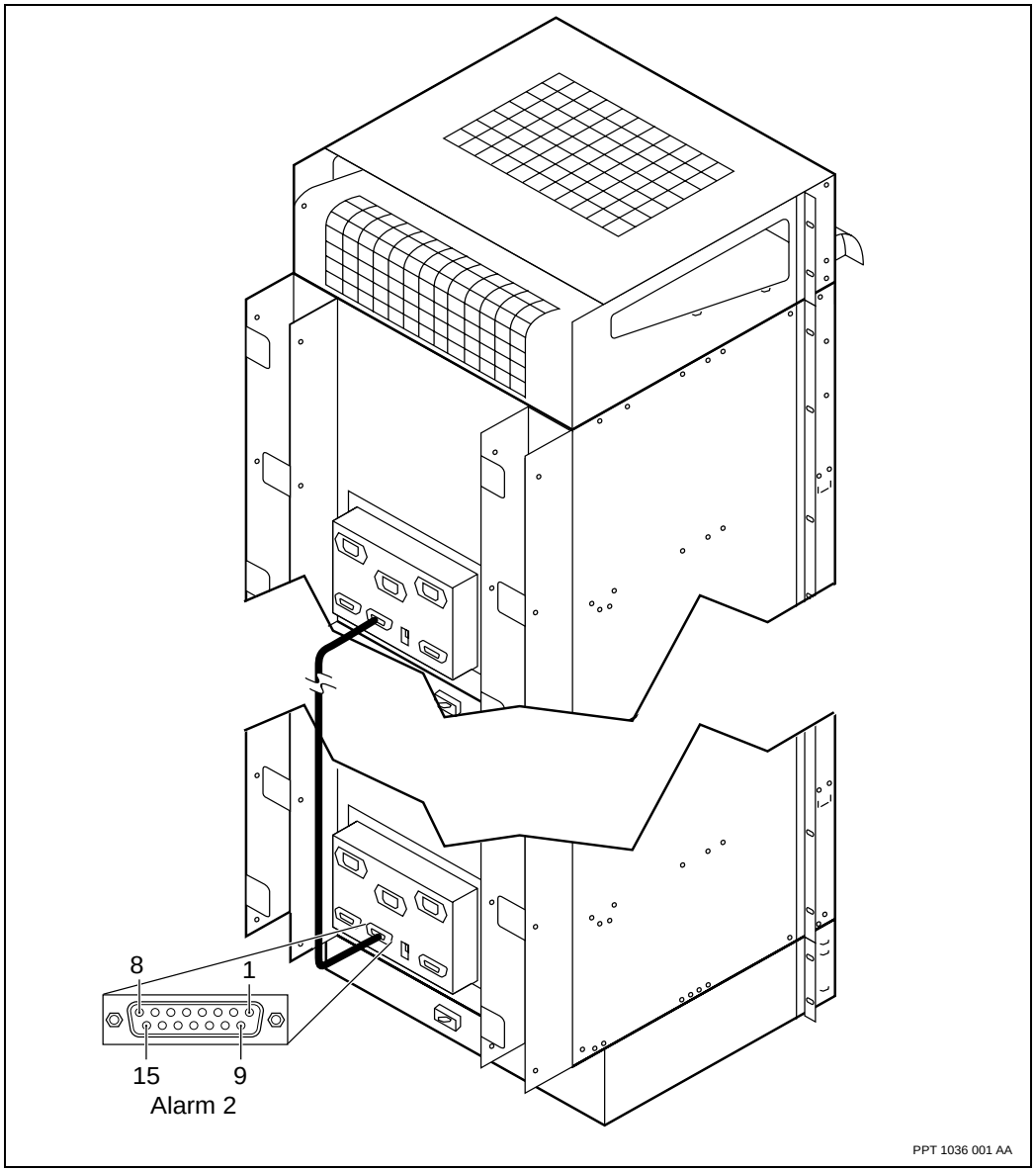


Figure 113
Multiservice Switch 7440 alarm connector and cutoff control

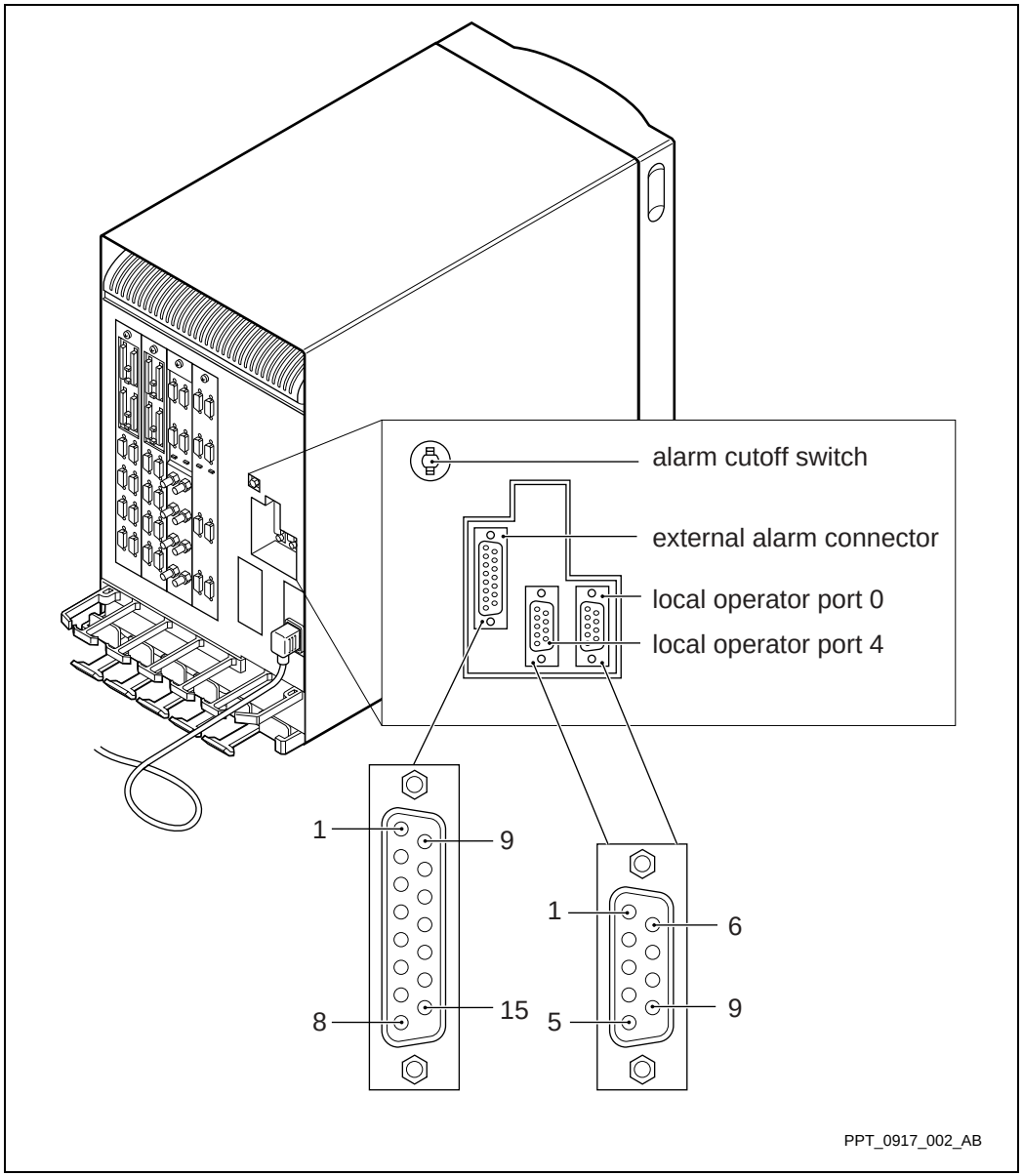
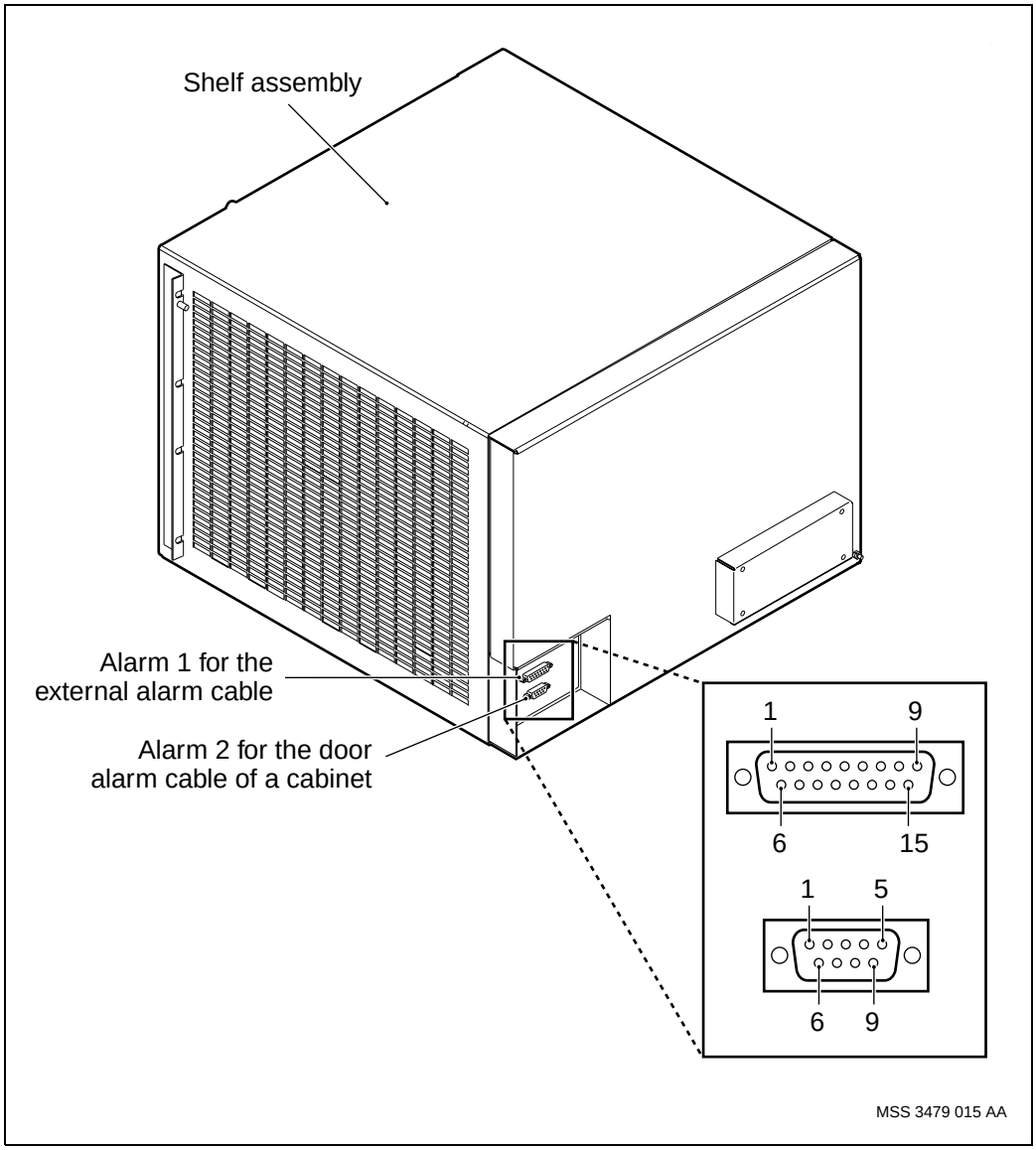


Figure 114
The external alarm connector of a Multiservice Switch 7460



Installing an FP

Install a function processor (FP) to enable a device to provide new or previously configured services.

Prerequisites

CAUTION

Risk of damage by electrostatic discharge (ESD)

When you handle processor cards, wear a grounded antistatic wrist strap or equivalent to protect electronic parts. For more information, see “Avoiding damage from static electricity” (page 208).

CAUTION

Risk of service loss by signal noise

Inserting or removing a processor card from a shelf can cause noise on the backplane that causes loss of service. Therefore, minimize the time you take to insert or remove a processor card. Do not let a processor card sit in the shelf with a partial connection to the backplane.

CAUTION

Risk of service loss by inadequate power

Two power supplies must be installed before inserting a 32-port MSA 2-slot FP with the PEC NTNQ69AA, NTNQ71AA, NTNQ73AA, NTNQ74AA, NTNQ76AA, or NTNQ78AA. There is a risk of a shelf reset when installing one of these FPs in a shelf with only one operating power supply unit. This risk does not apply when the FPs are already installed and one of two power supplies fails.

CAUTION
Risk of service loss
Before seating or unseating an FP in a sparing configuration, ensure that all the cables on the faceplate are disconnected. Seating a cabled FP can cause a traffic loss on the other FPs in the sparing configuration.

CAUTION
Risk of service loss
Whenever you install an FP that uses a control cable in a sparing configuration, you must always seat the FP into a slot on the shelf before you connect the control cable. If you connect the control cable between the FP and the termination or sparing panel before you insert the FP in the shelf, you can disrupt service to the other FPs in the sparing configuration.

- If the FP is an HSSI or V.11, you must first set the DIP switches according to “Setting DIP switches on a V.11 function processor” (page 520) or “Setting DIP switches on a HSSI function processor” (page 518).
- For initial installations, ensure that each FP type will be inserted into the slot that has been or will be configured for that FP. The hardware configuration must match the software configuration for the slot.
- The bottom of a Nortel Networks Multiservice Switch 7400 FP is typically where the status LED is located.
- Follow “Avoiding damage from static electricity” (page 208) to protect the card from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1 Hold the FP in front of the shelf assembly so that:

- you do not touch the copper-colored metal EMI gasket at the edge of the card
- its faceplate faces you

- it is parallel to the slot (vertically or horizontally)
- its bottom is positioned next to the cooling unit when the shelf assembly is mounted vertically or horizontally

2 Slide the FP half way into the slot.

3 Pull open the top and bottom latches of the FP until they are fully horizontal and continue sliding the FP into the slot until the latches begin to close.

4 Press the latches towards the faceplate to seat the FP connectors firmly into the backplane connectors at the rear of the shelf assembly. Stop pushing when the latches are flush with the faceplate.

5 Lock the latches as shown in the figure “Locking and unlocking processor card latches” (page 324).

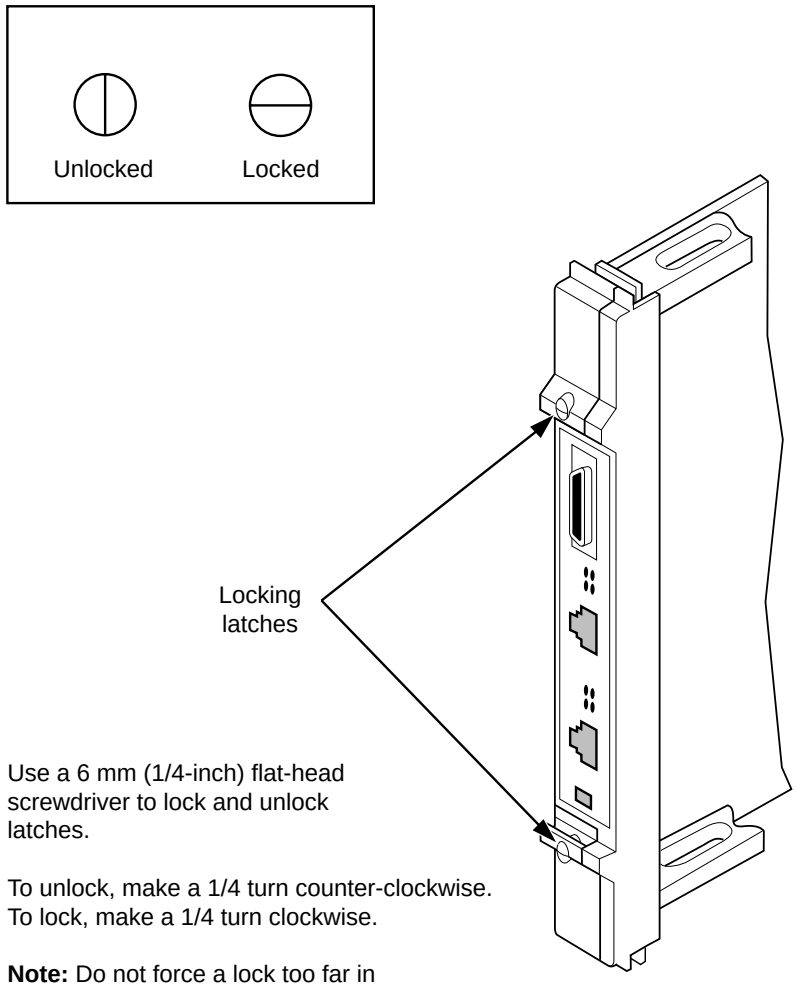
6 Monitor the status of the FP by observing the status LED as it lights throughout the initialization sequence. See “Processor card LED status display” (page 326) to verify that its final color is appropriate for your configuration.

The device generates alarms for the FP when

- a logical processor (LP) or FP is enabled
- an interface cable is not connected
- an interface cable is connected to the wrong port
- the FP fails to be loaded by the CP

Procedure job aid

Figure 115
Locking and unlocking processor card latches



Use a 6 mm (1/4-inch) flat-head screwdriver to lock and unlock latches.

To unlock, make a 1/4 turn counter-clockwise. To lock, make a 1/4 turn clockwise.

Note: Do not force a lock too far in either direction.

Figure 116
Disengaging a processor card

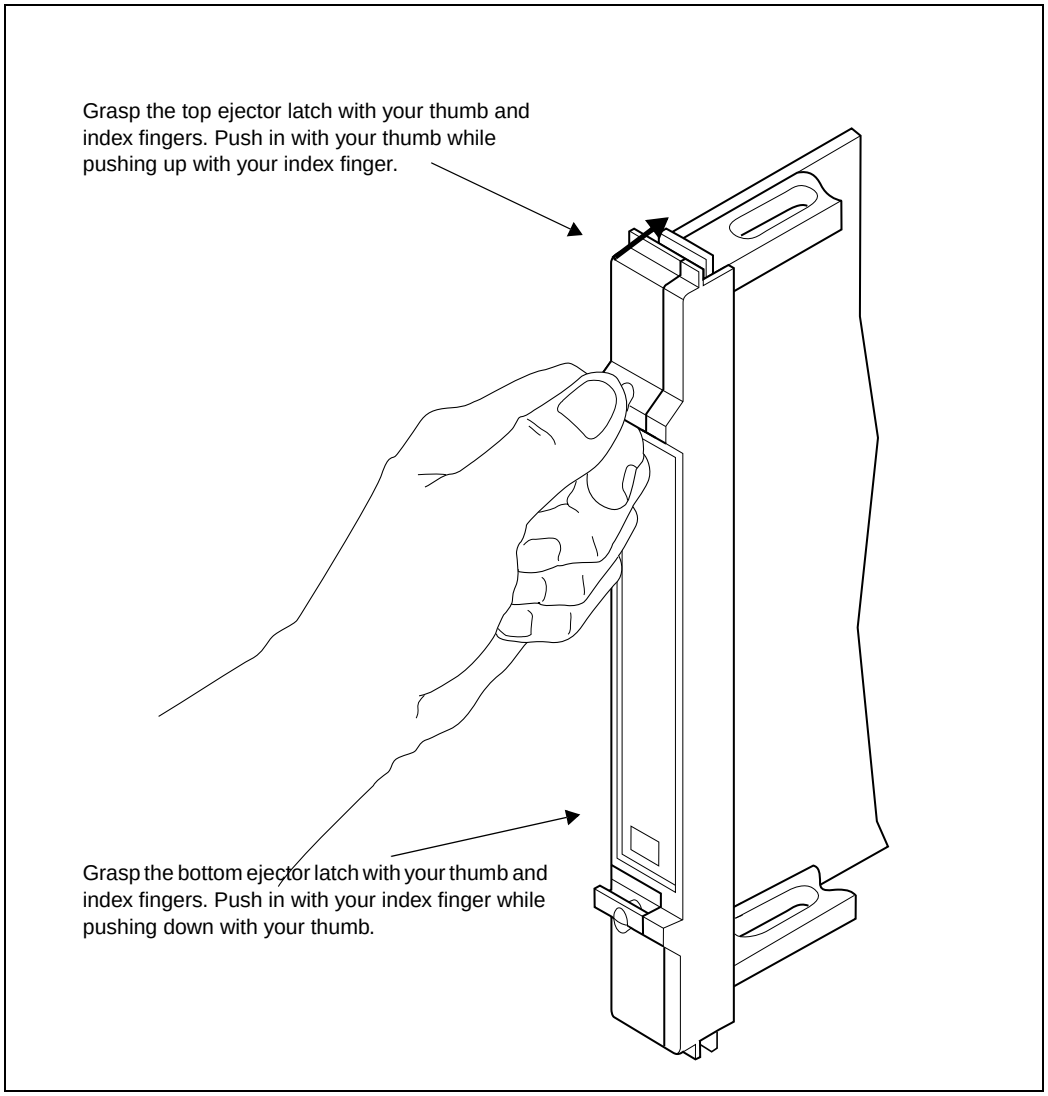


Table 3
Processor card LED status display

LED display	Card status
No color	No power is reaching the card.
Solid red	Card is powered and is either performing self-tests or, after 30 seconds, is faulty.
Slow pulsing red	Card has passed self-tests but has not yet fully loaded its software.
Slow pulsing green	Card's software is fully loaded but not yet activated. It may be initializing or in standby mode. For Multiservice Switch 7400s, the card may also be locked.
Fast pulsing green	Card is running as standby.
Solid green	Card is in active service.
Solid amber	Card is not faulty, but cannot operate. (For example, the card is not provisioned in software, or the slot was provisioned for one card type but another type was inserted or, for Multiservice Switch 7400 series, the card is unsupported.)

Installing covers for a Multiservice Switch 7440

Install covers on the front and back of a floor-mounted Nortel Networks Multiservice Switch 7440 to help keep the components dust-free.

Prerequisites

- You need a kit with PEC NTEP65 which contains the front and rear covers.

Procedure steps

1. Insert the mounting studs of the cover into the holes located at the bottom of the device. See the figures "Installing a front cover on a Multiservice Switch 7440" (page 327) and "Installing a rear cover on a Multiservice Switch 7440" (page 328).
2. Press the top of the cover into place. Friction holds the cover in place.
3. Ensure that you have routed all cables through the openings in the bottom of the cover.

Procedure job aid

Figure 117
Installing a front cover on a Multiservice Switch 7440

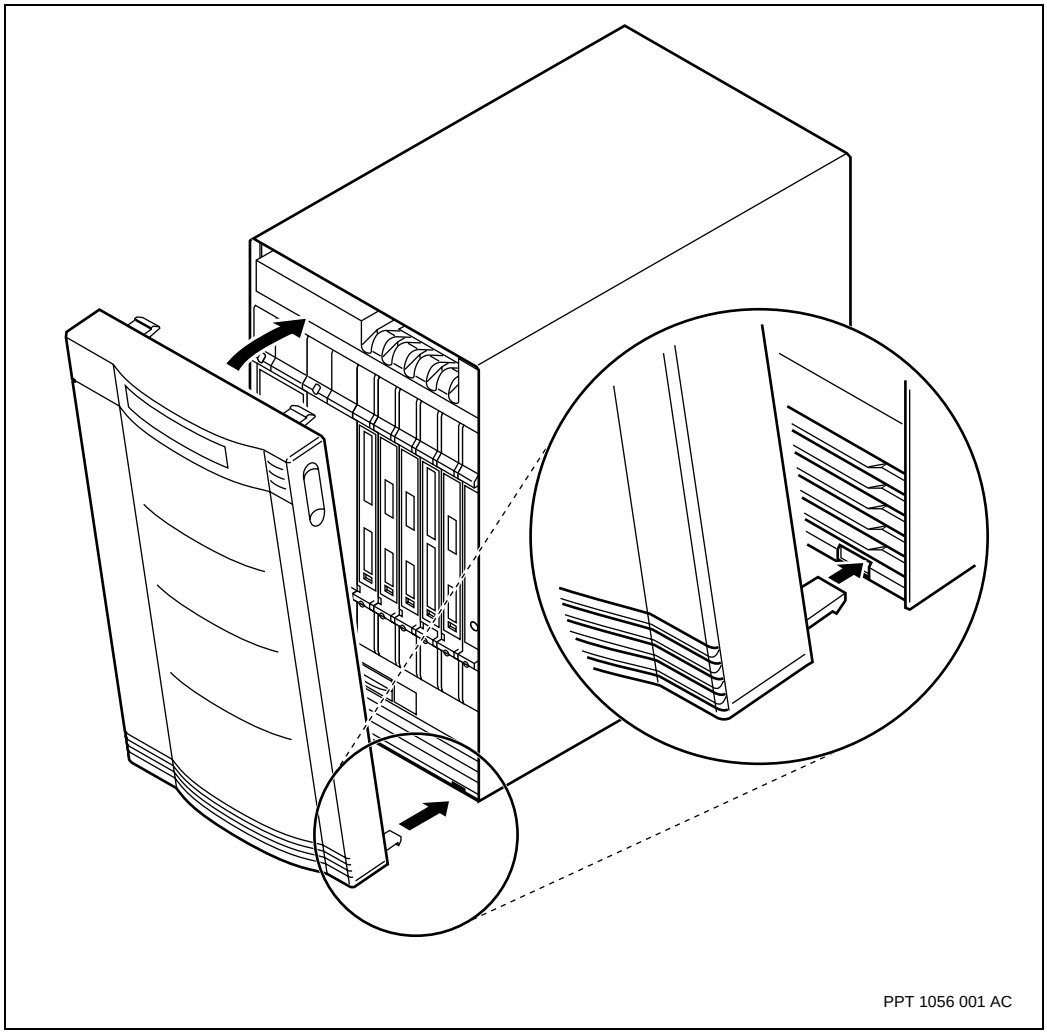
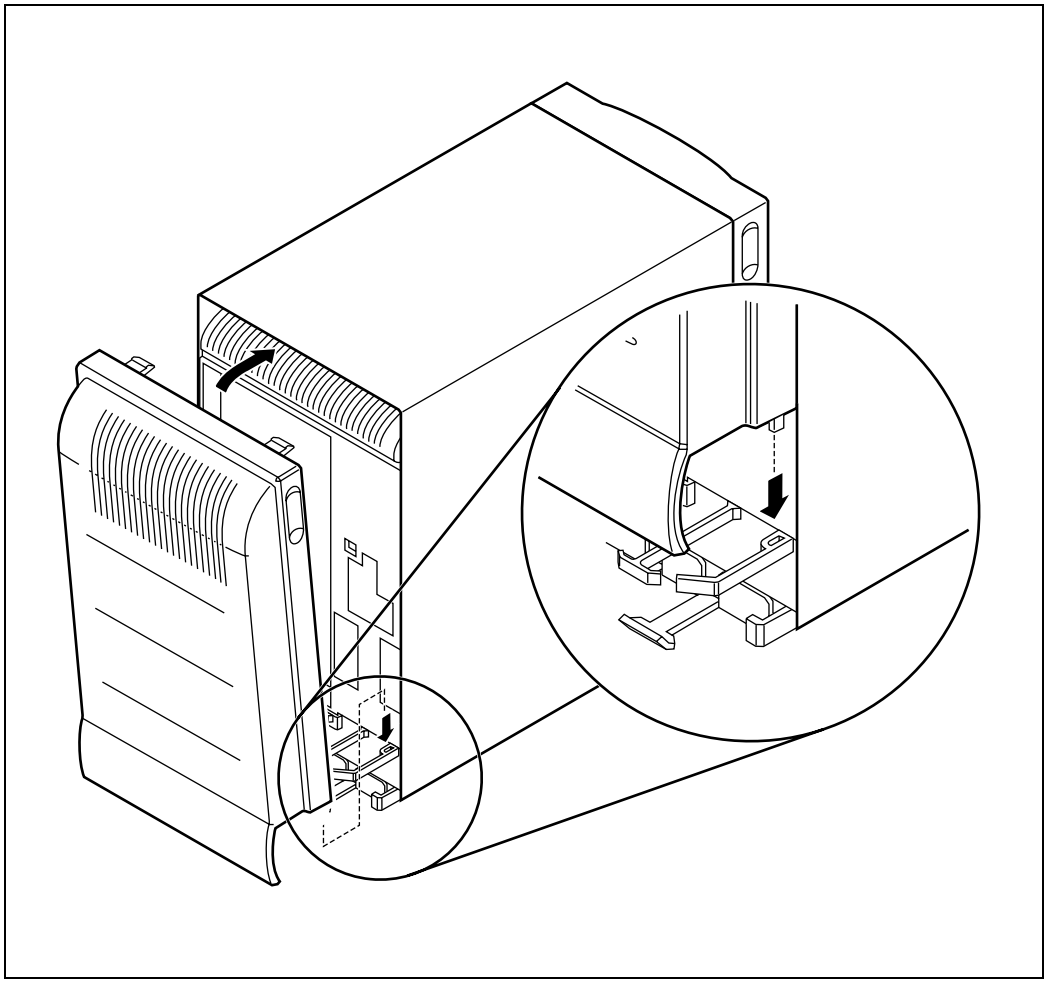


Figure 118
Installing a rear cover on a Multiservice Switch 7440



Installing CP cables for BITS

Install control processor (CP) building integrated timing supply (BITS) cables between a CP-with-BITS and the BITS termination panel.

Prerequisites

- Use the appropriate cable for your configuration. Refer to the NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description* for a list of cable part numbers and specifications.
- Ensure that you have routed and labeled the CP cable.
- The BITS termination panel provides the necessary terminations (DS1 or E1 balanced, or E1 unbalanced) for the CP-with-BITS.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

CAUTION
Risk of equipment damage
To avoid damaging equipment, always connect the cable to the termination panel before you connect it to the control processor.

1. Set the dip switch on the BITS termination panel to “single cp” or “dual cp” depending on whether you are connecting the termination panel to one control processor or to two redundant control processors.
2. Connect the BITS cables to the output ports on the BITS termination panel and tighten the screws. See the figure “Connections for CP-with-BITS” (page 330)
3. Connect the other end of the cables to the DS1/E1 BITS ports on the faceplates of the main and spare CPs. See the figure “Control processor with BITS faceplate” (page 331)

Procedure job aid

Figure 119
Connections for CP-with-BITS

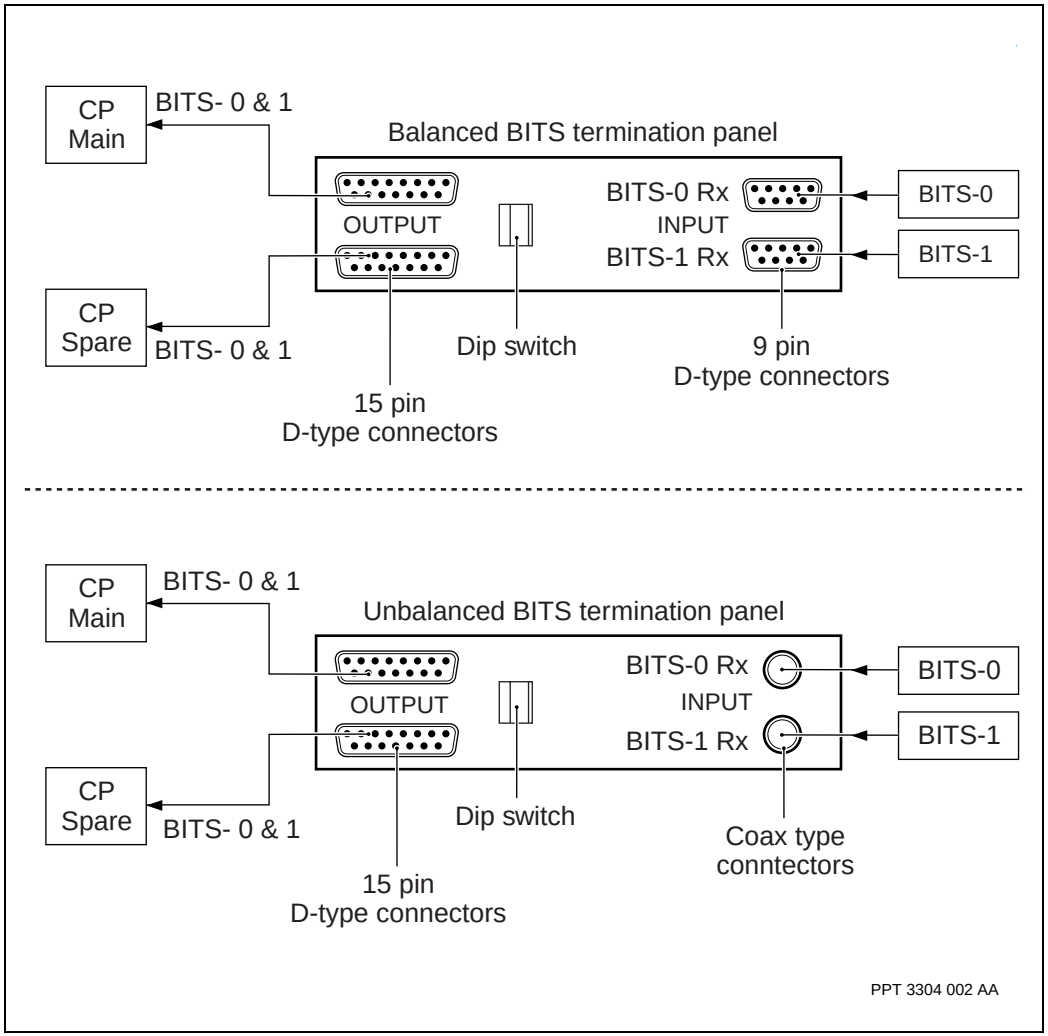
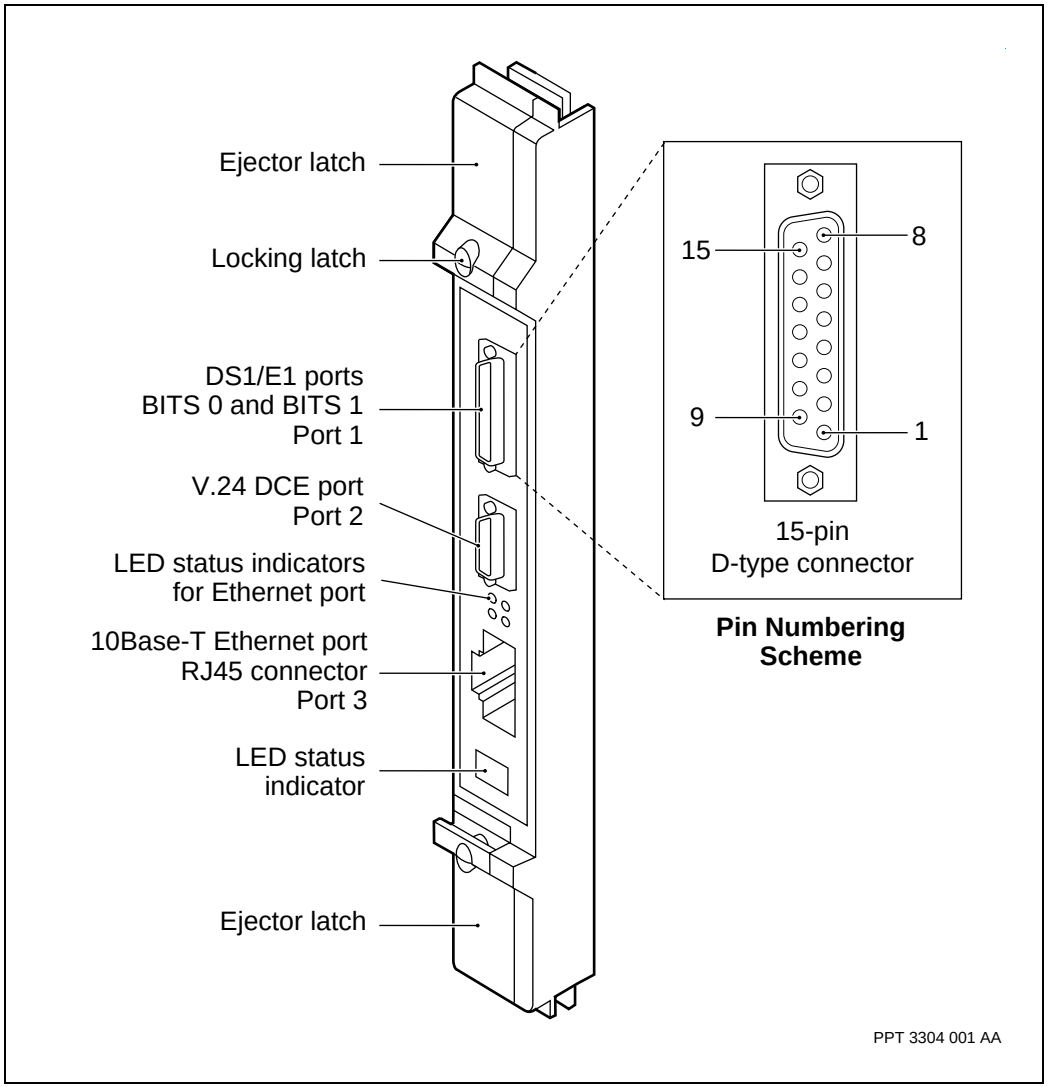


Figure 120
Control processor with BITS faceplate



Installing dc power cables onto a multiport aggregate device

Install dc power cables on a multiport aggregate device after you have mounted the device to the rack or cabinet.

Procedure steps

1. Connect the dc power cable for each power supply to the output terminals of the disconnect device.
2. Route the dc power cables into the cabinet or rack through the knockout.
3. Attach the terminal connector to the ends of the wires. Each cable contains three wires: a positive, a negative, and a ground. Each connector has three openings: a positive, a negative and a ground. Insert each wire into the opening that it matches and secure it in place by tightening the screw on the top of the connector. See the figure “Connecting power wires to the terminal connector” (page 333).
4. Connect the terminal connectors to the terminal block for one of the power supplies (on the rear of the unit); connect the second cable to the other terminal block. Push the connector into the terminal block until it clicks and feels secure. See the figure “Connecting the terminal connector” (page 334).
5. Connect the power cables from the disconnect device to the power source.

Procedure job aid

Figure 121
Connecting power wires to the terminal connector

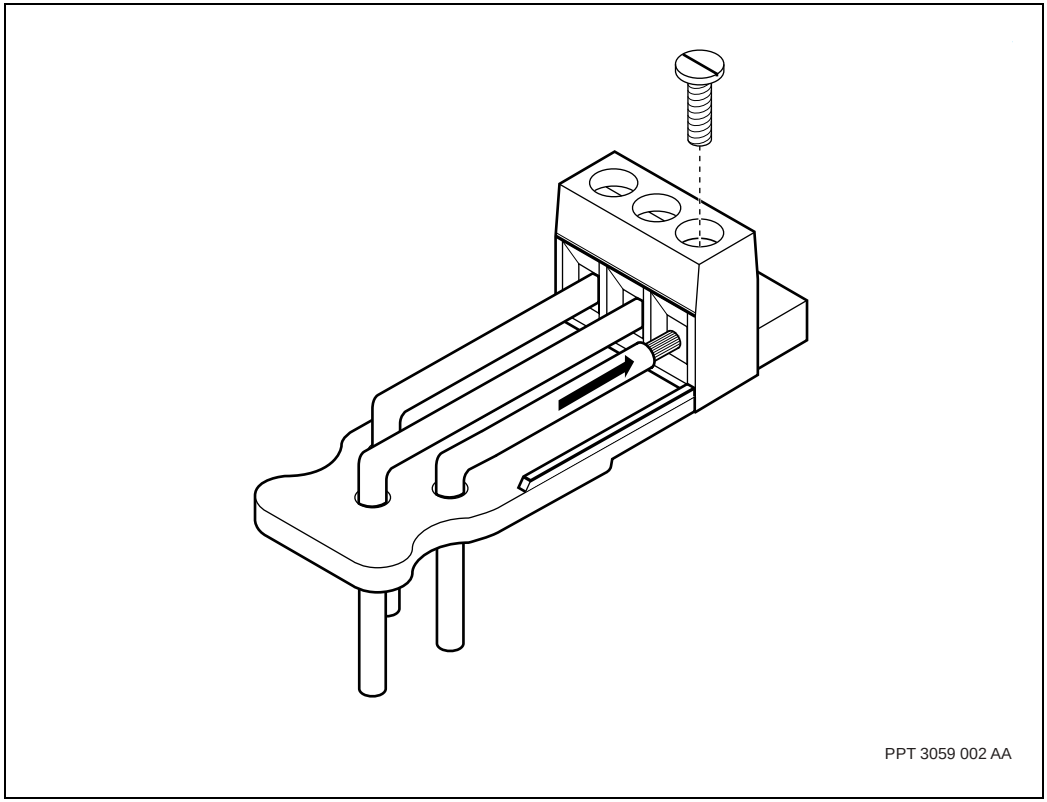
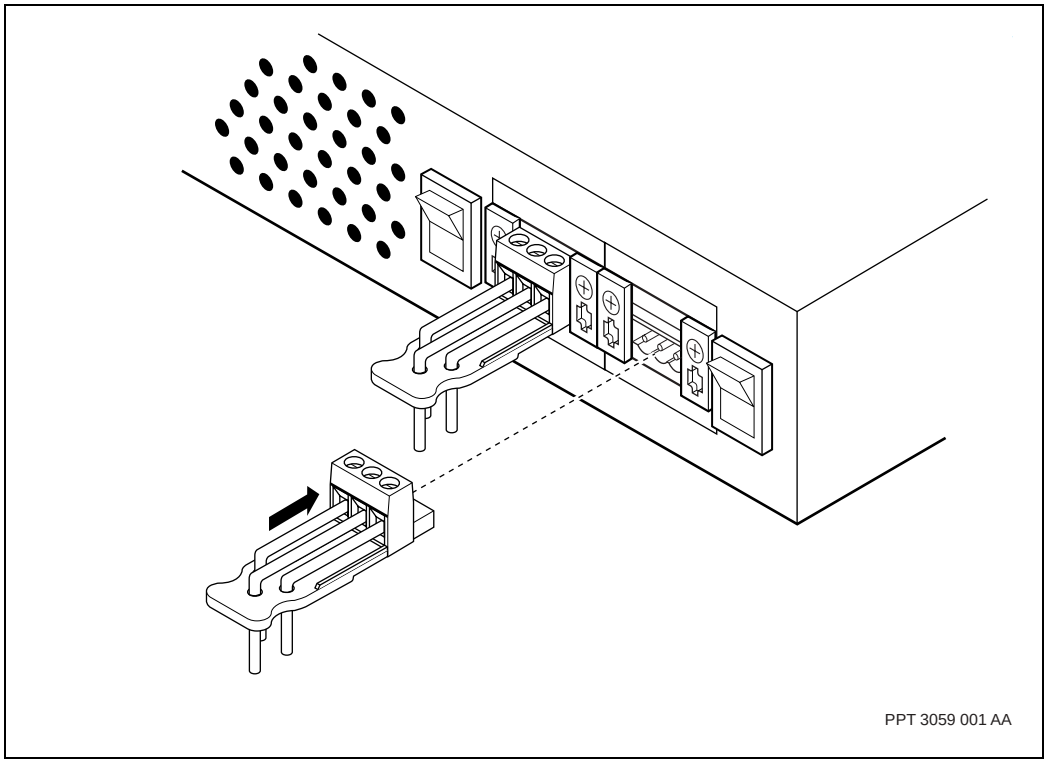


Figure 122
Connecting the terminal connector



Installing dc power cables onto a Multiservice Switch 7420

Install dc power cables to provide power to a Nortel Networks Multiservice Switch 7420.

Prerequisites

WARNING

Risk of injury by electric shock

Before installing any cables, ensure that the circuit breaker at the power distribution panel is toggled off and that the outlet is void of primary power.

WARNING

Damage to equipment; safety hazard

Protect the power feeds to the dc power supply as described in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. Failure to protect the power feeds can damage the equipment and pose a safety hazard.

- Before you install dc power cables, ensure that you have met the appropriate power requirements. For information, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Procedure steps

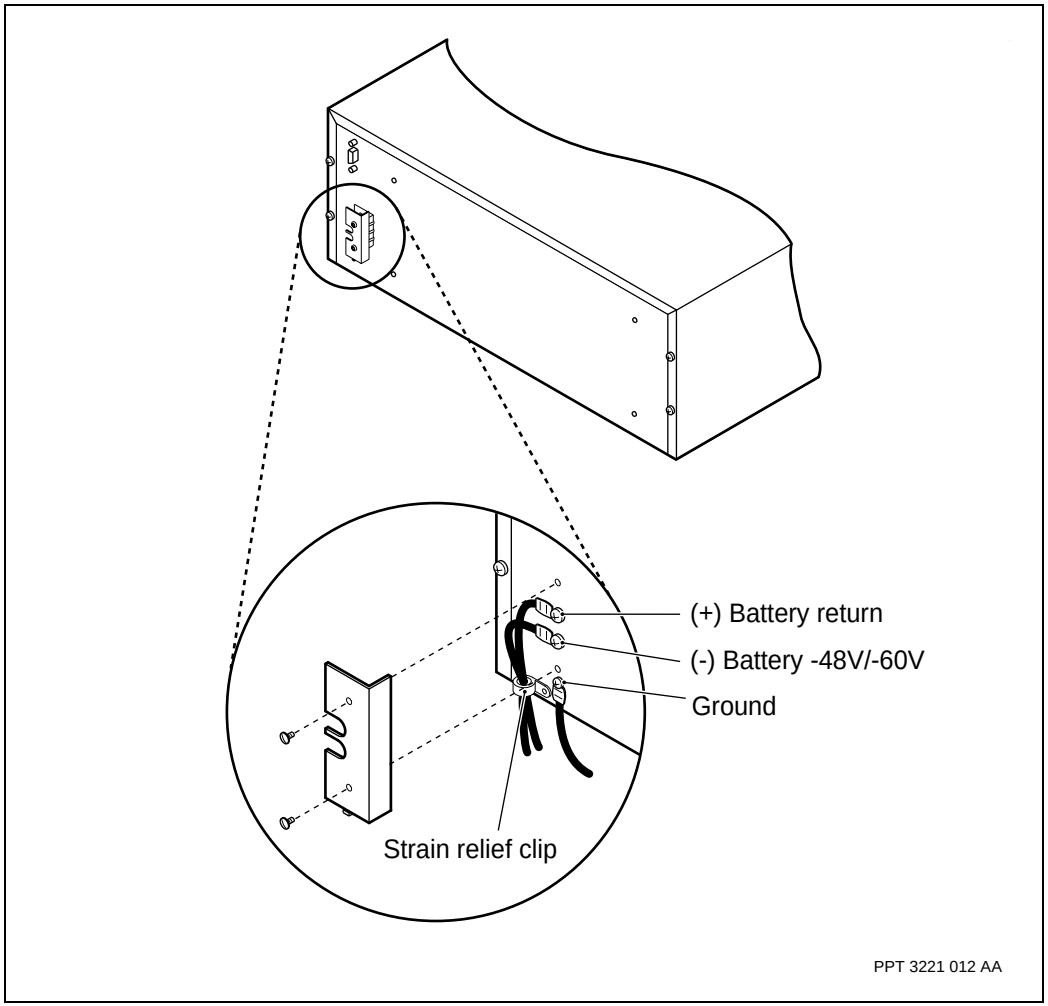
1. Route the dc power cables to the rear of the device.
2. Determine the length of the wires you require, and cut them to the appropriate length.
3. Attach wire lugs to the ends of the wires.
4. Remove the plastic cover from the terminal block.
5. Connect the -48/60 V dc and return wire lugs to the terminal block at the rear of the shelf assembly. See the figure “Multiservice Switch 7420 dc power cables” (page 336).
6. To ensure that the power cables are firmly secured and will not move or slip, use a strain relief clip. The strain relief clip can be mounted on the rear of the device, below the power supply terminal block.

7 Replace the plastic cover on the terminal block.

8 Connect the cables from the disconnect device to the power source.

Procedure job aid

Figure 123
Multiservice Switch 7420 dc power cables



Installing dc power cables onto a Multiservice Switch 7440

Install dc power cables onto a Nortel Networks Multiservice Switch 7440 to provide input power to a power supply.

Prerequisites

WARNING

Risk of injury by electric shock

Before installing any cables, ensure that the circuit breaker at the power distribution panel is toggled off and that the outlet is void of primary power.

WARNING

Damage to equipment; safety hazard

Protect the power feeds to the dc power supply as described in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. Failure to protect the power feeds can damage the equipment and pose a safety hazard.

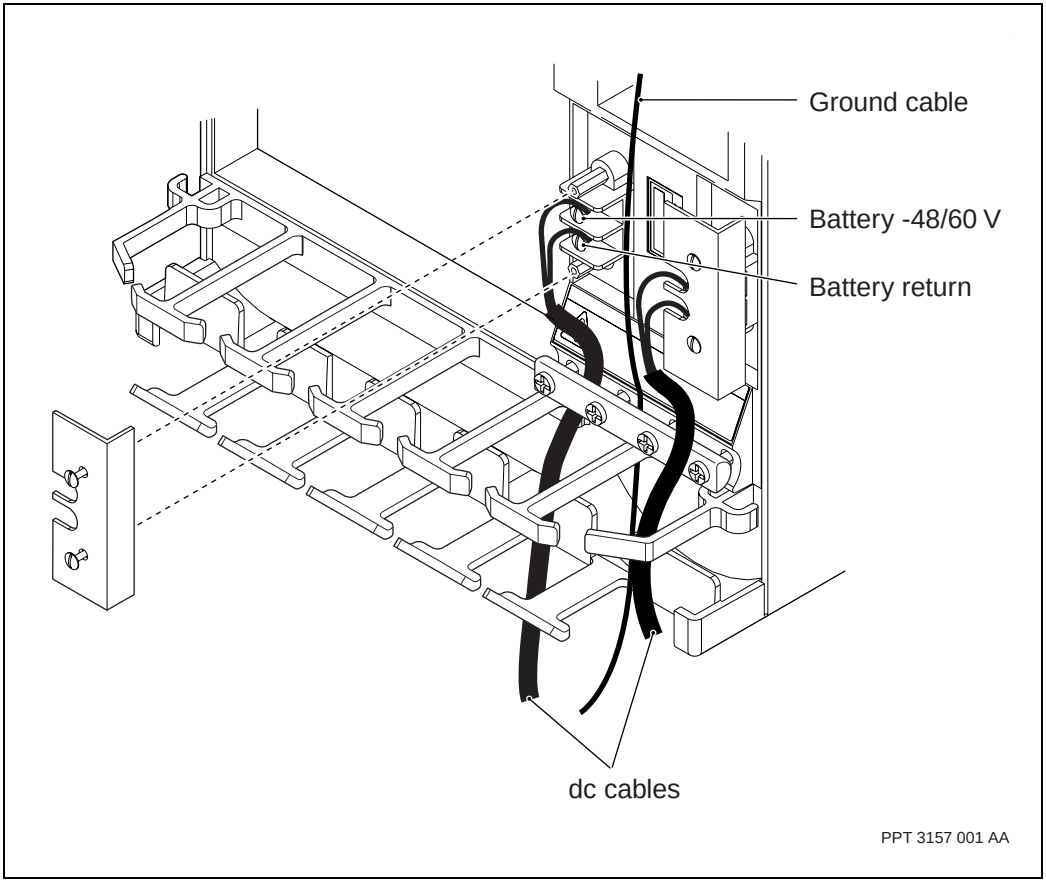
- Before you install dc power cables, ensure that you have met the appropriate power requirements. For information, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Procedure steps

1. Route the dc power cables to the rear of the device.
2. Secure the wires using the strain relief clip. The strain relief clip is on the rear of the device, below the openings for the power supply terminal blocks.
3. Determine the length of the wires you require, and cut them to the appropriate length. Ensure that the ground wire is long enough to reach the ground strip near the top of the device.
4. Attach wire lugs to the ends of the wires.
5. Connect the -48/60 V dc and return wire lugs to the terminal block at the rear of the shelf assembly. See figure “Multiservice Switch 7440 dc power cables” (page 338).
6. Connect the cables from the disconnect device to the power source.

Procedure job aid

Figure 124
Multiservice Switch 7440 dc power cables



Installing dc power cables onto a Multiservice Switch 7460

Install dc power cables onto a Nortel Networks Multiservice Switch 7460 to provide input power to a power supply.

Prerequisites

WARNING

Risk of injury by electric shock

Before installing any cables, ensure that the upstream circuit breakers of the battery (BATT) and battery return (RTN) cables are toggled off.

WARNING

Damage to equipment; safety hazard

Protect the power feeds to the dc power supply as described in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. Failure to protect the power feeds can damage the equipment and pose a safety hazard.

WARNING

Damage to equipment by overtightening nuts

The nuts for the studs on the power input terminal block can be overtightened such that they strip the stud or the nut. There is no field replacement for a stud, which means you would have to replace the shelf assembly or operate with only one power supply. Hand tighten the nuts as instructed in the procedure.

- Before you install dc power cables, ensure that you have met the appropriate power requirements that are identified in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Procedure steps

1. Connect the dc power cables to the power source. Follow your local electrical codes for this kind of dc cable connection.

2 If your device is in a Multiservice Switch or seismic cabinet, you can route the cable through the floor or ceiling with the other cables. To increase accessibility, unfasten the 10-mm (3/8-in.) hex screws and remove the smaller grill cutout in either the top or the bottom of the cabinet.

   or

   If your device is in a non-Multiservice Switch cabinet or rack, ensure that it has the appropriate conduit entries or knockouts to pass the cable through.

3 Route each dc power cable into the cabinet or rack through a knockout. Label each cable near the terminal block with the same information as its other end at the upstream power source.

4 Secure the cables to the rack or cabinet using cable ties.

5 Determine the length of the cables you require at the connections and cut them to the appropriate length.

6 Attach cable lugs to the ends of the wires. Match the lug size to the cable size. The terminal fits up to No. 10 AWG (5.26 mm^2).

7 Connect the cable lugs to the terminal block at the rear of the shelf assembly. See the figures:

   - “Terminal block for the dc power cables of an Multiservice Switch 7460” (page 341)
   - “Terminal block dc cable connections for an Multiservice Switch 7460” (page 342)

8 Connect the cables from the disconnect device to the power source.

9 Fasten the #10-32 hex nuts onto each stud of the terminal block. Tighten to snug plus a 1/4 turn.

10 Screw the insulation shield back onto the terminal block.

Procedure job aid

Figure 125
Terminal block for the dc power cables of an Multiservice Switch 7460

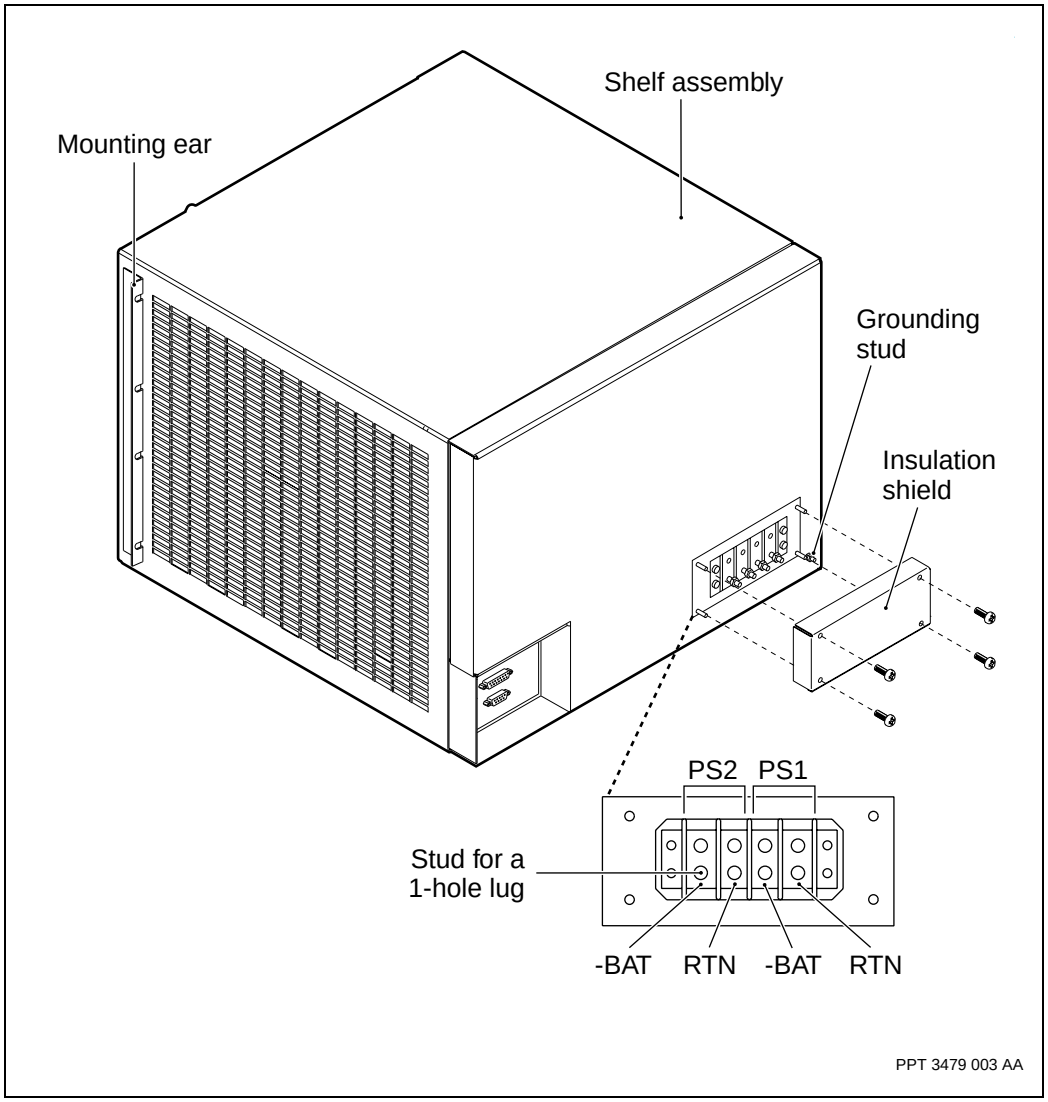
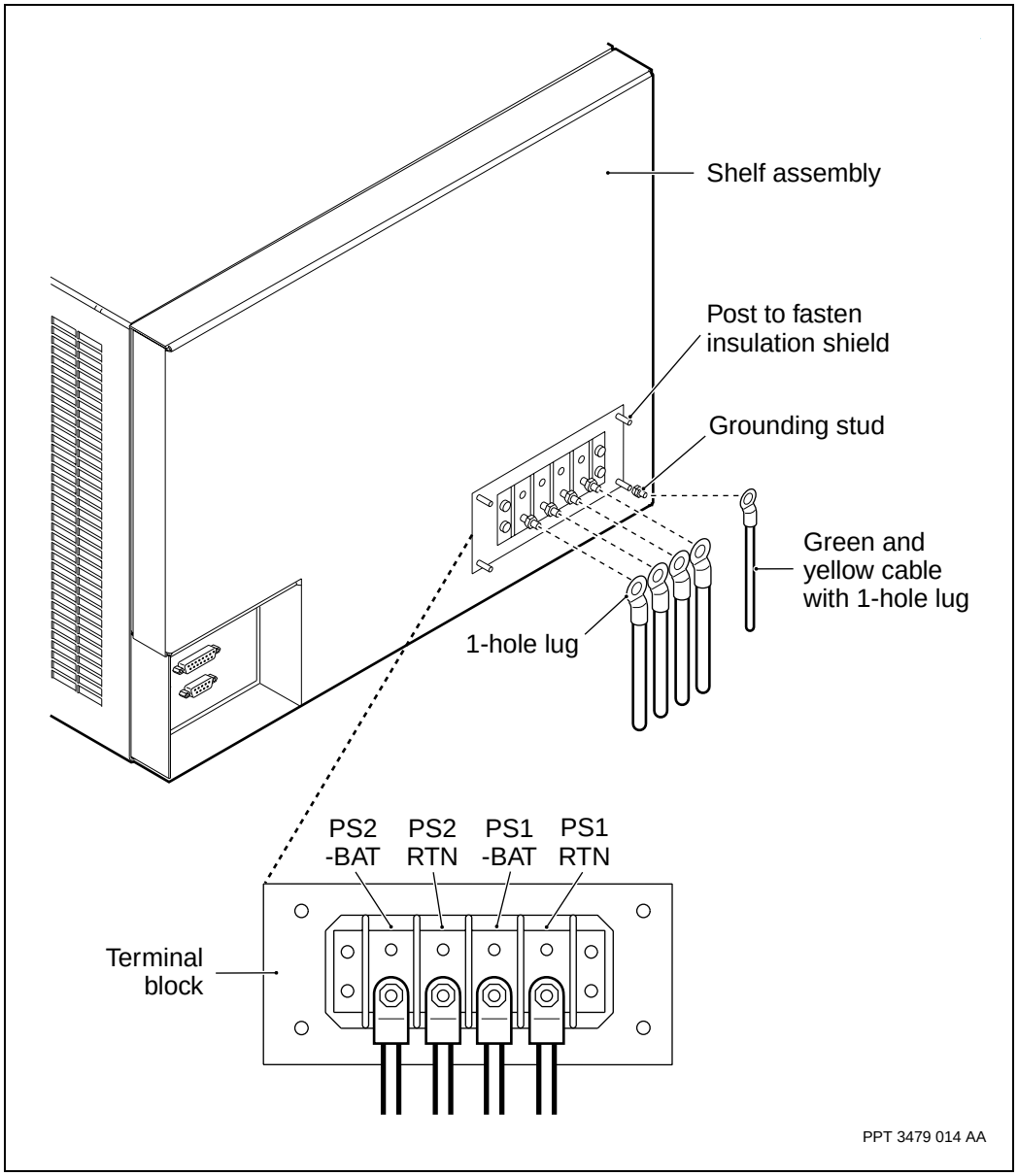


Figure 126
Terminal block dc cable connections for an Multiservice Switch 7460



Installing dc power cables onto a Multiservice Switch 7480

Install dc power cables onto a Nortel Networks Multiservice Switch 7480 to provide input power to a power supply.

Prerequisites

WARNING

Risk of injury by electric shock

Before installing any cables, ensure that the circuit breaker at the power distribution panel is toggled off and that the outlet is void of primary power.

WARNING

Damage to equipment; safety hazard

Protect the power feeds to the dc power supply as described in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*. Failure to protect the power feeds can damage the equipment and pose a safety hazard.

- Before you install dc power cables, ensure that you have met the appropriate power requirements. For information, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Procedure steps

1. Connect a dc power cable to the output terminal of the disconnect device.
2. If your device is in a Multiservice Switch or seismic cabinet, you can route the cable through the floor or ceiling with the other cables. To increase accessibility, unfasten the 10-mm (3/8-in.) hex head screws and remove the smaller grill cutout in either the top or the bottom of the cabinet.

   or

   If your device is in a cabinet or rack that is not a Multiservice Switch cabinet or rack, ensure that it has the appropriate conduit entries or knockouts to pass the cable through.
3. Route the dc power cable into the cabinet or rack through a knockout.
4. Run the cables beside the cable guide. Do not run the power cables inside the cable guide.

5 Secure the cables to the side of the cable guide using cable ties.

6 Determine the length of the cables you require at the connections and cut them to the appropriate length.

7 Attach cable lugs to the ends of the wires. Match the lug size to the cable size.

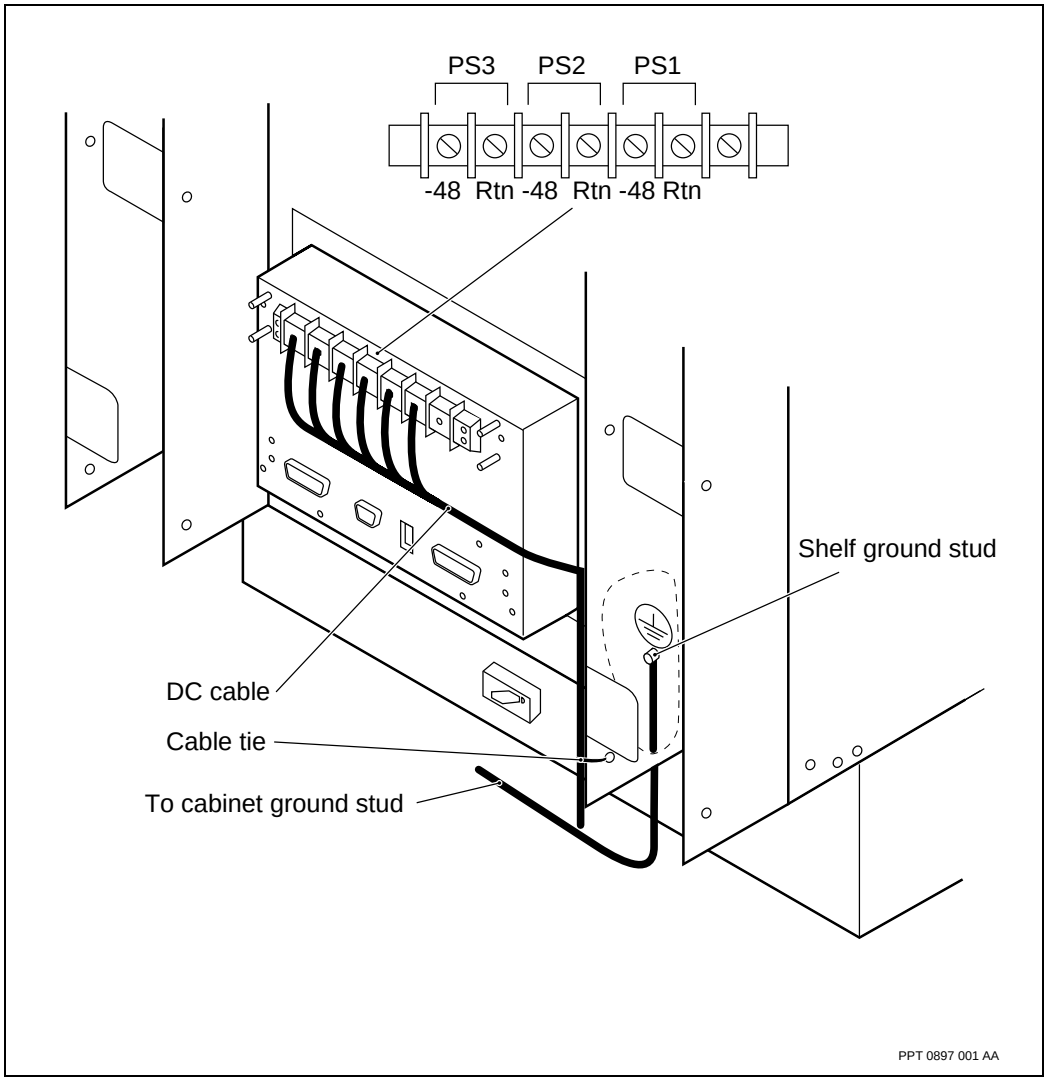
8 Connect the cable lugs to the terminal block at the rear of the shelf assembly. See the figure “Multiservice Switch 7480 dc power cables” (page 345).

PS3 supplies power to the power supply in slot 3. PS2 supplies power to the power supply in slot 2. PS1 supplies power to the power supply in slot 1. Do not connect any cables or wires to the signal ground connection on the terminal block. The signal ground is internally connected to the device ground.

9 Connect the cables from the disconnect device to the power source.

Procedure job aid

Figure 127
Multiservice Switch 7480 dc power cables



Installing ferrite beads onto dc power cables

Install ferrite beads onto the dc power input cables of a device to ensure that the cables comply with the Class B containment of electromagnetic interference (EMI) standard.

Prerequisites

WARNING

Risk of injury or equipment damage by electricity

If the barrel of any power input cable lug shows exposed metal near the edge of the insulation panel, that is, an uninsulated portion, contacting that metal risks electrocution or equipment damage. If any lug barrel is uninsulated, you must power down the device and its upstream power feed and fully insulate the lug barrels before adding any ferrite beads.

WARNUNG

Verletzungsgefahr oder Geräteschäden durch Elektrizität

Falls die Hülse eines Stromeingangskabelschuhs am Rand der Isolierverkleidung blankes Metall, also einen unisolierten Bereich, aufweist, besteht beim Berühren dieses metallenen Bereichs Lebensgefahr bzw. es können Geräteschäden auftreten. Bei einer unisolierten Hülse müssen Sie den Schalter sowie dessen Upstream-Stromzufuhr ausschalten und die Kabelschuhhülsen vollständig isolieren, bevor Sie Ferrit-Dämpfungsperlen einsetzen.

- Ensure that the power cables are not too large for the beads. The ferrite bead kit NTJS6381, which contains 3 ferrite beads and 6 tie-wraps, accommodates cable pairs up to 2.5 cm (1 in.) in diameter. This includes cables sizes from No. 10 to 6 AWG (5.26 mm^2 to 13.30 mm^2 or 4.0 mm^2 to 16 mm^2 for the full acceptable range).

- Before installing the ferrite beads, the power input cables must be installed and connected to the device. The terminal block that is shown in the figure “Location of ferrite beads on dc power cables” (page 348) is similar for all Multiservice Switch 7400 series devices. The method and criteria for attaching the beads is the same for all.
- The beads can be added to the cables while the power is on or off. If the power is on, the insulation shield must cover the terminal block and each lug barrel on a dc power input cable must be insulated with no exposed metal.

Procedure steps

1. At the rear of the device, locate the terminal strip on the terminal block where the dc power input cables connect. See the middle of the figure “Location of ferrite beads on dc power cables” (page 348).

   The insulating shield is not shown in the figure.

2. Where the cable pairs exit from under the insulation shield, ensure that there is enough space for the beads to be added before the cable bends. Carefully straighten or bend the cables in parallel pairs, as required.

3. On the terminal strip, locate the pair of power cables for PS 1. Cables can exit above or below the terminal strip. Refer to the inset in the figure “Location of ferrite beads on dc power cables” (page 348).

4. At the edge of the insulation shield, fasten a tie-wrap around the cable pair as close to the edge as possible, but not under it. Tighten the tie-wrap until the cables start to pinch. This tie-wrap prevents the bead from sliding into the cable lugs and causing a short.

5. Align a ferrite bead around the cable pair immediately beside the tie-wrap. To maximize the effectiveness of the ferrite bead, it should reside next to the tie-wrap and be within 2.5 cm (1 inch) of the connections.

6. Press the halves of the bead together until the tabs engage. It is acceptable if the bead fits loosely provided it remains in position.

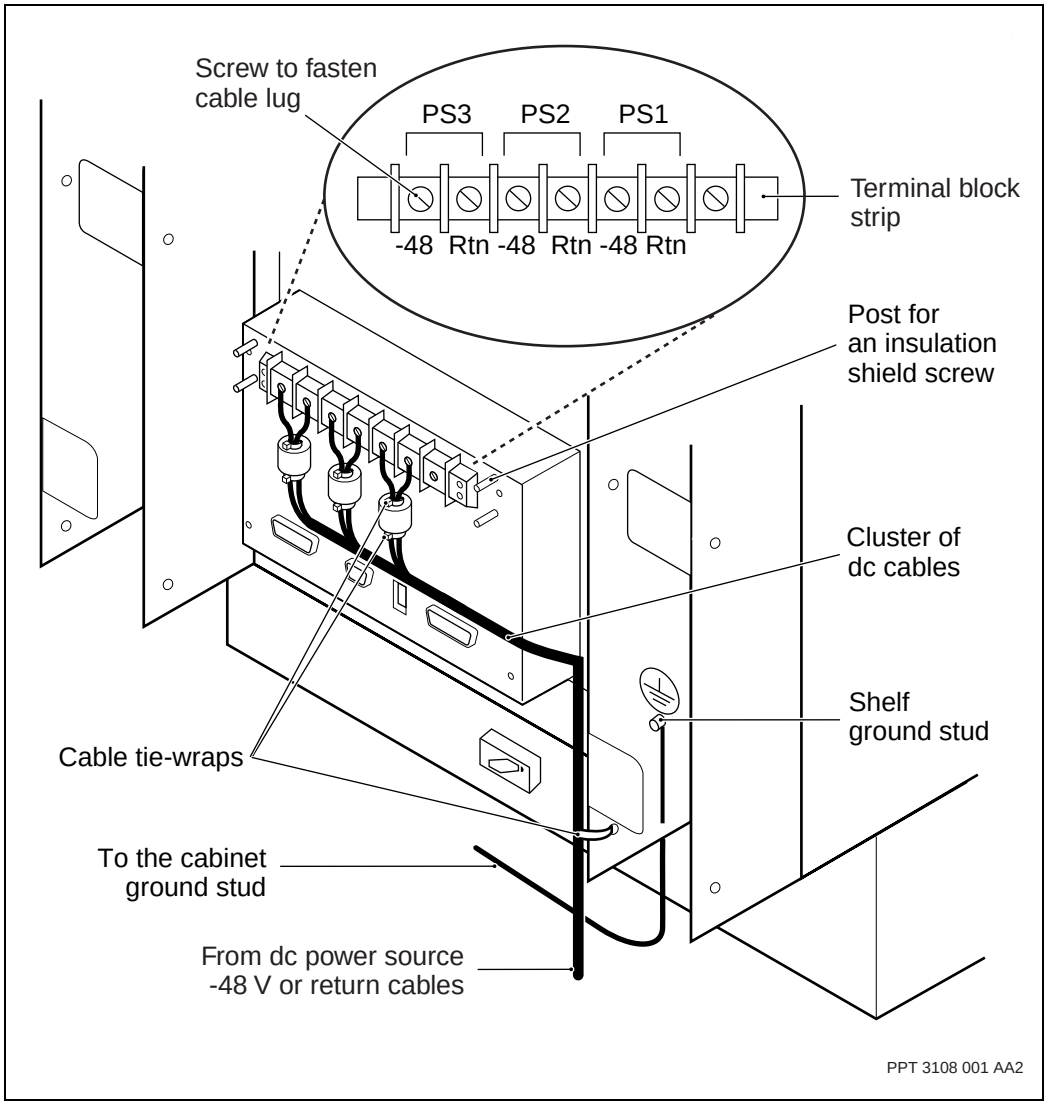
7. Keep the ferrite bead in position next to the tie-wrap by placing another tie-wrap around the cable pair on the other side of the bead. Tighten it until it starts to pinch the cable.

   The ferrite bead has a tie-wrap on either side of it to prevent sliding along the cable.

8. Repeat step 3 to step 7 for each power supply and its pair of power input cables. Move from left to right across the terminal strip.

Procedure job aid

Figure 128
Location of ferrite beads on dc power cables



Installing FP cables

Install FP cables after you have installed the function processor (FP) and any related termination panel or panels.

Prerequisites

WARNING

Risk of eye injury by laser

Never look directly into the end of a fiber cable, let an end pass in front of your eyes, or use an optical device to look at the end of an optical fiber unless you are certain the other end is not connected. The LASER travelling through a fiber cable can injure the human retina.

WARNUNG

Gefahr von Augenverletzungen durch Laserstrahlen

Blicken Sie nie direkt auf das Ende eines Glasfaserkabels, und überprüfen Sie auch einzelne Faserenden nicht mit einem optischen Gerät, wenn Sie nicht sicher sind, daß das andere Kabelende nicht angeschlossen ist. Der über die Glasfasern übertragene Laser kann die menschliche Netzhaut verletzen.

WARNING

Risk of personal injury

Connect device interfaces to safety extra-low voltage (SELV) circuits only. Connections to telephone network voltage (TNV) circuits must be through an external device that provides current protection and isolation, such as an approved channel service unit (CSU). All such devices must meet the equipment safety standards of the country of installation.

WARNUNG

Verletzungsgefahr

Verbinden Sie Multiservice Switch-Schnittstellen nur mit SELV-Schaltungen (Schutzkleinspannung). Verbindungen zu TNV-Schaltungen müssen über ein externes Gerät erfolgen, das Stromschutz und -isolierung bietet, z.B. eine geprüfte Kanaldiensteinheit (CSU, Channel Service Unit). Alle Geräte müssen den Sicherheitsstandards des jeweiligen Landes entsprechen.

CAUTION

Risk of personal injury

Do not directly connect devices to cables exposed to outdoor hazards (such as lightning) as defined by BS6701: Part I, 1986 “Installation of apparatus intended for connection to certain telecommunications systems.” Such cables include external overhead cables that extend more than four spans (used in the U.K. for connecting telecommunications systems).

WARNUNG

Verletzungsgefahr

Verbinden Sie Multiservice Switch Schalter nicht direkt mit außenliegenden Kabeln, die gefährlichen Wettereinflüssen wie Blitzschlag ausgesetzt sind (wie definiert in BS6701; Britischer Standard 6701: Teil I, 1986 „Installation of apparatus intended for connection to certain telecommunications systems.“; „Installation von Geräten zur Verbindung mit bestimmten Telekommunikationssystemen“). Zu solchen Kabeln gehören auch Überlandleitungen, deren Länge vier Spannen überschreitet (werden in Großbritannien zur Verkabelung von Telekommunikationssystemen eingesetzt).

CAUTION

Risk of service loss

Whenever you install an FP that uses a control cable, in a sparing configuration, you must always insert the FP into a slot on the shelf before you connect the control cable. If you connect the control cable between the FP and the termination or sparing panel before you insert the FP in the shelf, you can disrupt service to the other FP(s) in the sparing configuration.

CAUTION

Risk of service loss

Before connecting any cables to an FP, ensure that it is properly seated. Seating a cabled FP can cause a traffic loss on the other FPs in the sparing configuration.

- When you are using custom-made FP cables instead of the prefabricated cables provided by Nortel Networks, see “Making customer equipment cables” (page 382).
- When connecting cables in a spared configuration involving a sparing panel, complete the main connections first, and then the spare connections.
- For figures showing the cable connections between an FP and its termination panel, sparing panel, or the far end, see NN10600-172 *Nortel Networks Multiservice Switch 7400 FP Cabling Reference*.
- The fanout cables and fanout cable adapter for the 32-port DS1 or E1 MSA 1-slot FPs has connectors of different sizes and the cables are split. To understand how the user ports are divided between each branch, refer to their description in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- FP cable connectors engage the faceplates in different ways. Some are oriented by keyway guides, shape, size, or mechanism, and engagement actions vary. For example, D-sub connectors with a sliding latch or the two screws look similar but engage and disengage very differently.

Ensure that you know how to properly engage the connector without stressing it. Refer to the figure “Types of cable connectors used on Multiservice Switch processor cards” (page 355).

- The interface cables with shielded connectors are automatically grounded when they are securely connected at the FP faceplate and a Nortel Networks termination panel or sparing panel.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

CAUTION
Risk of equipment damage
When engaging or disengaging cable connectors, ensure that a cable connector with a guide ridge is aligned with the transceiver’s keyway. Improper coupling can damage the nose shield on the connector or the transceiver.

CAUTION
Risk of equipment damage
Ensure that the cable pins are not shorted together or to any metal surface. When connected to an on-line shelf assembly, these cables can carry power signals (+12 Vdc) that are used to supply power to the termination panel.

Do not bend the pins when you attach the cable to the connector.

CAUTION
Risk of equipment damage
To avoid damaging equipment, always connect the cable to the termination panel before you connect it to the FP.

CAUTION

Risk of equipment damage

To avoid damaging the center pin of the connector in the faceplate of an NTNQ90 card (2pSTM1eAtm FP) or NTNQ91 card (2pSTM1eCh FP), pay attention while establishing a connection. The female (cable side) connector must be oriented and inserted carefully to prevent risk of damage to the center pin of the faceplate-mounted male plug.

1 Route each FP cable from the FP in the front of the Multiservice Switch 7400 towards the next equipment connection according to “Card cable routing and labeling” (page 113).

The next equipment connection can be another FP, a termination panel, a sparing panel, or non-Multiservice Switch equipment at the far end.

2 Connect the FP cable securely to the faceplate according to the connection information on the cable label. The FP faceplate usually has P0, P1, P2 etc. Use the labels on the cables to ensure that you engage the appropriate cable connector to the faceplate connector.

The Pn numbers on the faceplate of an electrical FP such as a DS1 or E1 can indicate a series of ports through the connector. For example, connector P0 could have ports 0 to 7. The label of connection information on the cable should at least have P0 to indicate the faceplate connection and ports 0 to 7 to indicate the series of ports.

If the FP is part of a sparing configuration, cable the main FPs first and the spare FP last.

3 Connect to the next equipment:

- to another FP of the same type in another switch
- to a termination panel that is used as a patch panel interface
- to a sparing panel at the Main ports first then the Spare ports, whichever function the FP is intended to do
- to customer premises equipment (CPE)

All FP equipment connection end points are shown in figures for each type of FP in NN10600-172 *Nortel Networks Multiservice Switch 7400 FP Cabling Reference*. Refer to the figures that apply to your configuration.

When the FP is a 32-port DS1 or E1 MSA 1-slot FP (NTNQ94 or NTNQ93) that has replaced an equivalent 2-slot FP, you can either add the fanout cable adapter NTPS39 to connect the FP ports to installed cable assemblies (for example, NTPS03 and NTPS04 or your equivalent custom-made cables) or replace the cables with the MSA32 fanout cables for 1-slot FPs. Cable choices are identified in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

4 Repeat step 1 to step 3 for each other port on the FP faceplate.

5 When connecting to a sparing panel, also connect the control port cable to the FP faceplate. The MSA sparing panels NTJS95, NTY195, NTY196, and NTY197 have the control cable integrated into each user (traffic) port cable.

The control port cable also supplies power from the FP to the sparing panel. The MSA sparing panels require port P0 of a 2-slot FP to be cabled even if the port is not configured for use by the software. Refer to the section on power for sparing panels in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

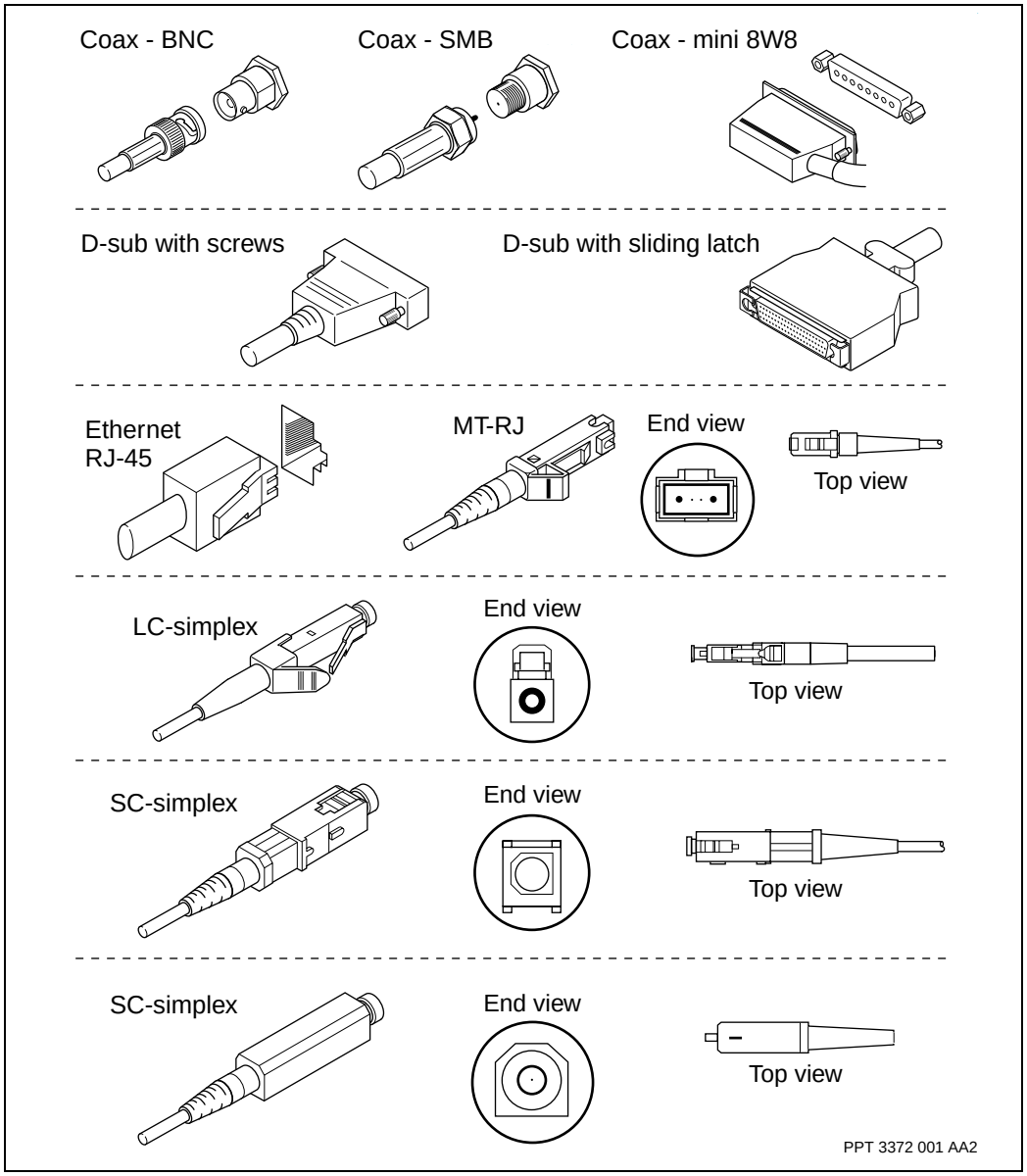
6 When the FP is part of a one-for-one or one-for-n sparing configuration, repeat step 1 to step 5 for each other FP in the configuration. Ensure that you know which FP is configured in the software as the spare and which one or ones are a main FP. Connect to the spare FP last.

7 When a termination panel or a sparing panel is used, connect the far-end equipment to the appropriate CPE ports on the panel.

8 Dress all cables along the path between the FP and the next equipment up to the far-end equipment.

Procedure job aid

Figure 129
Types of cable connectors used on Multiservice Switch processor cards



Installing multiple MSA32 sparing panels (DB15 or BNC)

Install multiple MSA32 sparing panels for a one-for-n sparing configuration.

Prerequisites

- The one-for-n (formerly 1:n) configurations of 32-port multi-service access (MSA32) sparing panels require one panel for each FP you want to spare. For example, a one-for-four configuration requires four sparing panels installed on the same face of a mounting apparatus, and connected in series through inter-panel flexi-cables. This modular design of MSA32 sparing panels means any one of the sparing panels in a series can be replaced without disrupting traffic on the FPs attached to the other panels in the sparing configuration.
- An MSA32 flexi-cable is an inter-panel connection cable that is equivalent to a flexible printed circuit board (PCB). See the figure “Inter-panel flexi-cable for MSA32 sparing panels with BNC or DB15 connectors” (page 358). The PEC for the DB15 or BNC inter-panel flexi-cable is NTY199.
- The installation of one or more MSA32 sparing panels in a series means installing the panels first, then cabling the FPs and the network equipment to the sparing panels. Ensure that you have installed all of the FPs necessary for your sparing configuration. If you need to install additional FPs, see the section “Installing an FP” (page 321).
- Power is supplied to an MSA32 sparing panel from its FPs. The 2-slot version of a DS1 or E1 MSA FP provides the power through the connections labelled P3, and only through this connection. For the sparing panel to operate with a 2-slot FP, the connectors at P3 must be cabled at both ends even if the port will not be configured in software. The 1-slot version of a DS1 or E1 MSA FP provides the power through the connections labelled P0. For the sparing panel to operate with a 1-slot FP, the connectors at P0 must be cabled at both ends even if the port will not be configured in software.
- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. Install all of the termination panels for one-for-n configuration as described in the procedure “Installing a 19-inch rack-mounted termination panel” (page 240).
2. Secure a cable management bracket to each side of the sparing panel with 4 of the provided screws.

   Note: The cable management brackets allow you to neatly route cables from the front of the sparing panel to the rear of the device.
3. Align, plug in and fasten the D-sub connectors of all the inter-panel flexi-cables into the faceplate of the sparing panels so that each OBPn connects to each corresponding IBPn below it. Omit connecting flexi-cables to the bottom row of connectors on the Main A (bottom) panel.
4. As each flexi-cable is plugged in, fasten the connectors together by sliding the latch along the long axis of the connector. The latch engages both connector studs in one motion.
5. If necessary, change the fasteners on the sparing connections of the Main A (bottom) panel as described in the procedure “Changing fasteners on an MSA32 sparing panel” (page 213).

Procedure job aid

Figure 130
Inter-panel flexi-cable for MSA32 sparing panels with BNC or DB15 connectors

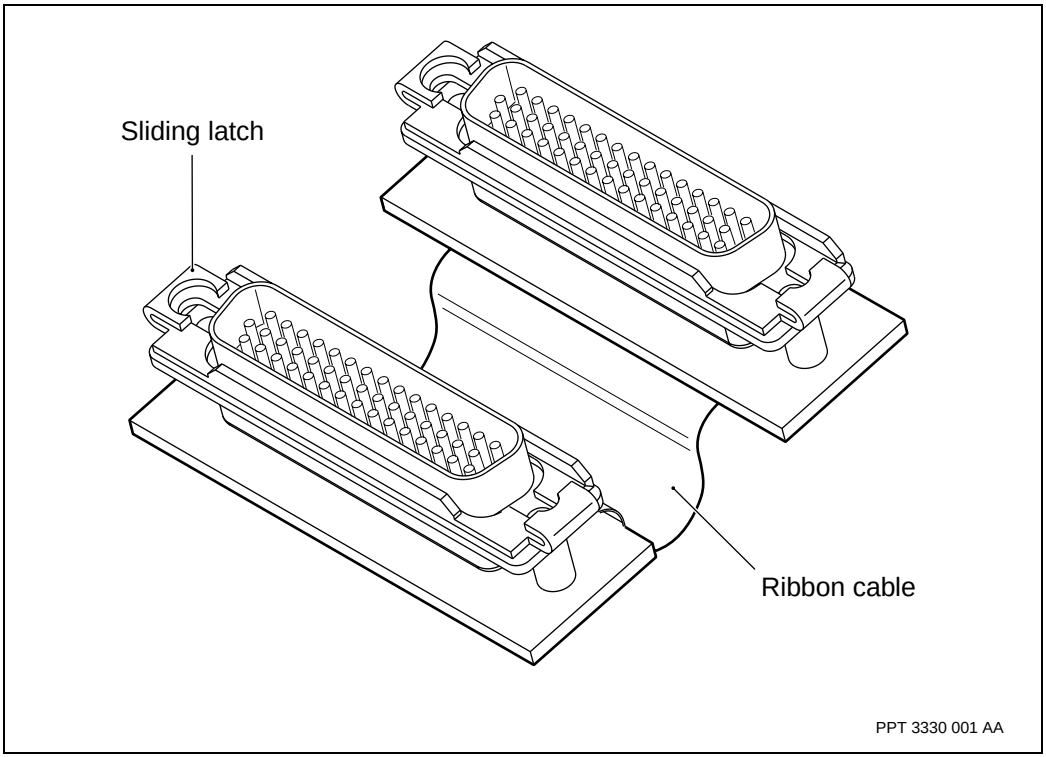
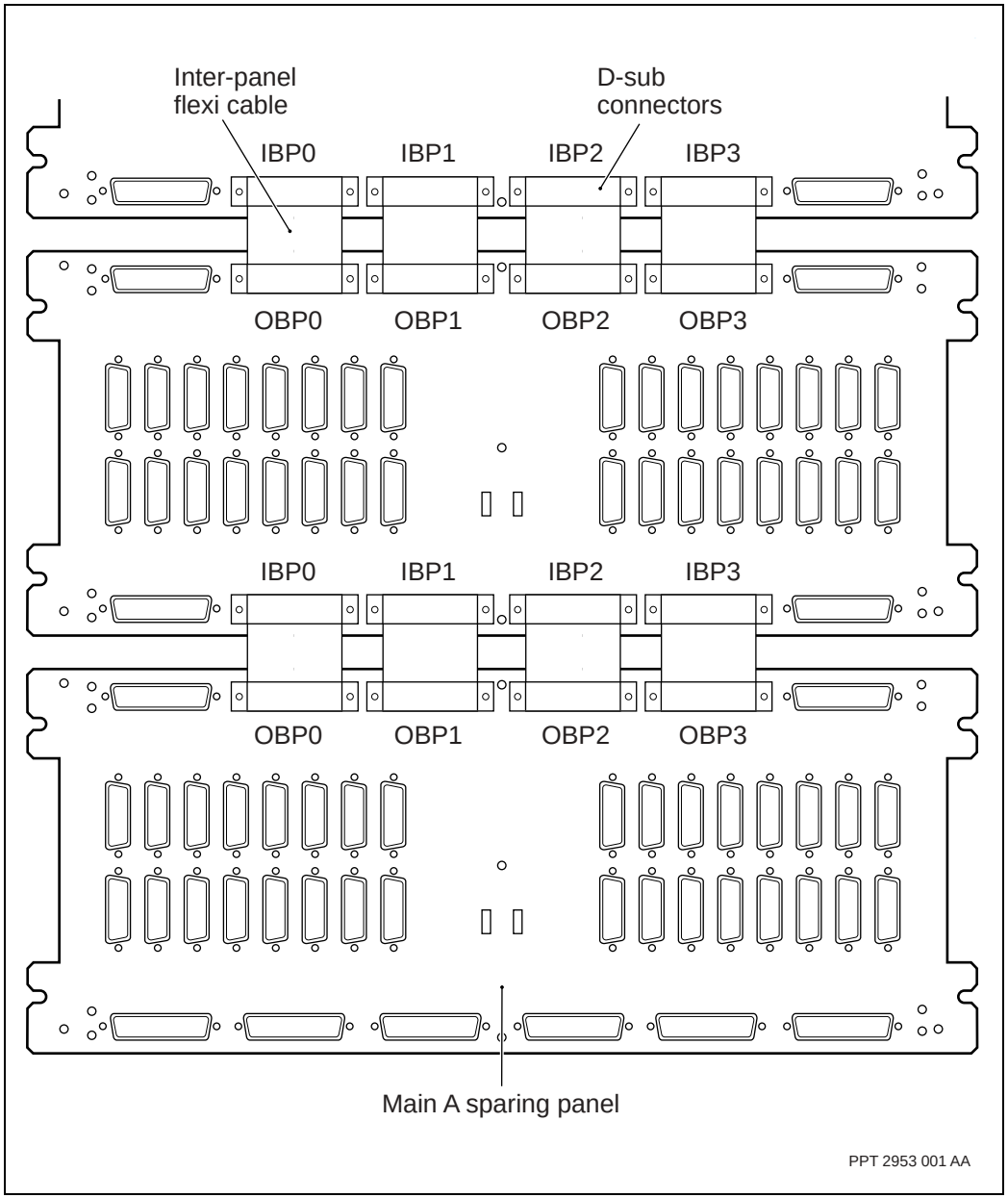


Figure 131
Location of MSA32 inter-panel flexi-cable connectors for BNC and DB15



Installing multiple MSA32 sparing panels (RJ-45)

Install multiple MSA32 sparing panels for a one-for-n sparing configuration.

Prerequisites

- The one-for-n (formerly 1:n) configurations of 32-port multi-service access (MSA32) sparing panels require one panel for each FP you want to spare. For example, a one-for-four configuration requires four sparing panels installed on the same face of a mounting apparatus, and connected in series through inter-panel flexi-cables. This modular design of MSA32 sparing panels means any one of the sparing panels in a series can be replaced without disrupting traffic on the FPs attached to the other panels in the sparing configuration.
- When using two or more MSA32 sparing panels with RJ-45 connectors (NTJS95) in a one-for-n sparing configuration, space is required between the panels to accommodate inter-panel flexi-cables.
- An MSA32 inter-panel connection cable is a flexi-cable, a ribbon cable that is equivalent to a flexible printed circuit board. Its product code is NTJS99. The flexi-cables for MSA32 RJ-45 sparing panels are different than other MSA32 panels by having a third D-sub connector. See the figure “Inter-panel flexi-cable for MSA32 sparing panels with RJ-45 connectors” (page 363).
- Since the flexi-cables are connected to the bottom of each sparing panel down to the Main A (bottom) one, you must install the inter-panel flexi-cables immediately after each panel is installed and before the next one in the series is installed.
- Power is supplied to an MSA32 sparing panel from its FPs. The 2-slot version of a DS1 or E1 MSA FP provides the power through the connections labelled P3, and only through this connection. For the sparing panel to operate with a 2-slot FP, the connectors at P3 must be cabled at both ends even if the port will not be configured in software. The 1-slot version of a DS1 or E1 MSA FP provides the power through the connections labelled P0. For the sparing panel to operate with a 1-slot FP, the connectors at P0 must be cabled at both ends even if the port will not be configured in software.

- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. Install the top MSA32 RJ-45 sparing panel according to the procedure “Installing a 19-inch rack-mounted termination panel” (page 240).
2. On each inter-panel flexi-cable (NTJS99), ensure that the D-sub sliding latches on each end are in the disengaged position. If a latch is engaged, the cable connector cannot be fastened to the panel connector. See the figure “Inter-panel flexi-cable for MSA32 sparing panels with RJ-45 connectors” (page 363).
3. Holding the end of the flexi-cable that has one D-sub connector (not two), at the underside of the panel connect the D-sub connector with the panel D-sub connector at one side of the panel. Fasten by sliding the latch along the long axis of the connector. The latch engages both connector studs in one motion. Allow the cable to hang freely.
4. Connect the remaining 3 flexi-cable connectors on the bottom of the sparing panel by repeating step 3. For easiest access, connect them one after the other in a row beside the one that is already connected.
5. Install the next RJ-45 sparing panel the same as the previous one. Below each sparing panel, leave a vertical space equal to the height of the panel faceplate. The space accommodates cables without pinching or crimping them after installation. Allow the flexi-cables from the panel above to be pushed back by this panel.
6. Take one of the flexi-cables hanging at the underside of the above panel and route it past the rear of the sparing panel to the underside of the panel that was last installed. See the inset in the figure “Cable connections of MSA32 sparing panels with RJ-45 connectors” on page 364.
7. Connect the D-sub cable connectors with the lower panel connectors that are in the same position. Always vertically align the connections so that the inter-panel cable connections occur in the same positions from panel to panel.
8. Fasten the D-subs by fixing a capped stud fastener at each post. The hex shank is 11/64-inch (4.4-mm). Stop when the screws are snug and the outside lip of the cable connector almost touches the flat surface. Avoid stripping a screw or the post hole.

9 Holding the end of another flexi-cable that has one D-sub connector (not two), align and plug the D-sub into the third D-sub connector on the underside of the sparing panel. Allow the cable to hang freely.

10 Repeat step 9 for the remaining 3 flexi-cables.

11 For each remaining sparing panel in the 1:n series up to but not including the Main A (bottom) panel, repeat step 5 to step 11 continuing downwards.

12 Install the last (bottom) RJ-45 sparing panel the same as the previous one. Below the panel, leave a vertical space equal to the height of 3 panel faceplates. Allow the flexi-cables from the panel above to be pushed back by this panel.

13 Connect and fasten the hanging flexi-cable D-subs from the sparing panel above the Main A into the underside of Main A. Fasten each D-sub as before except for each third D-sub connector, fasten them to the posts using the hex fasteners (not the stud fasteners).

Procedure job aid

Figure 132
Inter-panel flexi-cable for MSA32 sparing panels with RJ-45 connectors

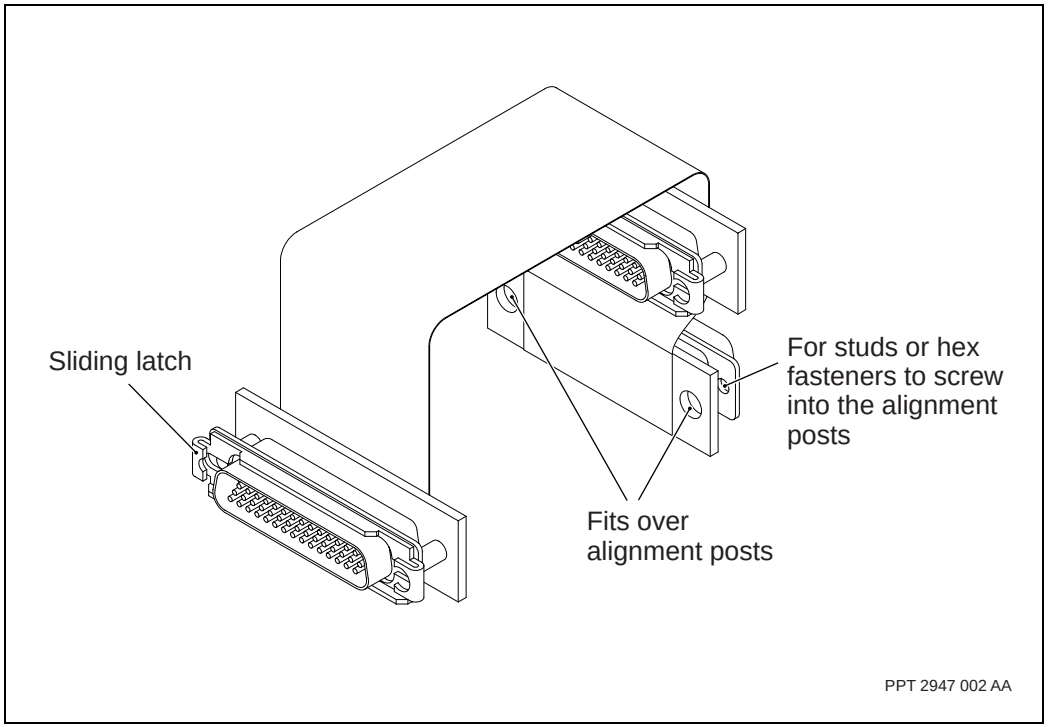


Figure 133
Cable connections of MSA32 sparing panels with RJ-45 connectors

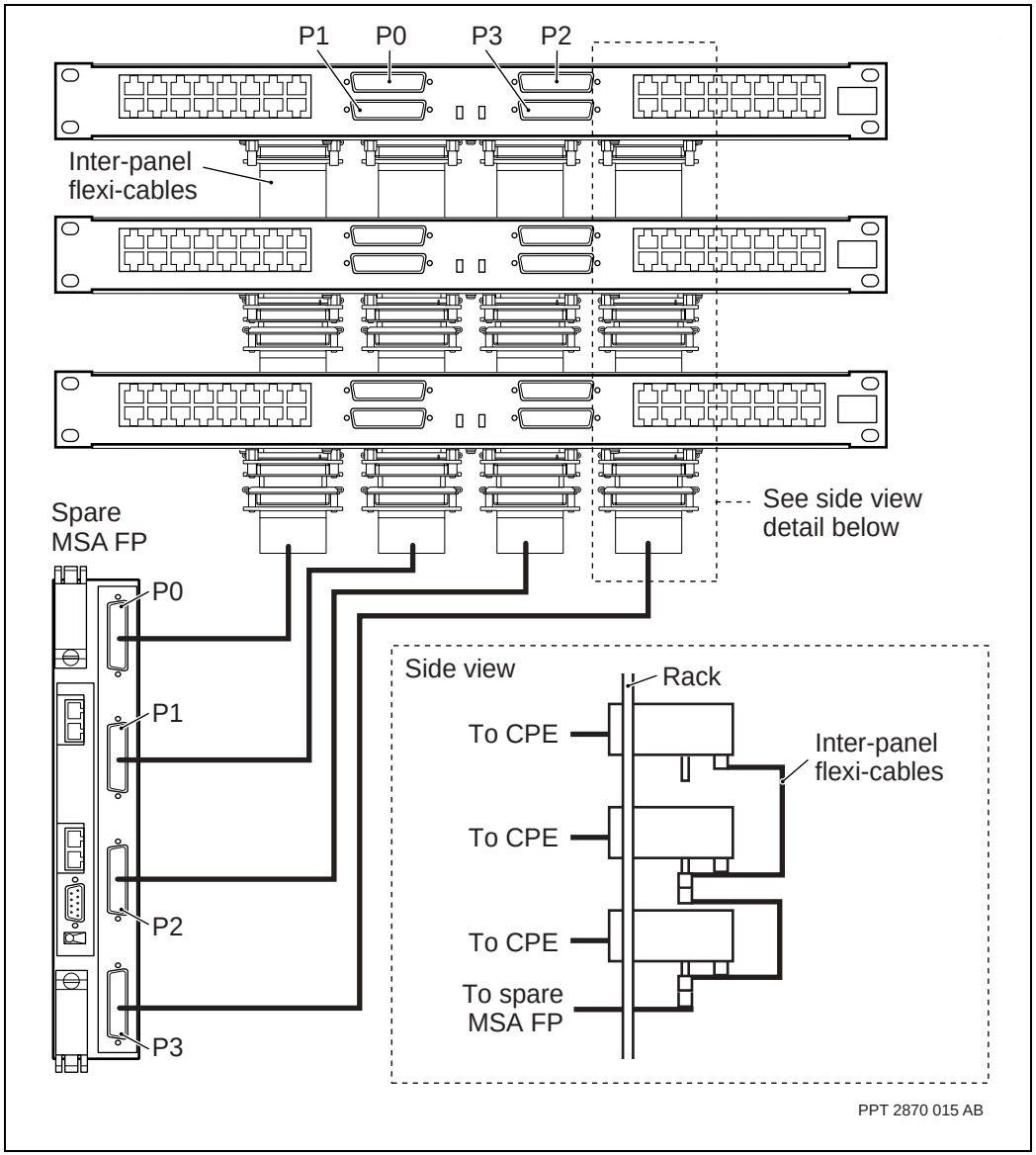
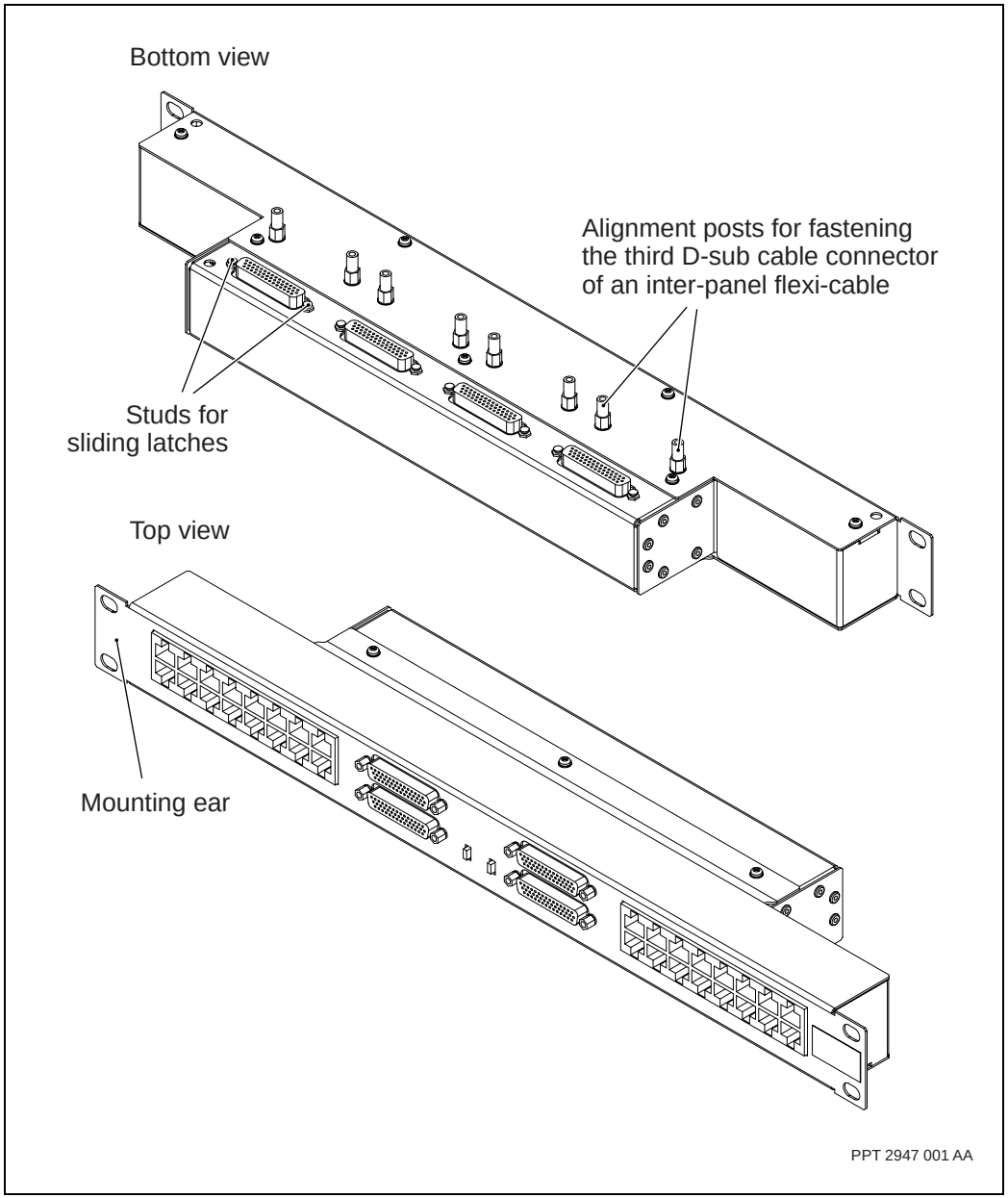


Figure 134
Bottom flexi-cable connections of MSA32 sparing panels with RJ-45 connectors



Installing seismic brackets for a Multiservice Switch 7460

Install seismic brackets onto a seismic cabinet to ensure compliance to Zone 4 earthquake standards when mounting a Nortel Networks Multiservice Switch 7460 in the cabinet.

Prerequisites

- You need a seismic brackets kit with PEC NTEP8025. The brackets are a pair of side panels and a pair of cross rails as shown in the figure "Orientation of seismic side panels and seismic cross rails for a Multiservice Switch 7460" (page 368). The left and right seismic side panels are identical and symmetrical. The left and right cross rails number are also identical.
- You need the shelf assembly NTEP80 to be handy for measurements.
- The side panels are the same height as the device because their location coincides with the location of the device in the cabinet. You must determine where in the cabinet the device will be positioned before you can install the brackets.
- The position of the vertical rails inside the seismic cabinet determines which way the seismic brackets are to be fastened to the rail.
  - — If the vertical rails are at the front of the seismic cabinet, the side panels are to be fastened to the rear face of the rail as viewed from the front of the cabinet.
  - — If the vertical rails are at the rear of the seismic cabinet, the side panels are to be fastened to the front face of the rail as viewed from the front of the cabinet.
- Ground yourself to an appropriate anti-static discharge device while handling the brackets.

Procedure steps

1 Since the side panels are fastened onto one face of the vertical rails and the shelf assembly is fastened onto the other face, ensure that their mounting ear holes will not share the same holes on the vertical rails. Compare the positions of holes on the mounting ears and mark which ones will be used on the side panel.

2. Position a seismic side panel against a vertical rail inside the seismic cabinet as shown in the figure “Position of side panels and cross rails for a Multiservice Switch 7460 in a seismic cabinet” on page 369.
3. Fasten the side panel to the vertical rail using 4 of the provided #12-24 thread-forming screws. Space the 4 as evenly as possible. Tighten to snug plus a 1/4 turn.
4. Position the second side panel against the vertical rail on the opposite side of the cabinet and fasten it the same way.
5. On the shelf assembly of the device, measure the length from a mounting ear to its rear edge. Record this as the depth of the shelf assembly.
6. Mark the depth of the shelf assembly onto the upper side panel slot by measuring from the vertical rail. The marks indicate where the cross rails will be fastened.
7. Repeat marking the depth on the lower slot, and repeat the marking on the opposite side panel.
8. Position a cross rail between the side panels at the depth marks and orient them as shown in the figure “Position of side panels and cross rails for a Multiservice Switch 7460 in a seismic cabinet” on page 369.
9. Fasten a cross rail through the left and right slots in the side panels at the depth marks using a washer with a #10-32 slotted screw. Tighten to snug plus a 1/4 turn.
10. Fasten the second cross rail in the same way through the lower side panel slots. Observe its mirrored orientation in the figure.

    The position and orientation of the cross rails are to cradle the rear edges of the shelf assembly when it is installed.

Procedure job aid

Figure 135
Orientation of seismic side panels and seismic cross rails for a Multiservice Switch 7460

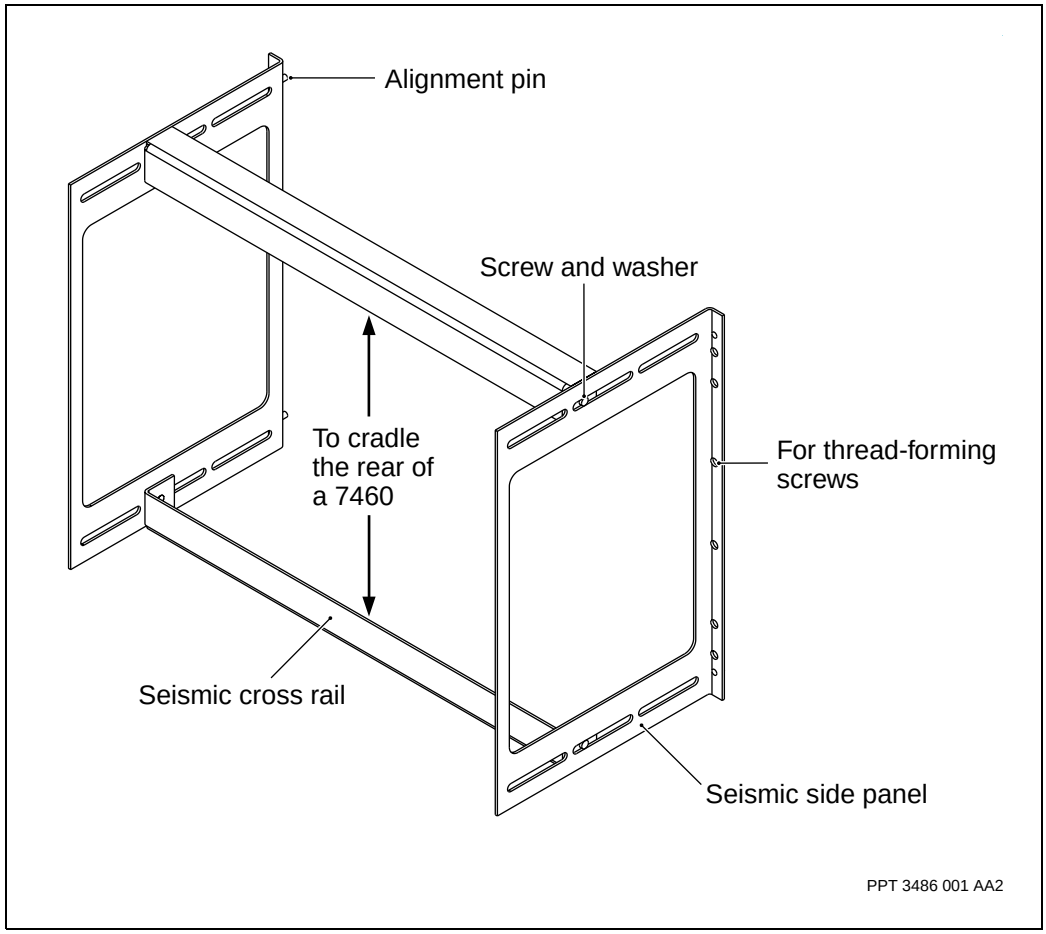
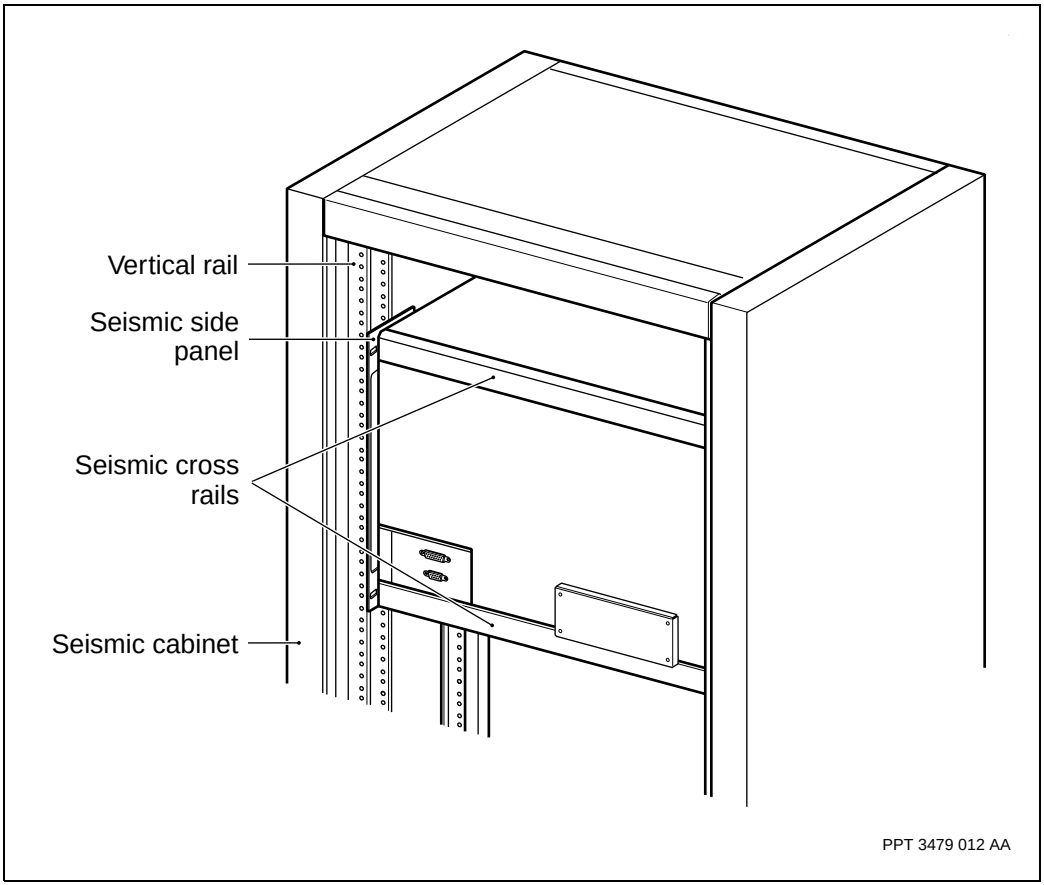


Figure 136
Position of side panels and cross rails for a Multiservice Switch 7460 in a seismic cabinet



Installing seismic hardware

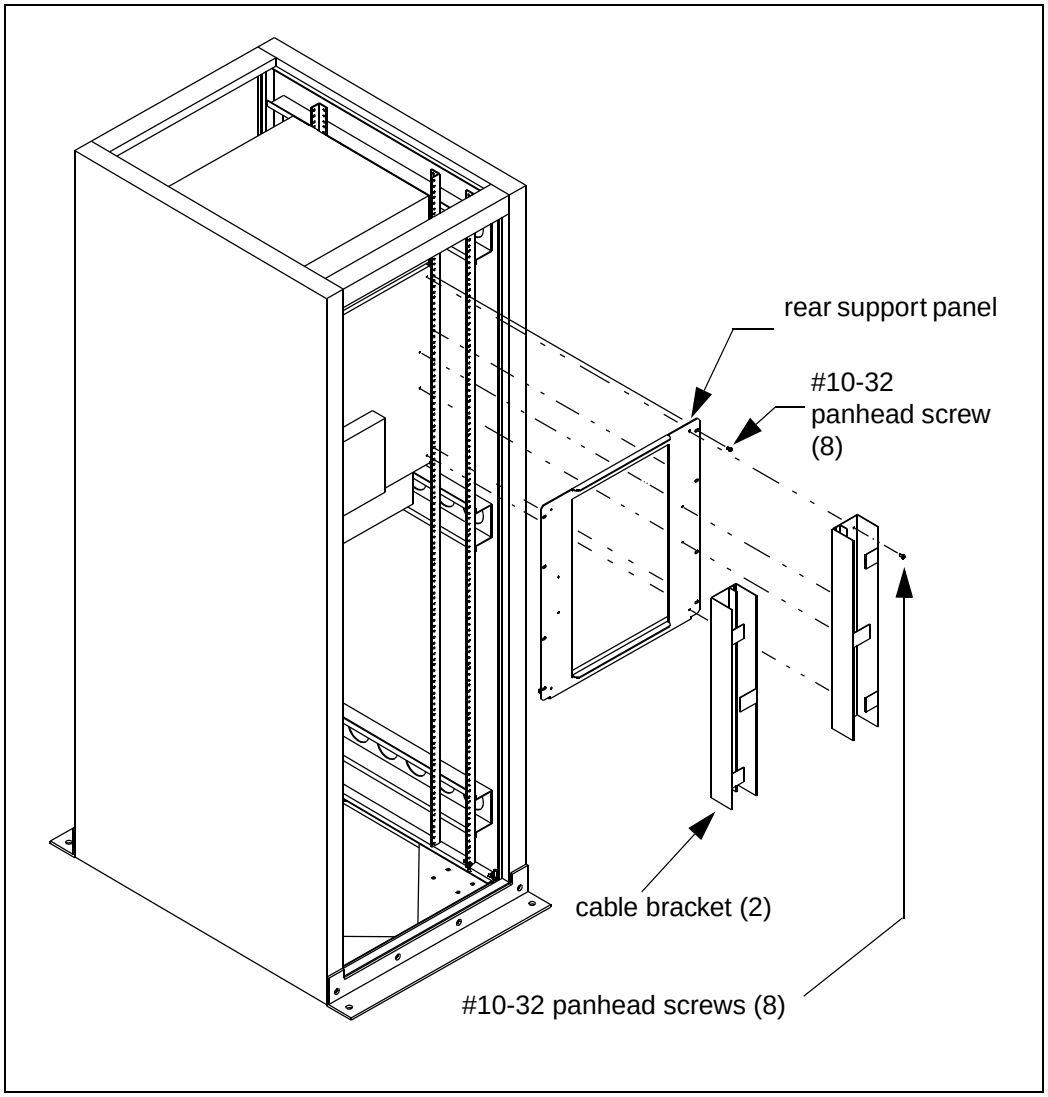
Install seismic hardware inside a seismic cabinet after you anchor the cabinet to the floor.

Procedure steps

1. Install the vertical mounting angles as shown in “Seismic cabinet mounting—front view” (page 207).
2. Use the panel shown in “Seismic cabinet mounting—rear view” (page 371) to connect the rear of the shelf to the additional seismic cabinet mounting rail kit. The rear support panel hardware is contained in the seismic shelf mounting collar kit.

Procedure job aid

Figure 137
Seismic cabinet mounting—rear view



Labeling a card cable connection

Label each CP and FP cable connection to ensure that it can be reconnected to the appropriate connector at each junction of the connection path.

Prerequisites

- Whether you plan to route one cable at a time from end to end of the full connection path between the FP and its far end, or route a cluster of cables along the path, you must ensure that each physical connection of the cable matches the software configuration. The software depends on matching the port number and slot number of a card in order to run without generating alarms for misconnected ports. You can connect and label the cables and then configure the software to match, or you can ensure that each cable connects to the appropriate port or ports along the connection path. Either way, each physical port connection must match its software configuration.
- You must determine the full path of each interface port along the connection path. Each cable connection to a hardware unit that is part of the connection path must have unique connection identification information. The connection path can include a combination of the following equipment:
  - the near-end FP faceplate
  - a termination panel such as a fanout panel, a sparing panel, or a fiber optic patch panel
  - an interworking device such as a DS1 EdgeLink 100 mux or a multiport aggregate device
  - the far-end termination such as another FP, a Nortel Networks product other than a Multiservice Switch, or a non-Nortel Networks product (also referred to as customer premises equipment or CPE)
- Typical identification information for each Multiservice Switch card cable connection includes:
  - the port number or series of port numbers on the card’s faceplate
  - the direction of the port as transmit (Tx) or receive (Rx)
  - the connection identifier that is on the hardware unit to which the cable will be connected

  - — the slot number of the shelf assembly
  - — the identifier of the Multiservice Switch in which the CP or FP resides, especially if more than one switch is in the same mounting apparatus

- Typical identification information for other equipment involved in the connection path includes:
  - — the identification of the hardware unit, especially if there is more than one kind of unit with the same type of connectors installed in the same mounting apparatus, for example, NTJS95 for a 19-inch DS1 or E1 MSA32 RJ-45 termination panel
  - — the location of the hardware unit relative to other units in the same mounting apparatus, for example, NTJS95 number 4 with the understanding that you always count from the top or bottom of the stack
  - — the connector identification on the unit
  - — the direction of the connection as Tx or Rx
  - — any other information that ensures a unique connection, for example, if the unit is replaced or redeployed
- When cabling a termination panel, especially a sparing panel, the connections between the sparing panel, the electrical FPs, and all equipment up to the far-end connection are intended to be Tx-to-Tx and Rx-to-Rx with Multiservice Switch equipment. When the Tx-to-Rx combinations get crisscrossed between an FP, a termination panel, and the far-end termination, the effect of one error nullifying another can establish a workable connection. It is important that you label the connection information of each Tx and Rx connection onto the end of the cable at each break in the cable path.
- Create a site record of the port-to-port connection information.
- You need cable labels that are large enough to accommodate the amount of connection information you require. The installed labels must not interfere with the operation or handling of cables for maintenance tasks. The labels must be robust enough to withstand occasional handling.

Procedure steps

1. Determine the port-to-port connections from the near end of the CP or FP card up to its far end interface.
2. Create the labels, each with its unique connection identification information.
3. On a cable at the CP or FP end, attach a label where it can be seen with minimal handling of cables. Since fiber optical cables are extremely sensitive to handling, you may want to stagger the labels along the cluster of cables.

   Ensure that you know exactly where the other end of the cable is so that it gets a mirror label.
4. Attach a mirror label at the other end of the card cable. With duplex cables, ensure that you label the appropriate half.
5. Repeat step 3 to step 4 for each other leg of the connection in the path up to the far end.
6. Repeat step 3 to step 5 for each other connection that will be done at the the card faceplate.
7. Repeat step 6 to label all other card cables at the shelf.
8. Record any changes you made to the cable connection information of your site records.

Making a BITS wire

Make a BITS wire for the connection between the external timing source and the BITS termination panel.

Prerequisites

- The BITS wire must be a braided shield, see “Making a braided shield” (page 379).
- The BITS cable must be custom made before completing the end-to-end timing connection.
- Match the wire gauge requirements for a BITS installation with the requirements of your site BITS timing source. Also, the gauge of wire depends on the distance between the endpoints and the capability to solder the bare wire onto the pins of a DB9 connector.
- Each timing connection requires 2 wires. When connecting both the 0 and 1 timing references, select color-coded twisted pair wires to distinguish between the 2 (this does not apply to E1 unbalanced connections).
- Ensure that the size of wire (for example, 22 AWG) can be soldered to the DB9 connector pins. The wire size depends on the length between the end points.
- Cable length depends on the transmitter line build out and the gauge of the cable. Refer to the table “Typical line build out application settings” (page 375).

Table 4
Typical line build out application settings

Gauge	Distance	Transmitter
0	0 to 41 m (133 ft)	0 db DSX-1/CSU
1	41 m (133 ft) to 81 m (266 ft)	DSX-1
2	81 m (266 ft) to 122 m (399 ft)	DSX-1
3	122 m (399 ft) to 163 m (533 ft)	DSX-1
4	163 m (533 ft) to 200 m (655 ft)	DSX-1

(Sheet 1 of 2)

Table 4 (continued)
Typical line build out application settings

Gauge	Distance	Transmitter
5		-7.5 db CSU
6		-15 db CSU
(Sheet 2 of 2)		

Procedure steps

1. Lay the wires from the timing source up to the connectors on the BITS termination panel. Route the wires up or down the right side of the frame against the cable management brackets.
2. Connect the wires at the timing source, using whatever method of connection is required.
3. Label each timing wire pair at both end points to distinguish which is reference 0 and which is reference 1.
4. Fasten the wires snugly with tie-wraps to whatever CPE wire support system leads to the cable management brackets on the mounting apparatus. Leave enough length at termination panel end of the wire to attach the D-sub or coax connectors.
5. Assemble the cable with the appropriate connector. Refer to the pinout tables below.

Procedure job aid

Table 5
Pinouts of the connectors for DS1 or E1 balanced

Pin	DS1 for BITS-0	DS1 for BITS-1
1	no connection	no connection
2	no connection	no connection
3	GND (ground)	GND (ground)
4	no connection	no connection
5	BITSRX0P	BITSRX1P
6	no connection	no connection
(Sheet 1 of 2)		

Table 5 (continued)
Pinouts of the connectors for DS1 or E1 balanced

Pin	DS1 for BITS-0	DS1 for BITS-1
7	no connection	no connection
8	no connection	no connection
9	BITSRX0N	BITSRX1N
(Sheet 2 of 2)		

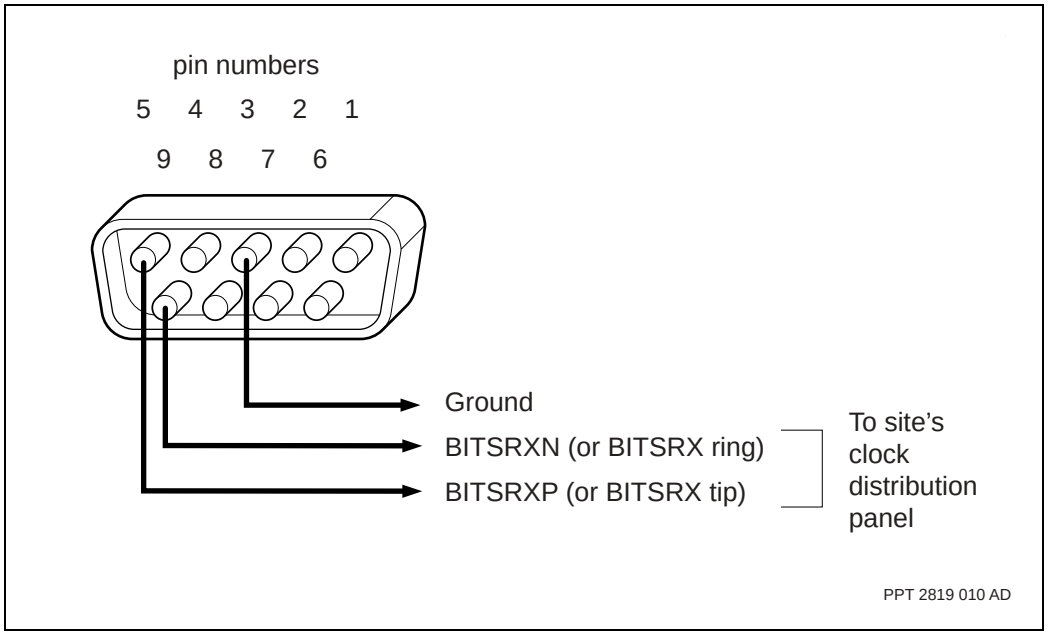
Table 6
Pinouts of the connectors for E1 unbalanced

Pin	E1 unbalanced for BITS-0	E1 unbalanced for BITS-1
1	BITSRX0P	BITSRX1P
2	BITSRX0N	BITSRX1N
Note: E1 unbalanced uses standard coax cables.		

The meanings of the entries in the preceding tables are:

- BITS is building integrated timing supply
- RX is receive, where the signal goes from the external clock into the BITS interface
- 0 is BITS-0
- 1 is BITS-1
- P is positive, which for balanced means tip and for unbalanced means signal
- N is negative, which for balanced means ring and for unbalanced means ground

Figure 138
D-sub pinout for BITS cables for DS1 or E1 balanced



Making a braided shield

Make a braided shield if a cable specification requires a cable to be shielded.

Prerequisites

CAUTION

Risk of compromise to EMI rating

All shielded cables that you assemble must have a braided shield. Failure to properly construct interface cable assemblies can compromise the EMI rating and affect the product compliances.

Procedure steps

1. Strip the outer cable jacket to expose the braid. Select an insert that tightly fits the cable jacket. Slide the insert over the jacket as shown in step one of the figure “Steps for making a braided shield” (page 380).
2. Cut two slits along the braid as shown in step two of the figure.
3. Carefully fold the braid back over the insert as show in step 3 of the figure.
4. Place the insert and assembled connector into the cavity of the bottom cover. See the figure “Braided shield assembly” (page 381).
5. With the insert and the connector in place, secure the top cover to the bottom cover.

Procedure job aid

Figure 139
Steps for making a braided shield

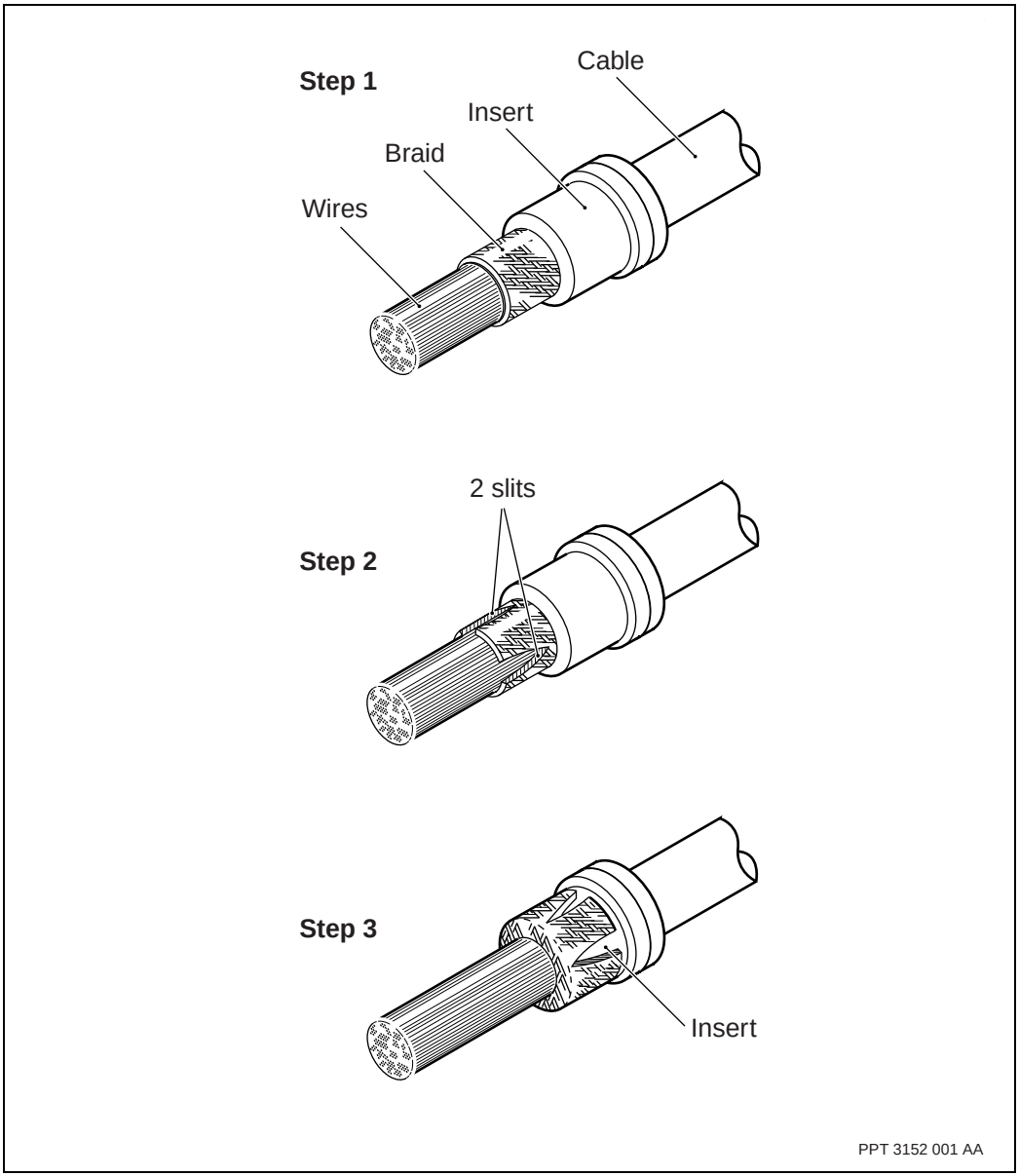
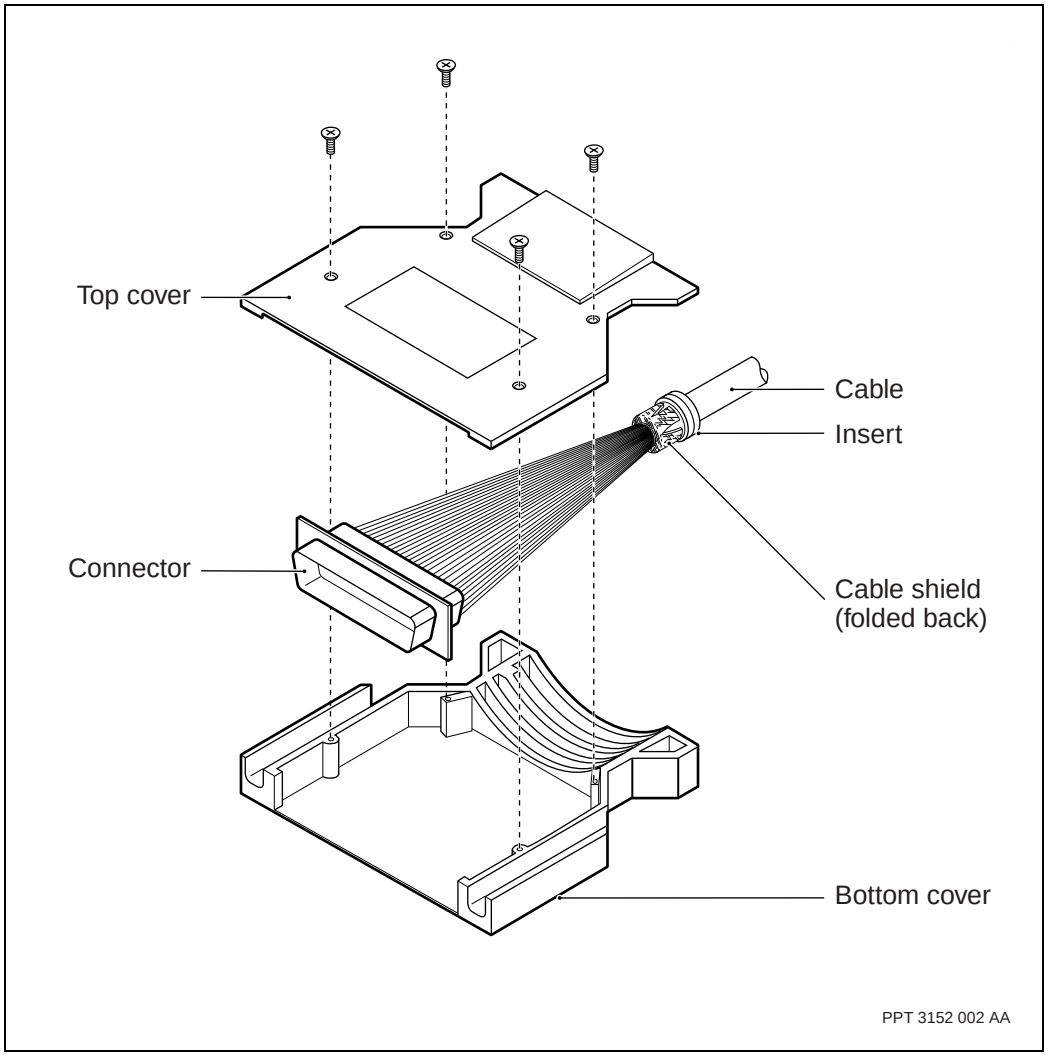


Figure 140
Braided shield assembly



Making customer equipment cables

Make customer equipment cables following this general procedure.

Prerequisites

CAUTION
Risk of compromise to EMI rating
The shielded cables that you assemble must have a braided shield. See the procedure, "Making a braided shield" (page 379) Failure to properly construct interface cable assemblies can compromise the EMI rating and affect the product compliances.

- Ensure that you know the appropriate cable specifications, including assembly parts, pinouts and standards to which a cable must comply. For more information, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- Ensure that you have assembled all required cable parts.

Procedure steps

1. Assemble the cable according to the specifications in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description* and your company operational procedures.
2. If you are making a shielded cable, make a braided shield. See the procedure "Making a braided shield" (page 379).
3. Ground the cable according to site practices.

   To avoid EMI problems, terminate shield grounds on equipment at the Multiservice Switch end as well as the customer end. This assumes that the equipment at both ends are properly grounded to avoid any ground loop problems.

   If necessary in order to avoid ground loops, you can terminate the shield ground at one end only.
4. Test end-to-end connections with an ohmmeter set to the lowest resistance range. Ensure that each connection is correct. Also ensure that the connector pins are not shorted together or to the connector shield.

Moving a door hinge to the other side of a cabinet

Move a door hinge to the other side of the cabinet if doing so improves access to the devices within the cabinet.

Procedure steps

1. Transfer the hinge-supporting plates to the opposite side of the frame.
2. Move the door latch and the blank door latch to opposite sides of the frame. See the figures “Cabinet door with hinges on the left” (page 384) and “Cabinet door with hinges on the right” (page 385).

Procedure job aid

Figure 141
Cabinet door with hinges on the left

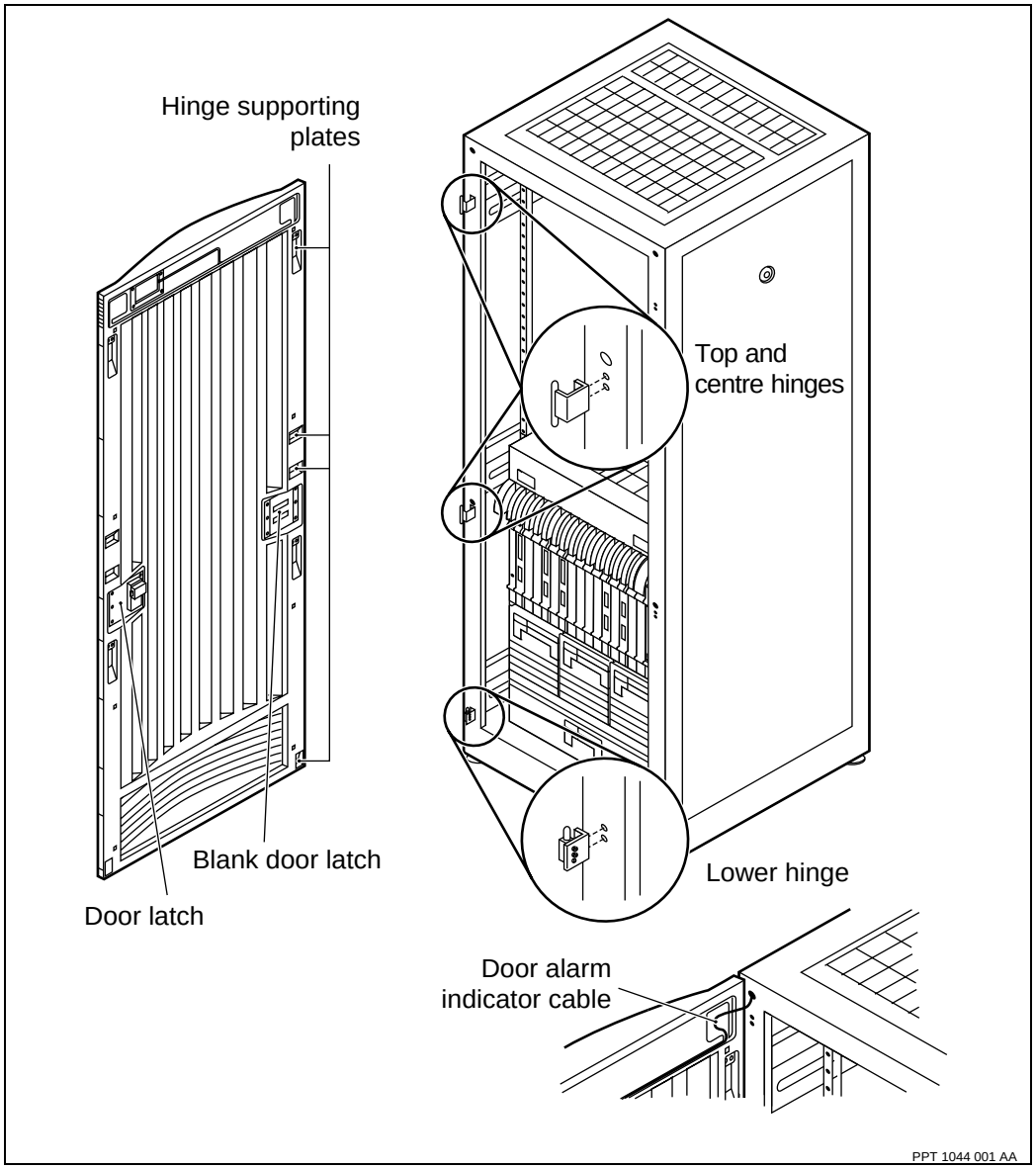
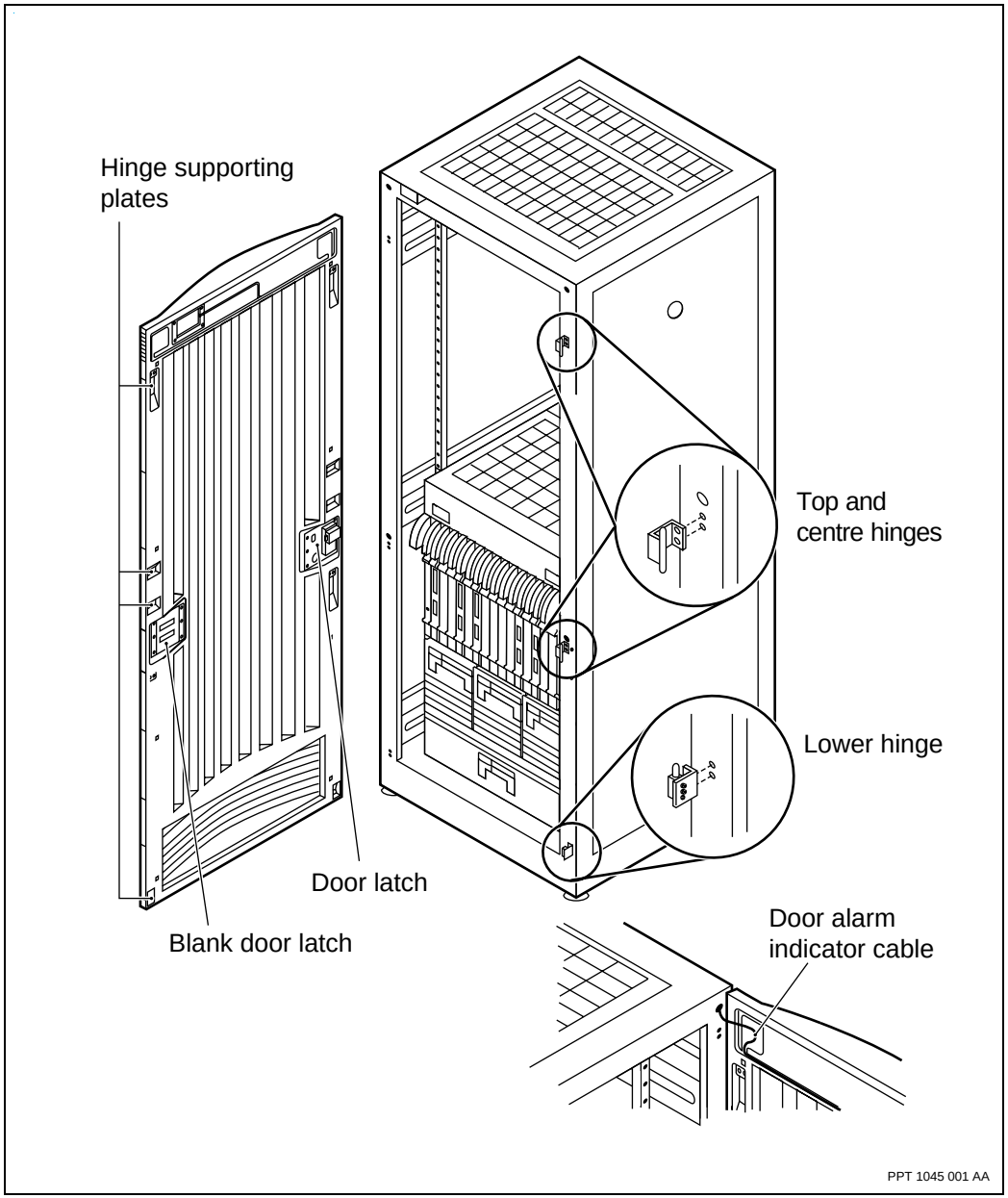


Figure 142
Cabinet door with hinges on the right



Packing a processor card

Pack a processor card after you remove it from a shelf in order to protect it from damage.

Prerequisites

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see “Avoiding damage from static electricity” (page 208).

CAUTION
Risk of equipment damage
Avoid physical damage and the accumulation of dirt or dust on processor card contacts. Never store or stack processor cards without first placing them in their antistatic material and shipping package.

- Follow “Avoiding damage from static electricity” (page 208) to protect the unit from damage by ESD or from transferring ESD to other hardware.

Procedure steps

1. Attach a label to the processor card. Record the date, your name, organization, department, telephone number, the processor card part, serial number, and the version of software running on the processor card. If the processor card has failed, include the failure time and, if known, the cause of the failure.
2. Pack the processor card in its original packaging. This prevents physical damage and accumulation of dirt and dust on contacts. Insert the processor card into its packaging with care.
3. Label the processor card box.

CAUTION

Risk of equipment damage

Prevent warping and electrical contact corrosion when you store or ship a processor card. Ensure that the relative humidity does not exceed 95% and that the temperature does not exceed 70 degrees Celsius (158 degrees Fahrenheit).

4 Store or ship the processor card in accordance with your company's operational procedures.

Placing and anchoring a Multiservice Switch cabinet

Place and anchor a Nortel Networks Multiservice Switch cabinet to ensure stability for devices.

Procedure steps

1. If you have not done so during site preparation, drill holes to accommodate the anchors. Use a roto hammer drill and a masonry drill bit to drill the holes. Wear safety goggles when you drill the holes.

   To properly stabilize a cabinet, you must anchor at least two diagonal corners of the cabinet. For increased safety, anchor all four corners.

2. Clean each anchor hole thoroughly using a vacuum cleaner. If you are not securing the cabinet immediately, cover the holes with tape to prevent them from being filled with debris.

3. For each anchor, tap the anchor into the drilled anchor hole until it is flush with the floor. Insert the threaded rod into the anchor and put the nut on the bolt. Use a socket wrench to fully insert the threaded rod into the anchor. Turn the rod until you are sure the anchor is secure in the hole.

4. Remove the nut and threaded rod from the anchor.

5. Remove the cooling unit from the bottom of the device. See the procedure “Removing the cooling unit from a Multiservice Switch 7480” (page 461).

6. Remove the large grille in the base of the cabinet (4 nuts) using a wrench.

7. Carefully slide the cabinet into position.

8. Use a spirit level, or a plumb bob attached to the top of the frame, to ensure that the cabinet is vertically aligned. Ensure that the cabinet is vertically aligned side-to-side and front-to-rear within 0.25 cm (0.1 inch) of the overall height.

   If necessary, tilt the cabinet and adjust the levelling feet at the base of the cabinet. Turn a levelling foot clockwise to lower the cabinet and counterclockwise to raise the cabinet.

9. Assemble the bolt-down bracket using the upper and lower bolt-down brackets as shown in “Multiservice Switch cabinet anchoring (concrete and raised floors)” (page 390). The upper bolt-down bracket is shipped with the cabinet. The lower bolt-down bracket is part of the anchoring kit.

   Place the 1/4-inch hex-head screw through the holes in the upper and lower bolt-down brackets. Make sure that the head of the screw is on the side of the upper bolt-down bracket. Place the 3/4-inch brass washer and

1/4-inch nut with the nylon insert on the screw. Do not tighten the screw completely.

10 Rotate the upper bolt-down bracket to face the hole with the anchor in it.

11 Place the bushing over the hole. Rotate the lower bolt-down bracket over the bushing as shown in “Multiservice Switch cabinet anchoring (concrete and raised floors)” (page 390).

12 Place the 1.9-inch plastic washer, the 2.3-inch plate washer, and the lock washer on top of the bolt-down bracket.

13 If you are anchoring the cabinet to a concrete floor, insert the shorter threaded rod through the washers, bolt-down bracket, and bushing and into the anchor. Put the nut on the threaded rod and tighten it.

or

If you are anchoring the cabinet to a raised floor, insert the 36-inch threaded rod through the washers, bolt-down bracket, bushing and into the floor. Place a plate washer, lock washer and nut over the anchor hole beneath the floor. Insert the threaded rod through these parts and into the anchor. Put the nut on the top of the threaded rod and tighten it.

14 Torque all the anchors with a torque wrench and socket, to a torque setting of 27 Nm (20 ft-lb.).

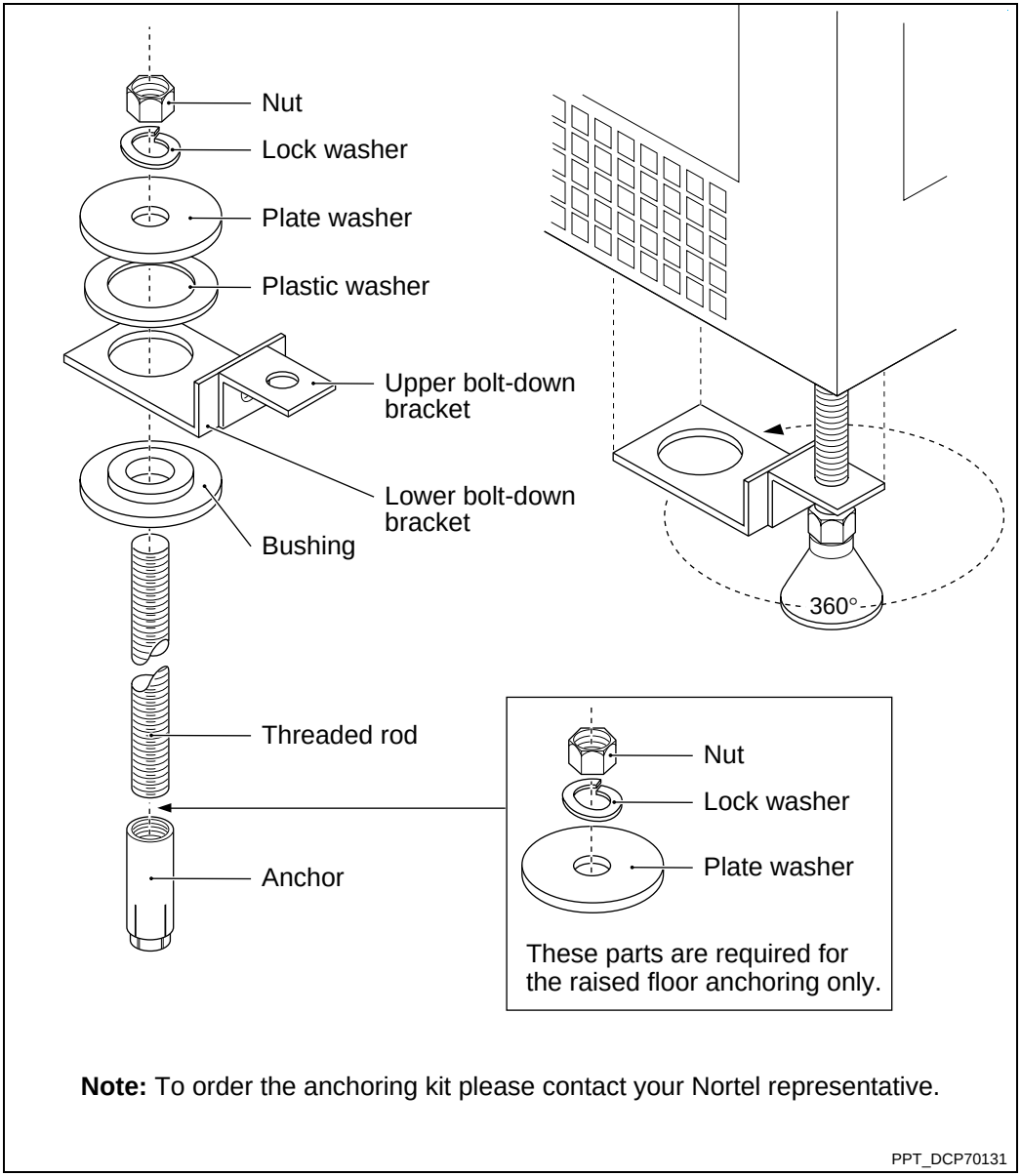
15 Tighten the bolt-down bracket screws.

16 Replace the large grille in the base of the cabinet.

17 Replace the cooling unit. See “Installing a cooling unit into a Multiservice Switch 7480” (page 260) for more information.

Procedure job aid

Figure 143
Multiservice Switch cabinet anchoring (concrete and raised floors)



Note: To order the anchoring kit please contact your Nortel representative.

PPT_DCP70131

Powering down a Multiservice Switch

Power down a Multiservice Switch when you are doing maintenance procedures that require all power distribution to be off.

Procedure steps

1. Toggle off the circuit breakers or fuses of the upstream source of power for the feeds that supply power to the Multiservice Switch.

   The front panel LED of each power supply remains lit for approximately two minutes after the power supply loses power. Capacitors are discharging while the LED is lit.

   If the primary power to the shelf assembly is on, never set the individual power supply toggles to the standby position. This can cause an overload to the on-line power supply.

2. After a couple of minutes, verify the LEDs for the power supplies, cooling unit, and each processor card faceplate are off.

3. Power off the power supplies.

Powering up a Multiservice Switch 7420

Power up a Nortel Networks Multiservice Switch 7420 after installing all processor cards.

Prerequisites

CAUTION

Risk of equipment damage

You can damage equipment if you power up a device before you have met the prerequisites listed in this section.

- install cabinet or device shelving (for rack-mounted installations)
- install termination panels, if required
- install power cables

Procedure steps

1. Connect and wear the antistatic wrist strap.
2. Make sure that the power control is in the standby position. See the figure “Multiservice Switch 7420 power control” (page 393).
3. Ensure that the CP in slot 0 and the FPs are engaged.
4. Turn on the circuit breakers for the outlets that supply power to the device.
5. Apply power by toggling the power control to the on position.
6. Verify that the cooling unit is operational and that the LED display on each FP is appropriate. See “Processor card LED status display” (page 326)
7. Verify that the appropriate LEDs are illuminated on termination panels. See “Termination panel LED status display” (page 393)

Procedure job aid

Figure 144
Multiservice Switch 7420 power control

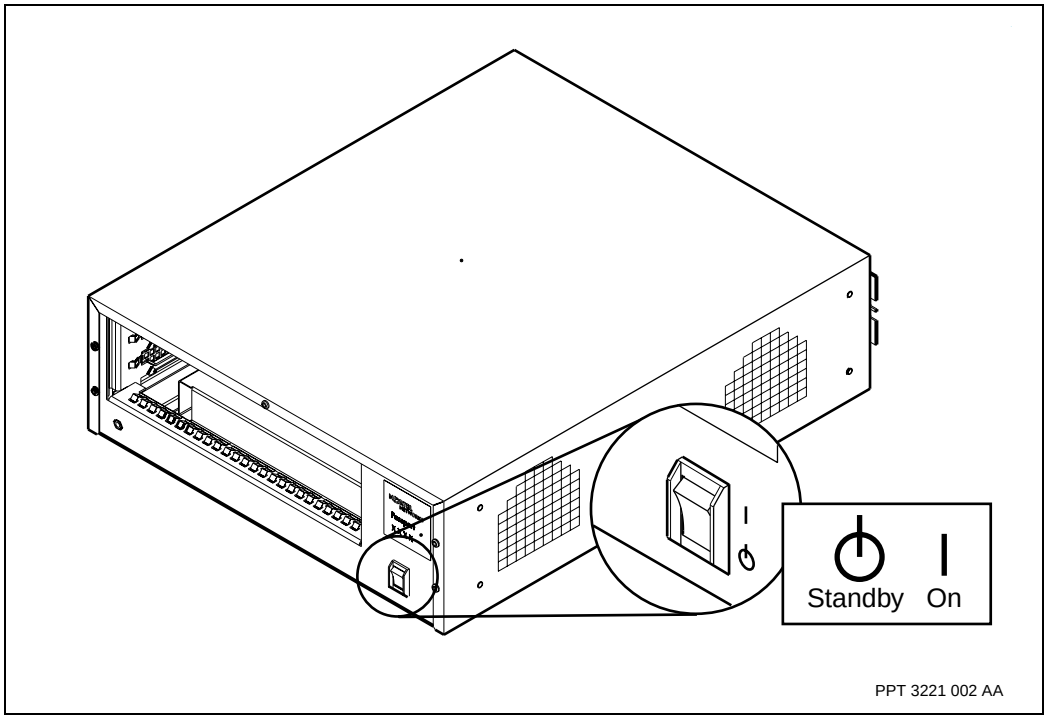


Table 7
Termination panel LED status display

LED display	Termination panel status
No LEDs illuminated	No power is reaching the termination panel
Any LED illuminated	Termination panel is powered
Main FP connection LED illuminated	Termination panel is powered and main FP is active
Spare FP connection LED illuminated	Termination panel is powered and spare FP is active

Powering up a Multiservice Switch 7440

Power up a Nortel Networks Multiservice Switch 7440 after installing all hardware and cabling.

Prerequisites

CAUTION
Risk of equipment damage
You can damage equipment if you power up a device before you have met the prerequisites listed in "Prerequisites" (page 399)

- install cabinet or device shelving
- install cooling unit equipment
- install power supplies (in standby mode)
- install termination panels, if required
- install customer-equipment cables, if required
- install control processors (CP) and function processors (FP) in the disengaged position
- install card cables
- install power cords
- install external alarm cables (for cabinet installations only)

Procedure steps

1. Connect and wear the antistatic wrist strap.
2. Make sure that all power supply controls are in the standby position. See the figure "Multiservice Switch 7440 power supply" (page 396).
3. Ensure that the CP in slot 0 and all FPs are engaged.
4. Toggle on the circuit breakers for the outlets that supply power to the device.
5. Verify that the LEDs on all power supplies are red.
6. Apply power to one of the power supplies by toggling its power control to the on position. See "Multiservice Switch 7440 power supply" (page 396).

The system does not supply power to the shelf if you turn on the power before you install a CP. The power supply LED will remain red. If you are using two power supplies, you must install at least one FP in addition to a CP.

Note: Devices that use power supply models NTEP26CA and NTEP27CA raise a minor alarm whenever the LED is green for one power supply and a second power supply is set to standby. Other models may also raise a minor alarm.

7 Verify that

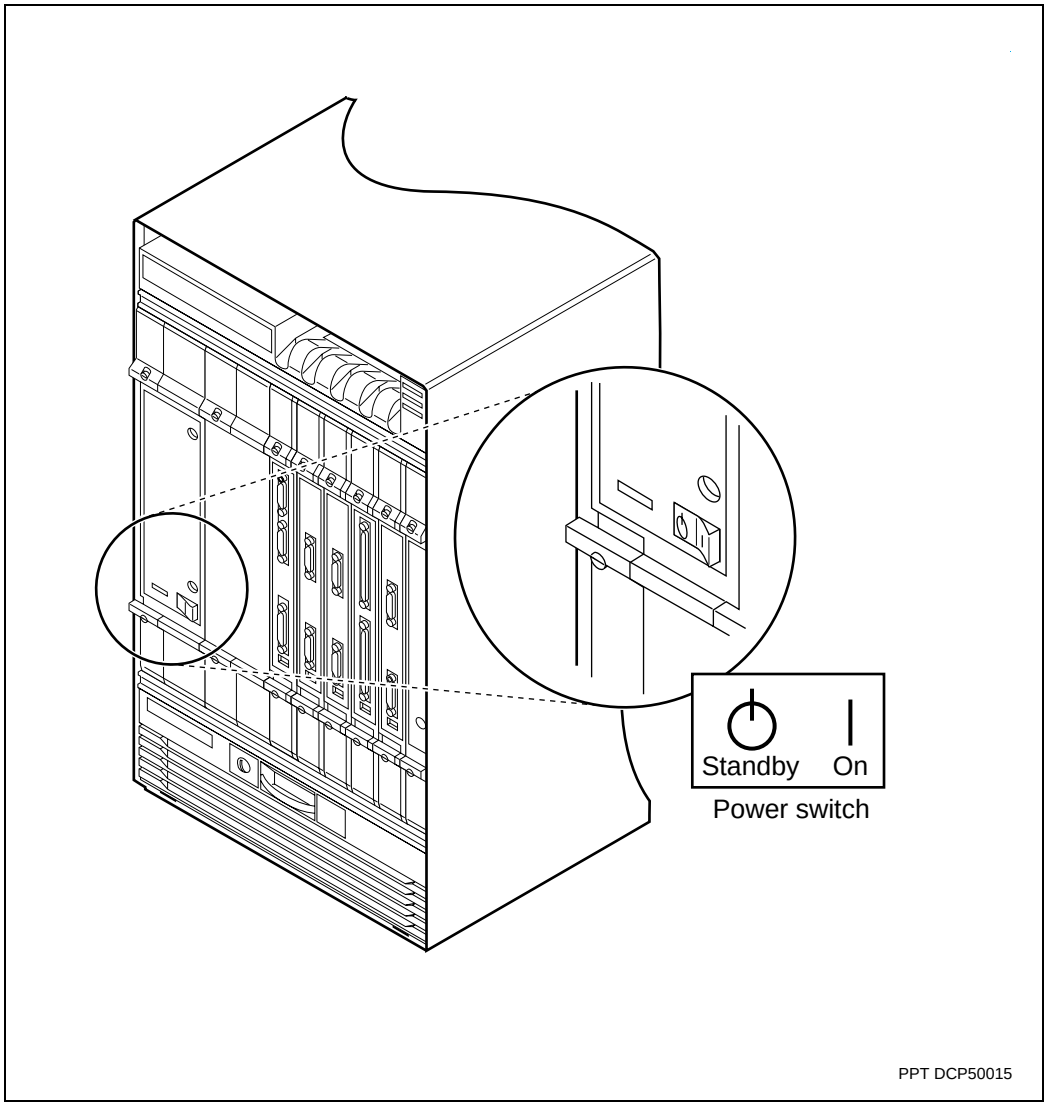
- the power supply LED is green
- the cooling unit is operational
- the LED display on each FP is appropriate. See “Processor card LED status display” (page 326)
- the cooling unit LED is green
- the power status indicator (top LED) on the front of the cabinet is green (for cabinet installations only)

8 If necessary, apply power to a second power supply by setting its power control to the on position. Verify that the power supply LED is green.

9 Verify that the appropriate LEDs are illuminated on termination panels. See “Termination panel LED status display” (page 393)

Procedure job aid

Figure 145
Multiservice Switch 7440 power supply



Powering up a Multiservice Switch 7460

Power up a Nortel Networks Multiservice Switch 7460 after you have installed all plug-in and screw-on parts onto the shelf assembly.

Prerequisites

- Verify that all power supply controls are in the standby position. See the figure “The power control on the power supply for a Multiservice Switch 7460” (page 398).

Procedure steps

1 Unseat all processor cards from the backplane of the shelf.

2 Seat the minimum number of processor cards required, based on the number of power supplies in the shelf.

If you have one power supply, seat a CP in slot 0 and at least one FP. Ensure that all other processor cards are unseated.

If you have two power supplies, seat at least one CP and two FPs. Or, seat two CPs and at least one FP.

3 Toggle on power to the device at the upstream power source.

4 Power up the power supply that is labeled PS1 by toggling its power control to the on position. See the figure “The power control on the power supply for a Multiservice Switch 7460” (page 398).

If you have not seated a CP or any FPs before you turn on a power supply, the system does not supply power to the shelf, and the LED on the power supply shows green.

5 Verify that the LED on the power supply is green.

6 Verify that the cooling unit LED is green and is operational. You should be able to hear the fans start to rotate.

7 If present, apply power to the second power supply labeled PS2 by toggling to the on position its power control. Verify that its LED is green.

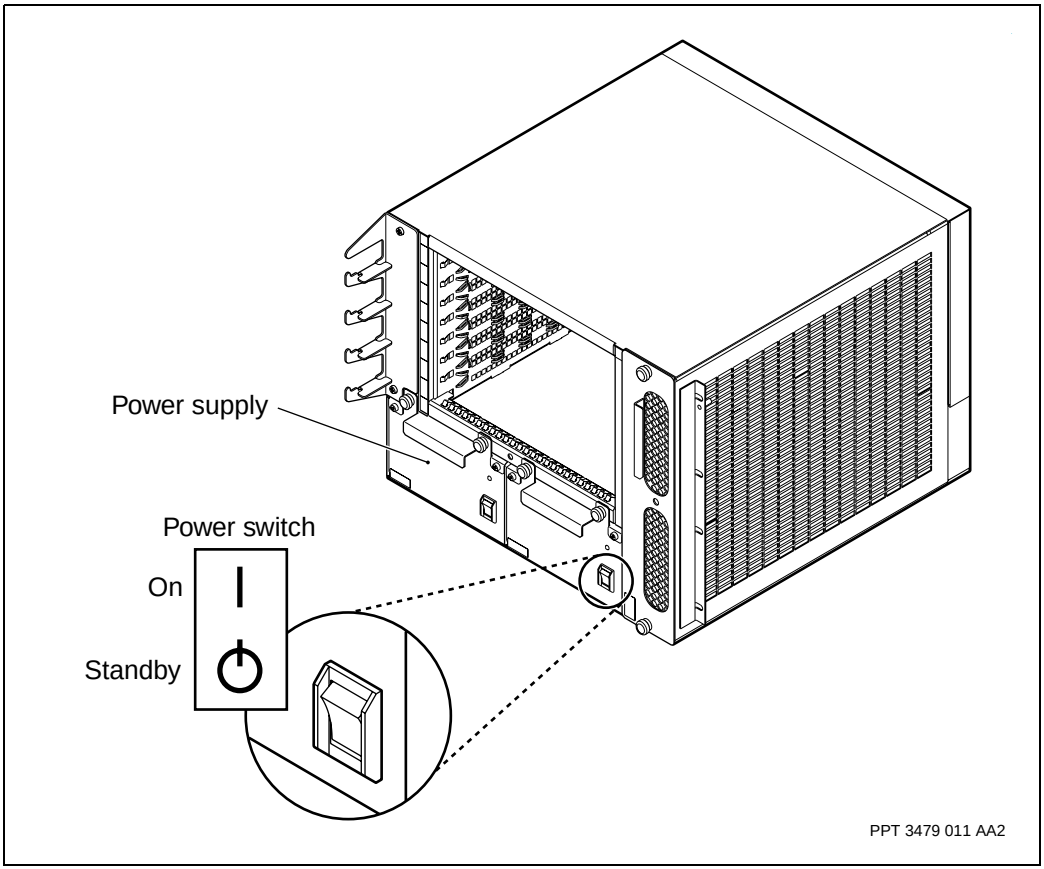
8 Seat the remaining processor cards.

9 Verify the LED color on the processor cards is appropriate. See the table “Processor card LED status display” (page 326).

10 Verify that the appropriate LEDs are illuminated on termination panels. See “Termination panel LED status display” (page 393).

Procedure job aid

Figure 146
The power control on the power supply for a Multiservice Switch 7460



Powering up a Multiservice Switch 7480

Power up a Nortel Networks Multiservice Switch 7480 after you have installed all shelf components.

Prerequisites

- Verify that all power supply controls are in the standby position. See the figure “Unlocked power supply on a Multiservice Switch 7480 with the power control in the standby position” (page 476).

Procedure steps

1. Disengage all processor cards from the backplane of the shelf.
2. Engage the minimum number of processor cards required, based on the number of power supplies in the shelf.

   If you have one power supply, engage a CP in slot 0 and at least one FP. Do not engage more than seven FPs. Ensure that all other processors are disengaged.

   If you have two power supplies, engage at least one CP and two FPs. Or, engage two CPs and at least one FP.

   If you have three power supplies, engage at least one CP and three FPs.
3. Turn on the circuit breakers for the outlets that supply power to the device.
4. Verify that the LEDs on all power supplies are red.
5. Apply power to one of the power supplies by toggling its power control to the on position. See the figure “Unlocked power supply on a Multiservice Switch 7480 with the power control in the standby position” (page 476). Verify that the power supply LED is green.

   Normal operation is not guaranteed if there are no processor cards in the shelf. If you have not installed any processor cards before you toggle on a power supply, the system does not supply power to the shelf and the power supply LED remains red.
6. Verify that the cooling unit LED is green and is operational. You should be able to hear the fans start to rotate.
7. If necessary, apply power to a second and third power supply by toggling to the on position their power controls. Verify that the LED for each power supply is green.

If you install eight or more FPs, you must use a second power supply. If your system contains fewer than eight FPs, the system uses the second power supply for redundancy.

8 If necessary, engage the remaining processor cards.

9 Verify the LED color on each FP is appropriate. See the table “Processor card LED status display” (page 326).

10 Verify that the appropriate LEDs are illuminated on termination panels. See “Termination panel LED status display” (page 393).

Preparing the floor for a Multiservice Switch cabinet

Prepare the floor for a Nortel Networks Multiservice Switch cabinet before installing the cabinet.

Prerequisites

- Ensure that your floor plan takes into consideration all of the information in “Site preparation” (page 77).

Procedure steps

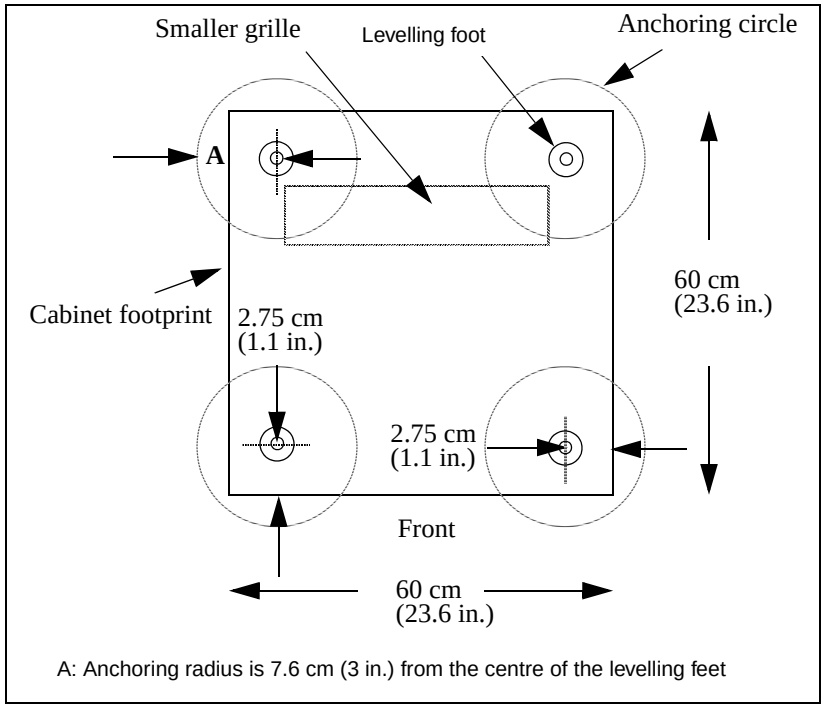
1 After the floor plan is complete, mark the floor to show the positions of all cabinets (and associated anchoring holes and cutouts, if required) and other equipment. The figure “Multiservice Switch cabinet footprint” (page 402) shows the footprint for a cabinet.

If you are installing one cabinet only, position the anchoring holes outside the cabinet footprint. If you are installing more than one cabinet, position the anchoring holes inside the cabinet footprint so that space around the cabinets will not be obstructed. The anchoring hardware swivels 360 degrees.

To properly stabilize a cabinet, you must anchor at least two diagonal corners of the cabinet. For increased safety, anchor all four corners. Anchoring is mandatory for cabinets containing one device if the device is in the top of the cabinet.

If you have a raised floor, drill the anchoring holes and cable cutouts during the site preparation, before installation begins. If you have a non-raised floor and are anchoring the cabinets, drill the anchoring holes as part of the installation.

Figure 147
Multiservice Switch cabinet footprint



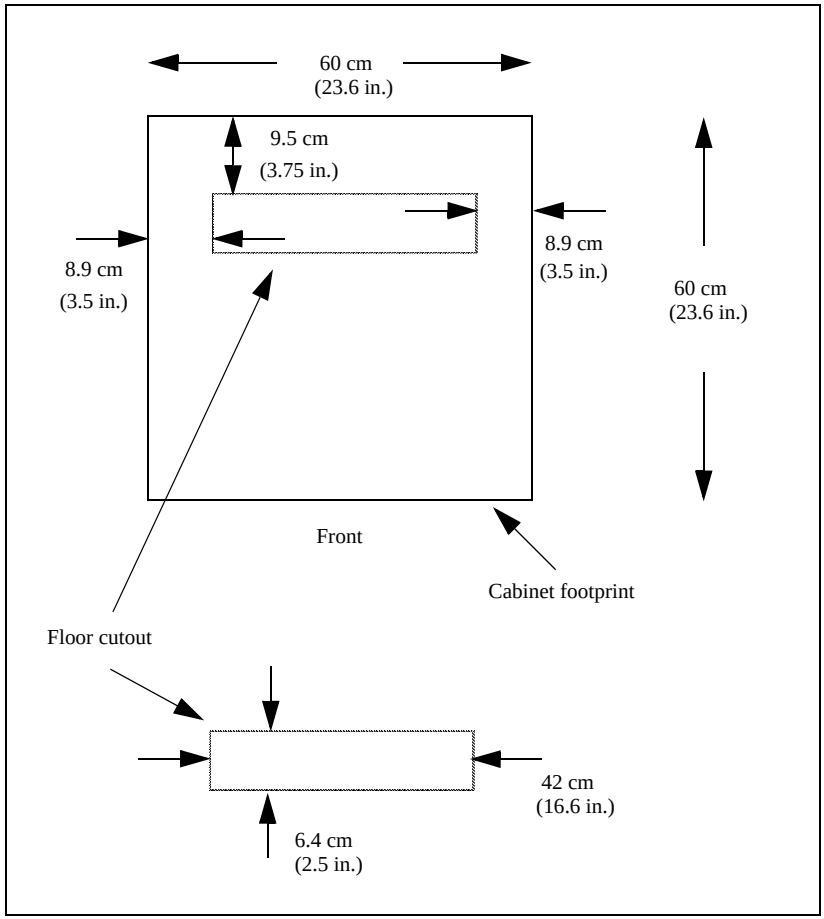
A: Anchoring radius is 7.6 cm (3 in.) from the centre of the levelling feet

2 Drill each hole and clean thoroughly with a vacuum cleaner.

3 Cover the holes with acetate tape to prevent them from being filled with debris.

4 Position cutouts for routing cables under a floor directly beneath the smaller grille at the base of the cabinet cutout. See the figure “Floor cutout position and size for under floor cable routing” (page 403).

Figure 148
Floor cutout position and size for under floor cable routing



5 Make the cutouts. A cutout 6.4 cm (2.5 in.) by 42 cm (16.6 in.) can accommodate all cables from a cabinet that contains two fully configured devices.

6 Smooth any sharp edges on the cutouts that can damage cables.

Preparing the floor for a seismic cabinet

Prepare the floor for a seismic cabinet using one of the seismic anchoring kits. Or, if you do not require seismic protection, you can anchor the seismic cabinet to stabilize the cabinet and prevent it from tipping over.

Prerequisites

- Ensure that your floor plan takes into consideration all of the information in “Site preparation” (page 77).

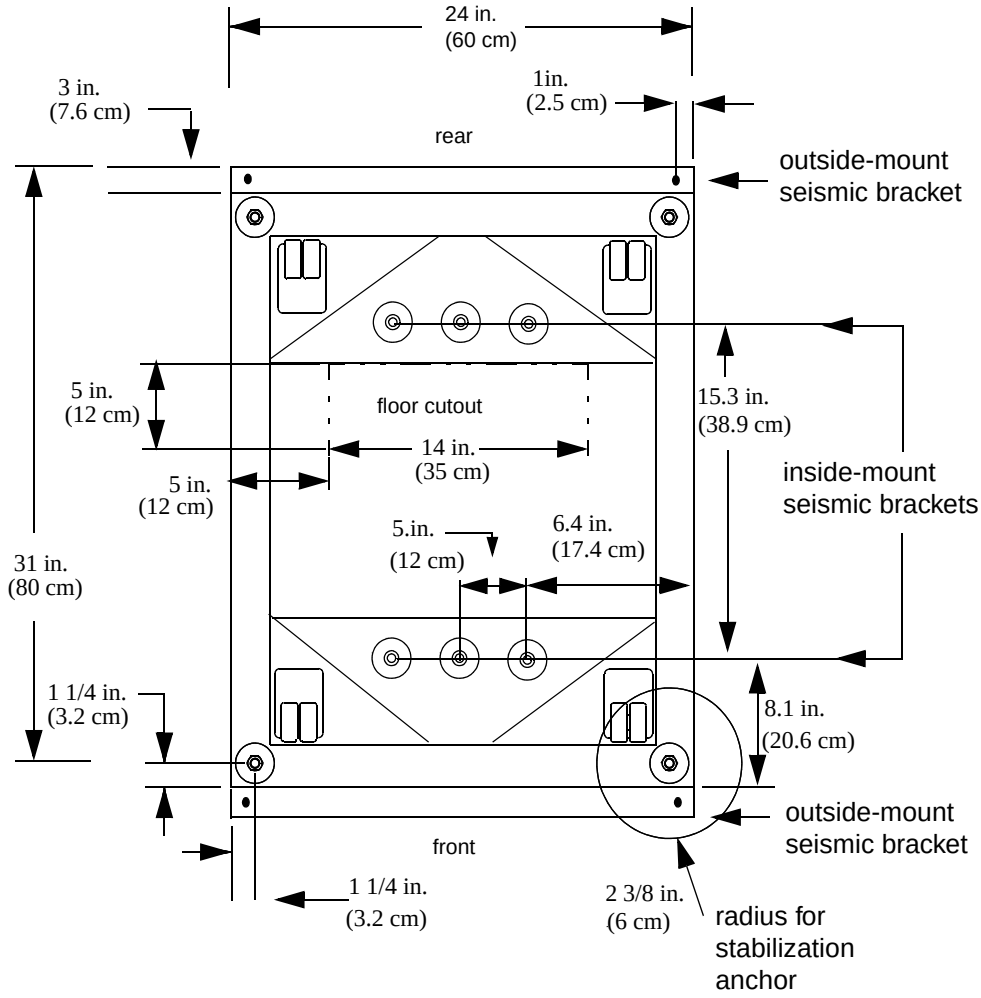
Procedure steps

1. After you complete a floor plan, mark the floor to show the positions of all cabinets and other equipment. The figure “Seismic cabinet footprint” (page 405) shows the footprint for a seismic cabinet.
2. Mark any cutouts for seismic anchoring brackets or stabilization anchors.

   The stabilization anchor hardware swivels 360 degrees. Therefore, you can place a stabilization anchor anywhere within the 2 3/8 in. (6 cm) radius of a levelling foot.

   For easy access to the stabilization anchor hardware, position the stabilization anchors outside the cabinet footprint. For multiple cabinet installations, position the anchors inside the cabinet footprint so that the stabilization anchors do not obstruct materials around the cabinets.
3. Mark any cutouts for routing cables under a raised floor. Cutouts for cables must be directly beneath the smaller grille at the base of the cabinet. See the figure “Seismic cabinet footprint” (page 405).
4. Drill all anchoring holes if you have a raised floor. If you do not have a raised floor, drill all holes during installation.
5. Clean each hole thoroughly with a vacuum cleaner.
6. Cover the holes with acetate tape to prevent them from being filled with debris.
7. Cut out any holes for routing cables under a raised floor. A 5.0 in. by 14 in. (12 cm by 35 cm) floor cutout can accommodate all cables from a fully configured cabinet.
8. Smooth any sharp edges on the cutouts that could damage cables.

Figure 149
Seismic cabinet footprint



Note: To anchor a seismic cabinet for seismic protection, install either the outside-mount seismic brackets or the inside-mount seismic brackets. To anchor a seismic cabinet to prevent it from tipping over, install stabilization anchors.

Removing a 13-inch termination panel from a Multiservice Switch 7420

Remove a termination panel from a Nortel Networks Multiservice Switch 7420 to replace a failed panel or if you are removing its associated FP(s) from the shelf.

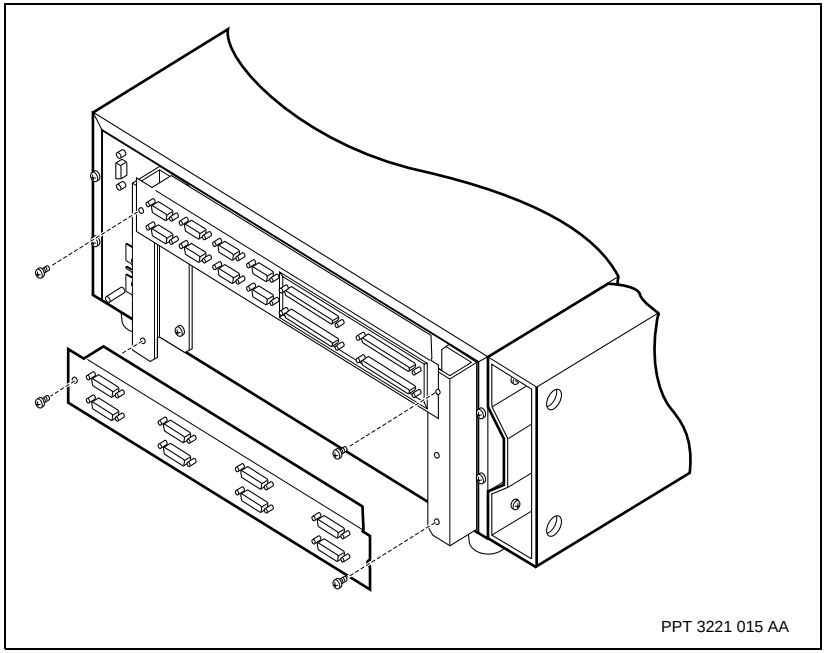
- "Procedure steps" on page 406
- "Procedure job aid" on page 407

Procedure steps

1. Label the cables connected to the termination panel. Then, remove the cables and coil them carefully out of the way.
2. Remove the screws at the ends of the termination panel that hold the panel in position. See the figure "Multiservice Switch 7420 termination panel removal" (page 407).
3. Replace the screw that you removed in step 2.

Procedure job aid

Figure 150
Multiservice Switch 7420 termination panel removal



Removing a 13-inch termination panel from a Multiservice Switch 7440

Remove a termination panel from a Nortel Networks Multiservice Switch 7440 to replace a failed panel or if you are removing its associated FP(s) from the shelf.

Prerequisites

CAUTION
Risk of equipment damage
When installing or removing a 13” termination panel from a Multiservice Switch 7440, do not force the bottom of the termination panel against the cable manager.

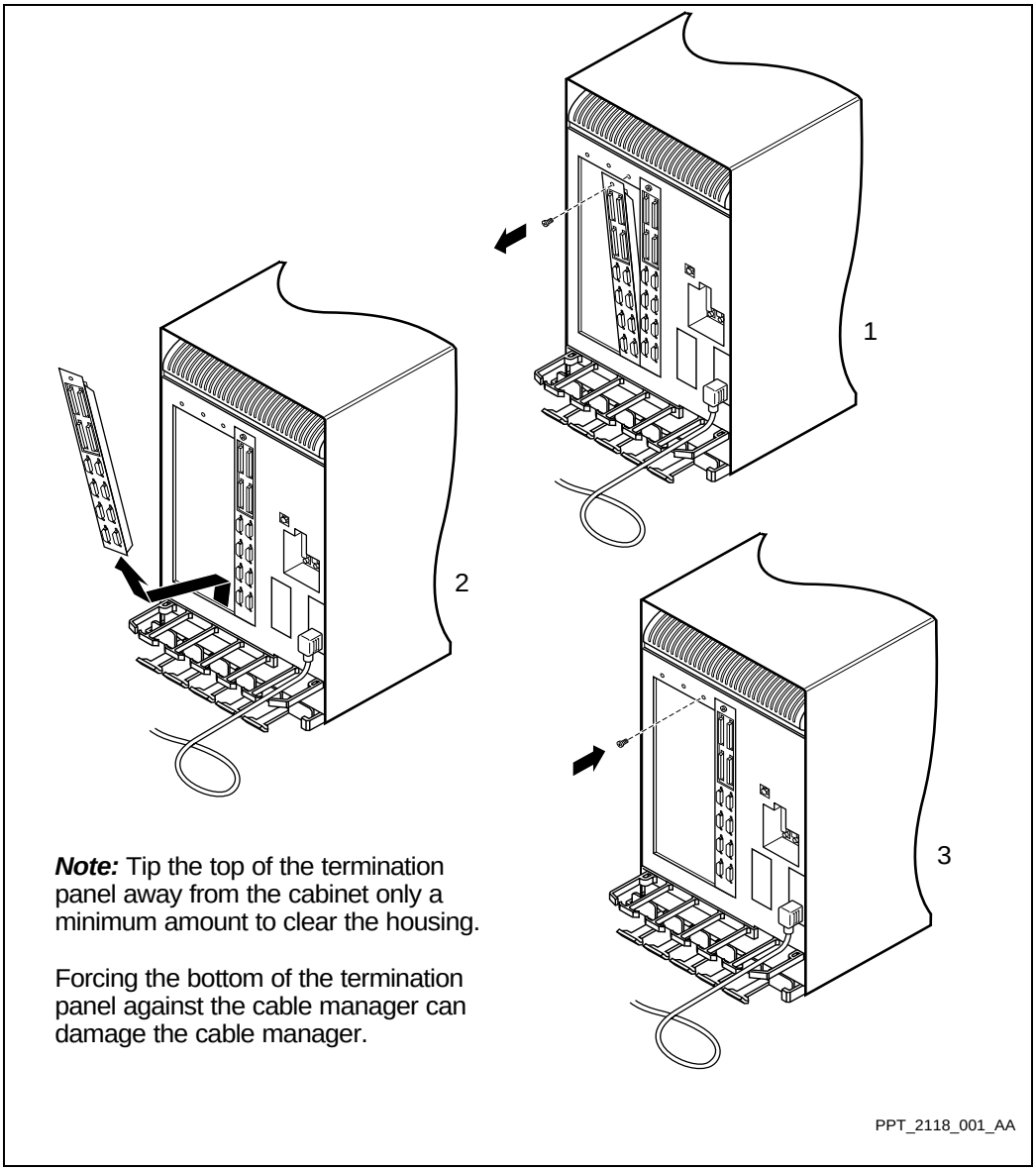
Procedure steps

1. Label the cables connected to the termination panel. Then, remove the cables and coil them carefully out of the way.
2. Remove the screw at the end of the termination panel that holds the panel in position. See the figure “Removing 13” termination panels from the rear of a Multiservice Switch 7440” (page 409).
3. Tip the termination panel backward and lift it out.

   Be careful when you remove the termination panel. Tip the top of the termination panel away from the cabinet far enough to clear the housing. Take care not to not pry the upper cable manager off the rear housing.
4. Replace the screw that you removed in step 2.

Procedure job aid

Figure 151
Removing 13” termination panels from the rear of a Multiservice Switch 7440



Removing a 19-inch rack-mounted termination panel

Remove a termination panel to replace a failed panel or if you are removing its associated FPs from the shelf.

Procedure steps

1. You can, if necessary, remove the front door before you remove termination panels from a cabinet. See the procedure “Removing a cabinet door” (page 412).
2. Label the cables connected to the termination panel. Then, remove the cables and coil them carefully out of the way.
3. Remove the two screws that fasten the termination panel to the frame. Remove the panel.
4. Tape the grounding wire and the grounding strip to the termination panel.

Removing a blank processor card

Remove a blank processor card to install a processor card (CP or FP) in that slot on the shelf.

Prerequisites

CAUTION

Risk of damage by electrostatic discharge (ESD)

When you handle processor cards, wear a grounded antistatic wrist strap or equivalent to protect electronic parts. For more information, see “Avoiding damage from static electricity” (page 208).

WARNING

Damage to equipment by electromagnetic interference

To meet electromagnetic interference (EMI) regulatory requirements and thermal specifications, each empty slot must be filled with a blank processor card (NTBP23).

- Ensure that you have appropriate packaging materials available so that you can store or ship a blank processor card after you remove it from the shelf.
- A blank processor card has PEC NTBP23.

Procedure steps

1. Unlock the latches on the blank processor card as indicated in the figure “Locking and unlocking processor card latches” (page 324).
2. Move both latches to a fully horizontal position and use the latches to pull the card out of the slot. Refer to the figure “Disengaging a processor card” (page 325).
3. Set the blank processor card aside or pack for shipping or storage in accordance with your company operational procedures.

Removing a cabinet door

Remove a cabinet door after you remove the door alarm indicator cable.

Prerequisites

- The door is heavy, so ensure that you have two people available to lift the door.

Procedure steps

1. Unlock and open the door.
2. Lift the door by the grips and remove it from the frame.

Removing a cabinet door alarm cable

Remove the door alarm indicator cable before you remove a cabinet door or if you need to replace a broken cable.

Procedure steps

1 Disconnect the cable at the rear of the shelf assembly. See the figures

- “Door alarm connectors for a Multiservice Switch 7480” (page 414)
- “Door alarm connector for a Multiservice Switch 7460” (page 415)

2 Slide the cable out through the feed-through hole to the front of the cabinet. Retain the grommet. See the figure “Cabinet door with hinges on the left” (page 384), or “Cabinet door with hinges on the right” (page 385).

3 Disconnect the cable on the cabinet’s front door. See the figure “Door alarm connectors for a Multiservice Switch 7480” (page 414). The door portion of this figure also applies to a Multiservice Switch 7460 device.

Procedure job aid

Figure 152
Door alarm connectors for a Multiservice Switch 7480

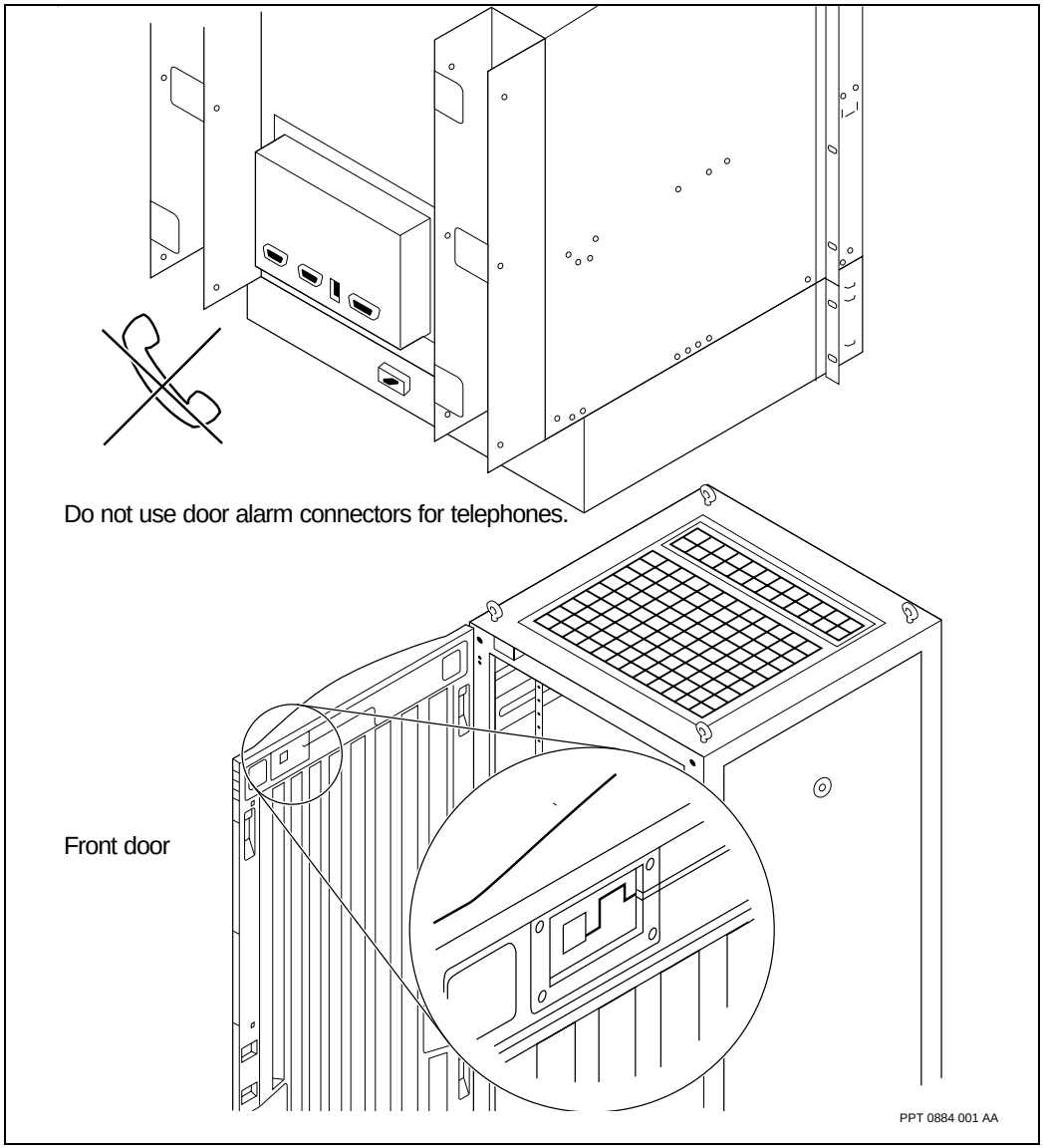
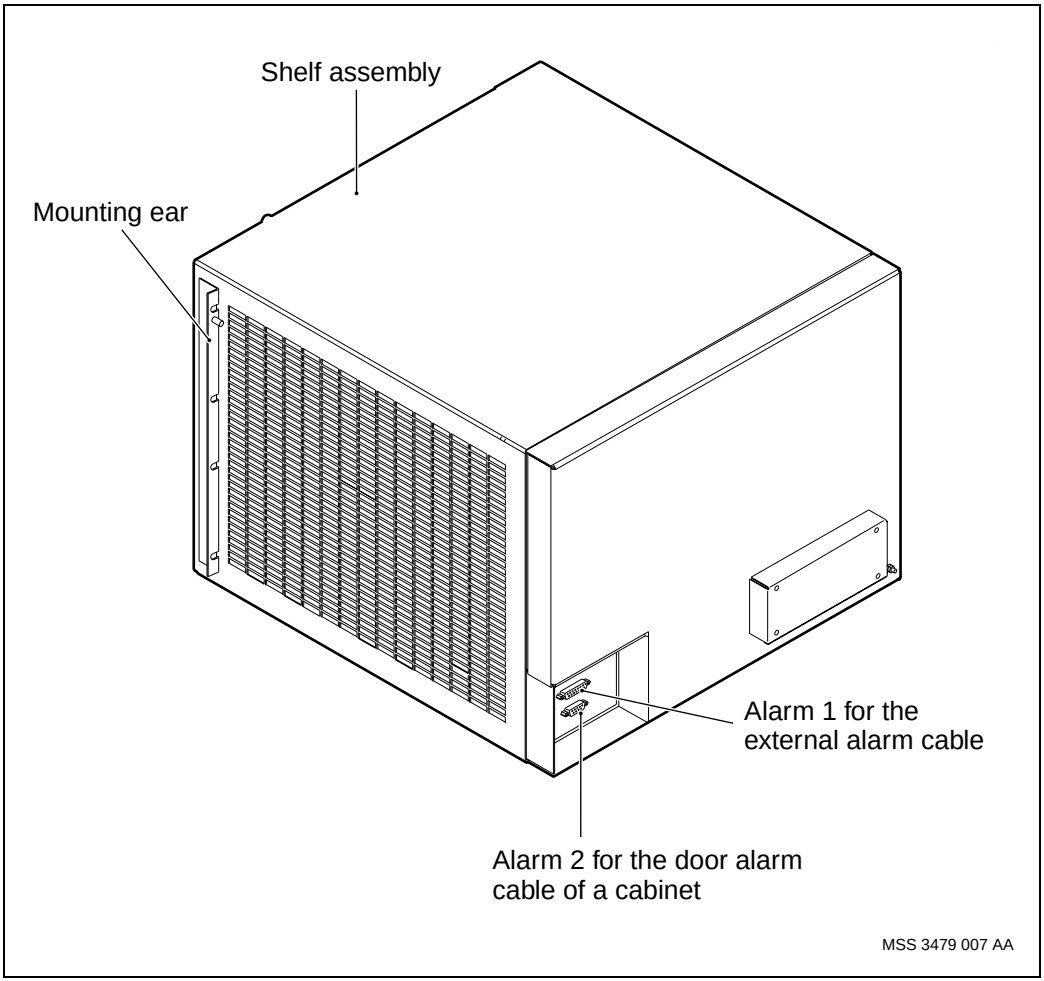


Figure 153
Door alarm connector for a Multiservice Switch 7460



Removing a control processor

Remove a control processor (CP) as preparation for installing a replacement.

Prerequisites

CAUTION
Risk of damage by electrostatic discharge (ESD)
When you handle processor cards, wear a grounded antistatic wrist strap or equivalent to protect electronic parts. For more information, see “Avoiding damage from static electricity” (page 208).

CAUTION
Risk of service loss
Do not remove a CP when the LED is solid green. A solid green LED means that the CP is in service and active. If you remove the active CP, you cause a switchover. For more information see “Processor card LED status display” (page 326).

CAUTION
Risk of service loss by signal noise
Inserting or removing a processor card from a shelf can cause noise on the backplane that causes loss of service. Therefore, minimize the time you take to insert or remove a processor card. Do not let a processor card sit in the shelf with a partial connection to the backplane.

- Verify that the CP being removed is inactive. The LED should be other than solid green.
- Ensure that no system switchover has occurred in the last 10 minutes of real time.
- If you are removing a CP-with-BITS and external timing is configured, you will need to reset the DIP switch on the BITS termination panel to “single CP” if the CP will not be replaced within 30 minutes. You can reset the DIP switch before or after removing the BITS cable.

Procedure steps

CAUTION

Risk of shelf reset by disconnecting an active cable

If you disconnect the Ethernet cable from the active CP, the shelf undergoes a reset or swaps activity with the spare CP, provided the spare is in standby mode.

1. If there is an Ethernet cable connected to the faceplate of the CP you need to remove it. Refer to the procedure “Removing a CP Ethernet cable” (page 420) before proceeding.
2. If there is a local operator or modem cable connected to the V.24 DCE port, remove it.
3. If there is a BITS cable connected to the CP, remove it.
4. Unlock the latches. See the figure “Locking and unlocking processor card latches” (page 418).
5. Use both latches in their unlocked, horizontal positions to pull the processor card out of the slot. See the figure “Disengaging a processor card” (page 325).
6. Pack the control processor. See the section “Packing a processor card” (page 386) for storage information.

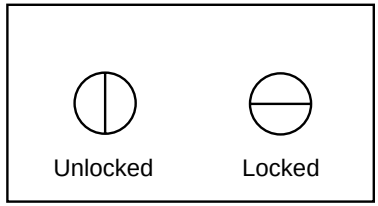
WARNING

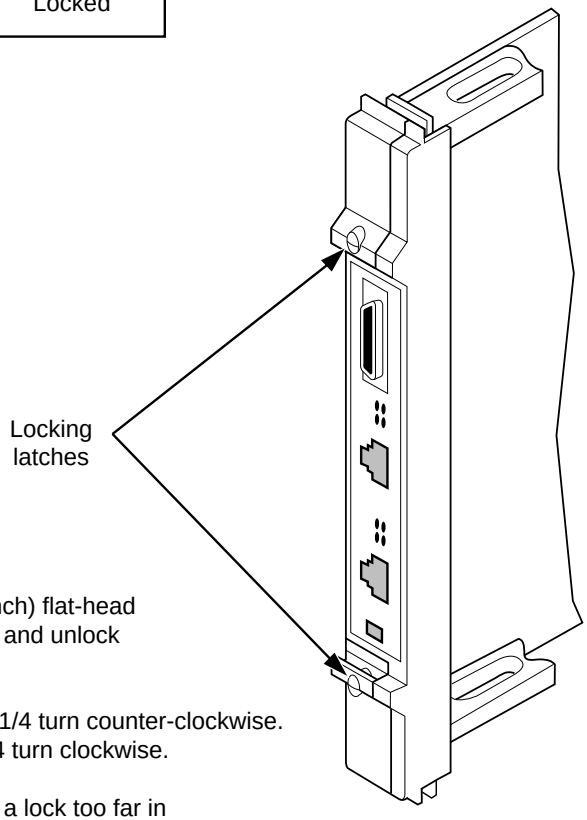
Damage to equipment by electromagnetic interference

To meet electromagnetic interference (EMI) regulatory requirements and thermal specifications, each empty slot must be filled with a blank processor card (NTBP23). See “Installing a blank processor card” (page 243).

Procedure job aid

Figure 154
Locking and unlocking processor card latches



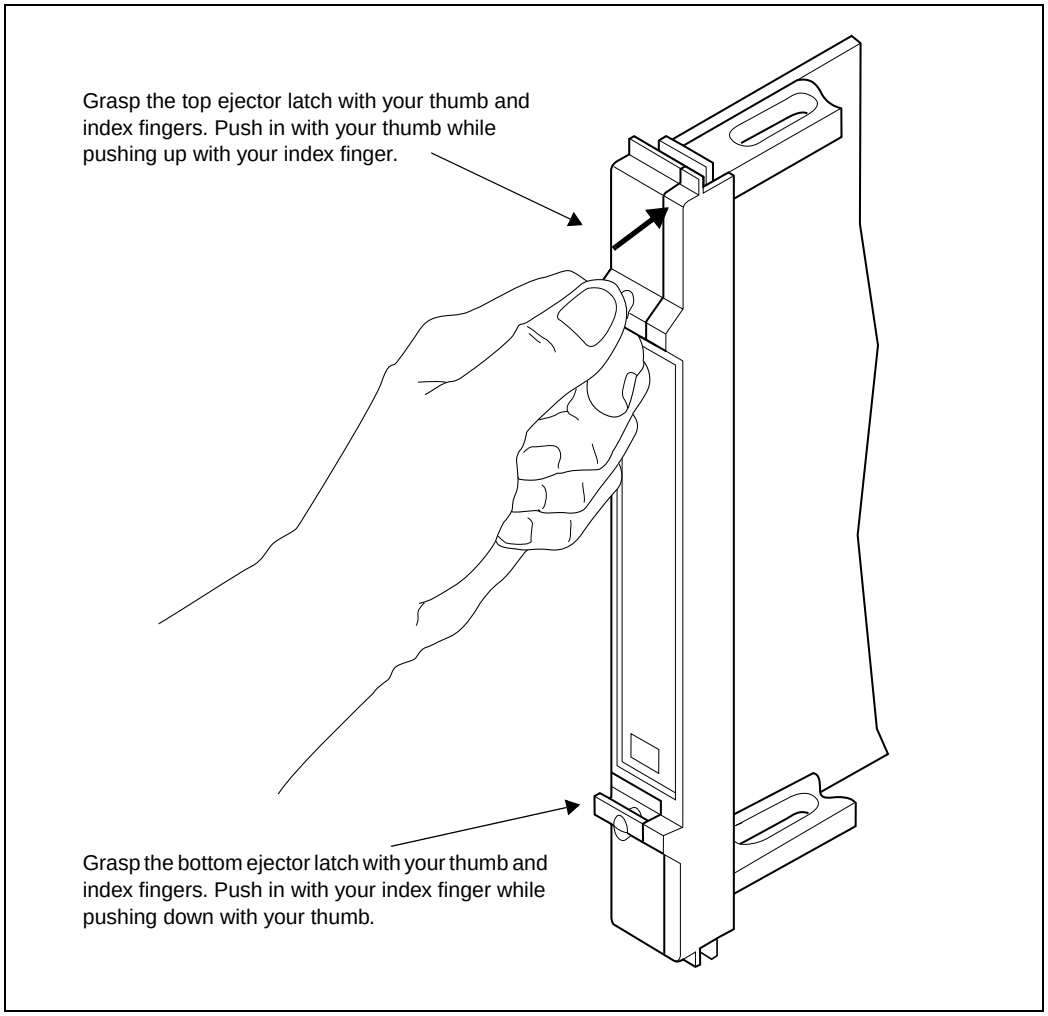


Use a 6 mm (1/4-inch) flat-head screwdriver to lock and unlock latches.

To unlock, make a 1/4 turn counter-clockwise. To lock, make a 1/4 turn clockwise.

Note: Do not force a lock too far in either direction.

Figure 155
Disengaging a processor card



Removing a CP Ethernet cable

Remove a CP Ethernet cable if it fails or as part of removing a control processor (CP).

Prerequisites

CAUTION

Risk of shelf reset by disconnecting an active cable

If you disconnect the Ethernet cable from the active CP, the shelf undergoes a reset or swaps activity with its mate provided the mate is in-service.

- If the CP is not spared, have the software operator disable the attribute SwitchoveronFailure as described in the section “Changing the switchover behavior of the OAM Ethernet port” in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

Procedure steps

1. On the faceplate of the CP, locate the Ethernet cable to be removed. Refer to the figure “Example of a control processor faceplate” (page 263).
2. Disconnect the cable from the CP faceplate.

Removing a multiport aggregate device

Remove a multiport aggregate device if you are replacing the device or are not using the equipment for an extended time.

Prerequisites

CAUTION

Service interruption

Before you power down a multiport aggregate device, ensure that a software operator has removed the affected ports from service.

- Ensure that you have appropriate packaging available so that you can store or ship the device.

Procedure steps

1. Turn off the circuit breakers for the outlets that supply power to the device.
2. On the rear of the unit, toggle to the off position the power control for each power supply.
3. Remove all of the cables from the device and coil them out of the way.
4. Use a 5/16-in. socket wrench to remove the screws that fasten the brackets to the frame and remove the device.
5. Attach a label to the multiport aggregate device. Record the date, your name, organization, department, telephone number, the processor card part, serial number and the version of software running on the processor card. If the processor card has failed, include the failure time and, if known, the cause of the failure.
6. Pack the device in its original packaging and label the box.

Removing a Multiservice Switch 7420

Remove a Nortel Networks Multiservice Switch 7420 to redeploy in another location or to decommission.

Prerequisites

CAUTION

Risk of equipment damage

You need two people to remove a Multiservice Switch 7420 from a rack or cabinet: one person must hold the chassis in place while a second person unfastens the screws.

CAUTION

Risk of damage to equipment by moving

When moving an uncrated cabinet or shelf assembly, protect it from strain, shock, impact, and vibration. Lack of protection can damage or warp the equipment.

Remove the power cables and processor cards and disconnect cables from any rear-mounted termination panels before removing the shelf.

Procedure steps

1. If the device is installed in a rack or cabinet, have one person remove the screws that fasten the front brackets to the rails of the rack or cabinet while another person supports the chassis. Remove the brackets from the chassis if no longer required. See the figure “Rack-mounting brackets on Multiservice Switch 7420” (page 423)
2. If the device is a vertical mount, remove the shelf plate, shelf assembly and cable guide as show in the figure “Removing vertical mount shelf hardware” (page 424).
3. If the device is a desk-top mount, remove the feet and cable guide. See the figures “Removing the feet on a desk-top mounted Multiservice Switch 7420” (page 425) and “Cable guide on desk-top mounted Multiservice Switch 7420” (page 266).
4. Remove any rear-mounted termination panels from the shelf, if no longer required.

5 Pack the shelf in its original packaging.

Procedure job aid

Figure 156
Rack-mounting brackets on Multiservice Switch 7420

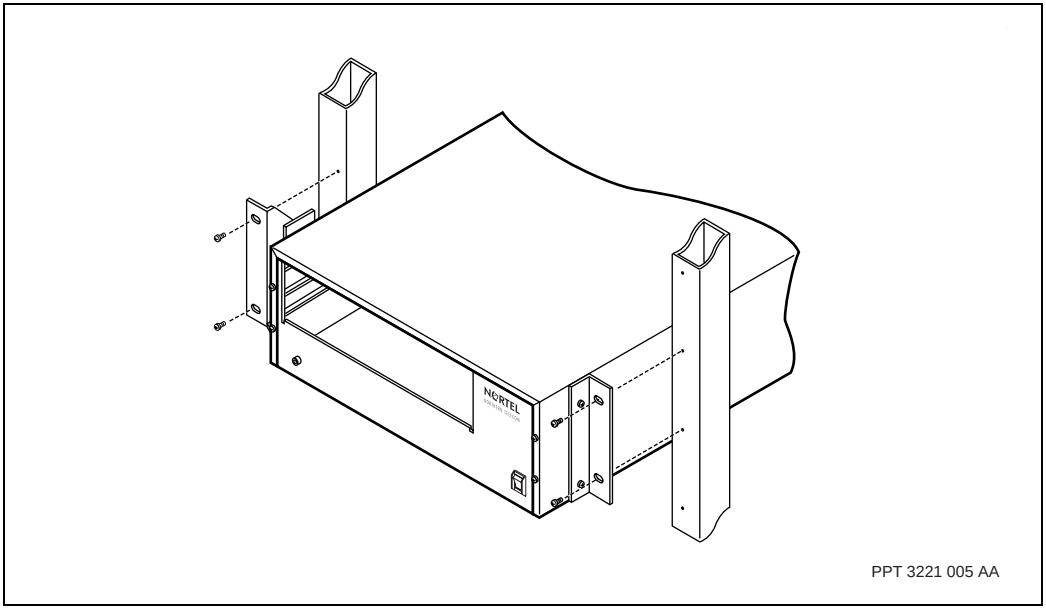


Figure 157
Removing vertical mount shelf hardware

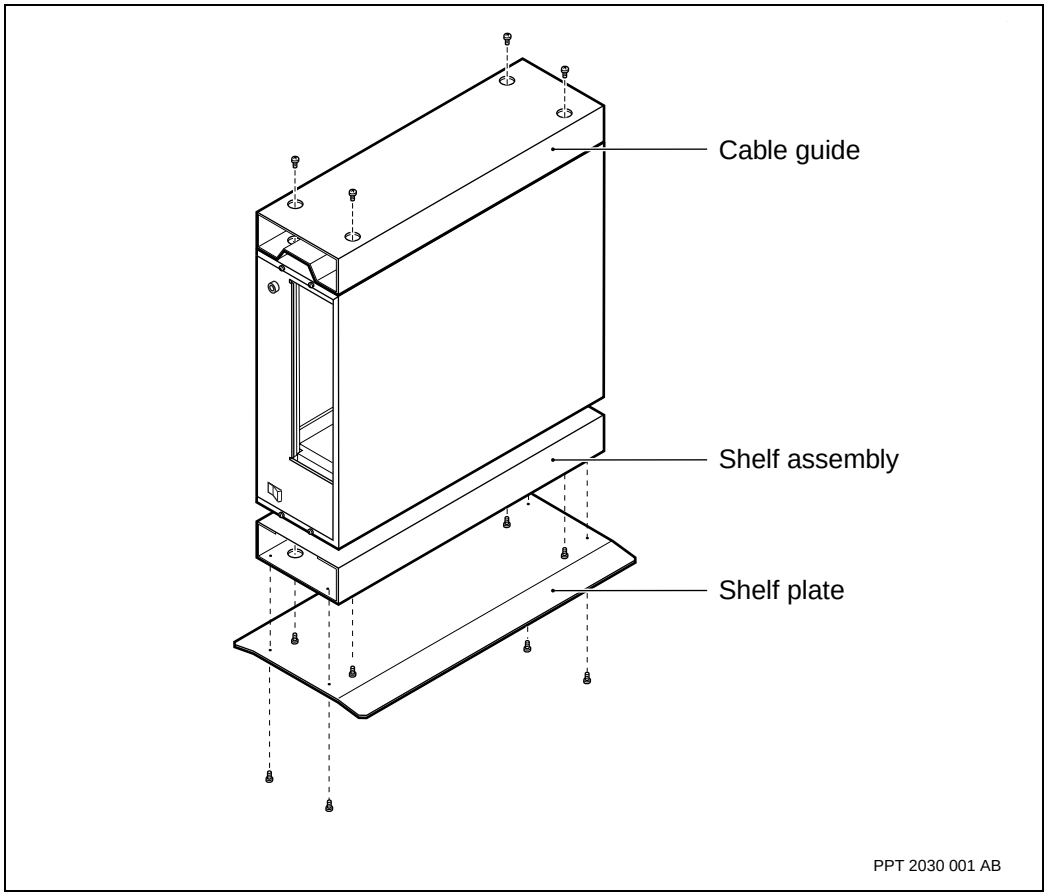


Figure 158
Removing the feet on a desk-top mounted Multiservice Switch 7420

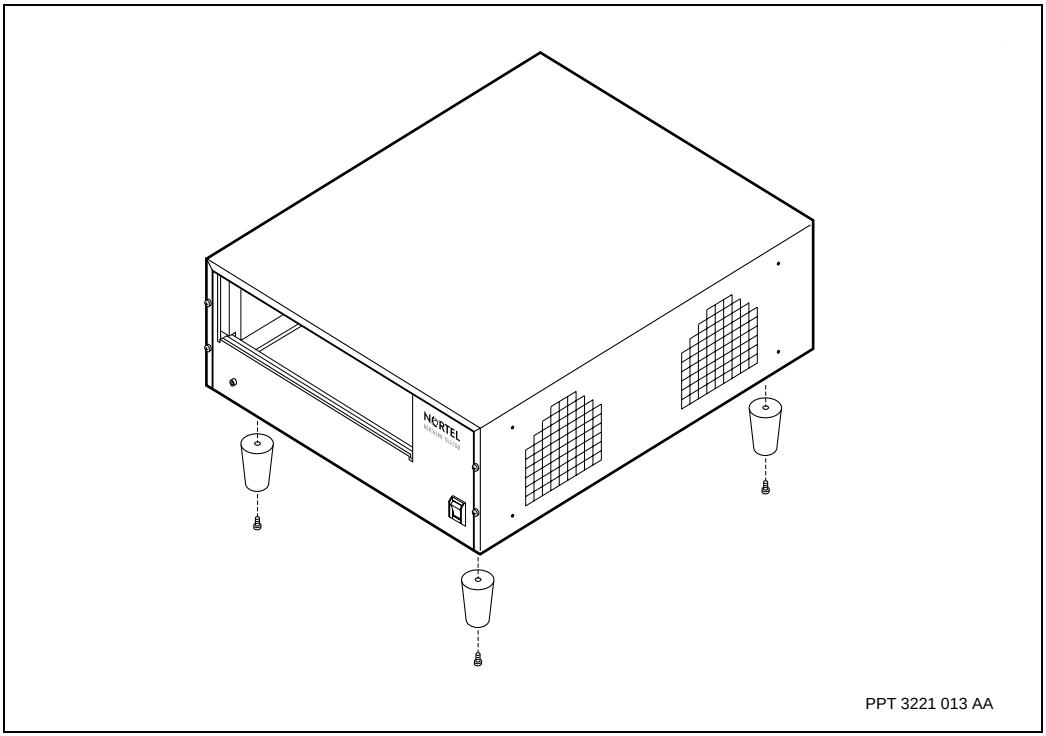
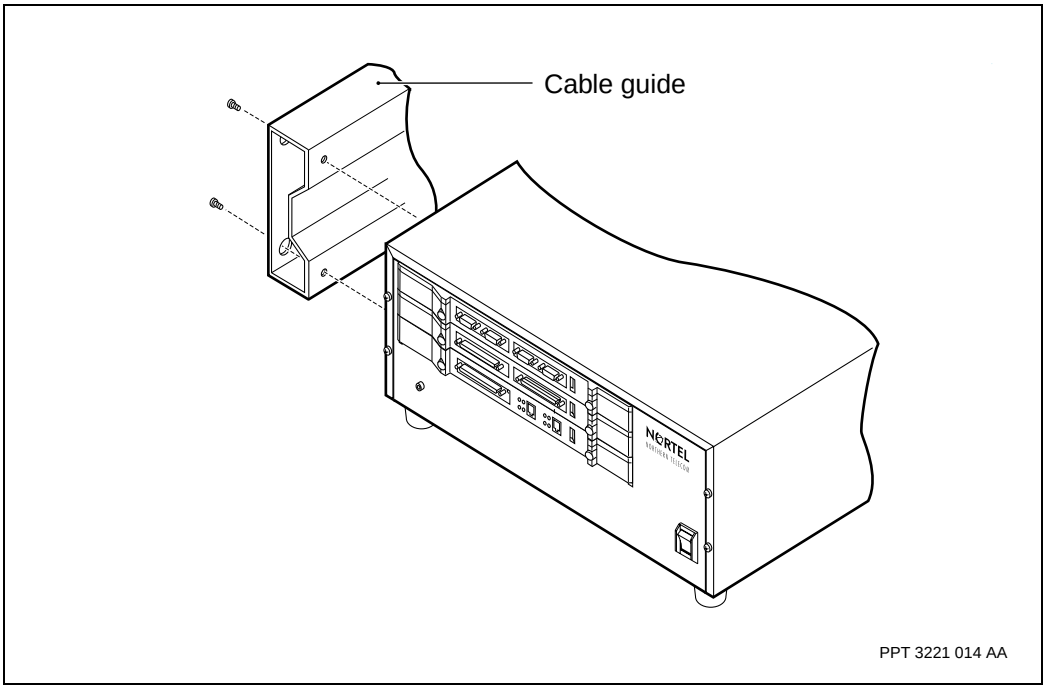


Figure 159
Cable guide on desk-top mounted Multiservice Switch 7420



Removing a Multiservice Switch 7440

Remove a Nortel Networks Multiservice Switch 7440 to replace a failed shelf, or when decommissioning a node.

Prerequisites

CAUTION
Risk of equipment damage
You need two people to remove a Multiservice Switch 7440 from a rack or cabinet: one person must hold the chassis in place while a second person unfastens the screws.

CAUTION
Risk of damage to equipment by moving
When moving an uncrated cabinet or shelf assembly, protect it from strain, shock, impact, and vibration. Lack of protection can damage or warp the equipment.

- Remove the power cables and processor cards and disconnect cables from any rear-mounted termination panels before removing the shelf.

Procedure steps

1. If necessary, disconnect the external alarm cable from the rear of the device.
2. If the device is in a rack or cabinet, have one person remove the screws that fasten the front brackets to the rails of the rack or cabinet while another person supports the chassis. Remove the brackets from the chassis if no longer required. See the figure “Removing the device from a rack” (page 428).
3. If the device is a floor-mounted model, remove the feet. See the figure “Removing the feet from the bottom of a floor-mounted device” (page 429)
4. Remove any rear-mounted termination panels from the shelf, if no longer required.
5. Pack the shelf in its original packaging.

Procedure job aid

Figure 160
Removing the device from a rack

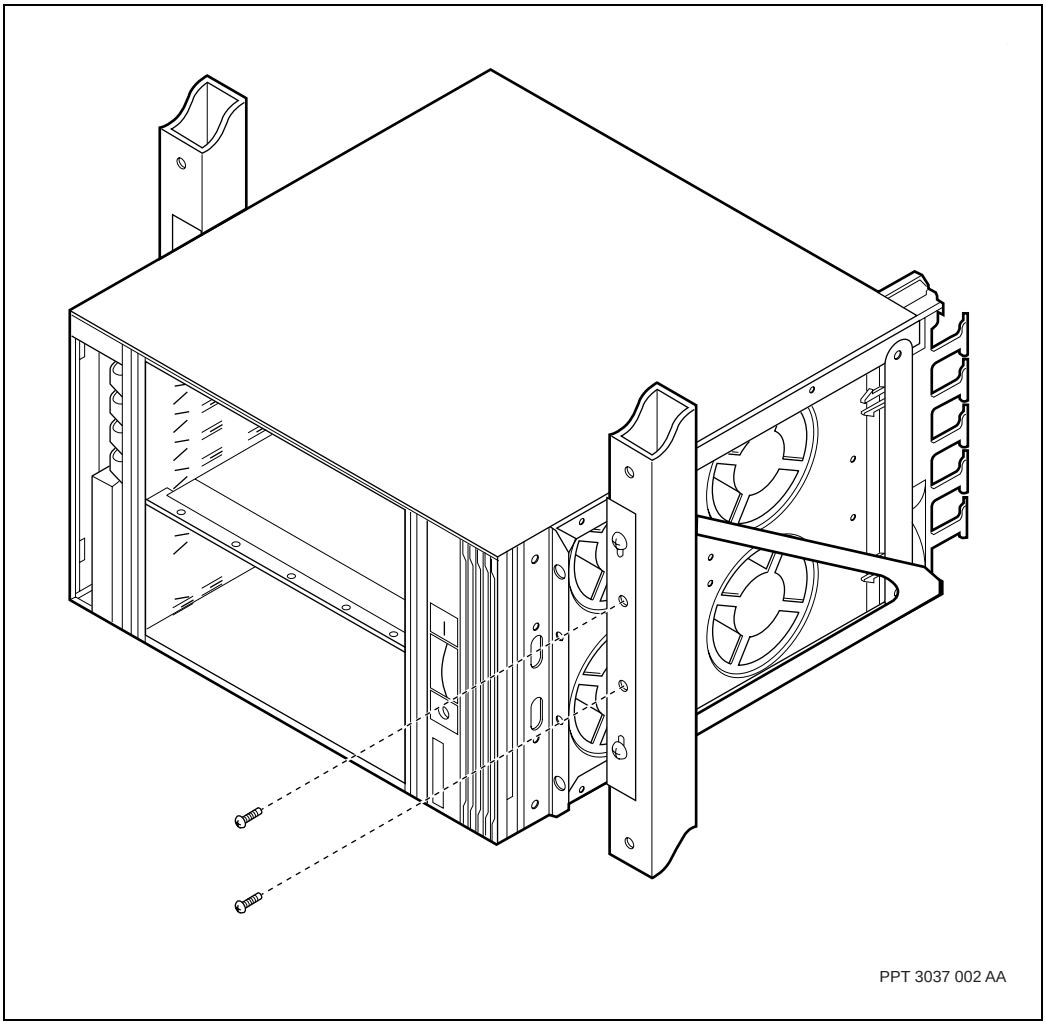
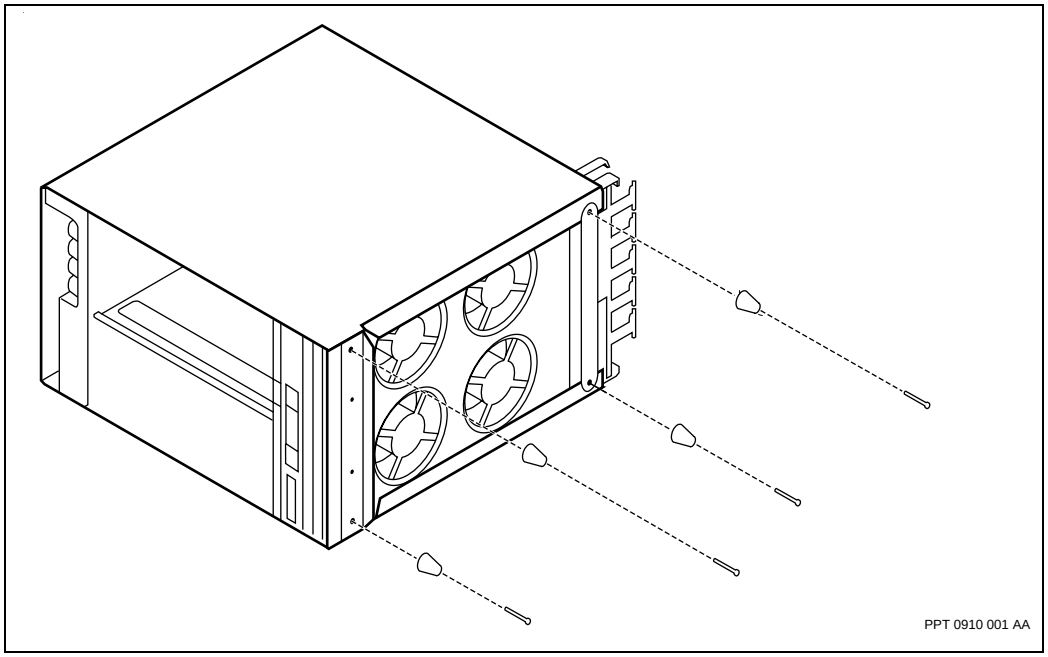


Figure 161
Removing the feet from the bottom of a floor-mounted device



Removing a Multiservice Switch 7480

Remove a Nortel Networks Multiservice Switch 7480 after you have removed the power supplies, processor cards and cooling unit drawer.

Prerequisites

WARNING
Risk of injury
The shelf assembly weighs 20.9 kg (46 lb). You need two people to perform this procedure.

WARNUNG
Verletzungsgefahr
Die Regalkomponente wiegt 20,9 kg. Zur Montage sind zwei Personen erforderlich.

CAUTION
Risk of damage to equipment by moving
When moving an uncrated cabinet or shelf assembly, protect it from strain, shock, impact, and vibration. Lack of protection can damage or warp the equipment.

Procedure steps

1. If the shelf used an external alarm, disconnect the external alarm cable from the rear of the device.
2. Use a 1/8-in. screwdriver to disconnect the cooling unit power cord from the “C.U. Power” connector on the back of the shelf assembly. See the figure “Cooling unit power cord” (page 501).
3. Use a 3/8-in. socket wrench to disconnect the shelf grounding cable from the cabinet or frame and tape the cable to the rear of the shelf next to the shelf assembly grounding stud. See the figure “Shelf assembly grounding stud” (page 232).
4. Remove the air filter assembly. If the air filter assembly is spring-loaded, carefully press and release the center of the air filter cartridge to

disengage the air filter assembly. Pull the air filter assembly out of its slot. See the figure “Removing the air filter assembly from a Multiservice Switch 7480” (page 496).

5 Remove all cables from the cable management unit.

6 Use a 5/16-in. socket wrench to remove the four screws that fasten the cable management unit to the frame. See the figure “Multiservice Switch 7480 cable management assembly” (page 290). Remove the cable management assembly.

7 Use a 5/16-in. socket wrench to remove the eight screws that secure the shelf assembly to the frame. See the figure “Multiservice Switch 7480 shelf assembly” (page 289). With the assistance of a second person, remove the shelf assembly.

8 Use a 5/16-in. socket wrench to remove the four screws that secure the cooling unit chassis to the frame. Remove the cooling unit chassis. See the figure “Multiservice Switch 7480 cooling unit chassis” (page 288).

9 Pack all shelf components in their original packaging.

Removing a Multiservice Switch cabinet from a pallet

After you unpack the Nortel Networks Multiservice Switch cabinet, remove it from its pallet. If the cabinet is the seismic version, see the procedure "Unpacking and removing a seismic cabinet from a pallet" (page 545).

Prerequisites

WARNING

Risk of personal injury

A cabinet that contains one device weighs 200. kg (441 lb). You need four people to move this cabinet.

A cabinet that contains two devices weighs 313. kg (689 lb). You need six people to move this cabinet.

WARNUNG

Verletzungsgefahr

Ein Gehäuse mit einem Switch wiegt 200 kg. Zum sicheren Bewegen dieses Gehäuses werden vier Personen benötigt.

Ein Gehäuse mit zwei Switches wiegt 313 kg. Zum sicheren Bewegen dieses Gehäuses werden sechs Personen benötigt.

CAUTION

Avoid structural stress when maneuvering uncrated cabinets and shelf assemblies

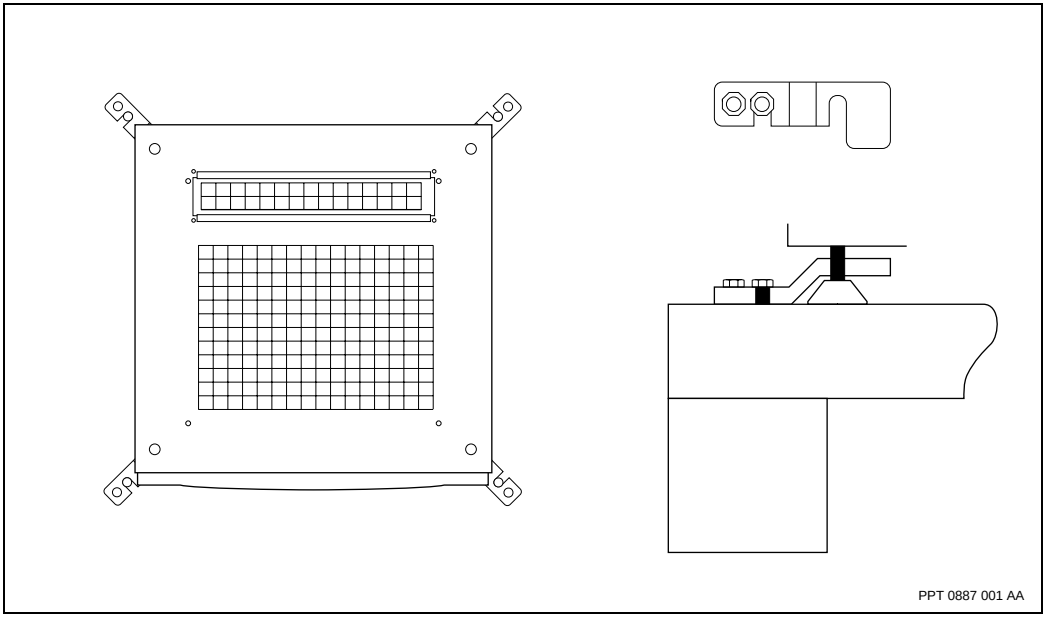
When handling and moving uncrated cabinets and shelf assemblies, avoid strain, excessive shock, or vibrations, which can damage or warp the equipment.

Procedure steps

1. Remove and keep the packing slips and shipping papers attached to the outside packaging.
2. Ensure that the pallet is on a flat surface.
3. The anchor brackets fasten the cabinet to the pallet with lag bolts. Use an open-end wrench or socket wrench to loosen the lag bolts. The figure

"Unanchoring a cabinet from a pallet" (page 433) shows the top view of the cabinet and a close-up of an anchor bracket.

Figure 162
Unanchoring a cabinet from a pallet



4 Pivot the anchor brackets off the lag bolts and away from the four leveling feet as shown in the figure. Ensure that the brackets are furthest from the feet.

WARNING
Risk of personal injury
To prevent injury, when working around the cabinet, especially to move it, ensure that no part of your hands or feet is under the cabinet, and do not allow the leveling feet to snag on an anchor bracket and tip the cabinet.

WARNUNG

Verletzungsgefahr

Zur Vermeidung von Verletzungen beim Arbeiten in unmittelbarer Nähe des Gehäuses und insbesondere beim Bewegen des Gehäuses stellen Sie sicher, dass Ihre Hände und Füße nicht unter das Gehäuse gelangen, und dass sich die Stützfüße nicht an der Verankerung verhaken und ein Umkippen des Gehäuses verursachen.

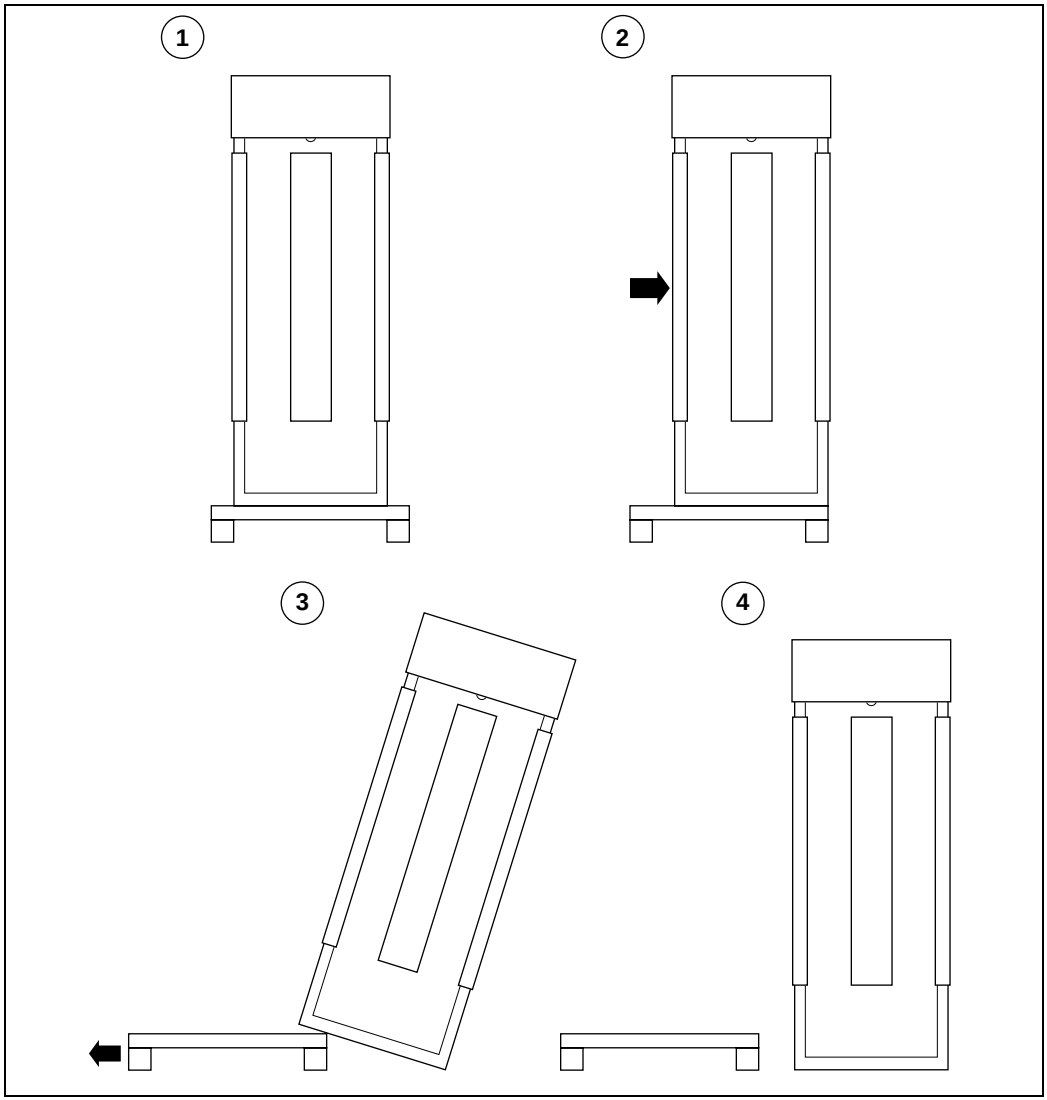
5 Determine the front of the cabinet.

a. If no doors are installed, the front is the same side as the largest open cavity with channels (slots with rails).

b. If doors are installed, open one to see which side has the largest open cavity. Each door has a lock. (Side panels have no lock.) The doors may have been locked for shipping.

6 Move the front of the cabinet toward the nearest end of the pallet. See the figure “Unloading a cabinet from a pallet” (page 435) to view the stages of movement.

Figure 163
Unloading a cabinet from a pallet



7 Tilt the cabinet and move it down the front end of the pallet.

8 With the cabinet tilted, remove the pallet from under the cabinet.

9 Rest the cabinet on all four leveling feet.

10 Reattach the anchoring brackets to the pallet.

11 Store the pallet for later use in case the cabinet must be moved.

Removing a rack-mounted alarm panel / power and alarm panel

Remove a rack-mounted alarm panel if you need to replace a failed panel, you do not want to use the panel any more, or you are re-deploying the panel elsewhere.

Procedure steps

1. Disconnect the alarm panel cable from the alarm cable connector on the alarm panel. See the figure “Alarm panel for rack-mounted alarm panel kits NTJS74AA and NTPS20AA” (page 437).
2. Remove the two screws that fasten the panel to the frame and remove the panel.
3. Tape the grounding wire and the grounding strip to the termination panel.
4. Route the cable down the shelf assembly and disconnect it from the door alarm connector on the back of the shelf. See the figure “Dual alarm shelf interconnection between two Multiservice Switch 7480s” (page 440).

Procedure job aid

Figure 164
Alarm panel for rack-mounted alarm panel kits NTJS74AA and NTPS20AA

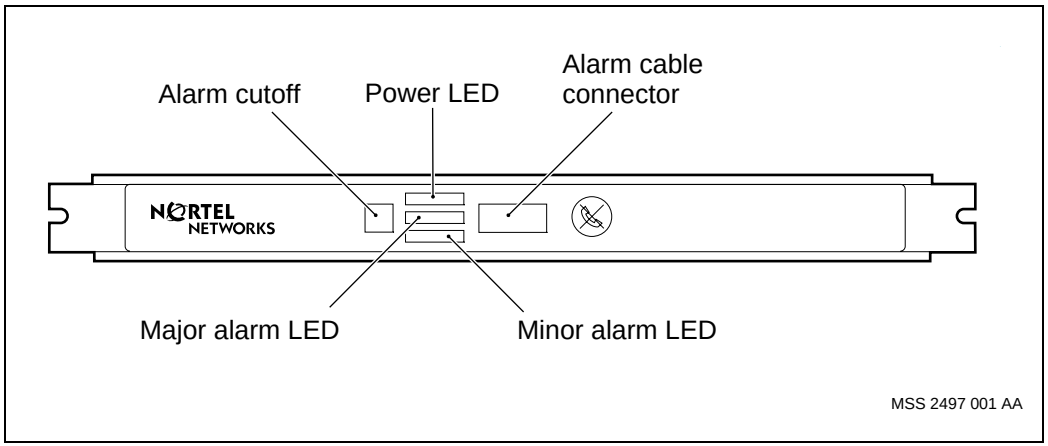
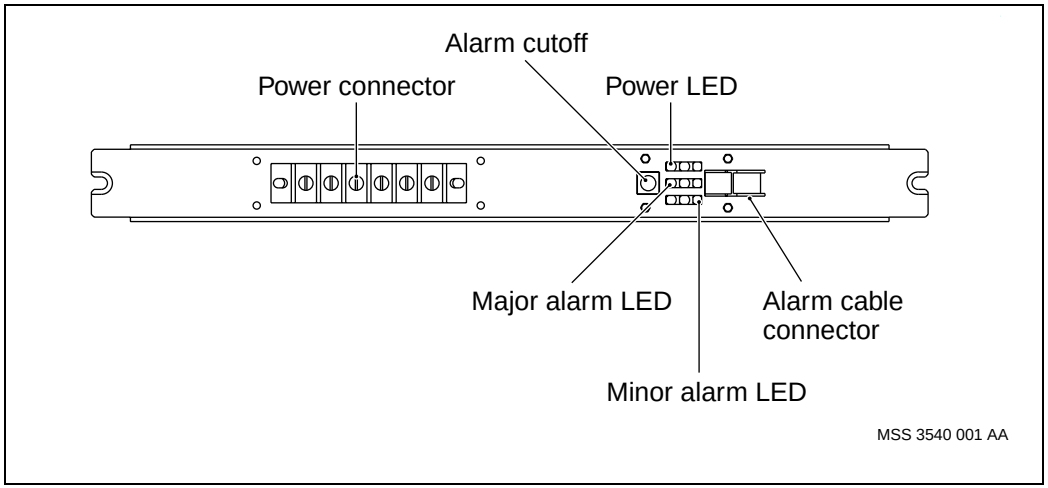


Figure 165
Power and alarm panel for rack-mounted alarm panel kit NTPS20BA



Removing a shelf interconnect cable

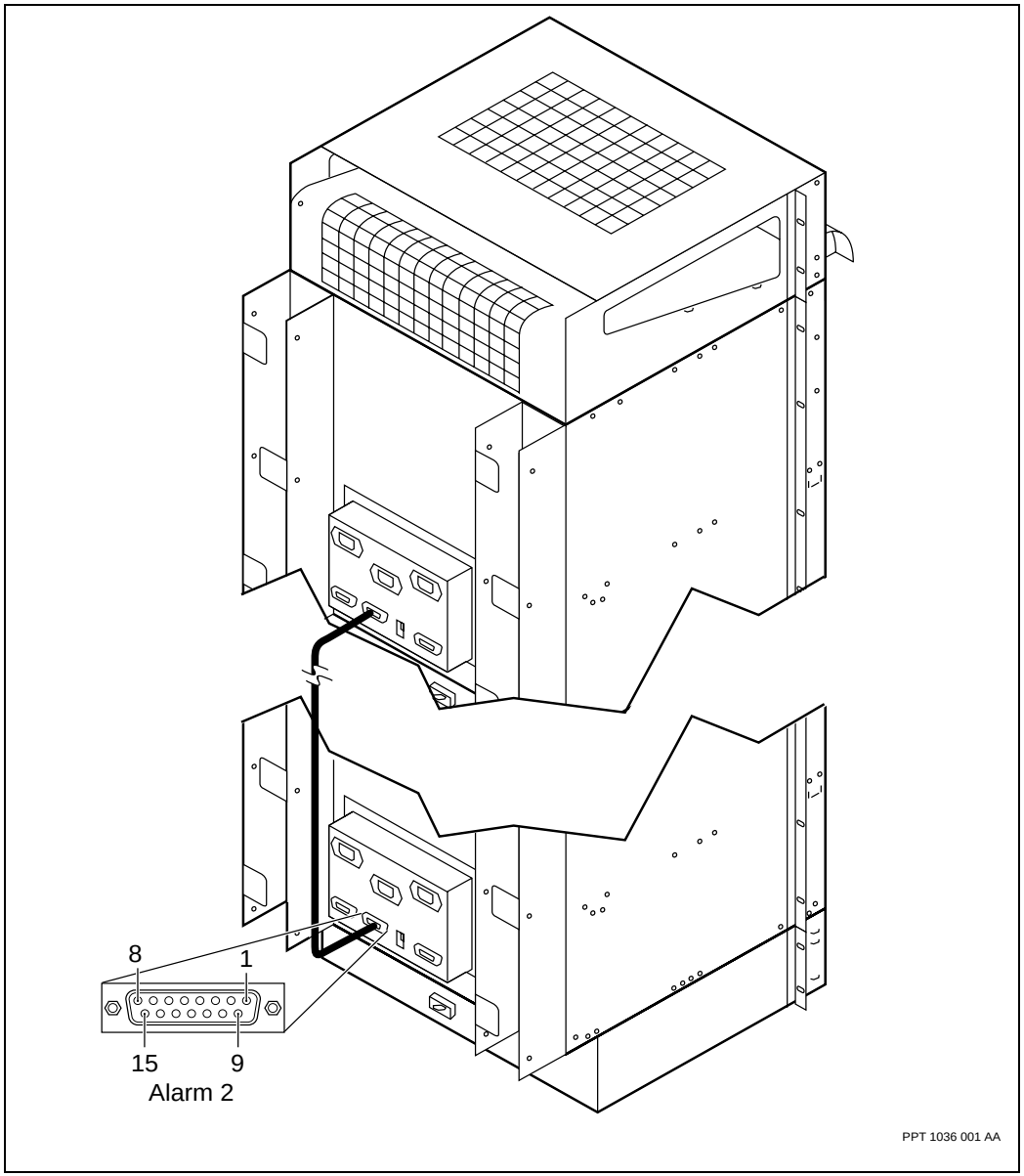
Remove a shelf interconnect cable between two Nortel Networks Multiservice Switch 7480s to replace a broken cable, or if you are removing one of the shelves.

Procedure steps

1 Disconnect the shelf interconnect cable from the Alarm 2 connector on the back of each shelf. See the figure “Dual alarm shelf interconnection between two Multiservice Switch 7480s” (page 440).

Procedure job aid

Figure 166
Dual alarm shelf interconnection between two Multiservice Switch 7480s



Removing an FP

Remove a function processor (FP) to replace it or decommission the slot.

Prerequisites

CAUTION
Risk of damage by electrostatic discharge (ESD)
When you handle processor cards, wear a grounded antistatic wrist strap or equivalent to protect electronic parts. For more information, see “Avoiding damage from static electricity” (page 208).

CAUTION
Risk of service loss by signal noise
Inserting or removing a processor card from a shelf can cause noise on the backplane that causes loss of service. Therefore, minimize the time you take to insert or remove a processor card. Do not let a processor card sit in the shelf with a partial connection to the backplane.

CAUTION
Risk of service loss
Before seating or unseating an FP in a sparing configuration, ensure that all the cables on the faceplate are disconnected. Seating a cabled FP can cause a traffic loss on the other FPs in the sparing configuration.

- Remove an FP only after a software operator has removed it from service.
- Ensure that you are removing the appropriate FP. The LED of the FP you are removing must not be solid green. For more information, see the table “Processor card LED status display” (page 326).

Procedure steps

CAUTION
Risk of equipment damage
When engaging or disengaging cable connectors, ensure that the cable connector's guide ridge is aligned with the transceiver's keyway. Improper coupling can damage the nose shield on the connector or the optic transceiver.

CAUTION
Risk of equipment damage
To prevent equipment damage, disconnect the cables attached to the ports of an FP before you disconnect the control cable that connects the FP to a termination panel.

1. Disconnect any cables from the FP faceplate. See the figure "Types of cable connectors used on Multiservice Switch processor cards" (page 355).

   If you are removing an FP that uses optical connections, cap the optical ports with an appropriate dust boot.

2. Unlock the upper and lower card latches. See the figure "Locking and unlocking processor card latches" (page 324).

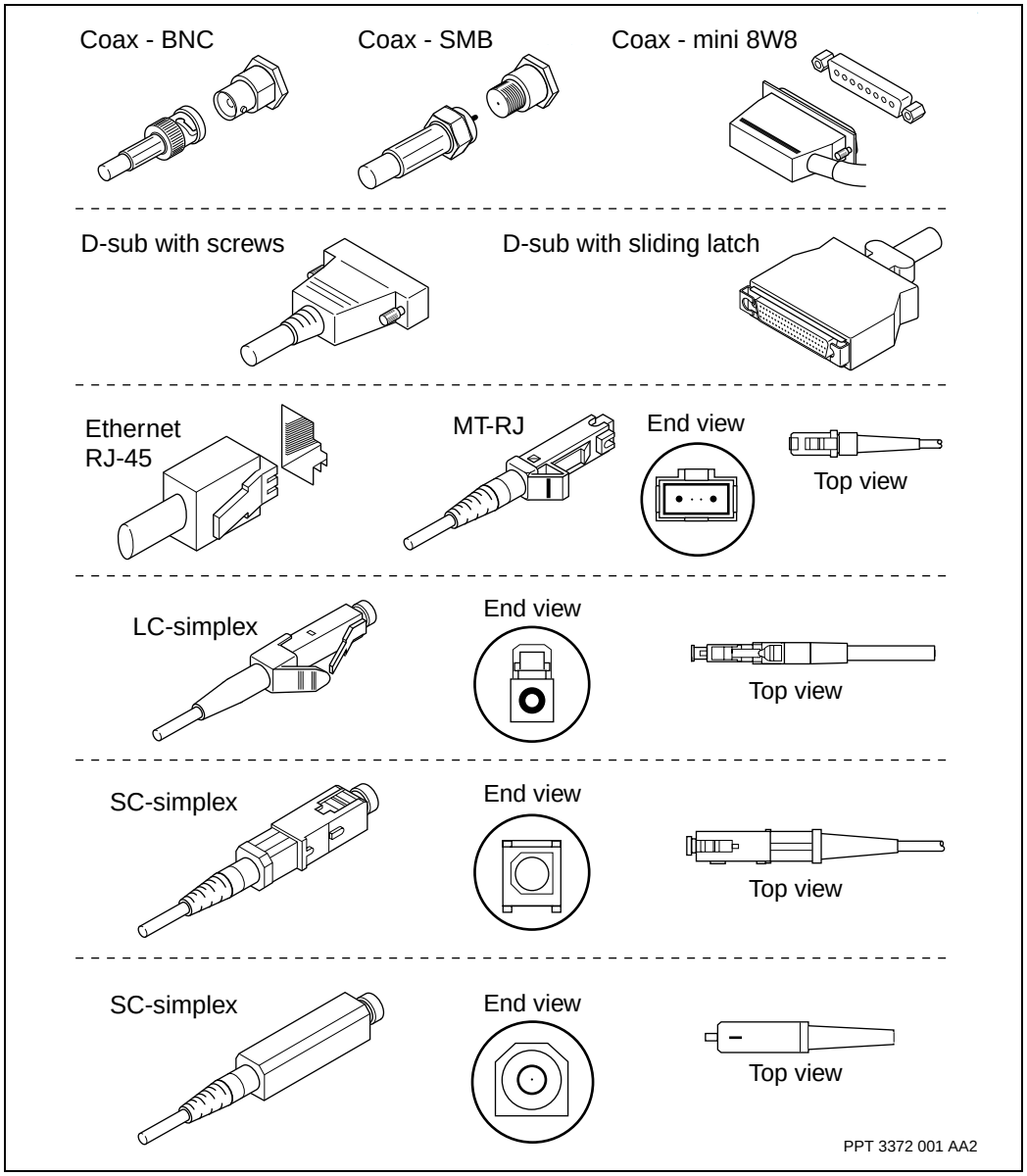
3. Move both latches to a fully horizontal position and use the latches to pull the FP card out of the slot. Refer to the figure "Disengaging a processor card" (page 325).

4. Pack the FP according to "Packing a processor card" (page 386). This applies whether a failed FP is being returned to Nortel Networks or the card is being re-deployed.

WARNING
Damage to equipment by electromagnetic interference
To meet electromagnetic interference (EMI) regulatory requirements and thermal specifications, each empty slot must be filled with a blank processor card (NTBP23). See "Installing a blank processor card" (page 243).

Procedure job aid

Figure 167
Types of cable connectors used by custom-made or prefabricated cable assemblies



Removing CP cables for BITS

Remove control processor cables for BITS to replace a faulty cable or before removing the CP-with-BITS from the shelf.

Prerequisites

- Removing a BITS cable from the active CP will cause both external timing sources to be lost, and the provisioned tertiaryReference will become the active timing reference. Before removing a BITS cable from an active CP lock the external timing ports. See “Locking external timing ports” in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*
- Removing a BITS cable from the inactive CP will have no impact on the external timing signal being received by the active CP.

Procedure steps

1. On the faceplate of the CP, locate the BITS cable to be removed. Refer to the figure “Control processor with BITS faceplate” (page 331).
2. Disconnect the cable from the CP faceplate and from the BITS termination panel.

Removing FP cables

Remove a function processor (FP) cable to replace a faulty cable, to upgrade the cable, or before unseating or removing an FP from the shelf.

Prerequisites

WARNING

Risk of eye injury by laser

Never look directly into the end of a fiber cable, let an end pass in front of your eyes, or use an optical device to look at the end of an optical fiber unless you are certain the other end is not connected. The LASER travelling through a fiber cable can injure the human retina.

WARNUNG

Gefahr von Augenverletzungen durch Laserstrahlen

Blicken Sie nie direkt auf das Ende eines Glasfaserkabels, und überprüfen Sie auch einzelne Faserenden nicht mit einem optischen Gerät, wenn Sie nicht sicher sind, daß das andere Kabelende nicht angeschlossen ist. Der über die Glasfasern übertragene Laser kann die menschliche Netzhaut verletzen.

CAUTION

Risk of service loss

Ensure that the cable being removed is not carrying traffic before you remove it.

CAUTION

Risk of damage by electrostatic discharge (ESD)

When you contact processor cards, wear a grounded antistatic wrist strap or equivalent to protect electronic parts. For more information, see “Avoiding damage from static electricity” (page 208).

CAUTION

Risk of equipment damage

To prevent equipment damage, disconnect the cables attached to the ports of an FP before you disconnect the control cable that connects the FP to a termination panel.

CAUTION

Risk of equipment damage

When engaging or disengaging cable connectors, ensure that a cable connector with a guide ridge is aligned with the transceiver's keyway. Improper coupling can damage the nose shield on the connector or the transceiver.

CAUTION

Risk of equipment damage

Ensure that the cable pins are not shorted together or to any metal surface. When connected to an on-line shelf assembly, these cables can carry power signals (+12 Vdc) that are used to supply power to the termination panel.

Procedure steps

1. Ensure that the cable or cables to be removed are labelled with connection information that will ensure you can re-connect the cable to the same port on the faceplate. If not, prepare labels for the disconnections.
2. Disconnect the appropriate cable(s) from the processor card. See the figure "Types of cable connectors used on Multiservice Switch processor cards" (page 355).

   If you are removing an FP that uses optical connections, cap the optical ports with an appropriate dust boot.

   If the cables are unlabeled, add the appropriate label as each cable is disconnected.
3. If necessary, remove the cable from the cable management unit.

   If the cable is fiber optical, ensure that you do not snag, pinch, crimp, or exceed its bend radius while handling it.

Removing power cables

Remove power cables so that you can replace faulty cables or if you need to do so as part of another maintenance task.

Prerequisites

CAUTION
Risk of service loss
If a device does not have redundant power, remove the device from service before removing a power cable or power supply. For information about minimum and redundant power configurations, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Procedure steps

1 Toggle to the standby position the power control on the power supply serviced by the cable you want to remove. See the appropriate figure

- "Multiservice Switch 7420 power control" (page 393)
- "Multiservice Switch 7440 power supply" (page 467)
- "Exploded view of power supplies in a Multiservice Switch 7460" (page 473)
- "Unlocked power supply on a Multiservice Switch 7480 with the power control in the standby position" (page 476)

2 At the power distribution panel, toggle off the circuit breaker for the outlet that supplies power to the cable you want to remove. Ensure that the outlet is void of primary power.

3 If the shelf is a Multiservice Switch 7460 and is connected to the front-facing power and alarm panel (NTEP67BA), disconnect the power cabling from the panel.

Note: If you are removing power cabling for a Multiservice Switch 7460 and it was connected to a front-facing power and alarm panel, do not continue this procedure until the shelf has been removed from the rack.

4 If you are removing a dc cable, disconnect the cables from the disconnect device.

or

If you are removing an ac cable, unplug the cable from the power outlet.

5 If you are removing a cable from a Multiservice Switch 7420 or Multiservice Switch 7460, unscrew the plastic insulation shield from the terminal block. Put the shield and screws aside for re-use.

6 If you are removing a dc cable, disconnect the appropriate -48/60 V dc and return wire lugs from the terminal block at the rear of the shelf assembly. See the appropriate figure

- “DC power cables connected to a Multiservice Switch 7420” (page 449)
- “DC power cables connected to a Multiservice Switch 7440” (page 450)
- “DC power cables connected to a Multiservice Switch 7460” (page 451)
- “DC power cables connected to a Multiservice Switch” (page 452)

or

If you are removing an ac cable, unplug the cable from the power connector on the power input panel on the rear of the device.

7 Cut any tie wraps that retain the power cable being replaced.

8 Remove the power cable.

If your device is in a cabinet, remove the cable through the floor or ceiling. You can remove the smaller grill cutout in either the top or the bottom of the cabinet with a 10 mm (3/8-in.) hex driver.

Procedure job aid

Figure 168
DC power cables connected to a Multiservice Switch 7420

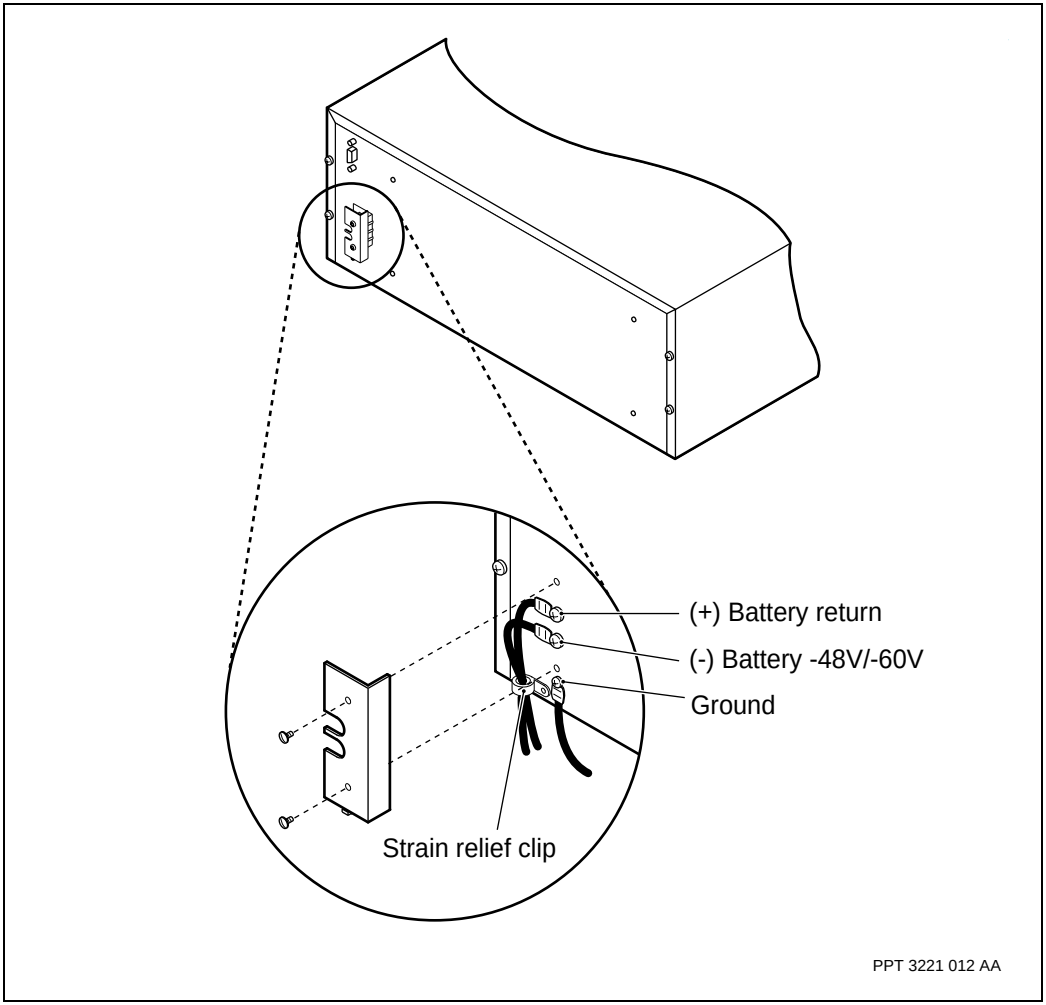


Figure 169
DC power cables connected to a Multiservice Switch 7440

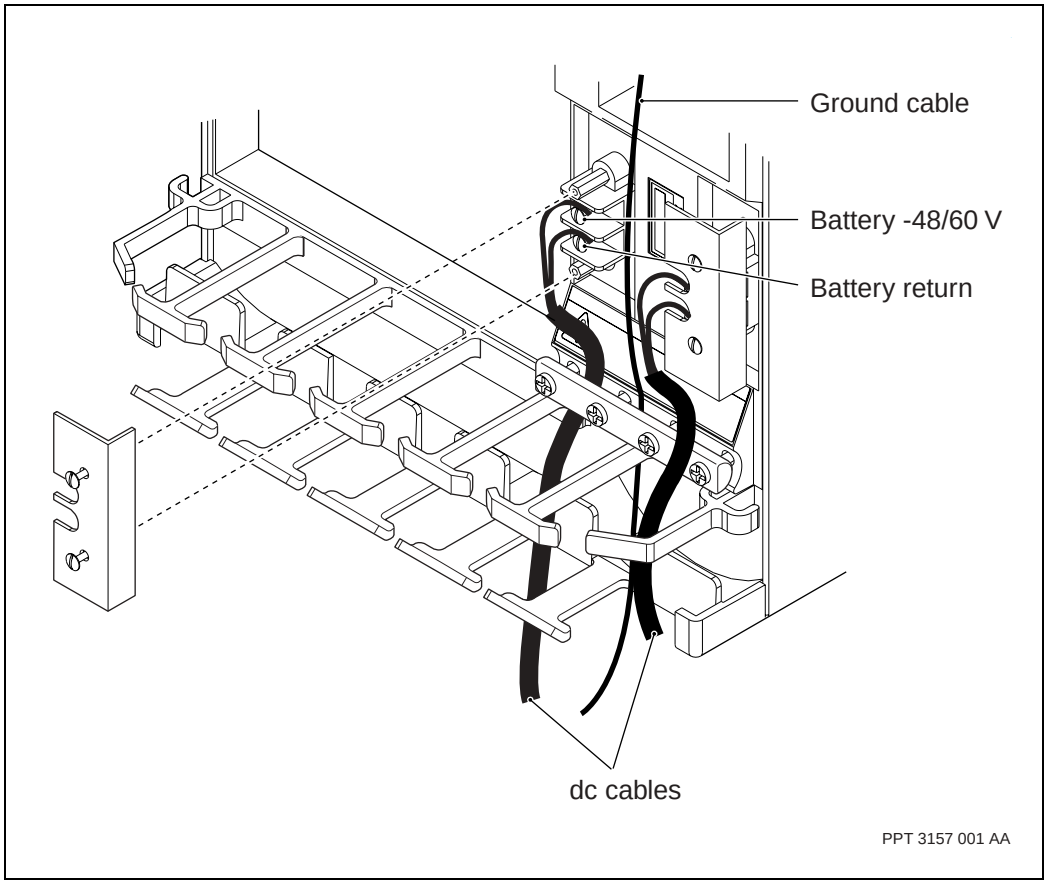


Figure 170
DC power cables connected to a Multiservice Switch 7460

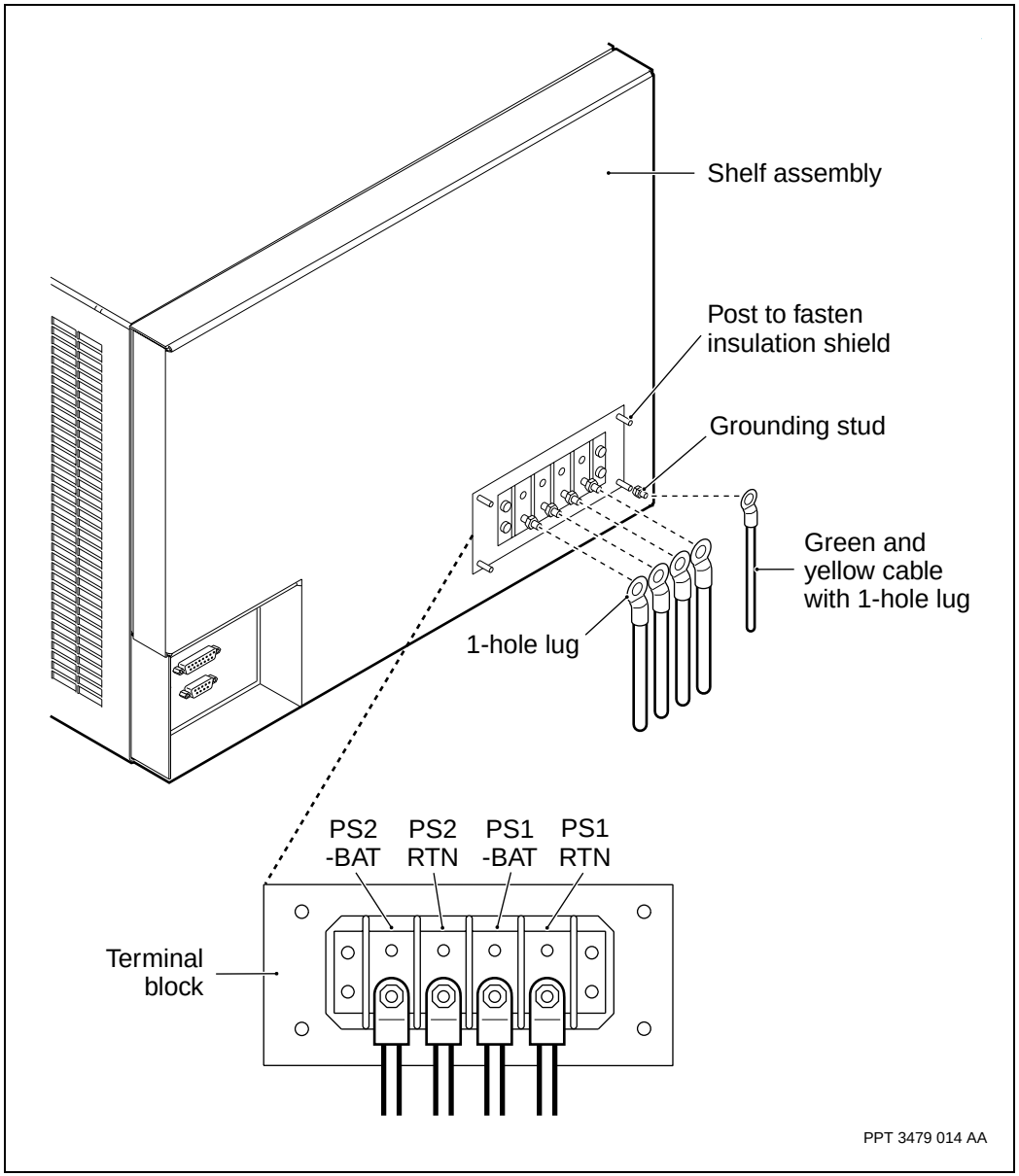
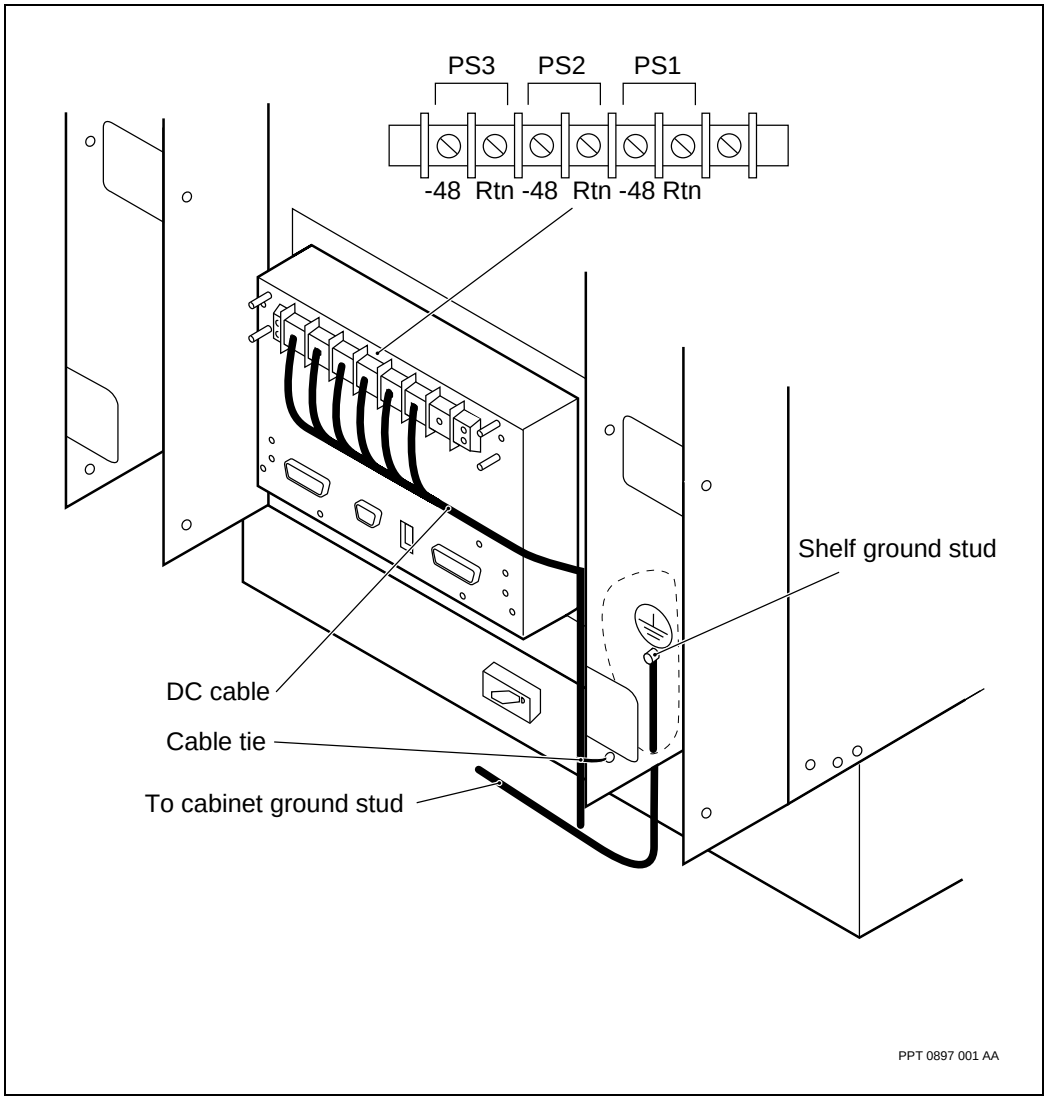


Figure 171
DC power cables connected to a Multiservice Switch



Removing the cable management bracket from a Multiservice Switch 7460

Remove a Nortel Networks Multiservice Switch 7460 cable management bracket to replace it.

Prerequisites

- The device can be in-service while removing the bracket. Handling processor card cables, especially fiber optical cables, can cause a loss of traffic.
- Decide if you can remove the bracket without disconnecting or mishandling any of the cables that pass through the bracket. If not, you must remove the cards from service in software and disconnect the cables from the faceplates of the processor cards in the device. Removing an FP from service is described in NN10600-550 *Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures*.

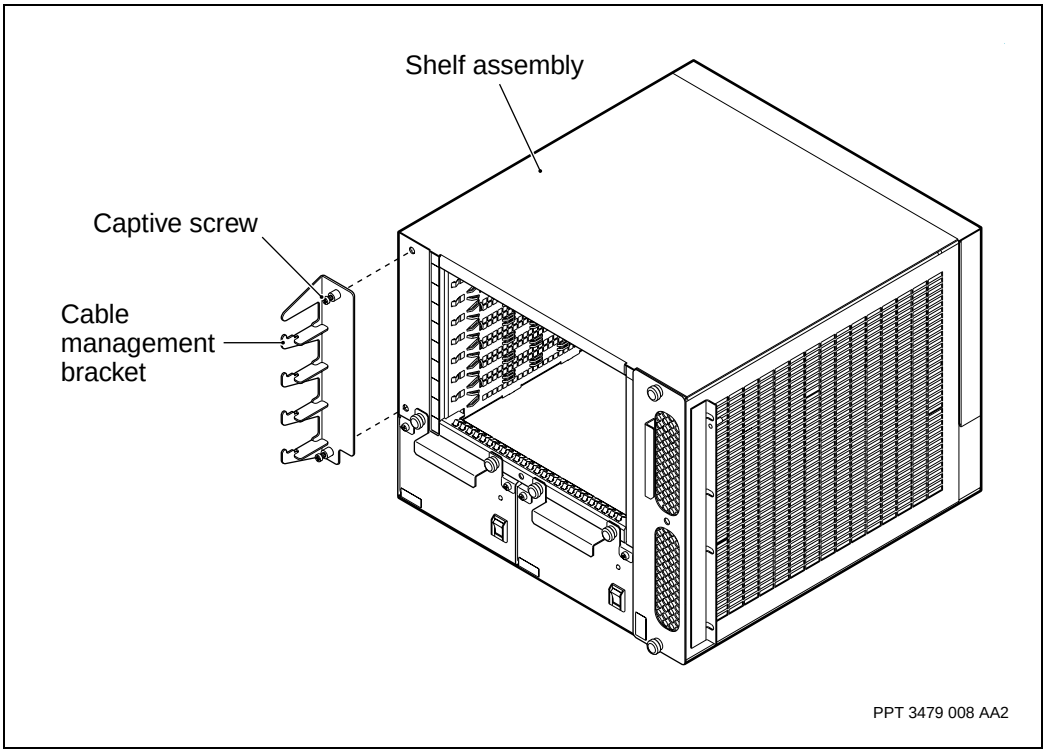
Procedure steps

1 With one hand, support the cable management bracket against the shelf assembly.

2 With your other hand, use a Phillips screwdriver to unscrew the 2 captive thumb screws on the cable management bracket. See the figure “Exploded view of a cable management bracket on a Multiservice Switch 7460” (page 454).

Procedure job aid

Figure 172
Exploded view of a cable management bracket on a Multiservice Switch 7460



Removing the cooling unit from a Multiservice Switch 7440

Remove the cooling unit from a Nortel Networks Multiservice Switch 7440 if the unit fails.

Prerequisites

CAUTION

Risk of equipment damage

Remove and restart cooling units in under 10 minutes.You can damage CPs and FPs and they can fail if the fans are off longer than 10 minutes.

WARNING

Risk of injury by fan blades

Do not handle the fans while the blades are rotating. When you remove a cooling unit, wait until the fan blades stop before you continue.

WARNUNG

Verletzungsgefahr durch Lüfterblätter

Berühren Sie einen Lüfter niemals, während die Blätter rotieren. Warten Sie bis zum vollständigen Stillstand der Lüfterblätter, bevor Sie ein Kühlaggregat entfernen.

Procedure steps

1. To unlock the door, use a 1/4-in. slot-head screwdriver to turn the locking latch on the cooling unit door 1/4 turn counter-clockwise. See the figure “Cooling unit lock on a Multiservice Switch 7480” (page 462).
2. Open the door to access the cooling equipment.
3. If you have the newer model cooling unit, the wires that connect the fans to the device are at the front of the fan tray. Cut the tie wrap and disconnect each connector. If you do not have the newer model, continue to the next step.
4. Pull the front edge of the cooling unit toward you carefully. Remove the cooling unit slowly.

Procedure job aid

Figure 173
Unlocking a Multiservice Switch 7440 cooling unit

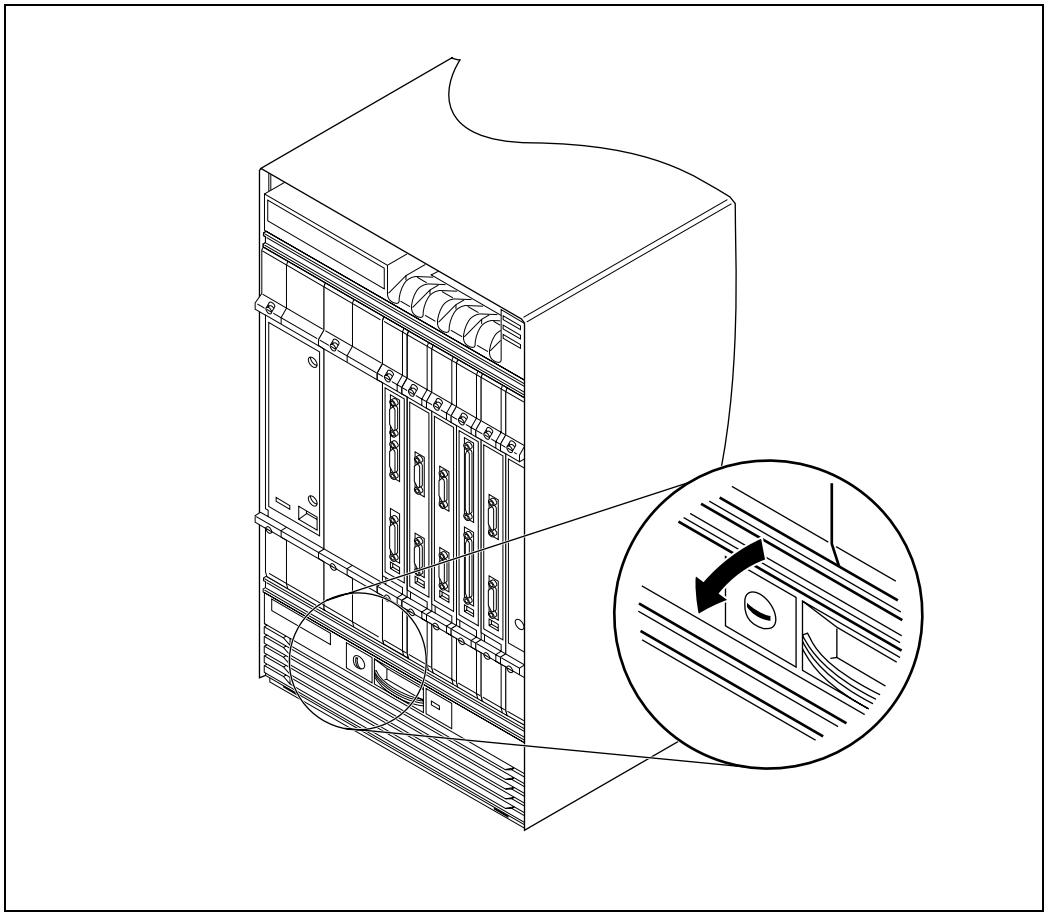
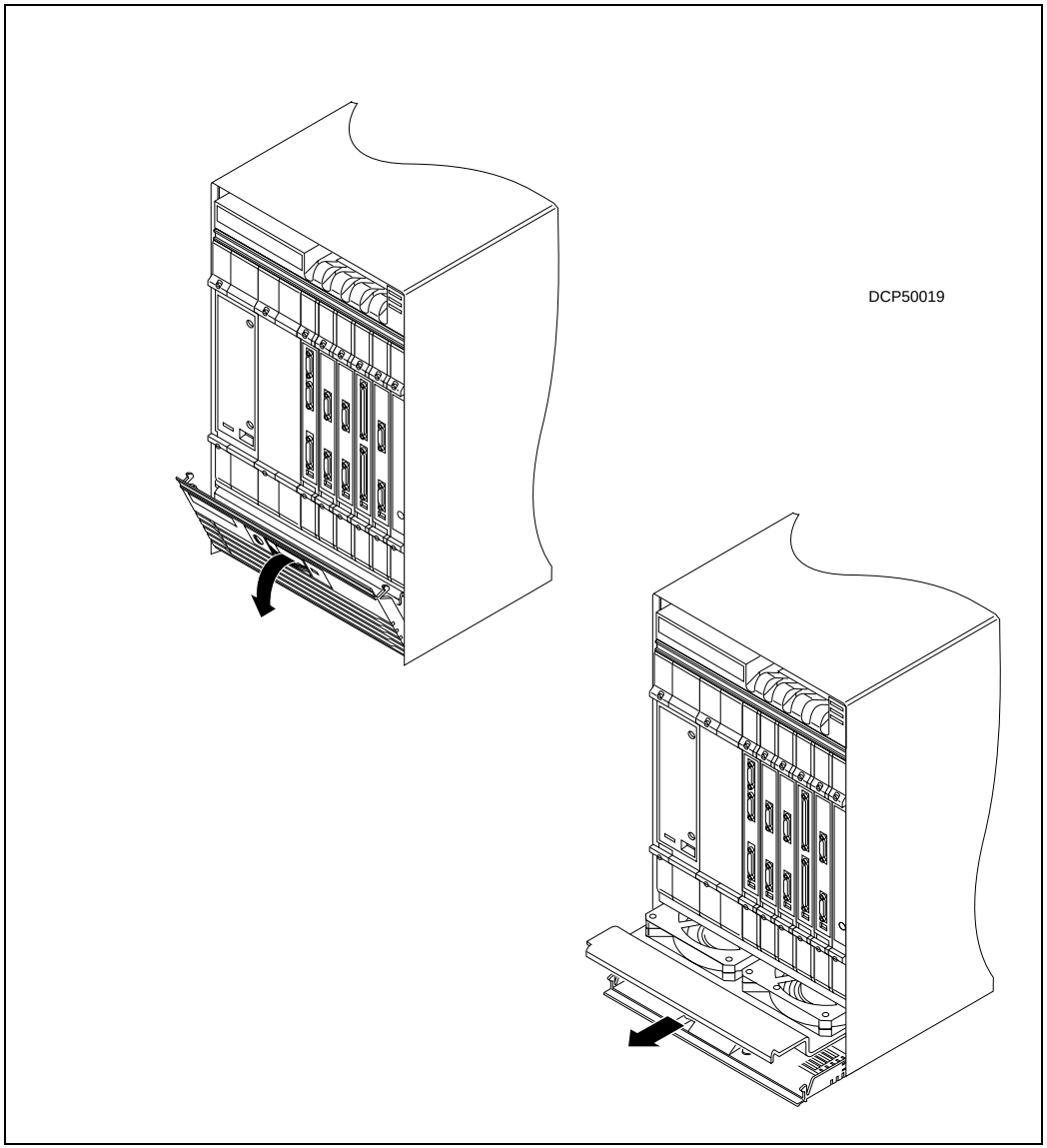


Figure 174
Removing a Multiservice Switch 7440 cooling unit



Removing the cooling unit from a Multiservice Switch 7460

Remove the cooling unit from a Multiservice Switch 7460 in preparation to restore the full cooling capabilities.

Prerequisites

CAUTION

Risk of equipment damage

Remove and restart cooling units in under 10 minutes. You can damage CPs and FPs and they can fail if the fans are off longer than 10 minutes.

WARNING

Risk of injury by fan blades

Do not handle the fans while the blades are rotating. When you remove a cooling unit, wait until the fan blades stop before you continue.

WARNUNG

Verletzungsgefahr durch Lüfterblätter

Berühren Sie einen Lüfter niemals, während die Blätter rotieren. Warten Sie bis zum vollständigen Stillstand der Lüfterblätter, bevor Sie ein Kühlaggregat entfernen.

- The cooling unit provides enough cooling for a fully provisioned shelf when only 4 of its 5 fans are running. The fifth fan is for redundancy. If a fan fails, a software alarm is generated. To restore operation to a failed fan, you must replace the entire cooling unit.

Procedure steps

1. Unfasten the 2 Phillips captive thumb screws on the faceplate of the cooling unit. See the figure “Exploded view of a cooling unit and Multiservice Switch 7460” (page 460).
2. Use the captive screws to disengage the cooling unit from its power connection. Stop when you can get fingers behind the upper and lower edges of the faceplate.

A minor alarm, ‘Hardware report = cooling unit’, occurs when you disconnect the cooling unit from an active shelf assembly.

3 Wait until the fan blades are no longer rotating before fully removing the cooling unit.

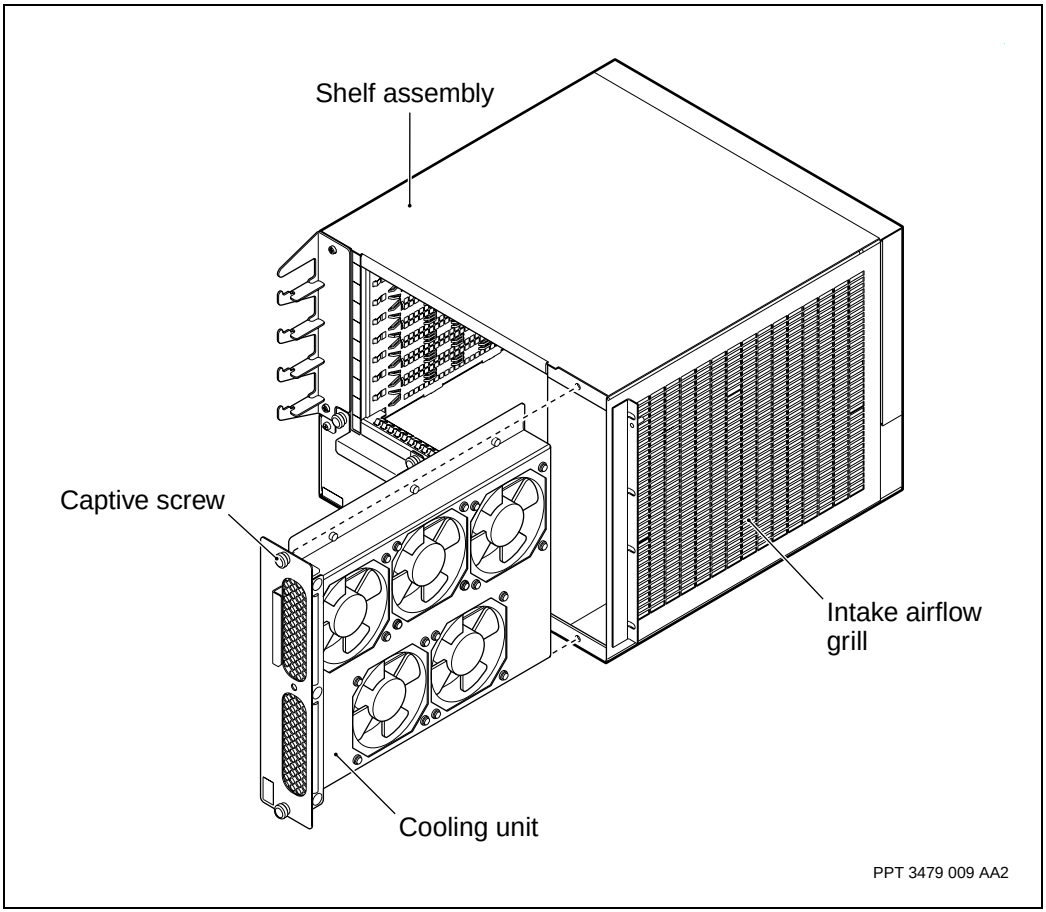
4 With your right hand, hold onto the handle located beside the upper airflow grill of the faceplate.

5 Pull the cooling unit out of its slot, making sure to support the underside of the unit with your left hand.

6 Hold the unit so that you do not contact any of the copper-colored EMI gaskets that are located behind the faceplate.

Procedure job aid

Figure 175
Exploded view of a cooling unit and Multiservice Switch 7460



Removing the cooling unit from a Multiservice Switch 7480

Remove the cooling unit from a Nortel Networks Multiservice Switch 7480 to replace a failed unit. Some types of air filter assemblies also require you to remove the cooling unit drawer when replacing the air filter.

Prerequisites

WARNING
Risk of injury by fan blades
Do not handle the fans while the blades are rotating. When you remove a cooling unit, wait until the fan blades stop before you continue.

WARNUNG
Verletzungsgefahr durch Lüfterblätter
Berühren Sie einen Lüfter niemals, während die Blätter rotieren. Warten Sie bis zum vollständigen Stillstand der Lüfterblätter, bevor Sie ein Kühlaggregat entfernen.

CAUTION
Risk of equipment damage
Replace and restart cooling units within 10 minutes. You can damage the CPs and FPs and they can fail if the cooling fans are off longer than 10 minutes.

Procedure steps

1. Use a 1/4-in. slot-head screwdriver to turn the handle locking screw 1/4 turn counter-clockwise. See the figure “Cooling unit lock on a Multiservice Switch 7480” (page 462).
2. Pull on the faceplate handle to disconnect the cooling unit from the power input panel connector at the back of the unit.

   A minor alarm occurs when you disconnect the cooling unit from an active shelf assembly.
3. Pull the unit half way out with one hand. Place your other hand under the partially removed cooling unit to support its weight. See the figure “Removing a cooling unit from a Multiservice Switch 7480” (page 463).

4 Tilt the unit up and pull it out completely; use your other hand to support the unit's weight.

5 Set the cooling unit aside. You can carry the unit by its faceplate handle.

Procedure job aid

Figure 176
Cooling unit lock on a Multiservice Switch 7480

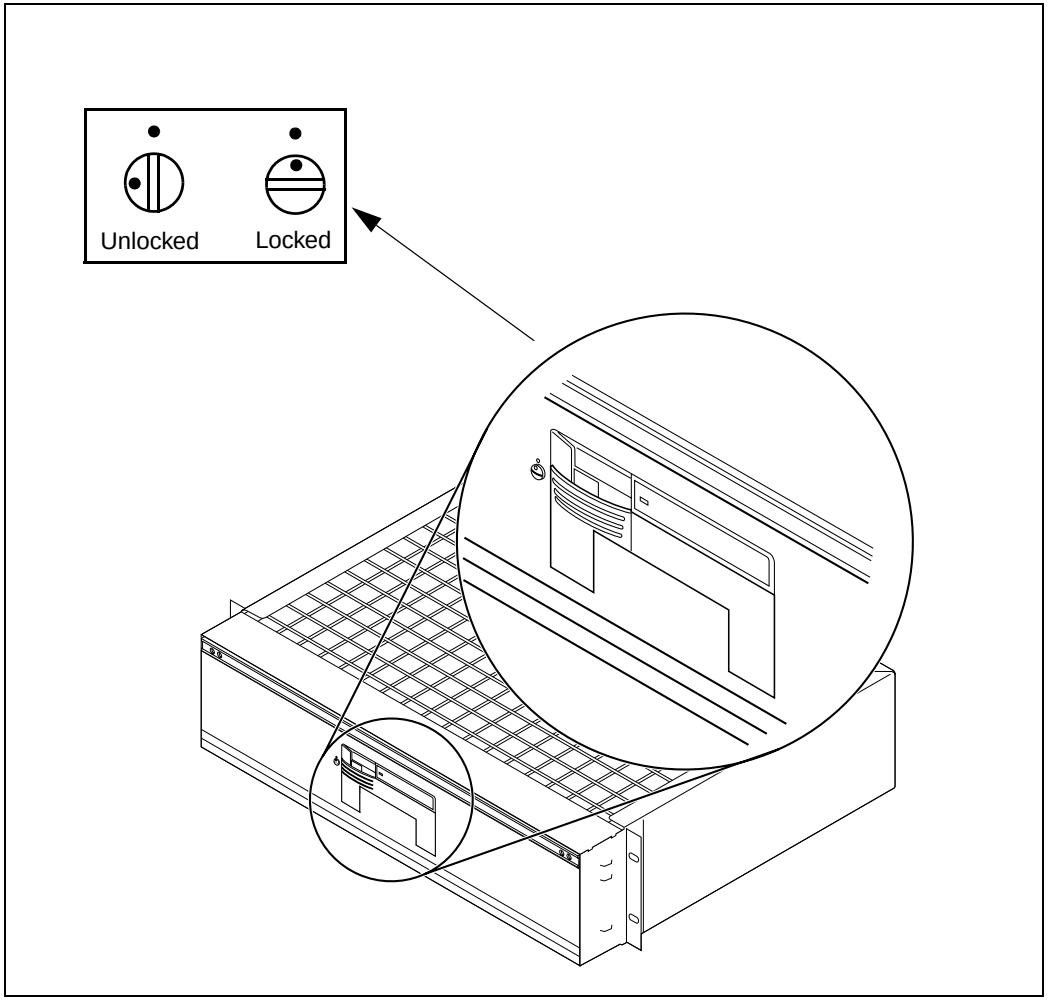
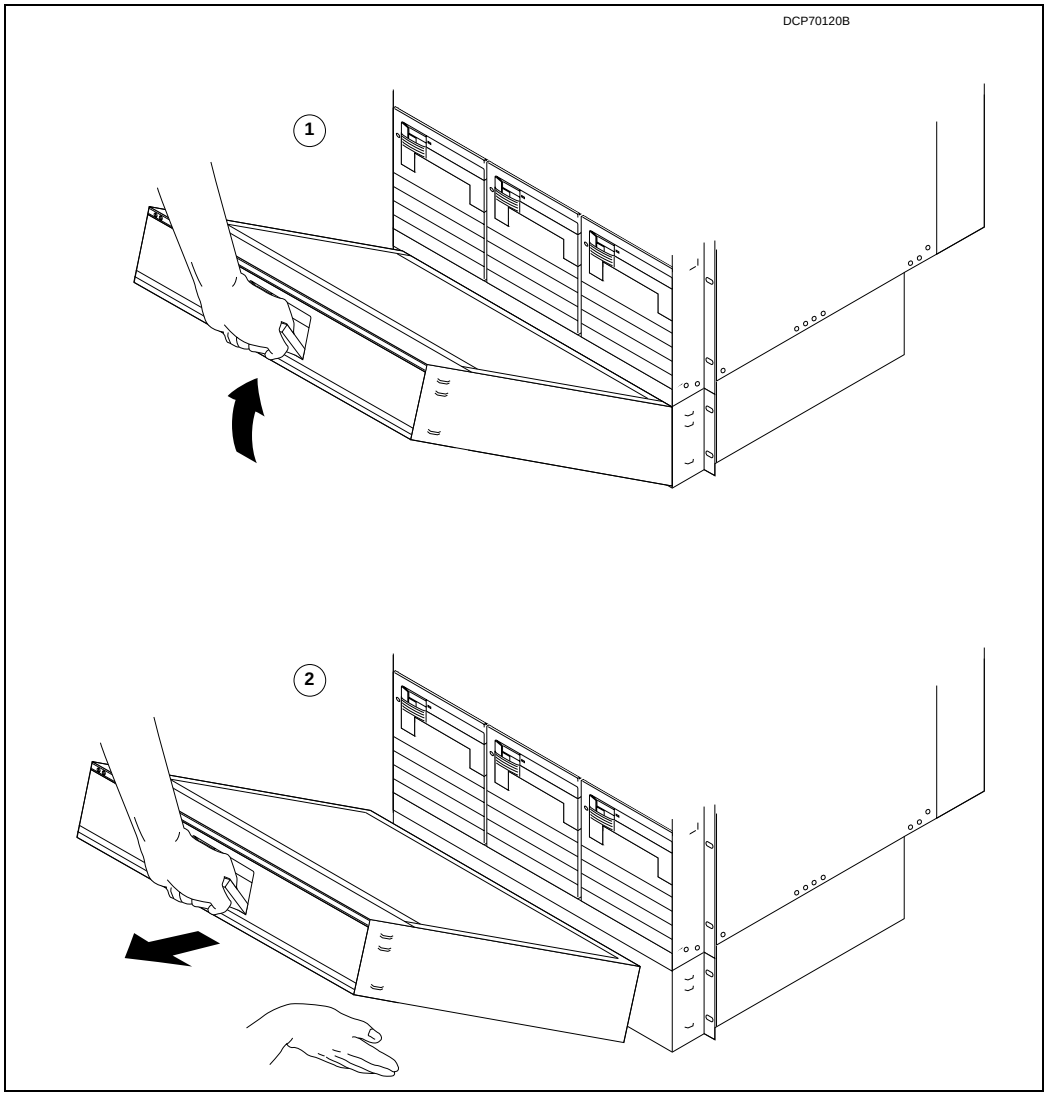


Figure 177
Removing a cooling unit from a Multiservice Switch 7480



Removing the front cover from a Multiservice Switch 7440

Remove the front cover from a Nortel Networks Multiservice Switch 7440 if you need to access interior components, for example the processor cards, air filter, or power supplies.

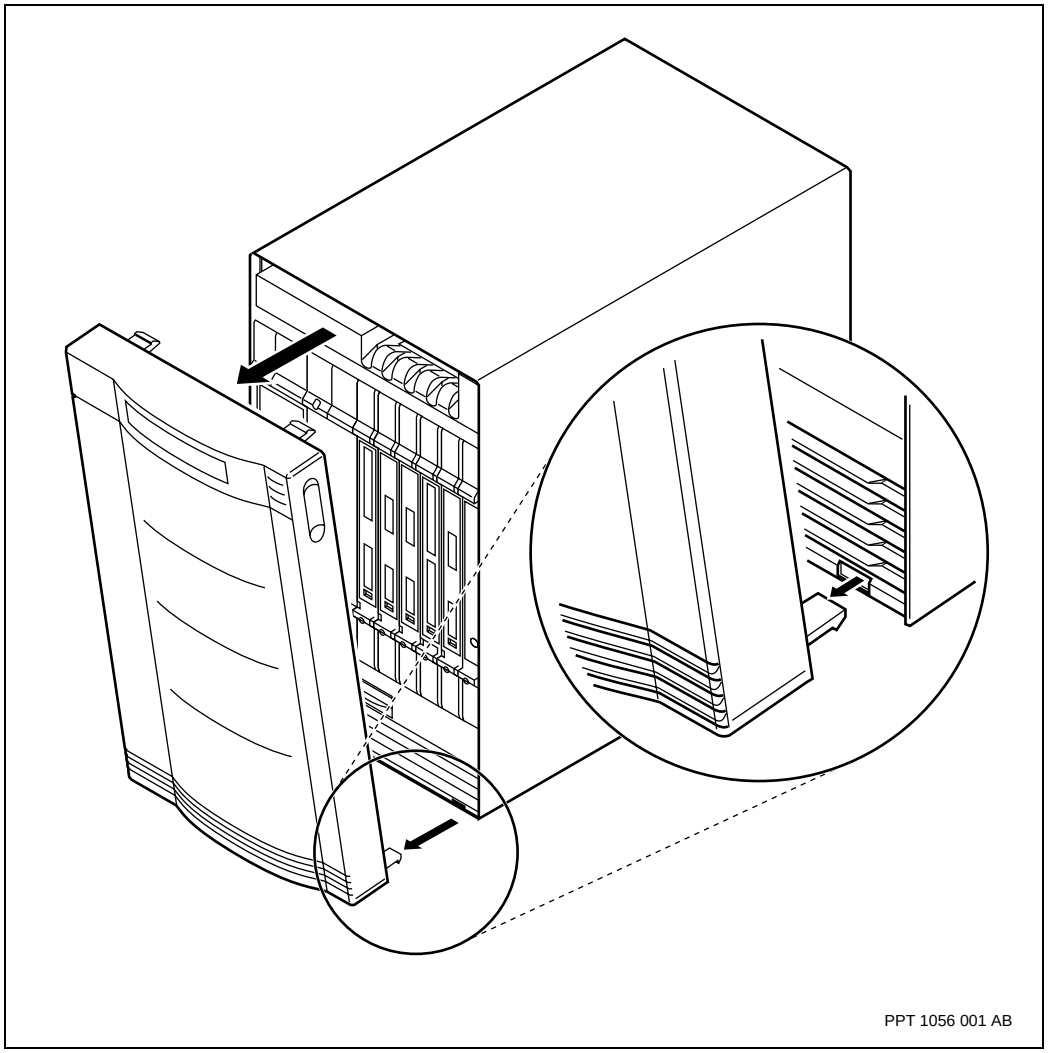
Procedure steps

1. Hold the cover on the outside edges. See the figure “Removing a Multiservice Switch 7440 front cover” (page 465).
2. Pull the cover out.

   The cover will pivot down on its insertion tabs.

Procedure job aid

Figure 178
Removing a Multiservice Switch 7440 front cover



Removing the power supply from a Multiservice Switch 7440

Remove a failed power supply from a Nortel Networks Multiservice Switch 7440 before installing a new one.

Prerequisites

WARNING

Damage to equipment by electromagnetic interference

To meet electromagnetic interference (EMI) regulatory requirements and thermal specifications, each empty power supply bay must be covered with a power supply filler (blank). Power supply fillers are removed and installed using the same procedure as for power supplies.

Procedure steps

1. Toggle to the standby position the power control on power supply faceplate. See the figure “Multiservice Switch 7440 power supply” (page 467).
2. At the power distribution panel, toggle off the circuit breaker for the outlet that supplies power to the power supply you want to remove. Ensure that the outlet is void of primary power.
3. If you are removing a dc power supply, disconnect the battery wire, the battery return wire, and the ground wire from the terminal block. See the figure “Multiservice Switch 7440 dc wiring” (page 468).

   or

   If you are removing an ac power supply, disconnect the power cord from the power input panel at the rear of the device. See “Removing the ac power supply from a Multiservice Switch 7440” (page 470)
4. Unlock the power supply: turn the power supply locking latches one-quarter turn clockwise. See the figure “Unlocking and removing a power supply from a Multiservice Switch 7440” (page 469).
5. Pull outwards on the latches to release the power supply and pull the power supply carefully from the device.

Procedure job aid

Figure 179
Multiservice Switch 7440 power supply

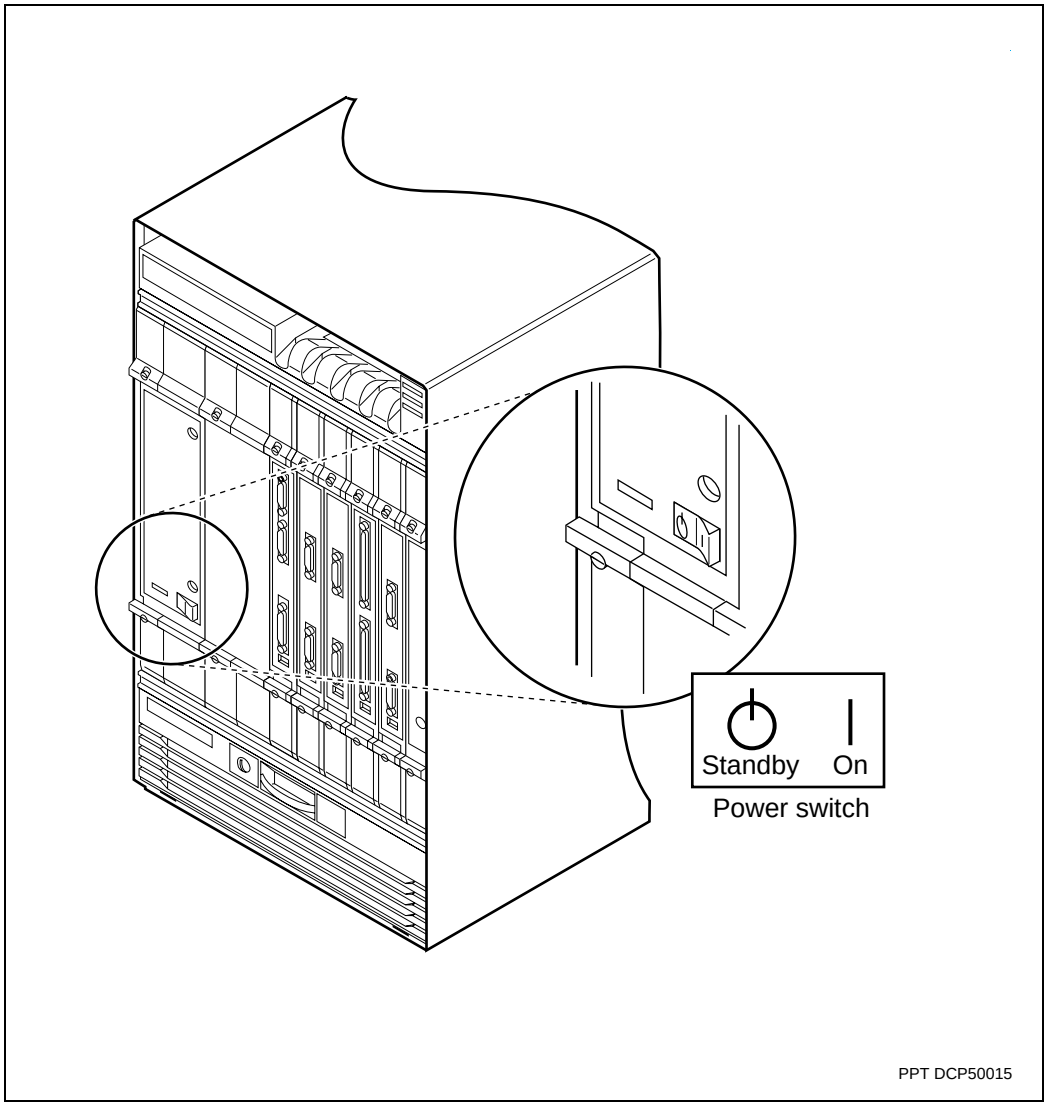


Figure 180
Multiservice Switch 7440 dc wiring

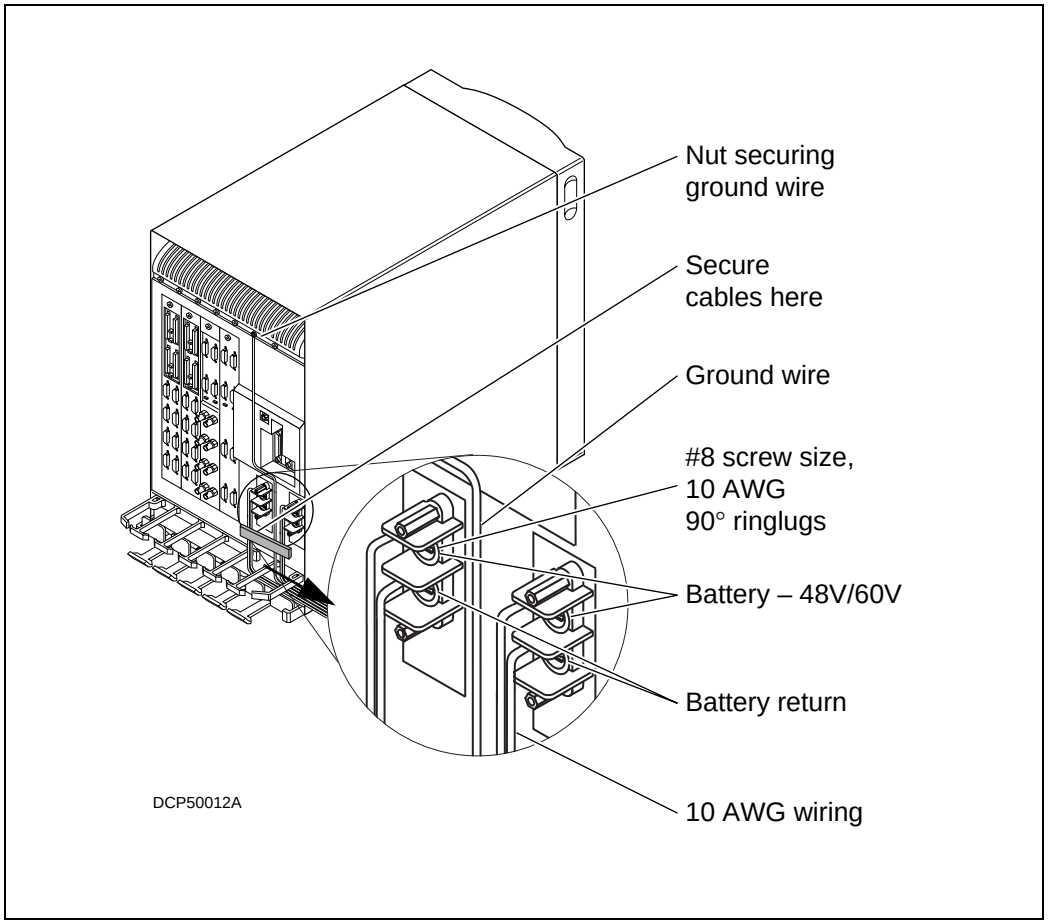


Figure 181
Unlocking and removing a power supply from a Multiservice Switch 7440

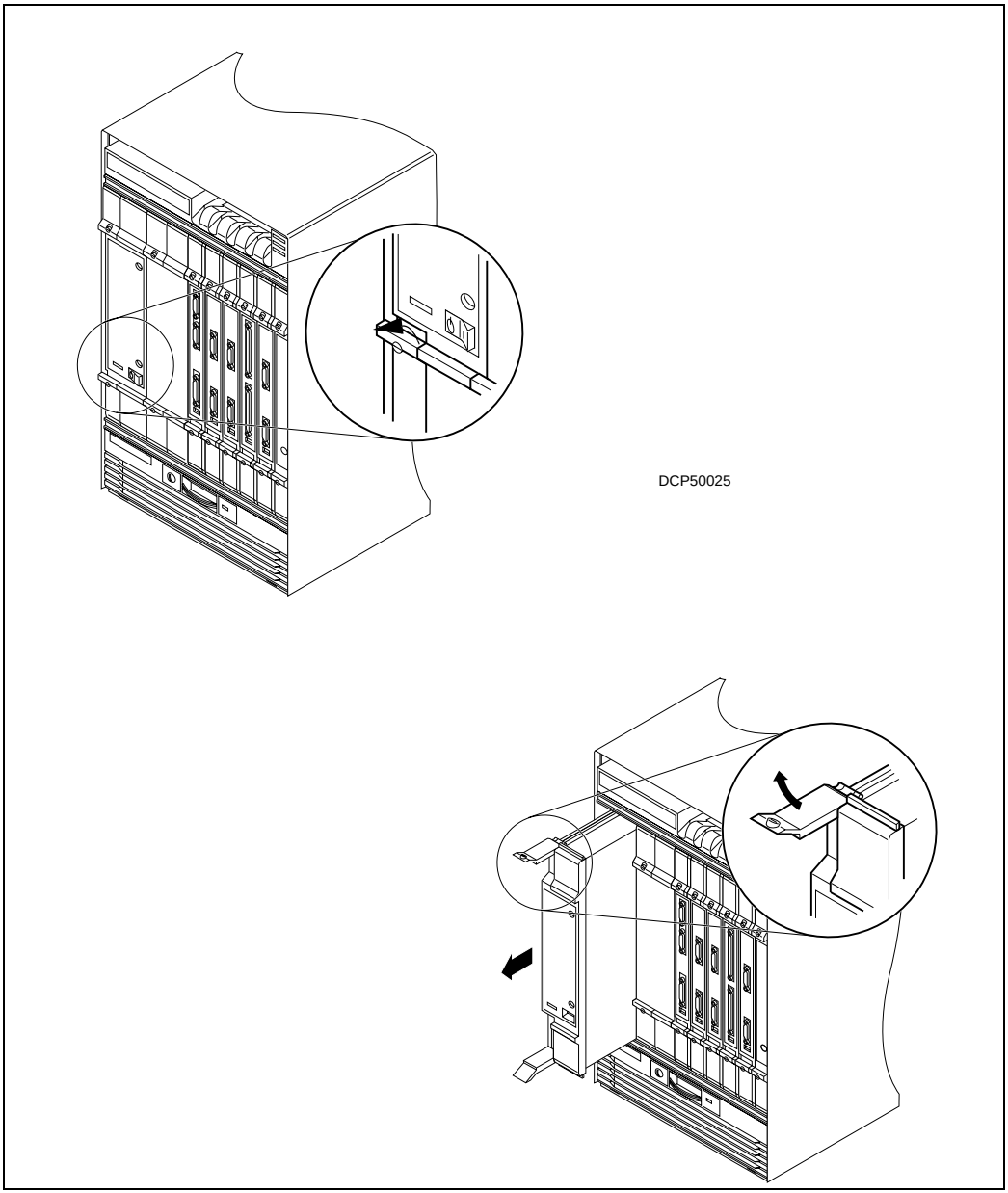
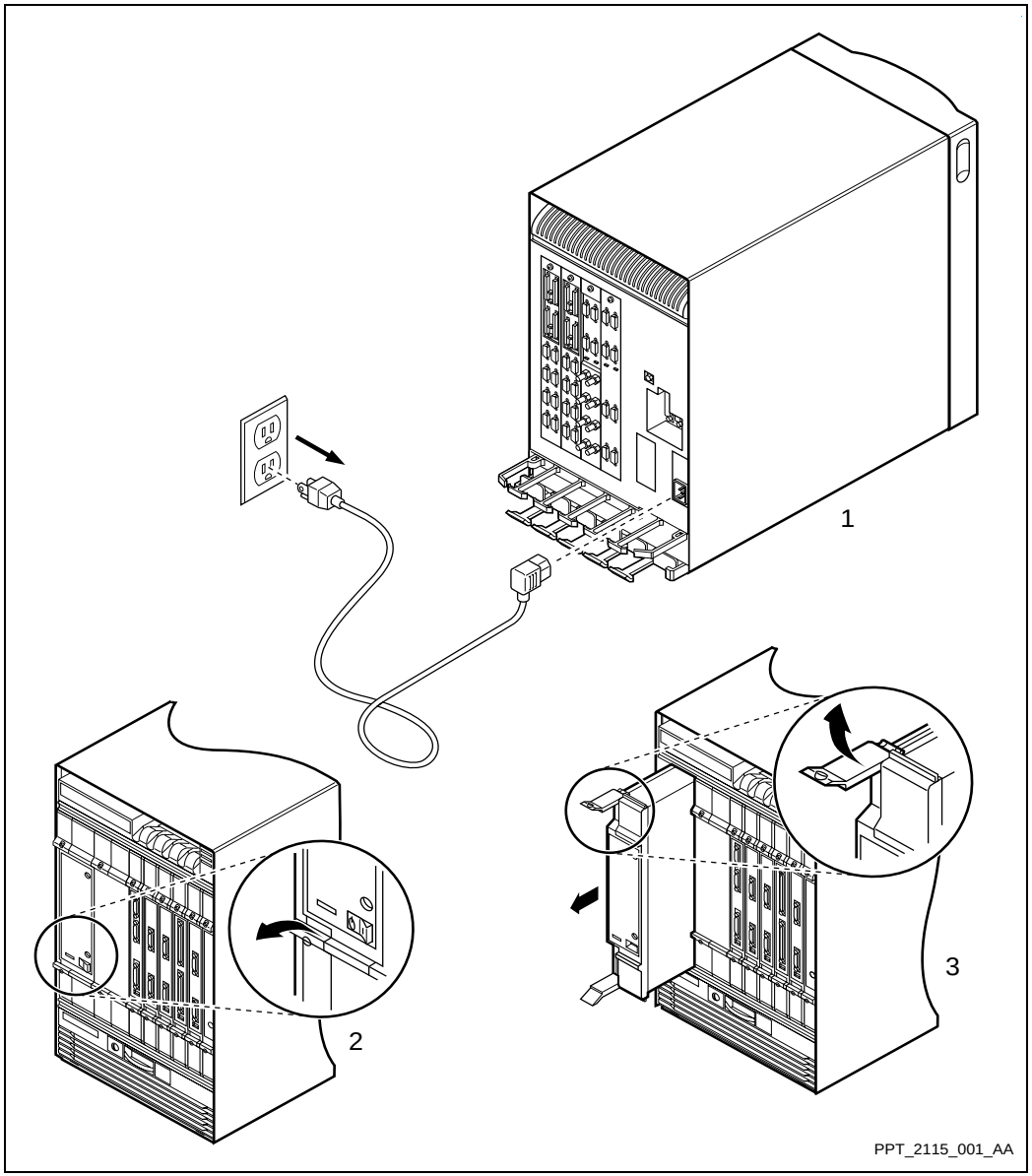


Figure 182
Removing the ac power supply from a Multiservice Switch 7440



Removing the power supply from a Multiservice Switch 7460

Remove the power supply from a Nortel Networks Multiservice Switch 7460 if it fails.

Prerequisites

CAUTION
Risk of service loss
Do not overload the power supplies. One power supply can support a maximum of one or two CPs and six or seven FPs up to a total of eight processor cards.

WARNING
Risk of personal injury
Power supplies weigh 5.7 kg (12.57 lb) each. Handle carefully and avoid dropping.

WARNUNG
Verletzungsgefahr
Die Stromversorgungsgeräte haben ein Gewicht von jeweils 5,7 kg. Seien Sie vorsichtig beim Umgang mit dem Gerät, und vermeiden Sie, es fallenzulassen.

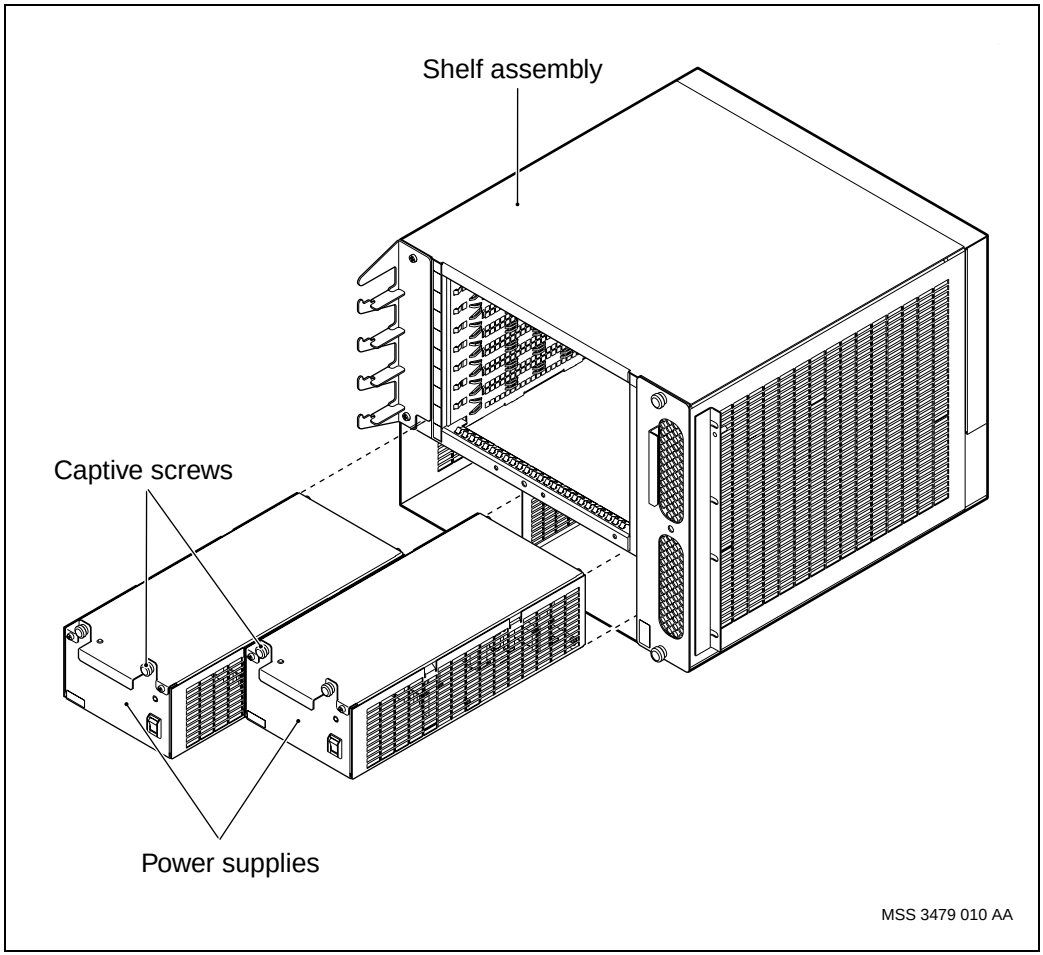
WARNING
Damage to equipment by electromagnetic interference
To meet electromagnetic interference (EMI) regulatory requirements and thermal specifications, each empty power supply bay must be covered with power supply filler (blank). Power supply fillers are removed and installed using the same method as power supplies.

Procedure steps

1. Toggle to the standby position the power control on the power supply faceplate, as shown in figure “Exploded view of power supplies in a Multiservice Switch 7460” (page 473).
2. Unfasten the 2 Phillips captive thumb screws. These are the screws with the large knobs.
3. Unseat the power supply to disengage the connectors inside the shelf assembly. Stop pulling when the handle is approximately 10 cm (4 in.) away from the front of the shelf assembly. Do not remove the power supply yet.
4. As soon as the power supply is disengaged, its LED on the faceplate changes from green to red. Red occurs while the capacitors inside the power supply are discharging. Wait until the red LED on the faceplate becomes unlit. Unlit means the capacitors are fully discharged.
5. Slide the power supply all the way out. Be prepared to support it when it clears the bay.

Procedure job aid

Figure 183
Exploded view of power supplies in a Multiservice Switch 7460



Removing the power supply from a Multiservice Switch 7480

Remove the power supply from a Nortel Networks Multiservice Switch 7480 if the unit fails.

Prerequisites

CAUTION
Risk of service loss
Do not overload the power supplies. One power supply can support a maximum of one or two CPs and six or seven FPs up to a total of eight processor cards.

WARNING
Risk of personal injury
Power supplies weigh 6.6 kg (14.5 lb) each. Handle carefully and avoid dropping.

WARNUNG
Verletzungsgefahr
Die Stromversorgungsgeräte haben ein Gewicht von jeweils 6,6 kg. Seien Sie vorsichtig beim Umgang mit dem Gerät, und vermeiden Sie, es fallenzulassen.

WARNING
Damage to equipment by electromagnetic interference
To meet electromagnetic interference (EMI) regulatory requirements and thermal specifications, each empty power supply bay must be covered with a power supply filler (blank). Power supply fillers are removed or installed using the same procedure as for power supplies.

Procedure steps

1. Toggle to the standby position the power control on the power supply faceplate. See the figure “Unlocked power supply on a Multiservice Switch 7480 with the power control in the standby position” (page 476).
2. Use a 1/4-in. flat-head screwdriver to turn the locking screw on the power supply faceplate to the unlocked (vertical) position, as shown in the figure.
3. Pull the faceplate handle down to release the power supply’s latch. Use this handle when you remove the unit.
4. Slide the power supply carefully about half-way out of its slot.
5. Use one hand to hold the handle, and use the other hand to support the unit’s weight. Carefully slide the unit completely out of the slot.

Procedure job aid

Figure 184
Unlocked power supply on a Multiservice Switch 7480 with the power control in the standby position

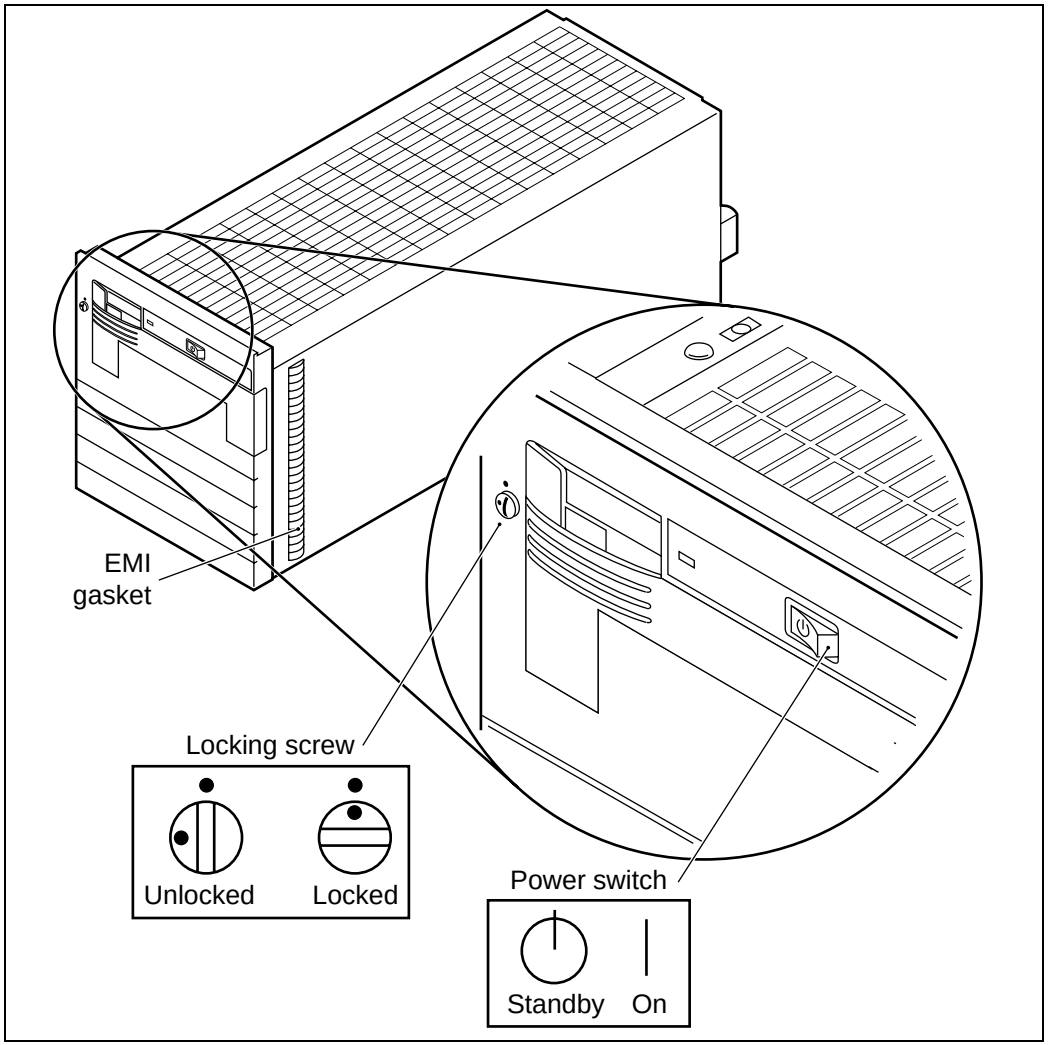


Table 8
Multiservice Switch 7480 minimum power supply requirements

Number of processor cards installed	Minimum number of power supplies required to maintain service
Eight or fewer	1
More than eight	2

Removing the rear cover from a Multiservice Switch 7440

Remove the rear cover from a Nortel Networks Multiservice Switch 7440 if you need access to interior components, for example rear-mounted termination panels, or the external alarm connector.

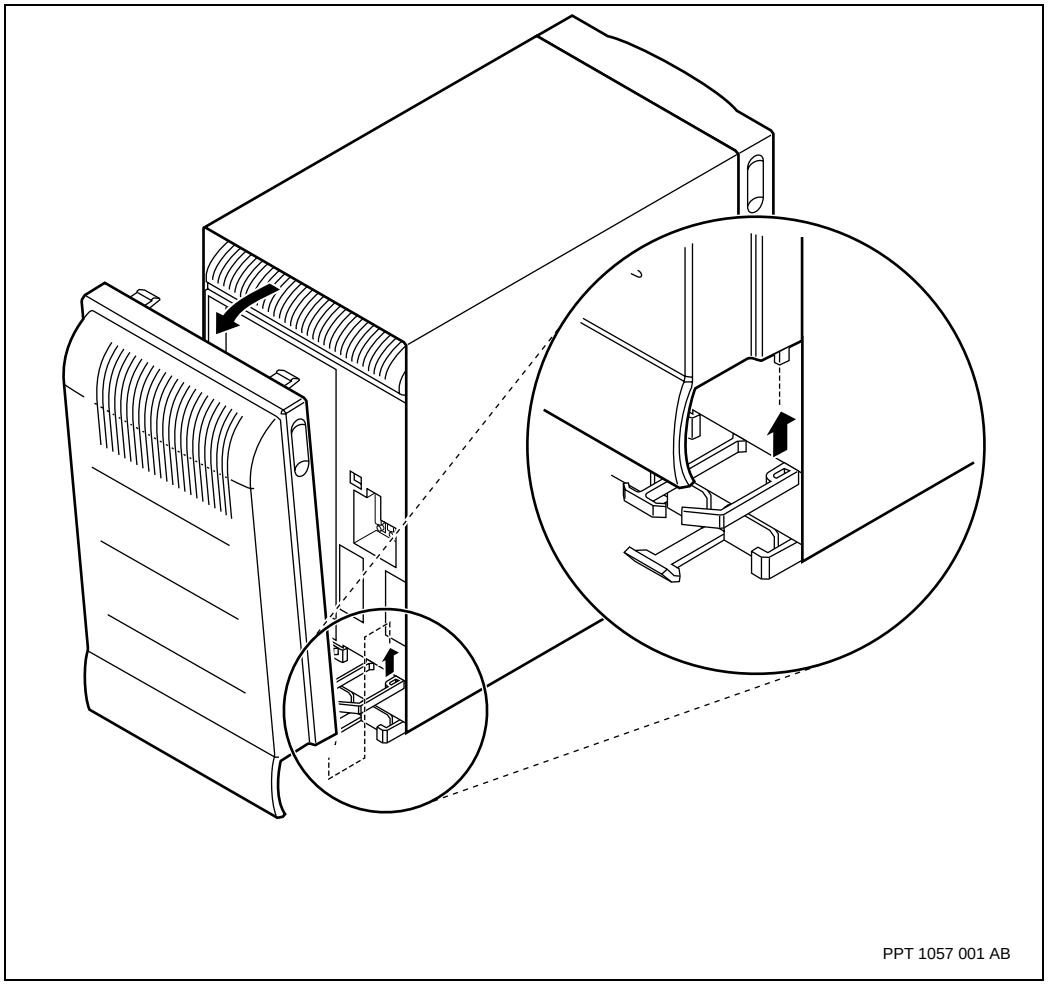
Procedure steps

1. Hold the cover on the outside edges. See “Removing a rear cover from a Multiservice Switch 7440” (page 479).
2. Pull the cover out.

   The cover will pivot down on its mounting studs.

Procedure job aid

Figure 185
Removing a rear cover from a Multiservice Switch 7440



Removing the shelf assembly of a Multiservice Switch 7460

Remove a n Nortel Networks Multiservice Switch 7460 if it has a bent or broken backplane pin, or if there is a failed card slot.

Prerequisites

WARNING
Risk of injury
The shelf assembly weighs 18.9 kg (41.667 lb). You need two people to perform this procedure.

WARNUNG
Verletzungsgefahr
Die Regalkomponente wiegt 18.9 kg. Zur Montage sind zwei Personen erforderlich.

CAUTION
Risk of equipment damage
You need two people to remove a Multiservice Switch 7460 from a rack or cabinet: one person must hold the chassis in place while a second person unfastens the screws.

CAUTION
Risk of damage to equipment by moving
When moving an uncrated cabinet or shelf assembly, protect it from strain, shock, impact, and vibration. Lack of protection can damage or warp the equipment.

- You need a helper to assist with removing the shelf assembly.
- The device must be powered down. See “Powering down a Multiservice Switch” (page 391).
- Remove a device only after you have removed the power supplies, processor cards, and cooling unit as shown by the figure “Exploded view of power supplies in a Multiservice Switch 7460” (page 473).

Procedure steps

1. If the shelf used an external alarm, disconnect the external alarm cable as shown in the figure “External alarm connector on a Multiservice Switch 7460” (page 504).
2. Unfasten the 10-mm (3/8-in.) nut on the shelf grounding cable stud at the rear of the shelf assembly as shown in the figure “Grounding a Multiservice Switch 7460 to the site ground window” (page 230).
3. Tape the grounding cable to the mounting apparatus so that it does not get snagged by the shelf assembly when it is removed.
4. While one person holds the shelf assembly, have the other person unfasten the eight 5/16-in. screws from the 2 mounting ears of the assembly. Refer to the figure “Shelf assembly of a Multiservice Switch 7460 removed from a rack” (page 483).
5. Pack all shelf components in their original packaging.

Procedure job aid

Figure 186
Exploded view of parts from a Multiservice Switch 7460 shelf assembly

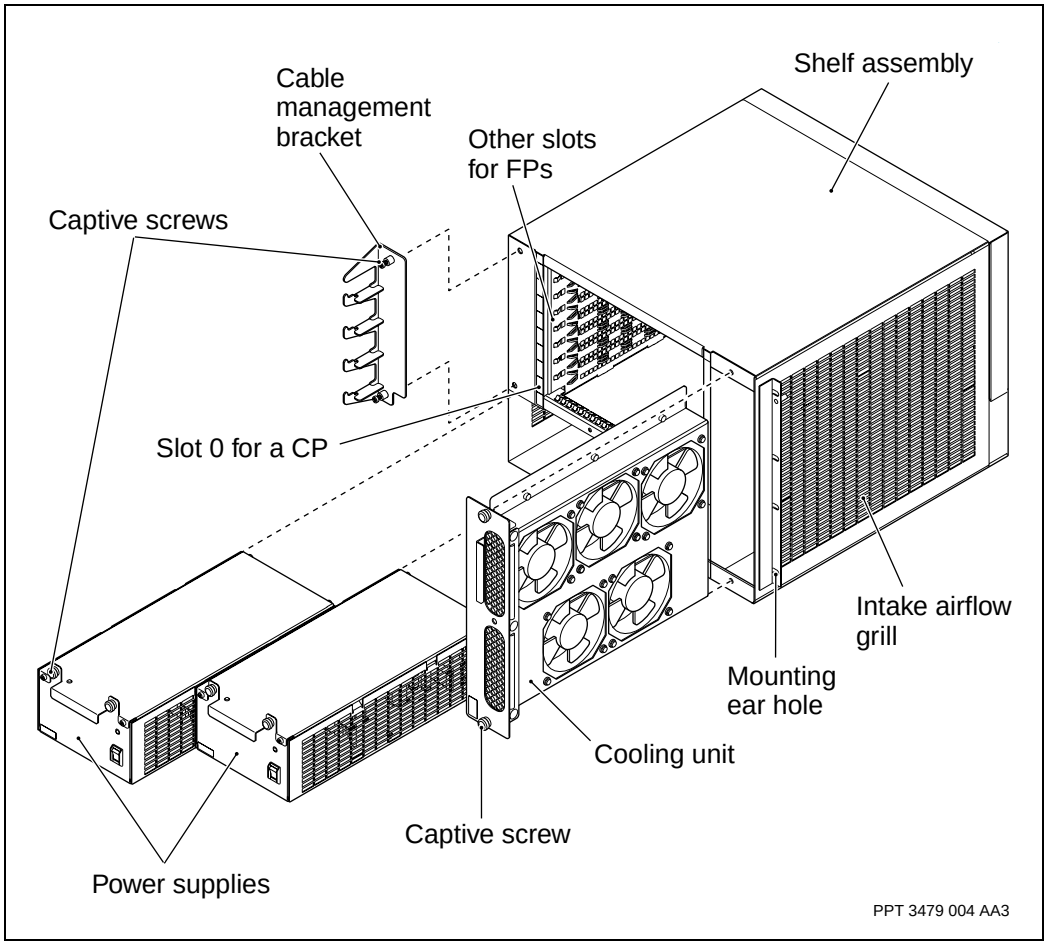
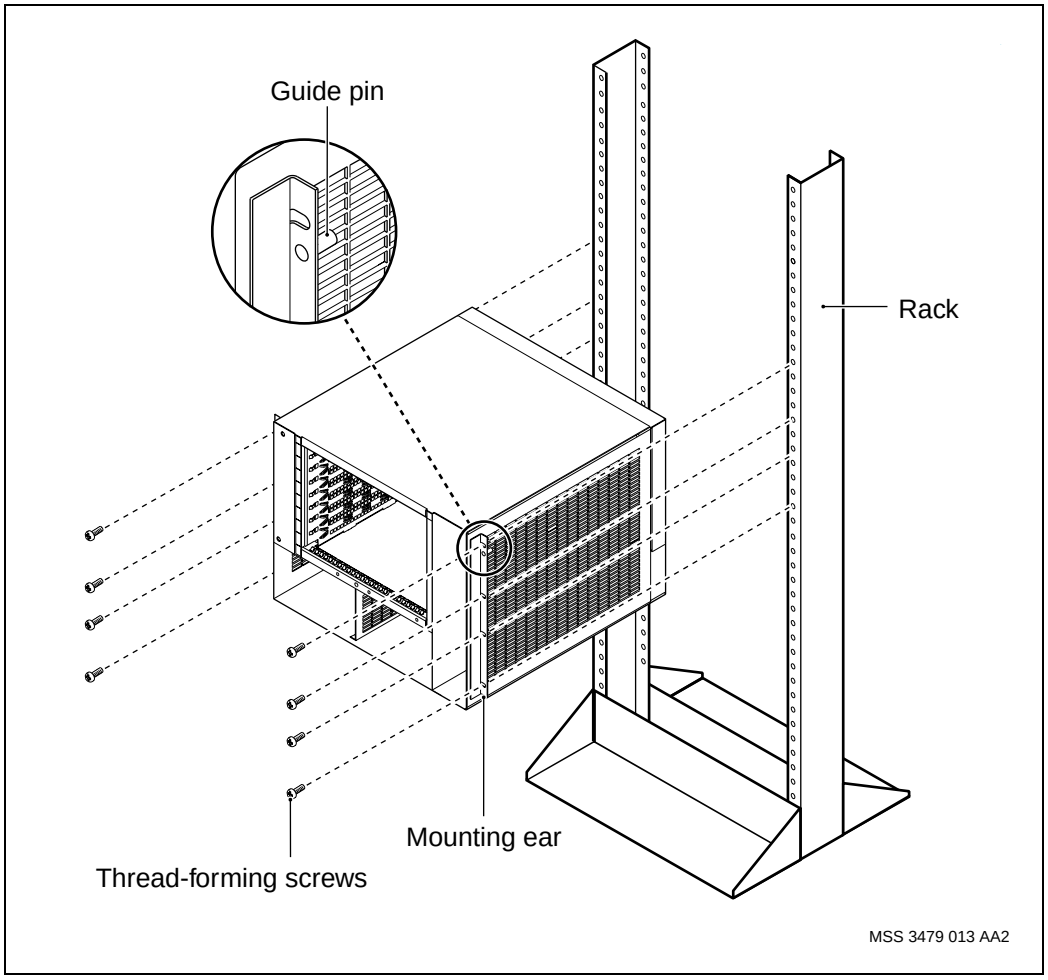


Figure 187
Shelf assembly of a Multiservice Switch 7460 removed from a rack



Replacing the air filter in a Multiservice Switch 7440

Replace the air filter in a Nortel Networks Multiservice Switch 7440 as part of regular maintenance to ensure proper air flow and to validate processor card warranties.

Prerequisites

CAUTION
Risk of damage to equipment
Never operate a device for longer than 30 minutes without an air filter. The air filter protects the power converters, CPs, and FPs from dust and particles.

- You need an air filter with part number A0626924.
- Replace an air filter while the switch continues to operate. Remove and insert an air filter without delay to minimize the amount of time the switch operates without a filter.
- You need a bag to contain the old filter after it is removed. This reduces the amount of floating dust from handling the filter.
- The air filter is inside the cooling unit and can be accessed only by removing the cooling unit.
- The air filter must be replaced every 3 months or more often. Record the frequency of replacement for the filter in the tables “Customer and equipment profile” (page 488) and “Schedule for replacing air filters and vacuuming equipment” (page 488). Ensure that you follow this frequency. These tables and the figures “Removing the air filter from a Multiservice Switch 7440” (page 486) and “Installing an air filter in a Multiservice Switch 7440” (page 487) are intended to be printed for your records.

Procedure steps

1. Locate the form for recording the air filter replacement for this switch. The form is a hardcopy combination of the following:
   - the table “Customer and equipment profile” (page 488)
   - the table “Schedule for replacing air filters and vacuuming equipment” (page 488)

- the figure “Removing the air filter from a Multiservice Switch 7440” (page 486)
- the figure “Installing an air filter in a Multiservice Switch 7440” (page 487)

If a form has not been started for this switch, print a copy of the form and fill in the table “Customer and equipment profile” (page 488).

2 Turn the latch on the cooling-unit door one-quarter turn counter-clockwise to unlock the door. See the figure “Removing the air filter from a Multiservice Switch 7440” (page 486).

3 Open the door to access the cooling equipment.

4 Pull the filter’s leading edge toward you carefully. Remove the filter slowly.

5 Insert the old filter into a dust-retaining container.

6 Insert the new filter into the air-filter tracks. Push the filter all the way into the device.

7 Close the cooling unit door.

8 Turn the latch 1/4 turn clockwise to lock the cooling unit door.

9 Record the filter replacement on the hardcopy of table “Schedule for replacing air filters and vacuuming equipment” (page 488). Keep this record to validate the warranties of processor cards that are returned to Nortel Networks.

Procedure job aid

Figure 188
Removing the air filter from a Multiservice Switch 7440

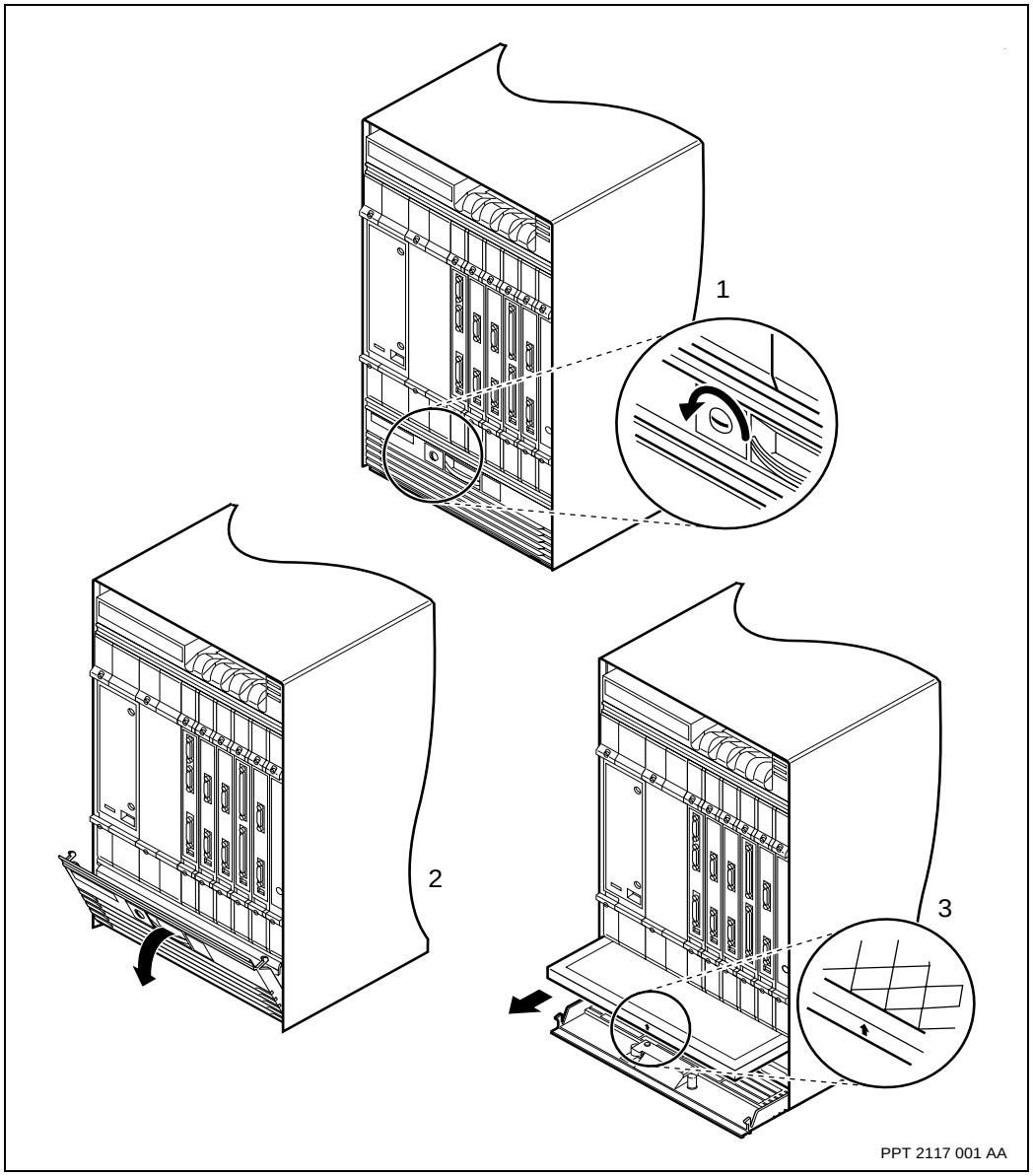


Figure 189
Installing an air filter in a Multiservice Switch 7440

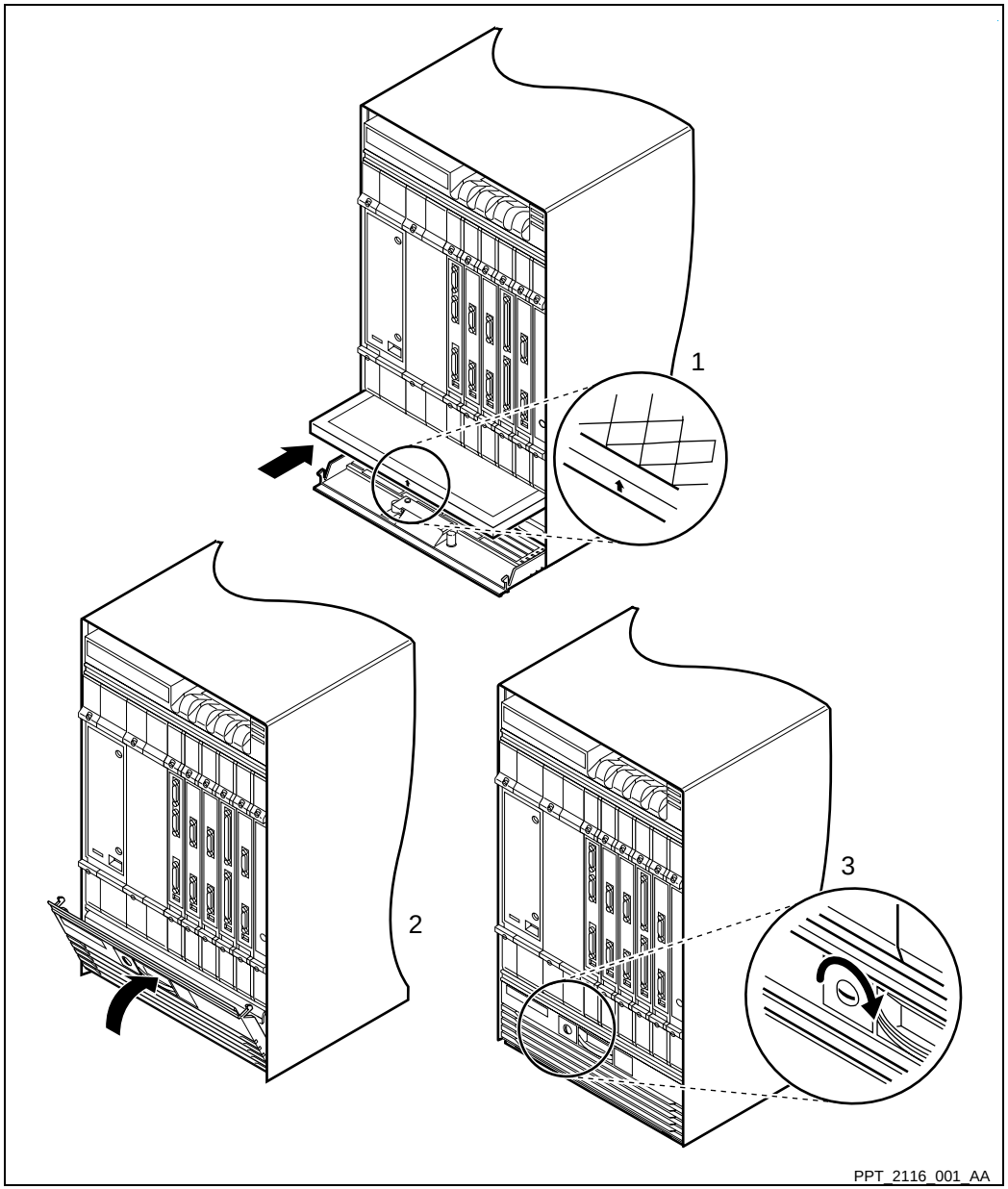


Table 9
Customer and equipment profile

Customer name	Equipment model	Equipment ID	Equipment location	Frequency
Note: The order number of an air filter pad for a Nortel Networks Multiservice Switch 7440 is A0626924.				

Table 10
Schedule for replacing air filters and vacuuming equipment

Year: ____	Eqpt. ID:_____				Eqpt. ID:_____				Eqpt. ID:_____			
	Filter	Vacuum	Person	Date	Filter	Vacuum	Person	Date	Filter	Vacuum	Person	Date
(e.g.)	√	√	B. B.	20								
Jan												
Feb												
Mar												
Apr												
May												
Jun												
Jul												
Aug												
Sep												
Oct												
Nov												
Dec												

Replacing the air filter in a Multiservice Switch 7460

Replace the air filter pad in a Nortel Networks Multiservice Switch 7460 as part of regular maintenance to ensure proper air flow and to validate processor card warranties.

Prerequisites

CAUTION
Risk of damage to equipment
Never operate a device for longer than 30 minutes without an air filter. The air filter protects the power converters, CPs, and FPs from dust and particles.

- You need an air filter foam replacement with part number P0609614.
- Replace an air filter while the switch continues to operate. Remove and insert an air filter without delay to minimize the amount of time the switch operates without a filter.
- You need a bag to contain the old filter after it is removed. This reduces the amount of floating dust from handling the filter.
- The air filter is inside the cooling unit and can be accessed only by removing the cooling unit.
- The air filter must be replaced every 3 months or more often. Record the frequency of replacement for the filter in the tables "Customer and equipment profile" (page 492) and "Schedule for replacing air filters and vacuuming equipment" (page 492). Ensure that you follow this frequency. These tables and the figure "An air filter from the cooling unit for a Multiservice Switch 7460" (page 491) are intended to be printed on one physical page for your records.

Procedure steps

1. Locate the form for recording the air filter replacement for this switch. The form is a hardcopy combination of the following:
   - the table "Customer and equipment profile" (page 492)
   - the table "Schedule for replacing air filters and vacuuming equipment" (page 492)

- the figure “An air filter from the cooling unit for a Multiservice Switch 7460” (page 491)

If a form has not been started for this switch, print a copy of the form and fill in the table “Customer and equipment profile” (page 492).

2 Remove any packaging from the replacement filter.

3 Remove the cooling unit according to the procedure “Removing the cooling unit from a Multiservice Switch 7460” (page 458).

4 From the cooling unit, carefully pull the air filter assembly up out of its slot as shown in the figure “An air filter from the cooling unit for a Multiservice Switch 7460” (page 491).

5 Insert the old filter into a dust-retaining container.

6 Insert the new, replacement filter into the air filter slot of the cooling unit, as shown in the figure “An air filter from the cooling unit for a Multiservice Switch 7460” (page 491).

7 Slide the air filter assembly back into its slot according to the procedure “Installing a cooling unit into a Multiservice Switch 7460” (page 257).

8 Record the filter replacement on the hardcopy of table “Schedule for replacing air filters and vacuuming equipment” (page 492). Keep this record to validate the warranties of processor cards that are returned to Nortel Networks.

Procedure job aid

Figure 190
An air filter from the cooling unit for a Multiservice Switch 7460

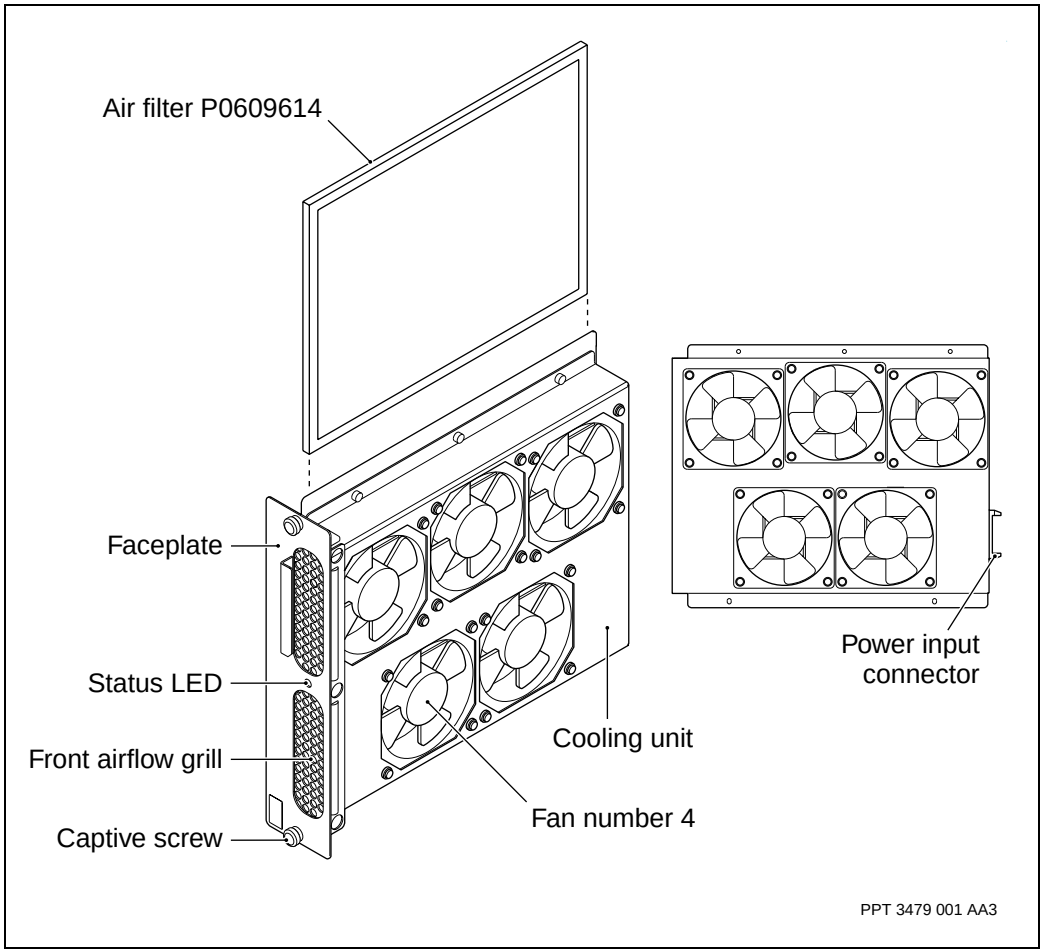


Table 11
Customer and equipment profile

Customer name	Equipment model	Equipment ID	Equipment location	Frequency
Note: The order number of an air filter pad for a Nortel Networks Multiservice Switch 7460 is P0609614.				

Table 12
Schedule for replacing air filters and vacuuming equipment

Year: ____	Eqpt. ID:_____				Eqpt. ID:_____				Eqpt. ID:_____			
	Filter	Vacuum	Person	Date	Filter	Vacuum	Person	Date	Filter	Vacuum	Person	Date
(e.g.)	√	√	B. B.	20								
Jan												
Feb												
Mar												
Apr												
May												
Jun												
Jul												
Aug												
Sep												
Oct												
Nov												
Dec												

Replacing the air filter in a Multiservice Switch 7480

Replace the air filter in a Nortel Networks Multiservice Switch 7440 as part of regular maintenance to ensure proper air flow and to validate processor card warranties.

Prerequisites

CAUTION
Risk of damage to equipment
Never operate a device for longer than 30 minutes without an air filter. The air filter protects the power converters, CPs, and FPs from dust and particles.

- You need an air filter with part number A0383866.
- Replace an air filter while the switch continues to operate. Remove and insert an air filter without delay to minimize the amount of time the switch operates without a filter.
- The device has two kinds of air filter assemblies. The spring-loaded air filter assembly displays the label “Air filter, press to release.” The air filter assembly that is not spring-loaded displays the label, “Air filter, remove cooling unit drawer first.”
- The air filter must be replaced every 3 months or more often. Record the frequency of replacement for the filter in the tables “Customer and equipment profile” (page 499) and “Schedule for replacing air filters and vacuuming equipment” (page 499). Ensure that you follow this frequency. These tables and the figures “Removing the air filter assembly from a Multiservice Switch 7480” (page 496), “Installing an air filter in a Multiservice Switch 7480” (page 498), and “Changing the air filter pad in a Multiservice Switch 7480” (page 497) are intended to be printed for your records.

Procedure steps

1. Locate the form for recording the air filter replacement for this switch. The form is a hardcopy combination of the following:
   - the table “Customer and equipment profile” (page 499)

- the table “Schedule for replacing air filters and vacuuming equipment” (page 499)
- the figure “Removing the air filter assembly from a Multiservice Switch 7480” (page 496)
- the figure “Installing an air filter in a Multiservice Switch 7480” (page 498)
- the figure “Changing the air filter pad in a Multiservice Switch 7480” (page 497)

If a form has not been started for this switch, print a copy of the form and fill in the table “Customer and equipment profile” (page 499).

2 If the air filter assembly is spring-loaded, carefully press and release the center of the air filter cartridge. This action disengages the air filter assembly.

or

If the air filter assembly is not spring-loaded, remove the cooling unit drawer. See the procedure “Removing the cooling unit from a Multiservice Switch 7480” (page 461).

3 Carefully pull the air filter assembly out of its slot. See the figure “Removing the air filter assembly from a Multiservice Switch 7480” (page 496).

4 Turn the air filter assembly so that the bottom side faces up. See the figure “Changing the air filter pad in a Multiservice Switch 7480” (page 497).

5 Open the filter gate.

6 Remove the old filter pad and replace it with a new filter pad.

7 Insert the old filter into a dust-retaining container.

8 Close the filter gate.

9 With the filter gate face down, slide the air filter assembly into its slot at the top of the cooling unit chassis. See the figure “Installing an air filter in a Multiservice Switch 7480” (page 498).

10 If the air filter assembly is spring-loaded, carefully press and release the center of the assembly to fasten it in position.

or

If the air filter assembly is not spring-loaded, replace the cooling unit drawer.

11 Record the filter replacement on the hardcopy of table “Schedule for replacing air filters and vacuuming equipment” (page 499). Keep this record to validate the warranties of processor cards that are returned to Nortel Networks.

Procedure job aid

Figure 191
Removing the air filter assembly from a Multiservice Switch 7480

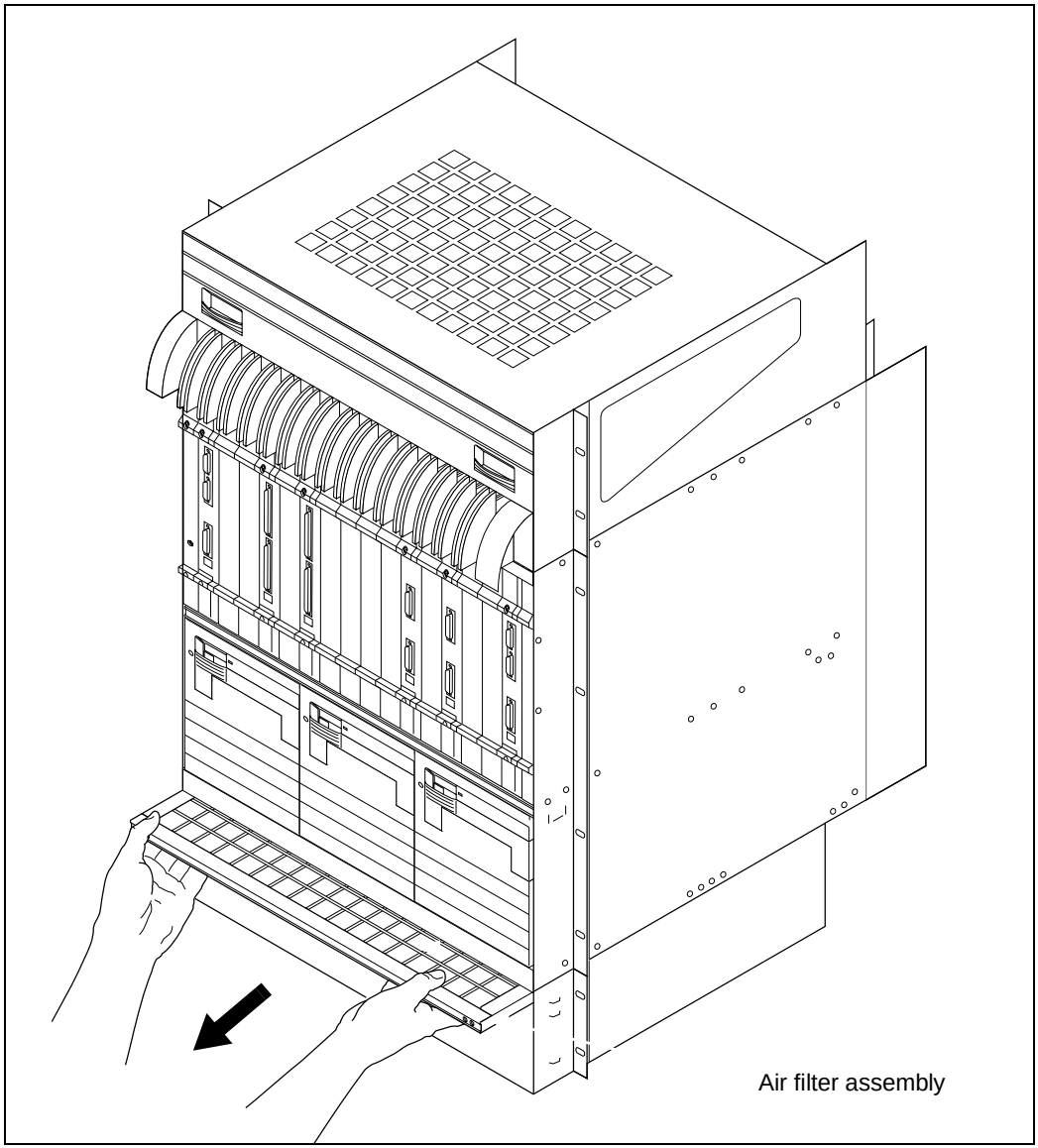


Figure 192
Changing the air filter pad in a Multiservice Switch 7480

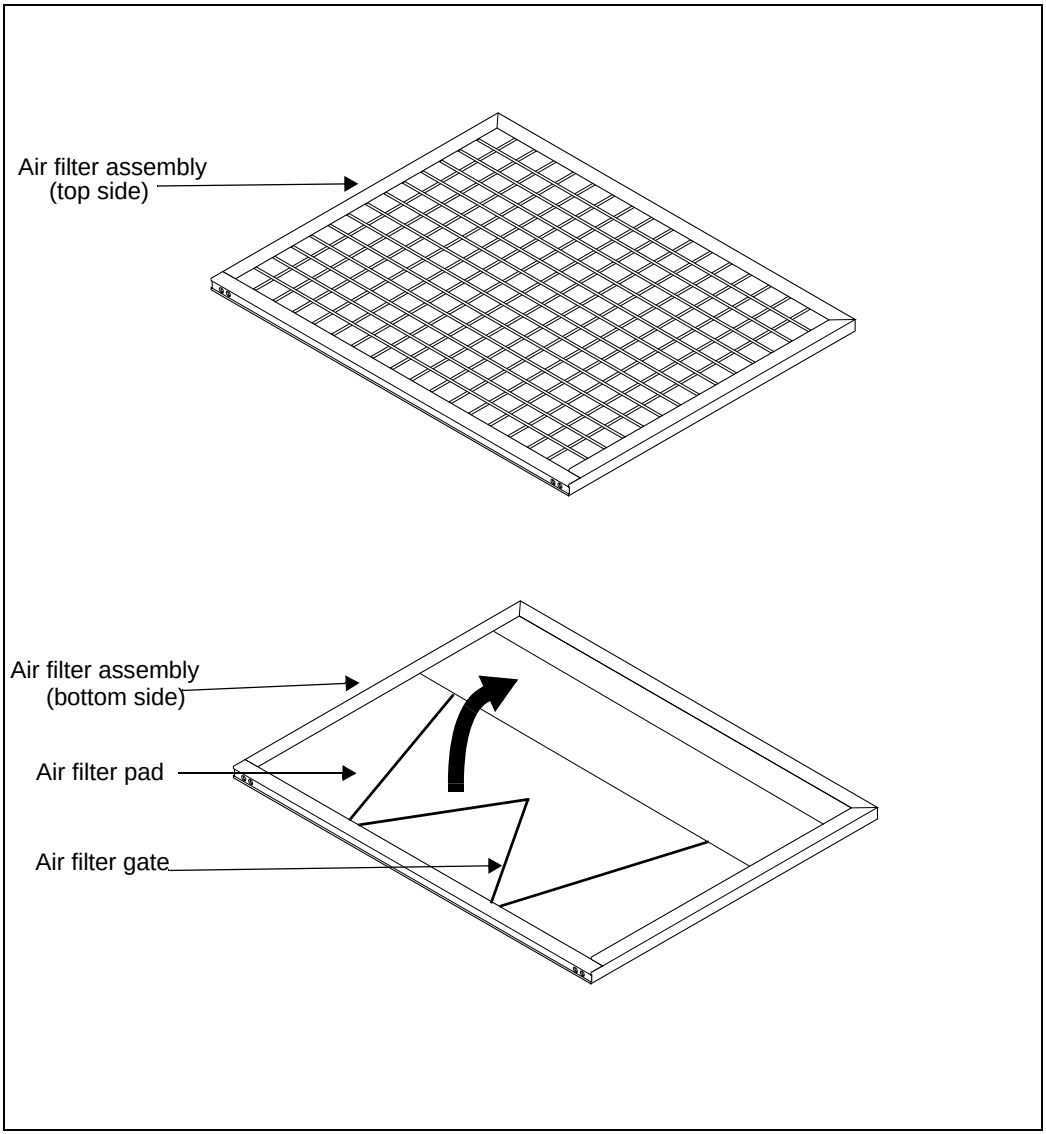


Figure 193
Installing an air filter in a Multiservice Switch 7480

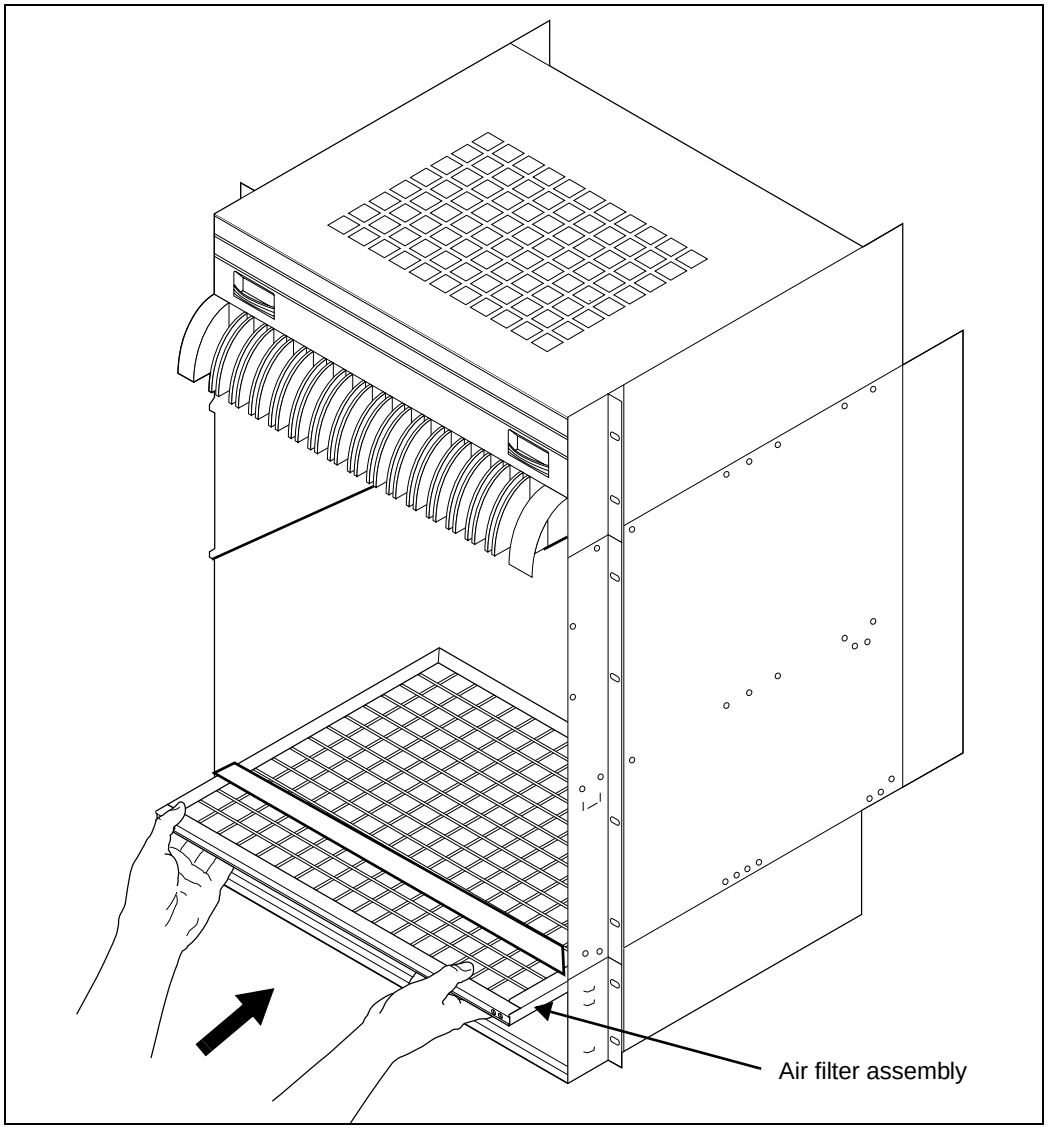


Table 13
Customer and equipment profile

Customer name	Equipment model	Equipment ID	Equipment location	Frequency
Note: The order number of an air filter pad for a Nortel Networks Multiservice Switch 7480 is A0383866.				

Table 14
Schedule for replacing air filters and vacuuming equipment

Year: ____	Eqpt. ID:_____				Eqpt. ID:_____				Eqpt. ID:_____			
	Filter	Vacuum	Person	Date	Filter	Vacuum	Person	Date	Filter	Vacuum	Person	Date
(e.g.)	√	√	B. B.	20								
Jan												
Feb												
Mar												
Apr												
May												
Jun												
Jul												
Aug												
Sep												
Oct												
Nov												
Dec												

Replacing the cooling unit power cord on a Multiservice Switch 7480

Replace the power cord on the cooling unit for a Nortel Networks Multiservice Switch 7480 if it fails.

Prerequisites

CAUTION

Risk of equipment damage

Replace a cooling unit power cord and restart cooling units within 10 minutes. You can damage the CPs and FPs and they can fail if the cooling fans are off longer than 10 minutes.

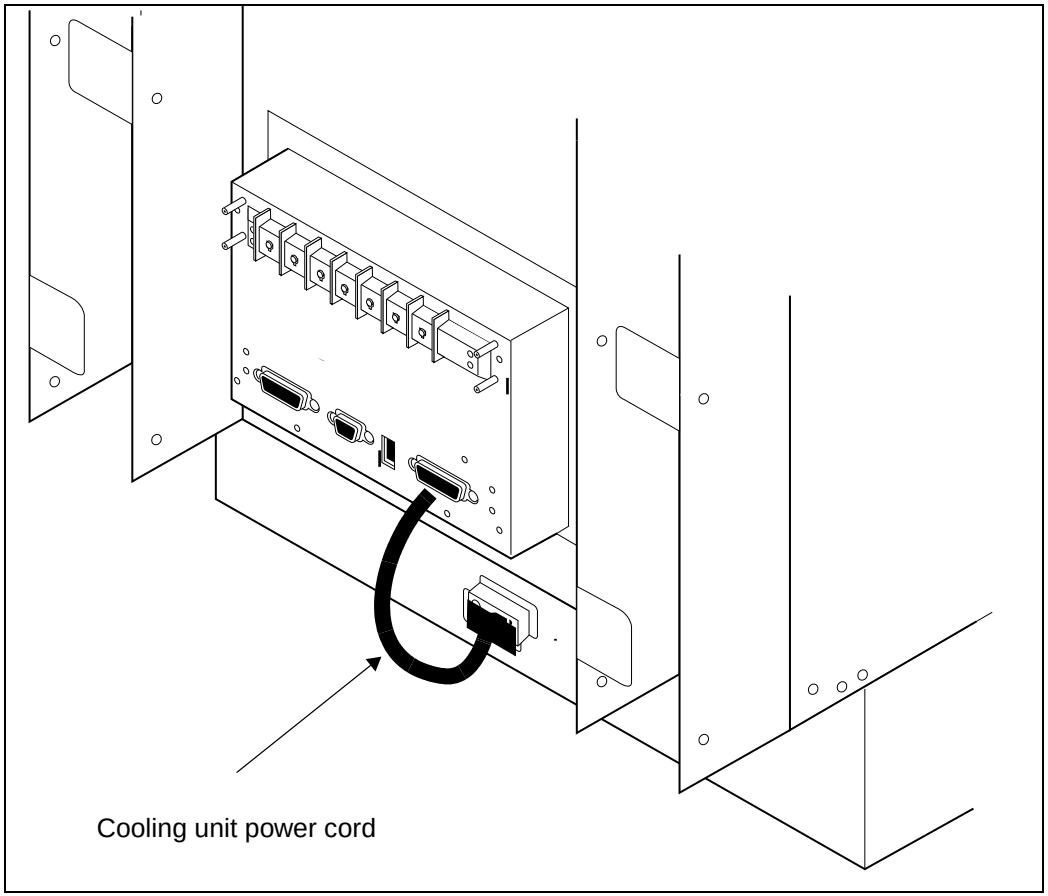
- You need a replacement cooling unit power cord with PEC NTHR66BA.

Procedure steps

1. Disconnect the power cord from the “C.U. Power” connector on the back of the shelf assembly. Use a 1/8-in. screwdriver to loosen the two screws. See the figure “Cooling unit power cord” (page 501).
2. Connect the replacement power cord to the “C.U. Power” connector on the back of the shelf assembly. Use a 1/8-in. screwdriver to tighten the two screws.

Procedure job aid

Figure 194
Cooling unit power cord



Replacing the external alarm cable

Replace an external alarm cable if it fails to restore external alarm capability.

Prerequisites

- Ensure that you have made the alarm cable to suit your installation and in accordance with the connector pinout information in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.
- If you are using long cables, ensure that your alarm system is not impeded by cable resistance.

Procedure steps

1 Disconnect the external alarm cable at Alarm 1 at the rear of the shelf assembly. See the appropriate figure for the location of the cable:

- “Location of the alarm connector and cutoff control on a Multiservice Switch” (page 503)
- “External alarm connector on a Multiservice Switch 7460” (page 504)
- “Dual alarm shelf interconnection between two Multiservice Switch 7480s” (page 440)

2 Connect the replacement cable to the rear of the device. It connects only one way. Ensure that the connector on the cable is the correct type, gender, and orientation of the connector on the shelf.

3 Connect the other end of the cable to your remote alarm system.

Procedure job aid

Figure 195
Location of the alarm connector and cutoff control on a Multiservice Switch

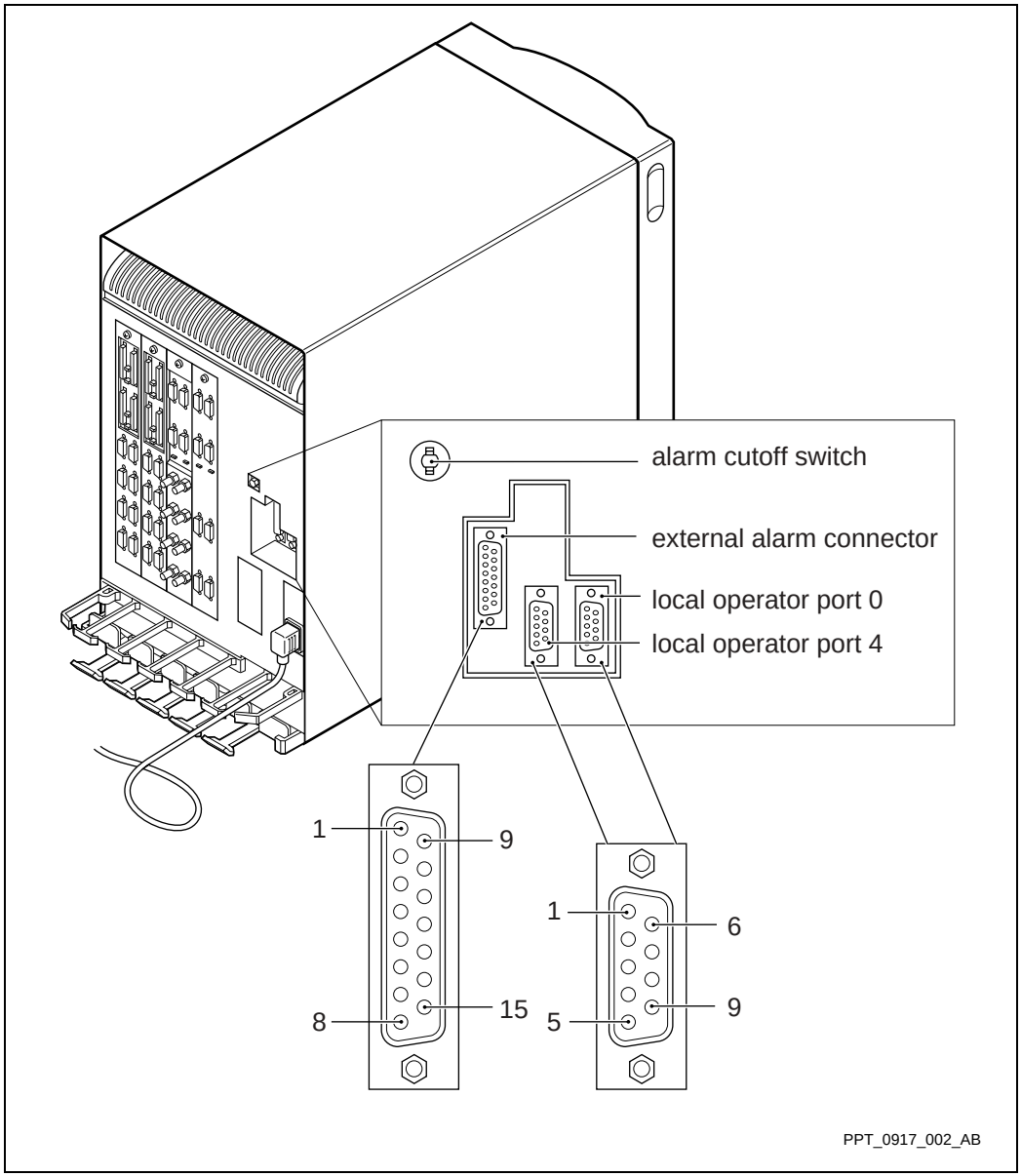


Figure 196
External alarm connector on a Multiservice Switch 7460

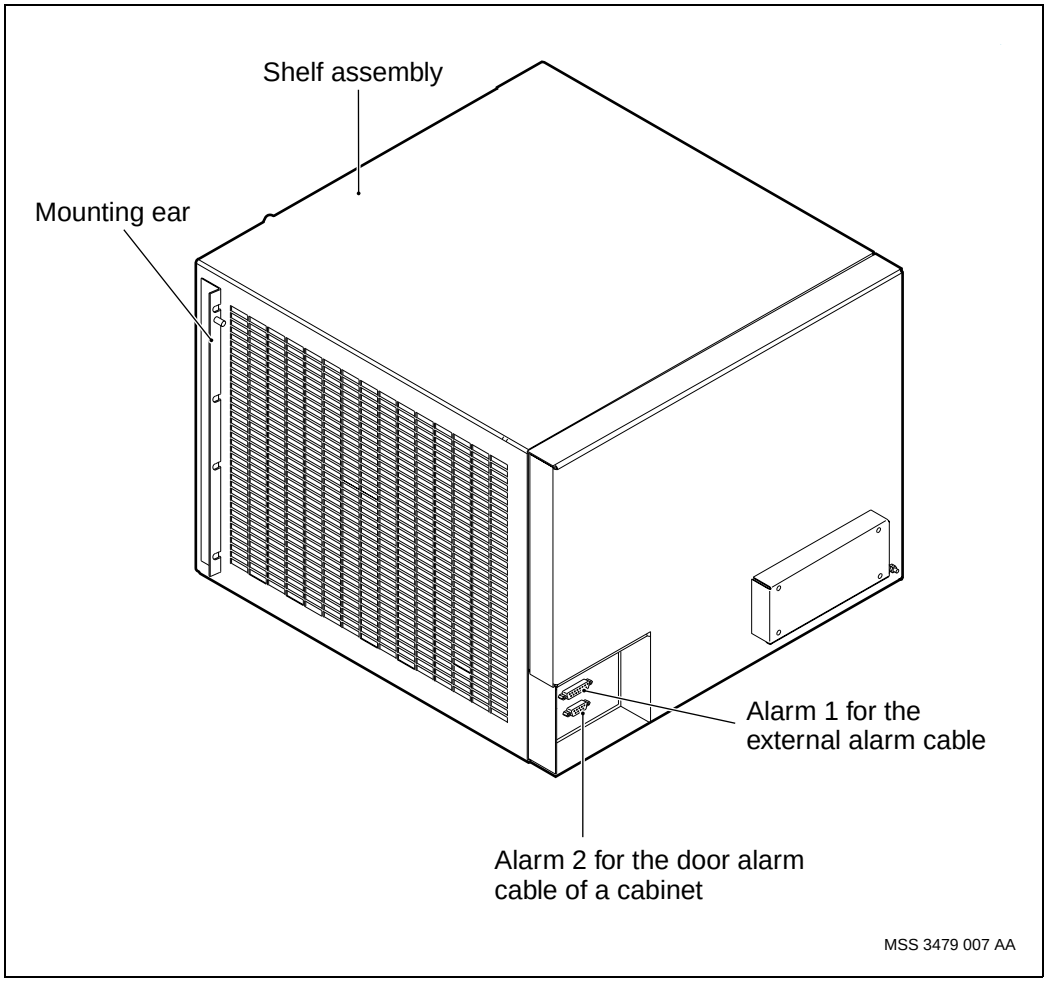
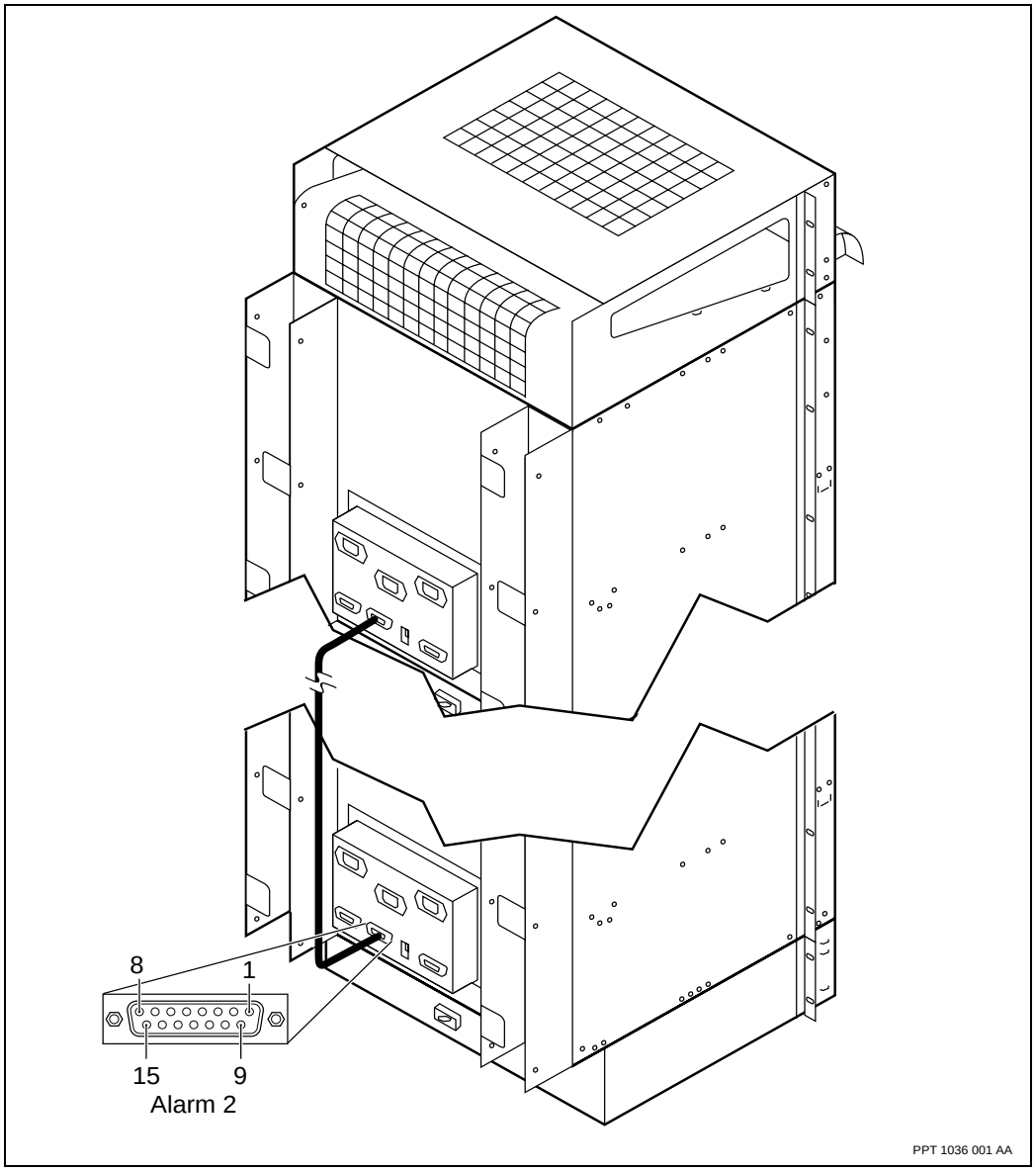


Figure 197
Dual alarm shelf interconnection between two Multiservice Switch 7480s



Resetting the alarm hardware

Reset the alarm hardware after you correct the fault that generated a major alarm.

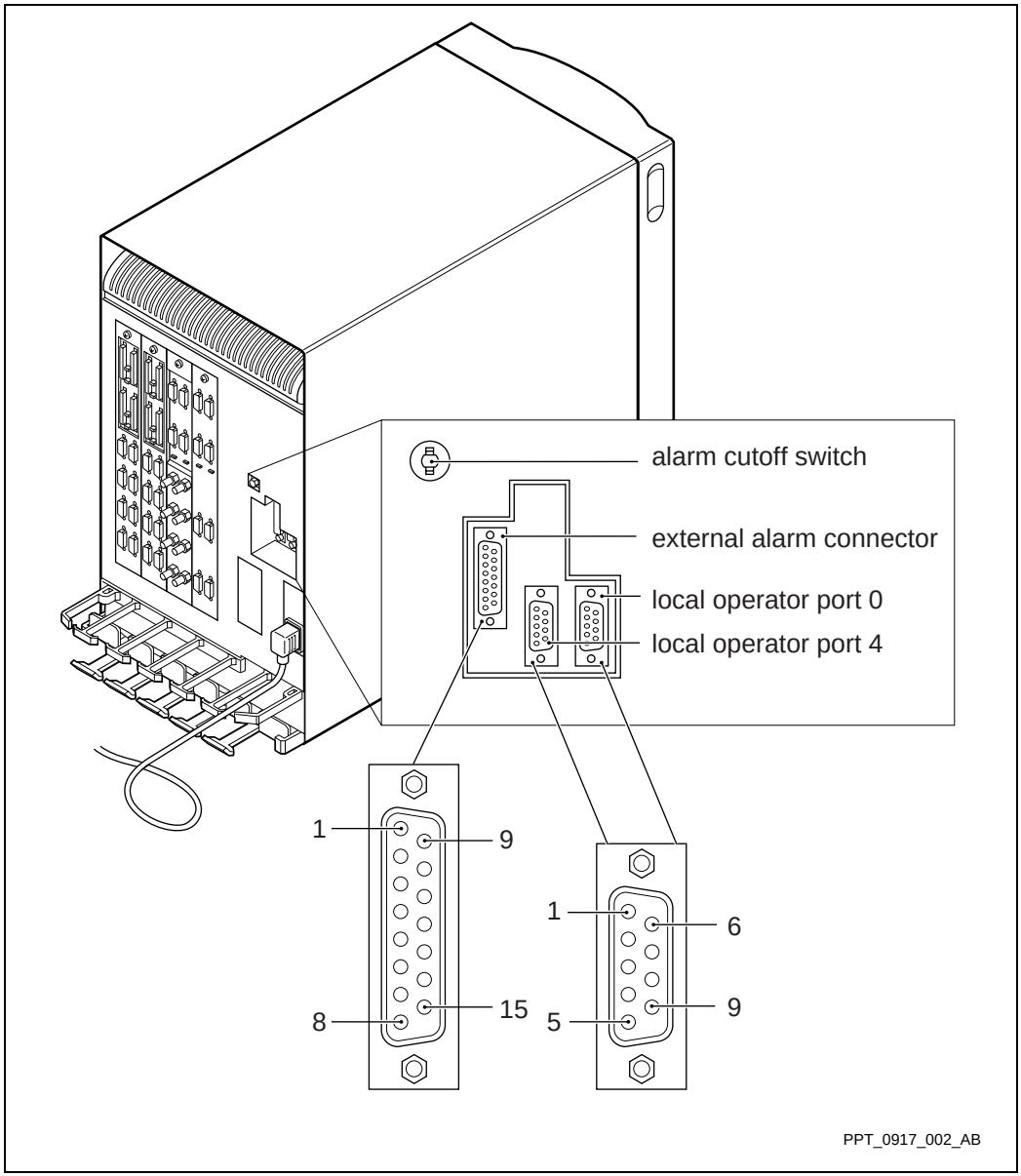
Procedure steps

1 For a major alarm press the alarm cutoff button. See the figures “Door alarm connectors for a Multiservice Switch 7480” (page 414), “Alarm panel for rack-mounted alarm panel kits NTJS74AA and NTPS20AA” (page 437), and “Multiservice Switch 7440 alarm connector and cutoff control” (page 507).

If you have not corrected the fault before you reset the alarm hardware, the shelf generates another alarm.

Procedure job aid

Figure 198
Multiservice Switch 7440 alarm connector and cutoff control



Routing cables out of a cabinet

Route cables through the top or bottom of a Multiservice Switch cabinet, depending on your installation.

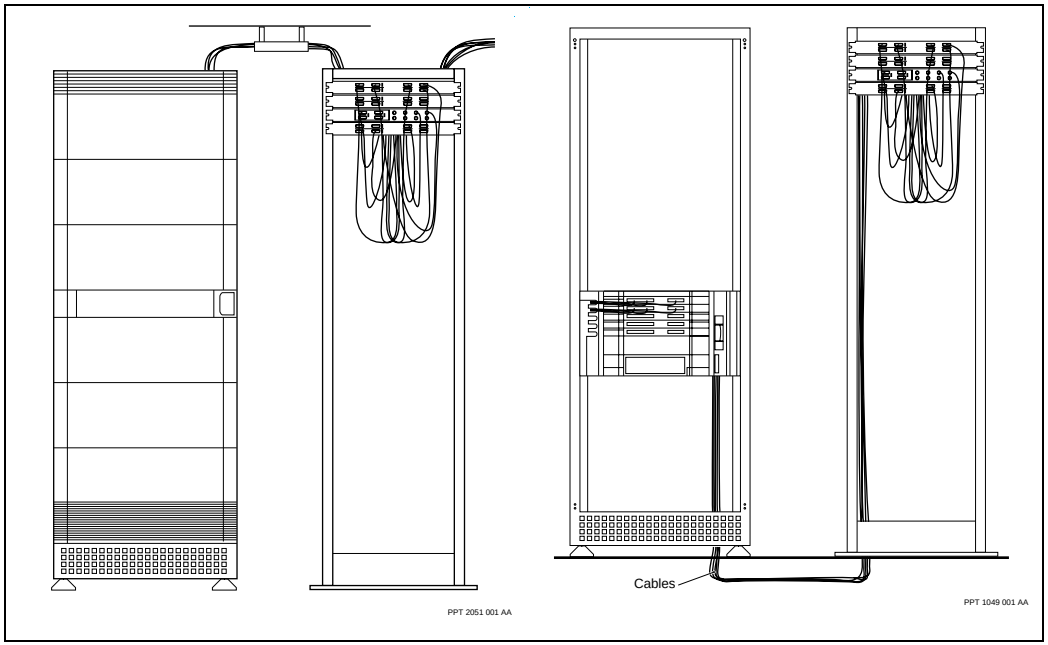
Procedure steps

1. Remove the 10-mm (3/8-in.) screws from smaller grill cutout in the top or bottom of the cabinet.
2. Route each cable through the cutout into the channels in the cable guide. The smaller channels in the cable guides are for fiber optic cables. See the figure “Cable routing through the top or bottom of a cabinet” (page 509).
3. Label all processor card cables near the connector to indicate the node name, slot number of the processor card, port number, and whether it is a receive or transmit cable.
4. Secure the cable to the sides of the cabinet at intervals to ensure that proper airflow around the shelves. Always ensure that you do not pinch cables, especially fiber cables.

   After you connect cables between endpoints, you may want to cluster groups of cables together.

Procedure job aid

Figure 199
Cable routing through the top or bottom of a cabinet



Routing card cables on a Multiservice Switch 7420

Route processor card cables through the built-in cable management assembly to termination panels installed on the back of the Multiservice Switch 7420.

Procedure steps

1. Route the cables from the faceplate of each processor card through the cable guides at the side of the device. See the figure “Multiservice Switch 7420 cable routing” (page 511).

   If you install termination panels at the back of the device, ensure that the top panel lines up with the top processor card. This simplifies cabling and avoids overlap.

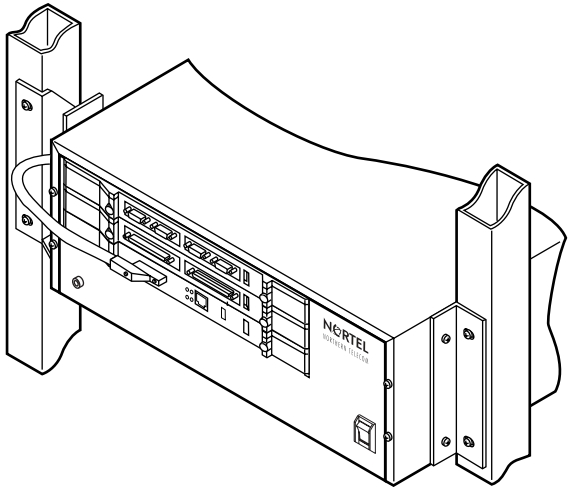
2. At the back of the device, route the cables to the termination panels.

3. Label all processor card cables near the connector to indicate the node name, slot number of the processor card, port number, and if it is a receive or transmit cable.

4. If desired, secure cables with cable ties. Always ensure that you do not pinch cables, especially fiber cables.

Procedure job aid

Figure 200
Multiservice Switch 7420 cable routing



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Routing card cables on a Multiservice Switch 7440

Route processor card cables through the built-in cable management assembly to termination panels installed on the back of a Nortel Networks Multiservice Switch 7440.

Procedure steps

1. Route the cables from the faceplate of each processor card through the cable guides at the top of the device. See the figure “Routing cables through a Multiservice Switch 7440” (page 513).

   Route processor card cables through the larger channels in the cable guide. Avoid overlapping the cables.

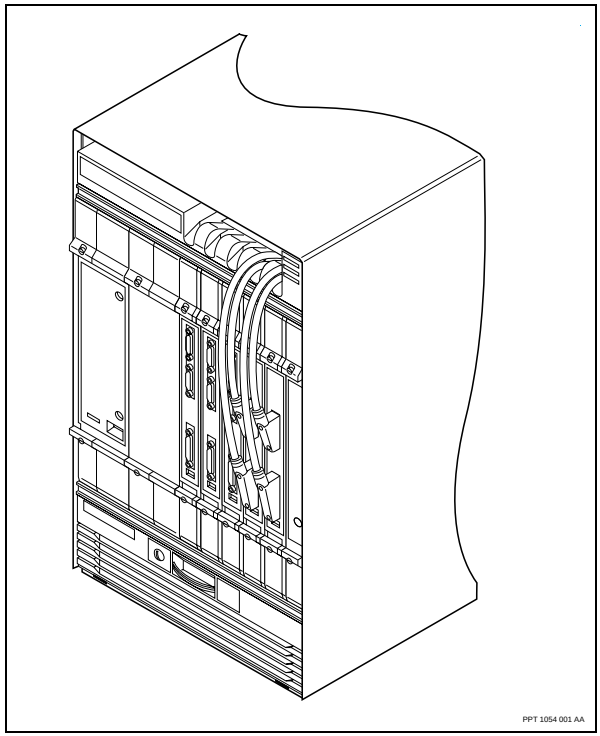
2. At the back of the device, route the cables to the termination panels.

3. Label all processor card cables near the connector to indicate the node name, slot number of the processor card, port number, and if it is a receive or transmit cable.

4. If desired, secure cables with cable ties. Always ensure that you do not pinch cables, especially fiber cables.

Procedure job aid

Figure 201
Routing cables through a Multiservice Switch 7440



Routing card cables on a Multiservice Switch 7460

Route processor card cables through the Nortel Networks Multiservice Switch 7460 cable management bracket, to keep them organized.

Procedure steps

1 Route the cables from the faceplate of each processor card through the cable management bracket as shown in the figure “Cable path from processor cards in a Multiservice Switch 7460” (page 515).

Processor card cables are intended to be routed to the left side of the shelf to accommodate offset connectors. If you route any cables along the right side of the shelf, you must ensure that they do not reduce or restrict the intake airflow from the right.

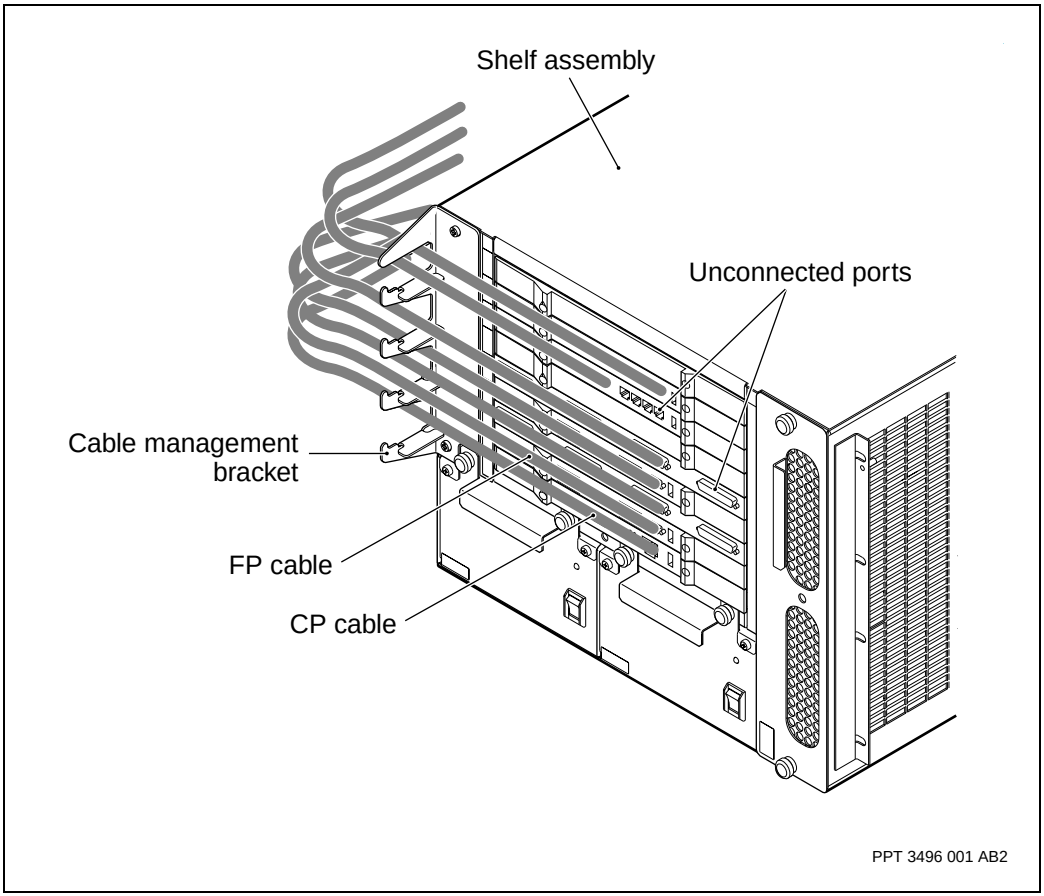
2 Label all processor card cables near the connector to indicate the node name, slot number of the processor card, port number, and if it is a receive or transmit cable.

3 Secure cables to the sides of the cabinet away from the side of the shelf assembly to ensure unrestricted or unreduced exhaust airflow from the left side of the shelf assembly. The shelf requires a minimum air flow space of 5 cm (2 in.) on each side of the shelf.

When dressing cables, always ensure that you do not crimp, pinch, snag, or over bend cables, especially fiber cables. The bend radii of cables is provided in NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Procedure job aid

Figure 202
Cable path from processor cards in a Multiservice Switch 7460



Routing card cables on a Multiservice Switch 7480

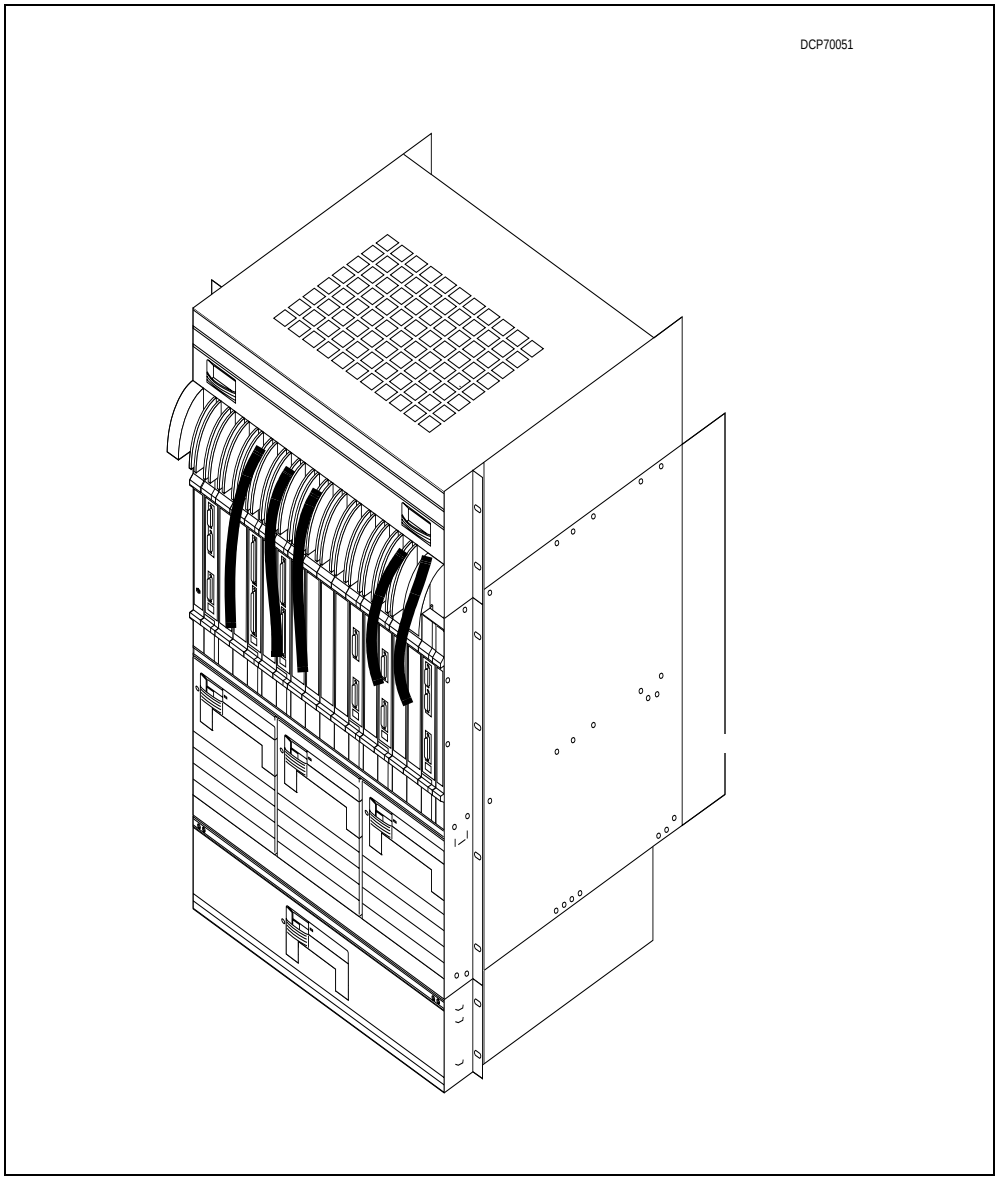
Route processor card cables through the cable management assembly on top of the Nortel Networks Multiservice Switch 7480 to keep them organized.

Procedure steps

1. Open the cable management assembly door.
2. Route the cables from the faceplate of each processor card through the cable management assembly above the shelf assembly. The smaller channels in the cable guides are for fiber optic cables. See the figure “Routing cables through a cable management assembly for a Multiservice Switch 7480” (page 517).
3. Label all processor card cables near the connector to indicate the if it is a receive or transmit cable.
4. Secure cables to the sides of the cabinet to ensure that proper airflow around the shelves. Always ensure that you do not pinch cables, especially fiber cables.
5. Close the cable management assembly door to hold the cables in place.

Procedure job aid

Figure 203
Routing cables through a cable management assembly for a Multiservice Switch 7480



Setting DIP switches on a HSSI function processor

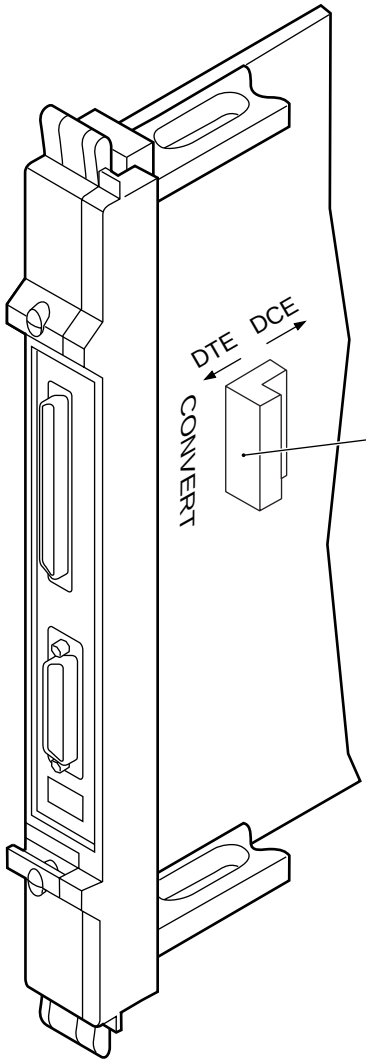
Set DIP switches on a HSSI function processor to DCE or DTE before you install the FP in a shelf.

Procedure steps

1. To set the HSSI function processor from DCE to DTE operation, set all poles of the DIP switch to the *convert* position. See the figure “DIP switch location and setting on HSSI function processors” (page 519).
2. Ensure that you set the DIP switch completely to DCE or DTE before you install the function processor in the shelf.

Procedure job aid

Figure 204
DIP switch location and setting on HSSI function processors



DCE/DTE DIP switch
Right = DCE
Left = DTE

DIP switch
should be
towards faceplate
(CONVERT position)
for DTE operation

Note:
The DIP switch is
a seven pole switch.
Ensure the switch is
completely set in
DTE or DCE position
before inserting card.

Setting DIP switches on a V.11 function processor

Set DIP switches on a V.11 function processor before you install the FP in a shelf.

Prerequisites

- The V.11 function processor has PEC NTNQ50.

Procedure steps

1 If your installation requires a terminated line, set the appropriate DIP switch to the *on* (down) position.

or

If your installation requires an unterminated line, set the appropriate DIP switches to the *off* (up) position.

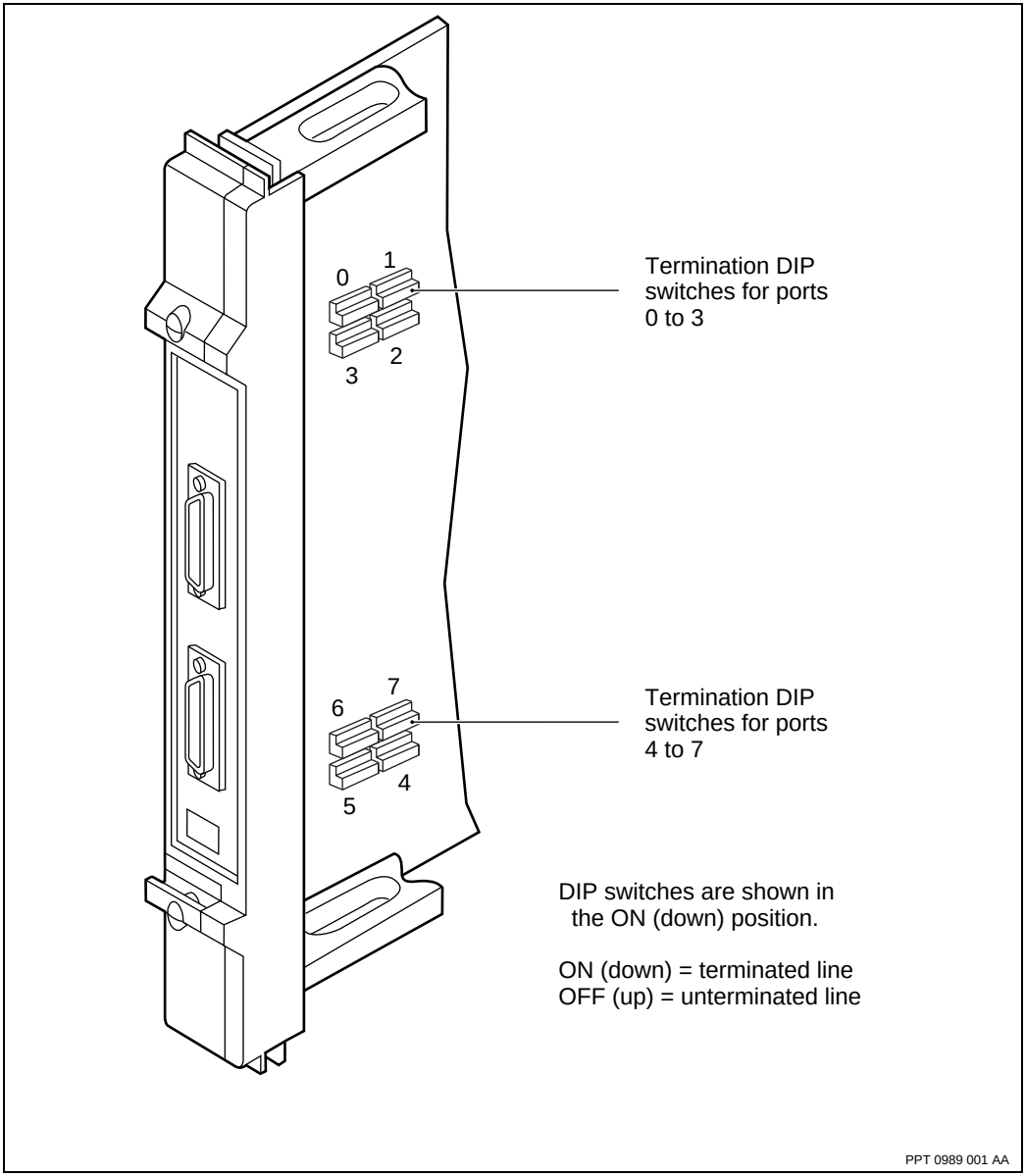
See the figure “Location of DIP switches on the V.11 function processor” (page 521).

2 Ensure that the position of the DIP switch corresponds to the setting for the *LineTerminationRequired* attribute.

The *LineTerminationRequired* attribute has no hardware impact. It does not change the setting of the DIP switch. However, the device raises an alarm if the settings do not match. The default setting for the *LineTerminationRequired* attribute is *yes.* For more information, see NN10600-060 *Nortel Networks Multiservice Switch 7400/15000/20000 Component Reference*.

Procedure job aid

Figure 205
Location of DIP switches on the V.11 function processor



Setting modem DIP switches

Set modem DIP switches using the instructions provided by the manufacturer of the modem before you configure the modem software.

Prerequisites

- Ensure that the modem you want to use supports all of the required settings. For more information, see “Modem selection” (page 175).

Procedure steps

1 Set the modem DIP switches as specified in the table “Modem DIP switch settings” (page 522). The table applies to a US Robotics 56K modem as an example of the settings you must apply.

Table 15
Modem DIP switch settings

DIP switch number	Description of the setting	Required setting
1	modem ignores DTR (override)	on (down)
2	verbal (word) results	off (up)
3	disable word codes	off (up)
4	suppresses echo	on (down)
5	modem answers on first ring, or higher if specified in non-volatile memory (NVRAM)	off (up)
6	modem sends CD signal when it connects with another modem, drops CD on disconnect	off (up)
7	loads Y or Y1 configuration from user-defined NVRAM	off (up)
8	disables command recognition (dumb mode)	off (up)

Turning on power

Turn on the power source after you have completed all procedures involving power supplies or cables.

Procedure steps

1. Toggle on the appropriate circuit breaker at the power source that feeds each power supply that was turned off.
2. Toggle to the on position the power control on the power supply.

   The LED on the power supply of a Nortel Networks Multiservice Switch 7460 device lights green to indicate power is on. Unlit means the power source is still off.

Unpacking a horizontally-packaged cabinet

Unpack a cabinet in a dust-free area near the installation site. Nortel Networks Multiservice Switch cabinets are generally shipped horizontally.

Prerequisites

WARNING

Risk of personal injury

A cabinet that contains one Multiservice Switch device weighs 200. kg (441 lb). You need four people to safely move this cabinet.

A cabinet that contains two devices weighs 313. kg (689 lb). You need six people to safely move this cabinet.

WARNUNG

Verletzungsgefahr

Ein Gehäuse mit einem Switches wiegt 200 kg. Zum sicheren Bewegen dieses Gehäuses werden vier Personen benötigt.

Ein Gehäuse mit zwei Switches wiegt 313 kg. Zum sicheren Bewegen dieses Gehäuses werden sechs Personen benötigt.

CAUTION

Avoid structural stress when maneuvering uncrated cabinets and shelf assemblies

When handling and moving uncrated cabinets and shelf assemblies, avoid strain, excessive shock, or vibrations, which can damage or warp the equipment.

Procedure steps

1. Ensure that the cabinet is properly secured to the pallet.
2. Move the cabinet on the pallet to the dust-free unpacking area using a self-standing wheeled apparatus (for example, a hand truck or fridge cart). Use two or three helpers to move the equipment over cables or doorway thresholds.

3 Verify that the cabinet will be placed off the pallet onto on a flat surface so that it does not tip over after you stand it upright.

WARNING
Risk of personal injury
The banding that secures the cabinet packaging is under pressure and can fly up when cut.

WARNUNG
Verletzungsgefahr
Die Gehäuseverpackung ist mit einem Spannband gesichert. Seien Sie vorsichtig beim Durchschneiden des Bandes, da es möglicherweise mit Gewalt aufspringt.

4 Use a pair of tin snips to cut the banding that secures the cabinet packaging.

5 Remove the cardboard packaging on the top and sides so that the cabinet remains resting on a tray of cardboard.

6 Without opening them, put aside all boxes containing control processors (CPs), function processors (FPs), the power supplies, the termination panels, and any other boxes. Each item is identified on the container by its Nortel Networks product engineering code (PEC) NTxxxxaa or part number Pnnnnnn.) Unpack them later when appropriate antistatic equipment protection will be specified for the installation procedure.

If the cabinet was shipped in wrapping material other than cardboard, there can be some electrostatic energy build-up as you remove this material. This is normal.

7 Slide the cabinet along the tray until the foot of the cabinet clears the tray.

8 Lift the cabinet from the top end and stand it upright on the floor.

9 Inspect the equipment for damage. If any equipment is damaged, contact your Nortel Networks sales representative to arrange having it replaced.

10 Remove and retain any assembly parts that are attached to the framework or cabinet.

11 Clear the unpacking area of all debris.

12 Compare the contents of your shipment with the table “Equipment checklist for unpacking a cabinet” (page 543) and the figure “Taking inventory after unpacking a cabinet” (page 544) to ensure that you have all the hardware components you require.

Unpacking a Multiservice Switch 7420

Unpack the Nortel Networks Multiservice Switch 7420 as close as possible to the installation site.

Prerequisites

CAUTION
Risk of electrostatic damage
To avoid electrostatic damage, do not unpack the termination panels at this time. When handling processor cards, always wear antistatic footwear or provide equivalent protection to avoid electrostatic damage to electronic parts.

- Nortel Networks ships mounting kits in separate boxes. Unpack your mounting kit and place the parts to the side until you are ready to mount the chassis.

Procedure steps

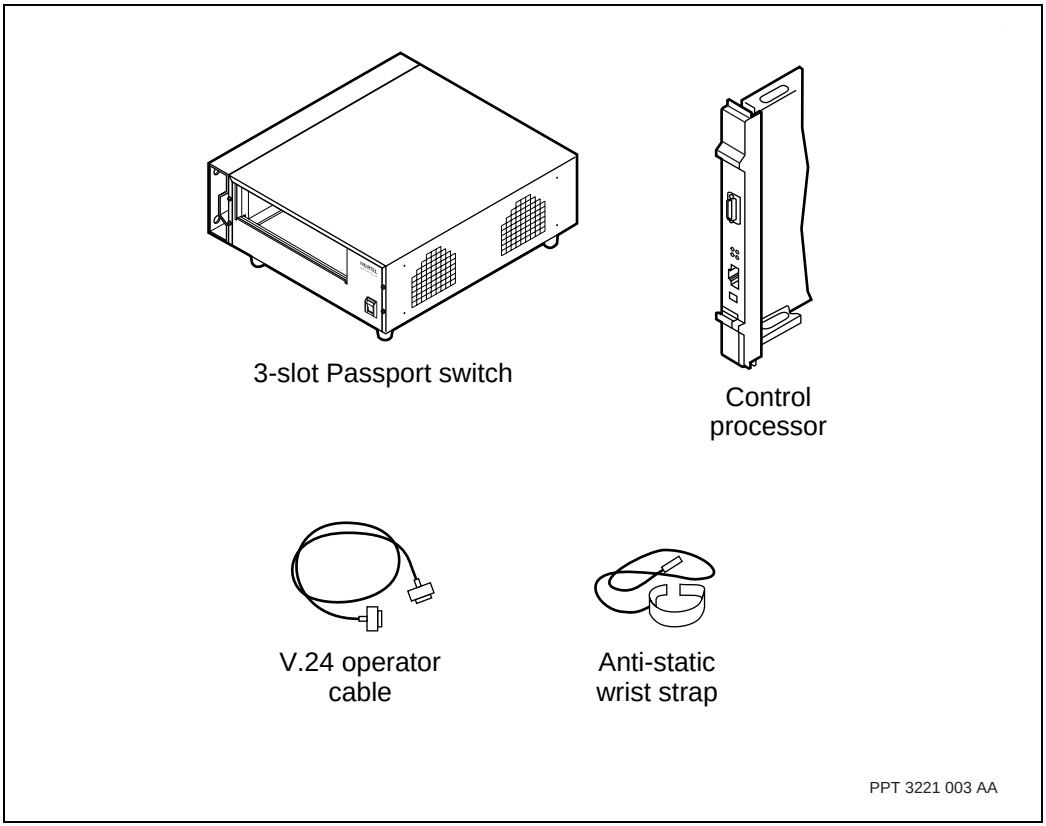
1. Place the termination panel boxes to one side. Do not unpack them.
2. Set the box on the floor with the top end up.
3. Cut the tape that seals the top flaps, taking care not to cut into the contents of the box, and fold back all four flaps.
4. Remove the foam from the top of the chassis.
5. Lift the chassis from the box and set it on the floor or table.
6. Remove the packing material from the chassis.
7. Unpack any other equipment that was delivered with the device.
8. Compare the contents of your shipment with the table “Equipment checklist for the Multiservice Switch 7420 base package” (page 528) and the figure “Taking inventory after unpacking a Multiservice Switch 7420” (page 529) to ensure that you have all the hardware you require.

Table 16
Equipment checklist for the Multiservice Switch 7420 base package

Equipment
Multiservice Switch 7420 with integrated dc power supply and cooling fan
control processor (CP)
DCE V.24 operator cable
antistatic wrist strap

Procedure job aid

Figure 206
Taking inventory after unpacking a Multiservice Switch 7420



Unpacking a Multiservice Switch 7440

Unpack the Nortel Networks Multiservice Switch 7440 as close as possible to the installation site.

Procedure steps

1. Set the box on floor with top end down.
2. Cut tape sealing the bottom flaps.
3. Fold back the bottom flaps against the outside sides of the box.
4. Turn the box right side up as you hold the bottom flaps out.
5. Lift the box up and off of the device.
6. Remove the box that contains the power supply.
7. Remove the packing material.
8. Compare the contents of your shipment with the table “Equipment checklist for unpacking a Multiservice Switch 7440” (page 530)and the figure “Taking inventory after unpacking a Multiservice Switch 7440” (page 532) to ensure that you have all the hardware components you require.

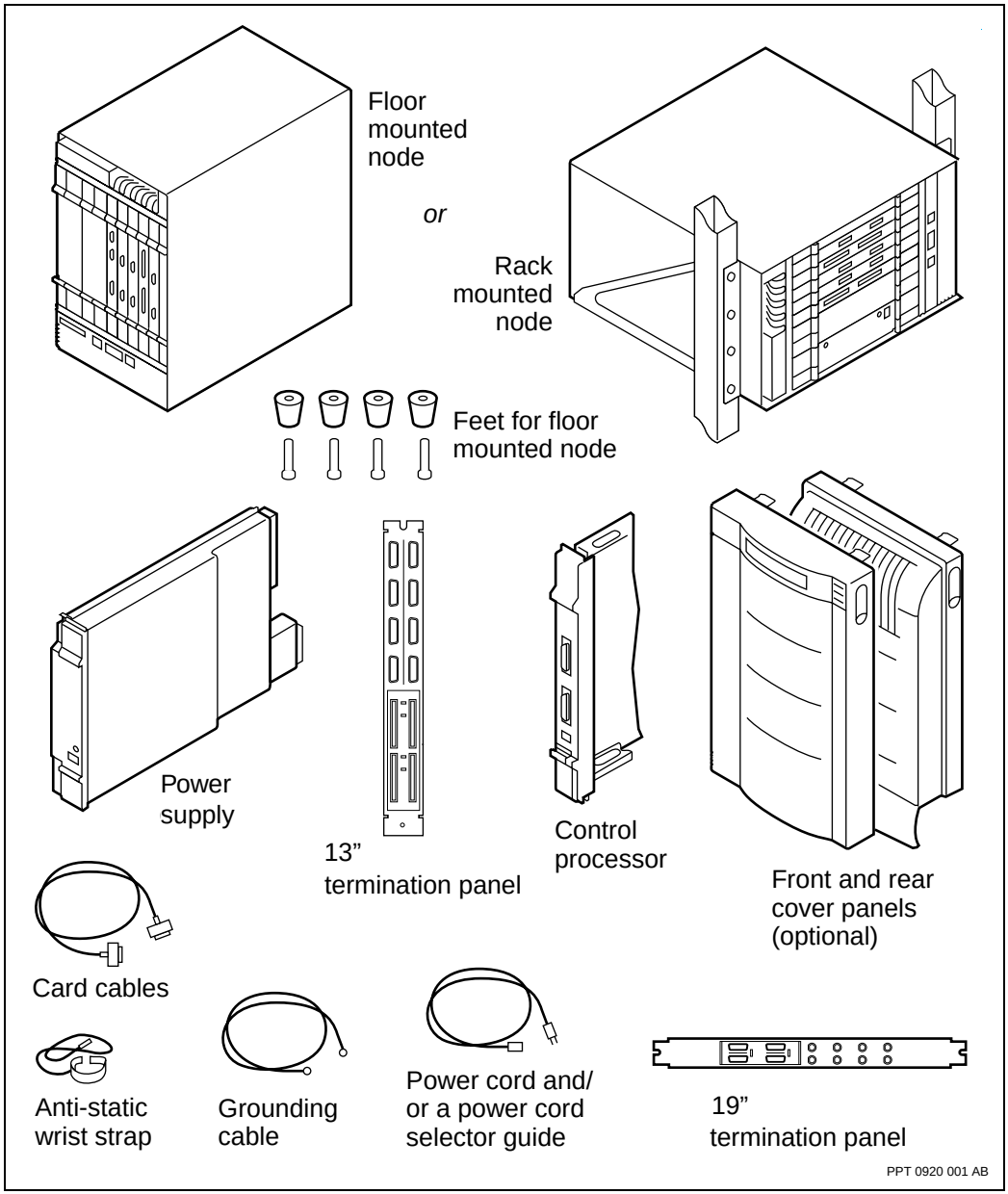
Table 17
Equipment checklist for unpacking a Multiservice Switch 7440

÷	Equipment
	Multiservice Switch 7440 with pre-installed: • FPs, 1 to 4 for each device • Blank processor cards (NTBP23), 4 for each device less the number of function processors • Cooling unit (fan tray) and air filter
	Power supply and a power supply filler
	Ac power cords (1 for each power supply) or Dc power wiring. See NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description* for dc power cabling requirements.
(Sheet 1 of 2)	

Table 17 (continued)
Equipment checklist for unpacking a Multiservice Switch 7440

÷	**Equipment**
	CP(1 or 2)
	FP cables
	Termination panels (as required)
	Grounding cable for termination panels
	Grounding strips for termination panels (1 for each panel)
	Optional: front and rear cover kit Optional: rubber feet and fasteners (4 of each) Optional: rack mounting brackets
	Antistatic wrist strap
(Sheet 2 of 2)	

Figure 207
Taking inventory after unpacking a Multiservice Switch 7440



Unpacking a Multiservice Switch 7460

Unpack the Nortel Networks Multiservice Switch 7460 as close as possible to the installation site.

Prerequisites

CAUTION

Avoid structural stress when maneuvering uncrated shelf assemblies

When handling and moving uncrated shelf assemblies, avoid strain, excessive shock or vibrations that can damage or warp the equipment.

Procedure steps

1. Use a knife to open the packaging.
2. Place the control and function processor boxes (labeled with their names and Nortel Networks part numbers) and termination panel boxes to one side. You unpack them later.

CAUTION

Risk of electrostatic damage

When handling circuit cards, wear a grounded antistatic wrist strap or equivalent protection to avoid damaging electronic parts.

3. Take each remaining unit of equipment from its box, and carefully remove its protective packaging.
4. Inspect the equipment for damage. If any equipment is damaged, contact your purchasing department and arrange to have it replaced.
5. Clear the unpacking area of all debris. Keep all the packing material and containers in case the equipment has to be moved later.
6. Compare the contents of your shipment with the table “Equipment checklist for unpacking a Multiservice Switch 7460” (page 534) and the figure “Taking inventory after unpacking a Multiservice Switch 7460” (page 535) to ensure that you have all the hardware you ordered.

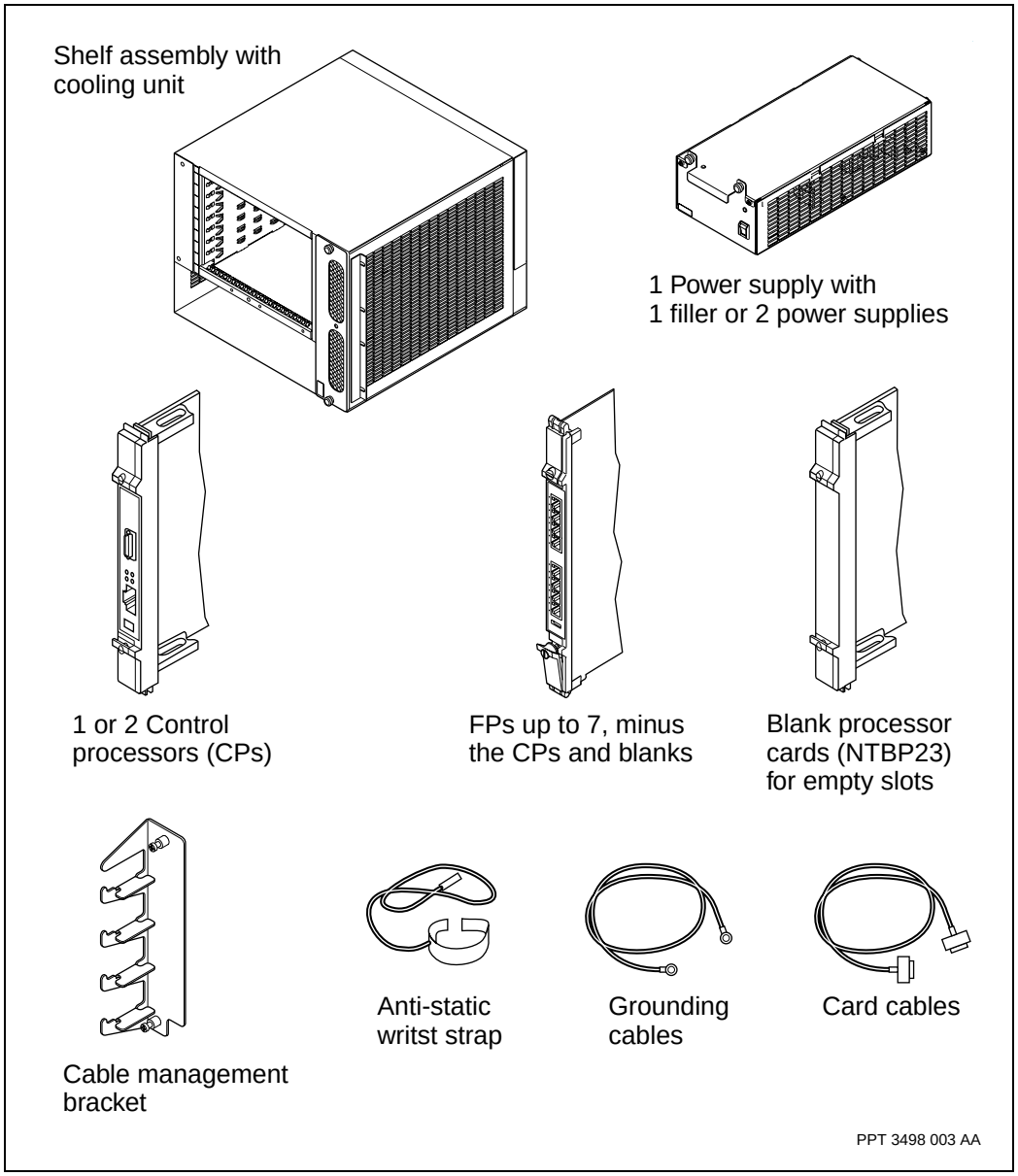
   If you purchased the device separately (not as part of a cabinet package), Nortel Networks packages each unit of hardware separately.

Procedure job aid

Table 18
Equipment checklist for unpacking a Multiservice Switch 7460

÷	Equipment
	NTBP23, blank processor cards (1 for each empty card slot)
	NTEP80, shelf assembly (empty)
	NTEP8023, cooling unit with air filter
	NTEP8025, seismic brackets kit (optional)
	NTPS19, DC power supplies, 1 or 2
	NTPS20, remote alarm panel (optional)
	NTPS21, cable management bracket
	NTPS22, power supply filler (only if 1 power supply is present)
	NTPS23, rear fanout panel mounting kit (optional)
	NTNQ01, control processor cards, 1 or 2
	NTNQ03, CP2 control processor cards with BITS, 1 or 2
	P0609614, air filter foam replacement pad (spare part)
	assorted function processor (FP) cards (up to 6)
	function processor (FP) cables (as required)
	termination panels (as required)
	grounding cable for termination panels
	grounding strips for termination panels (1 for each panel)
	ground cable for the shelf assembly
	antistatic wrist strap

Figure 208
Taking inventory after unpacking a Multiservice Switch 7460



Unpacking a Multiservice Switch 7480

Unpack a Nortel Networks Multiservice Switch 7480 as close as possible to the installation site.

Prerequisites

CAUTION

Avoid structural stress when maneuvering uncrated shelf assemblies

When handling and moving uncrated shelf assemblies, avoid strain, excessive shock or vibrations that can damage or warp the equipment.

Procedure steps

1. Use a knife to open the packaging.
2. Place the control and function processor boxes (labeled with their names and Nortel Networks part numbers) and termination panel boxes to one side. You can unpack them later.

CAUTION

Risk of electrostatic damage

When handling circuit cards, wear a grounded antistatic wrist strap or equivalent protection to avoid damaging electronic parts.

3. Take each remaining unit of equipment from its box, and carefully remove its protective packaging.
4. Inspect the equipment for damage. If any equipment is damaged, contact your purchasing department and arrange to have it replaced.
5. Clear the unpacking area of all debris. Keep all the packing material and containers in case the equipment has to be moved later.
6. Compare the contents of your shipment with the table “Equipment checklist for unpacking a Multiservice Switch 7480” (page 537) and the figure “Taking inventory after unpacking a Multiservice Switch 7480” (page 538) to ensure that you have all the hardware you require.

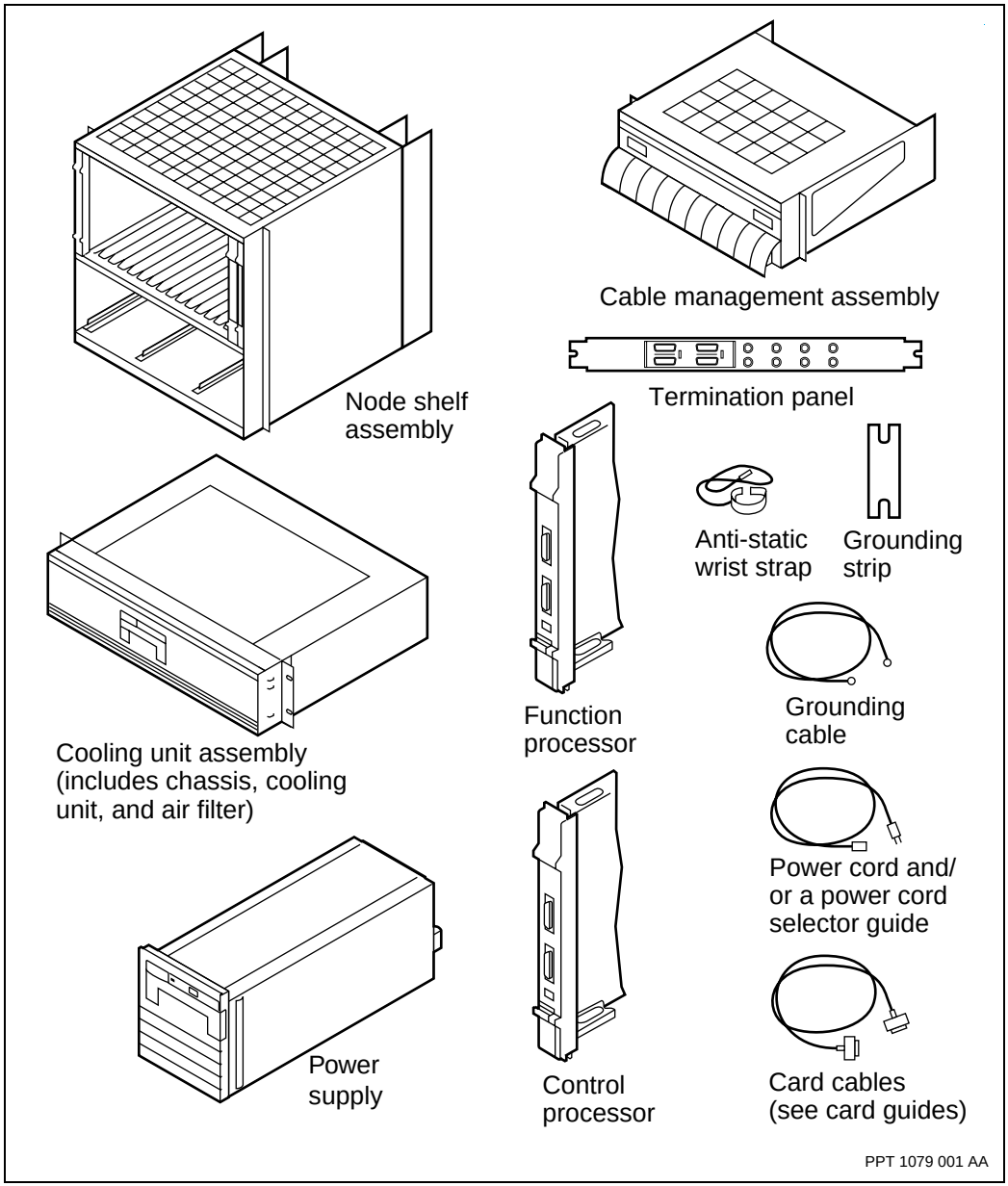
   If you purchased the device separately (not as part of a cabinet package) Nortel Networks packages each unit of hardware separately.

Procedure job aid

Table 19
Equipment checklist for unpacking a Multiservice Switch 7480

÷	**Equipment**
	Device shelving (for 1 or 2 devices, depending on your installation)
	Cooling unit chassis
	Cooling unit and air filter
	Cooling unit cables
	Shelf assembly ground cables
	Cable management assembly
	Power supplies (up to 3)
	Power supply filler (3 less the number of power supplies)
	CPs (1 or 2)
	FPs (up to 15)
	FP cables (as required)
	Blank processor cards (NTBP23), 14 for each device less the number of processor cards
	Termination panels (as required)
	Grounding cable for termination panels
	Grounding strips for termination panels (1 for each panel)
	Power cords (1 for each power supply)
	Power cord selector guide
	Antistatic wrist strap

Figure 209
Taking inventory after unpacking a Multiservice Switch 7480



Unpacking a processor card

Unpack a processor card in preparation for installation. Nortel Networks packs processor cards separately, in boxes that contain antistatic material.

Prerequisites

CAUTION
Risk of electrostatic damage
When handling processor cards, wear a grounded antistatic wrist strap so that you do not damage electronic parts. For more information, see “Avoiding damage from static electricity” (page 208).

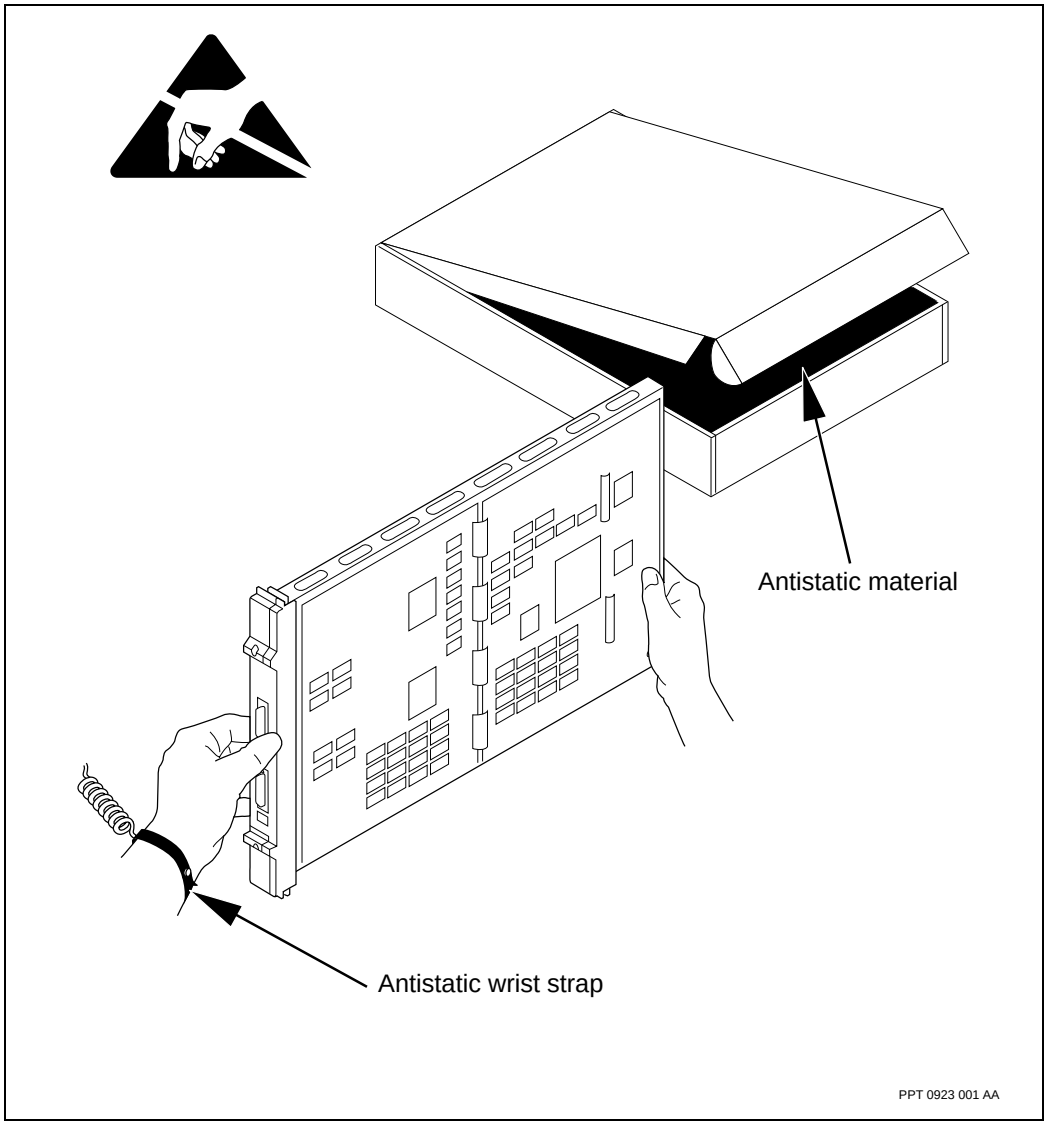
CAUTION
Risk of service degradation by condensation
Condensation on a processor card can affect its ability to operate. Allow an unpacked processor card at least one hour to adjust to the ambient temperature and humidity of the room before inserting it into a shelf.

Procedure steps

1. Open the box and remove the processor card. See the figure “Antistatic protection for unpacking a processor card” (page 540).
2. Save the original packaging. You must use this packaging if you need to store or ship the processor card.

Procedure job aid

Figure 210
Antistatic protection for unpacking a processor card



Unpacking a vertically-packaged cabinet

Unpack a cabinet in a dust-free area near the installation site.

Prerequisites

CAUTION
Avoid structural stress when maneuvering uncrated cabinets and shelf assemblies
When handling and moving uncrated cabinets and shelf assemblies, avoid strain, excessive shock, or vibrations, which can damage or warp the equipment.

- Unpacking a vertically packaged cabinet involves removing the packaging and removing the cabinet from the pallet. If space is limited at the unpacking area, remove the cabinet from the pallet first and transport it on a dolly. For the dimensions and weights of hardware, see NN10600-170 *Nortel Networks Multiservice Switch 7400 Hardware Description*.

Procedure steps

1. Ensure that the cabinet is properly secured to the pallet.
2. Move the cabinet on the pallet to the dust-free unpacking area using a self-standing wheeled apparatus (for example, a hand truck or fridge cart). Use two or three helpers to move the equipment over cables or doorway thresholds.
3. Verify that the cabinet will be placed off the pallet onto on a flat surface so that it does not tip over after you stand it upright.

WARNING
Risk of personal injury
The sharp ends of the staples that hold the packaging together and anchor the cabinet to the pallet can be exposed as you unpack the cabinet.

WARNUNG

Verletzungsgefahr

Die scharfen Enden der Klammern, mit denen die Verpackung zusammengehalten und an der Palette befestigt ist, stehen beim Auspacken des Gehäuses möglicherweise hervor.

4 Use a pair of pliers to pull the staples out of the cardboard packaging on the top of the cabinet.

5 Remove the packaging from the top of the cabinet.

6 Use the pliers to pull the staples out of the cardboard sleeves.

7 Remove the cardboard sleeves. Keep all the packaging material and containers, including the pallet.

8 Without opening them, put aside all boxes containing control processors (CPs), function processors (FPs), the power supplies, the termination panels, and any other boxes. Each item is identified on the container by its Nortel Networks product engineering code (PEC) NTxxxxaa or part number Pnnnnnn.) Unpack them later when appropriate antistatic equipment protection will be specified for the installation procedure.

If the cabinet was shipped in wrapping material other than cardboard, there can be some electrostatic energy build-up as you remove this material. This is normal.

9 Inspect the equipment for damage. If any equipment is damaged, contact your Nortel Networks sales representative to arrange having it replaced.

10 Remove and retain any assembly parts that are loosely attached to the framework or cabinet.

11 Clear the unpacking area of all debris.

12 Compare the contents of your shipment with the table “Equipment checklist for unpacking a cabinet” (page 543) and the figure “Taking inventory after unpacking a cabinet” (page 544) to ensure that you have all the hardware components you require.

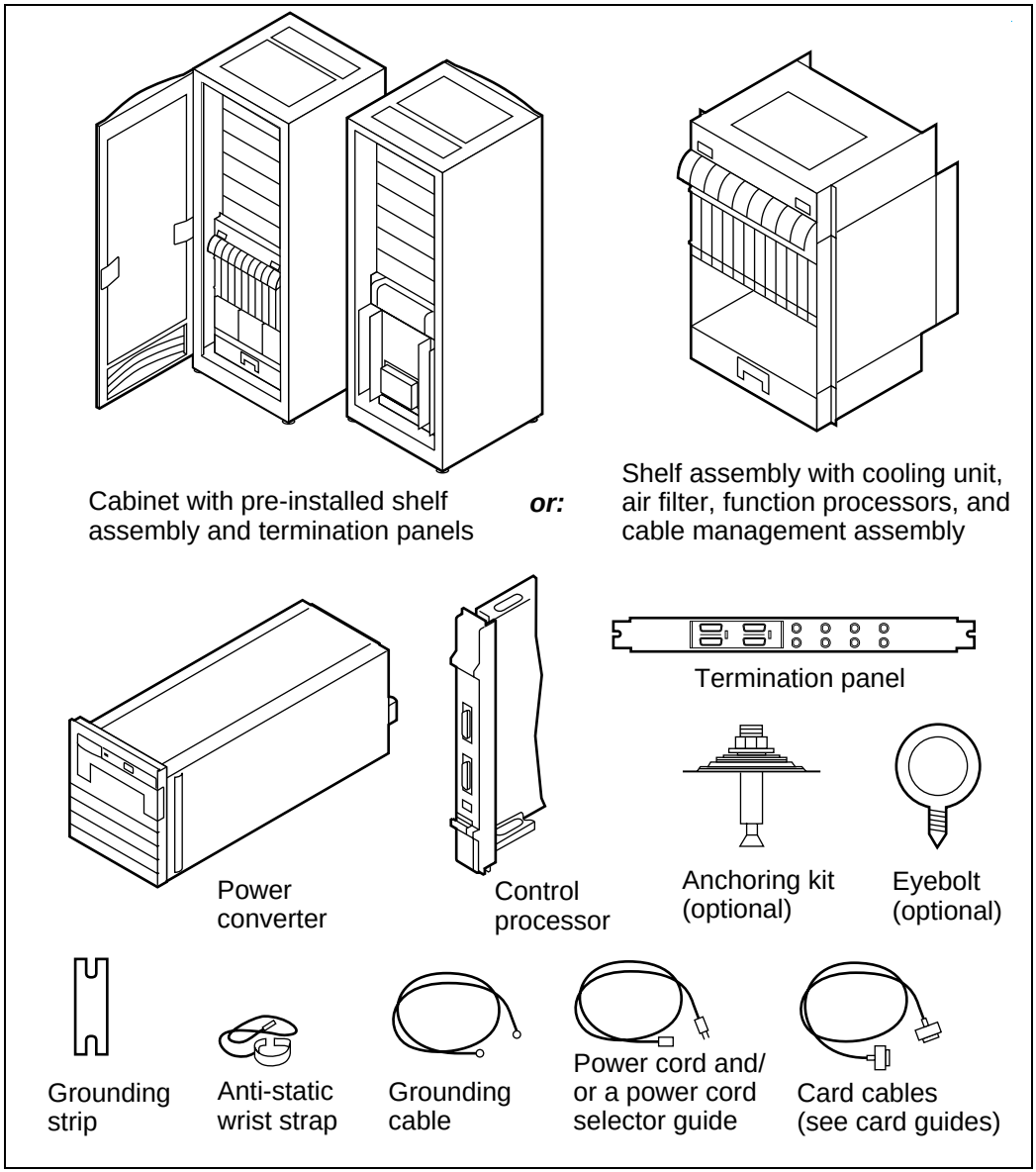
13 Depending on the type of cabinet, see the procedure “Removing a Multiservice Switch cabinet from a pallet” (page 432) or “Unpacking and removing a seismic cabinet from a pallet” (page 545).

Procedure job aid

Table 20
Equipment checklist for unpacking a cabinet

÷	Equipment
	Cabinet with pre-installed: • doors (2) and keys (2) • device shelving (1 or 2) • FPs (1 to 15 for each device) • blank processor cards (NTBP23), 14 for each device less the number of processor cards • cooling units and cables • cable management unit(s) • door alarm cables
	Power supplies (up to 3 for each device) and power supply fillers if device contains fewer than three power supplies
	CPs (1 or 2 for each device)
	Blank control processor card (NTBP23) if the device contains only 1 control processor)
	FP cables, as required
	Termination panels, as required for FPs
	Grounding cable for termination panels
	Grounding strips for termination panels (1 for each panel)
	Power cords (1 for each power supply)
	Power cord selector guide
	Antistatic wrist strap
	Optional: anchoring kit
	Optional: eyebolts (4)

Figure 211
Taking inventory after unpacking a cabinet



Unpacking and removing a seismic cabinet from a pallet

Unpack and remove a seismic cabinet in a dust-free area near the installation site.

Procedure steps

1. Move the pallet close to where it is to be installed.
2. Remove and keep the packing slips and shipping papers attached to the outside packaging.
3. Carefully cut the plastic stretch wrap around the cabinet.

WARNING

Risk of personal injury

The banding that secures the cabinet packaging is under pressure and can fly up when cut.

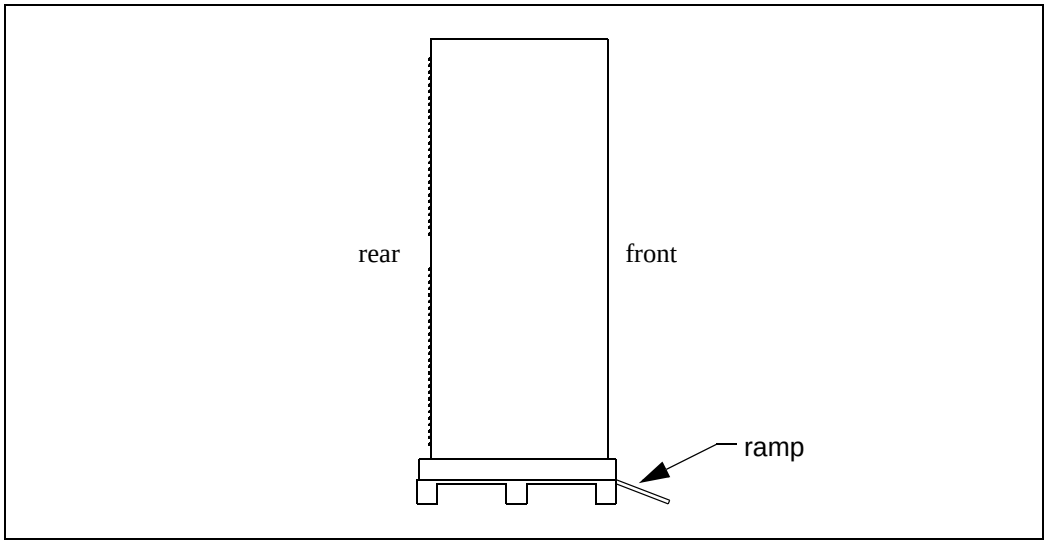
WARNUNG

Verletzungsgefahr

Die Gehäuseverpackung ist mit einem Spannband gesichert. Seien Sie vorsichtig beim Durchschneiden des Bandes, da es möglicherweise mit Gewalt aufspringt.

4. Use a pair of tin snips to cut the banding that secures the cabinet packaging.
5. Lower the ramp that is attached to the pallet as shown in “Lowering the pallet ramp” (page 546).

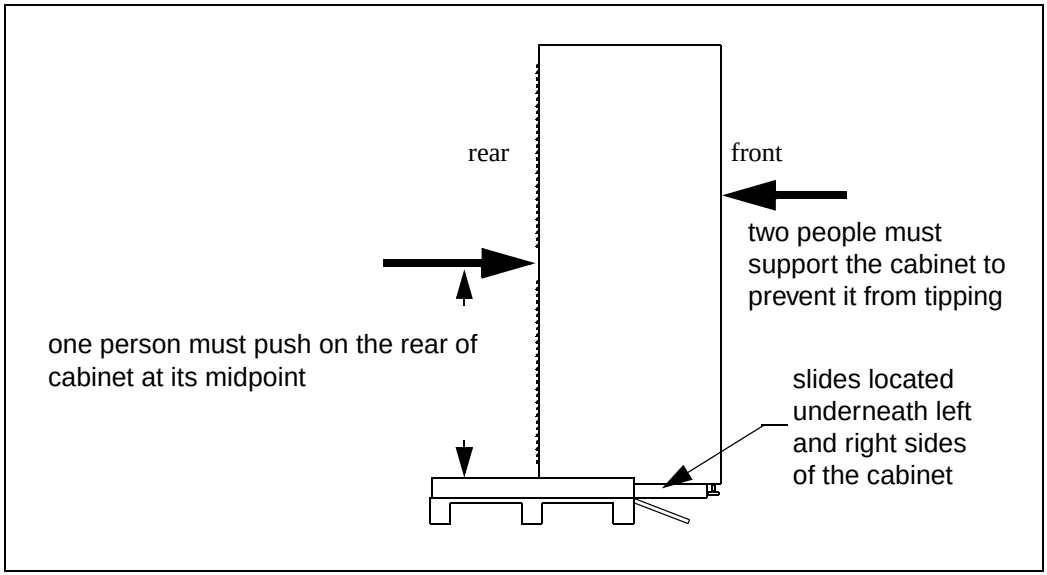
Figure 212
Lowering the pallet ramp



6 Lower the front leveling feet to almost touch the pallet surface. This prevents the casters from touching the floor first and gives you more control.

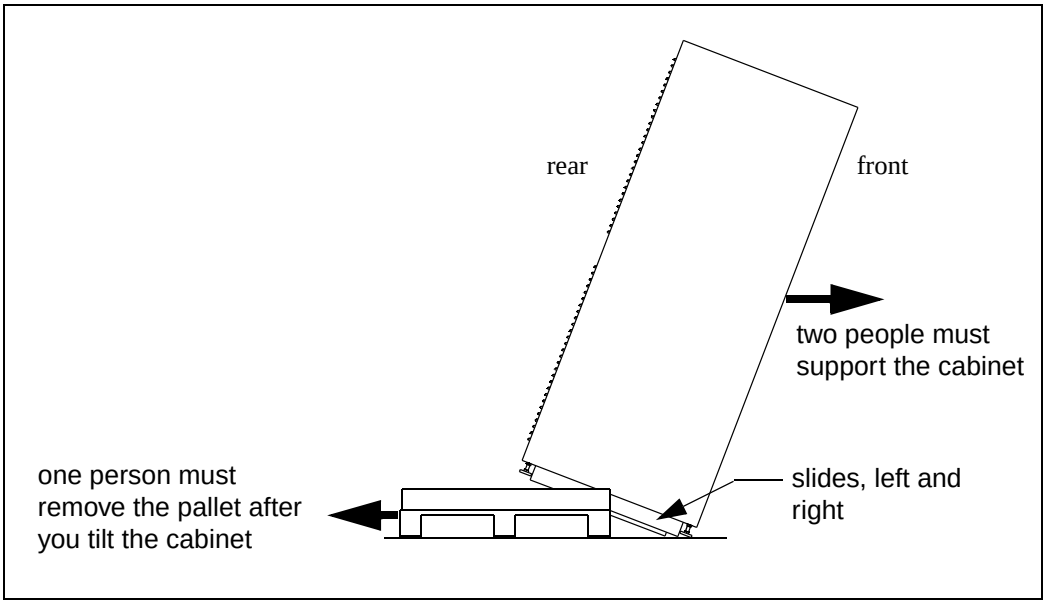
7 Slide the cabinet down the ramp as shown in “Sliding the cabinet down the ramp” (page 547).

Figure 213
Sliding the cabinet down the ramp



8 Tilt the cabinet onto the front leveling feet and slide the pallet from underneath the cabinet. See the figure “Removing the pallet” (page 548).

Figure 214
Removing the pallet



As you pull the pallet back, the wooden slides that support the left and right sides of the cabinet help you gently lower it down the ramp.

9 Tilt the cabinet to the left and right sides enough to remove the wooden slides one after the other. This allows the cabinet to rest on its casters.

10 Roll the cabinet on its castors into the anchoring position. The casters are intended for short distances and will not cross the threshold of a doorway or elevator.

11 Adjust the levelers downward to remove the weight from the casters. Use a spirit level to ensure that the cabinet is level.

Nortel Networks Multiservice Switch 7400

Hardware Installation, Maintenance, and Upgrade

Release 6.1

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