IBM

IntelliStation A Pro
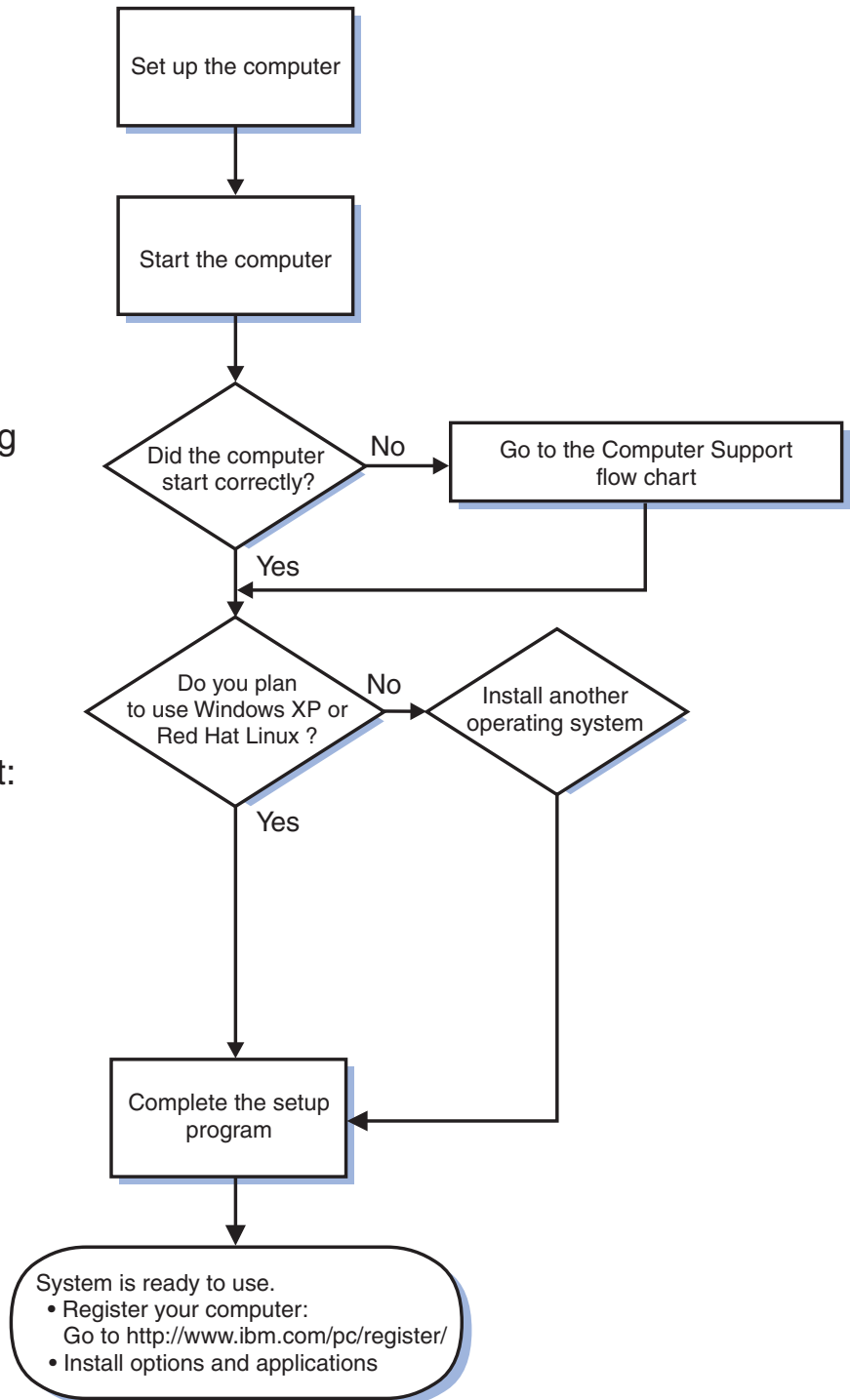Type 6217

Installation Guide

Welcome. . .

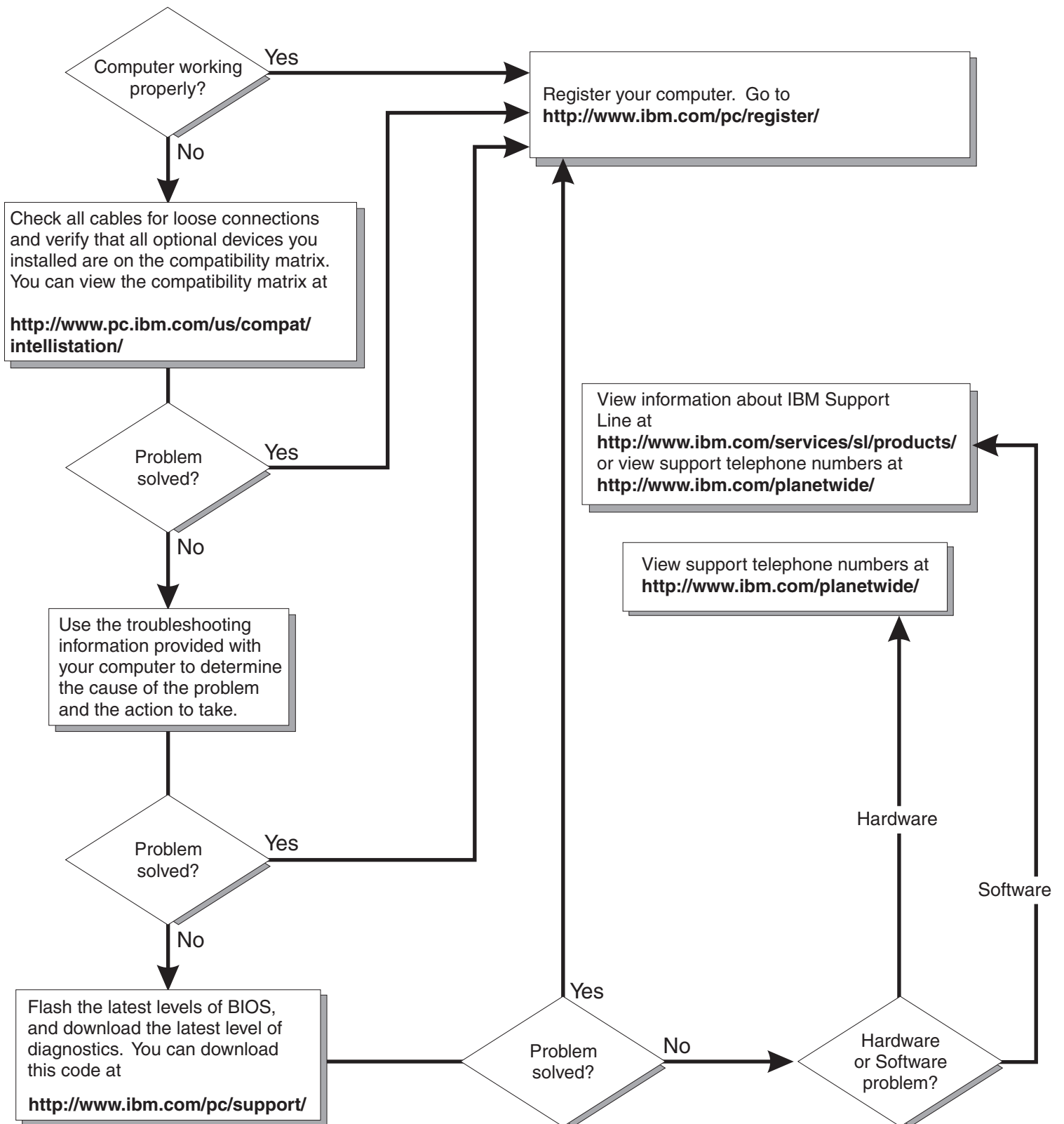Thank you for buying an IBM IntelliStation A Pro computer.

This *Installation Guide* contains information for setting up, installing options, and configuring your computer.
This book also contains information for every day use, and solving problems.

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

Set up the computer

↓

Start the computer

↓

Did the computer start correctly? — No → Go to the Computer Support flow chart

Yes

↓

Do you plan to use Windows XP or Red Hat Linux ? — No → Install another operating system

Yes

↓

Complete the setup program

↓

System is ready to use.
- Register your computer:
  Go to http://www.ibm.com/pc/register/
- Install options and applications

Computer Support

Computer working properly? — Yes → Register your computer. Go to **http://www.ibm.com/pc/register/**

No ↓

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

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

Problem solved? — Yes → Register your computer. Go to **http://www.ibm.com/pc/register/**

No ↓

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

Problem solved? — Yes → Register your computer. Go to **http://www.ibm.com/pc/register/**

No ↓

Flash the latest levels of BIOS, and download the latest level of diagnostics. You can download this code at

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

Problem solved? — Yes → Register your computer. Go to **http://www.ibm.com/pc/register/**

No → **Hardware or Software problem?**

Hardware ↑

View information about IBM Support Line at **http://www.ibm.com/services/sl/products/** or view support telephone numbers at **http://www.ibm.com/planetwide/**

Software →

View support telephone numbers at **http://www.ibm.com/planetwide/**

IntelliStation A Pro
Type 6217

Installation Guide

IBM

Note:

Before using this information and the product it supports, be sure to read the general information in and Appendix B, "Notices," on page 73, and the *Warranty and Support Information* document on the IBM *IntelliStation Documentation* CD.

Contents

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安裝本产品之前，请仔细阅读 Safety Information
（安全信息）。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας
(safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się
z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по
технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

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:
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:

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.

Statement 4:
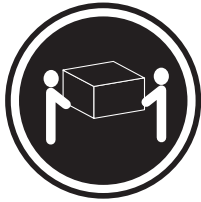
≥ 18 kg (39.7 lb)   ≥ 32 kg (70.5 lb)   ≥ 55 kg (121.2 lb)
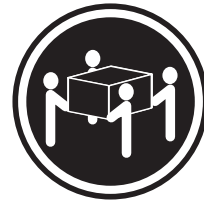
CAUTION:
Use safe practices when lifting.

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.

Statement 8:

CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.

Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Statement 23

CAUTION:
Do not place any object weighing more than 50 kg (110 lb) on top of rack-mounted devices.

>50 kg (110 lb)

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after handling.*

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. *Lávese las manos después de usar el producto.*

Important:

All caution and danger statements in this documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in the *IBM Safety Information* document.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *IBM Safety Information* document under statement 1.

Be sure to read all caution and danger statements in this documentation before performing the instructions. Read any additional safety information that comes with your computer or optional device before you install the device.

Chapter 1. Introduction

This *Installation Guide* contains instructions for setting up your IBM® IntelliStation® A Pro Type 6217 computer and basic instructions for installing some options. More detailed instructions for installing options are in the *User's Guide* on the IBM *IntelliStation Documentation* CD, which comes with your computer. This document contains information about:

- Setting up and cabling your computer
- Starting and configuring your computer
- Setting up your operating system

You can obtain up-to-date information about your computer and other IBM computer products at http://www.ibm.com/pc/intellistation/.

Packaged with this *Installation Guide* is the *Device Drivers* CD, which contains device drivers and hardware-specific support software.

The IBM *IntelliStation Documentation* CD is also included. This CD provides detailed information about your computer (see "The IBM IntelliStation Documentation CD" on page 2 for more detailed information).

The computer model and serial numbers are on labels on the lower-right front of the bezel and on the bottom of the computer. You will need these numbers to register your computer with IBM.

Note: Your computer 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.

If you plan to install your computer in a rack, you must purchase a *Tower-to-Rack Conversion Kit*. For a list of supported options for your computer, go to http://www.ibm.com/pc/; then, select your country and navigate to the list of options for your computer.

Note: Disregard the bezel in the conversion kit and use your original bezel when installing the computer in a rack.

Your computer comes with Microsoft Windows®[1] XP Professional or Red Hat Enterprise Linux WS (Workstation) preinstalled (depending on your model). To install another operating system, follow the instructions in the documentation that comes with the operating system and any updates. Then, follow the instructions in the readme file on the *Device Drivers* CD to install the support software.

Note: If you install another operating system, you might need additional software or device drivers. Some preinstalled device drivers are available on the *Device Drivers* CD. If you experience problems with the device drivers installed from this CD, you can obtain the latest device drivers from http://www.ibm.com/pc/support/.

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1. The Microsoft® Certificate of Authenticity is your assurance that the Windows software in your computer is legally licensed from Microsoft Corporation.

1

Before installing any operating system, make sure that you obtain the latest updates for that operating system. Contact the operating system manufacturer or, if applicable, check the manufacturer's Web site to obtain the updates.

Additional information about operating systems is posted periodically at http://www.ibm.com/pc/support/.

The IBM IntelliStation Documentation CD

The IBM *IntelliStation Documentation* CD contains documentation for your computer in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

Hardware and software requirements

The IBM *IntelliStation Documentation* CD requires the following minimum hardware and software:
- Microsoft Windows NT 4.0 (with Service Pack 3 or later), Windows 98, Windows 2000, or Red Hat Linux.
- 100 MHz microprocessor.
- 32 MB of RAM.
- Adobe Acrobat Reader 3.0 (or later) or xpdf, which comes with Linux operating systems. Acrobat Reader software is included on the CD, and you can install it when you run the Documentation Browser.

Using the Documentation Browser

Use the Documentation Browser to browse the contents of the CD, read brief descriptions of the documents, and view documents using Adobe Acrobat Reader or xpdf. The Documentation Browser automatically detects the regional settings in use in your system and displays the documents in the language for that region (if available). If a document is not available in the language for that region, the English version is displayed.

Use one of the following procedures to start the Documentation Browser:
- If Autostart is enabled, insert the CD into your CD-ROM drive. The Documentation Browser starts automatically.
- If Autostart is disabled or is not enabled for all users, use one of the following procedures:
  – If you are using a Windows operating system, insert the CD into your CD-ROM drive and click **Start --> Run**. In the **Open** field, type

    `e:\win32.bat`

    where *e* is the drive letter of the CD-ROM drive, and click **OK**.
  – If you are using Red Hat Linux, insert the CD into your CD-ROM drive; then, type the following command from the /mnt/cdrom directory:

    `sh runlinux.sh`

Select your computer from the **Product** menu. The **Available Topics** list displays all the documents for your computer. Some documents might be in folders. A plus sign (+) indicates each folder or document that has additional documents under it. Click the plus sign to display the additional documents.

When you select a document, a description of the document appears under **Topic Description**. To select more than one document, press and hold the Ctrl key while

you select the documents. Click **View Book** to view the selected document or documents in Acrobat Reader or xpdf. If you selected more than one document, all the selected documents are opened in Acrobat Reader or xpdf.

To search all the documents, type a word or word string in the **Search** field and click **Search**. The documents in which the word or word string appears are listed in order of the most occurrences. Click a document to view it, and press Crtl+F to use the Acrobat search function or Alt+F to use the xpdf search function within the document.

Click **Help** for detailed information about using the Documentation Browser.

Related documentation

This *Installation Guide* provides general information about your computer, including information about features, how to configure the computer, and setup and installation instructions. In addition to this *Installation Guide*, the following documentation comes with your computer.

- *User's Guide*

  This document is in Portable Document Format (PDF) on the IBM *IntelliStation Documentation* CD. It contains general information about your computer and how to use and configure the functions of the computer.

- *Problem Determination and Service Guide*

  This document is in PDF on the IBM *IntelliStation Documentation* CD and at http://www.ibm.com/pc/support/. It contains information to help you solve problems that might occur in your IBM IntelliStation A Pro Type 6217 computer.

- *Safety Information*

  This document is in PDF on the IBM *IntelliStation Documentation* CD. It contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* document.

- *Warranty and Support Information*

  This document is in PDF on the IBM *IntelliStation Documentation* CD. It contains information about the terms of the warranty and about service and assistance.

- *Adaptec SCSI documentation*

  This document is in PDF on the *Device Drivers* CD. It contains information and instructions for installing and configuring small computer system interface (SCSI) device drivers and devices.

- Readme files on the *Device Drivers* CD

  Several readme files on the CD contain information about preinstalled device drivers. Other readme files on the CD contain information about the various adapters and devices that might be installed in or attached to your computer.

- IBM *IntelliStation Documentation* CD
  This CD contains all of the IBM IntelliStation A Pro Type 6217 documents in Portable Document Format (PDF).

Depending on your computer model, additional documentation might be included on the IBM *IntelliStation Documentation* CD.

The computer might have features that are not described in the documentation that you received with the computer. The documentation might be updated occasionally to include information about those features, or technical updates might be available

to provide additional information. These updates are available from the IBM Web site. To check for updated documentation and technical updates, complete the following steps:

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/pc/support/.
2. In the **Browse by topic** section, click **Publications**.
3. On the Publications page, in the **Brand** field, select **IntelliStation**.
4. In the **Family** field, select **IntelliStation A Pro**.
5. Click **Continue**.

Notices and statements in this document

The caution and danger statements used in this document also appear in the multilingual *Safety Information* document, which is on the IBM *IntelliStation Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *Safety Information* document.

The following notices and statements are used in this document:

- **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 statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Inventory checklist

Take an inventory of items as you unpack them to make sure that you have all of the components. If any items are missing or damaged, contact your place of purchase. The following items come with your IBM IntelliStation A Pro computer:

- One keyboard
- One mouse
- One power cord (9-ft line cord)
- One *Device Drivers* CD
- One IBM *IntelliStation Documentation* CD
- This *Installation Guide*

If you are missing an item, contact your place of purchase.
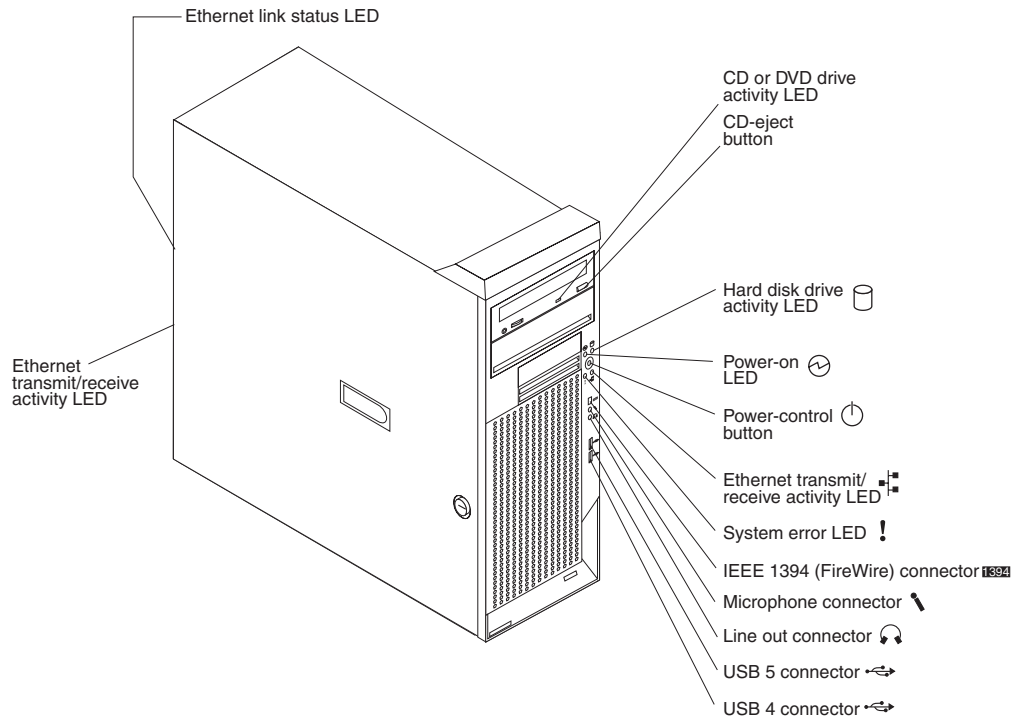
Features and specifications

The following table provides a summary of the features and specifications of your IntelliStation A Pro computer. Depending on your model, some features might not be available, or some specifications might not apply.

Table 1. Features and specifications

Microprocessor:
- Supports up to two AMD Opteron microprocessors (two 64-bit memory channels per microprocessor)
- 1 MB Level-2 cache
- 800 MHz front-side bus (FSB) with data rate of 1.6 GHz

Memory:
- Minimum: 1 GB
- Maximum: 16 GB (depending on your configuration)
- Type: PC2700 (2 GB DIMMs only) or PC3200 double-data-rate (DDR) registered
- Connectors: Four or eight dual inline memory module (DIMM) connectors, depending on your configuration

Internal Drives:
- Hard disk drive: SCSI or Serial ATA (SATA)
- One of the following optical drives:
  - CD-ROM: IDE
  - CD-RW: IDE
  - DVD-ROM: IDE
  - DVD-RAM Multiburner Plus: IDE
  - DVD/CD-RW combo: IDE

Expansion bays:
- Three slim-high 3.5-inch drive bays (one hard disk drive installed in some models)
- Two half-high 5.25-inch bays (optical drive installed in one bay)
- One slim-high 3.5-inch removable-media or hard disk drive bay

PCI expansion slots:
- Four 100 MHz/64-bit PCI-X slots
- One 133 MHz/64-bit PCI-X slot
- One PCI Express x16 slot

Power supply:
One 530 watts (115-230 V ac)

Cooling:
Five or six speed-controlled fans

Integrated functions:
- Broadcom 5703 10/100/1000 Ethernet controller with RJ-45 Ethernet connector
- Integrated RAID capability
- Two serial ports
- One parallel port
- Dual port Serial ATA controller
- Two IEEE 1394A (FireWire) ports (four-pin on front, six-pin on rear)
- Five Universal Serial Bus (USB) ports (two on front and three on rear)
- Keyboard port
- Mouse port
- Audio ports
  - Line out (front and rear)
  - Mic (front and rear)
  - Line in (rear only)
- Dual-channel IDE controller

Video adapter: (depending on your model)
- NVIDIA Quadro NVS 280 (DMS-59), PCI Express x16, with 64 MB DDR synchronous dynamic random access memory (SDRAM) video memory and dual analog connectors (or dual digital monitor capability with the purchase of an additional pigtail cable)
- NVIDIA Quadro FX 1400 (DVI-I), PCI Express x16, with 128 MB DDR synchronous dynamic random access memory (SDRAM) with dual DVI-I connectors
- NVIDIA Quadro FX 3400 (DVI-I), PCI Express x16, with 256 MB GDDR3 SDRAM video memory with dual DVI-I connectors
- 3Dlabs Wildcat Realizm 800 (DVI-I), PCI Express x16, with 512 MB GDDR3 (512-bit Unified) and 128 MB GDDR3 (128-bit direct burst) SDRAM video memory with dual DVI-I connectors

Electrical input:
- Sine-wave input (50 or 60 Hz) required
- Input voltage and frequency ranges automatically selected
- Input voltage low range:
  - Minimum: 90 V ac
  - Maximum: 137 V ac
- Input voltage high range:
  - Minimum: 180 V ac
  - Maximum: 265 V ac
- Input kilovolt-amperes (kVA) approximately:
  - Minimum: 0.24 kVA
  - Maximum: 0.86 kVA

Heat output:
Approximate heat output in British thermal units (Btu) per hour:
- Minimum configuration: 787 Btu (230 watts)
- Maximum configuration: 3012 Btu (882 watts)

Environment:
- Air temperature:
  - Computer on: 10° to 35°C (50° to 95°F). Altitude: 0 to 2134 m (7000 ft)
  - Computer off: -40° to +60°C (-40° to 140°F). Maximum altitude: 2133 m (7000 ft)
- Humidity (operating and storage): 8% to 80%

Acoustical noise emissions:
- Sound power, idle: 4.7 bel
- Sound power, operating: 5.3 bel

Size:
- Height: 438 mm (17.25 in.)
- Depth: 483 mm (19 in.)
- Width: 165 mm (6.5 in.)
- Weight: 16.3 kg (36 lb) to 20.8 kg (45.8 lb) depending upon configuration

Notes:

1. Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use.

2. These levels were measured in controlled acoustical environments according to the procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779 and are reported in accordance with ISO 9296. Actual sound-pressure levels in a given location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of computers will operate.

Controls, LEDs, and connectors

This section identifies the controls, LEDs, and front connectors on the IntelliStation A Pro Type 6217 computer. See "Cabling the computer" on page 40 for an illustration of the connectors on the rear of the computer.

Ethernet link status LED

CD or DVD drive activity LED

CD-eject button

Hard disk drive activity LED

Power-on LED

Ethernet transmit/receive activity LED

Power-control button

Ethernet transmit/receive activity LED

System error LED

IEEE 1394 (FireWire) connector 1394

Microphone connector

Line out connector

USB 5 connector

USB 4 connector

CD or DVD drive activity LED

> When this LED is lit, it indicates that the CD or DVD drive is in use.

CD-eject button

> Press this button to insert a CD or DVD into or remove a CD or DVD from the CD or DVD drive.

Hard disk drive activity LED

> When this LED is lit, it indicates that the hard disk drive is in use.

Power-on LED

> When this LED is lit and not flashing, it indicates that the computer is turned on. When this LED is flashing, it indicates that the computer is off and still connected to an ac power source (standby mode).

Power-control button

> Press this button to turn the computer on or off.

System-error LED

> When this amber LED is lit, it indicates that a system error has occurred. An LED on the system board is also lit to help isolate the error.

IEEE 1394A (FireWire) connectors

> Use these connectors (four-pin on the front and six-pin on the rear) to connect FireWire devices, such as digital video cameras and external hard disk drives.

Mic connector (pink)

> Use this connector to connect a microphone to your computer when you want to record voices or other sounds on the hard disk. You can also use this connector (and a microphone) with speech recognition software.

Line out connector (green)
Use this connector to send audio signals from the computer to external devices, such as speakers with built-in amplifiers, headphones, multimedia keyboards, or the audio line-in jack on a stereo system.

USB connectors
Use these connectors to connect USB devices to your computer, using redundant Plug and Play technology.

Ethernet transmit/receive activity LED
When this LED is lit, it indicates that there is activity between the computer and the network. There are two of these LEDs, one on the front and one on the rear of the computer.

Ethernet link status LED
When this LED is lit, it indicates that there is an active connection on the Ethernet port. This LED is located on the rear of the computer.

Chapter 2. Installing the hardware

This chapter provides instructions for installing or replacing options in your computer. For a list of supported options for your computer, go to http://www.ibm.com/pc/; then, select your country and navigate to the list of options for your computer. For more detailed installation information, see the *Problem Determination and Service Guide* on the IBM *IntelliStation Documentation* CD.

Selecting a location for your computer

Make sure that you have an adequate number of properly grounded electrical outlets for the computer, monitor, and any other devices. Select a location for the computer where it will remain dry. Leave approximately 50 mm (2 in.) of space around the computer for proper air circulation. For information about arranging your computer and ease of use, see the following sections.

Arranging your workspace

To get the most from your computer, arrange both the equipment you use and your work area to suit your needs and the kind of work you do. Your comfort is of foremost importance, but light sources, air circulation, and the location of electrical outlets can also affect the way you arrange your workspace.

Comfort

The following guidelines will help you decide what working position suits you best.

Choose a comfortable chair to reduce fatigue from sitting in the same position for long periods. The backrest and seat should adjust independently and provide good support. The seat should have a curved front to relieve pressure on the thighs. Adjust the seat so that your thighs are parallel to the floor and your feet are either flat on the floor, or on a footrest.

When using the keyboard, keep your forearms parallel to the floor and your wrists in a neutral, comfortable position. Try to keep a light touch on the keyboard, and your hands and fingers relaxed. Change the angle of the keyboard for maximum comfort by adjusting the position of the keyboard feet.

Adjust the monitor so that the top of the screen is at, or slightly below, eye level. Place the monitor at a comfortable viewing distance, usually 51 to 61 cm (20 to 24 in.), and position it so that you can view it without having to twist your body.

Glare and lighting

Position the monitor to minimize glare and reflections from overhead lights, windows, and other light sources. Place the monitor at right angles to light sources whenever possible. Reduce overhead lighting, if necessary, by turning off lights or using lower wattage bulbs. If you install the monitor near a window, use curtains or blinds to block the sunlight. You might have to adjust the Brightness and Contrast controls on the monitor as the lighting changes throughout the day.

Where it is impossible to avoid reflections or to adjust the lighting, place an antiglare filter over the screen. However, these filters might affect the clarity of the screen image; try them only after you have exhausted other methods of reducing glare.

Dust compounds problems associated with glare. Clean your monitor screen periodically using a soft cloth moistened with a nonabrasive, liquid glass cleaner.

Air circulation

Your computer and monitor produce heat. The computer fan pulls in fresh air and forces out hot air. The monitor lets hot air escape through vents. Blocking the air vents can cause overheating, possibly resulting in malfunction or damage. Place the computer and monitor so that nothing blocks the air vents; usually 50 mm (2 in.) of air space is sufficient. Also, make sure the vented air is not blowing on someone else.

Electrical outlets and cable lengths

The location of electrical outlets and the length of device power cords and cables might determine the final placement of your computer.

When arranging your work space:

- Avoid the use of extension cords. Whenever possible, plug the computer power cord directly into an electrical outlet.
- Keep power cords and cables neatly routed away from walkways and other areas where they might be accidentally dislodged.

For more information about power cords, see "Power cords" on page 77.

Installing options

This section provides instructions for installing and replacing hardware options in your computer. These instructions are intended for users who are experienced with setting up IBM computer hardware. If you need more detailed instructions, see the *Problem Determination and Serive Guide* on the IBM *IntelliStation Documentation* CD. For a list of supported options for your computer, go to http://www.ibm.com/pc/; then, select your country and navigate to the list of options for your computer.

If you have no options to install, continue with "Cabling the computer" on page 40.

Installation guidelines

Before you begin installing options in your computer, read the following information:

- Read the safety information beginning on page v and the guidelines in "Handling static-sensitive devices" on page 11. This information will help you work safely.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- Do not attempt to lift an object that you think is too heavy for you. If you have to lift a heavy object, observe the following precautions:
  - Make sure that you stand safely without slipping.
  - Distribute the weight of the object equally between your feet.
  - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
  - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
- Make sure that you have an adequate number of properly grounded electrical outlets for your computer, monitor, and other devices that you will connect to the computer.
- Back up all important data before you make changes to disk drives.

- Have a small flat-blade screwdriver available.
- When you need to access the inside of the computer to install options, you might find it easier to lay the computer on its side.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the computer, open or close a latch, and so on.
- When you are finished working on the computer, reinstall all safety shields, guards, labels, and ground wires.

System reliability considerations

To help ensure proper system cooling and system reliability, make sure that:

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed.
- There is adequate space around the computer to allow the computer cooling system to work properly. Leave approximately 50 mm (2 in.) of open space around the front and rear of the computer. Do not place objects in front of the fans. For proper cooling and airflow, replace the computer cover before turning on the computer. Operating the computer for extended periods of time (over 30 minutes) with the computer cover removed might damage computer components.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan as soon as possible.

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 packages until you are ready to install them.

Notes:

1. If you are instructed to return a device or component, follow all packaging instructions. Use any packaging materials for shipping that are supplied to you.
2. Use product-specific electrostatic-discharge procedures when they exceed the requirements provided here.
3. Make sure that the electrostatic-discharge-protective devices you use have been certified (ISO 9000) as fully effective.

To reduce the possibility of damage from electrostatic discharge, observe the following precautions:
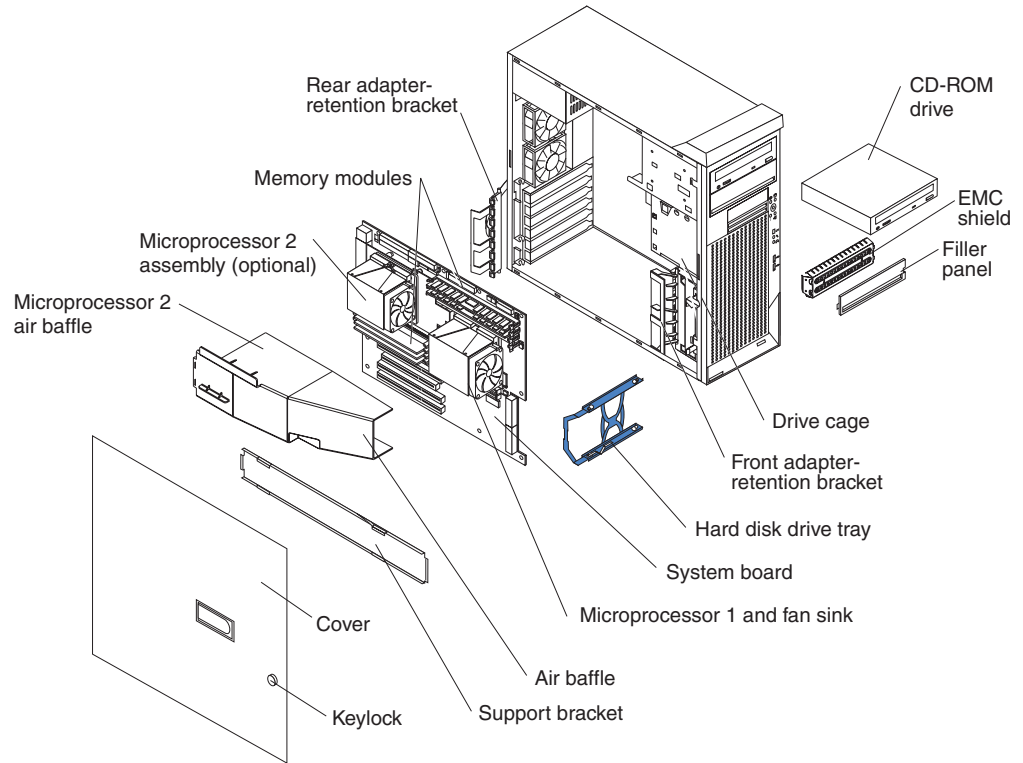
- Limit your movement. Movement can cause static electricity to build up around you.
- The use of a grounding system is recommended. For example, wear an electrostatic-discharge wrist strap, if one is available.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the system unit for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the computer without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on your computer cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Installing options in your computer

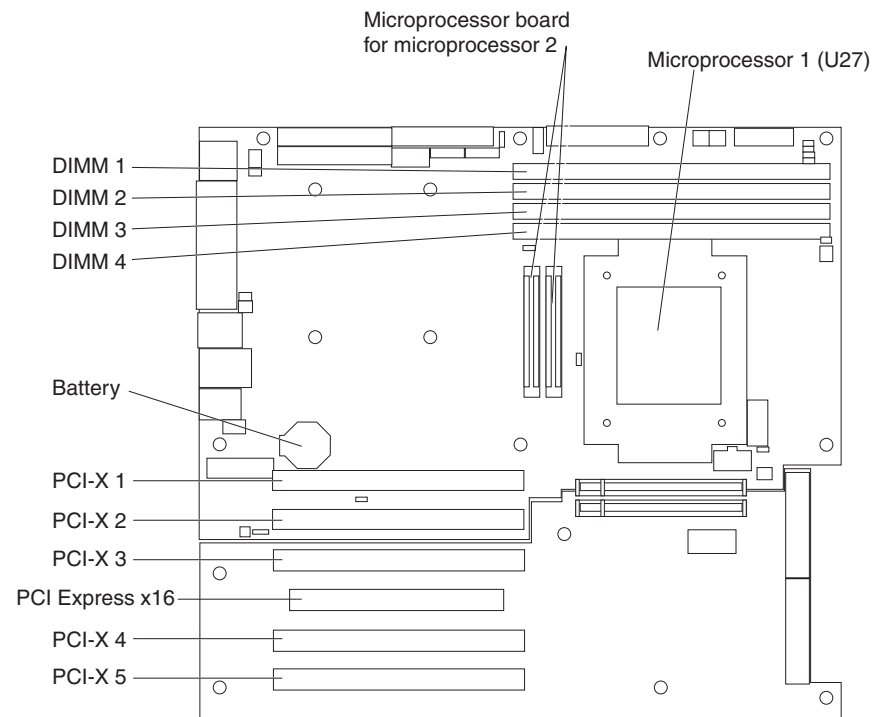This section provides instructions for installing hardware options in your computer.

Major components of your computer

The following illustration shows the major components in the A Pro Type 6217 computer.

Rear adapter-retention bracket

CD-ROM drive

Memory modules

EMC shield

Microprocessor 2 assembly (optional)

Filler panel

Microprocessor 2 air baffle

Drive cage

Front adapter-retention bracket

Hard disk drive tray

System board
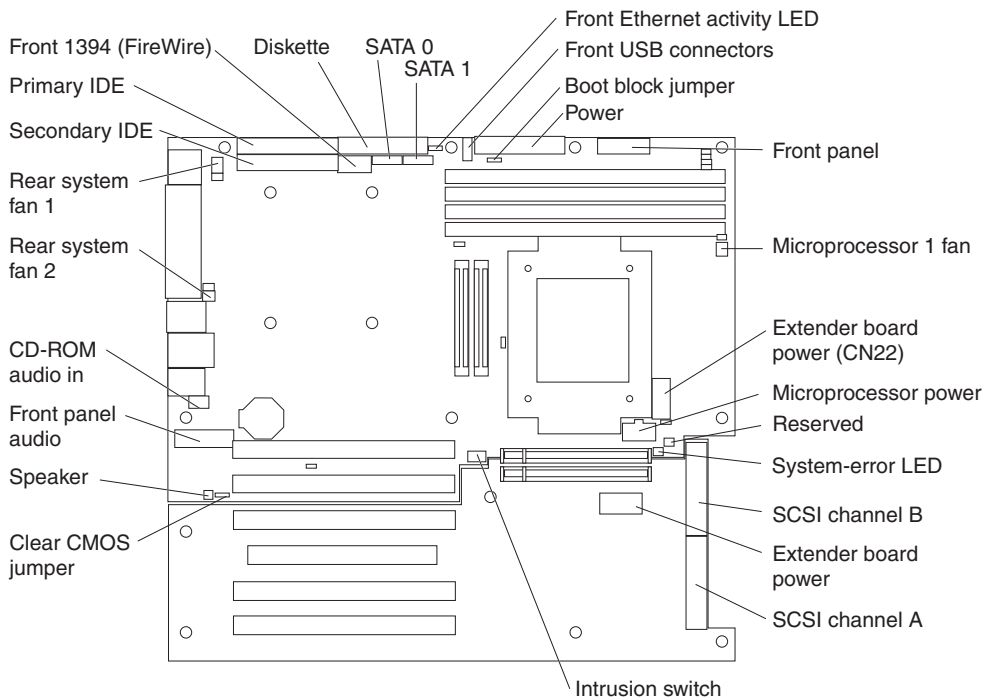
Cover

Microprocessor 1 and fan sink

Air baffle

Keylock

Support bracket

System-board option connectors

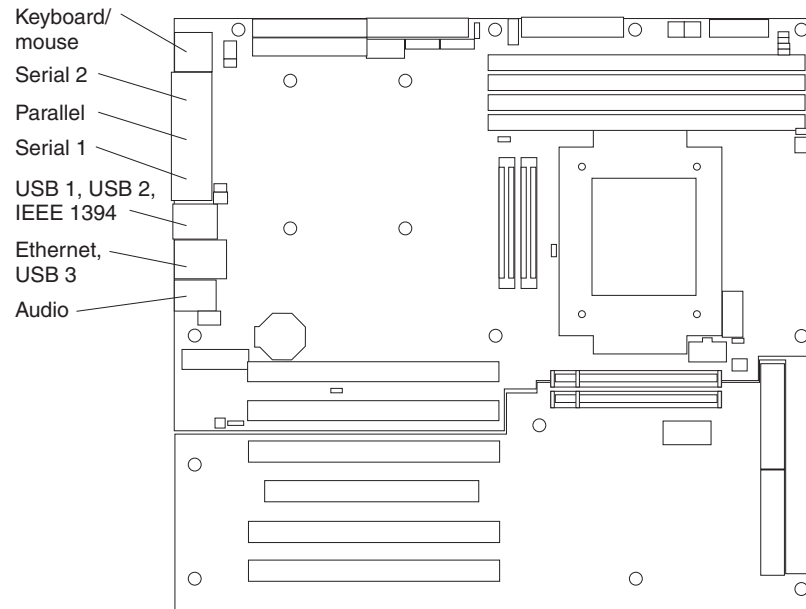The following illustration shows the system-board connectors for user-installable options.

Microprocessor board
for microprocessor 2

Microprocessor 1 (U27)

DIMM 1
DIMM 2
DIMM 3
DIMM 4

Battery

PCI-X 1
PCI-X 2
PCI-X 3
PCI Express x16
PCI-X 4
PCI-X 5

System-board internal connectors
The following illustration shows the internal connectors on the system board.

Front 1394 (FireWire)   Diskette   SATA 0
                                    SATA 1

Primary IDE

Secondary IDE

Rear system
fan 1

Rear system
fan 2

CD-ROM
audio in

Front panel
audio

Speaker

Clear CMOS
jumper

Front Ethernet activity LED
Front USB connectors
Boot block jumper
Power

Front panel

Microprocessor 1 fan

Extender board
power (CN22)

Microprocessor power

Reserved

System-error LED

SCSI channel B

Extender board
power

SCSI channel A

Intrusion switch

System-board external connectors

The following illustration shows the external input/output connectors on the system board.

Keyboard/
mouse

Serial 2

Parallel

Serial 1

USB 1, USB 2,
IEEE 1394

Ethernet,
USB 3

Audio

Optional microprocessor board connectors

If you decide to add a second microprocessor to your computer, the microprocessor option kit includes a microprocessor board that you attach to the system board. The following illustration shows the connectors on the microprocessor board.

Microprocessor fan

DIMM 8
DIMM 7
DIMM 6
DIMM 5
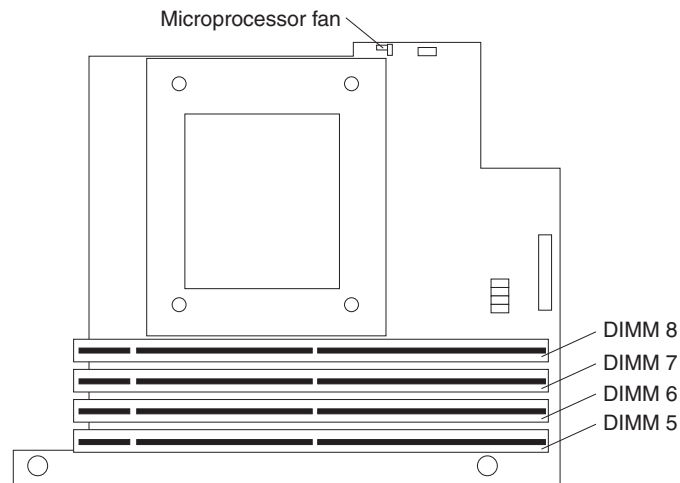
Removing the cover

To remove the computer side cover, you might find it easier to lay the computer on its side.

To remove the side cover, complete the following steps:

1. Review the "Installation guidelines" on page 10.
2. Turn off the computer and all attached devices (see "Turning off the computer" on page 42); then, disconnect all power cords and external cables.
3. Pull the cover-release latch away from the computer, and push the side cover toward the rear of the computer. Lift the side cover off the computer and set it aside.
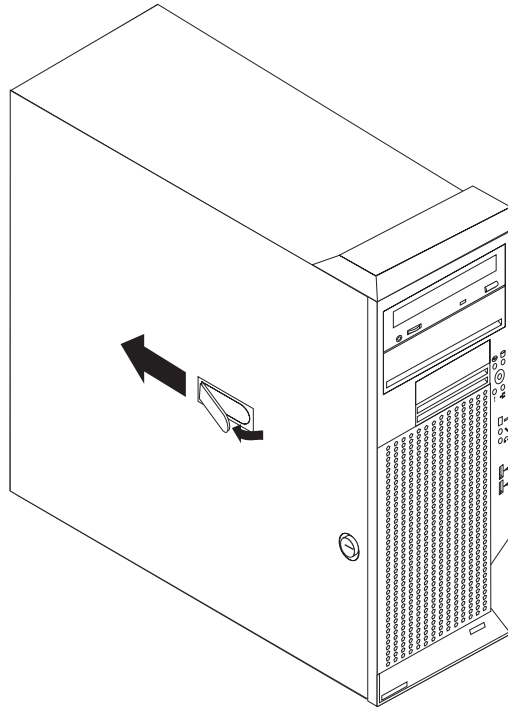
To replace the side cover, see "Replacing the side cover" on page 40.

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

Removing and installing the support bracket

When working with some options, such as hard disk drives and memory modules, you must first remove the support bracket to access the option.

To remove the support bracket, complete the following steps:

1. Read the safety information beginning on page v and the guidelines in "Handling static-sensitive devices" on page 11.
2. Turn off the computer and all attached devices (see "Turning off the computer" on page 42); then, disconnect all power cords and external cables.
3. Remove the side cover (see "Removing the cover" on page 16).
4. Pull out on the rear end of the support bracket approximately 150 mm (6 in.).
5. Disengage the front end of the support bracket from the computer and set the bracket aside.
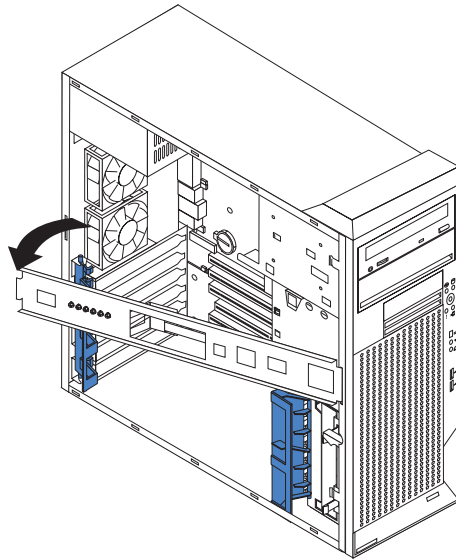
6. Continue with the option installation or removal procedure.

To reinstall the support bracket, reverse the previous steps.

Removing the bezel

When working with some devices, such as additional optical drives, you must first remove the bezel to access the device.

To remove the bezel, complete following steps:

1. Unlock the side-cover lock.
2. Remove the side cover (see "Removing the cover" on page 16).
3. Locate the bezel-release lever; then, press the bezel-release lever toward the front of the computer.
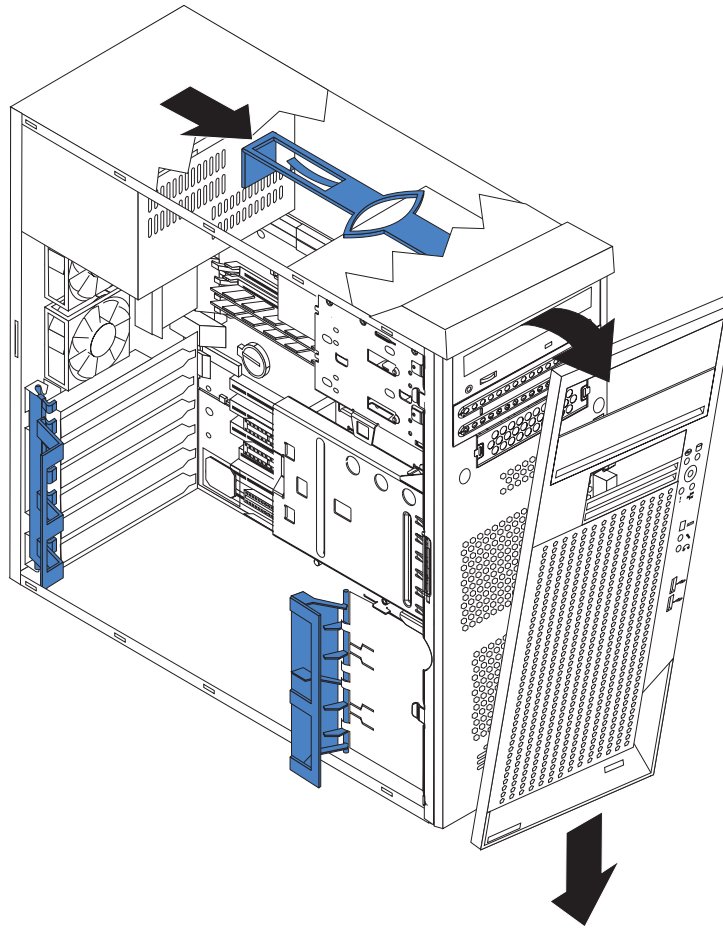
4. Pull the top of the bezel away from the chassis; then, push the bezel down to disengage the bottom tabs.
5. Remove the bezel from the computer and store the bezel in a safe place.

For instructions for replacing the bezel, see "Replacing the bezel" on page 39.

Installing an adapter

The following notes describe the types of adapters that your computer supports and other information that you must consider when installing an adapter. See "System-board option connectors" on page 13 for an illustration of the adapter slot locations.

- Read the documentation that comes with your operating system.

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this chapter. If you need to change the switch or jumper settings on the adapter, follow the instructions that come with the adapter.
- Your computer comes with adapter connectors or *slots*. The video adapter is installed in the PCI Express x16 slot. You can install up to five additional adapters in your computer in PCI-X slots 1, 2, 3, 4, and 5.
- The computer supports PCI-X adapters, 3.3 V PCI adapters, and universal PCI adapters.
- None of the PCI-X slots are hot-plug slots.
- You can install 64-bit or 32-bit adapters in PCI-X slots 1, 2, 3, 4, and 5.
- You can install full-length adapters in PCI-X slots 1, 3, 4, and 5; PCI-X slot 2 supports two-third length adapters.

   Note: If you install the 3Dlabs Wildcat Realizm 800 video adapter in the PCI Express x16 slot, it will overlap slot 4. Therefore, you will not be able to install an adapter in slot 4.
- If you install a ServeRAID 6i+ adapter, it must be installed in slot 3.
- The computer scans the PCI Express x16 slot and PCI-X expansion slots to assign system resources. Then, it starts the PCI devices in the following order, if you have not changed the default startup sequence: PCI Express x16 slot; PCI-X expansion slot 1; system-board integrated drive electronics (IDE), Serial ATA (SATA), or small computer system interface (SCSI) devices; and then PCI-X slots 2 through 5.
- For a list of supported options for your computer, go to http://www.ibm.com/pc/; then, select your country and navigate to the list of options for your computer.

To install an adapter, complete the following steps:
1. Read the safety information beginning on page v and the guidelines in "Handling static-sensitive devices" on page 11.
2. Turn off the computer and all attached devices (see "Turning off the computer" on page 42); then, disconnect all external cables and power cords.
3. Remove the side cover (see "Removing the cover" on page 16).
4. Determine which PCI-X slot you will use for the adapter. Review the instructions that come with the adapter for any requirements, restrictions, or cabling instructions. It might be easier to route any cables before you install the adapter.
5. For full-length adapters, rotate the rear adapter-retention bracket to the open (unlocked) position and remove it from the computer. Rotate the front adapter-retention bracket to the open position. If you are installing a smaller adapter, remove only the rear adapter-retention bracket.
6. Remove the expansion-slot cover. From the rear of the computer, press on the slot cover. Grasp it and pull it out of the expansion slot. Store it in a safe place for future use.

   Attention: Expansion-slot covers must be installed on all empty slots. This maintains the electronic emissions standards of the computer and ensures proper ventilation of computer components.
7. Follow the instructions that come with the adapter to set jumpers or switches, if any.
8. Remove the adapter from the static-protective package, carefully grasp the adapter by the top edge or upper corners, and align it with the expansion slot guides; then, press the adapter *firmly* into the expansion slot. Move the

adapter directly from the static-protective package to the adapter slot. Avoid touching the components and gold-edge connectors on the adapter.

Attention: Make sure that the adapter is correctly seated in the expansion slot before you turn on the computer. Incomplete installation of an adapter might damage the system board or the adapter.
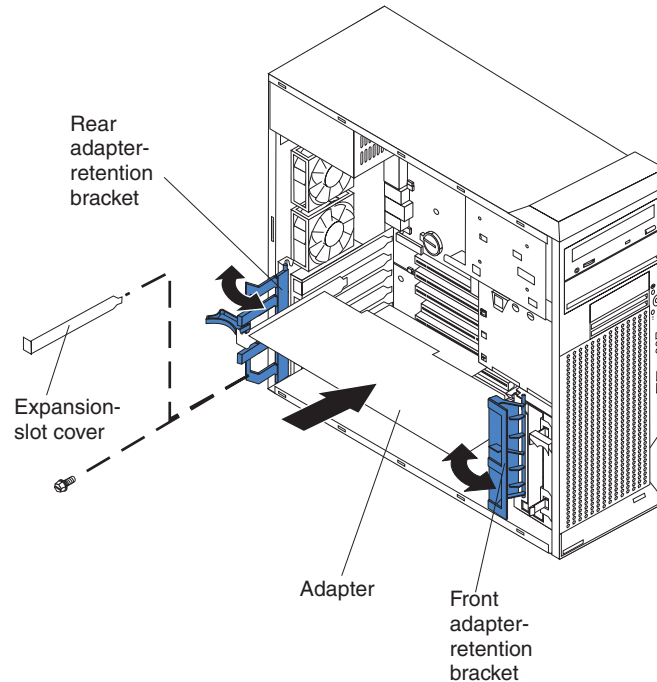
9. Connect required cables to the adapter. Route cables so that they do not block the flow of air from the fans. If you are installing an optional SCSI adapter, see "Cabling an optional SCSI adapter" for additional information.

10. If you have another adapter to install, repeat steps 4 through 9.

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

    Note: If any adapter in your computer is large or has heavy cables attached to it, you can secure the adapter with a screw: insert one backup expansion-slot screw (stored on the frame-support bracket) through the top of each adapter bracket into the screw hole and secure the adapter before proceeding to the next step. If you use a screw to secure an adapter, you will have to secure all adapters with screws. You cannot use both the screws and the retention brackets to secure adapters. You must use one method or the other.

12. Reinstall the rear adapter-retention bracket; then, rotate the bracket to the closed (locked) position.

    Note: The rear retention bracket rests against the computer side cover. You might find it easier to lay the computer on its side to replace the side cover.

13. If you have other options to install, do so now; otherwise, replace the side cover (see "Replacing the side cover" on page 40), reconnect the external cables and power cords, and turn on the computer. Then, go to "Completing the installation" on page 40.

Cabling an optional SCSI adapter

You can install an optional SCSI RAID adapter in your computer to control the internal hard disk drives and provide additional RAID capabilities. With a SCSI

RAID adapter installed, you can configure the internal hard disk drives into disk arrays. You can also cable a SCSI adapter to external hard disk drives. See your SCSI adapter option documentation for complete instructions for installing a SCSI adapter in your computer and for additional information about SCSI adapters.

Notes:

1. The SCSI cables that are used by the integrated SCSI controller cannot be used with an optional SCSI adapter.

2. If you install a ServeRAID 6i+ adapter, it must be installed in slot 3; no cabling is required for this adapter.

To cable an optional SCSI adapter, complete the following steps:

1. Install the SCSI adapter (see "Installing an adapter" on page 18).

2. Connect the SCSI-signal cable 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 to the adapter and to the SCSI-LED connector on the system board. See "System-board internal connectors" on page 14 for the location of the SCSI-LED connector.
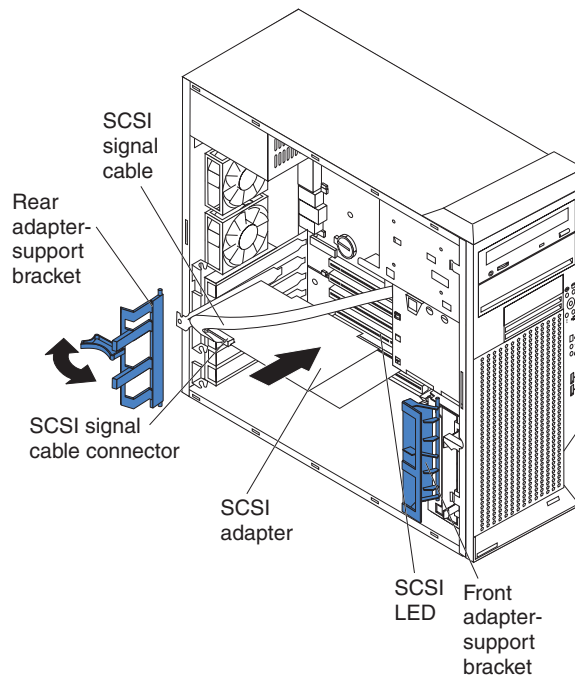
4. Complete the installation of the optional SCSI adapter.

Installing internal drives

Bay 1
Bay 2
Bay 3

Bay 6
Bay 5
Bay 4
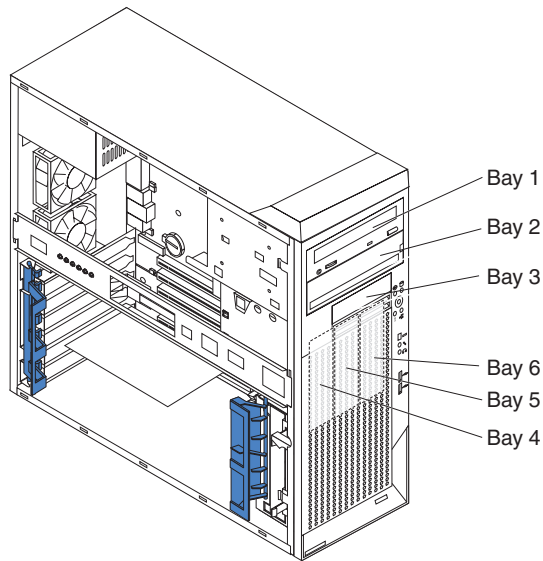
The following notes describe the types of drives that your computer supports and other information that you must consider when installing internal drives.

- Your IntelliStation A Pro computer comes with an IDE optical drive (CD-ROM, CD-RW, or DVD/CD-RW combo drive) in bay 1 and a hard disk drive in bay 4.
- You can install removable-media drives in bays 1, 2, and 3 only. Tape drives, diskette drives, CD-ROM, CD-RW, DVD-ROM, DVD/CD-RW combo, and DVD-RAM Multiburner Plus drives are examples of removable-media drives.
- You can install a 3.5-in. slim-high or 5.25-in. half-high removable-media drive, such as a tape backup drive, in bay 2.
- You can install an IDE diskette drive or a 3.5-in slim-high hard disk drive in bay 3.
- To install a 3.5-in. drive in a 5.25-in. bay, you must use the 5.25-in. conversion kit.
- The IntelliStation A Pro computer supports only one diskette drive: either an IDE diskette drive in bay 3 or a USB drive connected to the USB connector on the front of the computer.
- Two Serial ATA hard disk drive connectors are on the system board.
- When SCSI drives are installed, set the drive jumpers either to disable auto-start or to delay startup, to prevent overtaxing the system power supply by all drives trying to spin up at once.
- If you have SCSI hard disk drives and SATA hard disk drives in the same computer, note the following HostRAID considerations for hard disk drives:
  - You can enable HostRAID on only one subsystem (SCSI or SATA)
  - If HostRAID is enabled on a subsystem, you can install boot hard disk drives on that subsystem only.

  If you fail to observe these restrictions, the computer will usually disable the BIOS for the last subsystem loaded, which typically is SCSI.

  For more information about HostRAID, see "Using the Adaptec HostRAID configuration programs" on page 46.
- The electromagnetic interference (EMI) integrity and cooling of the computer are protected by having all bays and PCI-X slots covered or occupied. When you

install a drive or PCI-X adapter, save the EMC shield and filler panel from the bay or the PCI-X adapter slot cover in the event you later remove the drive or adapter.
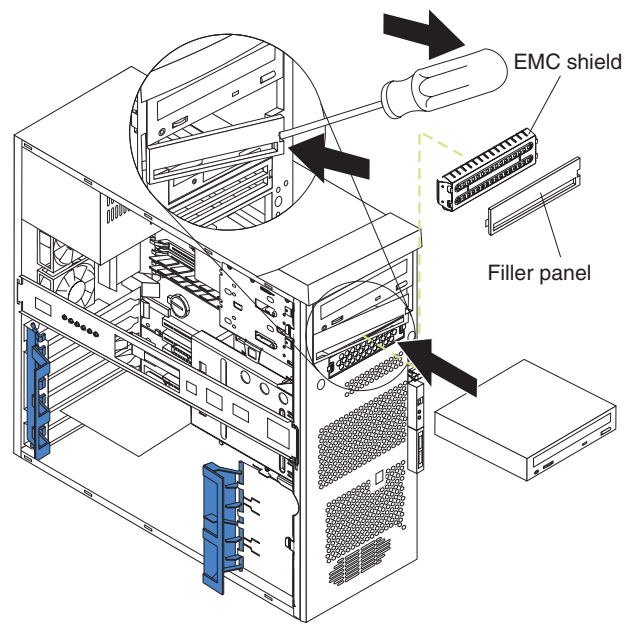
- For a complete list of supported options for your computer, go to http://www.ibm.com/pc/; then, select your country and navigate to the list of options for your computer.

Preinstallation steps: Some of these steps are required only the first time you install a hard disk drive in a specific bay.

1. Read the safety information beginning on page v,, the guidelines in "Handling static-sensitive devices" on page 11, and the documentation that comes with your drive.
2. Make sure that you have all the cables and other equipment specified in the documentation that comes with the drive.
3. Choose the bay in which you want to install the drive.
4. Check the instructions that come with the drive to see if you need to set any switches or jumpers on the drive. If you are installing a SCSI device, make sure to set the SCSI ID for that device.

Installing a drive in bay 2: To install a drive in bay 2, complete the following steps:

1. Follow the instructions in "Preinstallation steps."
2. Turn off the computer and all attached devices (see "Turning off the computer" on page 42); then, disconnect all power cords and external cables.
3. Remove the side cover (see "Removing the cover" on page 16).
4. Remove the front bezel (see "Removing the bezel" on page 18).
5. Remove the support bracket (see "Removing and installing the support bracket" on page 17).
6. Use a screwdriver to pry the filler panel and EMC shield away from the computer.

Note: If you are installing a drive that contains a laser, review 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.

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

 8. Follow the instructions that come with the drive to set jumpers or switches, if any.

     Note: You might find it easier to install the new drive into the opening on the front and then attach the cables.

 9. If you are installing a 3.5-in. drive in bay 2, attach a 5.25-in. conversion kit to the 3.5-in. drive.

10. Remove the clip from the side of the drive cage of bays 1 and 2 by sliding the clip to the left; then, snap the clip into the screw holes on the side of the drive (the blue side of the clip should be facing outward).
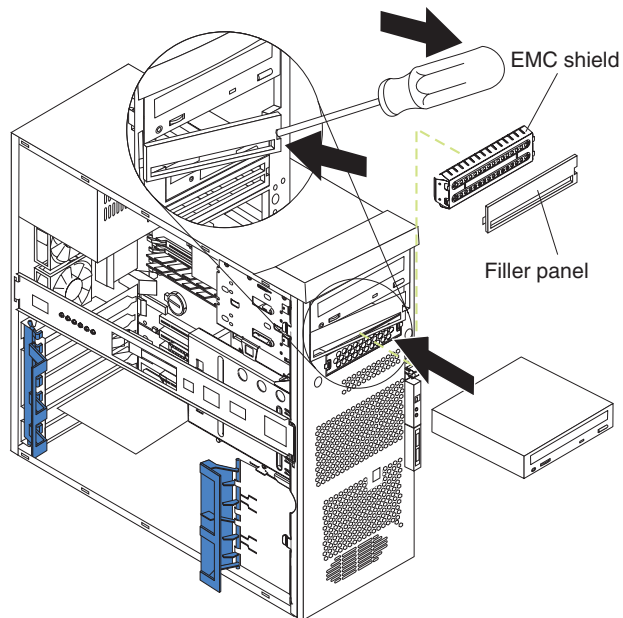
Drive clip
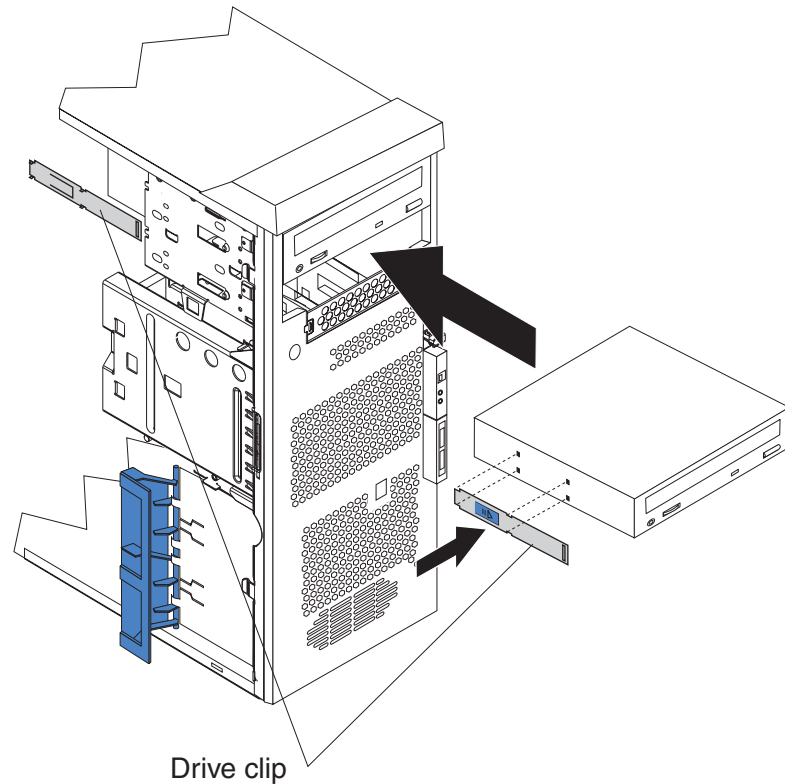
11. Push the drive into the bay.

12. Determine whether the drive is an IDE or SCSI device; then, connect one end of the applicable signal cable into the back of the drive and the other end of this cable into the applicable IDE or SCSI connector on the system board. See "Power and signal cables for internal drives" on page 29 for additional information about cabling drives and "System-board internal connectors" on page 14 for the location of IDE and SCSI connectors on the system board. If there are open connectors on the cables connecting existing IDE or SCSI drives, you can use these cables to connect the new drive.

13. Route the signal cable so that it does not block the airflow to the rear of the drives or over the microprocessor.

14. Connect the power cable to the back of the drive. The connectors are keyed and can be inserted only one way.

15. If you have other options to install or remove, do so now; otherwise, replace the bezel and support bracket and then go to "Completing the installation" on page 40.

Installing a drive in bay 3:

Note: Only a 3.5-in. device can be installed in bay 3.

To install a drive in bay 3, complete the following steps:

1. Follow the instructions in "Preinstallation steps" on page 23.
2. Turn off the computer and all attached devices (see "Turning off the computer" on page 42); then, disconnect all power cords and external cables.
3. Remove the side cover (see "Removing the cover" on page 16).
4. Remove the front bezel (see "Removing the bezel" on page 18).
5. Remove the support bracket (see "Removing and installing the support bracket" on page 17).
6. Use a screwdriver to pry the filler panel and EMC shield away from the computer.

Note: If you are installing a drive that contains a laser, review 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.

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

8. Follow the instructions that come with the drive to set jumpers or switches, if any.

   Notes:

   a. You might find it easier to install the new drive into the opening on the front and then attach the cables.

   b. If you are installing a hard disk drive, you might need to temporarily disconnect the front-panel cable from the system board. You can reconnect the front-panel cable after you have finished installing the hard disk drive.

9. Push the drive into the bay; then, use the two screws to attach the drive to the drive cage.

10. Determine whether the drive is an IDE or SCSI device; then, connect one end of the applicable signal cable into the back of the drive and the other end of this cable into the applicable IDE or SCSI connector on the system board (if you are installing a diskette drive in bay 3, connect the other end of the cable to the diskette connector on the system board).See "Power and signal cables for internal drives" on page 29 for additional information about cabling drives and "System-board internal connectors" on page 14 for the location of diskette, IDE, and SCSI connectors on the system board. If there are open connectors on the cables connecting existing IDE or SCSI drives, you can use these cables to connect the new drive.

11. Route the signal cable so that it does not block the airflow to the rear of the drives or over the microprocessor.

12. Connect the power cable to the back of the drive. The connectors are keyed and can be inserted only one way.

13. If you have other options to install or remove, do so now; otherwise, replace the bezel and support bracket and then go to "Completing the installation" on page 40.

Installing a hard disk drive in bay 4, 5, or 6: Bays 4, 5, and 6 are in the drive cage. The drive cage is behind the front of the adapter-support bracket.

Note: When installing options, you might find it easier to work with the computer lying on its side.

To install a drive in bay 4, 5, or 6, complete the following steps:

1. Follow the instructions in "Preinstallation steps" on page 23.

2. Turn off the computer and all attached devices (see "Turning off the computer" on page 42); then, disconnect all power cords and external cables.

3. Remove the side cover (see "Removing the cover" on page 16).

4. Remove the support bracket (see "Removing and installing the support bracket" on page 17).

5. Grasp the drive cage and rotate the cage out of the computer until it locks into place with the drive-cage retention tab.

   Note: You might need to disconnect the power cables from the drives before you rotate the cage all the way.

   The open ends of the drive slots and installed drives will face you. Make sure that the drive cage locks into place over the drive-cage retention tab by rotating the drive cage all the way out of the computer.
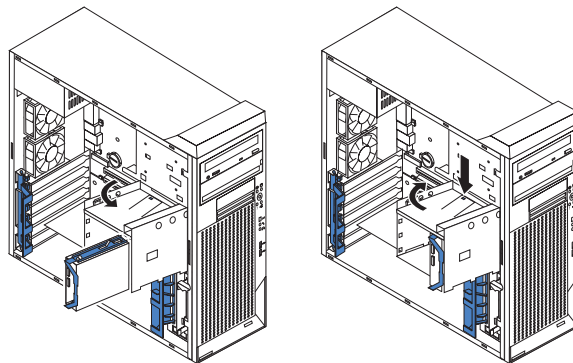
6. Slide the existing drive tray out of the drive bay.

7. Touch the static-protective package containing the new drive to any unpainted metal surface on the computer; then, remove the drive from the package and place it on a static-protective surface.

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

9. Attach the new drive to the drive tray. Place the drive on the drive tray and align the holes on the drive with the mounting pins on the drive tray. Gently pull both sides of the drive tray outward and insert the mounting pins into the holes on the drive.
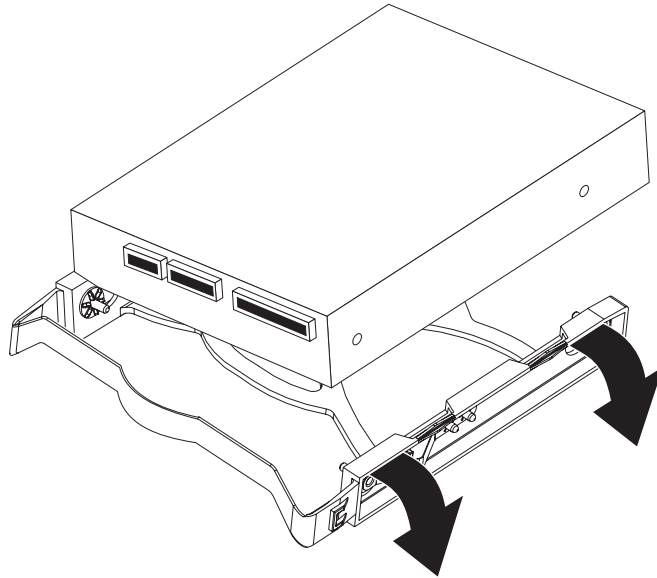
10. Slide the drive into the drive bay until the drive snaps into place.

11. Determine whether the drive is a Serial ATA or SCSI device; then, connect one end of the applicable signal cable into the back of the drive and the other end of this cable into the applicable Serial ATA or SCSI connector on the system board. If there are open connectors on the cables connecting existing Serial ATA or SCSI drives, these cables can be used to connect the new drive. See "Power and signal cables for internal drives" for additional information about cabling drives and "System-board internal connectors" on page 14 for the location of Serial ATA and SCSI connectors on the system board.

12. Route the signal cable so that it does not block the airflow to the rear of the drives or over any microprocessor.

13. Connect the power cable to the back of the drive. The connectors are keyed and can be inserted only one way.

14. Push the drive cage outward, and press in on the drive-cage release tab. Rotate the cage part-way into the computer; then, reconnect any power cables you disconnected in step 5 and rotate the cage the rest of the way back into the computer. Make sure that the drives and cables do not strike the microprocessor fan sink.

15. If you have other options to install or remove, do so now; otherwise, replace the support bracket (see "Removing and installing the support bracket" on page 17) and then go to "Completing the installation" on page 40.

Power and signal cables for internal drives: Your computer uses cables to connect IDE, Serial ATA, and SCSI devices to the power supply and to the system board. (See "System-board internal connectors" on page 14 for the location of system-board connectors.) Review the following information before connecting power and signal cables to internal drives:

• The drives that are preinstalled in your computer come with power and signal cables attached. If you replace any drives, remember which cable is attached to which drive, or label the cables.

• When you install a drive, make sure that one of the drive connectors of the signal cable is connected to the drive and that the connector at the other end of the signal cable is connected to the system board.

- When you install a drive, set the jumpers either to disable auto-start or to delay startup, to prevent the system power supply from being overtaxed by all drives trying to spin up at once.
- The computer has two IDE buses, primary and secondary. Each of these buses supports up to two IDE devices. The primary IDE bus uses connector IDE1 on the system board and the secondary IDE bus uses connector IDE2.
- If you have only one IDE device on a cable, it must be set as a master device.
- If two IDE devices are used on a single cable, one must be designated as the master device and the other as the subordinate device; otherwise, the computer might not recognize some of the IDE devices. The master and subordinate designation is determined by switch or jumper settings on each IDE device.

The following cables are provided:
- **Power cables:** Four-wire power cables connect the drives to the power supply. At the end of these cables are plastic connectors that attach to different drives; these connectors vary in size. With Serial ATA drives, you can use either a four-wire power cable or a five-wire Serial ATA power cable, but do not use both at the same time (use one or the other).
- **Signal cables:** Signal cables typically are flat cables, also called ribbon cables, that connect IDE, SATA, SCSI, and diskette drives to the system board. Two or three types of signal cables come with your computer:
  - **IDE:** The wider IDE signal cable has three connectors. One of these connectors is attached to the drive, one is a spare, and the third is attached to the primary or secondary IDE connector on the system board. The spare connector can be used to connect additional IDE drives to your computer.

    Note: The optical drive is attached to an ATA 100 signal cable. ATA 100 signal cables are color-coded. The blue connector is connected to the system board. The black connector is connected to the master IDE device. The gray middle connector is connected to the subordinate IDE device.
  - **Serial ATA:** The narrower, black signal cable has two connectors. One is connected to the SATA drive, and the other is connected to the connector on the system board. Each SATA drive comes with a cable. If you install an additional SATA drive, you will need an additional cable.
  - **SCSI:** The following cables can be used to attach SCSI devices to the integrated SCSI controller on the system board:
    - An Ultra320 twisted ribbon cable connects the internal Ultra320 SCSI hard disk drive to the SCSI connector on the system board. This cable has four additional connectors for attaching more internal SCSI devices.
    - A round SCSI cable connects external SCSI devices to the integrated SCSI controller on the system board. For more information about connecting SCSI devices, see the SCSI documentation.

Installing memory modules

The following notes describe the types of dual inline memory modules (DIMMs) that your computer supports and other information that you must consider when installing DIMMs.
- The computer must have at least one pair of DIMMs installed in the DIMM connectors for each microprocessor installed.
- The system board contains four DIMM connectors for microprocessor 1. The computer comes with one pair of DIMMs installed in the DIMM connectors on the system board.

- If you install a second microprocessor, the board that comes with the microprocessor option (microprocessor board) contains four DIMM connectors for microprocessor 2. You must install at least one pair of DIMMs in the DIMM connectors on the microprocessor board.
- You can add a second pair of DIMMs for either microprocessor at any time. It is not necessary to add a second pair of DIMMs for microprocessor 1 before adding a second pair of DIMMs for microprocessor 2.
- The DIMM options that are available for the computer are 512 MB, 1 GB, and 2 GB. The PC2700 DIMMs are available in 2 GB only. The computer supports a minimum of 1 GB and a maximum of 16 GB of system memory.

  Note: Although the computer supports a maximum of 16 GB of system memory, the Microsoft Windows XP operating systems recognize and support a maximum of 4 GB of system memory.
- The computer comes with two 512 MB or 1 GB memory DIMMs installed.
- Install only 2.5 V, 184-pin, double-data-rate (DDR), PC2700 (2 GB DIMMs only) or PC3200, registered, buffered synchronous dynamic random-access memory (SDRAM) with error correcting code (ECC) DIMMs. These DIMMs must be compatible with the latest PC2700 or PC3200 SDRAM registered, buffered DIMM specification. For a list of supported options for your computer, go to http://www.ibm.com/pc/; then, select your country and navigate to the list of options for your computer.
- DIMMs must be installed in matched pairs. The DIMMs in each pair must be the same size, speed, type, and technology as each other but do not have to match other pairs. You can mix compatible DIMMs from various manufacturers.
- The first pair of DIMMs on the system board are installed in DIMM connectors 1 and 2. If you install a second pair of DIMMs for microprocessor 1, install the pair in DIMM connectors 3 and 4. The following illustration shows the system board DIMM installation sequence.

Installation sequence on system board	
DIMMs	Slots
First pair of DIMMs	1, 2
Second pair of DIMMs	3, 4

- If you install a second microprocessor (microprocessor 2), install the first pair of DIMMs for the microprocessor in DIMM connectors 5 and 6 on the microprocessor option board. If you install a second pair of DIMMs for the microprocessor, install the pair in DIMM connectors 7 and 8 on the microprocessor board. See "Installing a second microprocessor" on page 33 for more information about the microprocessor option. The following illustration shows the microprocessor board DIMM installation sequence.

Installation sequence on microprocessor board	
DIMMs	Slots
First pair of DIMMs	5, 6
Second pair of DIMMs	7, 8

- Your computer supports two-way memory interleaving across the memory banks for each microprocessor.
- The amount of usable memory will be reduced depending on the system configuration. A certain amount of memory must be reserved for system

resources. The BIOS will display the total amount of installed memory and the amount of configured memory. To obtain a full 16 GB or more of usable memory, you must install a second microprocessor and memory.

- When you restart the computer after adding or removing DIMMs, the computer displays a message that the memory configuration has changed.

To install DIMMs, complete the following steps:

1. Read the safety information beginning on page v, and "Handling static-sensitive devices" on page 11.
2. Turn off the computer and all attached devices (see "Turning off the computer" on page 42); then, disconnect all power cords and external cables.
3. Remove the side cover (see "Removing the cover" on page 16).
4. Remove the support bracket (see "Removing and installing the support bracket" on page 17).
5. For easier access to the memory modules on the system board, rotate the drive cage out of the computer until it locks into place. You might need to disconnect the power cables from the drives before you rotate the cage all the way.

   Note: If you are installing memory modules on the microprocessor board for a second microprocessor on the computer, it is not necessary to move the drive cage.
6. If you are installing DIMMs for microprocessor 1, and you have installed a second microprocessor on the computer, remove the microprocessor 2 air baffle:
   a. Lift up on the large end of the air baffle until it releases.
   b. Slide the air baffle toward the front of the computer; then, lift the air baffle out of the computer.
7. Locate the DIMM connectors. Determine the connectors into which you will install the DIMMs. See the notes on page 31 for the installation sequence.
8. Gently open the retaining clip on each end of the DIMM connectors you have selected.
9. Touch the static-protective package containing the DIMM to any unpainted metal surface on the computer. Then, remove the new DIMM from the package.
10. Turn the DIMM so that the contacts align correctly with the connector.
11. Insert the DIMM into the connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly installed. Open the retaining clips, remove the DIMM, and then reinsert it.

DIMM
connector 1

DIMM
connector 2

DIMM
connector 3
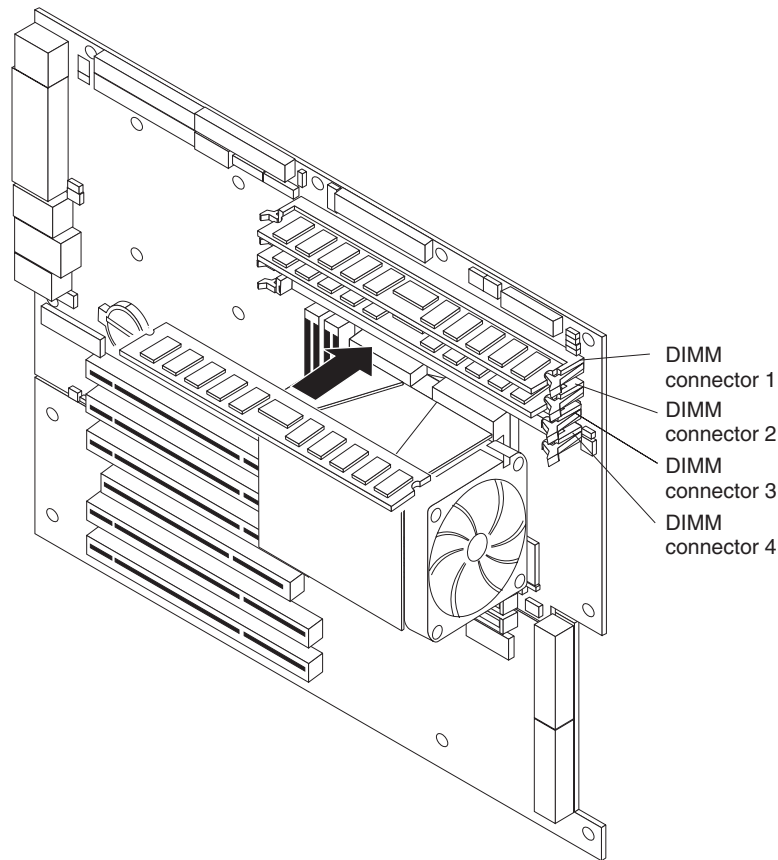
DIMM
connector 4

12. Repeat steps 8 through 11 for the second DIMM in the pair.

13. If you moved the drive cage out of the way in step 5, push the drive cage outward and press in on the drive-cage release tab. Rotate the cage part-way into the computer, reconnect any power cables you disconnected from the drives, and rotate the cage the rest of the way back into the computer.

14. If you have other options to install or remove, do so now. Otherwise, replace the support bracket (see "Removing and installing the support bracket" on page 17); then, go to "Completing the installation" on page 40.

Installing a second microprocessor

The computer supports a second microprocessor. The second microprocessor comes on a separate microprocessor board, with its own memory modules.

Note: When installing options, you might find it easier to work with the computer lying on its side.

The following notes describe information that you must consider when installing a second microprocessor in your computer.

- Microprocessor 1 and 2 must be identical (for example, the clock speed, cache size, clock frequencies, and number of cores).
- The microprocessor option kit comes with a microprocessor board, a microprocessor socket, the microprocessor, a fan sink, and a microprocessor air baffle. The necessary screws and the microprocessor socket are preinstalled on the microprocessor board.
- Each microprocessor contains a memory controller for the memory modules associated with it.

- You must install at least one pair of matched DIMMs on the microprocessor board with the microprocessor. The DIMMs in each pair must be the same size, speed, type, and technology as each other but do not have to match other pairs. See "Installing memory modules" on page 30 for information about the installation order and the type of DIMMs supported.
- With more than one microprocessor, the computer can operate as a symmetric multiprocessing (SMP) computer. With SMP, certain operating systems and application programs can distribute the processing load among the microprocessors. This enhances performance for database and other applications.
- To use SMP, obtain an SMP-capable operating system. For a list of supported operating systems, go to http://www.ibm.com/pc/us/compat/.
- Read the documentation that comes with the microprocessor to determine whether you need to update the computer basic input/output system (BIOS) code. The most current level of BIOS code for the computer is available from http://www.ibm.com/pc/support
- For a list of supported microprocessor options for your computer, go to http://www.ibm.com/pc/; then, select your country and navigate to the list of options for your computer
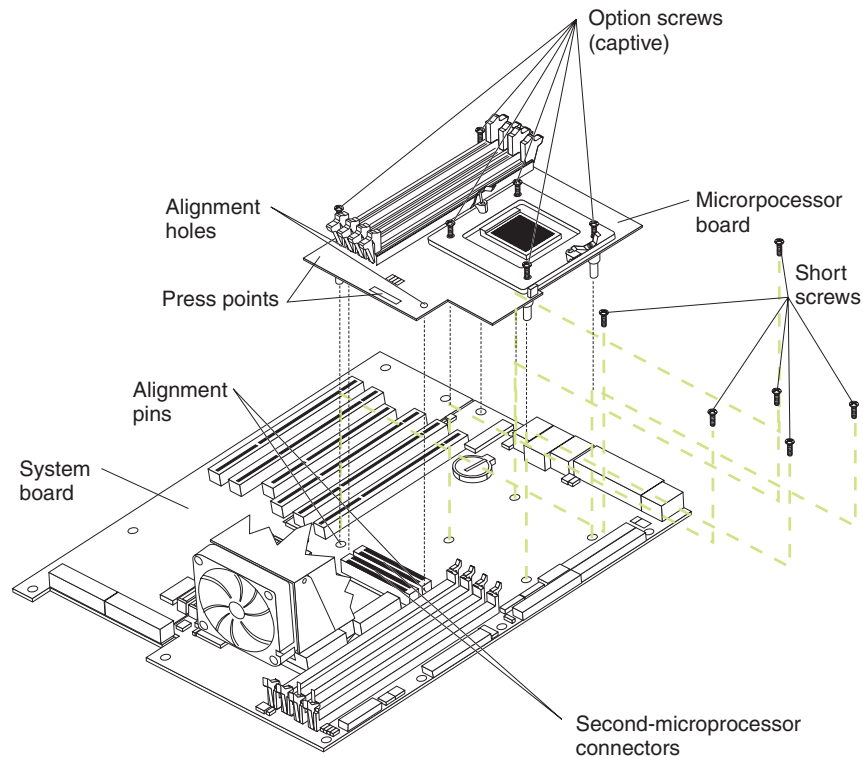
Before you begin, obtain the following items:
- A Phillips-head screwdriver
- A flat-blade screwdriver or a nut driver

To install a second microprocessor, complete the following steps.

Note: For clarity, the illustrations in this procedure show only the system board. You will not remove the system board from the computer to perform this procedure.

1. Read the safety information beginning on page v and the guidelines in "Handling static-sensitive devices" on page 11.
2. Turn off the computer and all attached devices. (See "Turning off the computer" on page 42.)
3. Disconnect all external cables and power cords; then, remove the side cover (see "Removing the cover" on page 16).
4. Remove the support bracket (see "Removing and installing the support bracket" on page 17).
5. Remove the rear adapter-retention bracket.
6. Touch the static-protective package containing the microprocessor board to any unpainted metal surface on the computer. Then, remove the microprocessor board from the package.

Option screws
(captive)

Alignment
holes

Microprocessor
board

Press points

Short
screws

Alignment
pins

System
board

Second-microprocessor
connectors

7. Remove the six indicated screws from the system board.

8. Position the alignment holes in the microprocessor board over the two plastic alignment pins on the system board; then, lower the microprocessor board onto the alignment pins.

   Notes:

   a. When lowering the microprocessor board onto the two plastic alignment pins, it might help to hold it by one of the DIMM slot tabs and one of the retention spring clips.

   b. The screws on the microprocessor board are spring-loaded. When the microprocessor board is correctly in place, the screws will stick straight down and align with the six screw holes on the system board.

   c. Make sure that the connectors on the underside of the microprocessor board line up with the second-microprocessor connectors on the system board.

9. Tighten the four screws on the fan-sink socket; then, tighten the two screws on the corners of the microprocessor board to secure the microprocessor board to the system board.

   Attention: When you tighten the screw on the microprocessor board that is closest to the rear fan in the computer, you might have to push the rear fan slightly to the side.

10. Press down on the barcode label and the indicated corner to make sure the microprocessor board is firmly seated in the connectors on the system board.

11. Remove the protective cover, tape, or label from the surface of the microprocessor socket, if any is present.

12. Lift the microprocessor-release lever to the fully open position (90°).
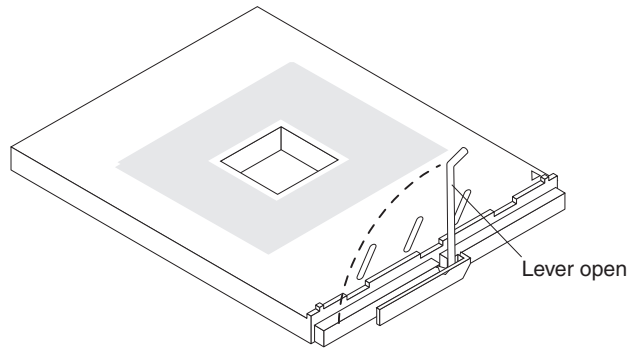
Lever open

Attention: You must make sure that the release lever on the microprocessor socket is in the fully open position before you insert the microprocessor in the socket. Failure to do so might result in permanent damage to the microprocessor, microprocessor socket, and system board.

13. Install the new microprocessor:

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

   b. Position the microprocessor over the microprocessor socket as shown in the following illustration. Carefully press the microprocessor into the socket.

   Attention: To avoid bending the pins on the microprocessor, do not use excessive force when pressing it into the socket.
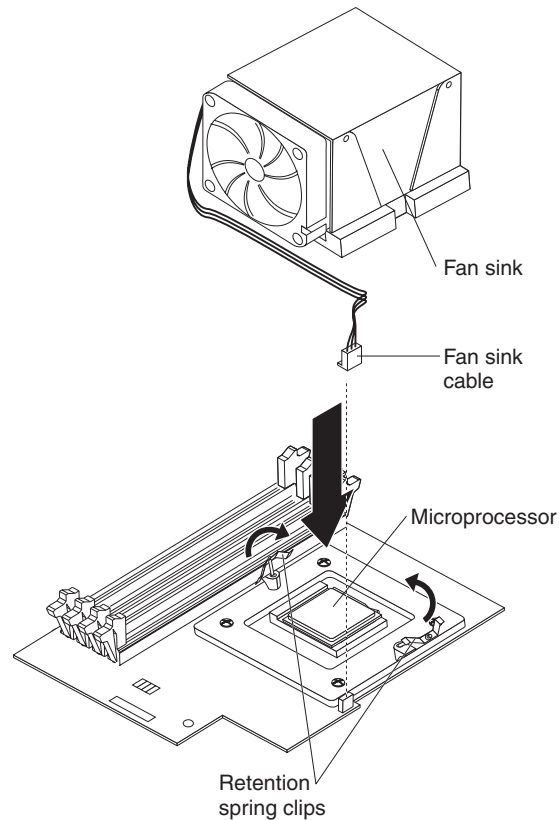
Microprocessor

Microprocessor orientation indicators

Microprocessor socket
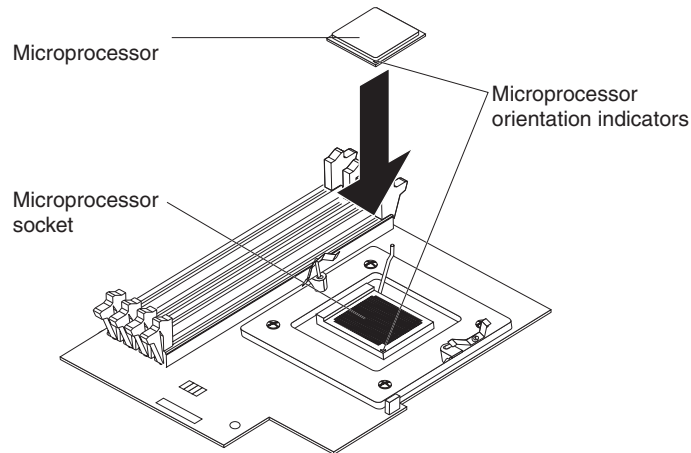
14. Close the microprocessor-release lever to secure the microprocessor.

   Attention:

   • Do not disturb or contaminate the grey thermal material on the bottom of the new fan sink. Doing so damages its heat-conducting capability and exposes the new microprocessor to overheating.

   • If you need to remove the fan sink after installing it, call for service.

15. Install the fan sink.

Fan sink

Fan sink
cable

Microprocessor

Retention
spring clips

a. Make sure that the two retention spring clips on the microprocessor retention bracket (on the microprocessor board) are open and rotated to either side as shown in the illustration above.

b. Remove the fan sink from its package and remove the cover from the bottom of the fan sink. Make sure that the thermal material is still on the bottom of the fan sink.

c. Remove the release liner and orient the fan sink above the microprocessor.

d. Make sure that you install the fan sink toward the rear of the computer so that the front of the fan sink and the fan-sink screws do not come in contact with any electrical components on the microprocessor board.

e. Connect the fan sink cable to the microprocessor fan connector on the microprocessor board; then, press the fan sink into place (see the illustration in "Optional microprocessor board connectors" on page 15 for the location of the connector).

f. Raise the retention spring clips into position on each side of the fan sink. Start both screws into the fan-sink socket; then, tighten both screws. Do not overtighten the screws.

16. Install at least one pair of supported DIMMs on the microprocessor board. See "Installing memory modules" on page 30 for information about the installation order and the type of supported DIMMs.

17. Install the microprocessor air baffle.

Power supply alignment flange

Locking lip
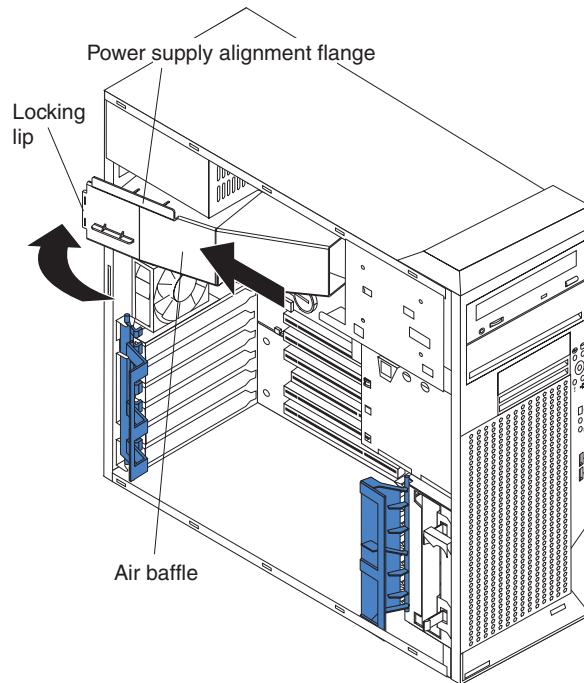
Air baffle

    a. Orient the air baffle as shown and align it with the side of the power supply.

    b. Insert the small end of the baffle into the computer toward the front of the computer.

    c. Lower the larger end of the baffle until the side flange rests on the power supply.

    d. Slide the baffle toward the rear of the computer until it stops and the rear flange (locking lip) is inside the computer chassis; then, press down on the large end of the baffle until it clicks into place.

18. If you have other options to install or remove, do so now. Otherwise, replace the support bracket (see "Removing and installing the support bracket" on page 17); then, go to "Completing the installation" on page 40.

Installing a security rope clip

To help prevent hardware theft, you can add a security rope clip and cable to your computer. After you add the security cable, make sure that it does not interfere with other cables that are connected to the computer.

Before you begin, obtain the following items:

- A flat-blade screwdriver
- An adjustable wrench
- A 19 mm (0.75 in.) rope clip or wire rope (similar to National Manufacturing number 3230, stock number 176-735)
- Threaded nuts that fit the rope clip
- A security cable
- A lock, such as a combination lock or padlock

To install a rope clip, complete the following steps:

1. Turn off the computer and all attached devices.
2. Disconnect all external cables and power cords; then, remove the side cover (see "Removing the cover" on page 16).

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

4. Insert the rope clip through the rear panel; then, attach and tighten the nuts.

5. Thread the cable through the rope clip and around an object that is not part of or permanently secured to the building structure or foundation, and from which the cable cannot be removed. Fasten the cable ends together with a lock. After you add the security cable, be certain it does not interfere with other cables that are connected to the computer.

Rope clip
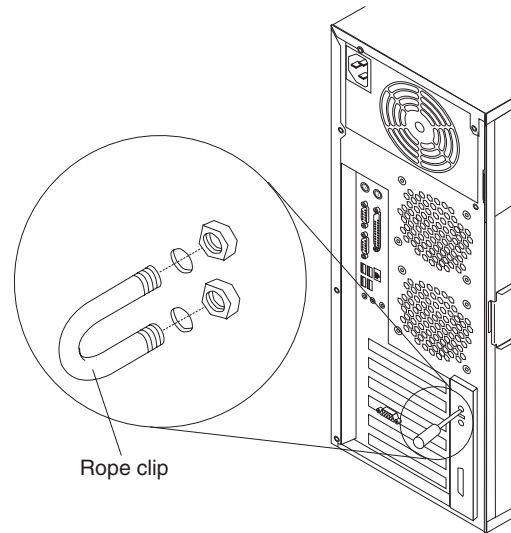
6. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 40.

Replacing the bezel

To replace the bezel, complete the following steps:

1. Insert the two tabs on the bottom of the bezel into the matching holes on the computer chassis.

2. Push the top of the bezel toward the computer until the two tabs at the top of the bezel snap into place.

Replacing the side cover

If you removed the support bracket, reinstall it before you replace the side cover. See "Removing and installing the support bracket" on page 17.

Note: The rear adapter-retaining bracket rests against the computer side cover. You might find it easier to lay the computer on its side to replace the side cover.

To replace the side cover, complete the following steps:

1. Before installing the cover, check that all cables, adapters, and other components are installed and seated correctly and that you have cleared all work tools from inside the computer.

2. Install the side cover by placing it into position on the computer. Make sure that the lip on the bottom of the cover rests on the ledge on the bottom of the chassis before rotating the cover up to the vertical position. Press down on the cover-release latch as you slide the side cover forward and lock it in place.
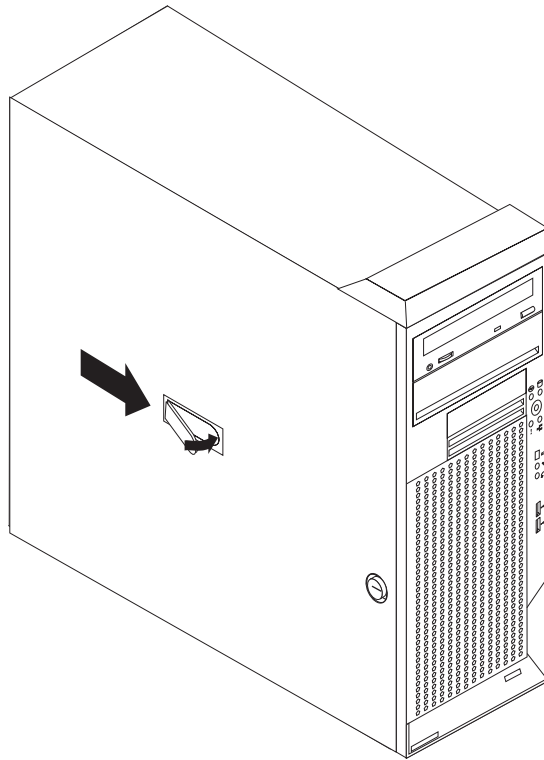
3. Reconnect the external cables and power cords to the computer.
4. Turn on the attached devices; then, turn on the computer.
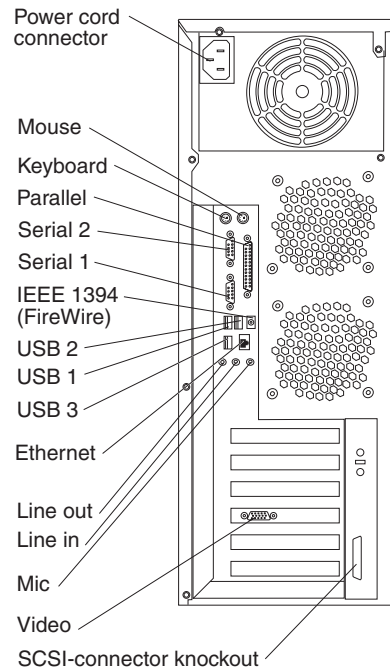
Completing the installation

To complete your installation, reinstall the bezel if you removed it, connect all the cables and, for certain options, run the Configuration/Setup Utility program. Follow the instructions in this section.

Cabling the computer

If your computer cables and connector panel have color-coded connections, match the color of each 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.

Attention: To prevent damage to equipment, connect the power cord last.

The following illustration shows the input/output (I/O) connectors on the rear of the computer.

Power cord
connector

Mouse
Keyboard
Parallel
Serial 2
Serial 1
IEEE 1394
(FireWire)
USB 2
USB 1
USB 3

Ethernet

Line out
Line in

Mic

Video

SCSI-connector knockout

Depending on the video adapter that is installed in your computer and the monitor you want to use, you might need to use special video cables that convert signals or provide an additional connection point for dual-monitor capability. See the *User's Guide* on the IBM *IntelliStation Documentation* CD and the documentation that comes with your monitor for additional information.

Turning on the computer

When the computer is connected to an ac power source but is not turned on, the operating system does not run, and all core logic is shut down; however, the computer can respond to requests to turn on the computer. The power-on LED flashes to indicate that the computer is connected to an ac power source but is not turned on.

Notes:

1. Turn on all external devices, such as the monitor, before turning on the computer.
2. The power-on LED on the front of the computer is lit when the computer is on and while it is being turned on.

Approximately 20 seconds after the computer is connected to ac power, the power-control button becomes active, and you can turn on the computer and start the operating system by pressing the power-control button. The computer can also be turned on any of the following ways:

- If a power failure occurs while the computer is turned on, the computer will restart automatically when power is restored.

- When you connect the computer to power for the first time, the Wake on LAN® feature can turn on the computer. If the computer was previously turned on, it must be turned off correctly for the Wake on LAN feature to turn on the computer.

Running the operating system setup program

If you are starting your computer for the first time, the setup program runs automatically when you start the computer. The program will prompt you to make choices or type information. If you need more information than is provided in this *Installation Guide*, see your operating-system manual.

Important:

1. After turning on your computer for the first time, you must complete the operating system setup procedure before turning off your computer; otherwise, unexpected results might occur.

2. The setup program might be slightly different from the one described in your operating-system manual. Some choices do not appear because they are preset.

3. During the setup procedure, you must indicate that you accept the license agreement.

4. For Windows operating systems, the registration information will already be displayed in the registration field. If the Product ID number is not already displayed, you must type it. The Product ID number is on a label attached to the computer.

You will need the following information to complete the setup program in Windows operating systems:

- The documentation that comes with your computer.
- Network information from your network administrator, if your computer is being connected to a network.
- The printer model and port, if a printer is attached directly to your computer.

After the setup procedure is completed and the computer restarts, the desktop opens, and the computer is ready for use.

Turning off the computer

When you turn off the computer and leave it connected to ac power, the computer can respond to requests, such as a remote request to turn on the computer. To remove all power from the computer, you must disconnect it from the power source.

Some operating systems require an orderly shutdown before you turn off the computer. See your operating-system documentation for information about shutting down the operating system.

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.

The computer can be turned off in any of the following ways:

- You can turn off the computer through the operating system. If this feature is supported by your operating system, it will turn off the computer after performing an orderly shutdown of the operating system.

  If you are using the preinstalled Microsoft Windows XP operating system, complete the following steps to shut down the operating system and computer:

  1. Save and close all files that you are working with.
  2. Close all open applications.
  3. Click **Start**.
  4. Click **Turn Off Computer**; then, click **Turn Off** to confirm.

  If you are using the preinstalled Red Hat Linux operating system, complete the following steps to shut down the operating system and computer:

  1. Save and close all files with which you are working.
  2. Close all open applications.
  3. Click **Red Hat Linux Main Menu Button** → **Log out** → **Shut Down**.
  4. Click **OK** to confirm.

- You can press the power-control button on the front of the computer. It will turn off the computer after performing an orderly shutdown of the operating system, if this feature is supported by your operating system.

  Note: After turning off the computer, wait at least 5 seconds before you press the power-control button to turn on the computer again.

- You can press and hold the power-control button for more than 4 seconds to cause an immediate shutdown of the computer. You can use this feature to turn off the computer if the operating system stops functioning.

Chapter 3. Installing software

This chapter describes how to install and configure software for your IBM IntelliStation A Pro Type 6217 computer.

Viewing the license agreement

The IBM *International License Agreement for Non-Warranted Programs* is viewable from the Access IBM folder. Use of your computer signifies acceptance of this agreement.

To view the license agreement in Windows XP, complete the following steps:
1. From the Windows XP desktop, click **Start → All Programs → Access IBM**.
2. Select **IBM License Agreement**.

For Red Hat Linux, when you start the computer, the License Agreement window opens. To accept the terms of the agreement, click **I Agree**. You can also view the license agreement by clicking on the **IBM License Agreement** icon on your desktop.

Using the built-in configuration programs

The following configuration programs are available to configure your computer:

- **Configuration/Setup Utility program**

  This program is part of the basic input/output system (BIOS) code in your computer. 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. For more information on how to start this utility, see "Starting the Configuration/Setup Utility program" on page 46. For detailed information, see the *User's Guide*.

- **Broadcom NetXtreme Gigabit Ethernet Boot Agent**

  The Broadcom NetXtreme Gigabit Ethernet Boot Agent is part of the BIOS code in your computer. You can use it to configure the network as a startable device, and you can customize where the network startup option appears in your startup sequence. You enable and disable the Broadcom NetXtreme Gigabit Ethernet Boot Agent from the Configuration/Setup Utility program. For more information, see "Enabling the Broadcom NetXtreme Gigabit Ethernet Boot Agent" on page 46.

- **Adaptec® HostRAID™ configuration programs**
  - **Adaptec RAID Configuration Utility programs (for Serial ATA RAID)**

    Use the Array Configuration Utility within the Adaptec RAID Configuration Utility programs to configure the integrated Serial ATA (SATA) controller with integrated RAID and the devices that are attached to it. For more information about using these utility programs, see "Using the Adaptec RAID Configuration Utility programs (for Serial ATA RAID)" on page 47.
  - **SCSISelect Utility program (for SCSI RAID)**

    Use the SCSI HostRAID feature of the SCSISelect Utility program to configure the integrated SCSI controller with integrated RAID and the devices that are attached to it. For more information about using this utility program, see "Using the SCSISelect Utility program (for SCSI RAID)" on page 48.

- **ServeRAID Manager**

  ServeRAID™ Manager is available as a stand-alone program and as an IBM Director extension. If a ServeRAID controller is installed in your computer, use ServeRAID Manager to define and configure your disk-array subsystem *before* you install your operating system. For information about using this program, see "Using ServeRAID Manager" on page 49.

- **Ethernet controller configuration**

  To configure the integrated Gigabit Ethernet controller, see "Configuring the Gigabit Ethernet controller" on page 51.

- **SCSISelect Utility program (some models)**

  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. For information about how to start this utility, see "Starting the SCSISelect utility program (some models)" on page 51.

Note: See the *User's Guide* on the IBM *IntelliStation Documentation* CD for detailed instructions for using the configuration programs.

The following sections provide the instructions for starting the utility programs.

Starting the Configuration/Setup Utility program

To start the Configuration/Setup Utility program, complete the following steps:

1. Turn on the computer and watch the monitor screen. If the computer is already on when you start this procedure, you must shut down the operating system, turn off the computer, wait a few seconds until all in-use LEDs are turned off, and restart the computer.

2. When the message `Press F1 for Configuration/Setup` appears on the screen during startup, press F1. (This prompt appears on the screen for only a few seconds. You must press F1 quickly.) If you have set both a user password and an administrator password, you must type the administrator password to access the full Configuration/Setup Utility menu.

3. Follow the instructions on the screen.

Enabling the Broadcom NetXtreme Gigabit Ethernet Boot Agent

The Broadcom NetXtreme Gigabit Ethernet Boot Agent is part of the BIOS code in your computer. You can use it to configure the network as a startable device, and you can customize where the network startup option appears in your startup sequence. You enable and disable the Broadcom NetXtreme Gigabit Ethernet Boot Agent from the Configuration/Setup Utility program.

To enable the Broadcom NetXtreme Gigabit Ethernet boot agent, complete the following steps:

1. From the Configuration/Setup Utility main menu, select **Devices and I/O Ports** and press Enter.

2. Select **System Board Ethernet PXE/DHCP** and use the Right Arrow (→) key to set it to **Enabled**.

3. Select **Save Settings** and press Enter.

Using the Adaptec HostRAID configuration programs

Use the Adaptec RAID Configuration Utility programs and SCSISelect Utility (also referred to as IBM ServeRAID-7e) to add RAID levels 0 and 1 functionality to the

integrated Serial ATA controller and the integrated SCSI controller. Be sure to use these programs as described in this document. Use these programs to:

- Configure a redundant array of independent disks (RAID) array
- View or change your RAID configuration and associated devices

Consider the following information when using the Adaptec RAID Configuration Utility programs and SCSISelect Utility program to configure and manage arrays:

- The integrated SCSI controller with integrated SCSI RAID (SCSI models) and the integrated Serial ATA controller (SATA models) with integrated SATA RAID supports RAID levels 0 and 1 with the option of having a hot-spare drive. Installing an optional ServeRAID controller provides additional RAID levels.
- Hard disk drive capacities affect how you create arrays. Drives in an array can have different capacities, but the RAID controller treats them as if they all have the capacity of the smallest hard disk drive.
- To help ensure signal quality, do not mix drives with different speeds and data rates.
- To update the firmware and BIOS code for an optional ServeRAID controller, you must use the IBM *ServeRAID Support* CD that comes with the ServeRAID option.
- If you install a different type of RAID controller in your computer, use the configuration method described in the instructions that come with that RAID controller to view or change SCSI settings for attached devices.

Using the Adaptec RAID Configuration Utility programs (for Serial ATA RAID)

Use the Array Configuration Utility within the Adaptec RAID Configuration Utility programs to add RAID levels 0 and 1 functionality to the integrated Serial ATA (SATA) controller. This utility is a part of the BIOS code in your computer. For additional information about using the Adaptec RAID Configuration Utility programs, see the documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD. If this CD did not come with your computer, you can download the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD from the IBM Web site at: http://www.ibm.com/pc/support/.

The integrated Serial ATA RAID feature (SATA HostRAID) comes disabled by default. You must enable the SATA RAID feature and install the device drivers before you can use it. The SATA RAID feature configuration utilities, device drivers, and information are available on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD.

Enabling the Serial ATA HostRAID feature: To enable the SATA RAID feature, complete the following steps:

1. Turn on the computer and watch the monitor screen.
2. When the message `Press F1 for Configuration/Setup` appears, press F1. If you have set a supervisor password, you are prompted to type the password.
3. Select **Advanced Setup**.
4. Scroll down and select **HostRAID**.
5. Use the left and right arrow keys to select **SATA**.
6. Press Esc three times; then, select **Yes** to save your changes.

Using the Serial ATA HostRAID feature: The instructions in this section are for using the Array Configuration Utility program to access and perform an initial level-1 RAID configuration. If you install a different type of RAID adapter in your computer,

use the configuration method described in the instructions that come with that adapter to view or change settings for the attached devices.

See the documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD for additional information about using the Array Configuration Utility program to create, configure, and manage arrays.

Configuring the controller: To use the Array Configuration Utility program to configure a level-1 RAID array, complete the following steps.

1. Turn on the computer and watch the monitor screen.
2. When the message `Press <CTRL><<A> for Adaptec RAID Configuration Utility` appears, press Ctrl+A.
3. Select **Array Configuration Utility (ACU)**.
4. Select **Create Array**.
5. From the list of ready drives, select the two drives that you want to group into the array.
6. Select **RAID-1** when asked to select the RAID level.
7. (optional), Type an identifier for the array.
8. Select **Quick Int** when asked for the array build method.
9. Follow the instructions on the screen to complete the configuration, and select **Done** to exit.
10. Restart the computer.

Viewing the configuration: To view information about the Serial ATA controller, complete the following steps:

1. Start the Array Configuration Utility.
2. From the Array Configuration Utility window, select **Manage Arrays**.
3. Select an array and press Enter.
4. Press Esc to exit the program.

Using the SCSISelect Utility program (for SCSI RAID)

Use the SCSISelect Utility to add RAID levels 0 and 1 functionality to the integrated SCSI controller. This utility is part of the BIOS code in your computer.

The integrated SCSI RAID feature (SCSI HostRAID) comes disabled by default. You must enable the SCSI RAID feature and install the device drivers before you can use it. The SCSI RAID configuration utilities, device drivers, and information are available on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD. If this CD did not come with your computer, you can download the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD from the IBM Web site at http://www.ibm.com/pc/support/.

Enabling the SCSI HostRAID feature: To enable the SCSI RAID feature, complete the following steps:

1. Turn on the computer and watch the monitor screen.
2. When the message `Press F1 for Configuration/Setup` appears, press F1. If you have set a supervisor password, you are prompted to type the password.
3. Select **Advanced Setup**.
4. Scroll down and select **HostRAID**.
5. Use the left and right arrow keys to select **SCSI**.
6. Press Esc three times; then, select **Yes** to save your changes.

7. When the message `Press <CTRL><A> for SCSISelect Utility` appears, press Ctrl+A. If you have set a supervisor password, you are prompted to type the password.

8. Use the arrow keys to select the channel for which you want to change settings and press Enter.

9. Select **Configure/View SCSI Controller Setting**; then, select **HostRAID**.

10. Select **Enabled**.

11. Press Esc; then, select **Yes** to save the changes.

Using the SCSI HostRAID feature: The instructions in this section describe how to access the SCSI RAID feature from the SCSISelect Utility program and perform an initial RAID level-1 configuration on your computer. If you install a different type of RAID adapter in your computer, use the configuration method described in the instructions that come with that adapter to view or change SCSI settings for attached devices.

See the documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD for additional information about how to use the SCSI HostRAID feature.

Configuring the controller: To use the SCSI HostRAID feature to configure a level-1 RAID array, complete the following steps:

1. From the SCSISelect main menu, select **Configure/View HostRAID Settings**.

2. From the list of ready drives, type `C` to create an array.

3. Select **RAID-1** when asked to select the RAID type.

4. From the list of ready drives, select the two drives that you want to group into the array.

5. Select **Create new RAID-1**.

6. Type an identifier for the array.

7. Select **Yes** to create the array.

8. Press Esc to exit the utility.

9. Restart the computer.

Viewing the configuration: You can use the SCSISelect Utility program to view information about the SCSI controller. From the list of available arrays, select an array and press Enter. Press Esc to exit the utility.

Using ServeRAID Manager

Use the ServeRAID Manager program to:
- Configure arrays
- View your RAID configuration and associated devices
- Monitor operation of your RAID controllers

To perform some tasks, you can run ServeRAID Manager as an installed program. However, to configure the SCSI controller and perform an initial RAID configuration on your computer, you must run ServeRAID Manager in a Startable-CD mode, as described in the instructions in this section. If you install a RAID adapter in your computer, use the configuration method described in the instructions that come with the adapter to view or change SCSI settings for attached devices.

See the ServeRAID documentation on the **IBM ServeRAID Support** CD or additional information about RAID technology and instructions for using ServeRAID

Manager to configure your SCSI controller. Additional information about ServeRAID Manager is also available from the **Help** menu. For information about a specific object in the ServeRAID Manager tree, select the object and click **Actions → Hints and tips.**

Configuring the controller

By running ServeRAID Manager in Startable CD mode, you can configure the controller before you install your operating system. The information in this section assumes that you are running ServeRAID Manager in Startable CD mode.

To run the ServeRAID Manager program in startable-CD mode, turn on the computer; then, insert the *IBM ServeRAID Support* CD into the CD-ROM drive. If the ServeRAID Manager program detects an unconfigured controller and ready drives, the program automatically starts the Configuration wizard.

In the Configuration wizard, you can select *Express configuration* or *Custom configuration*. Express configuration automatically configures the controller by grouping the first two physical drives in the ServeRAID Manager tree into an array and creating a RAID level-1 logical drive. If you select custom configuration, you can select the two physical drives that you want to group into an array and create a hot-spare drive.

Using express configuration

To use Express configuration, complete the following steps:

1. In the ServeRAID Manager tree, click the controller that you want to configure.
2. From the toolbar, click **Create**.
3. Click **Express configuration**.
4. Click **Next**. The "Configuration summary" window opens.
5. Review the information that is displayed in the "Configuration summary" window. To change the configuration, click **Modify arrays** or **Modify logical drives**.

   Note: Some operating systems have size limitations for logical drives. Before you save the configuration, verify that the size of the logical drive is appropriate for your operating system.
6. Click **Apply**; then, click **Yes** when asked if you want to apply the new configuration. The configuration is saved in the controller and in the physical drives.
7. Exit from the ServeRAID Manager program and remove the CD from the CD-ROM drive.
8. Restart the computer.

Using custom configuration

To use custom configuration, complete the following steps:

1. In the ServeRAID Manager tree, click the controller that you want to configure.
2. From the toolbar, click **Create**.
3. Click **Custom configuration**.
4. Click **Next**. The "Create arrays" window opens.
5. Click the appropriate tab in the right pane; then, from the list of ready drives, select the two drives you want to move to the array.
6. Click the icon to add the drives to the array.
7. If you want to configure a hot-spare drive, complete the following steps:
   a. Click the **Spares** tab.

      b. Select the physical drive you want to designate as the hot-spare drive; then, click the icon to add the drive.

8. Click **Next**. The "Configuration summary" window opens.

9. Review the information that is displayed in the "Configuration summary" window. To change the configuration, click **Back**.

10. Click **Apply**; then, click **Yes** when asked if you want to apply the new configuration. The configuration is saved in the controller and in the physical drives.

11. Exit from the ServeRAID Manager program, and remove the CD from the CD-ROM drive.

12. Restart the computer.

Viewing the configuration

You can use ServeRAID Manager to view information about RAID controllers and the RAID subsystem (such as arrays, logical drives, hot-spare drives, and physical drives). When you click an object in the ServeRAID Manager tree, information about that object appears in the right pane. To display a list of available actions for an object, click the object and click **Actions**.

To display available actions for an item, click the item in the ServeRAID Manager tree and click **Actions**.

Configuring the Gigabit Ethernet controller

The Ethernet controller is integrated on the system board. It provides an interface for connecting to a 10-Mbps, 100-Mbps, or 1-Gbps network and provides full duplex (FDX) capability, which enables simultaneous transmission and reception of data on the network. If the Ethernet port in the computer supports auto-negotiation, the controller detects the data-transfer rate (10BASE-T, 100BASE-TX, or 1000BASE-T) and duplex mode (full-duplex or half-duplex) of the network and automatically operates at that rate and mode.

You do not have to set any jumpers or configure the controller. However, you must install a device driver to enable the operating system to address the controller. For device drivers and information about configuring the Gigabit Ethernet controller, go to http://www.ibm.com/pc/support/.

Starting the SCSISelect utility program (some models)

To start the SCSISelect utility program, complete the following steps:

1. Turn on the computer.

2. When the `<<< Press <CTRL><A> for SCSISelect Utility! >>>` prompt appears, press Ctrl+A. If you have set an administrator password, you are prompted to type the password.

3. Use the arrow keys to make your selection.

4. When the prompt `Would you like to configure the SCSI controller or run the SCSI disk utility?` appears, make your selection and press Enter.

5. Use the arrow keys to make your selection.

6. Follow the instructions on the screen to change the settings of the selected items; then, press Enter.

Chapter 4. Completing the installation

This chapter provides information to help you register your computer, record important information, and back up your application programs.

Recording important numbers

Record information about your computer in the following table. You will need this information when you register your computer with IBM.

Product name	IBM IntelliStation A Pro
Machine type	6217
Model number	_____
Serial number	_____
Key serial number	_____
Key manufacturer	_____
Key phone number	_____

Registering your computer

Registering your computer helps IBM provide better service to you. When IBM receives your registration information, the information is placed into a central technical support database. If you need technical assistance, the technical-support representative will have information about your computer. In addition, comments about your computer are reviewed by a team dedicated to customer satisfaction and are taken into consideration in making improvements to IBM computers.

Use one of the following methods to register your computer in Windows:

- From the Windows XP desktop, click **Start → All Programs → IBM Registration** and then follow the instructions. If you do not have access to the Internet, you can use the registration program that starts from the IBM Registration folder to print your registration information and provide your mailing address to IBM for future assistance.
- Register your computer at http://www.ibm.com/pc/register/.

For Red Hat Linux, click the **Register PC** icon on the desktop to register your computer on the World Wide Web.

Creating an emergency recovery-repair diskette in Windows

Note: To create and use a diskette, you must add a diskette drive to the computer. To enable a USB diskette drive to work, you must disable the legacy diskette drive function in the Configuration/Setup Utility program (click **Devices and I/O Ports → Disable Legacy Diskette A**).

At your earliest opportunity, create a recovery-repair diskette and an IBM Enhanced Diagnostics diskette or CD, and store them in a safe place. In the unlikely event that the computer becomes unusable, you can use the recovery-repair diskette to access the Product Recovery program. For more information about using the diskette or CD, see the *User's Guide* on the IBM *IntelliStation Documentation* CD.

In Windows, you can create a recovery-repair diskette from the c:\ibmtools directory or from the Product Recovery program partition.

To create a recovery-repair diskette from the c:\ibmtools directory, complete the following steps:

1. Start the computer and operating system.
2. Use Windows Explorer to display the directory structure of the hard disk.
3. Open the c:\ibmtools folder.
4. Double-click **rrdisk.bat** and follow the instructions on the screen.

To create a recovery-repair diskette from the Product Recovery program partition, complete the following steps:

1. Shut down the operating system and turn off the computer.
2. Wait for at least 5 seconds; then, press and hold the F11 key while you restart the computer. When a menu appears, release the F11 key.
3. Use one of the following procedures:
   - If a menu is displayed in which you can select an operating system, use the arrow keys to select the operating system that is currently installed, press Enter, and then continue with the next step.
   - If an operating system menu is not displayed, continue with the next step.
4. From the Product Recovery Main menu, use the arrow keys to select **System utilities**, and then press Enter.
5. Use the arrow keys to select **Create a Recovery Repair diskette**, and then press Enter.
6. Follow the instructions on the screen.

See "Creating an IBM Enhanced Diagnostics Diskette or CD in Windows" for information about how to create an IBM Enhanced Diagnostics diskette.

Creating an IBM Enhanced Diagnostics Diskette or CD in Windows

Note: To create and use a diskette or CD, you must have a diskette, CD-RW, or DVD/CD-RW combo drive installed in your computer. To enable a USB diskette drive to work, you must disable the legacy diskette drive function in the Configuration/Setup Utility program (click **Devices and I/O Ports → Disable Legacy Diskette A**).

The *IBM Enhanced Diagnostics* diskette is a self-starting diagnostics diskette that you can use to test hardware components in your computer. You can only create an IBM Enhanced Diagnostics diskette from the Product Recovery program. You can create an IBM Enhanced Diagnostics diskette or CD from the World Wide Web.

To create an IBM Enhanced Diagnostics diskette from the Product Recovery program partition, complete the following steps:

1. Restart the computer and watch the monitor.
2. When the message `To start the Product Recovery Program, Press F11` appears, quickly Press F11.
3. Select **System utilities**.
4. Select **Create IBM Enhanced Diagnostics Diskette**.
5. Follow the instructions on the screen.

To create an IBM Enhanced Diagnostics diskette or CD from the World Wide Web, complete the following steps:

1. Go to http://www.ibm.com.
2. Click **Support & downloads**.
3. Click **Search technical support**.
4. In the **Enter keyword(s)** field, type `diagnostics 6217`, and click **Submit**.
5. From the "Search results" page, click the Enhanced Diagnostics item for your computer.
6. On the next page, click the executable file for the Enhanced Diagnostics code to download it (be sure to download the file to a hard disk directory and not to a diskette). You can click the text file to display the readme file.
7. At a command prompt, change to the directory where the file was downloaded.
8. Insert a blank, high-density diskette into the diskette drive.
9. Type *filename a***:** where *filename* is the name of the file you downloaded and *a* is the drive letter of the diskette drive; then, press Enter.

The downloaded file is self-extracting and is copied to the diskette. When the copy is completed, store the diskette in a safe place.

To download the latest CD image of the IBM Enhanced Diagnostics from the Web and create a startable Enhanced Diagnostics CD, complete the following steps:

1. Go to http://www.ibm.com.
2. Click **Support & downloads**.
3. Click **Search technical support**.
4. In the **Enter keyword(s)** field, type `diagnostics 6217`, and click **Submit**.
5. From the "Search results" page, click the Enhanced Diagnostics item for your computer.
6. On the next page, click the CD image file for the Enhanced Diagnostics code and download it using a writeable optional device (CD-RW or DVD/CD-RW combo drive).

For more information about using the IBM Enhanced Diagnostics program, see the *User's Guide* on the IBM *IntelliStation Documentation* CD.

Chapter 5. Solving problems

This chapter provides basic troubleshooting information to help you diagnose and solve some problems that might occur with your computer.

If you cannot diagnose and correct the problem using the information in this chapter, see Appendix A, "Getting help and technical assistance," on page 71 and "Solving problems" in the *Problem Determination and Service Guide* on the IBM *IntelliStation Documentation* CD.

Diagnostic tools

The following tools are available to help you diagnose and solve hardware-related problems:

* **POST beep codes and error messages**

  The power-on self-test (POST) generates beep codes and messages to indicate the successful test completion or the detection of a problem. See "Power-on self-test (POST)" on page 58 and "POST error codes" on page 58 for information. Additional information is recorded in the system error logs. (For detailed information, see "Configuration/Setup Utility menu choices" in the *Problem Determination and Service Guide*.)

* **Diagnostic programs, error codes, and messages**

  The diagnostic programs are the primary method of testing the major components of the computer. The diagnostic programs are stored on a hidden partition on the hard disk.

  Note: See "Solving problems" in the *Problem Determination and Service Guide* on the IBM *IntelliStation Documentation* CD for information about the diagnostic programs.

* **Troubleshooting tables**

  These charts list problem symptoms and steps to correct the problems. See the "Troubleshooting tables" on page 62 for information.

* **System-board and microprocessor board error LEDs**

  An LED on the system board (or microprocessor board if a second microprocessor is installed) might also be lit to help isolate an error indicated by the system error LED on the front of the computer. See the "System-board error LEDs" on page 68 and the "Microprocessor-board error LEDs" on page 69 for more information.

Power-on self-test (POST)

When you turn on the computer, it performs a series of tests to check the operation of system components and some of the options in the computer. This series of tests is called the power-on self-test, or POST.

If a power-on password is set, you must type the password and press Enter, when prompted, for POST to run.

If the POST process completes without detecting any problem, a single beep sounds, and the computer startup is completed.

If the POST process detects a problem, more than one beep might sound, or an error message is displayed. See "Beep code descriptions" in the *User's Guide* and "POST error codes" for more information.

POST beep codes

A beep code is a combination of short and long beeps or a series of short beeps separated by pauses (intervals without sound). For example, a "1-2-3" beep code is one short beep, a pause, two short beeps, a pause, and three short beeps. A beep code other than one beep indicates that POST has detected a problem. To determine the meaning of a beep code, see "Beep code descriptions" in the *Problem Determination and Service Guide* on the IBM *IntelliStation Documentation* CD. If no beep code sounds, see "No-beep symptoms" in the *User's Guide* on the IBM *IntelliStation Documentation* CD.

POST error codes

The following table provides an abbreviated list of the POST error codes that might appear during startup.

Note: See the *Problem Determination and Service Guide* on the IBM *IntelliStation Documentation* CD for more information about the POST error messages.

Table 2. POST error messages

•	**Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
•	**See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
•	**If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**

Error codes	Description	Action

162	A change in device configuration occurred. This error occurs under one or more of the following conditions:
	• A new device has been installed.
	• A device has been moved to a different location or cable connection.
	• A device has been removed or disconnected from a cable.
	• A device is failing and is no longer recognized by the computer as being installed.
	• An external device is not turned on.
	• An invalid checksum is detected in the battery-backed memory.
		1. Make sure that all external devices are turned on. You must turn on external devices before turning on the computer.
		2. If you did not add, remove, or change the location of a device, a device is probably failing. Running the diagnostic program might isolate the failing device.
		3. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.
		4. Reseat the following components:
		  a. Battery
		  b. Failing device
		  c. (Trained service technician only) System board
		5. Replace the following components one at a time, in the order shown, restarting the computer each time:
		  a. Battery
		  b. Failing device (If the device is a FRU, then the device should be replaced by a trained service technician only).
		  c. (Trained service technician only) System board.

163	The time of day has not been set.	1. Run the Configuration/Setup Utility program, select Load Default Settings, and make sure that the date and time are correct, and save the settings.
		2. Reseat the following components:
		  a. Battery
		  b. (Trained service technician only) System board
		3. Replace the following components one at a time, in the order shown, restarting the computer each time:
		  a. Battery
		  b. (Trained service technician only) System board.

Table 2. POST error messages (continued)

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**	
• **If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**	

Error codes	Description	Action

164	A change in the memory configuration occurred. This message might appear after you add or remove memory.	1. If POST error message 289 also occurred, follow the instructions for error message 289 first.
		2. If you just installed or removed memory, run the Configuration/Setup Utility program, and save the new configuration settings.
		3. Reseat the following components:
		  a. DIMM
		  b. (Trained service technician only) System board
		4. Replace the following components one at a time, in the order shown, restarting the computer each time:
		  a. DIMM
		  b. (Trained service technician only) System board.

201	An error occurred during the memory controller test. This error can be caused by:
	• Incorrectly installed memory
	• A failing memory module
	• A system board problem
		1. If you just installed memory, make sure that the new memory is correct for your computer.
		2. Reseat the following components:
		  a. DIMM
		  b. (Trained service technician only) System board
		3. Replace the following components one at a time, in the order shown, restarting the computer each time:
		  a. DIMM
		  b. (Trained service technician only) System board.

289	An error occurred during POST memory tests and a DIMM was disabled.	**Important:** In some memory configurations, the 3-3-3 beep code might sound during POST, followed by a blank monitor screen. If this occurs and the **Boot Fail Count** option in the **Start Options** of the Configuration/Setup Utility program is set to enabled (its default setting), you must restart the computer three times to force the system BIOS to reset the CMOS values to the default configuration (the memory connector or bank of connectors enabled). 1. If you just installed memory, make sure that the new memory is correct for your computer. 2. If the DIMM was disabled by the user, run the Configuration/Setup Utility program, select **Memory Settings** from the **Advanced Setup** menu option and enable the DIMM. 3. Make sure that the memory is installed and seated correctly. 4. Reseat the DIMM. 5. Replace the DIMM.

Table 2. POST error messages (continued)

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**	
• **If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**	

Error codes	Description	Action

301 and 303	An error occurred during the keyboard and keyboard controller test. These error messages also might be accompanied by continuous beeping.	1. If you just connected a new mouse or other pointing device, turn off the computer and disconnect that device. Wait at least 5 seconds; then, turn on the computer. If the error message goes away, replace the device.
		
		2. Make sure that nothing is resting on the keyboard or pressing on a key.
		
		3. Make sure that no key is stuck.
		
		4. Make sure that the keyboard cable is connected correctly to the keyboard and to the correct connector on the computer.
		
		5. After installing a USB keyboard, run the Configuration/Setup Utility program to enable keyboardless operation and prevent the POST error message from being displayed during startup.
		
		6. Reseat the following components:
		  a. Keyboard
		  b. (Trained service technician only) System board
		
		7. Running the diagnostic tests can isolate the computer component that failed, if the error message remains.
		
		8. Replace the following components one at a time, in the order shown, restarting the computer each time:
		  a. Keyboard
		  b. (Trained service technician only) System board.

1162	The serial port configuration conflicts with another device in the system.	1. Make sure that the IRQ and I/O port assignments needed by the serial port are available. 2. If all interrupts are being used by adapters, remove an adapter to make an interrupt available to the serial port, or force other adapters to share an interrupt. 3. Make sure that the serial port setting is correct in the Configuration/Setup Utility program. If the setting is not correct, change it and save the setting.
2462	A video memory configuration error occurred.	1. Run the Configuration/Setup Utility program and load the default settings. 2. Reseat the video adapter. 3. Replace the video adapter.

Troubleshooting tables

Use the troubleshooting tables to find solutions to problems that have identifiable symptoms.

Important: If diagnostic error codes are displayed that are not listed in the following table, make sure that the latest level of BIOS code is installed.

If you cannot find the problem in these tables, see "Starting the diagnostic programs and viewing the test log" in the *Problem Determination and Service Guide* on the IBM *IntelliStation Documentation* CD to test the computer.

If you have just added new software or a new optional device and the computer is not working, complete the following steps before using the troubleshooting tables:

- Remove the software or device that you just added.
- Run the diagnostic tests to determine whether the computer is running correctly.
- Reinstall the new software or new device.

CD or DVD drive problems

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**	
• **If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**	

Symptom	Action

CD or DVD drive is not recognized.	1. Make sure that:
	
	  • The IDE channel to which the CD or DVD drive is attached (primary or secondary) is enabled in the Configuration/Setup Utility program.
	  • All cables and jumpers are installed correctly.
	  • The correct device driver is installed for the CD or DVD drive.
	
	2. Run the CD or DVD drive diagnostic programs.
	
	3. Reseat the following components:
	  a. CD or DVD drive
	  b. CD or DVD drive cable
	  c. (Trained service technician only) System board
	
	4. Replace the following components one at a time, in the order shown, restarting the computer each time:
	  a. CD or DVD drive
	  b. CD or DVD drive cable
	  c. (Trained service technician only) System board.

Diskette drive problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**

Symptom	Action

The diskette drive activity LED stays lit, or the computer bypasses the diskette drive.	1. If there is a diskette in the drive, make sure that:
	  • The diskette drive is enabled in the Configuration/Setup Utility program.
	  • The diskette is good and not damaged. (Try another diskette if you have one.)
	  • The diskette is inserted correctly in the drive.
	  • The diskette contains the necessary files to start the computer.
	  • The software is working correctly.
	  • The cable is connected correctly (in the proper orientation).
	2. To prevent diskette drive read/write errors, make sure that the distance between monitors and diskette drives is at least 76 mm (3 in.).
	3. Run the diskette drive diagnostic test.
	4. Reseat the following components:
	  a. Cable
	  b. Diskette drive
	  c. (Trained service technician only) System board
	5. Replace the following components one at a time, in the order shown, restarting the computer each time:
	  a. Cable
	  b. Diskette drive
	  c. (Trained service technician only) System board.

Hard disk drive problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**

Symptom	Action
Not all drives are recognized by the hard disk drive diagnostic test (the Fixed Disk test).	Remove the drive that is indicated by the diagnostic tests; then, run the hard disk drive diagnostic test again. If the remaining drives are recognized, replace the drive that you removed with a new one.
The computer stops responding during the hard disk drive diagnostic test.	Remove the hard disk drive that was being tested when the computer stopped responding, and run the diagnostic test again. If the hard disk drive diagnostic test runs successfully, replace the drive that you removed with a new one.
A hard disk drive was not detected while the operating system was being started.	Reseat all hard disk drives and cables; then, run the hard disk drive diagnostic tests again.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**

Symptom	Action
A hard disk drive passes the diagnostic Fixed Disk Test, but the problem remains.	Run the diagnostic SCSI Fixed Disk Test (see "Starting the diagnostic programs and viewing the test log" in the *Problem Determination and Service Guide*. **Note:** This test is not available on computers that have RAID arrays or computers that have IDE or SATA hard disk drives.

Keyboard, mouse, or pointing-device problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**

Symptom	Action

All or some keys on the keyboard do not work.	1. Make sure that:
	   • The keyboard cable is securely connected to the computer, and the keyboard and mouse cables are not reversed.
	   • The computer and the monitor are turned on.
	2. Replace the following components one at a time, in the order shown, restarting the computer each time:
	   a. Keyboard
	   b. (Trained service technician only) System board.

The mouse or pointing device does not work.	1. Make sure that:
	   • The mouse or pointing-device cable is securely connected and the keyboard and mouse cables are not reversed.
	   • The mouse or pointing device drivers are installed correctly.
	2. Replace the following components one at a time, in the order shown, restarting the computer each time:
	   a. Mouse or pointing device
	   b. (Trained service technician only) System board.

Memory problems

Symptom	Action
	• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
	• See Chapter 3, Parts Listing, Machine Type 6217 in the *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
	• If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.

Symptom	Action

The amount of system memory displayed is less than the amount of installed physical memory.	1. Make sure that:
	  • The memory modules are seated corrected.
	  • You have installed the correct type of memory.
	  • If you changed the memory, you updated the memory configuration in the Configuration/Setup Utility program.
	  • All banks of memory are enabled. The computer might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.
	
	2. Check the POST error log for error message 289:
	  • If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM.
	  • If the DIMM was disabled by the user or by POST, run the Configuration/Setup Utility program and enable the DIMM. Save the settings and restart the computer.
	
	3. Replace the following components one at a time, in the order shown, restarting the computer each time:
	  a. DIMM
	  b. (Trained service technician only) System board.

Microprocessor problems

Symptom	Action
	• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
	• See Chapter 3, Parts Listing, Machine Type 6217 in the *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
	• If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.

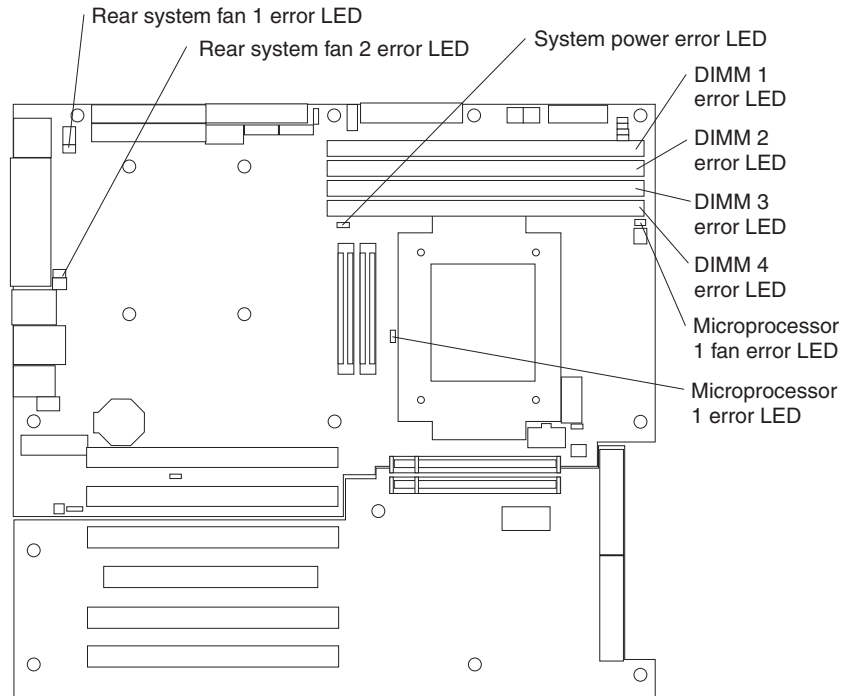| Symptom	Action
The computer emits a continuous beep during POST, indicating that the startup (boot) microprocessor is not working correctly.	1. Make sure that the startup microprocessor is seated correctly. 2. (Trained service technician only) Replace the microprocessor.

Monitor problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**

Symptom	Action

The screen is blank.	1. Make sure that:
	   • The computer power cord is connected to the computer and a working electrical outlet.
	   • The monitor cables are connected correctly.
	   • The monitor is turned on and the brightness and contrast controls are adjusted correctly.
	
	   Important: In some memory configurations, the 3-3-3 beep code might sound during POST, followed by a blank monitor screen. If this occurs and the **Boot Fail Count** option in the **Start Options** of the Configuration/Setup Utility program is set to enabled (its default setting), you must restart the computer three times to force the system BIOS to reset the CMOS values to the default configuration (the memory connector or bank of connectors enabled).
	
	2. Replace the following components one at a time, in the order shown, restarting the computer each time:
	   a. Monitor
	   b. Video adapter (if one is installed)
	   c. (Trained service technician only) System board.

Only the cursor appears.	See "Solving undetermined problems" in the *User's Guide*.

The monitor works when you turn on the computer, but the screen goes blank when you start some application programs.	1. Make sure that:
	   • The application program is not setting a display mode that is higher than the capability of the monitor.
	   • You installed the necessary device drivers for the applications.
	
	2. Replace the monitor.

The monitor has screen jitters, or the screen image is wavy, unreadable, rolling, distorted.	1. If the monitor self-tests show that the monitor is working properly, 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.
	
	   Attention: Moving a color monitor while it is turned on might cause screen discoloration. Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor.
	
	   Notes:
	   a. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any external diskette drive is at least 76 mm (3 in.).
	   b. Non-IBM monitor cables might cause unpredictable problems.
	
	2. Replace the following components one at a time, in the order shown, restarting the computer each time:
	   a. Video adapter (if one is installed)
	   b. (Trained service technician only) System board.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**	
• **If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**	

Symptom	Action

Wrong characters appear on the screen.	1. If the wrong language is displayed, update the BIOS code with the correct language.
	2. Replace the following components one at a time, in the order shown, restarting the computer each time:
	   a. Video adapter (if one is installed)
	   b. (Trained service technician only) System board.

Power problems

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**	
• **If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**	

Symptom	Action

The power-control button does not work, and the reset button, if supported, does work.	1. Reseat the following components:
	   a. Control panel assembly
	   b. (Trained service technician only) System board
	2. Replace the following components one at a time, in the order shown, restarting the computer each time:
	   a. (Trained service technician only) control panel assembly
	   b. (Trained service technician only) System board.

•	**Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
•	**See Chapter 3, Parts Listing, Machine Type 6217 in the** *Problem Determination and Service Guide* **to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
•	**If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician.**

Symptom	Action
The computer does not start.	1. Make sure that: • The power cords are correctly connected to the computer and to a working electrical outlet. • The type of memory that is installed is correct. 2. If you just installed an optional device, remove it, and restart the computer. If the computer now starts, you might have installed more devices than the power supply supports. 3. If LEDs for microprocessors or VRMs are lit, make sure that: • A VRM is installed if a second microprocessor is installed. • All microprocessors have the same speed. 4. Override the front panel power control button: a. Disconnect the computer power cords. b. Install a jumper on the force-power-on jumper (J27). c. Reconnect the power cords. If the computer does not start, (trained service technician only) replace the system board. 5. See "Solving undetermined problems" in the *Problem Determination and Service Guide*.
The computer does not turn off.	1. Determine whether you are using an Advanced Configuration and Power Interface (ACPI) or a non-ACPI operating system. If you are using a non-ACPI operating system, complete the following steps: a. Press Ctrl+Alt+Delete. b. Turn off the computer by pressing the power-control button for 4 seconds. c. If the computer fails POST and the power-control button does not work, disconnect the AC power cord. 2. If the problem remains or if you are using an ACPI-aware operating system, the problem could be with the system board.

System-board error LEDs

The following illustration shows the location of the LEDs on the system board. You might need to refer to this illustration when solving problems with the computer.

Each error LED is lit to indicate a problem with a specific component. After a problem is corrected, its LED will not be lit the next time the computer is restarted; if the problem remains, the LED will be lit again. See "Solving problems" in the *Problem Determination and Service Guide* on the IBM *IntelliStation Documentation* CD for additional information.

Rear system fan 1 error LED

Rear system fan 2 error LED

System power error LED

DIMM 1 error LED

DIMM 2 error LED

DIMM 3 error LED

DIMM 4 error LED

Microprocessor 1 fan error LED

Microprocessor 1 error LED

Microprocessor-board error LEDs

If you have installed a second microprocessor, it is installed on a microprocessor board, which is installed on the system board. The following illustration shows the error LEDs on the microprocessor board.

Each error LED is lit to indicate a problem with a specific component. After a problem is corrected, the LED will not be lit the next time the computer is restarted. If the problem remains, the LED will continue to be lit. See "Solving problems" in the *Problem Determination and Service Guide* on the IBM *IntelliStation Documentation* CD for additional information.

Microprocessor 2 fan error LED

Microprocessor 2 error LED

DIMM 8 error LED

DIMM 7 error LED

DIMM 6 error LED

DIMM 5 errorLED
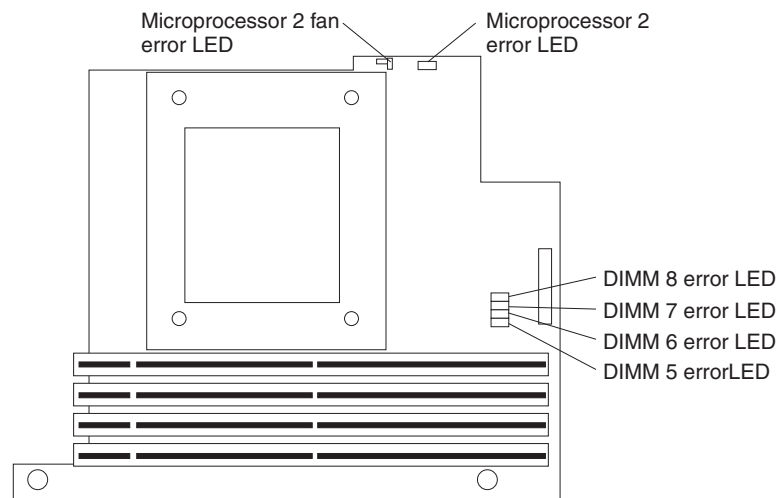
Product Recovery program

The Product Recovery program is on a hidden partition of the hard disk. The Product Recovery program runs independently of the operating system and reinstalls your operating system and preinstalled software.

If your hard disk drive, including the partition that contains the Product Recovery program, becomes damaged or if you replace the hard disk drive, contact IBM to order the *IBM Product Recovery* CD to recover your preinstalled operating system, application programs, and device drivers.See Appendix A, "Getting help and technical assistance," on page 71 for details.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your xSeries or IntelliStation system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the IBM *IntelliStation Documentation* CD or at the IBM Support Web site.
- Go to the IBM Support Web site at http://www.ibm.com/pc/support/ to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/pc/support/ and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is http://www.ibm.com/eserver/xseries/. The address for IBM IntelliStation information is http://www.ibm.com/pc/intellistation/.

You can find service information for your IBM products, including supported options, at http://www.ibm.com/pc/support/.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to http://www.ibm.com/services/sl/products/.

For more information about Support Line and other IBM services, go to http://www.ibm.com/services/, or go to http://www.ibm.com/planetwide/ for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. Go to http://www.ibm.com/planetwide/ for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Appendix B. Notices

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Chipkill	ThinkPad
EtherJet	Tivoli
e-business logo	Tivoli Enterprise
@server	Update Connector
FlashCopy	Wake on LAN
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Important notes

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

CD-ROM drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, 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.

Maximum memory may require replacement of the standard memory with an optional memory module.

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

Product recycling and disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets, and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. Information on product recycling offerings can be found on IBM's Internet site at http://www.ibm.com/ibm/environment/products/prp.shtml.

Battery return program

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml or contact your local waste disposal facility.

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

In the Netherlands, the following applies.

Electronic emission notices

IBM IntelliStation A Pro Type 6217

Federal Communications Commission (FCC) statement

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

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. 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.

Responsible party:
International Business Machines Corporation
New Orchard Road
Armonk, NY 10504
Telephone: 1-919-543-2193

Tested To Comply
With FCC Standards

FOR HOME OR OFFICE USE

Industry Canada Class B emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

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 B Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

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
02K0546	China
13F9940	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea

IBM power cord part number	Used in these countries and regions
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13F9997	Denmark
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14F0033	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Italy, Libyan Arab Jamahiriya
14F0087	Israel
1838574	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Colombia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States of America, Venezuela
24P6858	Korea (Democratic People's Republic of), Korea (Republic of)
34G0232	Japan
36L8880	Argentina, Paraguay, Uruguay
49P2078	India
49P2110	Brazil

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