IBM®

@server

xSeries 200
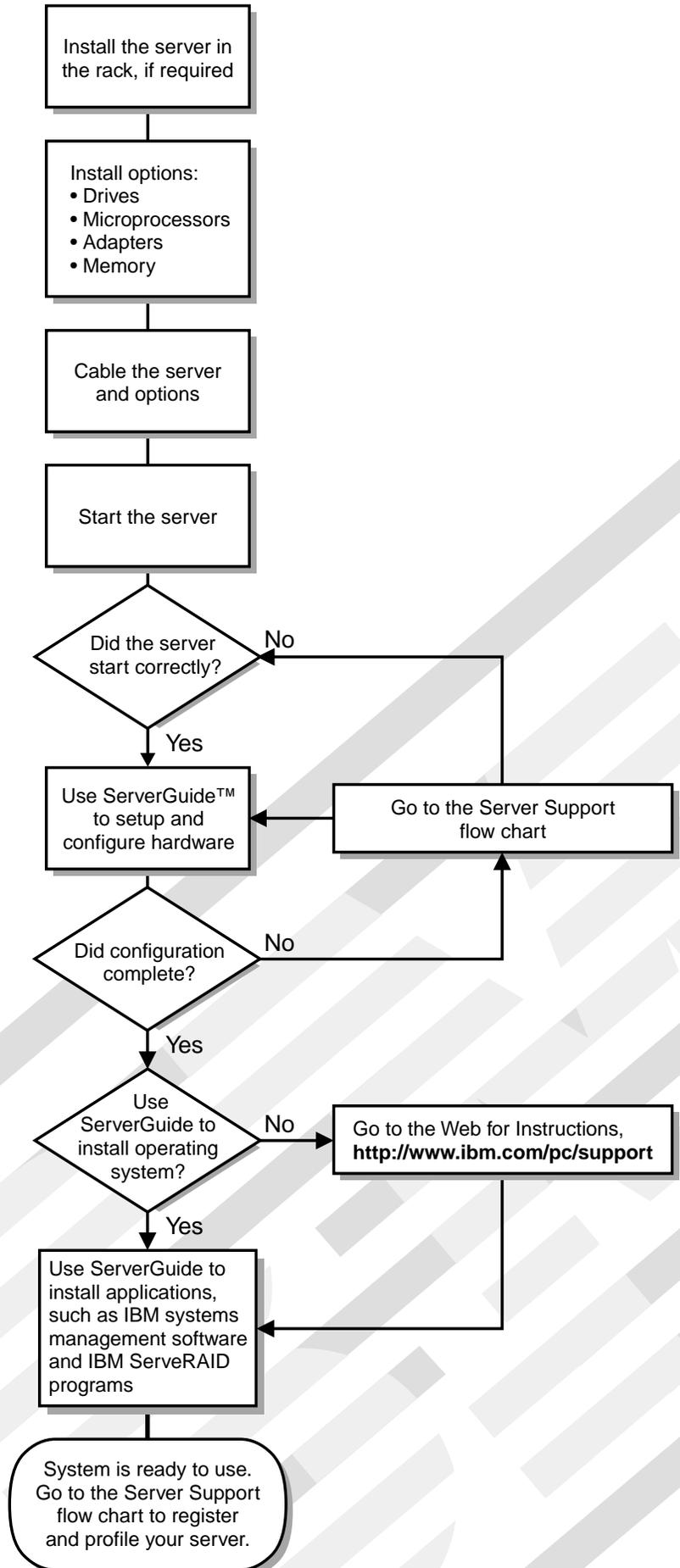
Installation Guide

Welcome. . .

Thank you for buying an
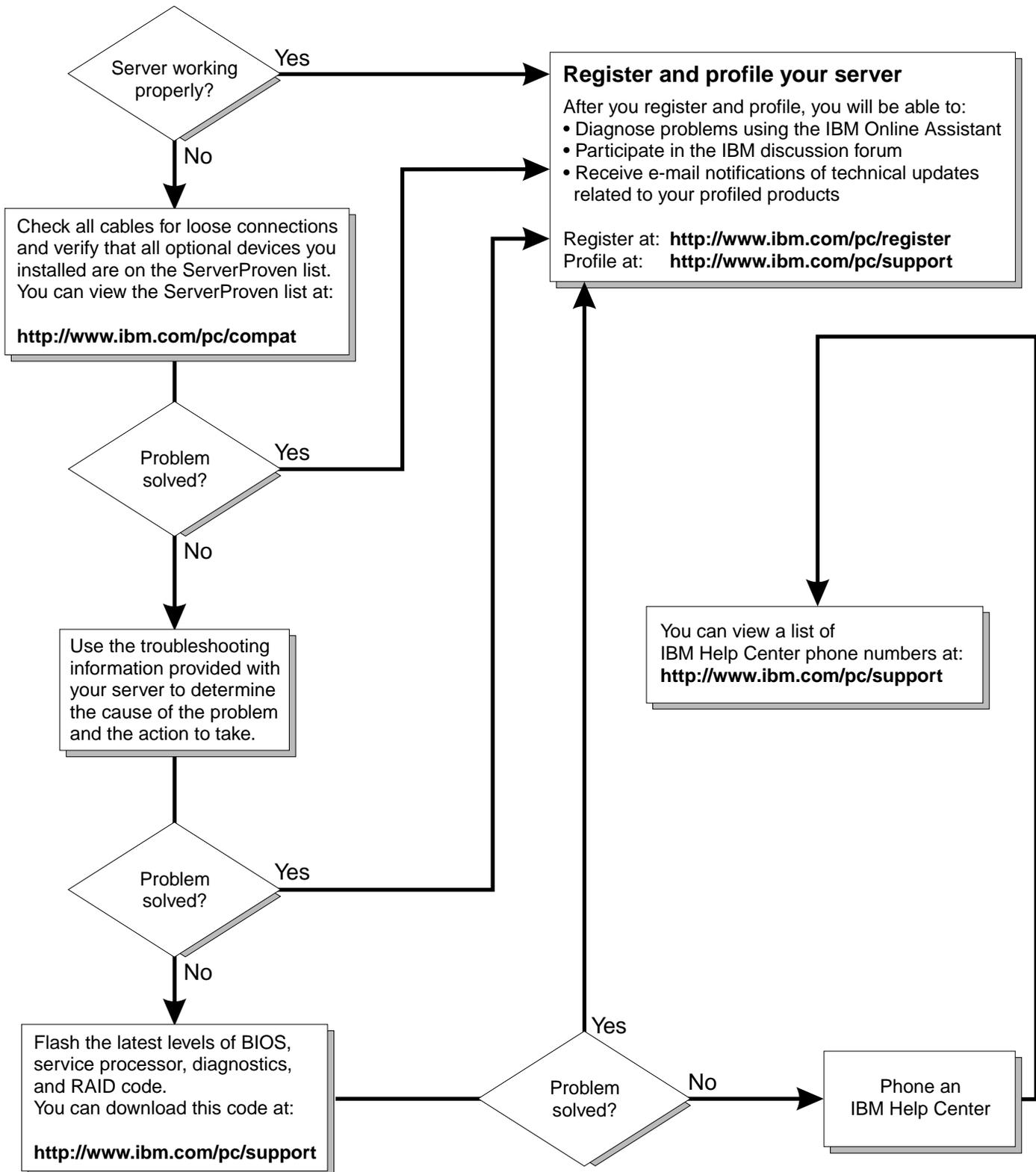IBM xSeries server.

This server *Installation Guide*
contains information for setting
up and configuring your server.

For detailed information
about your server, view the
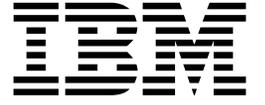*User's Reference* on the
Documentation CD.

You can also find the most
current information about your
server on the IBM Web site at:
http://www.ibm.com/pc/support

Install the server in
the rack, if required

↓

Install options:
• Drives
• Microprocessors
• Adapters
• Memory

↓

Cable the server
and options

↓

Start the server

↓

Did the server
start correctly? —No→ Go to the Server Support flow chart

↓ Yes

Use ServerGuide™
to setup and
configure hardware ←— Go to the Server Support
flow chart

↓

Did configuration
complete? —No→

↓ Yes

Use
ServerGuide to
install operating
system? —No→ Go to the Web for Instructions,
http://www.ibm.com/pc/support

↓ Yes

Use ServerGuide to
install applications,
such as IBM systems
management software
and IBM ServeRAID
programs

↓

System is ready to use.
Go to the Server Support
flow chart to register
and profile your server.

Server Support

Server working properly? — Yes →

No ↓

Check all cables for loose connections and verify that all optional devices you installed are on the ServerProven list. You can view the ServerProven list at:

http://www.ibm.com/pc/compat

↓

Problem solved? — Yes →

No ↓

Use the troubleshooting information provided with your server to determine the cause of the problem and the action to take.

↓

Problem solved? — Yes →

No ↓

Flash the latest levels of BIOS, service processor, diagnostics, and RAID code. You can download this code at:

http://www.ibm.com/pc/support

→ **Problem solved?** — Yes ↑

No →

Phone an IBM Help Center

Register and profile your server

After you register and profile, you will be able to:
• Diagnose problems using the IBM Online Assistant
• Participate in the IBM discussion forum
• Receive e-mail notifications of technical updates related to your profiled products

Register at: **http://www.ibm.com/pc/register**
Profile at: **http://www.ibm.com/pc/support**

You can view a list of
IBM Help Center phone numbers at:
http://www.ibm.com/pc/support

IBM xSeries 200

Installation Guide

NOTE

Before using this information and the product it supports, be sure to read the general information in "Appendix A. Product warranties and notices," on page 33.

Contents

Safety

Before installing this product, read the Safety Information book.

مج، يجب قراءة   دات السلامة

Antes de instalar este produto, leia o Manual de Informações sobre Segurança.

安装本产品前请先阅读《安全信息》手册。

Prije instalacije ovog proizvoda pročitajte priručnik sa sigurnosnim uputama.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs hæftet med sikkerhedsforskrifter, før du installerer dette produkt.

Lue Safety Information -kirjanen, ennen kuin asennat tämän tuotteen.

Avant de procéder à l'installation de ce produit, lisez le manuel Safety Information.

Vor Beginn der Installation die Broschüre mit Sicherheitshinweisen lesen.

Πριν εγκαταστήσετε αυτό το προϊόν, διαβάστε το εγχειρίδιο Safety Information.

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

Przed zainstalowaniem tego produktu należy przeczytać broszurę Informacje Dotyczące Bezpieczeństwa.

Prima di installare questo prodotto, leggere l'opuscolo contenente le informazioni sulla sicurezza.

本製品を導入する前に、安全情報資料を御読みください。

이 제품을 설치하기 전에, 안전 정보 책자를 읽어보십시오.

Пред да го инсталирате овој производ прочитајте ја книгата со безбедносни информации.

Lees voordat u dit product installeert eerst het boekje met veiligheidsvoorschriften.

Les heftet om sikkerhetsinformasjon (Safety Information) før du installerer dette produktet.

Prije instalacije ovog proizvoda pročitajte priručnik sa sigurnosnim uputama.

Antes de instalar este produto, leia o folheto Informações sobre Segurança.

Перед установкой продукта прочтите брошюру по технике безопасности (Safety Information).

Pred inštaláciou tohto produktu si pre ítajte Informa nú brožúrku o bezpe nosti.

Preden namestite ta izdelek, preberite knjižico Varnostne informacije.

Antes de instalar este producto, lea la Información de Seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

在安裝本產品之前，也請先閱讀「安全性資訊」小冊子。

Installálás el tt olvassa el a Biztonsági el írások kézikönyvét !

Statement 1

Danger

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**

- **Connect all power cords to a properly wired and grounded electrical outlet.**

- **Connect to properly wired outlets any equipment that will be attached to this product.**

- **When possible, use one hand only to connect or disconnect signal cables.**

- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**

- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**

- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To connect:	To disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

Statement 2

CAUTION:

![warning triangle icon]

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- **Throw or immerse into water.**
- **Heat to more than 100 C (212 F)**
- **Repair or disassemble**

Dispose of the battery as required by local ordinances or regulations.

Statement 3

![warning triangle icon]

CAUTION:
When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:
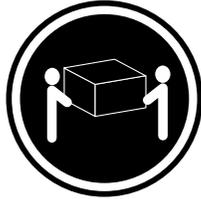
- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**
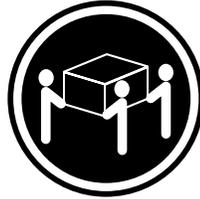
![warning triangle icon]

Danger
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following. Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Statement 4

≥18 kg (39.7 lbs)   ≥32 kg (70.5 lbs)   ≥55 kg (121.2 lbs)
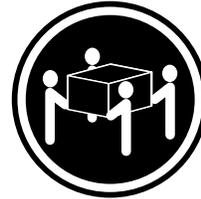
CAUTION:
Use safe practices when lifting.

Statement 5

CAUTION:
The power control button on the device and the power switch on the power
supply do not turn off the electrical current supplied to the device. The device
also might have more than one power cord. To remove all electrical current from
the device, ensure that all power cords are disconnected from the power source.

2
1
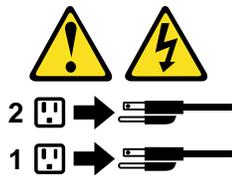
Handling static-sensitive devices

Attention: Static electricity can damage electronic devices and your system. To avoid damage, keep static-sensitive devices in their static-protective bag until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.

- Handle the device carefully, holding it by its edges or its frame.

- Do not touch solder joints, pins, or exposed printed circuitry.

- Do not leave the device where others can handle and possibly damage the device.

- While the device is still in its anti-static package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body.)

- Remove the device from its package and install it directly into your system unit without setting it down. If it is necessary to set the device down, place it on its static-protective package. (If your device is an adapter, place it component side up.) Do not place the device on your system unit cover or on a metal table.

- Take additional care when handling devices during cold weather as heating reduces indoor humidity and increases static electricity.

Chapter 1. Introduction

Thank you for purchasing an IBM® @server xSeries 200 server. This *Installation Guide* provides the information that is needed to:

- Set up and cable your server
- Start and configure your server
- Install your network operating system (NOS)

Packaged with the *Installation Guide* are software CDs that help you to configure hardware, install device drivers, and install the network operating system.

Also included is an *IBM xSeries Documentation* CD, which provides detailed information about your server.

Your server comes with a limited warranty and IBM Server Start Up Support. If you have access to the World Wide Web, you can obtain up-to-date information about your xSeries 200 model and other IBM server products at the following World Wide Web address: http://www.ibm.com/eserver/xseries

Record your product information in this table.
Product name _____
Machine type _____
Model number _____
Serial number _____
Key:
Serial number _____
Manufacturer _____
Phone Number _____

The server model and serial numbers are located on labels on the bottom of the server and on the lower right side of the bezel.

Note: Your server keys cannot be duplicated by locksmiths. If you lose them, order replacement keys from the key manufacturer. The key serial number and the telephone number of the manufacturer are on a tag attached to the keys.

Features and specifications

The following table provides a summary of the features and specifications of your xSeries 200 server.

Table 1. Features and Specifications

Microprocessor:	Power supply:	Environment:
Supports one microprocessor (depending on your model)	One 330 watt (90-240 V ac)	• Air temperature:
• Intel® Pentium® III with 256KB Level-2 cache and MMX™ (MMX2) technology or • Intel® Celeron® with 128KB Level-2 cache and MMX™ (MMX2) technology	**Video:** • S3 Savage 4 AGP video adapter • Compatible with SVGA and VGA • 8 MB SDRAM video memory	— Server on: 10° to 35° C (50.0° to 95.0° F). Altitude: 0 to 914 m (2998.7 ft.) — Server on: 10° to 32°C (50.0° to 89.6° F). Altitude: 914 m (2998.7 ft.) to 2133 m (6998.0 ft.) — Server off: 10° to 43° C (50.0° to 109.4° F). Maximum altitude: 2133 m (6998.0 ft.)
Memory: • Minimum: 64 MB • Maximum: 1.5 GB • Type: PC133 MHz, ECC, SDRAM, unregistered DIMMs • Slots: Three dual inline	**Size:** • Height: 470 mm (18.5 in.) • Depth: 508 mm (19.9 in.) • Width: 165 mm (6.5 in.) • Weight: approximately 19.5 Kg (43 lb.) when fully configured or 15.9 Kg (35 lb.) minimum	• Humidity: — Server on: 8% to 80% — Server off: 8% to 80%

Drives: (depending on your model)
 	
• Diskette: 1.44 MB
 	
• CD-ROM: IDE
 	
• Hard disk
 	
• Tape
	Integrated functions:
	
	• 10BASE-T/ 100BASE-TX Ethernet controller on the system board
	
	• Two serial ports
	
	• Parallel port
	
	• Two USB ports
	
	• Keyboard port
	
	• Mouse port
	
	• MIDI port
	
	• Audio ports
	  — Line out
	  — Line in
	  — Mic
	
	• Dual-channel bus mastering IDE controller
		Heat output:
		
		Approximate heat output in British Thermal Units (Btu) per hour
		
		• Minimum configuration: 341 Btu (100 watts)
		
		• Maximum configuration: 1604 Btu (470 watts)

Expansion bays:
 	
• Two 5.25-in. bays (one CD-ROM drive installed)
 	
• Two 3.5-in. bays (one diskette drive installed)
 	
• Three 3.5-in. slim-high bays available (one hard disk drive installed in some models)
		Electrical input:
		
		• Sine-wave input (50-60 Hz) required
		
		• Input voltage low range:
		  — Minimum: 90 V ac
		  — Maximum: 137 V ac
		
		• Input voltage high range:
		  — Minimum: 180 V ac
		  — Maximum: 265 V ac

PCI expansion slots:
 	
• Three 33 MHz/32-bit on the system board (some models come with a SCSI adapter installed)
 	
• Two 33 MHz/32-bit on the PCI Bus extender board
	Acoustical noise emissions:
	
	• Sound power, idling: 6.6 bel maximum
	
	• Sound power, operating: 6.8 bel maximum
		• Input kilovolt-amperes (kVA) approximately:
		  — Minimum: 0.095 kVA
		  — Maximum: 0.213 kVA

AGP slot: Accelerated graphics port (AGP) (contains the video adapter)		

Notices used in this book

This information product contains notices that relate to a specific topic. The Caution and Danger notices also appear in the multilingual *Safety Information* book provided on the *IBM xSeries Documentation* CD that comes with your server. Each notice is numbered for easy reference to the corresponding notices in the safety book.

The notice definitions are as follows:

* **Notes:** These notices provide important tips, guidance, or advice.

* **Important:** These notices provide information that might help you avoid inconvenient or problem situations.

* **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.

* **Caution:** These notices indicate situations that can be potentially hazardous to you. A caution notice is placed just before descriptions of potentially hazardous procedure steps or situations.

* **Danger:** These notices indicate situations that can be potentially lethal or extremely hazardous to you. A danger notice is placed just before descriptions of potentially lethal or extremely hazardous procedure steps or situations.

Major components of the xSeries 200

The following illustration shows the locations of major components in your server.

Note: The illustrations in this document might differ slightly from your hardware.
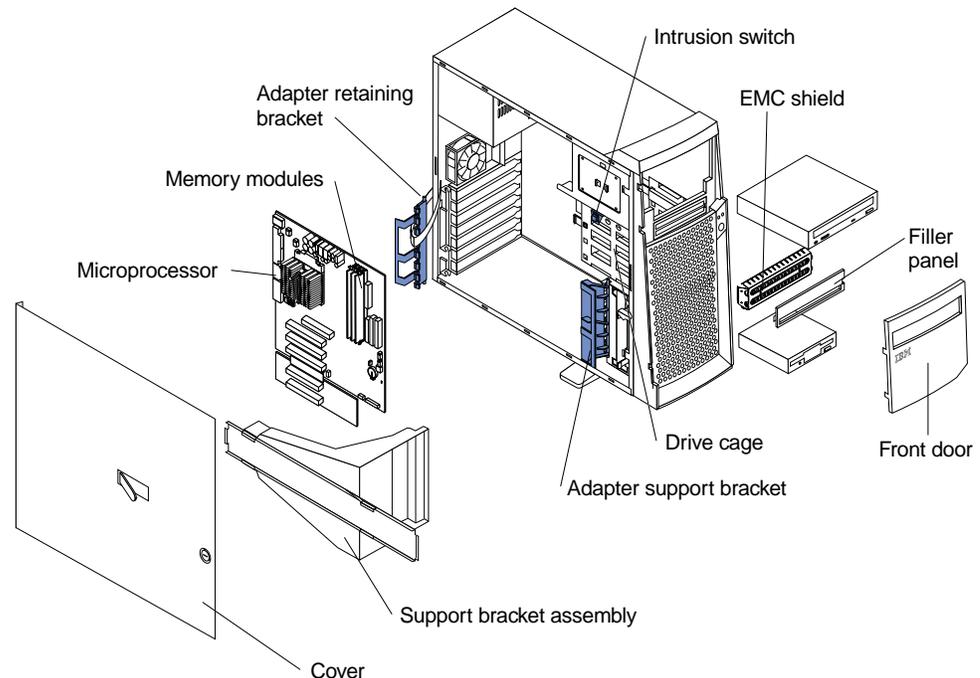
System and PCI extender board internal cable connectors

The following illustration identifies system and extender board connectors for internal cables.

System fan 2 (SYSFA2)

Microprocessor fan sink (CPUFA1)

Main power (JWR1)

Front panel connector (J1)

Secondary IDE (IDE2)

Primary IDE (IDE1)

Diskette drive (FDD1)

Support bracket assembly fan (SYSFA3)

SCSI LED (J3)
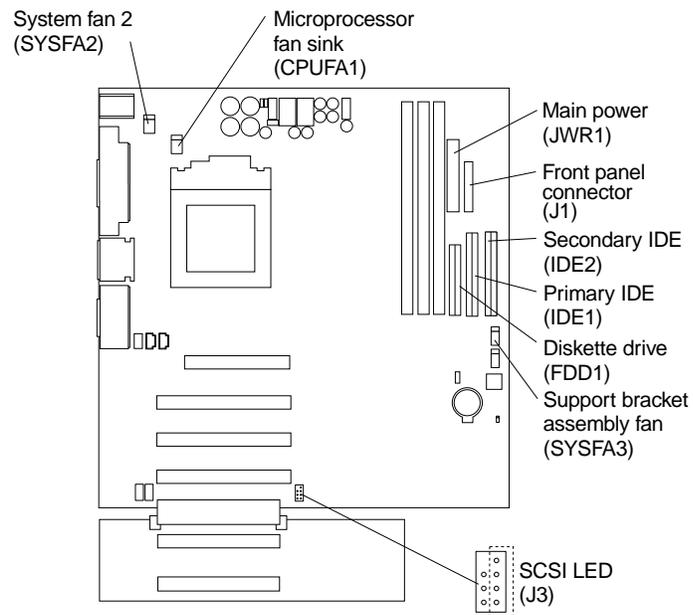
Chapter 2. Installing options

This chapter provides instructions to help you install options in your server. Some option-removal instructions are provided, in case you need to remove one option to install another. This section is for all users, but is written with the experienced user in mind. If you need more detailed installation information, refer to the *User's Reference* on the *IBM xSeries Documentation* CD.

Moving the stabilizing feet

The two front feet attached to the bottom of the server rotate 90 degrees to provide additional stability.

When you need to access the inside of the server, to install options, you might find it easier to lay the server on its side. If you do so, rotate the feet in towards the server, so they do not break off due to the weight of the server.
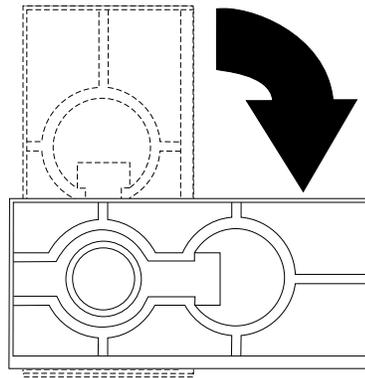
When you are finished installing options and have reinstalled the side cover, turn the two front stabilizing feet a quarter turn out from the server and set it carefully back on its feet.

Removing the side cover

The following information describes how to remove the side cover.

Note: The illustrations in this document might differ slightly from your hardware.

Cover-release latch

Key lock
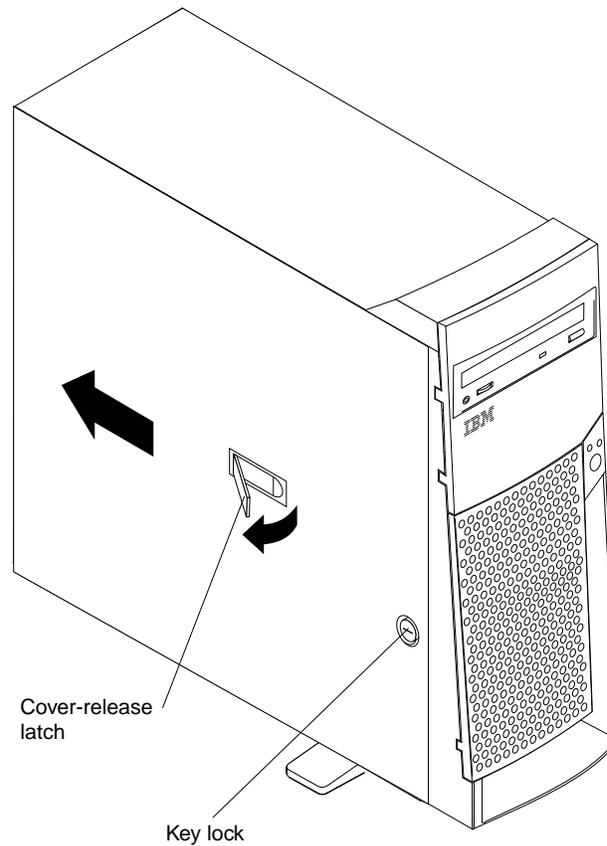
Complete the following steps to remove the side cover of the server.

1. Review the safety precautions listed in Statement 1 and Statement 5 in "Safety" on page v.

2. Turn off the server and peripheral devices and disconnect all external cables and power cords.

3. If necessary, unlock the server cover.

4. Pull out on the cover-release latch, which will slide the cover toward the rear of the server about 12.7 mm (1/2 in.). Then, remove the cover from the server.

Attention: For proper cooling and airflow, replace the cover before turning on the server. Operating the server with the cover removed might damage server components.

Removing the support bracket assembly

When working with some options such as hard disk drives, microprocessors, and memory modules, you must first remove the support bracket assembly to access the location of the option.
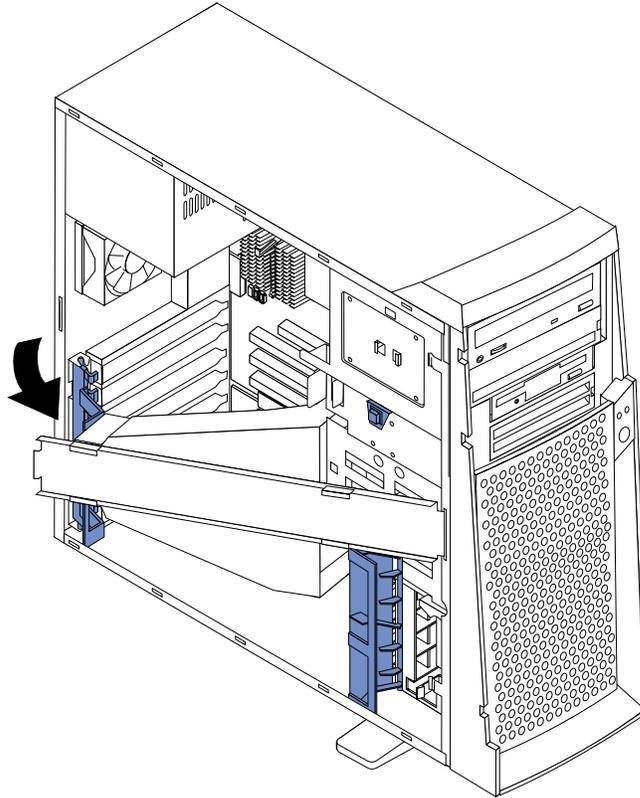
Complete the following steps to remove the support bracket assembly.

1. Disconnect the support bracket assembly fan cable from the connector (SYSFA3) on the system board. For the location of the fan cable connector, see "System and PCI extender board internal cable connectors" on page 4.

2. Pull out, about 152.4 mm (6 in.), on the end of the support bracket assembly located at the rear of the server.

3. Pull the front end of the support bracket assembly away from the server and place the assembly aside.

To reinstall the support bracket assembly, reverse the previous steps.

Working with adapters

Your server comes with adapter connectors, called *slots*. The AGP video adapter is installed in the AGP slot. You can install up to five PCI adapters in PCI expansion slots 1 through 5. All PCI expansion slots are 32-bit, 33 MHz slots.

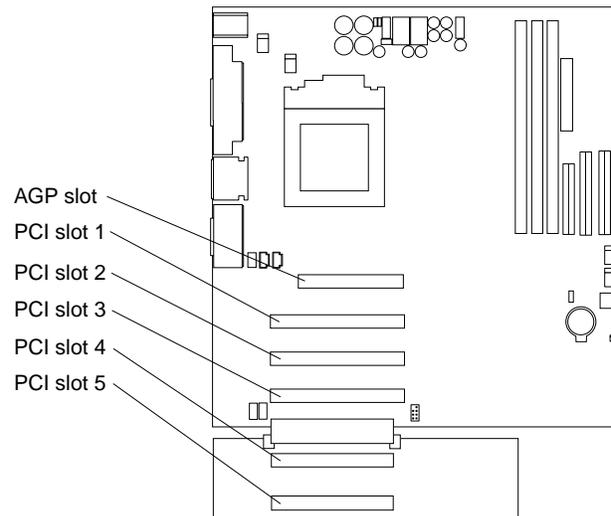**Note:** The illustrations in this document might differ slightly from your hardware.

The following illustration shows the location of the PCI expansion slots on the system and PCI extender boards.

AGP slot
PCI slot 1
PCI slot 2
PCI slot 3
PCI slot 4
PCI slot 5

Adapter considerations

Before you install an adapter, review the following:

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions given in this chapter. If you need to change switch or jumper settings on your adapter, follow the instructions that come with the adapter.

- You can install full-length adapters in all five PCI expansion slots.

- Your server supports 5.0 V and universal PCI adapters; it does not support 3.3 V adapters.

- Your server uses a rotational interrupt technique to configure PCI adapters. Because of this technique, you can install a variety of PCI adapters that currently do not support sharing of PCI interrupts.

- PCI slots 1 through 5 are on PCI bus 0.

  The system scans the AGP slot and PCI expansion slots 1 through 5 to assign system resources; then, the system starts (boots) the PCI devices in the following order, if you have not changed the default boot sequence: PCI expansion slots 1 and 2, system board integrated drive electronics (IDE) or small computer system interface (SCSI) devices, and then PCI expansion slots 3 through 5.

  Note: To change the boot sequence for PCI devices, start the Configuration/Setup Utility program, and select **Start Options** from the main menu, select **Startup Sequence**; then, select **Second device** (SCSI) to designate the adapter boot sequence. Refer to the *User's Reference* on the *IBM xSeries Documentation* CD for details on using the Configuration/Setup Utility program.

- For a list of supported options for your server, refer to http://www.ibm.com/pc/us/compat on the World Wide Web.

Installing an adapter
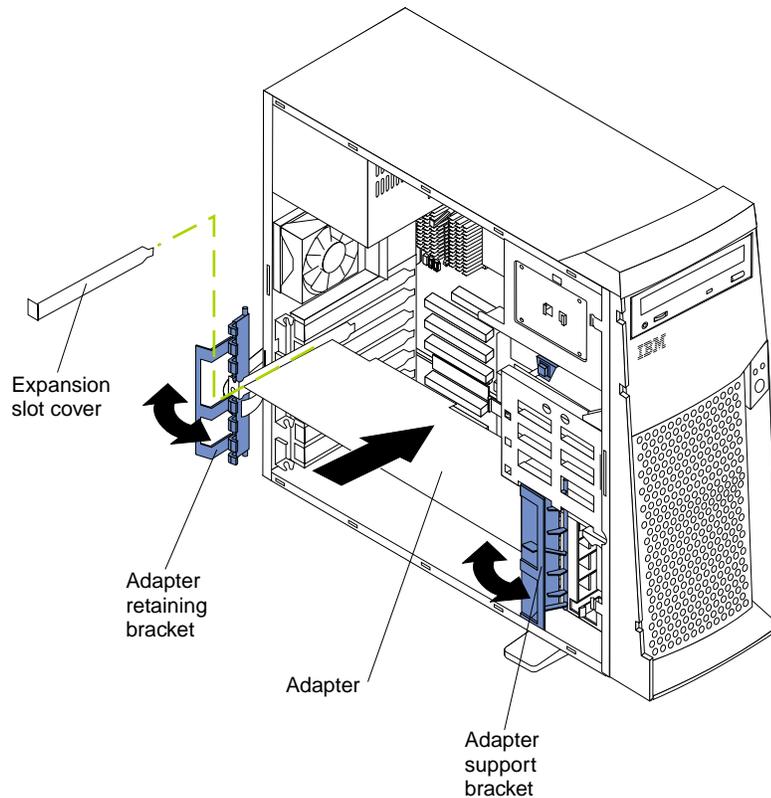
Complete the following steps to install an adapter.

Attention: When you handle electrostatic discharge-sensitive devices (ESD), take precautions to avoid damage from static electricity. For details on handling these devices, see "Handling static-sensitive devices" on page x.

1. Review the safety precautions listed in Statement 1 and 5 in "Safety" on page v.

2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the side cover. See "Removing the side cover" on page 6 for details.

3. Determine which PCI expansion slot you will use for the adapter.

   Note: Check the instructions that come with the adapter for any requirements, restrictions, or cabling instructions. It might be easier for you to route any cables before you install the adapter.

4. If you are installing a full-length adapter, rotate the front adapter support bracket to the open (unlocked) position.

5. Rotate the rear adapter retaining bracket to the open (unlocked) position; then, place it over the rear of the server.

6. Remove the PCI expansion-slot cover. From the rear of the server, press in on the slot cover. Grasp it and pull it out of the slot. Store it in a safe place for future use.
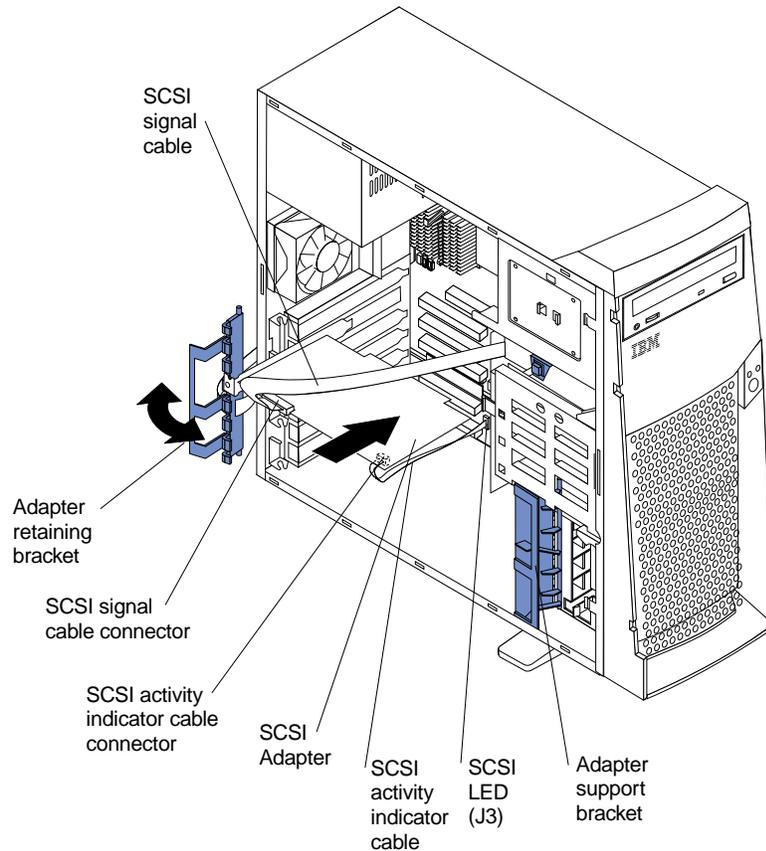
   Attention: PCI expansion-slot covers must be installed on all vacant slots. This maintains the electromagnetic emissions characteristics of the server and ensures proper cooling of server components.

7. Touch the static-protective package containing the adapter to any unpainted metal surface on the server. Then, remove the adapter from the package. Avoid touching the components and gold-edge connectors on the adapter.

8. Place the adapter, component-side up, on a flat, static-protective surface.

9. Set any jumpers or switches as described by the adapter manufacturer.

10. To install the adapter, carefully grasp the adapter by its top edge or upper corners, and align it with the PCI slot guides; then, press the adapter *firmly* into the PCI expansion slot.

    Attention: When you install an adapter in the server, be sure that it is completely and correctly seated in the PCI expansion slot before you turn on the server. Incomplete insertion might cause damage to the system board or the adapter.

11. Connect required cables to the adapter.

    Attention: Route cables so that they do not block the flow of air from the fans.

12. If you have another adapter to install, do so now.

13. If you have installed a full-length adapter, rotate the front adapter support bracket to the closed (locked) position.

14. Reinstall the rear adapter retaining bracket; then, rotate the bracket to the closed (locked) position.

15. If you have other options to install, do so now.

16. Reinstall the side cover, see "Installing the cover" on page 23 for details.

17. Reconnect the external cables and power cords; then, turn on the peripheral devices and the server.

Installing a SCSI or ServeRAID adapter (some models)

Complete the following steps to install a SCSI or ServeRAID adapter.

1. If you have not already installed the SCSI adapter, complete steps 1 through 10 of "Installing an adapter" on page 9. Then, return here to complete the installation.

SCSI
signal
cable

Adapter
retaining
bracket

SCSI signal
cable connector

SCSI activity
indicator cable
connector

SCSI
Adapter

SCSI
activity
indicator
cable

SCSI
LED
(J3)

Adapter
support
bracket

2. Connect one end of the SCSI signal cable (purchased separately) to the adapter and one or more of the signal cable connectors to the rear of the SCSI devices.

3. Connect the SCSI activity indicator cable (purchased separately) to the adapter and to the SCSI LED connector (J3) on the system board. See "System and PCI extender board internal cable connectors" on page 4 for the location of this connector.

   Note: If you are installing a ServeRAID adapter and already have a SCSI adapter installed, remove the SCSI adapter and store it for future use.

4. If you have another adapter to install or remove, do so now.

5. Rotate the front adapter support bracket to the closed (locked) position.

6. Reinstall the rear adapter retaining bracket; then, rotate the bracket to the closed (locked) position.

7. If you have other options to install or remove, do so now.

8. Install the side cover, see "Installing the cover" on page 23 for details.

9. Reconnect the external cables and power cords; then, turn on the peripheral devices and the server.

Installing memory modules

Your server comes with a dual in-line memory module (DIMM) installed on the system board in DIMM connector 1.

Memory considerations:

- When installing additional memory modules, install the second memory module in DIMM connector 2, and the third in DIMM connector 3. (See the illustration in this section for memory connector locations.)

- Your xSeries 200 server supports 64 MB, 128 MB, 256 MB, and 512 MB DIMMs. Your server supports a minimum of 64 MB and a maximum of 1.5 GB of system memory. See the ServerProven™ list at http://www.ibm.com/pc/compat for a list of memory modules for use with your server.

- Installing or removing DIMMs changes the configuration information in the server. Therefore, after installing or removing a DIMM, you must change and save the new configuration information by using the Configuration/Setup Utility program. When you restart the server, the system displays a message indicating that the memory configuration has changed. Start the Configuration/Setup Utility program and select **Save Settings.** Refer to the *User's Reference* on the *IBM xSeries Documentation* CD for more information.

- The illustrations in this document might differ slightly from your hardware.

DIMM connector 1

DIMM connector 2

DIMM connector 3

Retaining clip
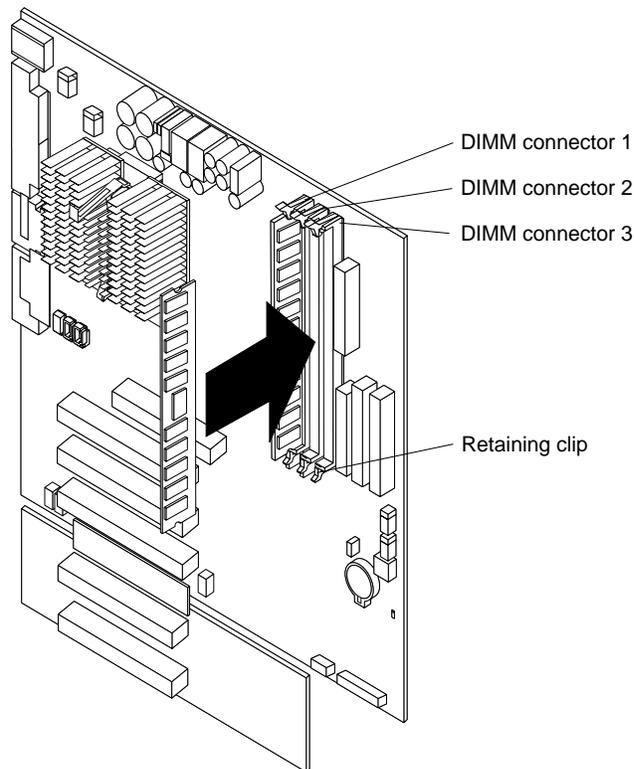
Complete the following steps to install a DIMM.

Attention: When you handle ESD-sensitive devices, take precautions to avoid damage from static electricity. For details on handling these devices, see "Handling static-sensitive devices" on page x.

1. Review the safety precautions listed in Statements 1 and 5 "Safety" on page v.

2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the side cover (see "Removing the side cover" on page 6 for details).

3. Remove the support bracket assembly and disconnect the support bracket assembly fan cable from the connector (SYSFA3) on the system board. See "Removing the support bracket assembly" on page 7 for details. See "System and PCI extender board internal cable connectors" on page 4 for the location of the fan cable connector.

4. Touch the static-protective package containing the DIMM to any unpainted metal surface on the server. Then, remove the DIMM from the package.

5. Install the DIMM.

   a. If you are installing a DIMM in connector 1, remove the AGP adapter.

        Remove the AGP adapter only if you are replacing the DIMM in connector 1. See "System and PCI extender board internal cable connectors" on page 4 for the location of the AGP connector. See "Installing an adapter" on page 9 for details about removing the AGP adapter.

    b. Open the retaining clip on each end of the DIMM connector. Turn the DIMM so that the pins align correctly with the connector.

        Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, open, and close the clips gently.

    c. Insert the DIMM into the connector by aligning the DIMM edges with the slots at each end of the DIMM connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. Be sure that the retaining clips snap into the locked position when the DIMM is firmly seated in the connector.

    d. If a gap exists between the DIMM and the retaining clips, the DIMM has not been properly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.

    e. If you removed the AGP adapter, reinstall it now, see "Installing an adapter" on page 9.

6. If you have other options to install or remove, do so now.

7. Replace the support bracket assembly and reconnect the fan cable to the connector (SYSFA3) on the system board. See "Removing the support bracket assembly" on page 7 and "System and PCI extender board internal cable connectors" on page 4 for the location of the fan cable connector.

8. Reinstall the side cover, see "Installing the cover" on page 23.

9. Reconnect the external cables and power cords, and turn on the peripheral devices and the server.

If you want to remove a DIMM, reverse the previous steps.

Installing an internal drive

Your server comes with an IDE CD-ROM drive installed in bay 1, a 3.5-in., 1.44 MB diskette drive in bay 3, and a hard disk drive in bay 5.
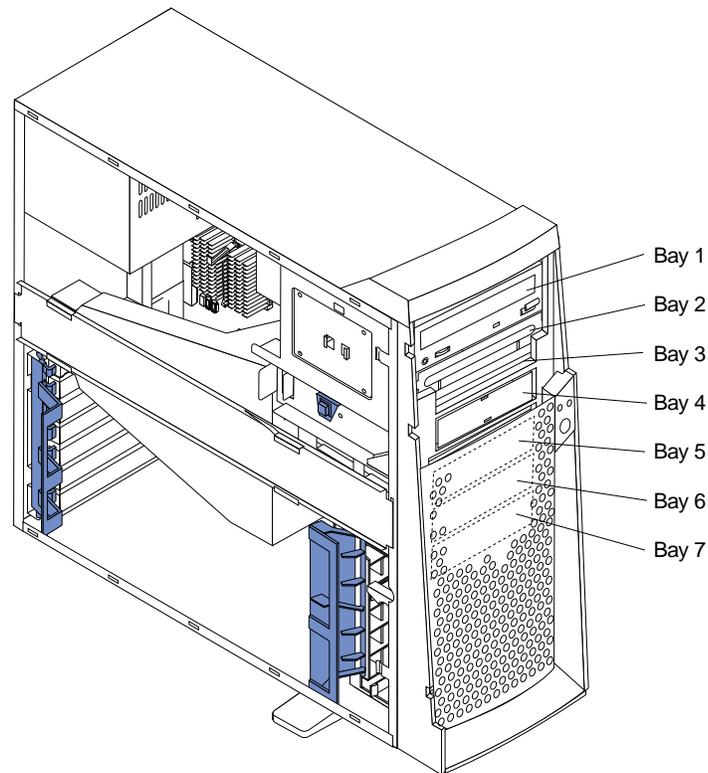
Drive considerations:

*   Diskette drives, tape drives, and CD-ROM drives are removable-media drives. You can install removable-media drives in bays 1, 2, 3, and 4.

*   You can install a 3.5 in., slim-high, or a 5.25-in., half-high, removable-media drive, such as a tape backup drive, in bay 2.

*   You can install only a 3.5 in., slim-high, removable-media drive in bay 4.

*   The xSeries 200 server supports only one diskette drive, which uses 1 MB and 2 MB diskettes.

*   Before you install a 3.5-in. drive in a 5.25-in. bay, you must attach the 5.25 in. conversion kit, supplied with your option, to the 3.5-in drive. Refer to the documentation that comes with the option for the conversion kit installation instructions.

    Note: Only 3.5-in. options that ship with proper mounting hardware can be supported in the 5.25-in. bays.

*   If you have a tape backup drive in your server, use a dry process cleaning cartridge to clean the tape head two hours after you first use a new data cartridge. Then, clean the tape head once a month, or after each eight hours of continuous read/write operations, whichever occurs first. For complete details about the tape backup drive, refer to the documentation that comes with your server or your backup option.

*   The electromagnetic interference (EMI) integrity and cooling of the server are both protected by having bays 1 through 4 covered or occupied. When you

install a drive, save the filler panel and EMC shield from the bay, in case you later remove the drive and do not replace it with another.

- For a list of supported options for your server, refer to http://www.ibm.com/pc/us/compat on the World Wide Web.
- The illustrations in this document might differ slightly from your hardware.

Installing a drive in bay 2 or 4

Complete the following steps to install a drive in bay 2 or 4.
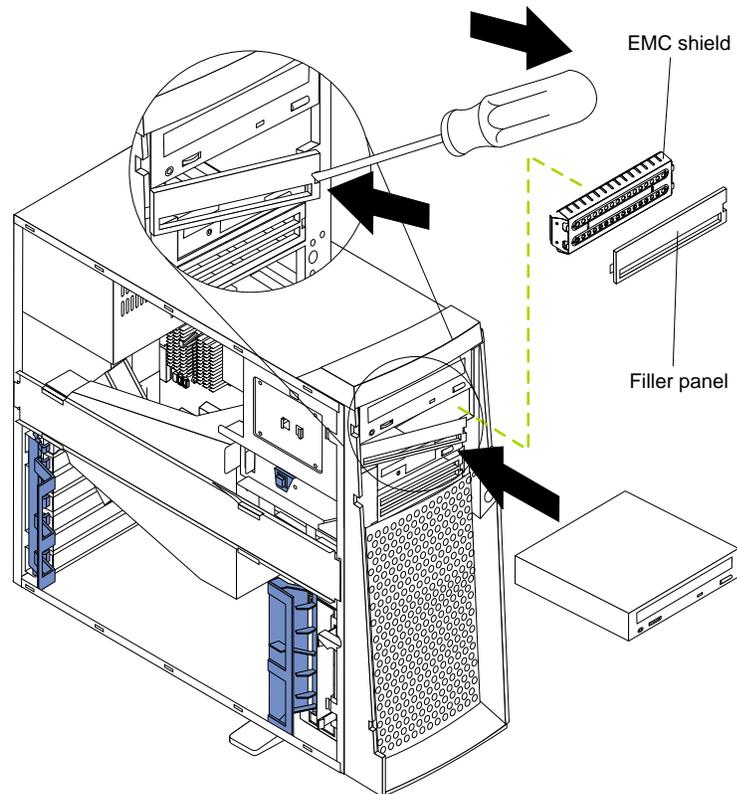
Attention: When you handle ESD-sensitive devices, take precautions to avoid damage from static electricity. For details on handling these devices, see "Handling static-sensitive devices" on page x.

1. Review the safety precautions listed in "Safety" on page v.

2. Turn off the server and peripheral devices and disconnect the external cables and power cords; then, remove the side cover (see "Removing the side cover" on page 6 for details).

3. Remove the support bracket assembly and disconnect the fan cable from the connector (SYSFA3) on the system board. See "Removing the support bracket assembly" on page 7.

4. Use a screwdriver to gently pry the filler panel and EMC shield away from the server.

   Note: If you are installing a drive that is a laser product, observe the following safety precaution:

Statement 3

CAUTION:
When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

•   **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**

•   **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**
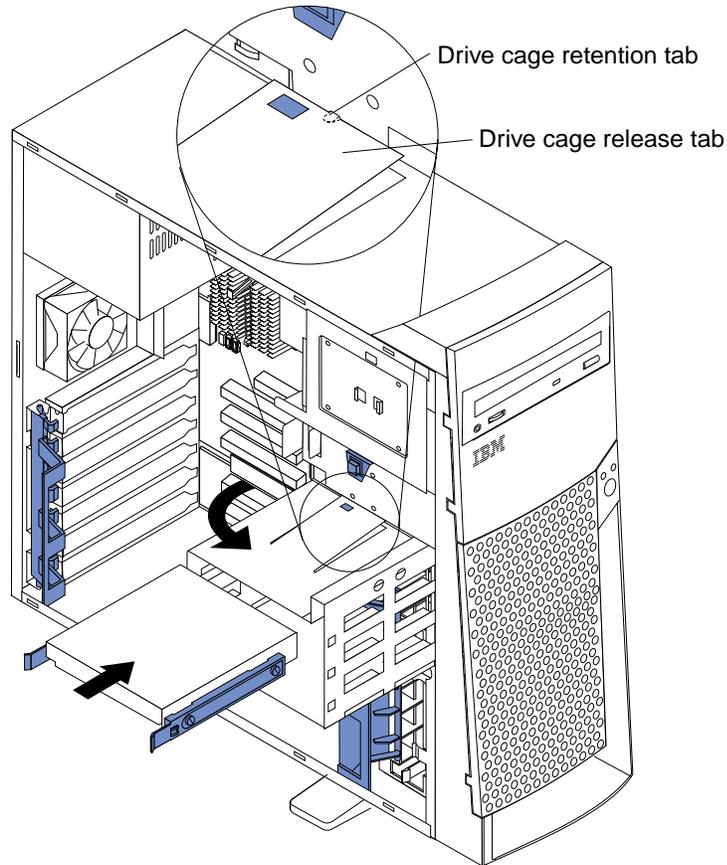

Danger

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following. Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

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5. Touch the static-protective bag containing the drive to any unpainted metal surface on the server; then, remove the drive from the bag and place it on a static-protective surface.

6. Set any jumpers or switches on the drive according to the documentation that comes with the drive.

7. Install the drive.

   •   If you are installing a 5.25-in drive in bay 2, push the drive into the bay; then, use the two screws to attach the drive to the drive cage.

   •   If you are installing a 3.5-in drive in bay 2, you must attach the 5.25-in conversion kit, supplied with your option, to the 3.5-in drive.

   Note: You can install only a 3.5-in device in bay 4.

8. Cable the drive.

   •   If the drive is an IDE device, plug one connector of the IDE signal cable into the back of the drive and the other end of the cable into the IDE connector (IDE1) on the system board. See "System and PCI extender board internal cable connectors" on page 4 for the location of the IDE connector.

   •   If the drive is a SCSI device, your server must have a SCSI adapter installed. Plug one connector of the SCSI signal cable into the back of the drive and the other end of the cable into the connector on the SCSI adapter. See "Installing an adapter" on page 9.

      Note: Make sure to route the signal cable so that it does not block the air flow to the rear of the drives or over the microprocessor.

9. If you have another drive to install, do so now.

10. Connect one of the power cables from the power supply into the back of the drive. The connectors are keyed and can be inserted only one way.

11. Replace the support bracket assembly and reconnect the fan cable to the connector (SYSFA3) on the system board. See "Removing the support bracket assembly" on page 7.

12. If you have other options to install, do so now.

13. Reinstall the side cover, see "Installing the cover" on page 23 for details.

14. Reconnect the external cables and power cords; then, turn on the peripheral devices and the server.

Installing a hard disk drive in bay 5, 6, or 7

Complete the following steps to install a hard disk drive in bays 5, 6, or 7.

Drive cage retention tab

Drive cage release tab

Attention: When you handle ESD-sensitive devices, take precautions to avoid damage from static electricity. For details on handling these devices, see "Handling static-sensitive devices" on page x.

1. Review the safety precautions listed in "Safety" on page v.

2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the side cover (see "Removing the side cover" on page 6 for details).

3. Remove the support bracket assembly and disconnect the fan cable from the connector (SYSFA3) on the system board. See "Removing the support bracket assembly" on page 7 and "System and PCI extender board internal cable connectors" on page 4 for the location of the fan cable connector.

4. Access the drive cage.

    a. If your server has hard disk drives installed in the drive cage, disconnect the power and signal cables from the rear of the drives.

    b. Rotate the drive cage out of the server until it locks into place over the drive cage retention tab.

       Note: Before you install a hard disk drive, ensure that the drive cage locks into place over the drive cage retention tab by pressing on the side of the drive cage.

5. Attach the blue, plastic guide rails to the sides of the drive using the screws and guide rails provided in the drive cage.

6. Slide the drive into the drive cage until the plastic tabs on the guide rails lock into place in the drive cage.

7. Lift the drive cage up and press in on the drive cage release tab; then, rotate the drive cage back into the server.

   Note: Clear any cables that might impede the replacement of the drive cage.

8. Connect the signal and power cables to the rear of each drive.

   Note: Make sure to route the signal cable so that it does not block the air flow to the rear of the drives or over the microprocessor.

9. If you have other options to install or remove, do so now.

10. Replace the support bracket assembly and reconnect the fan cable to the connector (SYSFA3) on the system board. See "Removing the support bracket assembly" on page 7 and "System and PCI extender board internal cable connectors" on page 4 for the location of the fan cable connector.

11. Reinstall the side cover, see "Installing the cover" on page 23 for details.

12. Reconnect the external cables and power cords; then, turn on the peripheral devices and the server.
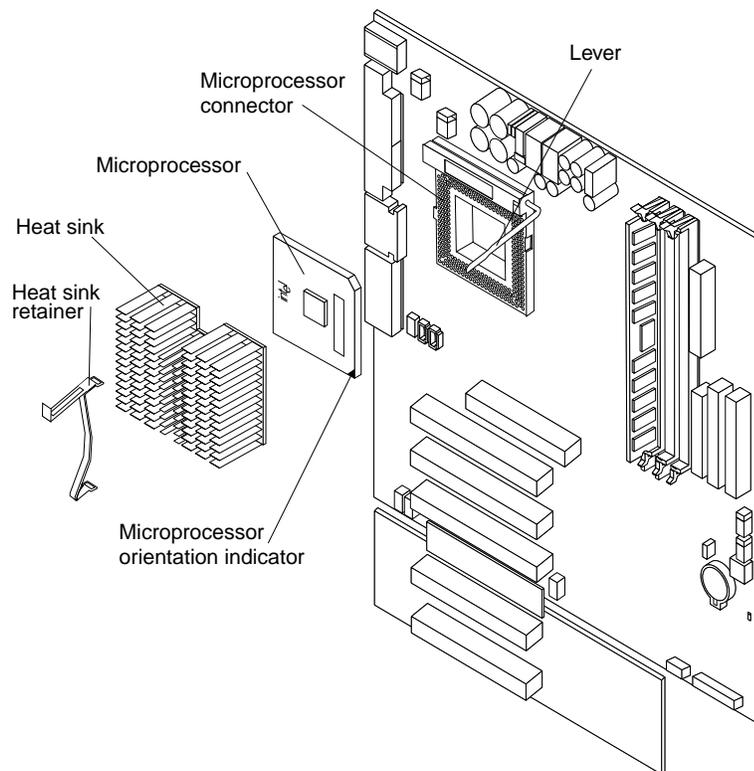
Removing and installing a microprocessor

Your server comes with one microprocessor installed on the system board in the microprocessor connector (U5).

Notes:

1. Before you install a new microprocessor, review the documentation that comes with the microprocessor to determine whether you need to update the server BIOS code. The latest level of the BIOS code for your server is available through the World Wide Web.

2. The illustrations in this document might differ slightly from your hardware.

Removing a microprocessor

Complete the following steps to remove a microprocessor.

Attention: When you handle ESD-sensitive devices, take precautions to avoid damage from static electricity. For details on handling these devices, see "Handling static-sensitive devices" on page x.

1. Review the safety precautions listed in Statement 1 and Statement 5 in "Safety" on page v.

2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the side cover (see "Removing the side cover" on page 6 for details).

3. Remove the support bracket assembly and disconnect the fan cable from the connector (SYSFA3) on the system board. See "Removing the support bracket assembly" on page 7 and "System and PCI extender board internal cable connectors" on page 4 for the location of the fan cable connector.

4. Push down and back on the heat-sink retainer to remove it from the heat sink.

Note: Allow sufficient time for the heat sink to cool, before you remove it from the microprocessor. Once you have removed the heat sink, you must replace it with a new heat sink.

5. Firmly grasp the heat sink and lift it off the microprocessor.

6. Pull out and lift up the release lever and remove the microprocessor from the connector. Store the microprocessor in a static-protective bag for possible future use.

7. If you are installing a new microprocessor, continue with step 4 in "Installing a microprocessor".

Installing a microprocessor

Complete the following steps to install a microprocessor.

Attention: When you handle ESD-sensitive devices, take precautions to avoid damage from static electricity. For details on handling these devices, see "Handling static-sensitive devices" on page x.

1. Review the safety precautions listed in Statement 1 and Statement 5 in "Safety" on page v.

2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the side cover (see "Removing the side cover" on page 6 for details).

3. Remove the support bracket assembly and disconnect the fan cable from the connector (SYSFA3) on the system board. See "Removing the support bracket assembly" on page 7 and "System and PCI extender board internal cable connectors" on page 4 for instructions.

4. Install the microprocessor:

   a. Touch the static-protective package containing the new microprocessor to any unpainted metal surface on the server; then, remove the microprocessor from the package.

   b. Pull out and lift up on the microprocessor release lever to unlock the microprocessor connector.

   c. Arrange the microprocessor over the microprocessor connector as shown in the following illustration. Carefully press the microprocessor into the connector.
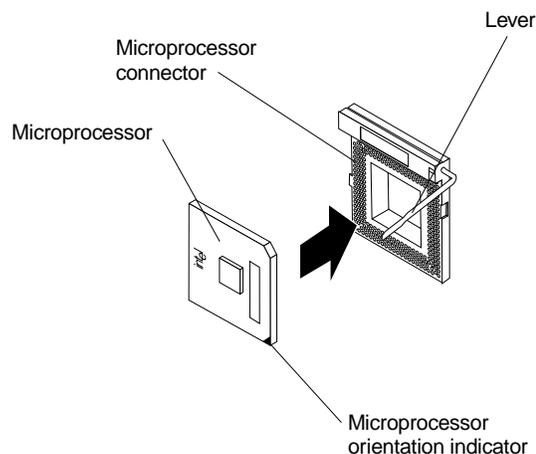

Note: Do not use excessive force when pressing the microprocessor into the connector.

5. Push the microprocessor release lever down to lock the microprocessor into the connector.

6. Install a heat sink or a fan sink.

   • If you are installing a heat sink on the microprocessor:

   Note: Refer to the illustration in "Removing a microprocessor" on page 19.

   a. Peel the plastic protective strip off the bottom of the heat sink. Make sure that the square of thermal material is still on the bottom of the heat sink; if not, replace the heat sink with a new one.

   b. Align and place the heat sink on top of the microprocessor.

   c. Align and place the retainer over the heat sink; then, snap it into place.

   • If you are installing a fan sink on the microprocessor:

   a. Peel the plastic protective strip off the bottom of the fan sink. Make sure that the square of thermal material is still on the bottom of the fan sink; if not, replace the fan sink with a new one.

   b. Align and place the fan sink on top of the microprocessor.

   c. Align and push the fan-sink retainer through the groove in the center of the fan sink.

   d. Insert a small, flat-bladed screwdriver into the tab on the fan-sink retainer.

   e. Press the screwdriver down to snap the fan-sink retainer into place.

   f. Connect the fan-sink power cable to the microprocessor fan-sink connector (CPUFA1) on the system board. For the location of the microprocessor fan-sink connector, see "System and PCI extender board internal cable connectors" on page 4.
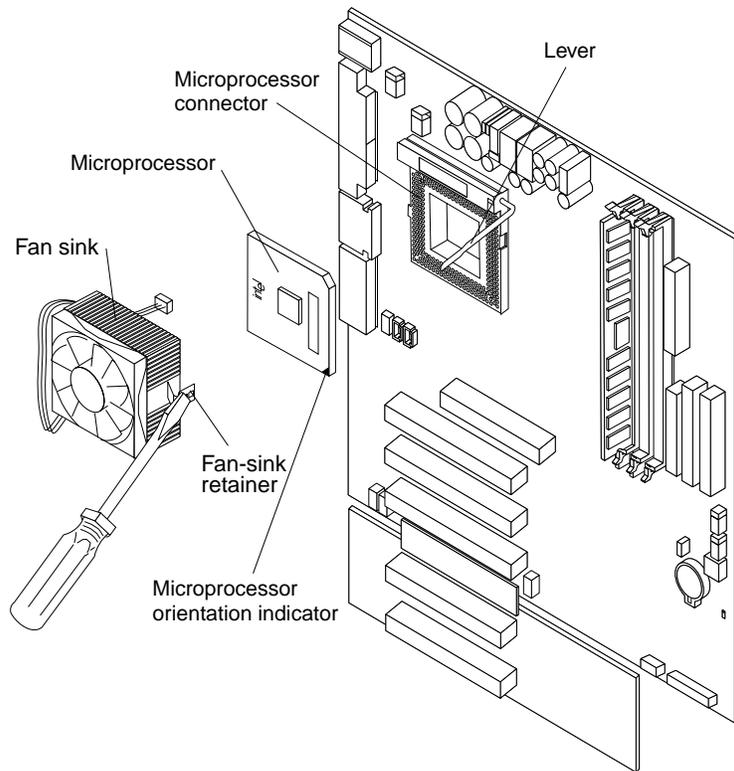
7. If you have other options to install or remove, do so now.

8. Replace the support bracket assembly and reconnect the fan cable to the connector (SYSFA3) on the system board. See "Removing the support bracket assembly" on page 7 for details. See "System and PCI extender board internal cable connectors" on page 4 for the location of the fan cable connector.

9. Reinstall the side cover, see "Installing the cover" on page 23.

10. Reconnect the external cables and power cords; then, turn on the peripheral devices and the server.

Installing a security U-bolt

To help prevent hardware theft, you can add a security U-bolt and cable to your server. After you add the security cable, make sure that it does not interfere with other cables that are connected to the server.
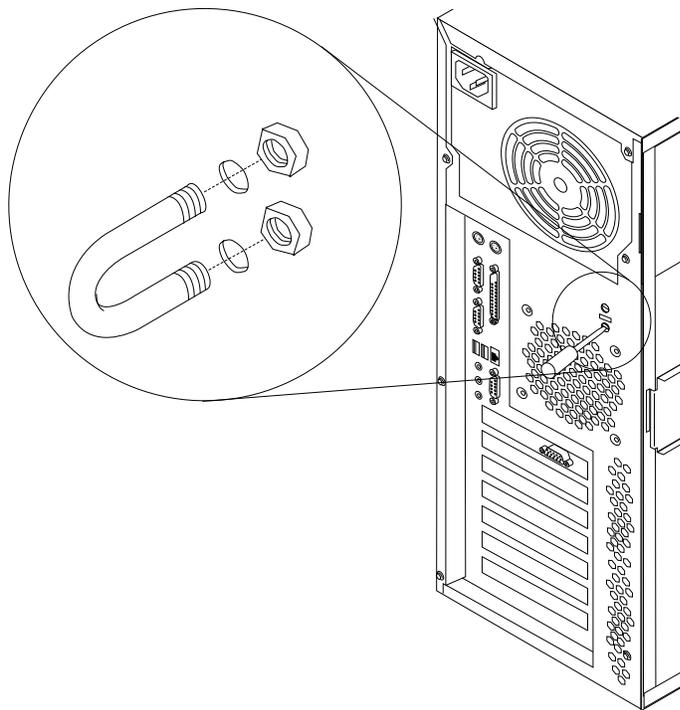
Before you begin:

- Obtain the following items:
  — A flat-blade screwdriver
  — An adjustable wrench
  — A 199 mm (3/4 in.) U-bolt or wire rope (similar to National Manufacturing No. 3230, Stock No. 176-735)
  — Threaded nuts that fit the U-bolt
  — A security cable
  — A lock, such as a combination lock or padlock
- Read the information in "Safety" on page v and "Handling static-sensitive devices" on page x.

Complete the following steps to install an U-bolt.

1. Review the safety precautions listed in Statement 1 and Statement 5 in "Safety" on page v.

2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the cover (see "Removing the side cover" on page 6 for details).

3. Use a screwdriver to remove the two metal knockouts.

4. Insert the U-bolt through the rear panel; then, attach and tighten the nuts.

5. Replace the side cover, see "Installing the cover".

6. Thread the cable through the U-bolt and around an object that is a part of or permanently secured to the building structure or foundation, and from which it cannot be removed; then, fasten the cable ends together with a lock.

7. Reconnect the external cables and power cords, and turn on the peripheral devices and the server.

Installing the cover

The following information describes the cover installation procedure.
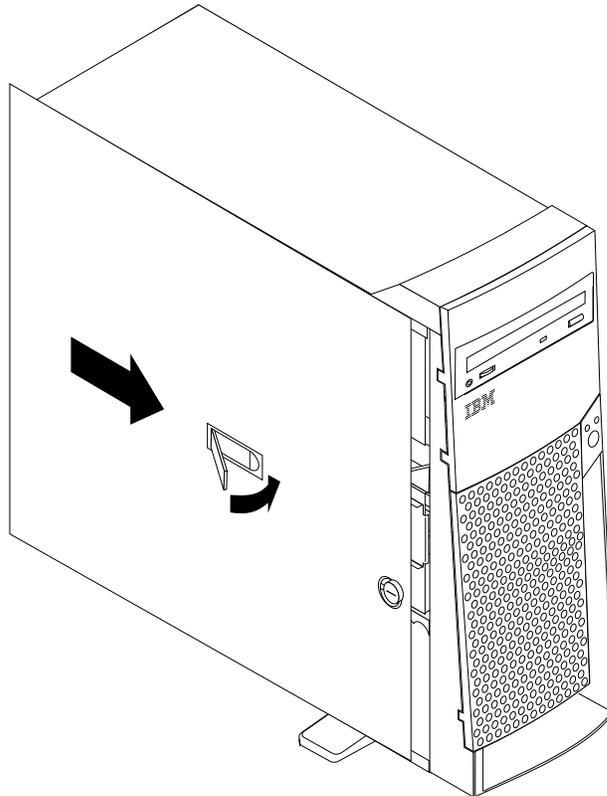
Notes:

1. The illustrations in this document might differ slightly from your hardware.

2. If you removed the support bracket assembly after you removed the cover, reinstall it before you install the cover. See "Removing the support bracket assembly" on page 7 for details.

Complete the following steps to install the server cover.

1. Clear any cables that might impede the replacement of the cover.

2. Install the side cover by placing it into position on the server. Close the cover release latch to secure the cover in place.

3. Lock the cover.

4. If you have not done so already, make sure that the two front stabilizing feet are rotated outward so that they properly support the server. Rotate each individual foot outward 90 degrees.

5. Reconnect the external cables and power cords to the server, and then plug the power cords into electrical outlets.

6. Turn on the peripheral devices; then, turn on the server.

Cabling the server

Note: The illustrations in this document might differ slightly from your hardware.

If your server cables and connector panel have color-coded connections, match the color of the cable end with the color of the connector. For example, match a blue cable end with a blue panel connector, a red cable end with a red connector, and so on.

The following illustration shows the I/O connectors on the rear of the server.
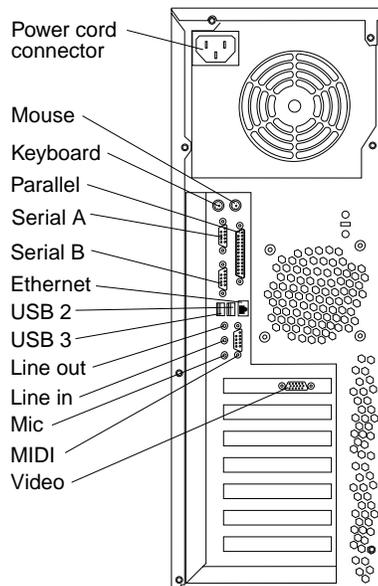
Chapter 3. Server power, controls, and indicators

This chapter describes how to turn on and turn off the server, and what the controls and indicators mean.

Turning on the server

After you plug one end of the server power cord into the power supply connector on the rear of the server, and the other end of the power cord into an electrical outlet, the server can start as follows:

- You can press the power control button on the front of the server to start the server.

- If the server is turned on and a power failure occurs, the server will start automatically when power is restored.

Turning off the server

You can turn off the server as follows:

Statement 5

CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.
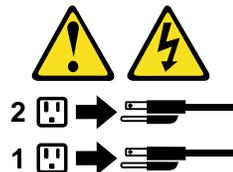
- You can press the power control button on the front of the server. This starts an orderly shutdown of the operating system, if this feature is supported by your operating system, and places the server in standby mode.

  Note: After turning off the server, wait at least five seconds before you press the power control button to turn on the server again.

- You can press and hold the power control button for more than four seconds to cause an immediate shutdown of the server and place the server in standby mode. You can use this feature if the operating system stops functioning.

- You can disconnect the server power cords from the electrical outlets to shut off all power to the server.

Note: After disconnecting the power cords, wait approximately 15 seconds for your system to stop running.

Server controls and indicators
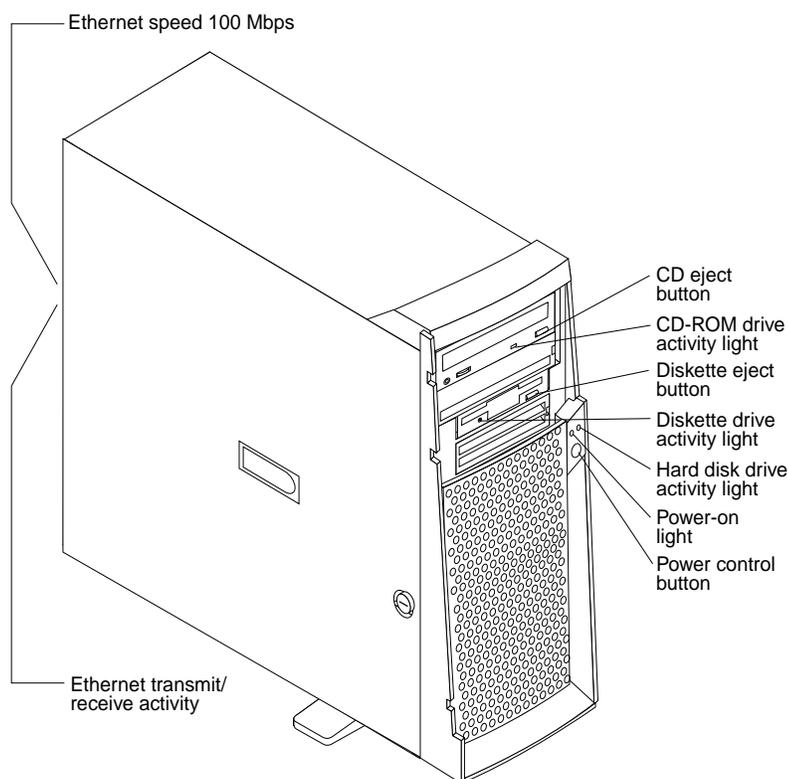
CD eject button: Push this button to open the tray to insert or remove a CD.

CD drive activity light: When this light is on, it indicates that the CD-ROM drive is in use.

Diskette eject button: Push this button to release a diskette from the drive.

Diskette drive activity light: When this light is on, it indicates that the diskette drive is in use.

Ethernet speed 100 Mbps: When this light is on, the Ethernet speed is 100 Mbps. When the light is off, the Ethernet speed is 10 Mbps.

Ethernet transmit/receive activity: When this light is on, there is activity between the server and the network. The Ethernet transmit/receive activity light is located on the Ethernet (RJ-45) connector on the rear of the server.

Hard disk drive activity light: When this light is on, it indicates that the hard disk drive is in use.

Power-on light: This status indicator lights when you turn on your server.

Power control button: Press this button to manually turn the server on or off.

Chapter 4. Configuring your server

The *ServerGuide™* CDs include software setup and installation tools that are specifically designed for your xSeries 200 server. You can use these CDs during the initial installation of your server to configure the server hardware features and simplify your network operating system installation. The *ServerGuide* CDs also contain a collection of application programs, which you can install after your server is up and running. Refer to the User's Reference on the *IBM xSeries Documentation* CD.

In addition to the *ServerGuide* CDs, you can use the following configuration programs to customize your server hardware:

- **Configuration/Setup Utility**

  This program is part of the *basic input/output system* (*BIOS*) code that comes with your server. You can use this program to configure serial- and parallel-connector assignments, change the drive startup sequence, set the date and time, and set passwords.

- **SCSISelect Utility**

  With the SCSISelect Utility program, you can configure the devices that are connected to the optional SCSI adapter. Use this program to change default values, resolve configuration conflicts, and perform a low-level format on a SCSI hard disk drive.

- **ServeRAID programs**

  The ServeRAID programs come with the optional ServeRAID adapters and with server models that have a ServeRAID adapter preinstalled. If your server has a ServeRAID adapter installed, you must use the ServeRAID configuration program to define and configure your disk-array subsystem *before* you install your operating system.

Attention: Refer to the *User's Reference* on the *IBM xSeries Documentation* CD for detailed instructions for using the configuration programs and *ServerGuide* CDs.

Using the ServerGuide CDs

The *ServerGuide* CDs provide state-of-the-art programs to detect the server model and hardware options that are installed, configure the server hardware, provide device drivers, and install your network operating system.

Note: If the *ServerGuide* CD does not start, see "ServerGuide startup problems" on page 30.

1. Insert the *Setup and Installation* CD, and restart the server.

2. Follow the instructions on the screens to:

   a. Select your language.

   b. Select your keyboard layout and country.

   c. View the Overview to learn about ServerGuide features.

   d. View the README file to review installation tips about your NOS and adapter.

   e. Start the setup and hardware configuration programs.

   f. Start the NOS installation. You will need your copy of the NOS CD.

Note: For information on the supported NOS versions, refer to the *Setup and Installation* CD label.

Chapter 5. Solving problems

This section provides basic troubleshooting information to help you resolve some common problems that might occur with your server.

If you cannot locate and correct the problem using the information in this section, refer to the "Solving problems" section in the *User's Reference* on the *IBM xSeries Documentation* CD.

Diagnostic tools overview

The following tools are available to help you identify and resolve hardware-related problems:

- **POST beep codes**

  The power-on self-test (POST) beep codes indicate the detection of a problem.

- **Diagnostic programs and error messages**

  The server-diagnostic programs are provided on the *IBM Enhanced Diagnostics* CD. These programs test the major components of your server.

  Note: Refer to the "Solving Problems" section in the *User's Reference* on the *IBM xSeries Documentation* CD for more detailed information about the diagnostic programs.

- **Troubleshooting chart**

  This chart lists problem symptoms and steps to correct the problems. See the "Troubleshooting chart" on page 31 for more information.

- **Customized support page**

  You can create a customized support page on the World Wide Web that is specific to your hardware, including frequently asked questions, parts information, technical hints and tips, and downloadable files. In addition, you can choose to receive electronic mail (e-mail) notifications whenever new information becomes available about your registered products.

  After you register and profile your xSeries 200, you can diagnose problems using the IBM Online Assistant, and you can participate in the IBM discussion forum. For more detailed information about registering and creating a customized profile for your IBM products, visit the following addresses on the Web:

  — http://www.ibm.com/pc/register

  — http://www.ibm.com/pc/support

POST beep code descriptions

The possible types of beep codes that your system might emit are:

Repeating long beeps
    Indicates that a memory error has occurred. Ensure that all DIMMs are correctly installed.

One long beep and two short beeps
> Indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. Ensure that the video adapter is correctly installed.

Note: Refer to the "Solving Problems" section in the *User's Reference* on the *IBM xSeries Documentation* CD for more detailed information about the POST beep codes.

ServerGuide startup problems

Look for the symptom in the left column of the chart. Probable solutions to the problem are in the right column.

Setup and Installation CD	Action
Setup and Installation CD will not start.	• Ensure that the system is a supported server model with a startable (bootable) CD-ROM drive. • If the startup (boot) sequence settings have been altered, be sure the CD-ROM is first in the boot sequence. • If more than one CD-ROM drive is installed, be sure that only one drive is set as the primary drive. Start the CD from the primary drive.
ServeRAID program cannot view all installed drives or cannot install NOS.	• Ensure that there are no duplicate SCSI IDs or IRQ assignments. • Ensure that the hard disk drive is connected properly.
The operating system installation program continuously loops.	Free up more space on the hard disk drive.
ServerGuide will not start your NOS CD.	Ensure that the NOS CD is supported by ServerGuide. See the *Setup and Installation* CD label for a list of NOS versions.
Cannot install NOS.	Ensure that the NOS is supported on your server. If the NOS is supported, either there is no logical drive defined (ServeRAID systems) or the ServerGuide System Partition is not present. Run the ServerGuide setup and configuration program and ensure that the setup is complete.

System Updates and Applications CD	Action
Get "time out" or "Unknown host" errors.	Ensure that you have access to the Internet through file transfer protocol (FTP) directly.

Troubleshooting chart

Notes:

1. See the "Solving Problems" section in the *User's Reference* on the *IBM xSeries Documentation* CD for more detailed troubleshooting charts.

2. If you cannot find the problem in the troubleshooting charts, run the diagnostic programs. If you have run the diagnostic test programs, or if running the tests does not reveal the problem, call for service.

Monitor	Suggestion Action
The screen is blank.	Verify that: 1. The server power cord is plugged into the server and a working electrical outlet. 2. The monitor cables are connected properly. 3. The monitor is turned on, and the brightness and contrast controls are adjusted correctly. If the items above are correct and the screen remains blank, call for service.
Only the cursor appears.	Call for service.
The monitor works when you turn on the server, but goes blank when you start some application programs.	Verify that: 1. The primary monitor cable is connected to the video port. 2. You installed the necessary device drivers for the applications. Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, refer to the information that comes with the monitor for adjusting and testing instructions. If the items above are correct and the screen remains blank, call for service.
Wavy, unreadable, rolling, distorted screen, or screen jitter.	If the monitor self-tests show the monitor is OK, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.) Then move the device and the monitor at least 305 mm (12 in.) apart. Turn on the monitor. **Notes:** 1. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.). 2. Non-IBM monitor cables might cause unpredictable problems. 3. An enhanced monitor cable with additional shielding is available for the 9521 and 9527 monitors. For information about the enhanced monitor cable, see your IBM reseller or IBM marketing representative. If the problem remains, call for service.
Wrong characters appear on the screen.	If the wrong language is displayed, update the BIOS with the correct language. If the problem remains, call for service.

Power	Suggested action
The server does not power on.	Verify that: 1. The power cables are properly connected to the server. 2. The electrical outlet functions properly. 3. The type of memory that is installed is correct. 4. If you just installed an option, remove it, and restart the server. If the server now turns on, you might have installed more options than the power supply supports. 5. The LEDs on the power supply are on. If the problem remains, call for service.
Memory	**Suggested action**
The amount of memory displayed is less than the amount of memory installed.	Verify that: 1. The memory modules are seated properly. 2. You have installed the correct type of memory. 3. If you changed the memory, you must update the memory configuration with the Configuration/Setup Utility program. 4. All banks of memory on the DIMMs are enabled. The server might have automatically disabled a DIMM bank if it detected a problem, or a DIMM bank could have been manually disabled. If the problem persists, call for service.
Option	**Suggested action**
An IBM option that was just installed does not work.	Verify that: 1. The option is designed for the server. 2. You followed the installation instructions that came with the option. 3. The option is installed correctly. 4. You have not loosened any other installed options or cables. 5. You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration. If the problem remains, call for service.
Expansion enclosure	**Suggested action**
The SCSI expansion enclosure used to work, but does not work now.	Verify that: 1. The cables for all external SCSI options are connected correctly. 2. The last option in each SCSI chain, or the end of the SCSI cable, is terminated correctly. 3. External SCSI options are turned on. You must turn on an external SCSI options before turning on the server. For more information, see your SCSI and expansion enclosure documentation.

Appendix A. Product warranties and notices

This chapter contains warranty and emission notices. It also contains trademark and general-information notices.

Warranty Statements

The warranty statements consist of two parts: Part 1 and Part 2. Part 1 varies by country. Part 2 is the same for all countries. Be sure to read both the Part 1 that applies to your country and Part 2.

*   **United States, Puerto Rico, and Canada (Z125-4753-05 11/97)**

    (page 33, Part 1 - General Terms)
*   **Worldwide except Canada, United States, and Puerto Rico (Z125-5697-01 11/97)**

    ("Part 1 - General Terms," on page 36)
*   **Worldwide Country-Unique Terms**

    ("Part 2 - Worldwide Country-Unique Terms" on page 38)

IBM Statement of Limited Warranty for United States, Puerto Rico, and Canada (Part 1 - General Terms)

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. **The terms of Part 2 may replace or modify those of Part 1.** The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

Machine - IBM @server xSeries 200

Warranty period*
*   Canada - Parts: Three (3) years Labor: Three (3) years
*   United States and Puerto Rico - Parts: Three (3) years Labor: One (1) year

IBM will provide warranty service without charge for:
  1. parts and labor during the first year of the warranty period
  2. parts only, on an exchange basis, in the second and third years of the warranty period.
      IBM will charge you for any labor it provides in performance of the repair or replacement.

* Contact your place of purchase for warranty service information. Some IBM Machines are eligible for on-site warranty service depending on the country where service is performed.

The IBM Warranty for Machines
IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded. The replacement may not be new, but will be in good working order.

Extent of Warranty
The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty
IBM does not warrant uninterrupted or error-free operation of a Machine.

Unless specified otherwise, IBM provides non-IBM machines **WITHOUT WARRANTIES OF ANY KIND.**

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service
To obtain warranty service for the Machine, contact your reseller or IBM. In the United States, call IBM at 1-800-772-2227. In Canada, call IBM at 1-800-565-3344. (In Toronto, call 416-383-3344.) You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not

be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Any feature, conversion, or upgrade IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;

2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and

3. where applicable, before service is provided

   a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,

   b. secure all programs, data, and funds contained in a Machine,

   c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and

   d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Production Status
Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

Limitation of Liability
Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and

2. the amount of any other actual direct damages, up to the greater of U.S. $100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

   This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

IBM Statement of Warranty Worldwide except United States, Puerto Rico, and Canada (Part 1 – General Terms)

This Statement of Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. **The terms of Part 2 may replace or modify those of Part 1.** The warranties provided by IBM in this Statement of Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

Machine - IBM @server xSeries 200

Warranty Period* - Parts: Three (3) years Labor: Three (3) years

* Contact your place of purchase for warranty service information. Some IBM Machines are eligible for On-site warranty service depending on the country where service is performed.

The IBM Warranty for Machines
IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded. The replacement may not be new, but will be in good working order.

Extent of Warranty
The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not

responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty
IBM does not warrant uninterrupted or error-free operation of a Machine.

Unless specified otherwise, IBM provides non-IBM machines **WITHOUT WARRANTIES OF ANY KIND.**

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND.**

Warranty Service
To obtain warranty service for the Machine, contact your reseller or IBM. You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Any feature, conversion, or upgrade IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;

2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and

3. where applicable, before service is provided

a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,

b. secure all programs, data, and funds contained in a Machine,

c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and

d. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Production Status
Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

Limitation of Liability
Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and

2. the amount of any other actual direct damages, up to the greater of U.S. $100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

   This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Part 2 - Worldwide Country-Unique Terms

<u>ASIA PACIFIC</u>

AUSTRALIA: The IBM Warranty for Machines: The following paragraph is added to this Section:
The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other legislation and are only limited to the extent permitted by the applicable legislation.

Extent of Warranty: The following replaces the first and second sentences of this Section:
The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, operation in other than the Specified Operating Environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible.

Limitation of Liability: The following is added to this Section:
Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

PEOPLE'S REPUBLIC OF CHINA: Governing Law: The following is added to this Statement:
The laws of the State of New York govern this Statement.

INDIA: Limitation of Liability: The following replaces items 1 and 2 of this Section:

1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence;

2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

NEW ZEALAND: The IBM Warranty for Machines: The following paragraph is added to this Section:
The warranties specified in this Section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: The following is added to this Section:
Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this Section are subject to the limitations in that Act.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

The following terms apply to all EMEA countries.

The terms of this Statement of Warranty apply to Machines purchased from an IBM reseller. If you purchased this Machine from IBM, the terms and conditions of the applicable IBM agreement prevail over this warranty statement.

Warranty Service

If you purchased an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchased an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of

Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

The applicable laws, Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided. However, the laws of Austria govern this Statement if the warranty service is provided in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Federal Republic of Yugoslavia, Georgia, Hungary, Kazakhstan, Kirghizia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine.

The following terms apply to the country specified:

EGYPT: Limitation of Liability: The following replaces item 2 in this Section:
2. as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

FRANCE: Limitation of Liability: The following replaces the second sentence of the first paragraph of this Section:
In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: (items 1 and 2 unchanged).

GERMANY: The IBM Warranty for Machines: The following replaces the first sentence of the first paragraph of this Section:
The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this Section:
The minimum warranty period for Machines is six months.

In case IBM or your reseller are unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

Extent of Warranty: The second paragraph does not apply.

Warranty Service: The following is added to this Section:
During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Production Status: The following paragraph replaces this Section:
Each Machine is newly manufactured. It may incorporate in addition to new parts, re-used parts as well.

Limitation of Liability: The following is added to this Section:
The limitations and exclusions specified in the Statement of Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

In item 2, replace "U.S. $100,000" with "1.000.000 DEM."

The following sentence is added to the end of the first paragraph of item 2:
IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

IRELAND: Extent of Warranty: The following is added to this Section:
Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the

foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: The following replaces items one and two of the first paragraph of this Section:
1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and 2. the amount of any other actual direct damages, up to the greater of Irish Pounds 75,000 or 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

Applicability of suppliers and resellers (unchanged).

The following paragraph is added at the end of this Section:
IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

ITALY: Limitation of Liability: The following replaces the second sentence in the first paragraph:
In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than: (item 1 unchanged) 2)as to any other actual damage arising in all situations involving non-performance by IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

The following replaces the second paragraph of this Section:
Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: (items 1 and 2 unchanged) 3) indirect damages, even if IBM or your reseller is informed of their possibility.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND: Limitation of Liability: The following is added to this Section:
IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

TURKIYE: Production Status: The following replaces this Section:
IBM fulfills customer orders for IBM Machines as newly manufactured in accordance with IBM's production standards.

UNITED KINGDOM: Limitation of Liability: The following replaces items 1 and 2 of the first paragraph of this Section:
1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; 2. the amount of any other actual direct damages or loss, up to the greater of Pounds Sterling 150,000 or 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

The following item is added to this paragraph:
3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

The following is added to the end of this Section:
IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default will be limited to damages.

NORTH AMERICA

CANADA: Warranty Service: The following is added to this section:
To obtain warranty service from IBM, call **1-800-565-3344**. In Toronto, call **416-383-3344**.

UNITED STATES OF AMERICA: Warranty Service: The following is added to this section:
To obtain warranty service from IBM, call **1-800-772-2227**.

Notices

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IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Processing date data

This IBM hardware product and IBM software products that might be packaged with it have been designed, when used in accordance with their associated documentation, to process date data correctly within and between the 20th and 21st centuries, provided all other products (for example, software, hardware, and firmware) used with these products properly exchange accurate date data with them.

IBM cannot take responsibility for the date data processing capabilities of non-IBM products, even if those products are preinstalled or otherwise distributed by IBM. You should contact the vendors responsible for those products directly to determine the capabilities of their products and update them if needed. This IBM hardware product cannot prevent errors that might occur if software, upgrades, or peripheral devices you use or exchange data with do not process date data correctly.

The foregoing is a Year 2000 Readiness Disclosure.

Trademarks

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Other company, product, and service names may be trademarks or service marks of others.

Important notes

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

When referring to hard disk drive capacity, MB stands for 1 000 000 bytes and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Unless otherwise stated, IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Electronic emission notices

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not 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.

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom telecommunications safety requirement

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

European Union EMC Directive conformance 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. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

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

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Taiwan electrical emission statement

警告使用者：
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

Japanese Voluntary Control Council for Interference (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Ａ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Power cords

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

IBM power cord part number	Used in these countries and regions
13F9940	Argentina, Australia, China (PRC), New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa
13F9979	Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, China (Macau S.A.R.), Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe
13F9997	Denmark
14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka

IBM power cord part number	Used in these countries and regions
14F0033	Antigua, Bahrain, Brunei, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dubai, Fiji, Ghana, India, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Ethiopia, Italy, Libya, Somalia
14F0087	Israel
1838574	Thailand
6952301	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela

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