

IntelliStation POWER 9114 Model 275



# Installation Guide



IntelliStation POWER 9114 Model 275



# Installation Guide

**First Edition (July 2003)**

Before using this information and the product it supports, read the information in "Safety Notices" on page vii, Appendix B, "Environmental Notices", on page 65, and Appendix C, "Notices", on page 67.

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## Safety Notices

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. Danger notices appear on the following pages:

- vii
- 3
- 38

A *caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury. Caution notices appear on the following pages:

- vii
- ix
- 3
- 5
- 12
- 23
- 59

**Note:** For a translation of these notices, see *System Unit Safety Information*, order number SA23-2652.

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## Electrical Safety

Observe the following safety instructions any time you are connecting or disconnecting devices attached to the workstation.

### DANGER

**An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.**

**Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.**

**When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.**

**Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.**

**During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.**

D05

### CAUTION:

**This product is equipped with a three-wire power cable and plug for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.**

C01

**DANGER**

To prevent electrical shock hazard, disconnect all power cables from the electrical outlet before relocating the system.

D01

---

## Laser Safety Information

**CAUTION:**

This product may contain a CD-ROM, DVD-ROM, or laser module on a PCI card, which are class 1 laser products.

C30

## Laser Compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with the IEC 825 (first edition 1984) as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

**CAUTION:**

All IBM laser modules are designed so that there is never any human access to laser radiation above a class 1 level during normal operation, user maintenance, or prescribed service conditions. Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. Only trained service personnel should perform the inspection or repair of optical fiber cable assemblies and receptacles.

C25, C26



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## Data Integrity and Verification

IBM computer systems contain mechanisms designed to reduce the possibility of undetected data corruption or loss. This risk, however, cannot be eliminated. Users who experience unplanned outages, system failures, power fluctuations or outages, or component failures must verify the accuracy of operations performed and data saved or transmitted by the system at or near the time of the outage or failure. In addition, users must establish procedures to ensure that there is independent data verification before relying on such data in sensitive or critical operations. Users should periodically check the IBM support websites for updated information and fixes applicable to the system and related software.



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## About This Book

This book provides information about the IntelliStation POWER 9114 Model 275, specifically how to set up and cable the system, install and remove options, use the system diagnostics to verify the system operation, and record your system configuration.

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## ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

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## Highlighting

The following highlighting conventions are used in this book:

<b>Bold</b>	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
<i>Italics</i>	Identifies parameters whose actual names or values are to be supplied by the user.
Monospace	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

---

## Accessing Information

Documentation for the IBM @server pSeries is available online. Visit the IBM @server pSeries Information Center at [http://publib16.boulder.ibm.com/pseries/en\\_US/infocenter/base](http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base).

- To access the pSeries publications, click **Hardware documentation**.
- To view information about the accessibility features of @server pSeries hardware and the AIX operating system, click **AIX and pSeries accessibility**.

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## References to AIX Operating System

This document may contain references to the AIX operating system. If you are using another operating system, consult the appropriate documentation for that operating system.

This document may describe hardware features and functions. While the hardware supports them, the realization of these features and functions depends upon support from the operating system. AIX provides this support. If you are using another operating system, consult the appropriate documentation for that operating system regarding support for those features and functions.

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## Related Publications

The following publications provide additional information about your system unit:

- The *IntelliStation POWER 9114 Model 275 User's Guide*, order number SA38-0635, contains information to help users use the system, use the service aids, and solve minor problems.
- The *IntelliStation POWER 9114 Model 275 Service Guide*, order number SA38-0636, contains reference information, maintenance analysis procedures (MAPs), error codes, removal and replacement procedures, and a parts catalog.
- The *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*, order number SA38-0509, contains diagnostic information, service request numbers (SRNs), and failing function codes (FFCs).

- The *RS/6000 @server pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems*, order number SA38-0516, contains information about adapters, devices, and cables for your system. This manual is intended to supplement the service information found in the *RS/6000 @server pSeries Diagnostic Information for Multiple Bus Systems*.
- The *Site and Hardware Planning Guide*, order number SA38-0508, contains information to help you plan your installation.
- The *System Unit Safety Information*, order number SA23-2652, contains translations of safety information used throughout this book.
- The *PCI Adapter Placement Reference*, order number SA38-0538, contains information regarding slot restrictions for adapters that can be used in this system.

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## Ergonomic Information

After you have set up your system, we encourage you to visit the Healthy Computing Web site. Good ergonomic practice is important to get the most from your workstation and to avoid discomfort. This means that the equipment and the workplace should be arranged to suit your individual needs and the kind of work you do.

The Healthy Computing Web site gives ergonomic guidelines to help you understand the ergonomic considerations that you should know when working at a computer workstation. The address is:  
<http://www.us.pc.ibm.com/healthycomputing>

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- IBM
- pSeries
- @server

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# Chapter 1. Setting Up the System

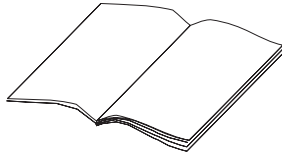
To set up your system, follow the procedures in this chapter.

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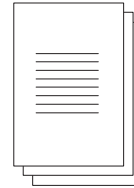
## Step 1. Check Your Inventory

### IntelliStation POWER 9114 Model 275

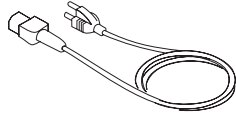
Books, CD-ROM and Other Media



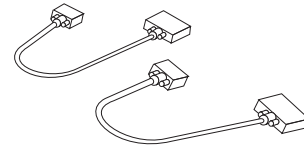
"About Your Machine" Document



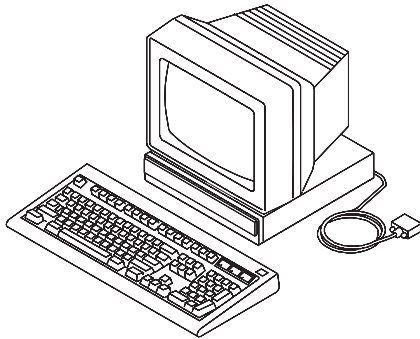
Power Cables (1 standard, 2 optional)



9-Pin to 25-Pin Serial Converters (2) (optional)

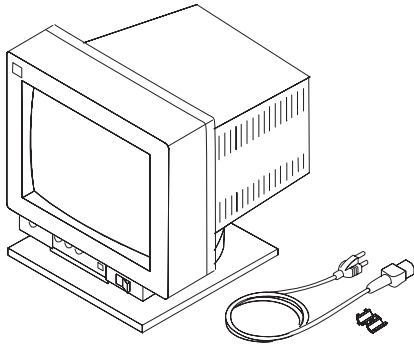


ASCII Terminal (optional)

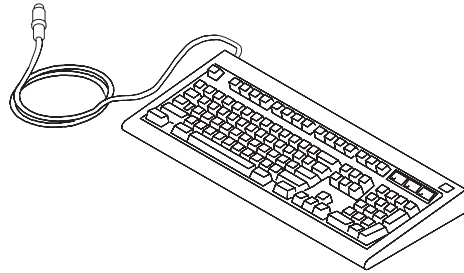


Inventory table continued from the previous page.

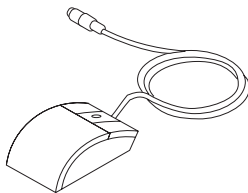
Display, Cable (optional), and Cable Toroid (optional)



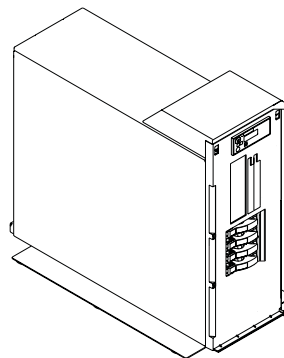
Keyboard (optional), Wrist/Palm Rest (optional)



Mouse (optional)



Model 275



Power-On Guard



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## Step 2. Need Help?

If you encounter difficulties while setting up your system unit, contact your sales representative for assistance.

---

## Step 3. Read the Safety Notices

Before continuing, read the following safety information. Do not plug any cables into the system unit, adapters, or electrical outlets until you have reviewed this information. Make sure none of the power cords are connected before continuing to the next step.

In the system you are about to set up:

- The ac power-interface connector is considered the main power disconnect device.
- This system has redundant power supply capabilities. Meaning your system has the capability of running two power supplies simultaneously. When instructed to disconnect the power source, ensure that all power cables have been unplugged.

### DANGER

**An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.**

**Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.**

**When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.**

**Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.**

**During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.**

D05

### CAUTION:

**This product is equipped with a three-wire power cable and plug for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.**

C01

### DANGER

**To prevent electrical shock hazard, disconnect all power cables from the electrical outlet before relocating the system.**

D01

---

## Step 4. Check the Power Source

This system can be equipped with two power supplies. When two power supplies are installed, the power source to the system unit should be provided on two separate power circuits. If the power is supplied this way, when there is an interruption on one circuit, the system will keep running on the other circuit.

---

## Step 5. Are All of the Internal Options Installed?

These instructions are for systems that have internal options (such as adapters, disk drives, or memory upgrades) already installed.

If you have internal options that are not installed, install them now. Refer to Chapter 3, "Installing Options", on page 23, and then return here.

---

## Step 6. Position the System Unit and Display

Position the system unit and display (optional) at or near their installed location.

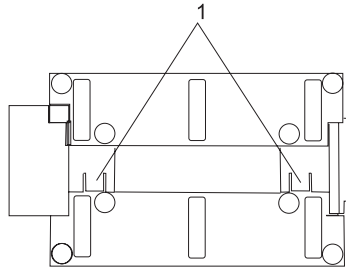
Observe the following guidelines when you are positioning the system unit:

- The system unit weighs between 34 kg (75 pounds) and 41 kg (90 pounds). Do not try to lift the system unit by yourself.
- Displays and ASCII terminals can weigh as much as 35 kg (77 pounds). Use caution when lifting or moving the display or ASCII terminal.
- Leave enough space around the system unit to safely and easily complete the setup procedures.
- Observe standard ergonomic guidelines while arranging your system unit so that you can work comfortably and safely. For more information on arranging your workstation, visit the Healthy Computing Web address at: <http://www.pc.ibm.com/us/healthycomputing>.
- Be sure to maintain at least 51 mm (2 inches) of space on the sides of the system unit and 152 mm (6 inches) at the rear of the system unit to allow the system unit to cool properly. The front of the system requires a minimum of 76 mm (3 inches) of space. Blocking the air vents can cause overheating, which might result in a malfunction or permanent damage to the system unit.
- Place the system unit in a location where it can safely and easily reach any necessary power outlets and network connections.
- Place the display or ASCII terminal in a stable and sturdy location.

---

## Step 7. Adjust the Stability Feet

To retract the stability feet, push the tabs down and slide the plates inward. To extend the feet, slide the plates outward until the retraction tabs are fully visible and snap securely into place.



1 Stability Feet Retraction Tabs (bottom view)

### CAUTION:

The system is equipped with stability feet to help ensure that the system unit cannot easily be tipped over. The stability feet might be either standard non-adjustable feet or an adjustable base stability foot. Ensure that the stability feet are installed and adjusted to their fully extended position.

C34

---

## Step 8. Check Your Display or Console Type

### Notes:

1. If you are using an ASCII terminal with a keyboard as the console for this system, and do not have a graphics display to connect, refer to “Step 12. Connect the Serial Devices, Parallel Devices, and ASCII Terminal” on page 9.
2. If you are using a graphics display with a keyboard and mouse, continue with “Step 9. Attach the Display Cable Toroid” on page 6.

If you ordered a graphics display with your system unit, the graphics adapter has been set to use the highest display resolution and refresh rate available for that display. If you want to:

- Attach another display to your system unit

OR

- Change the default display resolution or refresh rate

after completing the installation steps, refer to the *Customer Installable Options Library* CD-ROM for the documentation for your graphics adapter.

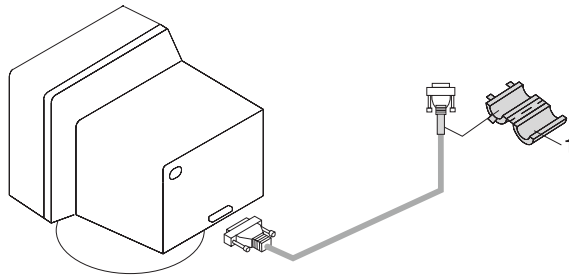
As shown in “Step 9. Attach the Display Cable Toroid” on page 6, connect the graphics display cable to the back of the display and to the graphics adapter connector. Consult the “About Your Machine” document for the locations of installed adapters.

For more information about your display, refer to the documentation included with the display.

---

## Step 9. Attach the Display Cable Toroid

If the cable for your display does not include a toroid, locate the toroid shipped with your system and follow the installation instructions included with the toroid.



1 Display Cable Toroid

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## Step 10. Connect the Graphics Display

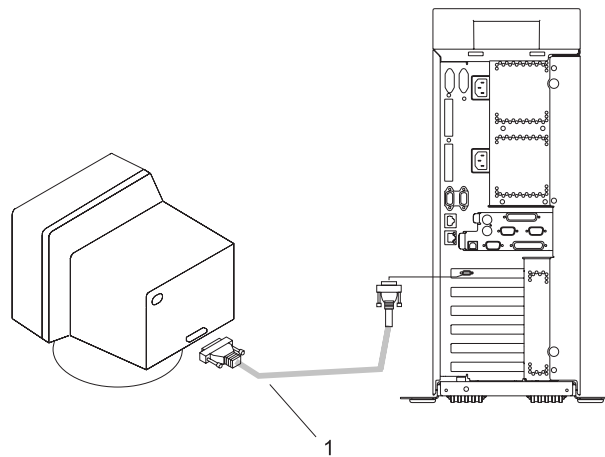
**Note:** If you are using an ASCII terminal as the console for this system, and do not have a graphics display to connect, continue with “Step 12. Connect the Serial Devices, Parallel Devices, and ASCII Terminal” on page 9.

As shown in “Step 9. Attach the Display Cable Toroid” on page 6, connect the graphics display cable to the back of the display and to the graphics adapter connector. For the locations of installed adapters, consult the “About Your Machine” document.

For more information about your display, refer to the documentation included with the display.

**Notes:**

1. A PCI 2D graphics adapter or 3D graphics adapter can be installed in any of the six PCI slots.
2. Some displays require an additional cable.



1 Display Cable

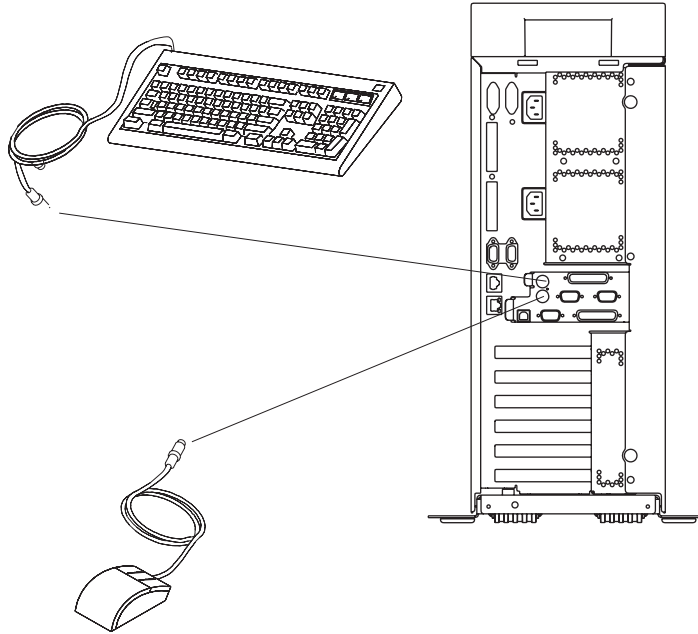
---

## Step 11. Connect the Keyboard and Mouse (When Using a Graphics Display)

**Note:** Before doing this step, read and understand “Step 3. Read the Safety Notices” on page 3.

If a wrist or palm rest was included with your keyboard and you want to attach it, refer to the keyboard documentation for installation instructions.

As shown in the following illustration, connect the keyboard and mouse to the connectors on the rear of the system unit.





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## Step 12. Connect the Serial Devices, Parallel Devices, and ASCII Terminal

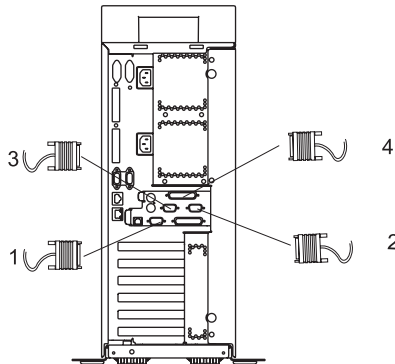
### Notes:

1. Before doing this step, read and understand “Step 3. Read the Safety Notices” on page 3.
2. To connect a local ASCII terminal, connect the terminal to the rear serial port by using the 9-pin to 25-pin serial converter cable. The 9-pin to 25-pin serial converter is a customer-purchased option.
3. If you have a remote ASCII terminal, connect it through an external modem to serial connector S1, and connect a local ASCII terminal to serial connector S2 or serial connector S3.

If you have a local ASCII terminal or a single serial device, connect it to serial connector S1.

You can connect additional serial devices to the two remaining serial ports (S2 and S3) that are located at the rear of the system.

If you have a parallel device (such as a printer), connect it to the parallel connector.



- 1 Serial Port 1 Connector
- 2 Serial Port 2 Connector
- 3 Serial Port 3 Connector
- 4 Parallel Connector

The current usage for the serial port connectors is as follows:

Serial Port Number	Location	Examples of Applicable Usage
Serial Port 1 (S1 Rear)	Rear of the System	Service Processor menus, Service Agent, PDA system management applications (interface cable required), ASCII Terminal for AIX Console, and Modems
Serial Port 2 (S2)	Rear of the System	Service Processor menus, HACMP, ASCII Terminal for AIX Console, and Modems
Serial Port 3 (S3)	Rear of the System	HACMP, UPS (uninterruptible power supply), ASCII Terminal for AIX Console, and Modems

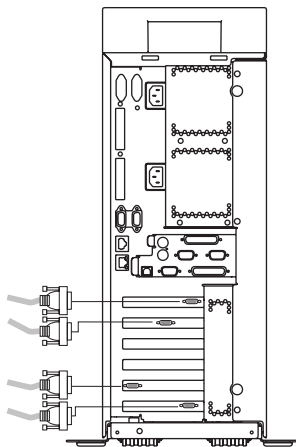
**Note:** Serial port S1 is never used to run HACMP or to attach a UPS. If you are configuring your system to run HACMP with a UPS attached, you must connect the HACMP cable to serial port S2 and the UPS cable to serial port S3. *Do not* run a UPS connected to serial port S2. If you decide to disconnect HACMP, you *must* reset the service processor using the pinhole reset switch before running another application. The service processor pinhole reset switch is located on the operator panel.

---

## Step 13. Connect the Adapter Cables

**Note:** Before doing this step, read and understand “Step 3. Read the Safety Notices” on page 3.

If you are using any optional adapters (such as token ring or 8-port EIA-232), connect the cables to the appropriate adapter connectors in the PCI slots of your machine. For the locations of installed adapters, consult the “About Your Machine” document.



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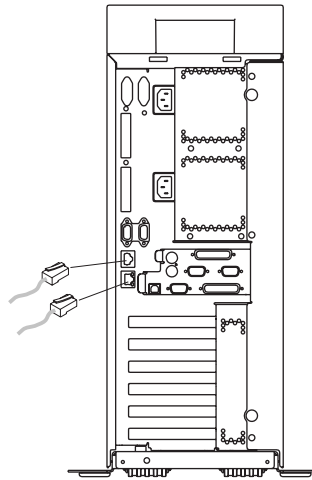
## Step 14. Are You Using an Ethernet Connection?

If you are unsure whether you are using an Ethernet connection, ask your system administrator. If you are not using Ethernet or you have already connected your Ethernet to an adapter, continue to “Step 15. Connect the Power Cables to the System” on page 12.

To connect the Ethernet cable, do the following:

**Note:** The twisted-pair connector is compatible with the IEEE 802.3 Ethernet network 10/100/1000 Base T link.

1. Connect the twisted-pair cable to one of two RJ-45 connectors located on the rear of the system drawer. For RJ-45 connector locations, see the following illustration.
2. The twisted-pair Ethernet cable is now installed. Continue with “Step 15. Connect the Power Cables to the System” on page 12.



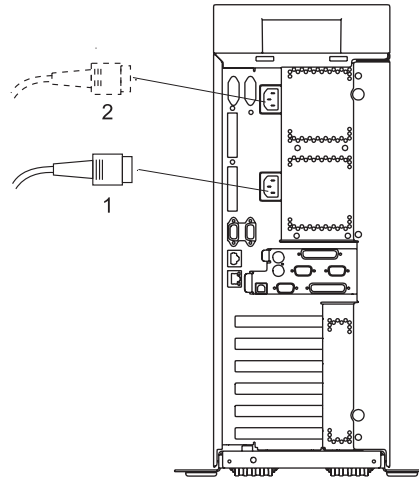
---

## Step 15. Connect the Power Cables to the System

Plug the power cables into the system, display, and attached devices.

### Notes:

1. The system could be equipped with two power supplies. Each power supply needs its own power cable.
2. If your system is equipped with one power supply, connect the power cable to the power receptacle. A second power receptacle is present when a second (redundant) power supply has been added to the system drawer. See the following illustration.



- 1 Primary Power Supply Cable  
2 Redundant Power Supply Cable

### CAUTION:

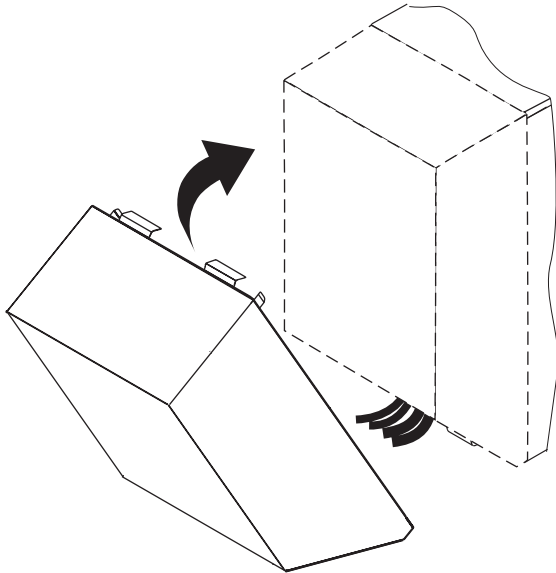
This product is equipped with a three-wire power cable and plug for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.

C01

---

## Step 16. Install the Rear Acoustical Cover

Install the acoustical cover to the rear of the system.



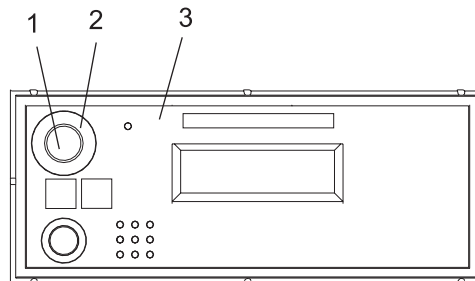
**Note:** It is important to have the rear acoustical cover installed to suppress excess noise from your system.

---

## Step 17. Install the Power-On Button Guard

To help prevent accidental power-on or power-off operations, ensure that the power-on button guard is installed.

Snap the power-on button guard into place securely around the power-on button located on the operator panel. See the following illustration.



- 1 Power-On Button
- 2 Power-On Button Guard
- 3 Operator Panel

---

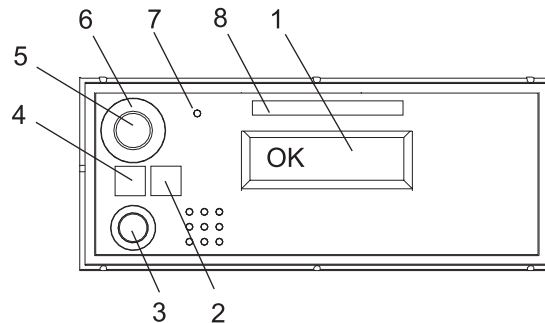
## Step 18. Connect the Power Cables to Electrical Outlets

Connect the power source to the system unit.

After 10 to 20 seconds, the system comes up to standby mode. The indicators of standby mode are as follows:

- The power LED is slowly blinking.
- OK is visible in the operator panel display.

The following illustration shows the operator panel in standby mode with OK visible in the operator panel display.



- |                          |                                            |
|--------------------------|--------------------------------------------|
| 1 Operator Panel Display | 5 Power-On Button                          |
| 2 Attention LED          | 6 Power-On Button Guard                    |
| 3 System Reset Button    | 7 Service Processor Reset Switch (Pinhole) |
| 4 Power LED              | 8 Serial Number Label                      |

If your system does not come up to standby mode, check all cables for good connection. If you cannot find a problem, call your support center for assistance.

---

## Step 19. Your System Hardware is Now Set Up

Arrange your system unit and attached devices so that you can use them comfortably.

If an operating system has been preinstalled in your system, continue to “Step 20. Start Your Model 275” on page 15.

If you plan to install the operating system now, see the installation instructions provided with your operating system.

Installation of the operating system can be accomplished in one of the following ways:

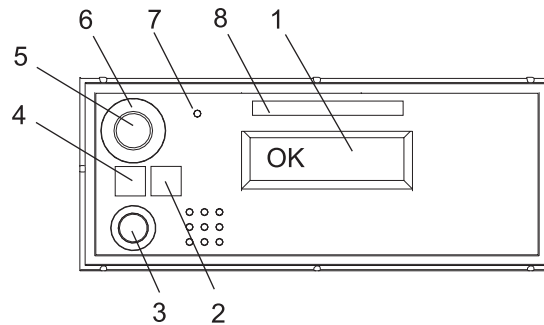
- Installed from a CD (if a CD-ROM drive is installed). On the IntelliStation POWER 9114 Model 275, the CD-ROM drive is a customer-installable option.
- If you are installing the AIX operating system, AIX can be installed from a Network Installation Management (NIM) server. For information about installing AIX from a NIM server, see the *AIX 5L Installation Guide and Reference*, order number SC23-4389. For other software installation, refer to the documentation provided with the software.

---

## Step 20. Start Your Model 275

To power on the system, do the following:

1. Open the bezel door.
2. Before you press the power button on your operator panel, observe the following:
  - The power LED is slowly blinking.
  - An OK prompt is visible in the operator panel display.



- |                                |                                            |
|--------------------------------|--------------------------------------------|
| 1 Operator Panel Display       | 5 Power LED                                |
| 2 Front Serial Connector (FS1) | 6 Power-On Button                          |
| 3 Attention LED                | 7 Power-On Guard                           |
| 4 System Reset Button          | 8 Service Processor Reset Switch (Pinhole) |
|                                | 9 Serial Number Label                      |

3. Press the power-on button on the operator panel.

After you press the power-on button located on the operator panel, observe the following:

- a. The power LED begins to blink visibly faster.
- b. The system cooling fans are activated after a short interval and can be heard accelerating to operating speed.

**Note:** There is approximately a 30-second transition period between the time the power-on button is pressed and the power LED remains on solid (no longer blinking).

- c. The power LED stays on solid. Progress indicators, also referred to as *checkpoints*, are visible on the operator panel display.

---

## Step 21. Run System Verification

1. If your system displays the login prompt and you want to test your hardware, go to Chapter 2, “Verifying the Hardware Operation”, on page 17.
2. If the login prompt does not display, recheck your installation procedures and try starting your system again.
3. If your system continues to fail, call your service representative.

---

## Step 22. Access the System Documentation

If you are installing this system and another person is the system administrator, deliver this book to the system administrator when the installation is complete. Ensure that the system administrator reads the following information and is aware of the options to access the documentation for the new system.

### Hardware Documentation

IBM @server pSeries hardware publications are available online. To access the online hardware books, visit our IBM @server pSeries Information Center at [http://publib16.boulder.ibm.com/pseries/en\\_US/infocenter/base](http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base). Click **Hardware Documentation**.

### Operating System Documentation

Documentation for the AIX operating system is available from the IBM @server pSeries Information Center at [http://publib16.boulder.ibm.com/pseries/en\\_US/infocenter/base](http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base). Select **AIX documentation**. The *AIX Documentation* CD contains the base set of publications for the operating system, including system-management and end-user documentation.



---

## Chapter 2. Verifying the Hardware Operation

The system verification procedure checks the system for correct hardware operation. If you have a problem with your system in the future, use this procedure to test the system hardware to help you determine if you have a hardware problem. Run the system verification procedure as described in the following steps.

---

### Considerations Before Running This Procedure

These verification procedures use either online AIX diagnostics or standalone AIX diagnostics. Either the online AIX diagnostics or the standalone AIX diagnostics must be available to perform this procedure. Read the following before using this procedure:

- If this system unit is directly attached to another system unit or attached to a network, be sure communications with the other systems are stopped.
- This procedure requires use of all of the system resources. No other activity can be running on the system while you are performing this procedure.
- This procedure requires a display attached to a graphics adapter, or an ASCII terminal attached to the S1 or S2 port.

#### Does the system have online AIX diagnostics preinstalled?

**YES**            Go to “Loading the Online AIX Diagnostics on a System” on page 18.

**NO**             Go to “Loading the Standalone Diagnostics on a System from CD-ROM” on page 18.

### Power Procedures

These power procedures are here for reference during the system verification tests. Do not perform any power procedures until the verification procedures instruct you to do so.

#### Operator Panel Power-On Method

Perform the following steps to power on the system unit using the power button on the operator panel.

1. Look for OK on the operator panel display, which indicates that the system is in standby.
2. Press the power-on button on the operator panel.

The power LED on the operator panel starts blinking at a fast rate. 9xxx checkpoints appear in the operator panel display.

When the power-on sequence is complete, the following events have occurred:

- The power LED on the system operator panel stops blinking and stays on.
- The power LEDs on the I/O subsystem come on and stay on.

---

## Loading the Online AIX Diagnostics on a System

To run the online diagnostics in service mode from the boot hard disk, do the following:

1. Stop all programs including the operating system (get help if needed).
2. Remove all tapes, diskettes, and CD-ROM discs.
3. Turn off the system unit power.
4. Turn on the system unit power.
5. After the **keyboard** POST indicator displays on the firmware console and before the last POST indicator (**speaker**) displays, press the numeric 6 key on either the directly attached keyboard or the ASCII terminal to indicate that a service mode boot should be initiated using the customized service mode boot list.
6. Enter any requested password.

**Note:** If you are unable to load the diagnostics to the point when the DIAGNOSTIC OPERATING INSTRUCTIONS display, call your support center for assistance.

---

## Loading the Standalone Diagnostics on a System from CD-ROM

To run the standalone diagnostics in service mode from the CD-ROM, do the following:

**Note:** Online diagnostics are not available when the operating system is Linux.

1. Stop all programs including the operating system (get help if needed).
2. Remove all tapes, diskettes, and CD-ROM discs.
3. Turn off the system unit power.
4. Turn on the system unit power and immediately insert the diagnostic CD-ROM into the CD-ROM drive.
5. After the **keyboard** POST indicator displays on the firmware console and before the last POST indicator (**speaker**) displays, press the numeric 5 key on either the directly attached keyboard or the ASCII terminal to indicate that a service mode boot should be initiated using the default service mode boot list.
6. Enter any requested password.

**Note:** If you are unable to load the diagnostics to the point when the DIAGNOSTIC OPERATING INSTRUCTIONS display, call your support center for assistance.

---

## Running Standalone Diagnostics from a Network Installation Management (NIM) Server

A client system connected to a network with a Network Installation Management (NIM) server can boot standalone diagnostics from the NIM server if the client-specific settings on both the NIM server and client are correct.

### Notes:

1. All operations to configure the NIM server require root user authority.
2. If you replace the network adapter in the client, the network-adapter hardware-address settings for the client must be updated on the NIM server.
3. The **Cstate** for each standalone diagnostics client on the NIM server should be kept in the *diagnostic boot has been enabled* state.
4. On the client system, the NIM server network adapter should be put in the bootlist after the boot disk drive. This allows the system to boot in standalone diagnostics from the NIM server if there is a problem booting from the disk drive. For information about setting the bootlist, see the **Multiboot** section under “SMS” in the client system’s service guide.

## NIM Server Configuration

Refer to the “Advanced NIM Configuration Tasks” chapter of the *AIX 5L Installation Guide and Reference*, order number SC23-4389, for information about doing the following:

- Registering a client on the NIM server
- Enabling a client to run diagnostics from the NIM server

Documentation for the AIX operating system is available from the IBM @server pSeries Information Center at [http://publib16.boulder.ibm.com/pseries/en\\_US/infocenter/base](http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base). Select **AIX documentation**. The *AIX Documentation* CD contains the base set of publications for the operating system, including system-management and end-user documentation.

To verify that the client system is registered on the NIM server and the diagnostic boot is enabled, run the **lsnim -a Cstate -Z ClientName** command from the command line on the NIM server. Refer to the following table for system responses.

**Note:** The *ClientName* is the name of the system on which you want to run standalone diagnostics.

System Response	Client Status
#name:Cstate: ClientName:diagnostic boot has been enabled:	The client system is registered on the NIM server and enabled to run diagnostics from the NIM server.
#name:Cstate: ClientName:ready for a NIM operation:  or  #name:Cstate: ClientName:BOS installation has been enabled:	The client is registered on the NIM server but not enabled to run diagnostics from the NIM server. <b>Note:</b> If the client system is registered on the NIM server but Cstate has not been set, no data will be returned.
0042-053 lsnim: there is no NIM object named "ClientName"	The client is not registered on the NIM server.

## Client Configuration and Booting Standalone Diagnostics from the NIM Server

To run standalone diagnostics on a client from the NIM server, do the following:

1. Remove any removable media (tape or CD-ROM disc).
2. Stop all programs including the operating system (get help if needed).
3. If you are running standalone diagnostics in a full system partition, verify with the system administrator and system users that the system unit can shut down. Stop all programs, including the operating system. Refer to the operating system documentation for **shutdown** command information.

In a partitioned system, make the CD-ROM drive available to the partition used to run standalone diagnostics (refer to the *IBM Hardware Management Console for pSeries Installation and Operations Guide* for more information). Verify with the system administrator and system users using that partition that all applications on that partition must be stopped, and that the partition will be rebooted. Stop all programs on that partition, including the operating system.

4. If you are in a full system partition, power on the system unit to run standalone diagnostics. In a partitioned system, reboot the partition to run standalone diagnostics.
5. When the keyboard indicator is displayed (the word **keyboard**), press the number 1 key on the keyboard to display the SMS menu.
6. Enter any requested passwords.
7. Select **Setup Remote IPL (Initial Program Load)**.

8. Enter the client address, server address, gateway address (if applicable), and subnet mask. Exit to the Network Parameters screen.
9. If the NIM server is set up to allow pinging from the client system, use the **ping** utility in the RIPL utility to verify that the client system can ping the NIM server. Under the **ping** utility, choose the network adapter that provides the attachment to the NIM server to do the ping operation. If the ping returns with an OK prompt, the client is prepared to boot from the NIM server. If ping returns with a FAILED prompt, the client cannot proceed with the NIM boot.  
If the ping fails, contact your service representative.

To do a one-time boot of the network adapter attached to the NIM server network, do the following:

1. Exit to the SMS Main screen.
2. Select **Select Boot Options**.
3. Select **Install or Boot a Device**.
4. On the Select Device Type screen, select **Network**.
5. Set the network parameters for the adapter from which you want to boot.
6. Exit completely from SMS. The system starts loading packets while doing a **bootp** from the network.

Follow the instructions on the screen to select the system console.

- If Diagnostics Operating Instructions Version x.x.x displays, standalone diagnostics have loaded successfully.
- If the operating system login prompt displays, standalone diagnostics did not load. Check the following items:
  - The network parameters on the client may be incorrect.
  - Cstate on the NIM server may be incorrect.
  - Network problems might be preventing you from connecting to the NIM server.

Verify the settings and the status of the network. If you continue to have problems, contact your service representative.

---

## Running System Verification

When the Diagnostic Operating Instructions display, do the following to run system verification:

1. Press Enter.
2. If the terminal type is requested, you must use the **Initialize Terminal** option on the Function Selection menu to initialize the operating system before you can continue with the diagnostics.

**Note:** If you use a virtual terminal on the HMC and you are asked to define the terminal type, the virtual terminal is considered a VT320.

3. Select the **System Verification** option on the Diagnostic Mode Selection menu.
4. To run a general checkout of all installed resources, select the **All Resource** option on the Diagnostic Selection menu. Follow the instructions on the screen to complete the checkout procedure.  
To check one particular resource, select that resource on the Diagnostic Selection menu.

The checkout program ends with either of the following results:

- The Testing Complete screen displays a message stating No trouble was found.
- The A Problem Was Detected On (Time Stamp) menu displays, with either a service request number (SRN) or an error code. Make a note of any codes displayed on the display or operator panel.

To perform additional system verification, go to “Performing Additional System Verification”. To exit diagnostics, go to “Stopping the Diagnostics”.

---

## Performing Additional System Verification

To perform additional system verification, do the following:

1. Press Enter to return to the Diagnostic Selection menu.
2. To check other resources, select the resource. When you have checked all of the resources you need to check, go to “Stopping the Diagnostics”.

---

## Stopping the Diagnostics

To stop the diagnostics, do the following:

1. To exit the diagnostics, press the F3 key (from a defined terminal) or press 99 (from an undefined terminal).
2. If you changed any attributes on your terminal to run the diagnostics, change the settings back to normal.
3. This completes the system verification.

If the server passed all the diagnostic tests, the verification process is complete and your server is ready to use.

---

## Verify that the Latest Firmware and Adapter Microcode are Installed

Use the procedures in this section to verify that the latest firmware and adapter microcode are installed on the system. The firmware and microcode are available from either of the following sources:

- Web site:

<http://techsupport.services.ibm.com/server/mdownload2/download.html>

From the Web site, follow the instructions for checking your system's firmware level and for downloading the latest level of code. Adapter and drive microcode packages are also available from this Web site.

- Current Object Repository (CORE):

If you have access to CORE, do the following to access the firmware and microcode:

1. Access Current Object Repository (CORE).
2. Select **CORE Product Family** and **eServer pSeries - RS/6000**
3. Select **CORE Machine Type** and **pSeries - RS/6000 - Microcode-System/Service**

---

## Access the System Documentation

If you are installing this system and another person is the system administrator, deliver this book to the system administrator when the installation is complete. Ensure that the system administrator reads the following information and is aware of the options to access the documentation for the new system.

### Accessing Hardware Documentation

Documentation for the IBM @server pSeries is available online. Visit the IBM @server pSeries Information Center at [http://publib16.boulder.ibm.com/pseries/en\\_US/infocenter/base](http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base).

- To access the pSeries publications, click **Hardware documentation**.
- To view information about the accessibility features of @server pSeries hardware and the AIX operating system, click **AIX and pSeries accessibility**.

### Accessing System Documentation

Documentation for the AIX operating system is available from the IBM @server pSeries Information Center at [http://publib16.boulder.ibm.com/pseries/en\\_US/infocenter/base](http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base). Select **AIX documentation**. The *AIX Documentation* CD contains the base set of publications for the operating system, including system-management and end-user documentation.

---

## Chapter 3. Installing Options

This chapter provides procedures for installing options in the Model 275 system unit.

### Notes:

1. Installing options in the Model 275 can be performed with the system in either the vertical or horizontal position.
2. Before performing any of the installation procedures in this chapter, read the following notices.

For the system unit in which you are about to install an option:

- The ac power interface connector is considered the main power disconnect device.
- This system unit has redundant power supply capabilities, meaning that it has the ability to have two power supplies running simultaneously in the same system unit. When instructed to disconnect the power source, ensure that all power cables have been unplugged.

### DANGER

**An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.**

**Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.**

**When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.**

**Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.**

**During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.**

D05

### CAUTION:

**This product is equipped with a three-wire power cable and plug for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.**

C01

### CAUTION:

**This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect two power supply cords before servicing.**

C21

---

## Handling Static-Sensitive Devices

**Attention:** Electronic boards, diskette drives, and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags to prevent this damage.

Take the following precautions:

- If you have an antistatic wrist strap available, use it while handling the device.
- Do not remove the device from the antistatic bag until you are ready to install the device in the system.
- With the device still in its antistatic bag, touch it to a metal frame of the system.
- Grasp cards and boards by the edges. Hold drives by the frame. Avoid touching the solder joints or pins.
- If you need to lay the device down while it is out of the antistatic bag, lay it on the antistatic bag. Before picking it up again, touch the antistatic bag and the metal frame of the system at the same time.
- Handle the devices carefully to prevent permanent damage.

---

## Options and Task List

The following table provides a listing that allows you to quickly locate the appropriate procedures:

Option/Task	Option/Task Name and Page Location
Adapters	"PCI Adapters" on page 29
Battery Replacement	"Replacing the Battery" on page 59
Bezels	"Bezels" on page 27
Bezel Door	"Bezel Door" on page 26
Covers	"Covers" on page 28
Disk Drives	"Hot-Plug Disk Drives" on page 47
Disk Drive Backplane	"Disk Drive Backplane" on page 52
Disk Drive Bezels and Fillers	"Disk Drive Bezels and Fillers" on page 45
Hot-Swap System Fans	"Hot-Swap System Fans" on page 34
Fan Tray Assembly	"Fan Tray Assembly" on page 35
Media Drives	"Media Drives (Diskette, CD-ROM, DVD-ROM, Tape, or Disk Drive)" on page 42
Media Bay Chassis	"Media Bay Chassis" on page 44
Memory DIMMs	"Memory DIMMs" on page 54
Power Supply	"Power Supply" on page 38
Service Processor Assembly	"Service Processor Assembly" on page 57
Starting the System	"Starting the System" on page 25
Static-Sensitive Devices	"Handling Static-Sensitive Devices"
Stopping the System	"Stopping the System" on page 25



---

## Stopping the System

**Attention:** When shutting down your system to install options, shut down all applications first and then shut down the operating system. The system power turns off and the system goes into standby mode when the operating system is shut down. Before removing power from the system, ensure that the shutdown process is complete. Failure to do so can result in the loss of data. Some option-installation procedures do not require the system to be stopped for installation. The option-installation procedures in this chapter will direct you here if stopping the system is required.

1. Log in to the system as root user. Record error codes if they are displayed on the operator panel display.
2. Have your system administrator stop all applications that are running on the system.
3. At the command line, ask the administrator to type shutdown.
4. After you shut down the operating system, set the power switches of any attached devices to Off.

---

## Starting the System

To power on the system, do the following:

1. Open the bezel door.
2. Ensure that the power is connected the system unit.

Before you press the power-on button on your operator panel, observe the following:

- The power-on LED is slowly blinking.
- An OK prompt is visible in the operator panel display.

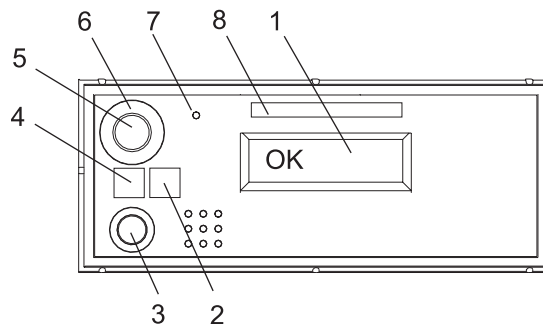
3. Press the power-on button on the operator panel.

After pressing the power-on button located on the operator panel, observe the following:

- a. The power LED begins to blink visibly faster.
- b. The system cooling fans are activated after a short interval and can be heard accelerating to operating speed.

**Note:** There is approximately a 30-second transition period between the time the power-on button is pressed and the power LED remains on solid (no longer blinking).

- c. The power LED stays on solid and progress indicators, also referred to as *checkpoints*, are visible on the operator panel display.



- 1 Operator Panel Display
- 2 Attention LED
- 3 System Reset Button
- 4 Power LED

- 5 Power-On Button
- 6 Power-On Button Guard
- 7 Service Processor Reset Switch (Pinhole)
- 8 Serial Number Label

---

## Placing the Model 275 into the Service and Operating Position

The Model 275 can be placed on its side or left in an upright position with the side removed in order to work on the inside of the system unit. When finished working on the system, return it to the position in which it was placed for customer operations.

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### Bezel Door

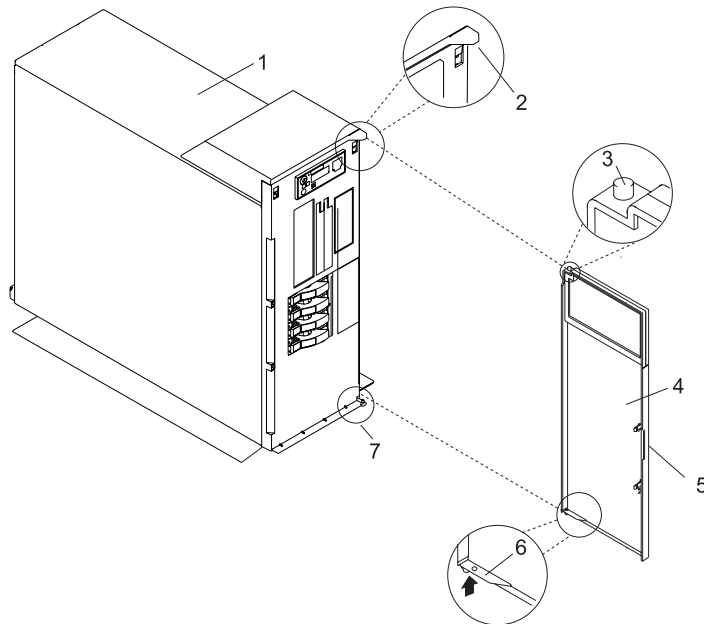
The following procedure covers removal and replacement of the bezel door.

#### Bezel Door Removal

Refer to the following illustration while you perform the steps in this procedure.

To remove the bezel door, do the following:

1. Open the bezel door by grasping the door handle. Swing the bezel door away from the system.
2. Lift the bezel door release tab located at the bottom of the door in order to clear the post.
3. Gently swivel the bottom of the door forward, out past the bottom of the system.
4. Pull the door down to remove the top retaining post from the bezel.



- |                                              |                                   |
|----------------------------------------------|-----------------------------------|
| 1 Model 275                                  | 4 Bezel Door                      |
| 2 System Handle Assembly Post Retaining Hole | 5 Bezel Door Handle               |
| 3 Bezel Door Top Retaining Post              | 6 Bezel Door Release Tab          |
|                                              | 7 Bezel Door Lower Retaining Post |

#### Bezel Door Replacement

To replace the bezel door, do the following:

1. Place the top retaining post into the system handle assembly post retaining hole. See the preceding illustration.
2. Lift the door release tab and rotate the door onto the lower retaining post.
3. Rotate the bezel door toward the bottom of the system.
4. Close the bezel door.

---

## Bezels

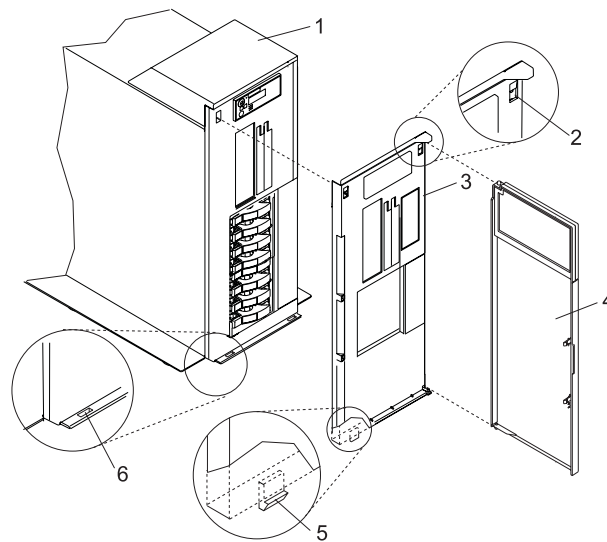
Before performing the following procedures, read the “Safety Notices” on page vii.

### Front Bezel Removal

Refer to the following illustrations while you perform the steps in this procedure.

To remove the front bezel, do the following:

1. Remove the bezel door as described in “Bezel Door” on page 26.
2. Press down on the two blue bezel-release levers.
3. Pull the top of the bezel out and away from the system chassis.
4. Gently pull the bezel up off the base, releasing the lower bezel locking tabs.
5. Put the bezel and bezel door in a safe place.



- 1 Model 275
- 2 Bezel-release lever
- 3 Front Bezel

- 4 Front Door
- 5 Lower Bezel Locking Tab (Quantity 2)
- 6 Lower Bezel Retaining Slots (Quantity 2)

### Front Bezel Replacement

To replace the front bezel, do the following:

1. Place the two lower bezel locking tabs into the retaining slots located on the chassis base.
2. Rotate the bezel up toward the top of the chassis, ensuring that the aligning pins are aligned with their mating holes located on the chassis.
3. Gently push the bezel in until the two blue bezel release levers are seated in their respective slots.
4. Replace the bezel door as described in “Bezel Door” on page 26.

---

## Covers

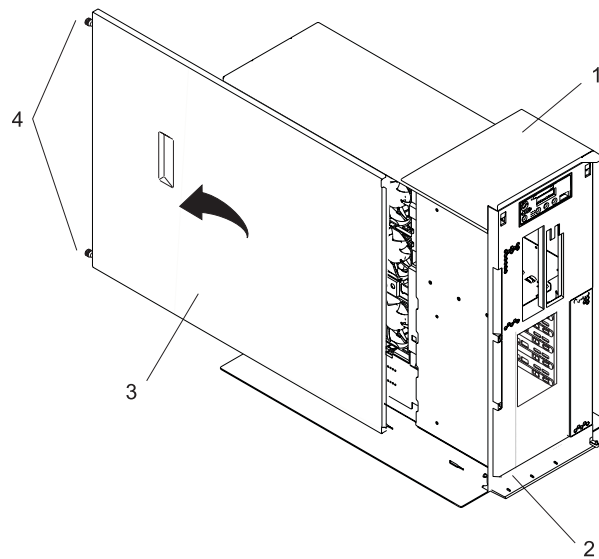
Before performing the following procedures, read the “Safety Notices” on page vii.

### Service Access Cover Removal

To remove the service access cover, do the following:

1. Loosen the two captive thumbscrews located on the rear of the cover. See the following illustration for thumbscrew locations.
2. Slide the cover toward the rear of the system drawer. After the front of the service access cover has cleared the front chassis ledge, lift the cover out and off the system unit.

**Attention:** For proper cooling and airflow, replace the cover before turning on the system. Operating the system for extended periods of time (over 30 minutes) with the cover removed might damage system components.



1 Model 275

2 Front Chassis Ledge

3 Service Access Cover

4 Thumbscrews

### Service Access Cover Replacement

To replace the service access cover, do the following:

1. Align the service access cover with the side of the system, about 25 mm (1 inch) from the front of the system. The flanges on the top and bottom of the cover wrap around the system chassis.
2. Hold the service access cover against the system drawer, and slide it toward the front of the system. The front edge of the service access cover slides beneath the chassis ledge.
3. Tighten the three thumbscrews located on the rear of the cover.

---

## PCI Adapters

Before performing this procedure, read “Safety Notices” on page vii.

### Notes:

1. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support along the back edge of the card. To use in this system unit, you *must* remove the blue handle or support from the card.
2. For adapter installation, the system must be powered off. *Hot-pluggable* PCI adapters are not supported.

## Non-Hot-Pluggable PCI Adapter Removal

To remove a PCI adapter, do the following:

1. Place the system into the service position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
2. Shut down the system as described in “Stopping the System” on page 25.
3. Disconnect the power source to the system.

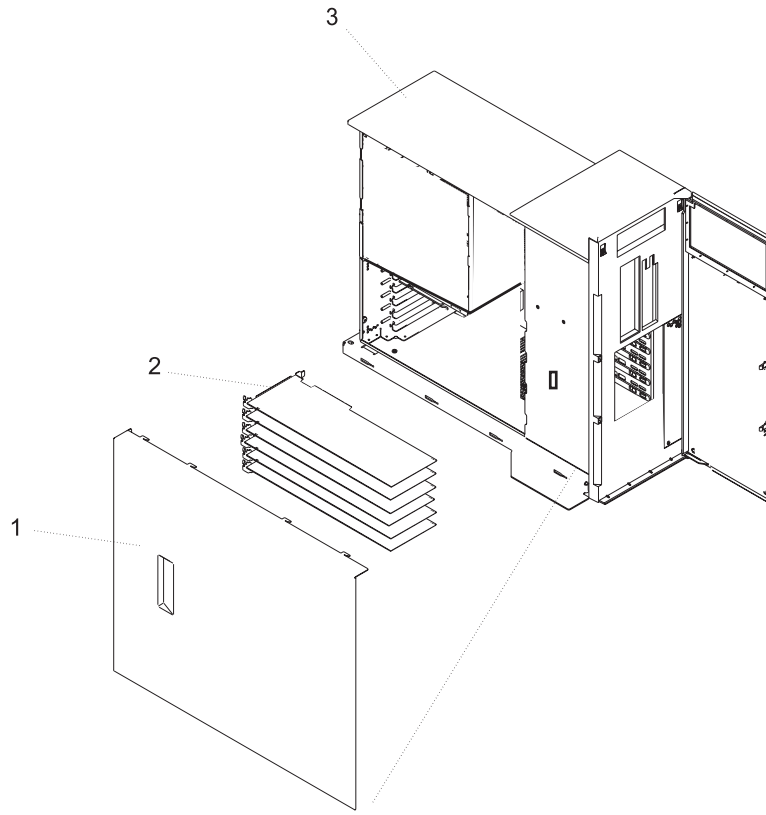
**Note:** This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the system power source is completely disconnected.

4. Remove the service access cover as described in “Service Access Cover Removal” on page 28.
5. Determine which adapter you plan to remove, then label and disconnect all cables attached to that adapter.
6. Record the slot number and location of each adapter being removed.

**Note:** Adapter slots are numbered on the rear of the system unit.

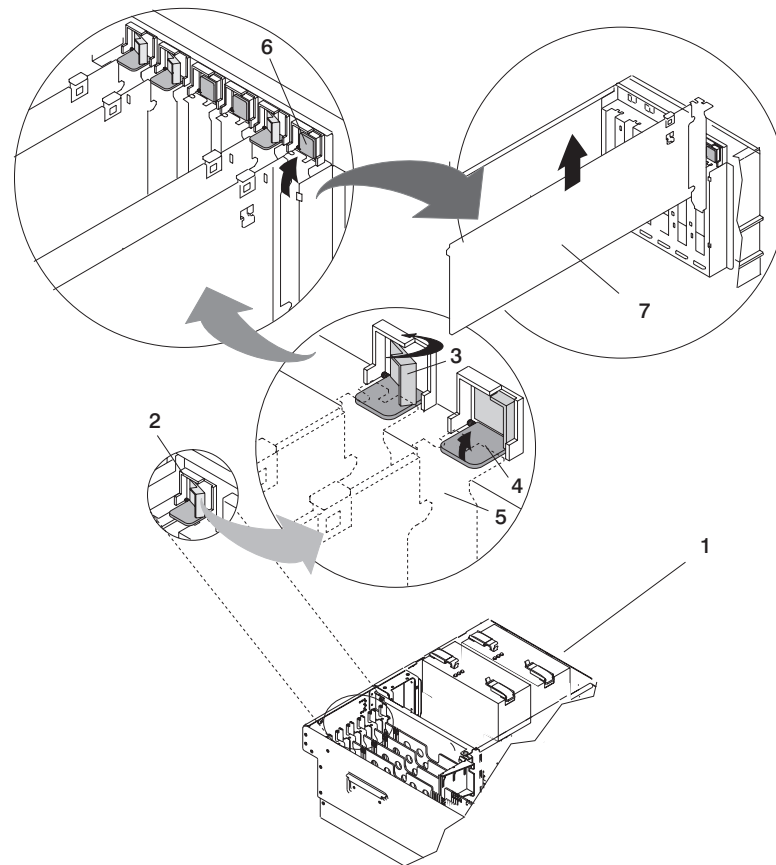
7. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 24.

8. If you are removing a long adapter, make note of how the back edge of the adapter slides into the molded grooves located on the back wall of the PCI adapter slots.



- 1 Service Access Cover
- 2 PCI Adapters
- 3 System Unit

- Rotate the adapter retainer clip counterclockwise, as shown in the following illustration.



- |                                                                                                 |                                                        |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| 1 Model 275                                                                                     | 5 PCI adapter faceplate (dotted lines)                 |
| 2 Adapter Retainer Assembly                                                                     | 6 Adapter Retainer Assembly (in the unlocked position) |
| 3 Adapter Retainer Assembly (retainer seat down and the retainer clip in the locked position)   | 7 PCI Adapter                                          |
| 4 Adapter Retainer Assembly (retainer seat down and the retainer clip in the unlocked position) |                                                        |

- The tab resting on the adapter retention bracket springs to a vertical position, coming to rest next to the adapter retention latch.
- Carefully grasp the PCI adapter by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.
- If you do not plan to install another adapter into the vacated slot, seal the expansion slot using an expansion-slot cover and continue on to the next step. If you are installing another adapter, go to “Adding or Replacing a Non-Hot-Pluggable PCI Adapter” on page 32.
- If you have other options to install, refer to “Options and Task List” on page 24. If you do not have other options to install, continue on to the next step.
- Replace the service access cover as described in “Service Access Cover Replacement” on page 28.
- Connect the adapter cables.
- Reconnect the power source to the system.
- Return the system to the operating position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.

18. Power on the system as described in “Starting the System” on page 25.
19. Replace the bezel door if it was removed in one of the previous steps.

## Adding or Replacing a Non-Hot-Pluggable PCI Adapter

To add or install an adapter, do the following:

1. Place the system into the service position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
2. Shut down the system as described in “Stopping the System” on page 25.
3. Disconnect the power source to the system.

**Note:** This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the system has been completely disconnected from its power source.

4. Remove the service access cover as described in “Service Access Cover Removal” on page 28.
5. Refer to the *PCI Adapter Placement Reference* for information regarding slot restrictions for adapters that can be used in this system.
6. If necessary, remove the adapter expansion slot shield.
7. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 24.
8. If necessary, remove the adapter from the antistatic package.

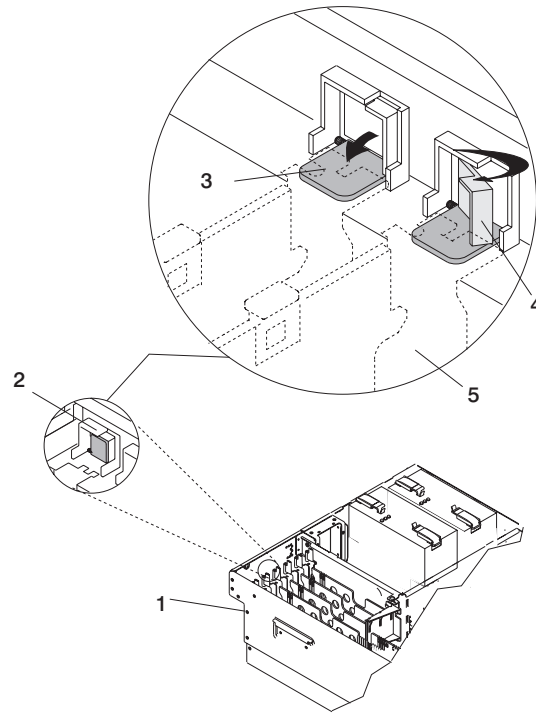
**Attention:** Avoid touching the components and gold-edge connectors on the adapter.

9. Place the adapter, component-side up, on a flat, static-protective surface.
10. Set any jumpers or switches as instructed by the adapter’s manufacturer documentation.
11. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the PCI riser card.
12. Press the adapter *firmly* into its connector.

**Attention:** When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.



- Lower the tab onto the PCI adapter faceplate. Rotate the adapter retainer clip clockwise until it covers the tab at approximately a 45-degree angle. See the following illustration.



- |                                                                                                        |                                                                                                      |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>1</b> Model 275                                                                                     | <b>4</b> Adapter Retainer Assembly (retainer seat down and the retainer clip in the locked position) |
| <b>2</b> Adapter Retainer Assembly (in the unlocked position)                                          | <b>5</b> PCI adapter faceplate (dotted lines)                                                        |
| <b>3</b> Adapter Retainer Assembly (retainer seat down and the retainer clip in the unlocked position) |                                                                                                      |

- If you have other options to install, refer to “Options and Task List” on page 24. If you do not have other options to install, continue on to the next step.
- Replace the service access cover as described in “Service Access Cover Replacement” on page 28.
- Return the system to the operating position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
- Connect the adapter cables.
- Reconnect the power source to the system.
- Power on the system as described in “Starting the System” on page 25.
- Replace the bezel door if it was removed in one of the previous steps.

---

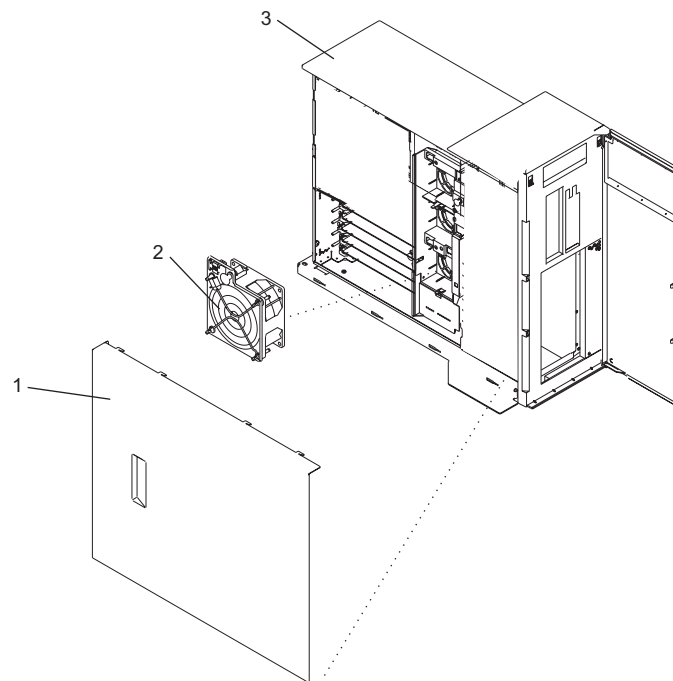
## Hot-Swap System Fans

This system supports hot plug and redundant cooling. The DASD and system electronics is cooled with three system cooling fans. Before performing the following procedures, read “Safety Notices” on page vii.

### Hot-Swap System Fan Removal

To remove a hot-swap fan, do the following:

1. Place the system into the service position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
2. Remove the service access cover as described in “Service Access Cover Removal” on page 28
3. Locate the cooling fans, as shown in the following illustration.
4. Pull on the locking knob of the failing fan until you feel it unlock.
5. Pull on the locking knob of the failing fan again until you feel the fan pull loose from its connector.
6. Grasp the sheet metal lip of the fan and pull the fan towards the side that contains the locking knob.
7. Lift out the failing fan unit.



- 1 Model 275
- 2 Service Access Cover
- 3 Cooling Fan (Fan #1)

### Hot-Swap System Fan Replacement

#### Notes:

1. On systems with Linux installed, you may be required to shut down and run AIX diagnostics to verify the hot-swap repair.
2. This note applies only to systems running the AIX operating system. If a fan assembly is being replaced for a redundant failure, after the service repair action is completed, ask the customer to check the **crontab** file for any power/cooling warning messages. When a power or cooling error is encountered, AIX adds an entry to the **crontab** file to “wall” a warning message every 12 hours, to alert or remind the customer of the problem. Replacing the faulty part does not clear this **crontab**

entry, so unless the **crontab** file is edited to remove this entry, the customer continues to be reminded of the failure despite its having been repaired. Use the **crontab -l** command to read the **crontab** file to determine if an entry exists. Use the **crontab -e** command to edit the file.

Documentation for the AIX operating system is available from the IBM @server pSeries Information Center at [http://publib16.boulder.ibm.com/pseries/en\\_US/infocenter/base](http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base). Select **AIX documentation**. The *AIX Documentation* CD contains the base set of publications for the operating system, including system-management and end-user documentation.

To replace the hot-swap cooling fans, do the following:

1. Pull out on the locking knob on the replacement fan to ensure that it is unlocked.
2. Align the fan with the slot in the fan tray assembly with the power plug over the connector.
3. Place the fan into the fan tray.
4. Press down on the fan to ensure that the power plug is connected.

**Note:** The fan starts to run when the power plug connects.

5. Press the locking knob down until you feel it lock.
6. Replace the service access cover as described in “Service Access Cover Replacement” on page 28.
7. Return the system to the operating position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.

---

## Fan Tray Assembly

The three system cooling fans rest in a fan tray. The fans can remain in the tray while it is removed or replaced.

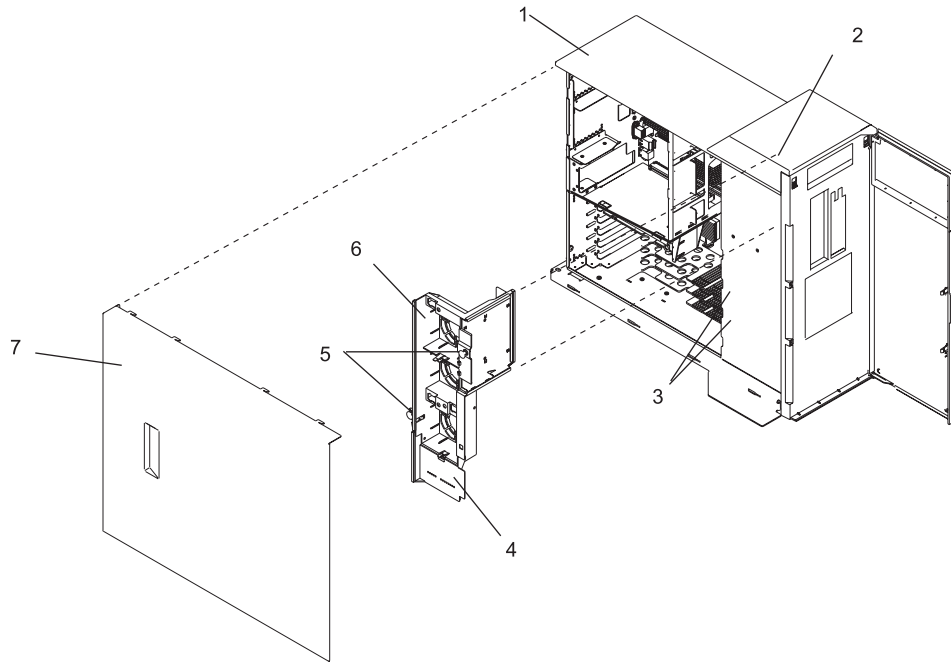
### Removing the Fan Tray Assembly

To remove the fan tray assembly, do the following:

1. Place the system into the service position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
2. Shut down the system as described in “Stopping the System” on page 25.
3. Disconnect the power source from the system.

**Note:** This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system is completely disconnected.

4. Remove the service access cover as described in “Service Access Cover Removal” on page 28.
5. If your system does not contain a SCSI media device, go to the next step. If your system does contain SCSI media device, press the media bay chassis latches and pull the bay chassis forward in the system chassis, but do not remove it from the system chassis.
6. Locate the fan tray assembly, as shown in the following illustration.
7. Release the LED light pipe plate by pressing the latch and rotating the plate up off the LED light pipes.
8. Pull up on the two blue latch buttons located at either end of the fan tray until you feel them unlock.
9. While holding the blue plastic tab on the back of the disk drive backplane, lift the fan assembly straight up and out from the system unit.



- 1 Model 275
- 2 Guide Rails
- 3 Latch Tabs

- 4 LED Light Pipe Plate
- 5 Latch Buttons
- 6 Fan Tray Assembly
- 7 Service Access Cover

## Replacing the Fan Tray Assembly

To replace the fan tray assembly, do the following:

1. Confirm that the latch buttons are in the unlocked position
2. Align the guides on the front of the fan tray with the guide rails in the chassis.
3. Lower the fan tray into the system with the LED light pipe cover plate toward the LED light pipes, and press it down into place.
4. Press the latch buttons down until you feel them lock.
5. Latch the LED light pipe plate over the LED light pipes. Be sure to align the LED light pipes with the appropriate holes in the LED light pipe plate.
6. If your system does not contain a SCSI media device, go to the next step. If your system does contain SCSI media device, press the media bay chassis into place until you feel the latches lock.
7. Replace the service access cover as described in “Service Access Cover Replacement” on page 28.
8. Return the system to the operating position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.

## Power Supply

### DANGER

**Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit.**  
D02

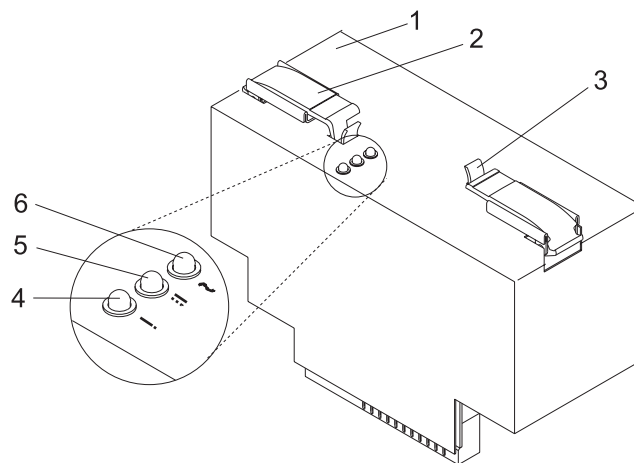
This system unit can have up to two power supplies. If you are installing an option that requires removal of the power supplies, perform the procedures below. If you are replacing a power supply, go to “Power Supply Replacement” on page 40. If you are installing a second power supply as an optional feature, go to “Installing a Power Supply” on page 41

### Power Supply Removal

Before performing any of the following procedures, read and understand all of the safety notices beginning with “Safety Notices” on page vii.

To install options on the system backplane, you must first remove the power supplies. Do the following:

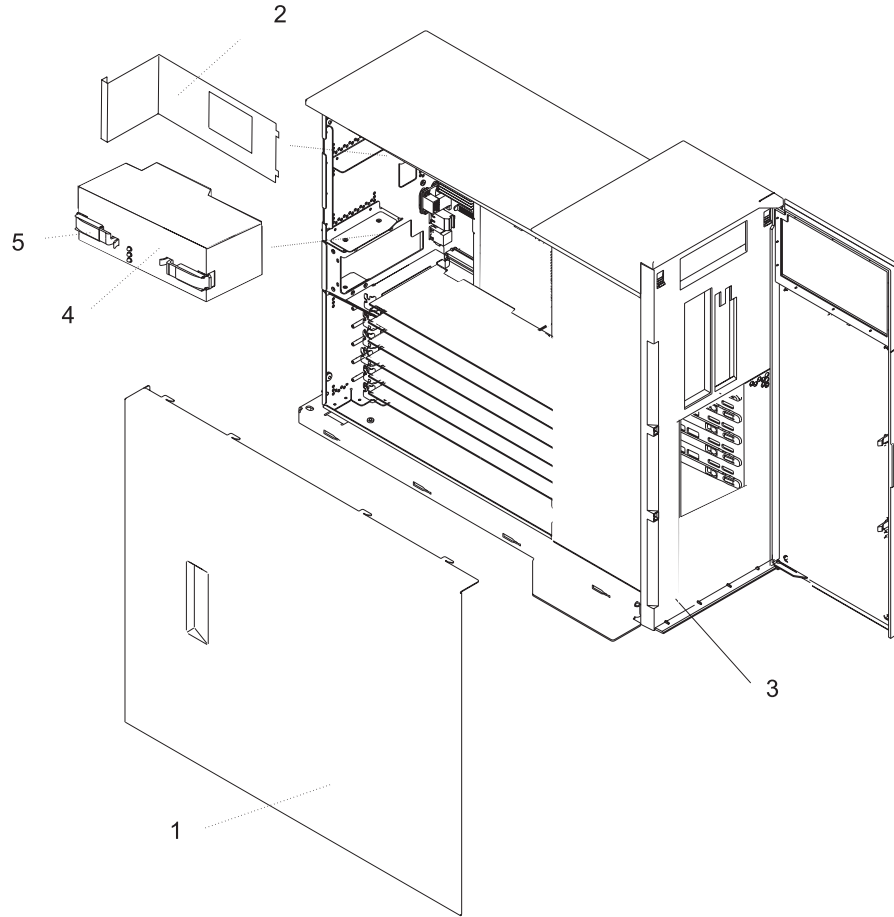
1. Open the bezel door.
2. Shut down the system as described in “Stopping the System” on page 25.
3. Remove the service access cover as described in “Service Access Cover Removal” on page 28.
4. Remove the power cable from the rear of the power supply.
5. Wait at least 10 seconds before performing the next step.
6. Grasp the ends of both power supply handles, and slide the retractable spring-activated portion of each handle toward its hinged base. This action releases the locking tab located on the bottom side of each release handle. See the following illustration.



- |                                                      |                       |
|------------------------------------------------------|-----------------------|
| 1 Power supply                                       | 4 Fault LED (Amber)   |
| 2 Power supply handle latch                          | 5 DC Good LED (Green) |
| 3 Retractable spring-activated portion of the handle | 6 AC Good LED (Green) |

7. Lift the handle until it is perpendicular (90 degrees) to the top of the power supply. By placing the handle perpendicular to the top of the power supply, the base or hinged portion of each handle acts as

a cam and helps pry the power supply from its connector located on the system backplane.



- 1 Service Access Cover
- 2 Power Supply Filler Panel
- 3 System Unit

- 4 Power Supply #1 (Primary)
- 5 Power Supply Release Handle

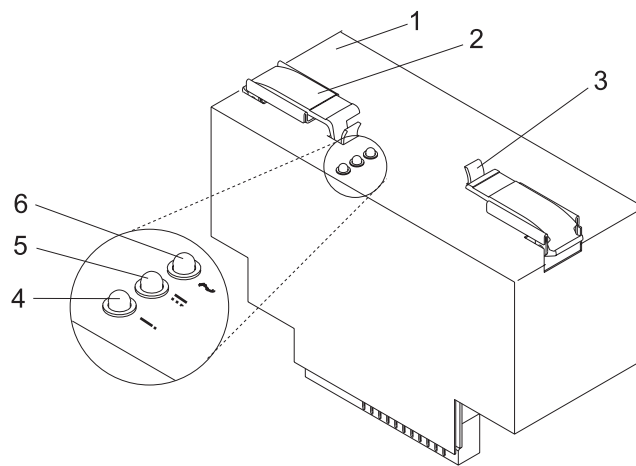
8. After the power supply is released from its connector, pull the power supply straight out from the system unit. Repeat this procedure for the secondary power supply, if it is installed.

## Power Supply Replacement

**Note:** During normal operation, the secondary power-supply bay must have either a power supply or filler panel installed for proper cooling.

To replace a power supply, do the following:

1. Grasp the handles located on top of the new power supply. Pivot the handles upward to 90 degrees. This action puts the handle cams into the correct position to help seat the power supply into its connector.
2. Carefully insert the new power supply into the power supply bay.
3. Lower the power supply release handles, carefully pressing the power supply into the connector. The spring latch located on the underside of each handle will snap into place, indicating that the power supply is seated correctly and locked into position.



- |                                                      |                       |
|------------------------------------------------------|-----------------------|
| 1 Power supply                                       | 4 Fault LED (Amber)   |
| 2 Power supply handle latch                          | 5 DC Good LED (Green) |
| 3 Retractable spring-activated portion of the handle | 6 AC Good LED (Green) |

4. Plug the power cables into the back of the power supplies.

**Note:** Do not connect the power cables to the power source until you are instructed to do so.

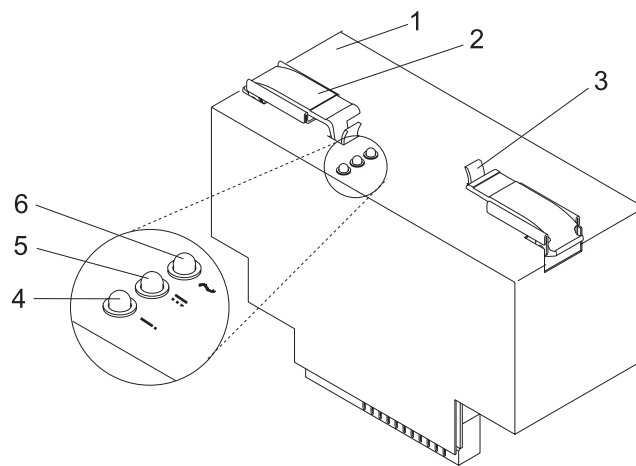
5. Replace the service access cover as described in “Service Access Cover Replacement” on page 28.
6. Reconnect the system unit to the power source.
7. Power on the system unit as described in “Starting the System” on page 25.



## Installing a Power Supply

The second power supply can be installed with the power turned on. To install a power supply, do the following:

1. Put the system in the service position.
2. Remove the service access cover.
3. If you are installing the redundant power supply, remove the power supply filler by grasping the handle and pulling the filler inward and then up and out of the system unit.
4. Grasp the handles located on top of the new power supply. Pivot the handles upward to 90 degrees. This action puts the handle cams into the correct position to help seat the power supply into its connector.
5. Carefully insert the new power supply into the optional power supply bay.
6. Lower the power supply release handles, carefully pressing the power supply into the connector. The spring latch located on the underside of each handle will snap into place, indicating that the power supply is seated correctly and locked into position.



- |                                                      |                       |
|------------------------------------------------------|-----------------------|
| 1 Power supply                                       | 4 Fault LED (Amber)   |
| 2 Power supply handle latch                          | 5 DC Good LED (Green) |
| 3 Retractable spring-activated portion of the handle | 6 AC Good LED (Green) |

7. Plug the second power cable into the back of the new power supply.

**Note:** Do not connect the power cable to the power source until you are instructed to do so.

8. Replace the service access cover as described in “Service Access Cover Replacement” on page 28.
9. Connect the power source to the system unit.
10. Power on the system unit as described in “Starting the System” on page 25.

---

## Media Drives (Diskette, CD-ROM, DVD-ROM, Tape, or Disk Drive)

**Attention:** Neither the Linux nor the AIX operating system support hot-plugging any hot-pluggable PCI adapters. All systems must be shut down and powered off before installing any PCI adapter. Use the non-hot-pluggable adapter procedures when replacing a PCI adapter with the Linux operating system installed.

### Notes:

1. The two Slimline media bays can be used to house a CD-ROM, DVD-ROM, or diskette drive. For the location of the two media bays, see the illustration on “Slimline Media”. However, if your system has a CD-ROM drive, place it in media bay 1.
2. Hot-swap devices are not supported in the optional media device bay.

Before performing this procedure, read the following:

- “Safety Notices” on page vii
- “Laser Safety Information” on page ix

### Slimline Media

A Slimline diskette drive must be placed in the right drive slot, media bay 1, on the Model 275. Having two diskette drives installed results in an error.

**Note:** Slimline media devices are not hot-swappable.

### Slimline Media Drive Removal

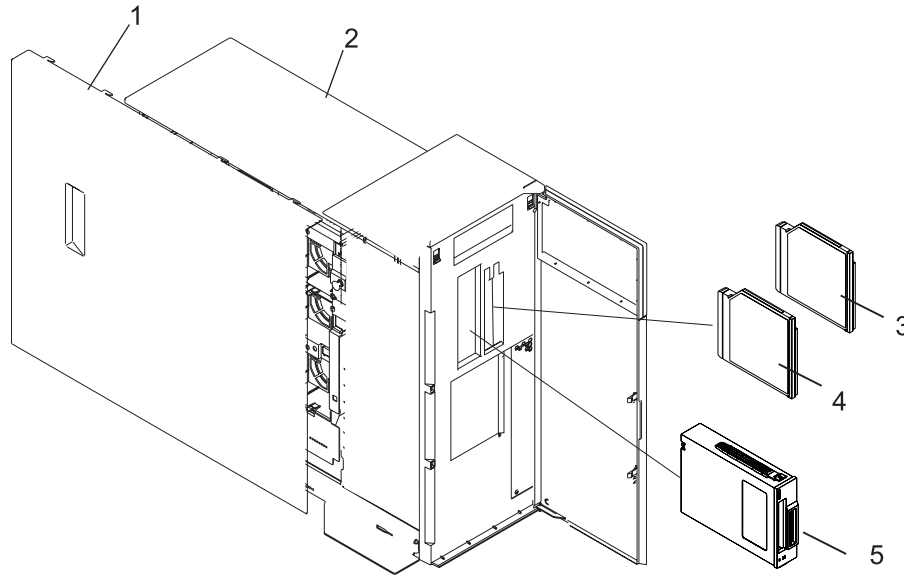
To remove a Slimline media drive, do the following:

1. Push the blue plastic retaining tab away from the drive.
2. While holding the blue plastic retaining tab, grasp the drive and pull it out of the system.

### Slimline Media Drive Replacement

To replace a Slimline media drive, do the following:

1. Push the blue plastic retaining tab away from the device slot.
2. While holding the blue plastic retaining tab, grasp the drive and push it into the system.



1 Service Access Cover

2 Model 275

3 Slimline Diskette (Media Bay 2)

4 Slimline CD-ROM (Media Bay 1)

5 SCSI Media Device (for example: Tape Drive, DVD-RAM Drive)

## SCSI Media Devices

The SCSI media device bay is a full-height bay for SCSI devices only.

### SCSI Media Device Removal

To remove a SCSI media device, do the following:

1. Open the bezel door.
2. Remove the media bay chassis as described in “Media Bay Chassis” on page 44.
3. Unplug the SCSI cable and power cable from the rear of the SCSI media device and the backplane at the rear of the media bay chassis.
4. Detach the media drive from the media bay chassis.
5. Put the media drive in a safe place.

### SCSI Media Device Installation or Replacement

To replace a media device, do the following:

1. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 24.
2. Attach the media drive to the media bay chassis.
3. Plug the SCSI cable and the power cable into the rear of the SCSI media device and the backplane at the rear of the media bay chassis.
4. Replace the media bay chassis as described in “Media Bay Chassis” on page 44.
5. Replace the bezel as described in “Front Bezel Replacement” on page 27.

### Replacing SCSI Media Device Power Cables and SCSI Cables

To replace SCSI media device power cables or SCSI cables, see “SCSI Media Device Removal” and “SCSI Media Device Installation or Replacement”.

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## Media Bay Chassis

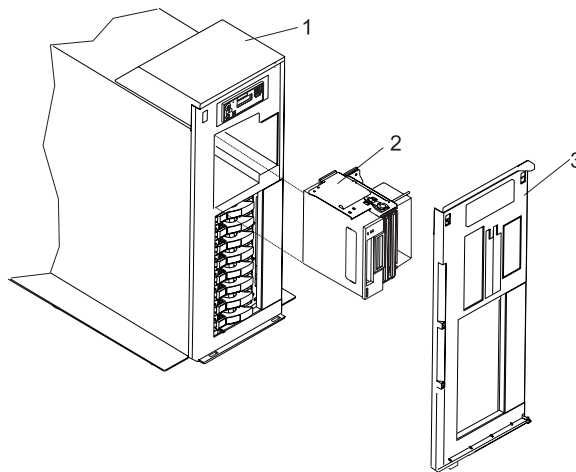
Before performing the following procedures, read “Safety Notices” on page vii.

### Removing the Media Bay Chassis

To remove a the media bay chassis, do the following:

1. Shut down the system as described in “Stopping the System” on page 25.
2. Place the system into the service position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
3. Remove the front bezel as described in “Bezels” on page 27.
4. Press the media bay chassis latches, and pull the bay chassis from the system chassis.

**Note:** If you are servicing a Model 275, the operator panel will remain in the media bay chassis while it is removed.



- 1 Model 275
- 2 Media Bay Chassis
- 3 Front Bezel

### Replacing the Media Bay Chassis

To replace the media bay chassis, do the following:

1. Align the media bay chassis with the chassis opening and press the chassis into place until the latches lock.
2. Replace the front bezel as described in “Bezels” on page 27.
3. Return the system to the operating position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
4. Start the system as described in “Starting the System” on page 25.

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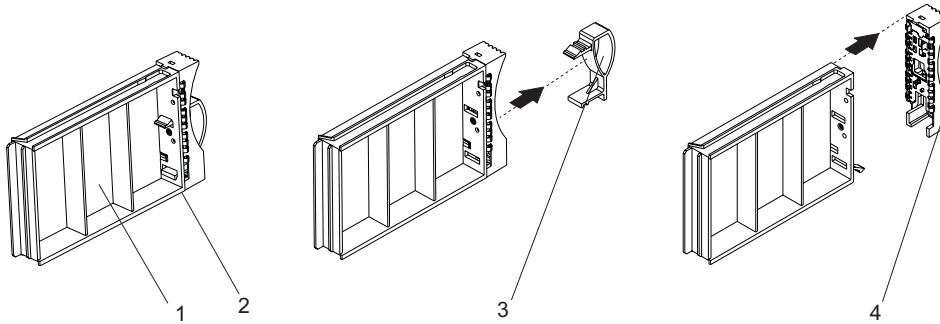
## Disk Drive Bezels and Fillers

Each disk drive slot in the Model 275 must contain either a disk drive or the appropriate filler panel.

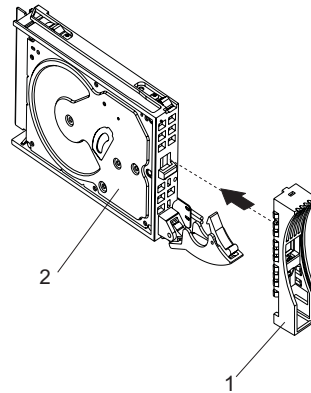
### Installing a Disk Drive Bezel to a Disk Drive

To install a disk drive bezel to a disk drive, do the following:

1. Remove the disk drive filler panel from the slot you want to use.
2. Remove the disk drive bezel plug from the front of the filler panel.
3. Remove the disk drive bezel from the front edge of the filler panel.
4. Attach the disk drive bezel to the front of the disk drive.
5. Follow the procedures for adding a disk drive as described in “Hot-Plug Disk Drives” on page 47.



- 1 Filler Panel with Bezel Attached
- 2 Disk Drive Bezel Plug
- 3 Disk Drive Bezel



- 1 Disk Drive Bezel
- 2 Disk Drive

## Removing a Disk Drive Bezel from a Disk Drive or Filler

To remove a disk drive bezel from a disk drive or filler, do the following:

1. Remove the filler panel from the disk drive slot, or follow the procedures for removing a disk drive as described in “Hot-Plug Disk Drives” on page 47.
2. Remove the disk drive bezel from the front of the filler or disk drive.
3. Attach the disk drive bezel to the front edge of the filler panel or replacement disk drive.
4. Place the filler panel in the empty disk drive slot, or follow the procedures for adding a disk drive as described in “Hot-Plug Disk Drives” on page 47.

---

## Hot-Plug Disk Drives

Before performing the following procedure, read “Safety Notices” on page vii.

**Attention:** The Linux operating system does not support these hot-pluggable procedures. A system with Linux installed must be shut down and powered off before installing any disk drive or PCI adapter.

**Note:** You do not have to power off your AIX system to remove a hot-plug disk drive. Before you perform these procedures, ensure that you have taken the appropriate actions to back up the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-plug disk drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption.

## Deconfiguring (Removing) or Configuring a Disk Drive

Use these procedures if you are removing or installing a drive while the system power is turned on.

### Deconfiguring (Removing) a Disk Drive

Before removing a disk drive from a volume group, do the following:

1. Log in as root user.
2. Before a disk can be removed from a volume group, all data must be backed up and the data removed from the disk to be replaced. Use AIX Logical Volume Manager to perform this task.  
Documentation for the AIX operating system is available from the IBM @server pSeries Information Center at [http://publib16.boulder.ibm.com/pseries/en\\_US/infocenter/base](http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base). Select **AIX documentation**. The *AIX Documentation* CD contains the base set of publications for the operating system, including system-management and end-user documentation.
3. At the command line, type `smitty`.
4. Select **System Storage Manager (Physical and Logical Storage)** and press Enter.
5. Select **Logical Volume Manager** and press Enter.
6. Select **Volume Groups** and press Enter.
7. Select **Set Characteristics of a Volume Group** and press Enter.
8. Select **Remove a Physical Volume from a Volume Group**.
9. Press F4 to list the available volume groups, then select the volume group name and press Enter.
10. Press F4 to select a physical volume, and follow the instructions on the screen to select the physical volume. Then press Enter.
11. Press the F3 key enough times to return to first smitty menu. Then select **System Storage Management (Physical and Logical Storage)**.
12. Select **Removable Disk Management**.
13. Select **Remove a Disk**.
14. Select the desired disk from the list on the screen and press Enter.
15. Follow the instructions on the screen to remove the drive.
16. When you are asked “Are you sure?,” press Enter. The power LED on the drive that you selected will remain on.
17. Remove the disk drive by pulling the disk drive lever toward you until it is completely open. Then remove the disk drive from the slot. The LED on the top of the slot will turn off when the disk drive is removed.
18. Press F10 to exit smitty.

## Configuring (Replacing) a Disk Drive

To configure or replace a disk drive, do the following:

1. Remove the disk drive from its protective packaging, and open the drive latch handle.
2. Install the disk drive in the drive slot. Align the disk drive with the drive slot rails, and slide the disk drive into the slot until it contacts the backplane at the rear of the drive bay. The drive should be in far enough for the latch handle to engage the latch. Push the disk drive lever up and to the rear to lock the disk drive. The LED above the slot will turn on.
3. Log in as root user.
4. At the command line, type `smitty`.
5. Select **Devices**.
6. Select **Install/Configure Devices Added After IPL** and press Enter. Successful configuration is indicated by the OK message displayed next to the Command field at the top of the screen
7. Press the F3 key enough times to return to first smitty menu. Then select **System Storage Management (Physical and Logical Storage)**.
8. Select **Logical Volume Manager** and press Enter.
9. Select **Volume Groups** and press Enter.
10. Select **Set Characteristics of a Volume Group** and press Enter.
11. Select **Add a Physical Volume to a Volume Group**.
12. Fill in the fields for the drive you are adding to the system. Press F4 for a list of selections.
13. See the *AIX System Management Guide: Operating System and Devices* to finish the drive configuration.

Documentation for the AIX operating system is available from the IBM @server pSeries Information Center at [http://publib16.boulder.ibm.com/pseries/en\\_US/infocenter/base](http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base). Select **AIX documentation**. The *AIX Documentation* CD contains the base set of publications for the operating system, including system-management and end-user documentation.

14. Press F10 to exit smitty.



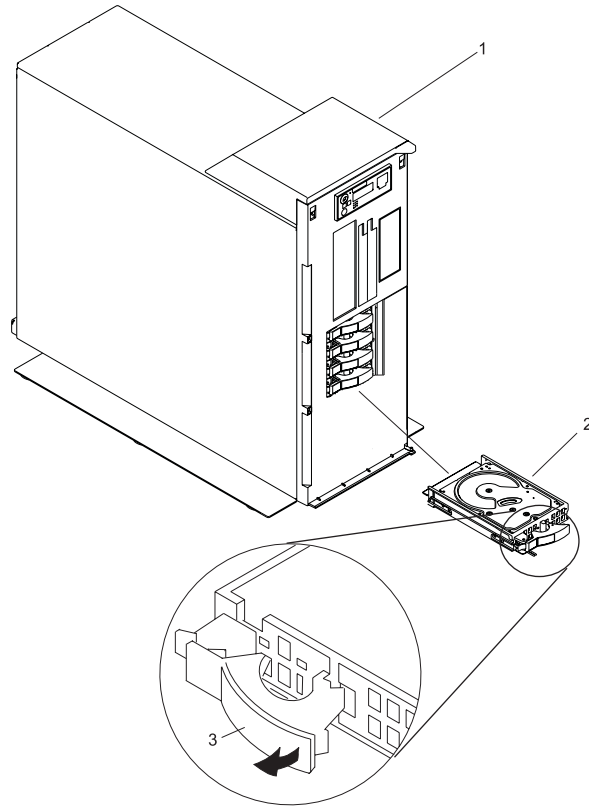
## Hot-Plug Disk Drive Removal

**Attention:** Before you perform the following procedure, ensure that the customer has taken appropriate actions to back up the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-plug drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption. Refer to “Deconfiguring (Removing) a Disk Drive” on page 47.

**Attention:** The Linux operating system does not support these hot-pluggable procedures. A system with Linux installed must be shut down and powered off before installing any disk drive or PCI adapter.

To remove a hot-plug disk drive, do the following:

1. Before removing the disk, ensure all data has been saved.
2. Deconfigure the drive you are removing from the system. See “Deconfiguring (Removing) a Disk Drive” on page 47.
3. Open the front bezel door.
4. Locate the hot-plug disk drive you plan to remove. If you are removing a faulty disk drive, a lit amber LED located at the front of each disk drive will help you isolate the faulty drive.
5. Log in as root user.
6. At the command line, type `smitty`.
7. Select **System Storage Management (Physical and Logical Storage)**.
8. Select **Removable Disk Management**.
9. Select **Remove a Disk**.
10. Select the desired disk from the list on the screen and press Enter.
11. Remove the disk drive by placing the handle on the disk drive into the open position (perpendicular to the drive) and pulling the hot-plug disk drive away from the bay. The lit LED on the disk drive will turn off when the disk drive is removed.



- 1 Model 275
- 2 Disk Drive
- 3 Disk Drive Release Handle

12. Press F10 to exit smitty.

## Installing Hot-Plug Disk Drive

**Attention:** Before you perform these procedures, ensure that the customer has taken appropriate actions to back up the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-plug drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption. Refer to “Deconfiguring (Removing) a Disk Drive” on page 47.

*Do not* use **Install/Configure Devices Added After IPL** if your system is set up to run HACMP clustering. Consult with your system administrator or software support to determine the correct method to configure the replacement disk.

**Attention:** The Linux operating system does not support these hot-pluggable procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. A system with Linux installed must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Use the non-hot-pluggable adapter procedures when replacing a PCI adapter with the Linux operating system installed.

To install a hot-plug disk drive, do the following:

1. Ensure the handle on the front of the disk drive is open (perpendicular to the drive).
2. Align the drive assembly so that it engages the guide rails in the bay.
3. Push the drive assembly into the bay until the drive handle engages the lock mechanism.
4. Push the disk drive handle in until it locks. The LED on the disk drive will turn on.
5. Log in as root user.
6. At the command line, type `smitty`.
7. Select **Devices**.
8. Select **Install/Configure Devices Added After IPL** and press Enter. Successful configuration is indicated by the OK message displayed next to the **Command** field at the top of the screen.
9. Press F10 to exit smitty.
10. Close the bezel door.

---

## Disk Drive Backplane

It is strongly recommended that the system be placed on its side, on a flat and stable surface. To avoid potential breakage, the system front foot must not be resting on the surface.

Before performing the following procedure, read “Safety Notices” on page vii.

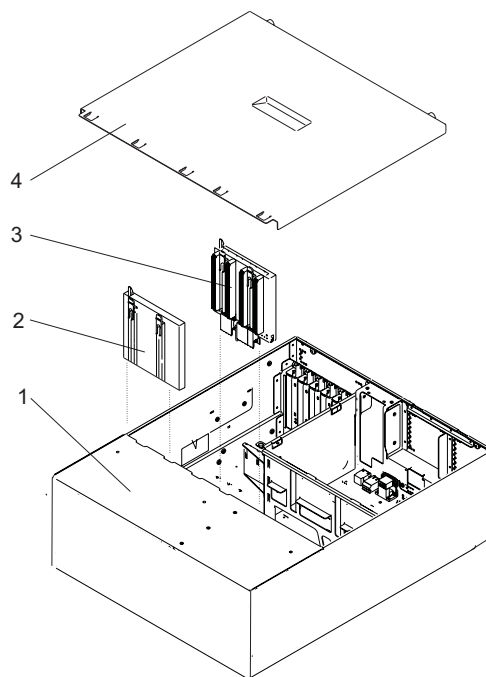
### Removing the Disk Drive Backplane

To remove the disk drive backplane, do the following:

1. Place the system into the service position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
2. Shut down the system as described in “Stopping the System” on page 25.
3. Disconnect the power source from the system.

**Note:** This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

4. Remove the service access cover as described in “Service Access Cover Removal” on page 28.
5. Remove the fan tray assembly as described in “Removing the Fan Tray Assembly” on page 35.
6. Before handling any card, board, or DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 24.
7. Disconnect the disk drive by placing the handle on the disk drive into the open position (perpendicular to the drive) and pulling the hot-swap disk drive forward in, but not out of the bay. The lit LED on the disk drive will turn off when the disk drive is removed. Pull and disk drive fillers forward in the bay.
8. Squeeze the blue latch tabs on the top edge of the disk drive backplane, and pull the backplane upward to release it from the connector. Tip the disk drive backplane away from the chassis hooks on the wall of the chassis, and lift the disk drive backplane out of the system.



1 System Unit in Service Position  
2 Disk Drive Filler Panel

3 Disk Drive Backplane  
4 Service Access Cover

## Installing or Replacing the Disk Drive Backplane

To replace the disk drive backplane, do the following:

1. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 24.
2. If necessary, remove the disk drive backplane from the antistatic package.
3. If necessary, remove the disk drive backplane filler from the slot.
4. Carefully grasp the disk drive backplane by the latch tabs located on the top edge.
5. Insert the disk drive backplane into the system chassis at an angle to the chassis hooks, and align the hooks with the guides on the disk drive backplane.
6. Tip the disk drive backplane forward onto the chassis hooks. Firmly press the disk drive backplane into the connector until you feel the latch tabs lock into place.
7. Press the disk drives back into place and close the handle. Press any disk drive fillers back into place.
8. Replace the fan tray assembly as described in “Fan Tray Assembly” on page 35
9. Reconnect the power source to the system.
10. Replace the service access cover as described in “Covers” on page 28.
11. Return the system to the operating position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
12. Power on the system as described in “Starting the System” on page 25.

## Memory DIMMs

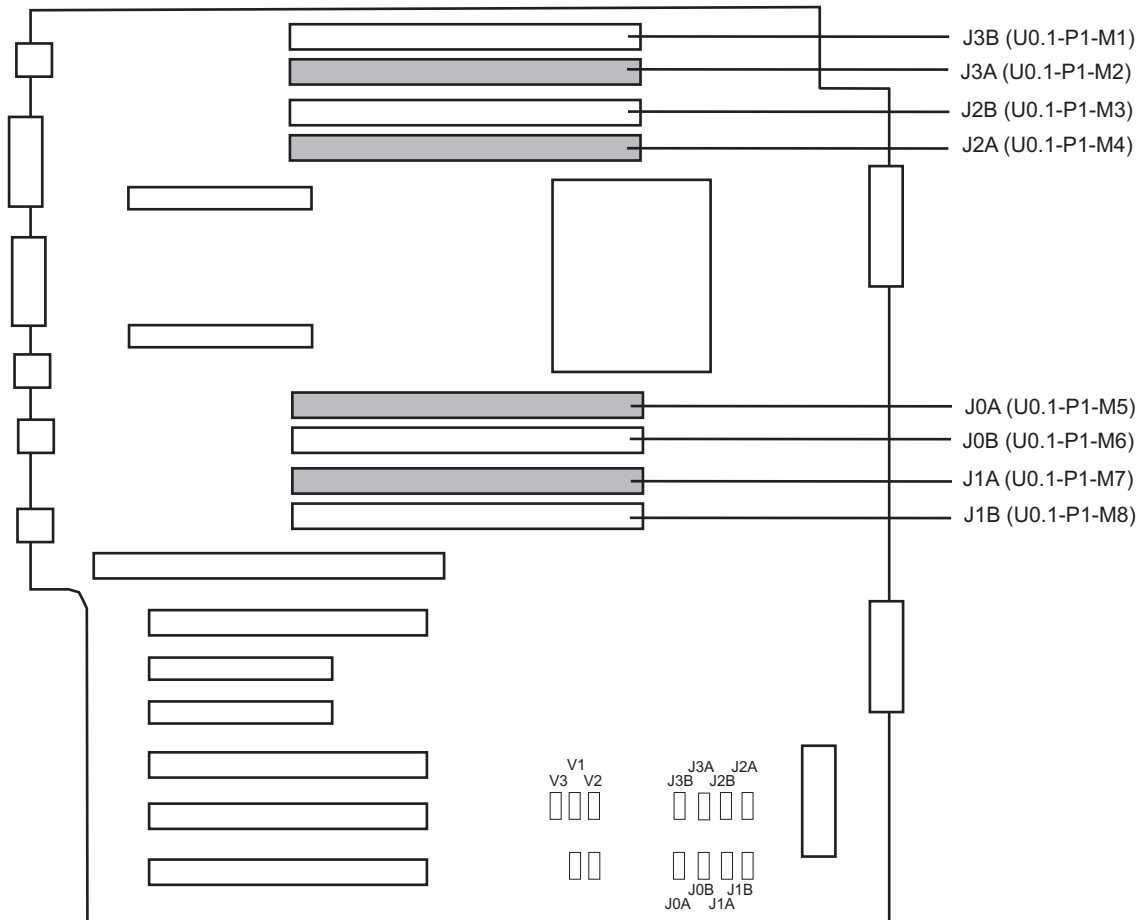
Before performing the following procedures, read “Safety Notices” on page vii.

**Note:** Memory DIMMs must be installed in quads (groups of four) and in the correct slots. M2, M4, M5, and M7 are in one quad. M1, M3, M6, and M8 are in the other quad. Either quad can be populated first.

## Memory DIMM Installation and Replacement

If a memory DIMM must be removed before you can install one, refer to “Memory DIMM Removal” on page 56. To install a memory DIMM, do the following:

1. Shut down the system as described in “Stopping the System” on page 25.
2. Place the system into the service position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
3. Remove the service access cover as described in “Service Access Cover Removal” on page 28.
4. Remove the fan tray assembly as described in “Removing the Fan Tray Assembly” on page 35.
5. The following illustration shows the system backplane with the memory DIMM slots labelled. Determine which DIMM slots you will need to access in order to install or replace a memory DIMM.

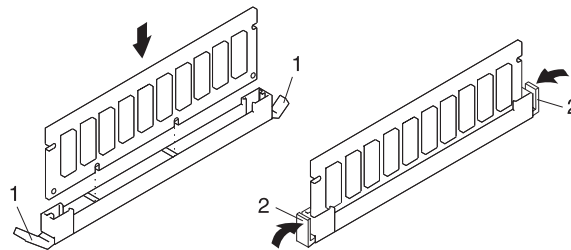


Number	Description	Location Code
<b>M1</b>	Memory slot 1 (J3B)	U0.1-P1-M1
<b>M2</b>	Memory slot 2 (J3A)	U0.1-P1-M2
<b>M3</b>	Memory slot 3 (J2B)	U0.1-P1-M3

Number	Description	Location Code
M4	Memory slot 4 (J2A)	U0.1-P1-M4
M5	Memory slot 5 (J0A)	U0.1-P1-M5
M6	Memory slot 6 (J0B)	U0.1-P1-M6
M7	Memory slot 7 (J1A)	U0.1-P1-M7
M8	Memory slot 8 (J1B)	U0.1-P1-M8

6. If necessary to access the DIMM slots, remove components such as power supplies or the service processor . Refer to “Power Supply Removal” on page 38 and “Removing the Service Processor Assembly” on page 57.
7. If necessary, remove the current memory DIMM from the desired location as described in “Memory DIMM Removal” on page 56
8. Before handling any card, board, or memory DIMM, touch any metal surface of the chassis with one hand to minimize the static electricity discharge. Refer to “Handling Static-Sensitive Devices” on page 24.
9. Remove the new memory DIMM from its antistatic package.
10. Ensure that the connector locking tabs are pushed out in the unlocked position,as shown in the following illustration, before installing a new memory DIMM.
11. Carefully grasp the memory DIMM along two edges and align the connector.
12. Insert the memory card firmly into the connector.
13. Secure the memory DIMM with the locking tabs located at each end of the DIMM connector, as shown in the following illustration.

**Attention:** To prevent damage to the memory DIMM and the memory DIMM connectors, open or close the retention latches at the same time.



- 1 Locking Tabs (unlocked position)  
2 Locking Tabs (locked position)

14. If they were removed to gain access to the DIMM slots, replace components such as power supplies or the service processor. Refer to “Power Supply Replacement” on page 40 and “Replacing the Service Processor Assembly” on page 57.
15. Replace the fan tray assembly as described in “Replacing the Fan Tray Assembly” on page 37.
16. Replace the service access cover as described in “Service Access Cover Replacement” on page 28.
17. Reconnect all power and signal cables.
18. Return the system to the operating position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
19. Power on the system as described in “Starting the System” on page 25.

## Memory DIMM Removal

To remove the memory DIMMs, do the following:

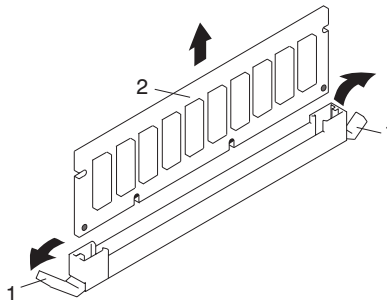
1. Shut down the system as described in “Stopping the System” on page 25.
2. Place the system into the service position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
3. Disconnect the power source from the system.

**Note:** This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

4. Remove the service access cover as described in “Service Access Cover Removal” on page 28.
5. Remove the fan tray assembly as described in “Removing the Fan Tray Assembly” on page 35.
6. If necessary to access DIMM positions on the system backplane, remove the power supply filler and the power supply as described in “Power Supply Removal” on page 38.
7. If necessary to access DIMMs on the system backplane, remove the service processor assembly as described in “Service Processor Assembly” on page 57.
8. Before handling any card, board, or memory DIMM, touch any metal surface of the chassis with one hand to minimize static electricity discharge. Refer to “Handling Static-Sensitive Devices” on page 24.
9. Determine which memory DIMM you want to remove. See the illustration in “Memory DIMM Installation and Replacement” on page 54.
10. Remove the memory DIMM by pushing the tabs out and then down. The tabs’ camming action forces the memory DIMM out of the connector.

**Attention:** To prevent damage to the memory DIMM and the memory DIMM connectors, open or close the retention latches at the same time.

11. Pull the memory DIMM out of the connector as shown in the following illustration.



- 1 Connector Tabs (unlocked position)
- 2 Memory DIMM



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## Service Processor Assembly

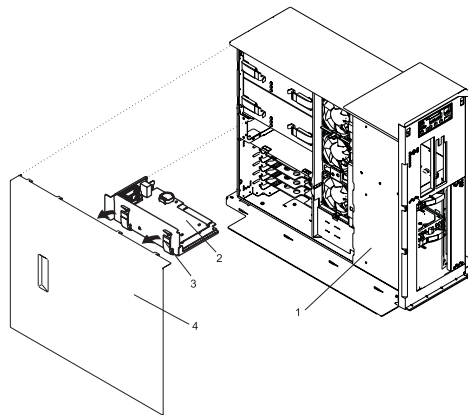
Before performing the following procedure, read “Safety Notices” on page vii.

### Removing the Service Processor Assembly

1. Shut down the system as described in “Stopping the System” on page 25.
2. Place the system into the service position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
3. Write down the information displayed on the operator panel.
4. Disconnect the power source from the system.

**Note:** This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

5. Label and disconnect all cables connected to the service processor assembly.
6. Remove the service access cover as described in “Service Access Cover Removal” on page 28.
7. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 24.
8. Locate the service processor assembly as shown in the following illustration.
9. Unlock the two camming latches on top of the service processor assembly.
10. Release the service processor assembly by pressing the camming latches and rotating outward.
11. Lift the assembly out of the chassis.
12. Put the service processor assembly in a safe place.



1 Model 275  
2 Service Processor Assembly

3 Camming Latch  
4 Service Access Cover

### Replacing the Service Processor Assembly

1. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 24.
2. Unlock the two camming latches on the top of the service processor assembly and rotate them into the open position.
3. Align the service processor assembly with the slots in the system chassis.
4. While holding the service processor assembly by the camming latches, lower it into place.

**Note:** Ensure that the two alignment pins on the top flange of the service processor align with the corresponding holes in the rear bulkhead as the service processor is pressed into place.

5. Press firmly on the top of the service processor assembly until you feel it lock into place.
6. Rotate the camming latches downward until they lock into place.
7. Replace the service access cover, as described in “Service Access Cover Replacement” on page 28.
8. Return the system to the operating position as described in “Placing the Model 275 into the Service and Operating Position” on page 26.
9. Reconnect cables to the service processor assembly.
10. Reconnect all system power cables.
11. Power on the system as described in “Starting the System” on page 25.

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## Replacing the Battery

Before performing the following procedure, read “Safety Notices” on page vii.

### CAUTION:

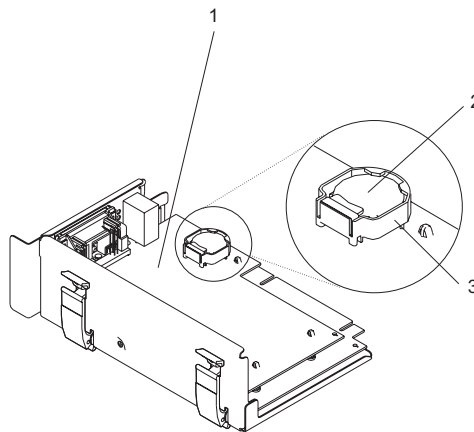
A lithium battery can cause fire, explosion, or severe burn. Do not recharge, disassemble, heat above 100°C (212°F), solder directly to the cell, incinerate, or expose cell contents to water. Keep away from children. Replace only with the part number specified for your system. Use of another battery may present a risk of fire or explosion.

The battery connector is polarized; do not attempt to reverse polarity.

Dispose of the battery according to local regulations.

To replace the system’s battery, do the following:

1. Open the bezel door.
2. Shut down the system as described in “Stopping the System” on page 25.
3. Remove the service access cover as described in “Service Access Cover Removal” on page 28.
4. Remove the service processor assembly as described in “Removing the Service Processor Assembly” on page 57.
5. Locate the battery on the service processor assembly.
6. Use your fingernail to pry the battery out of its plastic mount. After the bottom of the battery has cleared the top edge of the plastic mount, pull it up and away from the system planar.



- 1 Service processor assembly
- 2 Battery
- 3 Battery plastic mount

7. Replace the battery with part number 00P3903 or equivalent.
8. When installing the new battery, ensure that the battery polarity is correct. For this system, the positive (+) side of the battery should be facing up in its plastic mount.
9. Gently insert the new battery into its plastic mount.
10. Replace the service processor assembly in the system unit as described in “Replacing the Service Processor Assembly” on page 57.
11. Replace the service access cover, as described in “Service Access Cover Replacement” on page 28.
12. Turn on the system power.
13. If you are running AIX, the **bootlist** command may need to be run while logged in as root user. This action rebuilds the customized boot list. IP (Internet protocol) parameters may also need to be reentered.

Documentation for the AIX operating system is available from the IBM @server pSeries Information Center at [http://publib16.boulder.ibm.com/pseries/en\\_US/infocenter/base](http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base). Select **AIX documentation**. The *AIX Documentation* CD contains the base set of publications for the operating system, including system-management and end-user documentation.

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## Appendix A. Communications Statements

The following statement applies to this product. The statement for other products intended for use with this product appears in their accompanying documentation.

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### Federal Communications Commission (FCC) Statement

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

- International Business Machines Corporation
- New Orchard Road
- Armonk, New York 10504
- Telephone: (919) 543-2193



FOR HOME OR OFFICE USE

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## European Union (EU) Statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards supplied by third parties. Consult with your dealer or sales representative for details on your specific hardware.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

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## International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

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## United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

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## Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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## Canadian Department of Communications Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

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## VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。  
取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class B Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). This product is aimed to be used in a domestic environment. When used near a radio or TV receiver, it may become the cause of radio interference. Read the instructions for correct handling.

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## Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.





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## Appendix B. Environmental Notices

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### Product Recycling and Disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. For country specific instructions refer to the following web site: <http://www.ibm.com/ibm/environment/products/prp.phtml>

**This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries, contact your local waste disposal facility.**

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and other battery packs from IBM Equipment. For information on proper disposal of these batteries, please contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

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### Environmental Design

The environmental efforts that have gone into the design of this system signify IBM's commitment to improve the quality of its products and processes. Some of these accomplishments include the elimination of the use of Class 1 ozone-depleting chemicals in the manufacturing process and reductions in manufacturing wastes. For more information, contact an IBM account representative.

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### Acoustical Noise Emissions

The equivalent continuous A-weighted sound pressure level at workstations (emission sound pressure level at the 1-meter bystander positions) does not exceed 70 dB(A).

Der Geräuschpegel der Einheit ist kleiner oder gleich 70 db(A).

### Declared Acoustical Noise Emissions

Product Configuration	Declared A-Weighted Sound Power Level, <i>L<sub>WA</sub>d</i> (B)	
	Operating	Idling
275	6.0	5.9

**Notes:**

- L<sub>WA</sub>d* is the declared (upper limit) sound power level for a random sample of machines. (1B = 10dB)
- L<sub>pAm</sub>* is the mean value of the A-weighted sound pressure level at the 1-meter bystander positions for a random sample of machines.
- All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296.



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## Appendix C. Notices

This information was developed for products and services offered in the U.S.A.

The manufacturer may not offer the products, services, or features discussed in this document in other countries. Consult the manufacturer's representative for information on the products and services currently available in your area. Any reference to the manufacturer's product, program, or service is not intended to state or imply that only that product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any intellectual property right of the manufacturer may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any product, program, or service.

The manufacturer may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the manufacturer.

**The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law:** THIS MANUAL IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions; therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. The manufacturer may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Information concerning products made by other than the manufacturer was obtained from the suppliers of those products, their published announcements, or other publicly available sources. The manufacturer has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to products made by other than the manufacturer. Questions on the capabilities of products made by other than the manufacturer should be addressed to the suppliers of those products.



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## Appendix D. System Records

Use this appendix to keep a record of the system's identification information.

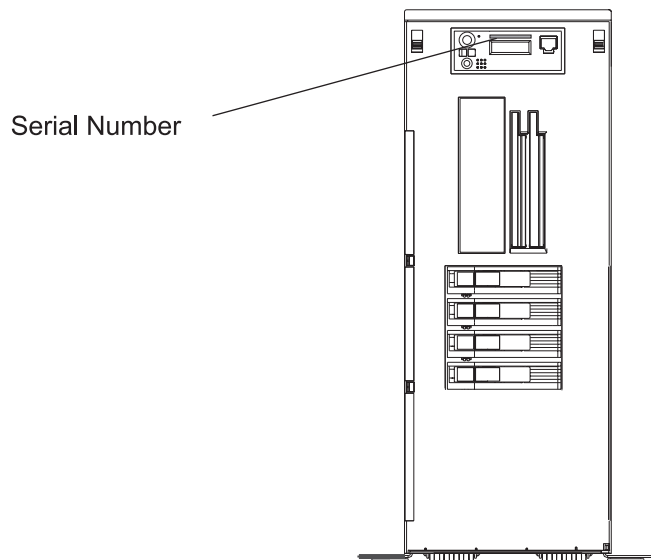
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### Identification Numbers

Record and retain the following information:

Product Name	IntelliStation POWER 9114 Model 275
Serial Number	
Key Serial Number	

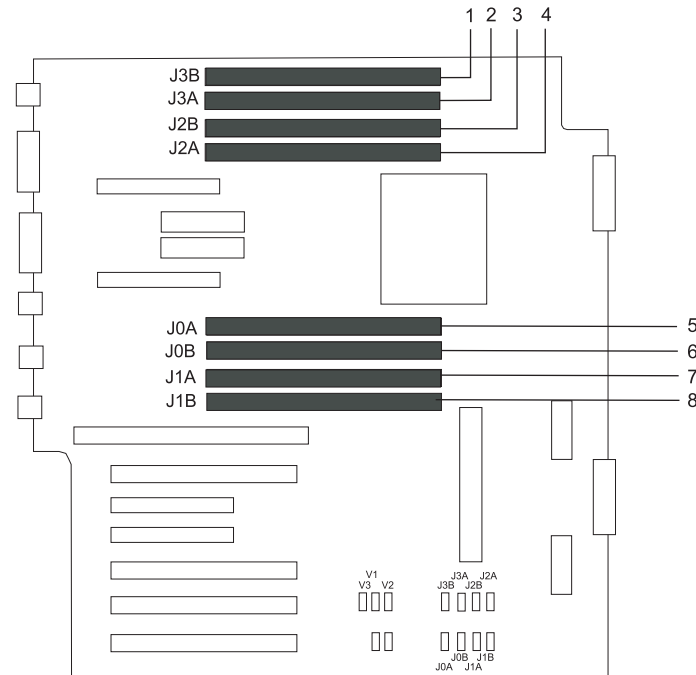
The system unit's serial numbers are located on the front of the machine, as shown in the following illustration:



## Device Records

Use the following tables to keep a record of the options installed in or attached to your system. This information can be helpful when you install additional options in your system or if your system needs service.

## Memory Card



- 1 Memory DIMM 1 J3B (U0.1-P1-M1)
- 2 Memory DIMM 2 J3A (U0.1-P1-M2)
- 3 Memory DIMM 3 J2B (U0.1-P1-M3)
- 4 Memory DIMM 4 J2A (U0.1-P1-M4)

- 5 Memory DIMM 5 J0A (U0.1-P1-M5)
- 6 Memory DIMM 6 J0B (U0.1-P1-M6)
- 7 Memory DIMM 7 J1A (U0.1-P1-M7)
- 8 Memory DIMM 8 J1B (U0.1-P1-M8)

**Note:** The storage capability available of each memory DIMM slot is 256 MB, 512 MB, 1024 MB, or 2048 MB.

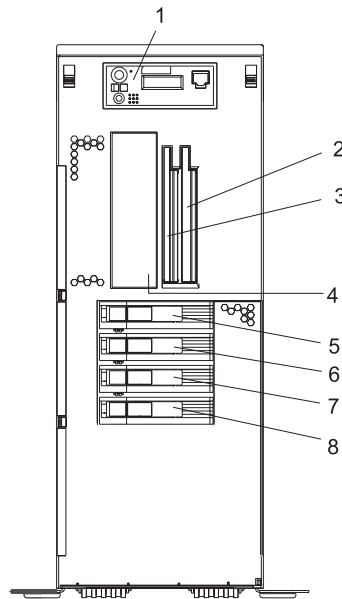
# Options

Location	Option Description
Mouse Connector	<u>IBM Mouse</u> <input type="checkbox"/> <u>Other:</u> _____
Keyboard Connector	<u>Space Saving</u> <input type="checkbox"/> <u>Enhanced</u> <input type="checkbox"/> <u>Other:</u> _____
Expansion Slot 6	_____
Expansion Slot 5	_____
Expansion Slot 4	_____
Expansion Slot 3	_____
Expansion Slot 2	_____
Expansion Slot 1	_____
Parallel Port	_____
Serial Port 1	_____
Serial Port 2	_____
Serial Port 3	_____
Ethernet 1	_____
Ethernet 2	_____
	_____

## SCSI IDs and Bay Locations

The following figures show the SCSI bay locations for the IntelliStation POWER 9114 Model 275.

### Model 275



Index	Drive Name	SCSI ID	
1	Operator Panel		
2	Diskette Drive or IDE Optical Drive	(U0.1-P1-X1/Q6-A1, for optical drive)	
3	IDE CD-ROM (Default) or IDE DVD-ROM (Optional)	IDE (Non-SCSI) (U0.1-P1-X1/Q6-A0)	
4	Tape Drive (Optional)	SCSI ID 0	
	SCSI DVD-RAM (Optional)	SCSI ID 1	
5	Disk Drive 1	SCSI Bus 0	SCSI ID 3
6	Disk Drive 2		SCSI ID 4
7	Disk Drive 3		SCSI ID 5
8	Disk Drive 4		SCSI ID 8

#### Notes:

1. The SCSI bus IDs are the recommended values and indicate how the IDs are set when the system is shipped from the factory. Field installations might not comply with these recommendations.
2. One disk drive backplane is standard in the IntelliStation POWER 9114 Model 275; a second backplane can be added. In the figure above, the system is shown fully populated with two backplanes and four disk drives.
3. Media bay location Index 2 is designed to house one of the following optional devices:
  - IDE Optical Drive
  - Diskette Drive

Any SCSI device used in media bay location Index 4 must be connected to a PCI SCSI adapter.



## Appendix E. General Attributes Required When Using a TTY Terminal

The following general attributes are the default settings for the diagnostic programs. Be sure your terminal is set to these attributes.

**Note:** Set these attributes before the diagnostic programs are loaded.

General Setup Attributes	3151 /11/31/41 Settings	3151 /51/61 Settings	3161 /3164 Settings	Description
Machine mode	3151	3151 PC	3161 or 3164	The diagnostic programs are set to emulate use of the 3161 ASCII Display Terminal. If your terminal can emulate a 5085, 3161 or 3164 terminal, use these attribute settings. Otherwise, refer to your operator's manual, compare the attribute descriptions with those of your terminal, and set your attributes accordingly.
Generated Code Set		ASCII		
Screen	Normal	Normal		Uses the EIA-232 interface protocol.
Row and Column	24 x 80	24 x 80		Uses the EIA-232 interface protocol.
Scroll	Jump	Jump	Jump	When the last character on the bottom line is entered, the screen moves down one line.
Auto LF	Off	Off	Off	For the "On" setting, pressing the Return key moves the cursor to the first character position of the next line. For the "Off" setting, pressing the Return key moves the cursor to the first character position of the current line. The CR and LF characters are generated by the New line setting.
CRT saver	Off	Off	10	The "10" setting causes the display screen to go blank if there is no activity for 10 minutes. When the system unit sends data or a key is pressed, the screen contents display again.
Line wrap	On	On	On	The cursor moves to the first character position of the next line in the page after it reaches the last character position of the current line in the page.
Forcing insert	Off	Off		
Tab	Field	Field	Field	The column tab stops are ignored, and the tab operation depends on the field attribute character positions.
Trace			All	Both inbound data (data to the system unit) and outbound data (data from the system unit) to and from the main port can be transferred to the auxiliary port without disturbing communications with the system unit when the Trace key is pressed.

---

## Additional Communication Attributes

The following communication attributes are for the 3151, 3161, and 3164 terminals.

Communication Setup Attributes	3151/11 /31/41) Settings	3151 /51/61, Settings	3161 /3164 Settings	Description
Operating mode	Echo	Echo	Echo	Data entered from the keyboard on the terminal is sent to the system unit for translation and then sent back to the display screen. Sometimes called <i>conversational mode</i> .
Line speed	9600 bps	9600 bps	9600 bps	Uses the 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).
Turnaround character	CR	CR	CR	Selects the carriage return (CR) character as the line turnaround character.
Interface	EIA-232	EIA-232	EIA-232	Uses the EIA-232 interface protocol.
Line control	IPRTS	IPRTS	IPRTS	Uses the 'permanent request to send' (IPRTS) signal to communicate with system unit.
Break signal (ms)	500	500	500	The terminal sends a break signal to the system unit within 500 ms after the Break key is pressed.
Send null suppress	On	On		Trailing null characters are not sent to the system unit.
Send null			On	Trailing null characters are sent to the system unit.
Response delay (ms)	100	100	100	The terminal waits for 100 ms for the system unit to respond.

---

## Additional Keyboard Attributes

The following keyboard attributes are for the keyboard attached to the 3151, 3161, and 3164 terminals.

Keyboard Setup Attributes	3151/11 /31/41) Settings	3151 /51/61) Settings	3161 /3164 Settings	Description
Enter	Return	Return	Return	The Enter key functions as the Return key.
Return	New line	New line	New line	The cursor moves to the next line when the Return key is pressed.

<b>Keyboard Setup Attributes</b>	<b>3151/11 /31/41 Settings</b>	<b>3151 /51/61 Settings</b>	<b>3161 /3164 Settings</b>	<b>Description</b>
New line	CR	CR	CR	The Return key generates the carriage return (CR) and the line feed (LF) characters. The line turnaround occurs after the CR and LF characters are generated.
Send	Page	Page	Page	The contents of the current page are sent to the system unit when the Send key is pressed.
Insert character	Space	Space	Space	A blank character is inserted when the Insert key is pressed.

---

## **Additional Printer Attributes**

The following printer attributes are for a printer attached to the 3151, 3161, and 3164 terminals.

<b>Printer Setup Attributes</b>	<b>3151/11 /31/41 Settings</b>	<b>3151 /51/61 Settings</b>	<b>3161 /3164 Settings</b>	<b>Description</b>
Line speed	9600	9600	9600	Uses 19200 or 9600 bps (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects eight bits as a data word length (byte).
Parity	Even	Even	No	
Stop bit	1	1	1	Places a bit after a data word (byte).
Characters	ALL	ALL		
Line end			CR-LF	
Print			View port	
Print EOL			Off	
Print null			Off	



---

## Appendix F. Firmware Updates

---

### Determining the Level of Firmware on the System

**Note:** This information may be superseded by the information that is available at <http://www.rs6000.ibm.com/support/micro>. Always check the Web site for the latest images and instructions for checking the firmware level.

The firmware level is denoted by vFyymmdd, where v = version number, F = the system's firmware designation, yy = year, mm = month, and dd = day of the release.

If the system is running AIX, the firmware level can be determined by either of the following methods:

- On the AIX command line, by typing:

```
lscfg -vp|grep -p Platform
```

A line that begins with ROM level (alterable).. displays the firmware level that is currently on the system.

- Looking at the top of the service processor main menu.

If the system is running Linux, the platform firmware level can be determined by the following methods:

- On the Linux command line type:

```
/usr/sbin/ibmras/nvram/ --print-vpd | grep 3F
```

A line similar to the following displays the firmware level that is currently on the system:

```
Alterable ROM Level 3F030504
```

- Look at the top of the service processor menu main menu.

---

### System Firmware Update Using a Locally Available Image

To update the system firmware using a locally available image, perform the following steps:

1. Log in as root user.
2. If the directory **/tmp/fwupdate** does not exist, create it by running the following command:

```
mkdir /tmp/fwupdate
```

3. The firmware update file must be downloaded or copied into the **/tmp/fwupdate** directory on the system. This can be done by using the **ftp** command to get the image from an ftp server or NFS-mounting the directory on the host system.

The firmware updated file can also be transferred to the target system by backing up the image onto diskettes from another server and restoring it into the **/tmp/fwupdate** directory.

After the firmware update file has been downloaded or copied into the **/tmp/fwupdate** directory, verify its existence by running the following command:

```
ls /tmp/fwupdate/3F*.img
```

The update file will have the format 3Fyymmdd.img. The 3F indicates that this is an update image for your system: yy is the year, mm is the month, and dd is the day of the update file.

4. After the update file has been written to the **/tmp/fwupdate** directory, enter the following commands:

```
cd /usr/lpp/diagnostics/bin
```

```
./update_flash -f /tmp/fwupdate/3Fyymmdd.img
```

**Attention:** Do not overlook the periods (.) in the commands shown above. AIX commands are case-sensitive. Type them exactly as shown.

You will be asked for confirmation to proceed with the firmware update and the required reboot. If you confirm, the system will apply the new firmware, reboot, and return to the AIX prompt. This may take up to ten minutes depending on the configuration of the system.

**Attention:** On some systems, the message `Wait for rebooting before stopping` may display on the system console. Do not turn off the system until the system has fully rebooted to the AIX login prompt. If a shutdown is necessary at that time, log in as root user and issue the **shutdown** command.

While the update is in progress, you will see `Rebooting...` on the display for several minutes.

The firmware update is complete.

---

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Installation Guide

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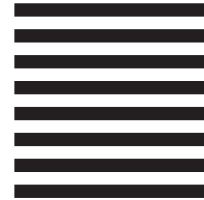
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