



User Guide  
NetVista  
Type 6644, 6645, and 6646





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**Note**

Before using this information and the product it supports, be sure to read “Safety information” on page vii and “Product warranty and notices” on page 69.

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## Safety information

### 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.

<b>To connect:</b> <ol style="list-style-type: none"><li>1. Turn everything OFF.</li><li>2. First, attach all cables to devices.</li><li>3. Attach signal cables to connectors.</li><li>4. Attach power cords to outlet.</li><li>5. Turn device ON.</li></ol>	<b>To disconnect:</b> <ol style="list-style-type: none"><li>1. Turn everything OFF.</li><li>2. First, remove power cords from outlet.</li><li>3. Remove signal cables from connectors.</li><li>4. Remove all cables from devices.</li></ol>
---	---

### DANGER

Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux.

Pour éviter tout risque de choc électrique :

- Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.
- Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.
- Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.



- Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.;
- Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.
- Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relient aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).
- Lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.

Connexion:	Déconnexion:
<ol style="list-style-type: none"> <li>1. Mettez les unités hors tension.</li> <li>2. Commencez par brancher tous les cordons sur les unités.</li> <li>3. Branchez les câbles d'interface sur des connecteurs.</li> <li>4. Branchez les cordons d'alimentation sur des prises.</li> <li>5. Mettez les unités sous tension.</li> </ol>	<ol style="list-style-type: none"> <li>1. Mettez les unités hors tension.</li> <li>2. Débranchez les cordons d'alimentation des prises.</li> <li>3. Débranchez les câbles d'interface des connecteurs.</li> <li>4. Débranchez tous les câbles des unités.</li> </ol>

---

## Lithium battery notice

### CAUTION:

Danger of explosion if battery is incorrectly replaced.

When replacing the battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the 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.

### ATTENTION

Danger d'explosion en cas de remplacement incorrect de la batterie.

Remplacer uniquement par une batterie IBM de type ou d'un type équivalent recommandé par le fabricant. La batterie contient du lithium et peut exploser en cas de mauvaise utilisation, de mauvaise manipulation ou de mise au rebut inappropriée.

**Ne pas :**

- Lancer ou plonger dans l'eau
- Chauffer à plus de 100°C (212°F)
- Réparer ou désassembler

**Mettre au rebut les batteries usagées conformément aux règlements locaux.**

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## **Modem safety information**

To reduce the risk of fire, electrical shock, or injury when using telephone equipment, always follow basic safety precautions, such as:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.

**CAUTION:**

To reduce the risk of fire, use only No.26AWG or larger telecommunication line cord.

### **Consignes de sécurité relatives au modem**

Lors de l'utilisation de votre matériel téléphonique, il est important de respecter les consignes ci-après afin de réduire les risques d'incendie, d'électrocution et d'autres blessures :

- N'installez jamais de cordons téléphoniques durant un orage.
- Les prises téléphoniques ne doivent pas être installées dans des endroits humides, excepté si le modèle a été conçu à cet effet.
- Ne touchez jamais un cordon téléphonique ou un terminal non isolé avant que la ligne ait été déconnectée du réseau téléphonique.
- Soyez toujours prudent lorsque vous procédez à l'installation ou à la modification de lignes téléphoniques.
- Si vous devez téléphoner pendant un orage, pour éviter tout risque de choc électrique, utilisez toujours un téléphone sans fil.
- En cas de fuite de gaz, n'utilisez jamais un téléphone situé à proximité de la fuite.

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## **Laser compliance statement**

Some IBM Personal Computer models are equipped from the factory with a CD-ROM drive. CD-ROM drives and DVD-ROM drives are also sold separately as

options. CD-ROM drives and DVD-ROM drives are laser products. These drives are certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, these drives are certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

When a CD-ROM drive or a DVD-ROM drive is installed, note the following.

**CAUTION:**

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

Removing the covers of the CD-ROM drive or DVD-ROM drive could result in exposure to hazardous laser radiation. There are no serviceable parts inside the CD-ROM drive or DVD-ROM drive. **Do not remove the drive covers.**

Some CD-ROM drives and DVD-ROM drives contain an embedded Class 3A or Class 3B laser diode. Note the following.

**DANGER**

**Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.**

Certains modèles d'ordinateurs personnels sont équipés d'origine d'une unité de CD-ROM ou de DVD-ROM. Mais ces unités sont également vendues séparément en tant qu'options. L'unité de CD-ROM/DVD-ROM est un appareil à laser. Aux États-Unis, l'unité de CD-ROM/DVD-ROM est certifiée conforme aux normes indiquées dans le sous-chapitre J du DHHS 21 CFR relatif aux produits à laser de classe 1. Dans les autres pays, elle est certifiée être un produit à laser de classe 1 conforme aux normes CEI 825 et CENELEC EN 60 825.

Lorsqu'une unité de CD-ROM/DVD-ROM est installée, tenez compte des remarques suivantes:

**ATTENTION: Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites.**

L'ouverture de l'unité de CD-ROM/DVD-ROM peut entraîner un risque d'exposition au rayon laser. Pour toute intervention, faites appel à du personnel qualifié.

Certaines unités de CD-ROM/DVD-ROM peuvent contenir une diode à laser de classe 3A ou 3B. Tenez compte de la consigne qui suit:

**DANGER**

**Rayonnement laser lorsque le carter est ouvert. Évitez toute exposition directe des yeux au rayon laser. Évitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques.**

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## About this book

This book will help you become familiar with your IBM® computer and its features. It describes how to operate, maintain, and install options in your computer. In the unlikely event you experience problems, you will find helpful troubleshooting information and instructions for obtaining service in this book.

---

## Conventions used in this book

The conventions used in this book denote text with special meaning. The following are explanations of the conventions.

Convention	Purpose
<b>DANGER</b>	A DANGER notice is used to call attention to a situation that is potentially lethal or extremely hazardous to people.
<b>CAUTION</b>	A CAUTION notice is used to call attention to a situation that is potentially hazardous to people.
<b>Attention</b>	An Attention notice contains important information that can help you avoid damage to the hardware or software that comes with your computer.
<b>Note:</b>	A Note contains information you might find especially useful.
<b>Important</b>	An Important notice warns you about possible problems you could encounter.

Highlighted text is also used as a convention in this book. There are several ways that text is highlighted, and each highlighting convention has a specific purpose.

Highlight	Purpose
<b>Bold</b>	Bold text is used to identify items on the screen you are instructed to click or double-click. Bold text is also used in table titles, in numbered lists, and in certain other lists to call attention to a term or phrase being defined.
Example	Example text is used to show text that you need to type from your keyboard.
<i>Italic</i>	Italic font is used to show proper names of books and disks, and to emphasize a particular word or instruction. This font also is used to show variable information, such as numbers in an error code or a drive letter.

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## Related information

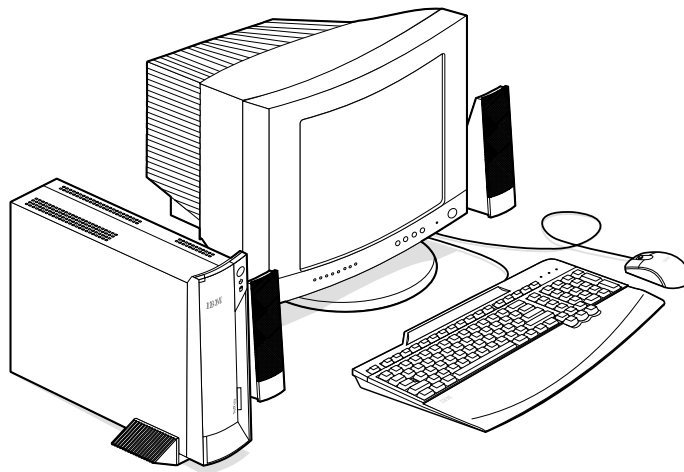
The following is a description of the publications that contain additional information about your computer. These documents are available in Adobe Acrobat PDF files at <http://www.ibm.com/pc/support> on the World Wide Web.

- *Quick Reference Manual*  
This publication provides an overview of the following information: safety, setting up your computer, recovering your operating system, getting help and service, warranty, and other notices.
- *About Your Software*  
This publication contains information about the operating system, device drivers, applications, and product recovery software.
- *Hardware Maintenance Manual*  
This publication, for trained service technicians, can also be ordered from IBM. To purchase a copy, refer to “Chapter 7. IBM HelpWare support and services,” on page 59.
- *Technical Information Manual*  
This publication contains information for individuals who want to know more about the technical aspects of their computer.

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## Chapter 1. Product overview

Thank you for selecting an IBM computer. Your computer incorporates many of the latest advances in computer technology. This chapter provides an overview of the computer, features, and preinstalled software. The artwork shown below is for reference only. Some components are sold separately and other components shown vary by model.



---

### Identifying your computer

In most instances, the best way to identify your computer is by the machine type/model number. The machine type/model number indicates the various features of the computer, such as the type of microprocessor and the number of bays. You can find this number on the small label on the front of your computer behind the access door. An example of a machine type/model number is 6644-xxx.

---

### Hardware features

The following information covers a variety of models. For a listing of features for your specific model, refer to the System Summary screen in the Configuration/Setup Utility. For more information, see “Chapter 4. Using the Configuration/Setup Utility program,” on page 27.

## Microprocessor

- Intel® Celeron™ or Pentium® III microprocessor
- Internal L2 cache memory (varies by model)
- 66 MHz or 133 MHz front side bus (FSB) (varies by model)

## Memory

- Two dual inline memory module (DIMM) sockets
- 100 MHz or 133 MHz synchronous dynamic random access memory (SDRAM) operating at a maximum of 100MHz
- 64 MB, 128, and 256 MB non-ECC DIMMs (supported)
- Maximum SDRAM of 512 MB
- 512 KB flash memory for system programs

## Internal drives

- One EIDE hard disk drive
- One CD-ROM (varies by model)

## Graphics subsystem

Integrated high-performance graphics controller

## Audio subsystem

- Integrated, 16-bit Sound Blaster Pro compatible audio controller with three audio connectors (line/headphone out, line in, and microphone)
- Built in speaker to support multimedia applications

## Communications

- Low-profile Ethernet controller
- Low-profile Peripheral Component Interconnect (PCI) modem (optional)

## System management features

- Wake on LAN®
- Wake on Ring
- Wake on Alarm
- Alert on LAN™
- Automatic power-on startup
- System Management BIOS and software
- Ability to store power-on self-test (POST) hardware test results

### **Keyboard and mouse features**

- IBM Preferred USB (Universal Serial Bus) Keyboard
- IBM Rapid Access™III USB (Universal Serial Bus) Keyboard
- Two USB connectors on the Rapid Access III keyboard
- IBM ScrollPoint™ III USB (Universal Serial Bus) Mouse
- IBM Sleek USB (Universal Serial Bus) Mouse (some models)

### **Expansion capability**

- Two low-profile PCI adapter expansion slots (one available)
- Five USB connectors
- Two DIMM sockets (one available)

### **Power**

- 95 watts
- Manual switch between ranges, 90–137 or 180–265 V ac
- Automatic switching, 57–63 or 47–53 Hz input frequency range
- Built-in overload and surge protection
- Advanced Power Management support
- Advanced Configuration and Power Interface (ACPI) support

### **Security features (varies by model)**

- Power-on and administrator passwords
- Cover lock (some models only)
- Startup sequence control
- Unattended start mode
- Diskette and hard disk I/O control
- Alert on LAN

### **Supported operating systems**

- Microsoft Windows 2000 Professional



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## Software

This section describes the IBM-preinstalled software and other software that comes with your computer.

### IBM preinstalled software

Your computer comes with preinstalled software. An operating system, device drivers to support built-in features, and other support programs are included. See the *About Your Software* publication for a detailed description of the preinstalled software.

### Additional software

Your computer comes with a *Software Selections CD* that includes additional software that you might choose to install. See the *About Your Software* publication for a description of the additional software that comes with your computer.

### Access IBM

The Access IBM program is preinstalled on your computer and is accessible from the Windows desktop. It provides the following:

Start up	This selection provides topics about setting up your computer.
How Do I...?	This selection provides topics describing how to complete specific tasks.
Customize	This selection provides information about customizing the Access IBM program.
Get help	This selection provides help information and ways of getting help from IBM.
View license and warranty	This selection gives you access to the warranty for your computer and the license that covers the programs preinstalled by IBM (excluding the operating system) and those programs on the <i>Software Selections CD</i> that are not covered by their own license.

For more information about Access IBM, see the *About Your Software* publication that comes with your computer.

---

## Chapter 2. Setting up your computer

This chapter provides information for setting up your computer for the first time.

### **Before you begin**

Read the safety information before setting up your computer. See “Safety information” on page vii.

You will need the following:

- Computer
- Pedestal
- Power cord
- Keyboard
- Mouse
- Monitor (sold separately)

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

---

### **Selecting a location for your computer**

Make sure you have an adequate number of properly grounded electrical outlets for the computer and any other attached devices. Select a location for the computer where it will remain dry. Leave about 50 mm (2 in.) of space around the computer for proper air circulation.

### **Attention**

For proper computer operation in the vertical position, the pedestal must be installed. Refer to the pedestal instructions for installation procedures.

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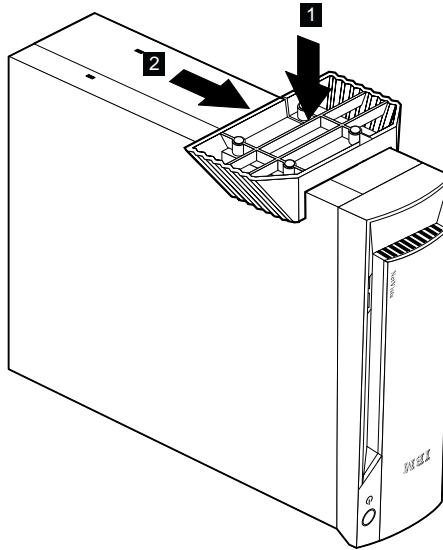
### **Selecting the position of your computer**

You can use your computer in a vertical or horizontal position. For proper computer operation in the vertical position, the pedestal must be installed. To use the computer in a horizontal position, you can attach rubber feet to the base of the computer.

## Installing the pedestal

To install the pedestal, do the following:

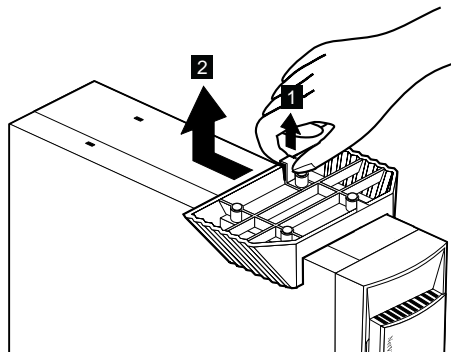
1. Turn the computer over.
2. Set the pedestal down **1**, and slide it into place **2**.



3. Turn the computer over.

To remove the pedestal, do as follows:

1. Turn the computer over.
2. Pull the pedestal release upwards **1**, and slide the pedestal out **2**.

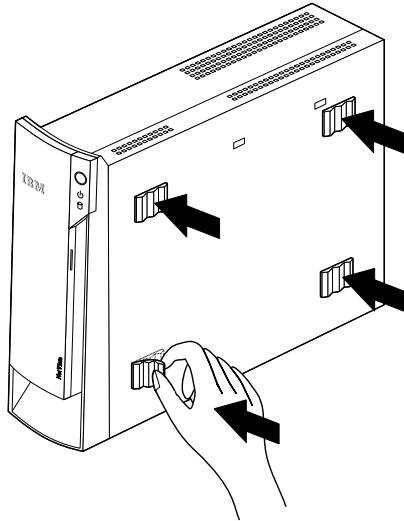


3. Turn the computer over.

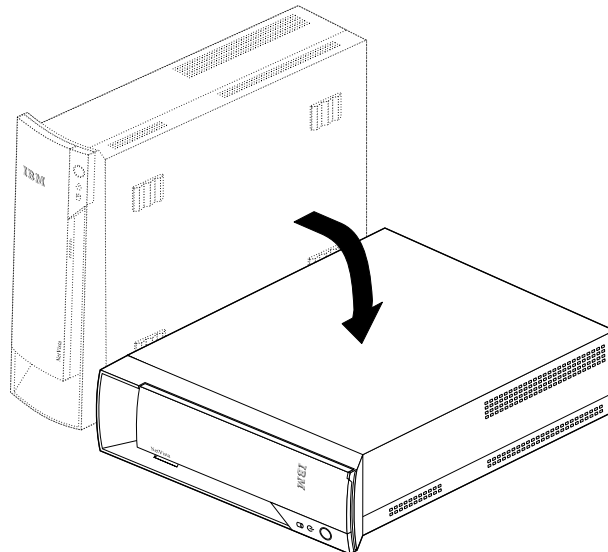
## Attaching the rubber feet

To attach the rubber feet, do the following:

1. Attach the four rubber feet to the computer.



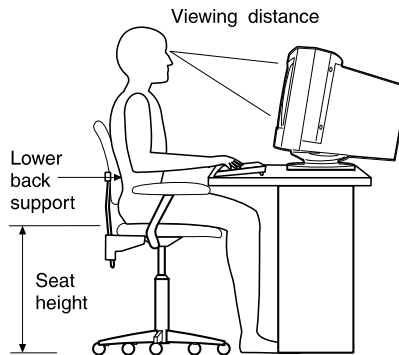
2. Set the computer down.



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## 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

Although no single working position is ideal for everyone, the following guidelines will help you find a position that suits you best.

Choose a good chair to reduce the frequency of fatigue from sitting in the same position for a long time. 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.

## Glare and lighting

Position the monitor and adjust the tilt to minimize glare and reflections from overhead lights, windows, and other light sources. Place it at right angles to windows and other 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 room 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 image on the screen; try them only after you have exhausted other methods of reducing glare.

Dust buildup compounds problems associated with glare. Remember to 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 has a fan that pulls in fresh air and forces out hot air. The monitor lets hot air escape through vents. Blocking the air vents can cause overheating, which might result in a malfunction or damage. Place the computer and monitor so that nothing blocks the air vents; usually, 51 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 power cords and cables that connect to the printer and other devices might determine the final placement of your computer.

When arranging your workspace:

- 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.

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## **Connecting cables**

Read the following before connecting cables:

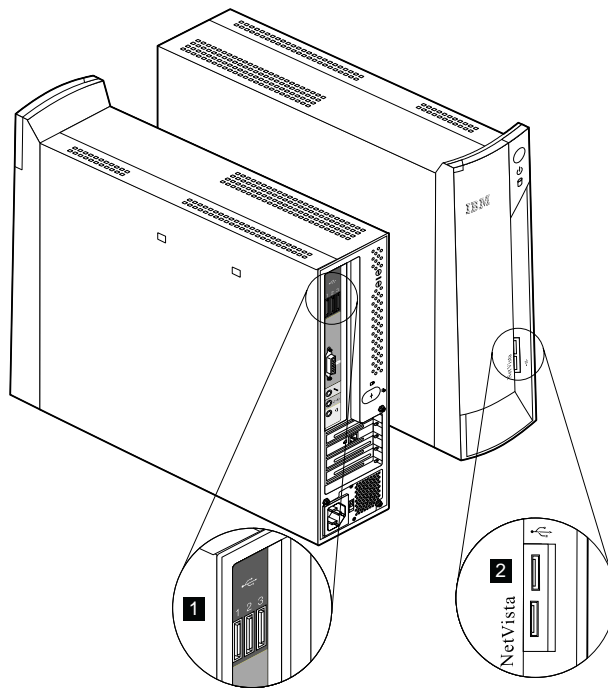
- Connect all device cables before plugging any power cords into an electrical outlet.
- Connect the power cords to the computer and to the other devices before plugging them into an electrical outlet.

### **Important**

If your computer is being connected to an Ethernet network, a Category 5 Ethernet cable must be used for operation of the system within FCC Class A limits.

## USB connectors

There are five USB connectors on your computer: three at the rear **1** and two on the front **2**. In addition, if you have a Rapid Access keyboard, there are two USB connectors at the rear of the keyboard. When setting up your computer for the first time, plug the keyboard and the mouse cables into the USB ports at the rear of the computer. USB devices, such as a keyboard, mouse, printer, or scanner can be connected to any one of the available USB connectors. These cables can be relocated to other USB connectors at a later time if desired.



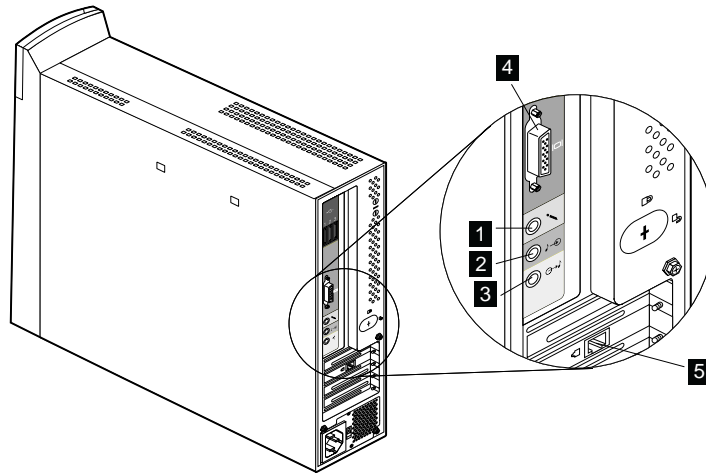
If you want to move or add a USB device, ensure the computer and operating system are running. It is also recommended that you move or add one device at a time.

The two USB connectors on the Rapid Access III keyboard are designed for low-powered USB devices, such as a mouse or gamepad, only. USB devices that require more power, such as speakers or an unpowered USB hub, should be connected to one of the USB connectors on the computer.

**Note:** Cable connectors from USB devices are keyed so that they cannot be connected incorrectly.

## Audio connectors

The audio connectors located at the rear of the computer, are microphone **1**, audio line in **2**, and audio line out **3**.



---

## Other connectors

The previous illustration also shows the monitor connector **4**, and the modem or Ethernet connector **5**.

---

## Recording identification numbers

Locate identification numbers (serial and type/model) at the front of the computer behind the access door and record this information. See “Appendix A. Computer records,” on page 67.

See “Related information” on page xii for sources of other information about your computer. For information about IBM-installed software, see the *About Your Software* publication. Additional programs and device drivers are on the *Software Selections CD* and, in some cases, on other CDs and diskettes.

---

## Starting the computer

Go to Chapter 2 “Getting Started” in the *About Your Software* publication to continue with the software setup of your computer. For information about how to turn on your computer, see “Chapter 3. Operating and caring for your computer,” on page 13.

**Note:** If you suspect a problem, see “Chapter 6. Troubleshooting,” on page 41.





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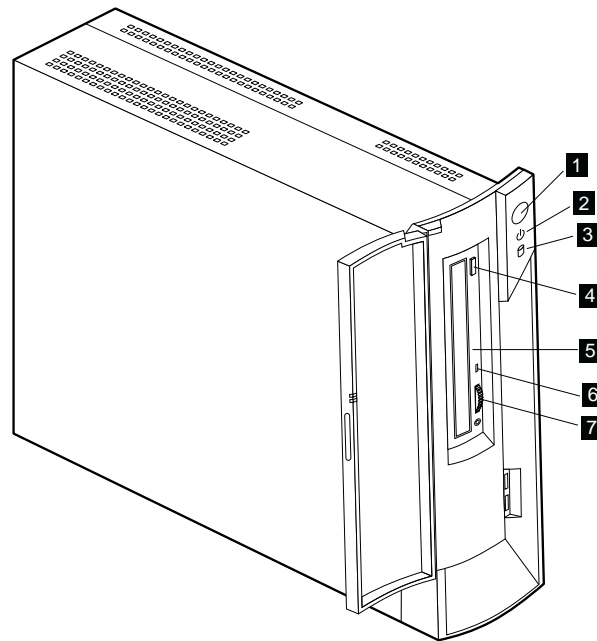
## Chapter 3. Operating and caring for your computer

This chapter provides information to help you in the day-to-day use and care of your computer.

---

### Controls and status indicators

Each button at the front of your computer controls a specific function, such as turning on the computer. The lights are status indicators that tell you when a certain device, such as the CD-ROM drive, is in use.



- 1 Power button
- 2 Power/standby indicator
- 3 Hard disk drive in-use indicator
- 4 CD-ROM eject button

- 5 Emergency-eject hole
- 6 CD-ROM in-use indicator
- 7 Volume control

The following is a description of the controls and status indicators for your computer.

**Power button:** Press this button to turn your computer on or off. Do not turn off your computer if the in-use indicator for the hard disk drive or diskette drive (USB optional drive) is on.

**Note:** The power button normally operates with a single touch. However, in some circumstances the computer might not immediately turn off. If this happens, hold the power button down for approximately five seconds, and the computer will then turn off.

**Power/standby indicator:** This status indicator is on when power to your computer is turned on, and blinking when in standby mode.

**Hard disk drive in-use indicator:** When this light is on, it indicates that the hard disk drive heads are being positioned or that your computer is reading from or writing to the hard disk. Do not turn off your computer when this indicator is on or blinking.

**Emergency eject hole:** Insert a pin to open the tray for removing a disc when the computer is turned off.

**CD-ROM eject button:** Press this button on the CD-ROM drive to open the tray for inserting or removing a disc.

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

**Volume control:** During audio CD playback, adjusts the volume of the headphone connected to the headphone jack on the CD-ROM drive.

---

## Starting your computer

What you see and hear when you turn on your computer depends on the settings in the Start Options menu of the Configuration/Setup Utility program. For more information, see “Chapter 4. Using the Configuration/Setup Utility program,” on page 27.

If any errors are detected during POST, error messages are displayed. If a power-on password is set, a password prompt is displayed on the screen. If you have set both power-on and administrator passwords, you can type either password at the password prompt. When you type your password at the prompt and press Enter, the first screen of your operating system or application program is displayed.

---

## Shutting down the computer

When you are ready to turn off your computer, always follow the shutdown procedure. This prevents the loss of unsaved data or damage to your software programs. To shut down Windows:

1. Click **Start** on the Windows desktop.
2. Click **ShutDown**.
3. Click **Shut down**.
4. Click **OK**.

---

## Using the Rapid Access III keyboard

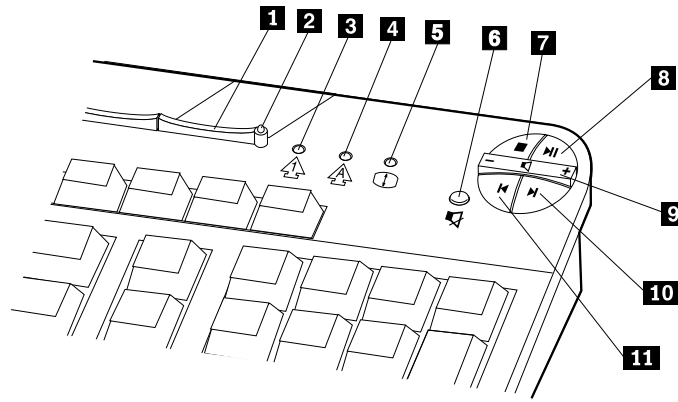
The Rapid Access keyboard features special buttons for your convenience.

The buttons provide *shortcuts* on the keyboard to start a program, open a file, or perform a specific function. With these keys, you can go directly to a file, program, or Internet address by pressing a button instead of having to click an icon, search for the program in the Start menu, or type an Internet address in your browser.

Some of the Rapid Access Buttons are preset to support important multimedia functions on your computer (Mute, Volume, and CD-ROM or DVD-ROM controls); these cannot be changed.

There are eight color-coded Rapid Access buttons positioned across the top of the keyboard. Some of these buttons are permanently set to start certain programs on your computer. The preset functions are printed on the label above the buttons. Three of the buttons, EMail, Access IBM Web, and Standby, are permanently programmed. Depending on the preloaded operating system loaded in your computer, three of the remaining five buttons might be preset. You can customize the other buttons to start any program or file you want. For example, if you enjoy playing Solitaire, you can customize a Rapid Access button to open the Solitaire program.

The two USB connectors on the Rapid Access III keyboard are designed for low-powered USB devices, such as a mouse or gamepad, only. USB devices that require more power, such as speakers or an unpowered USB hub, should be connected to one of the USB connectors on the computer.



- 1** Standby button
- 2** Standby LED
- 3** Num Lock LED
- 4** Caps Lock LED
- 5** Scroll Lock LED

- Multimedia controls**
- 6** Mute button
- 7** Stop button
- 8** Play/Pause button
- 9** Volume control
- 10** Next track button
- 11** Previous track button

To customize a Rapid Access Button, do the following:

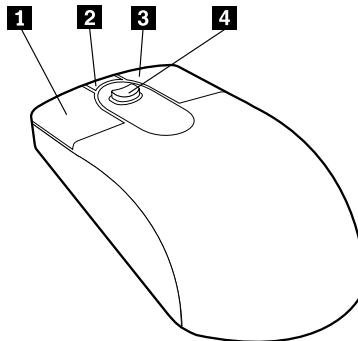
1. From the Windows desktop, click **Start**.
2. Select **Settings**, and then click **Control Panel**.
3. Double-click **Keyboard (Rapid Access)**. The Rapid Access Keyboard Customization program starts.
4. Follow the instructions on the screen.

To learn more about the Rapid Access keyboard, click **Help**.

---

## Using the IBM ScrollPoint III mouse

The ScrollPoint III mouse has the following controls.



**1 Primary mouse button:** Use this button to select or start a program or menu item.

**2 Quick/auto scroll button:** Use this button to put the mouse into *auto-scroll* mode. When the mouse is in auto-scroll mode, the movement of the mouse controls the scrolling direction and speed. To exit from the auto-scroll mode, click any of the mouse buttons.

**3 Context menu button:** Use this button to display a menu for the active program, icon, or object.

**4 Scroll stick:** Use this stick to control the scrolling action of the mouse. This stick is pressure sensitive. The direction in which you apply pressure controls the direction of the scrolling action. The amount of pressure you apply controls the scrolling speed.

**Note:** The Scroll stick works only when the mouse pointer is located over a scrollable area, such as a long document.

---

## Using a CD-ROM drive

Your computer might have a preinstalled CD-ROM drive. These drives can play back or read from a CD disc but cannot write information to it. CD-ROM drives use industry-standard, 12 cm (4.75-inch) CDs.

Follow these guidelines when using a CD-ROM drive:

- Do not place the drive where there is:
  - High temperature
  - High humidity
  - Excessive dust

- Excessive vibration or sudden shock
- An inclined surface
- Direct sunlight
- Do not insert any object other than a CD into the drive.
- Before moving the computer, remove the CD from the drive.

## **Handling a CD disc**

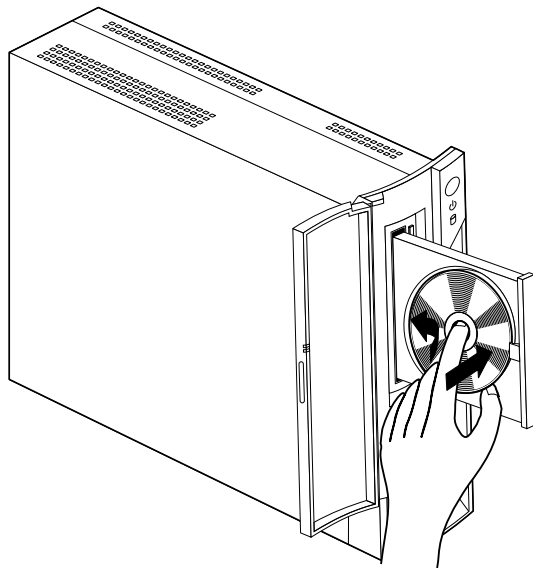
When handling a CD disc, follow these guidelines:

- Hold the disc by its edges. Do not touch the surface of the side that is not labeled.
- To remove dust or fingerprints, wipe the disc with a clean, soft cloth from the center to the outside. Wiping the disc in a circular direction might cause loss of data.
- Do not write or stick paper on the disc.
- Do not scratch or mark the disc.
- Do not place or store the disc in direct sunlight.
- Do not use benzene, thinners, or other cleaners to clean the disc.
- Do not drop or bend the disc.

## Inserting and removing a CD disc

To insert a disc:

1. With the computer turned on, press the eject button.
2. Place the disc in the tray with the label facing up (or away from the tray), and press the disc until it clicks into place.
3. Close the tray by gently pushing the tray closed. When the tray is closed, the indicator light on the front of the drive will activate to indicate that the drive is in use.



To remove a disc:

1. With the computer turned on, press the eject button.
2. Close the tray by gently pushing the tray closed.

**Note:** If the tray does not slide out when you press the eject button, insert the end of an opened paper clip into the emergency-eject hole located the front of the CD-ROM drive.



---

## Using video features

Your computer has a super video graphics array (SVGA) graphics controller. SVGA is a standard for displaying text and graphics images on a monitor screen and supports a variety of *video modes*. Video modes are different combinations of resolution, refresh rate, and color.

Depending on the applications you use and your personal preferences, you might need to change the video mode.

To change the video mode:

1. From the Windows desktop, click **Start**.
2. Select **Settings**, and then click **Control Panel**.
3. Double-click **Display**.
4. Click **Settings**, make the necessary changes, and then click **OK**.

## Video device drivers

To take full advantage of the graphics adapter in your computer, some operating systems and application programs require software, known as video device drivers. These device drivers provide support for greater speed, higher resolution, more available colors, and flicker-free images. Device drivers for the graphics adapter and a README file with instructions for installing the device drivers are provided on the *Product Recovery CD* that comes with your computer.

If your computer has IBM-preinstalled software, video device drivers have already been installed on the hard disk. However, you can use the device driver installation instructions if you need to reinstall the device drivers or if you need information on obtaining and installing updated device drivers. See the *About Your Software* publication for more information.

---

## Using audio features

Your computer has a digital audio controller built into the system board. The system-board audio controller supports applications written for Sound Blaster standards and are compatible with the Microsoft Windows Sound System. The audio connectors in your computer are 3.5 mm (1/8-in.) mini-jacks.

## Controlling volume

You can control the volume through several different means:

- The software volume control is accessible through the speaker icon in the taskbar, which is located at the bottom-right corner of the Windows desktop.
  - If you click the speaker icon one time, the volume control is displayed. Use your mouse to drag the volume-control slider up or down to control the volume, or select the Mute check box to turn the audio off.

- If you double-click the speaker icon, a master volume-control window opens. You can use the settings in the window to control individually the volume for each type of audio format.
- If you are using a Rapid Access keyboard, you can also adjust the software volume control through the volume-control button located at the top-right corner of the keyboard.

## Recording and playing back sound

Procedures for recording and playing back sound vary from program to program. One method of recording sound is to use the Sound Recorder program provided with your operating system. Refer to your operating-system documentation for information and instructions.

**Note:** If you experience interference or speaker feedback while recording, try reducing the microphone recording volume (gain).

---

## Using power-management features

Your computer supports the Standby feature. This feature lets the computer enter a low-power state to conserve energy. You can put the computer in Standby mode in three ways:

- Using the Windows Start menu
- Using the Standby button on the Rapid Access keyboard
- Using the power button

When the computer goes into standby mode, programs that are running go into a suspended state, but are not shut down. The monitor screen goes blank, but the power/standby indicator on the computer flashes to indicate that the computer is in Standby mode.

### Notes:

1. The keyboard Standby indicator will be flashing when the computer is in standby mode.
2. The keyboard Standby indicator will be on when the monitor is in a low-power state.

## Using the Windows Start menu

Follow these steps to put the computer in Standby mode using Windows:

1. From your Windows desktop, click the **Start** button.
2. Click **ShutDown**.
3. Click **Stand by**.
4. Click **OK**.

## Using the Standby button on the keyboard

If you are using the Rapid Access keyboard, you can put the computer in Standby mode by pressing the Standby button located at the top of the keyboard. The LED in the Standby button illuminates when the monitor is in a low-power or sleep state.

To bring the computer out of Standby mode, do one of the following:

- Press any key on the keyboard
- Press one of the mouse buttons
- Press the computer power button for less than four seconds

## Using the power button

With Windows, you can set your power button to one of two modes: Shutdown or Standby.

- When the power button is set for Standby, the computer goes into Standby mode if you press the button for less than four seconds while the computer is on. To bring the computer out of Standby mode, press any key on the keyboard or press one of the mouse buttons. An incoming modem ring while the computer is in Standby mode also brings the computer out of Standby mode.
- When the power button is set for Shutdown, pressing the power button, regardless of the length of time you hold it in, simply turns off or starts the computer.

The power button is preset for standby. To change the power button mode, do the following:

1. From the Windows desktop, click **Start**.
2. Select **Settings**; and then click **Control Panel**.
3. Double-click **Power Management**. The Power Management Properties window opens.
4. Click **Advanced**.
5. In the Power buttons area, locate the **When I press the power button on my computer** field, select either **Shutdown** or **Standby**, and then click **OK**.

## Setting power schemes

You can set the duration of inactivity that must elapse before the computer, monitor, or hard disk automatically enter standby mode. To set the duration, do the following:

1. From the Windows desktop, click **Start**.
2. Select **Settings**; then, click **Control Panel**.
3. Double-click **Power Options**. The Power Options Properties window opens.
4. From the **Power Schemes** tab, you can:

- Select an existing power scheme with preset durations
  - Modify an existing power scheme by changing the preset durations
  - Create a new power scheme with custom durations
5. After making the changes, click **OK**.

After the computer, hard disk drive, or monitor has entered Standby mode, any use of the keyboard or mouse, or an incoming modem ring, brings the computer, monitor, or hard disk drive out of the Standby mode.

## How to wake up the system

You can use the power button, keyboard, or mouse to wake up the system from standby. The power button can always be used to wake up the system. The keyboard can be configured to wake up the system as follows:

1. Click **Start**, **Settings**, and then **Control Panel**.
2. Click **Keyboard**, then select the **Hardware** tab.
3. Select the **HID Keyboard**, then click **Properties**.
4. Select the **Power Management** tab.
5. Select "Allow device to bring the computer out of Standby".
6. Click **OK**.

### Notes:

1. It is not recommended to use the mouse as a wake up device.
2. If you move the keyboard to a different USB port, you will need to reconfigure this power management setting.

---

## Using security features

To deter unauthorized use of your computer you can lock the keyboard. To restrict access to components inside the computer, you can lock the computer cover (some models only).

### Locking the cover

Some models come with a built-in cover lock. You can use this to restrict access to components inside the computer.

### Locking the keyboard

You can set a power-on password through the Configuration/Setup Utility program and use the security features built into the Windows operating system. If you decide to use passwords, do not forget them.

If you set a power-on password, the keyboard is locked when you turn on the computer. You must type the correct password before the keyboard will unlock. Use the Configuration/Setup Utility program to set a power-on password. For more information, see “Using passwords” on page 29.

You can also use the password and screen-saver features built into the Windows operating system to assign a password that locks the keyboard and mouse after a predefined period of inactivity. To use these features, refer to the operating system publication that comes with your computer.

---

## Taking care of your computer

This section provides guidelines for the proper handling and care of your computer.

### Basics

Here are some basic points about keeping your computer functioning properly:

- Keep your computer in a clean, dry environment. Make sure it rests on a flat, sturdy surface.
- Do not place items on top of the monitor or cover any of the vents in the monitor or computer. These vents provide air flow to keep your computer from overheating.
- Keep food and drinks away from all parts of your computer. Food particles and spills might make the keyboard and mouse unusable.
- Do not get the power buttons or other controls wet. Moisture can damage these parts and cause an electrical hazard.
- Always disconnect a power cord by grasping the plug, not the cord.

### Cleaning your computer and keyboard

It is a good practice to clean your computer periodically to protect the surfaces and ensure trouble-free operation.

**Attention:**

**Be sure to turn off the computer before cleaning.**

Use only mild cleaning solutions and a damp cloth to clean the painted surfaces of the computer.

### Monitor and screen

Do not use abrasive cleaners when cleaning the surface of the monitor screen. The screen surface is easily scratched, so avoid touching it with pens, pencil points, and erasers.

To clean the screen surface, wipe it gently with a soft, dry cloth, or blow on the screen to remove grit and other loose particles. Then use a soft cloth moistened with a nonabrasive liquid glass cleaner.

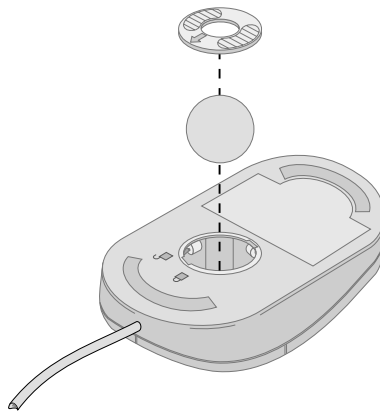
## Mouse

If the pointer on the screen does not move smoothly with the mouse, you might need to clean the mouse.

To clean your mouse, do the following:

1. Turn off the computer.
2. Disconnect the mouse cable from the computer.
3. Turn the mouse upside down. Unlock the retainer on the bottom of the mouse by rotating it in the direction of the arrow.

**Note:** Some mice have lock and unlock symbols to indicate how far you need to rotate the retainer.



4. Place your hand over the retainer and turn the mouse right-side up. The retainer and ball will drop out into your hand.
5. Using a damp cloth, wipe the outside of the mouse and the retainer. Be sure to wipe the rollers inside the mouse.
6. Insert the ball and retainer. Lock the retainer by rotating it opposite the direction of the arrow.
7. Reconnect the mouse cable to the computer.

---

## Moving your computer

Take the following precautions before moving your computer.

1. Remove all media (compact disc) from the drives.
2. Turn off the computer and all attached devices. Your hard disk drive automatically parks the read/write heads to prevent damage to the hard disk.
3. Unplug the power cords from electrical outlets.
4. Disconnect communication cables, such as network cables, from the telephone or network outlets first, and then disconnect the other ends of cables from the computer.
5. Disconnect all cables connecting external devices such as a monitor, keyboard, mouse, printer, scanner, and joystick.
6. If you are moving your computer other than a short distance and you saved the original shipping cartons and packing materials, use them to pack the units. If you are using different cartons, cushion the units to avoid damage.

---

## **Chapter 4. Using the Configuration/Setup Utility program**

The Configuration/Setup Utility program is stored in the electrically erasable programmable read-only memory (EEPROM) of your computer. You can use the Configuration/Setup Utility program to view and change the configuration settings of your computer, regardless of which operating system you are using. However, the settings you select in your operating system might override any similar settings in the Configuration/Setup Utility program.

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### **Starting and using the Configuration/Setup Utility program**

To start the Configuration/Setup Utility program, do the following:

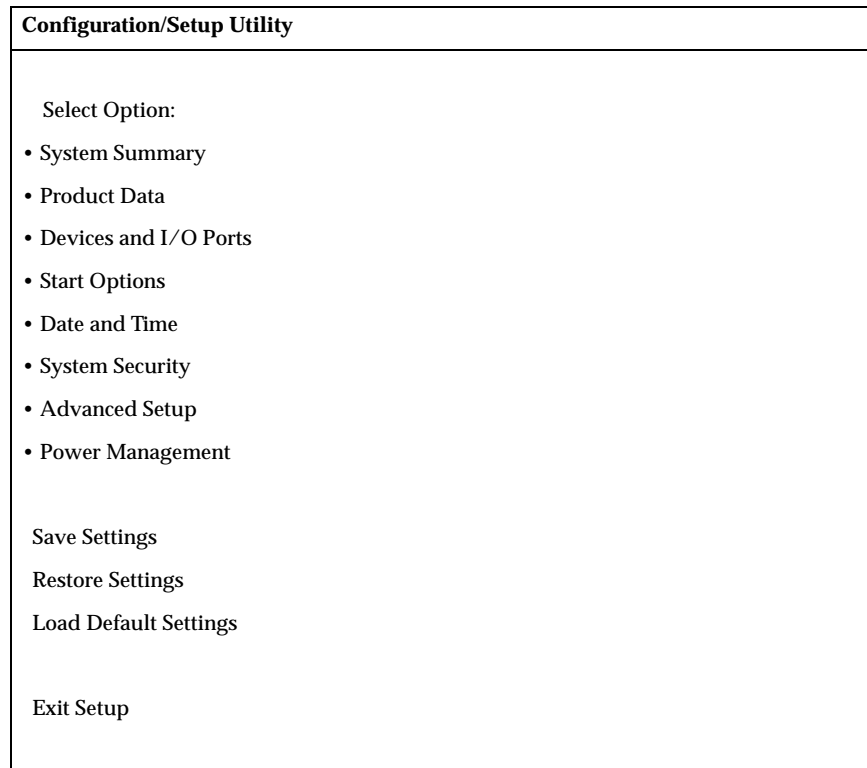
1. If your computer is already on when you start this procedure, you must shut down the operating system and turn off the computer.
2. Press and hold F1 while turning on the computer. If you have not set a password, the Configuration/Setup Utility program menu is displayed. If you have set a password, the Configuration/Setup Utility program menu is not displayed until you type your password at the prompt and press Enter. See "Using passwords" on page 29 for more information.

The Configuration/Setup Utility program might start automatically when POST detects that hardware has been removed or new hardware has been installed in your computer.



## Viewing and changing settings

The Configuration/Setup Utility menu displayed by your computer might look slightly different from the menu shown here, but it will operate the same way.



The Configuration/Setup Utility program menu lists items that identify system configuration topics. You might see symbols next to configuration menu items. The following table explains these symbols.

- An additional submenu or screen is available
- > A change to that item has been made in the system configuration, or the Configuration/Setup Utility program has detected an error and attempted to correct it. Also, an additional menu might follow a menu item with a ° beside it.
- \* A system resource conflict was detected. Resolve this conflict before exiting from the Configuration/Setup Utility program so that your computer will function properly.

- [ ] In the Configuration/Setup Utility program menus, the configuration information you can change is enclosed in brackets like these. You cannot change information that is not enclosed in brackets.

When working with the Configuration/Setup Utility program menu, you must use the keyboard. The following table shows the keys used to accomplish various tasks.

↑ ↓	Use these arrow keys to move among menu items until the item you want is highlighted.
← →	Use these arrow keys to display and toggle among choices for a menu item.
<b>Enter</b>	Press this key to select a highlighted menu item.
<b>Esc</b>	Press this key to exit from a menu after viewing or making changes to the settings in the menu.
+	Use this key in some menus to increase the numerical value of a setting.
-	Use this key (the minus or hyphen key) in some menus to decrease the numerical value of a setting.
<b>0 - 9</b>	Use the number keys in some menus to change the numerical value of a setting.
<b>F1</b>	Press this key for help on a selected menu item.
<b>F9</b>	Press this key if you changed and saved the setting of a selected menu item and you want to restore the setting that was active before you made the change.
<b>F10</b>	Press this key to return the setting of a selected menu item to a default value.

**Note:** Active keys are displayed at the bottom of each screen; not all of these keys are active on every menu.

## Exiting from the Configuration/Setup Utility program

When you finish viewing or changing settings, press Esc to return to the Configuration/Setup Utility program menu (you might have to press Esc several times). If you want to save the new settings, select Save Settings before you exit. Otherwise, your changes will not be saved.

---

## Using passwords

You can use passwords to provide security for your computer and data. There are two kinds of passwords: a power-on password and an administrator password. You do not have to set a password of either type to use your computer. However, if you decide to set either one, read the following sections.

## Power-on password

The power-on password feature deters unauthorized persons from gaining access to your computer. To set a power-on password, you must first set an administrator password.

## Administrator password

Setting an administrator password deters unauthorized persons from changing configuration settings. If you are responsible for maintaining the settings of several computers, you might want to set an administrator password.

After you set an administrator password, a password prompt is displayed each time you try to access the Configuration/Setup Utility program. If you type the wrong password, you will see an error message. If you type the wrong password three times, you must turn the computer off and start again.

If both the power-on and administrator passwords are set, you can type either password. However, to change any configuration settings, you must use your administrator password.

## Setting, changing, and deleting a password

To set, change, or delete a password, do the following:

**Note:** A password can be any combination of up to seven characters (A- Z, a-z, and 0-9). To set a power-on password, an administrator password must be set.

1. Start the Configuration/Setup Utility program (see “Starting and using the Configuration/Setup Utility program” on page 27).
2. From the Configuration/Setup Utility program menu, select **System Security** and press Enter. Press F1 for help when setting, changing or deleting passwords.

---

## Using Security Profile by Device

You can use Security Profile by Device to control the level of security for the following:

<b>IDE controller</b>	When this feature is set to <b>Disable</b> , all devices connected to the IDE controller (such as hard disk drives) are disabled and will not be displayed in the system configuration.
-----------------------	---

Using Security Profile by Device, you can also control which devices require a password before they start up. There are two classes of these devices:

- Removable media drives, such as CD-ROM drive

- Hard disk drives
- Network devices

You can set these devices to request a user password, an administrator password, or to not require a password. This way, if you have a power-on or administrator password set for your computer, you can configure your computer to prompt you for a password only when certain devices are accessed at startup. For example, if you set **Hard Disk Devices** to require a user password, each time you attempt to start up from the hard disk, you will be prompted to type the password before the startup proceeds.

Some operating systems require you to type a password before the operating system will start. Security Profile by Device does not change the way the operating system works. If an operating system password is required, you must type it when prompted, regardless of the Security Profile by Device settings.

To set Security Profile by Device, do the following:

1. Start the Configuration/Setup Utility program (see “Starting and using the Configuration/Setup Utility program” on page 27).
2. From the Configuration/Setup Utility program menu, select **System Security** and press Enter.
3. Select **Security Profile by Device** and press Enter.
4. Select the desired devices and settings and press Enter.
5. Press Esc twice to return to the Configuration/Setup Utility program menu.
6. Select **Save Settings** from the Configuration/Setup Utility menu and press Enter. Then press Esc and follow the instructions on the screen to exit from the Configuration/Setup Utility program.

---

## Other settings in the Configuration/Setup Utility program

The information in this section contains instructions for changing the startup sequence, Remote Administration, and the Pentium III microprocessor serial number feature.

### The startup sequence

Your computer can be started from several devices including the hard disk drive, and CD ROM drive, or from the network. The startup program looks for these devices in a specified sequence and starts the computer from the first device in the sequence that contains startable media or code. You can specify a different startup sequence for when your computer is turned on from the power button than for when it is turned on automatically, such as over a LAN or by a timer. The Configuration/Setup Utility program is used to select the primary startup sequence and the automatic power-on startup sequence.

## Changing the startup sequence

To view or change the primary or automatic power-on startup sequence, do the following:

1. Start the Configuration/Setup Utility program (see “Starting and using the Configuration/Setup Utility program” on page 27).
2. Select **Start Options** and press Enter.
3. Select **Startup Sequence** from the Start Options menu and press Enter.
4. Use the arrow keys to make your selections, and press Esc until you return to the Configuration/Setup utility program menu.
5. Select **Save Settings** from the Configuration/Setup utility menu and press Enter; then press Esc and follow the instructions on the screen to exit from the Configuration/Setup utility program.

If you have changed these settings and want to return to the default settings, select **Load Default Settings** on the main Configuration/Setup Utility menu.

## Pentium III microprocessor serial number feature

Some models have an Intel Pentium III microprocessor that features a unique electronic identification number designed to enhance security during electronic commerce transactions and to hamper software piracy.

To change this setting, do the following:

1. Start the Configuration/Setup Utility program. See “Starting and using the Configuration/Setup Utility program” on page 27.
2. From the Configuration/Setup Utility program menu, select **Advanced Setup** and press Enter.
3. At the Advanced Setup menu, select **Processor Control** and press Enter.
4. Select **CPU Serial Number**.
5. Press the right arrow key to change the setting to either **Enabled** or **Disabled**.
6. Press Esc two times to return to the Configuration/Setup Utility program menu.
7. Select **Save Settings** and press Enter.
8. Select **Exit Setup** and press Enter.
9. When prompted, press Enter to exit from the Configuration/Setup Utility program.

For more information about the Pentium III microprocessor, visit <http://www.intel.com/pentiumiii/utility.htm> on the World Wide Web.

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## Chapter 5. Installing options

You can expand the capabilities of your computer by adding more memory or optional low-profile PCI adapters. Use the instructions in this chapter along with instructions that might come with the option.

This chapter includes information about removing the computer cover and the hard disk drive. To replace these items, you can generally reverse the removal procedure. If you need additional information when replacing the hard disk drive and covers, look in the removal procedures.

---

### Handling static-sensitive devices

Static electricity, although harmless to you, can seriously damage computer components and options. When you add an option, do *not* open the static-protective package containing the option until you are instructed to do so.

When you handle options and other computer components, take these precautions to avoid static electricity damage:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle components carefully.
- Handle adapters and memory modules by the edges. Never touch any exposed circuitry.
- Prevent others from touching components.
- When you install a new option, touch the static-protective package containing the option to an unpainted metal surface on the computer for at least two seconds. This reduces static electricity in the package and your body.
- When possible, remove the option and install it directly in the computer without setting the option down. When this is not possible, place the static-protective package that the option came in on a smooth, level surface and place the option on it.
- Do not place the option on the computer cover or other metal surface.

---

## Backing up configuration settings

### Important

Run ConfigSafe (or a similar application) to take a snapshot of your computer configuration before installing an optional device. Using this snapshot, you can view and compare the changes in the computer configuration after you install an option. Also, if you have problems configuring the option after it is installed, you can use ConfigSafe to restore the configuration to the previous settings.

When you start your computer for the first time, ConfigSafe takes a snapshot of the initial configuration of your computer. You might be able to use this snapshot to restore the configuration to the initial settings.

ConfigSafe is a part of the preinstalled software in your computer. For more information, use the ConfigSafe help system.

---

## Available options

For the latest information about available options, see the following World Wide Web pages:

- <http://www.ibm.com/pc/us/options/>
- <http://www.ibm.com/pc/support/>

You can also obtain information through the following sources:

- Within the United States, call 1-800-IBM-2YOU (1-800-426-2968), your IBM reseller, or IBM marketing representative.
- Within Canada, call 1-800-565-3344 or 1-800-465-7999.
- Outside the United States and Canada, contact your IBM reseller or IBM marketing representative.

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## Tools required

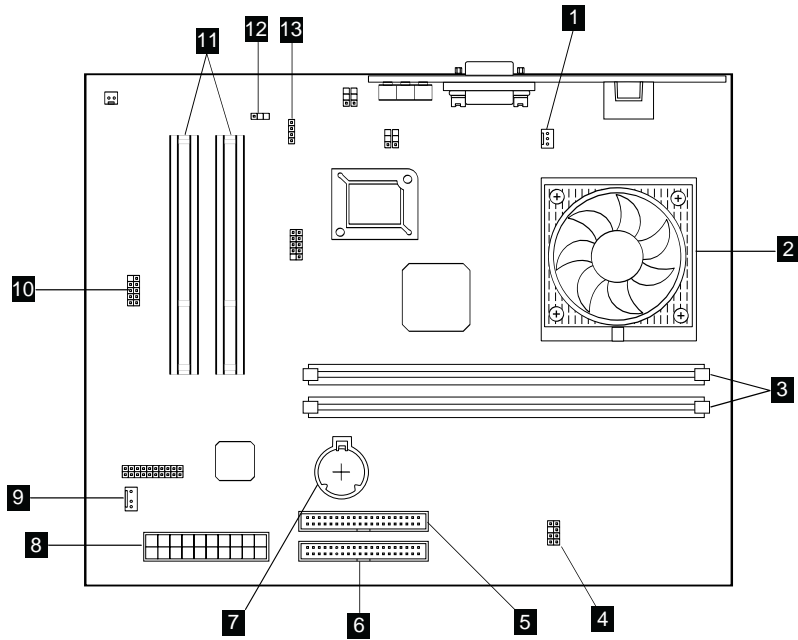
To install or remove some options in your computer, you will need a Phillips-head and a flat-blade screwdriver. Additional tools might be needed for certain options. See the instructions that come with the option.

---

## Component locations

The following illustration shows the locations of various components on the system board.

## System board



- |                                    |   |
|------------------------------------|---|
| <b>1</b> Fan connector             | <b>8</b> Power connector                  |
| <b>2</b> Microprocessor            | <b>9</b> Asset ID antenna connector       |
| <b>3</b> DIMM sockets (SDRAM)      | <b>10</b> Front USB port connector        |
| <b>4</b> LEDs, power connector     | <b>11</b> Low-profile PCI expansion slots |
| <b>5</b> CD-ROM drive connector    | <b>12</b> Boot Block (CMOS Clear) Jumper  |
| <b>6</b> Hard disk drive connector | <b>13</b> CD-ROM drive audio connector    |
| <b>7</b> Battery                   |   |



---

## Disconnecting cables

To disconnect cables, do the following:

1. Remove any media (CD) from the CD-ROM drive and shut down your operating system.
2. Read the “Safety information” on page vii.
3. Read “Handling static-sensitive devices” on page 33.
4. Turn off all attached external devices and turn off the computer.
5. Unplug the computer power cord from the electrical outlet.
6. Unplug the power cords for any attached devices from their electrical outlets.
7. Disconnect all communication cables (such as modem and network cables) from communication outlets.
8. Disconnect all other cables attached to the computer.

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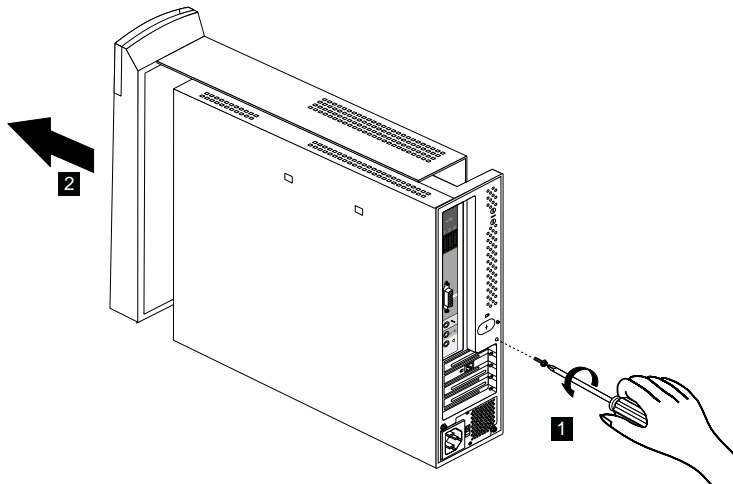
## Removing the computer cover

You must remove the computer cover to install internal options such as memory and low-profile PCI adapters.

**Attention:** Proper cooling is necessary to avoid damage to your computer. Do not operate your computer without all covers in place.

To remove the computer cover, do the following:

1. Disconnect all cables attached to your computer. See “Disconnecting cables” on page 36.
2. Remove the screw **1** that secures the computer cover to the computer.
3. Carefully slide the computer cover forward **2**, and lift the cover up.



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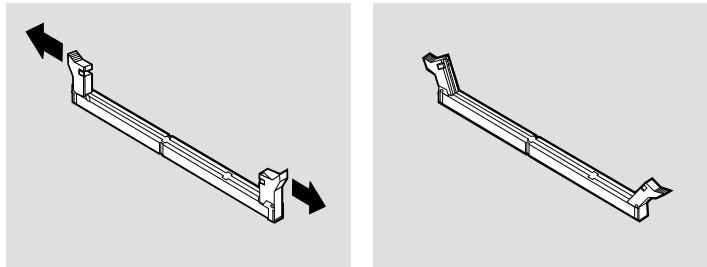
## Installing memory

You can add memory to your computer to increase system performance. Your computer has two DIMM connectors for installing memory. The maximum amount of SDRAM memory is 512 MB.

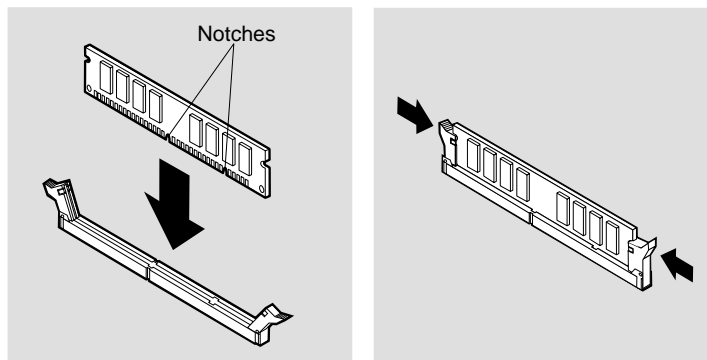
To install a DIMM, do the following:

1. Remove the computer cover. See “Removing the computer cover” on page 36.
2. Locate the DIMM sockets on the system board. See “System board” on page 35.
3. Open the module retaining clips on one of the DIMM sockets.

**Note:** If you are replacing an existing DIMM, remove the existing DIMM.



4. Position the new DIMM over the socket, making sure that the notches in the DIMM are aligned with the tabs on the socket. Push the DIMM straight down into the connector until the retaining clips close.



5. Replace the computer cover.

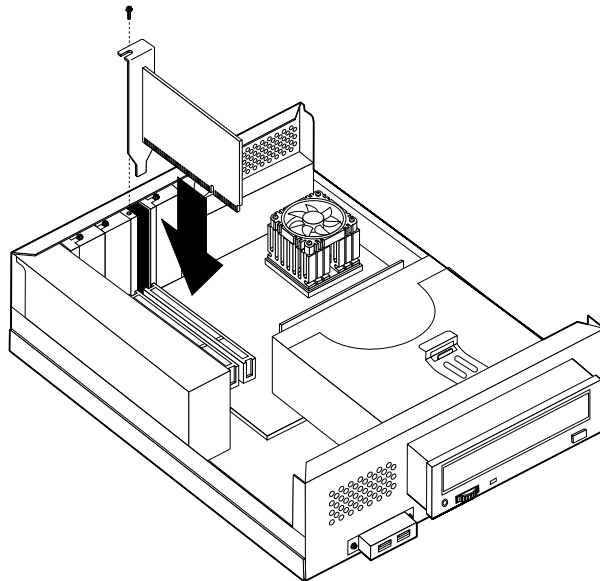
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## Installing an adapter

Your computer system board has two low-profile peripheral component interconnect (PCI) expansion slots. Depending on your model, the expansion slots might already have adapters installed. You can install a low-profile PCI adapter in any available PCI expansion slot. These adapters must not exceed 16.9 cm (6.66 inches) in length and 5.15 cm (2.04 inches) in height. Also, low-profile PCI adapters use low-profile mounting brackets.

To install an adapter, do the following:

1. Remove the computer cover. See “Removing the computer cover” on page 36.
2. Remove the screw and slot cover for the expansion slot.
3. Install the adapter into the expansion slot on the system board, and then install the screw that secures the adapter.



4. Replace the computer cover.

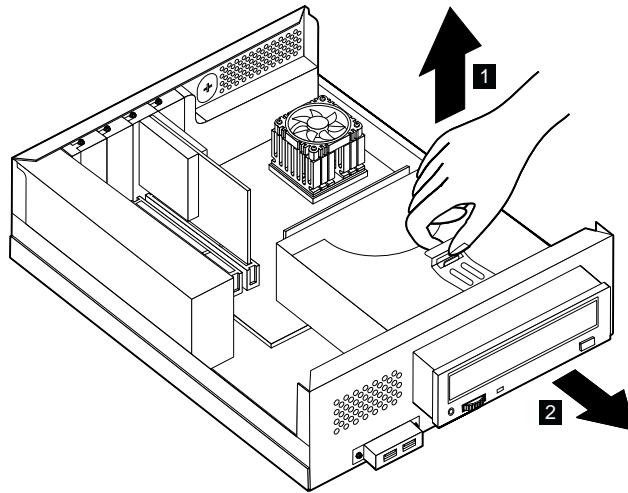
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## Removing the CD-ROM drive

You have to remove the CD-ROM drive to replace the hard disk drive.

To remove the CD-ROM drive, do the following:

1. Remove the computer cover. See “Removing the computer cover” on page 36.
2. Release the CD-ROM drive by pulling on the clip **1** as shown in the following illustration.



3. Unplug the signal, power and audio cables from the CD-ROM drive.
4. Pull out the CD-ROM drive **2**, and set it aside.

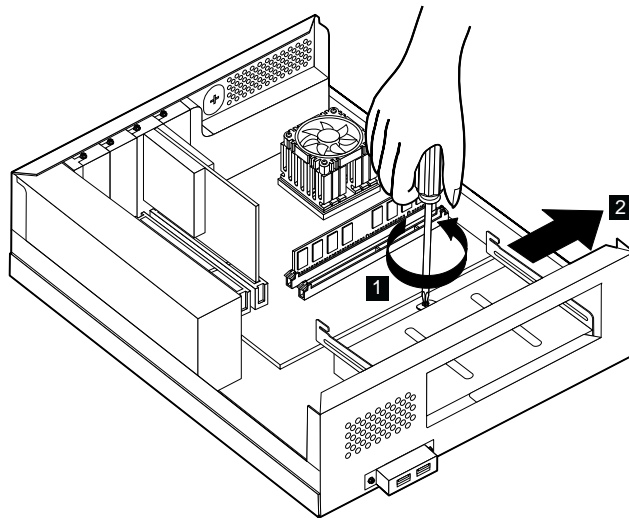
---

## Replacing the hard disk drive

You can replace the hard disk drive to increase capacity.

To remove the hard disk drive, do the following:

1. Remove the computer cover. See “Removing the computer cover” on page 36.
2. Remove the CD-ROM drive. See “Removing the CD-ROM drive” on page 39.
3. Remove the screw **1** that secures the hard disk drive (with frame) to the computer.



4. Slide the hard disk drive (with frame) outward **2**, and disconnect the power cable and the signal cable from the drive.
5. Detach the hard disk drive (with frame).
6. Remove the four screws that secure the hard disk drive to its frame, and detach the hard disk drive.
7. Insert a replacement hard disk drive into the frame and install the screws.
8. Reinstall the hard disk drive (with frame).
9. Reinstall the CD-ROM drive.
10. Replace the computer cover.

---

## Chapter 6. Troubleshooting

This chapter describes diagnostic tools that you can use to identify and correct problems that might come up as you use your computer. This chapter also contains information about option diskettes and how to recover from a BIOS update failure.

### Note

If your computer does not start when you press the power button, do the following:

- Make sure your computer is connected to a working electrical outlet.
- Make sure all cables are securely connected to the correct connectors.

If this does not correct the problem, have the computer serviced.

Computer problems can be caused by hardware, software, or user error (for example, erasing the wrong file). You can use the diagnostic aids discussed in this chapter to help you solve such problems yourself or gather helpful information you can pass on to a service technician.

You can check the hardware by following the procedures in this chapter. You can also use the diagnostic programs provided with your computer (see “IBM Enhanced Diagnostics” on page 56 for a description of these programs).

If you do not identify a hardware problem and have not made a user error, you might have a software problem. If you suspect that you have a software problem and your computer comes with IBM-preinstalled software, see “IBM Enhanced Diagnostics” on page 56 for information about how to run the IBM Enhanced Diagnostics program provided by IBM. Also see the operating system documentation supplied with your computer. If you have installed software applications yourself, see the documentation supplied with the software.

The following tools are available to diagnose hardware-related problems:

- Power-on self-test (POST)
- Troubleshooting procedure
- Error codes and messages
- Troubleshooting charts
- IBM Enhanced Diagnostics program

---

### Troubleshooting procedure

Use this procedure as a starting point for problem identification.

1. To begin troubleshooting, perform the following steps:
  - a. Remove any media from the drives.

- b. Turn off the computer and wait a few seconds.
- c. Turn on any attached devices; then, turn on the computer.
- d. Wait the normal amount of time for the first window of your application or the operating system to be displayed.

**Is either the Windows desktop or the first screen of your application program displayed?**

**No** - Continue at step 2.

**Yes** - The power-on self-test (POST) did not detect a problem. Further diagnostic testing is required. Go to "Running the IBM Enhanced Diagnostics program" on page 57 and run the diagnostic programs. If you are unable to run the diagnostic programs or if the diagnostic programs do not detect an error, go to "Device troubleshooting charts" on page 47.

2. You have an unreadable display or an error message is displayed.

**Is an error message displayed?**

**No** - Continue at step 3.

**Yes** - Refer to "POST error codes" on page 43 and look for the error message; then return here.

**Is the error message in this table?**

**No** - The message might be from your software. Refer to documentation for your application program.

**Yes** - Continue at step 4.

3. Go to "Device troubleshooting charts" on page 47. Find the symptom that best describes the problem, and take the appropriate action. If the problem persists, have the computer serviced.
4. **Did the Configuration/Setup Utility program start automatically after the error message was displayed?**

**No** - Follow the action for this error message described in "POST error codes" on page 43.

**Yes** - continue to step 5.

5. **Have you recently added, removed, or changed any hardware?**

**No** - Have the computer serviced.

**Yes** - Do one of the following:

- If the failure occurred *immediately* after you installed or removed an option, and you have not yet updated the configuration, see "Chapter 4. Using the Configuration/Setup Utility program," on page 27.
- If the computer was functioning correctly after you installed an option and is now malfunctioning, have the computer serviced.
- If the failure occurred immediately after you made a change to the configuration, verify that you selected the correct settings.

---

## Power-on self-test (POST)

Each time you turn on your computer, it automatically performs a series of tests that check the basic operation of the base computer. This series of tests is called the *power-on self-test* (POST).

POST does the following:

- Checks basic system board operations
- Checks the memory operation
- Compares the current system configuration with that established by the Configuration/Setup Utility program
- Starts the video operation
- Verifies that the hard disk drive and the CD-ROM drive are working

POST error codes are displayed when POST detects problems with or changes to the hardware configuration during startup. POST error messages are 3-, 4-, 5-, 8-, or 12-character alphanumeric messages and include brief explanations.

---

## POST error codes

The computer might display more than one error message. Often, the first error to occur causes subsequent errors. When using the POST message charts in this section, always begin by following the suggested action for the first error message that is displayed. Note that, in these tables, *x* can be any alphanumeric character.

Code	Description	Action
101	Interrupt failure	Have the computer serviced.
102	Timer failure	Have the computer serviced.
103	Processor speed set too high	Have the computer serviced.
106	Diskette controller failure	Have the computer serviced.
114	External ROM checksum failure	Have the computer serviced.
129	Level 1 cache error	Have the computer serviced.
131	POST detected a system board voltage out of range	Have the computer serviced.
135	Microprocessor fan failure	Have the computer serviced.
136	Hardfile fan failure	Have the computer serviced.
151	Real time clock failure	Have the computer serviced.
161	Defective CMOS Battery	Replace the battery. See "Replacing the battery" on page 57.



<b>Code</b>	<b>Description</b>	<b>Action</b>
162	A change in the device configuration occurred -or- CMOS RAM checksum failure	<ol style="list-style-type: none"> <li>1. Verify that all external devices are turned on.</li> <li>2. Verify that all devices are properly installed and securely connected.</li> <li>3. If you added, removed, or changed the location of a device, you must save the new configuration in the Configuration/Setup Utility program. See "Chapter 4. Using the Configuration/Setup Utility program," on page 27 for more information.</li> </ol>
163	Clock not updating	Have the computer serviced.
164	CMOS RAM memory size does not match	Go to "Running the IBM Enhanced Diagnostics program" on page 57 for instructions on running memory diagnostics.
166	Boot block checksum error	Have the computer serviced.
167	Clock not updating	Have the computer serviced.
168	Alert-on-LAN is not working correctly	<ol style="list-style-type: none"> <li>1. Go to "Starting and using the Configuration/Setup Utility program" on page 27, and follow the instructions to verify that Alert on LAN is enabled.</li> <li>2. If Alert on LAN is enabled and you still get this error code, have the computer serviced.</li> </ol>
175	EEPROM error	Have the computer serviced.
176	System cover has been removed	Type the administrator password. If the problem persists, have the computer serviced.
177	Inventory violation	Type the administrator password. If the problem persists, have the computer serviced.
183	Administration password required	Type the administrator password.
184	Asset control antenna not detected	Have the computer serviced.
186	System board or hardware security error	Have the computer serviced.
187	Administrator password and startup sequence has been cleared	Go to "Starting and using the Configuration/Setup Utility program" on page 27, and follow the instructions to set an administrator password and the startup sequence.

<b>Code</b>	<b>Description</b>	<b>Action</b>
19x	The computer chassis-intrusion detector was cleared. This is an informational message.	No action is required.
2xx	Memory error	Go to "Running the IBM Enhanced Diagnostics program" on page 57 for instructions on running memory diagnostics.
301 or 303	Keyboard error	<ol style="list-style-type: none"> <li>1. Make sure the keyboard is properly connected.</li> <li>2. If the keyboard is properly connected, have the computer serviced.</li> </ol>
604	Unsupported diskette drive installed	<ol style="list-style-type: none"> <li>1. Go to "Running the IBM Enhanced Diagnostics program" on page 57 and follow the instructions for running the IBM Enhanced Diagnostics program.</li> <li>2. If the problem persists, have the computer serviced.</li> </ol>
605	Diskette unlocked problem	Have the computer serviced.
662	Diskette drive configuration error	<ol style="list-style-type: none"> <li>1. Go to "Starting and using the Configuration/Setup Utility program" on page 27, and follow the instructions to verify the diskette drive configuration.</li> <li>2. Run the diagnostic program for the diskette drive. See "Running the IBM Enhanced Diagnostics program" on page 57.</li> <li>3. If the problem persists, have the computer serviced.</li> </ol>
762	Math coprocessor configuration error	Have the computer serviced.
1762	Hard disk configuration error	<ol style="list-style-type: none"> <li>1. Go to "Starting and using the Configuration/Setup Utility program" on page 27, and follow the instructions to verify the hard disk configuration.</li> <li>2. If the problem persists, have the computer serviced.</li> </ol>

Code	Description	Action
178x	Hard disk or IDE device failed	<ol style="list-style-type: none"> <li>1. Go to “Running the IBM Enhanced Diagnostics program” on page 57, and follow the instructions for running the diagnostic program for the hard disk drive and IDE devices.</li> <li>2. If the problem persists, have the computer serviced.</li> </ol>
18xx	A PCI adapter has requested an unavailable resource	Go to “Starting and using the Configuration/Setup Utility program” on page 27 and follow the instructions to reconfigure the PCI devices.
1962	No startup device found	<ol style="list-style-type: none"> <li>1. Go to “Starting and using the Configuration/Setup Utility program” on page 27 and follow the instructions to verify that the startup sequence is configured properly.</li> <li>2. If the problem persists, have the computer serviced.</li> </ol>
2400	Display adapter failed; using alternate	Have the computer serviced.
2462	Video configuration error	Have the computer serviced.
5962	IDE CD-ROM configuration error	Have the computer serviced.
8601	Pointing device error	Have the computer serviced.
8603	Pointing device has been removed	<ol style="list-style-type: none"> <li>1. Make sure that the pointing device is properly attached.</li> <li>2. If the problem persists, have the computer serviced.</li> </ol>

**Note:** Error codes 106, 604, 605, 622 may appear only if an external USB diskette drive is installed.

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## Device troubleshooting charts

You can use the troubleshooting charts in this section to find solutions to problems that have definite symptoms.

### **Important**

If you find it necessary to remove the computer cover, first read “Safety information” on page vii.

If you have just added new software or a new computer option and your computer is not working, do the following before using the troubleshooting charts:

1. Remove the software or device you just added.
2. Run the diagnostic programs to determine if your computer is running properly. (See “Running the IBM Enhanced Diagnostics program” on page 57 for information about diagnostic programs provided with your computer.)
3. Reinstall the new software or new device.

Use the following directory to quickly locate problem categories in the troubleshooting charts.

<b>Problem type</b>	<b>Go to</b>
Audio problems	“Audio problems” on page 48
CD-ROM drive	“CD-ROM drive problems” on page 49
Display/monitor	“Display/monitor problems” on page 50
General	“General problems” on page 50
Intermittent	“Intermittent problems” on page 51
Keyboard, mouse, or pointing device	“Keyboard, mouse, or pointing device problems” on page 51
Memory	“Memory problems” on page 52
Modem	“Modem problems” on page 52
Optional device	“Optional-device problems” on page 55
Software	“Software problems” on page 56
Universal Serial Bus (USB) device	“Universal Serial Bus (USB) problems” on page 56

## Audio problems

Symptom	Action
No audio in Windows	<ol style="list-style-type: none"> <li>1. Check the Windows Volume Control program to ensure the volume settings are not set too low or that the mute setting is not enabled. To access the Windows Volume Control program, do the following:               <ol style="list-style-type: none"> <li>a. From the Windows desktop, click <b>Start</b>.</li> <li>b. Select <b>Programs</b>.</li> <li>c. Select <b>Accessories</b>.</li> <li>d. Select <b>Multimedia</b>.</li> <li>e. Click <b>Volume Control</b>.</li> </ol> </li> <li>2. Make sure the program you are using is designed for use in Windows. If the program is designed to run in DOS, it does not use Windows sound features and must be configured to use Sound Blaster Pro or Sound Blaster emulation.</li> </ol> <p>If these actions do not correct the problem, run the diagnostic programs (see "Running the IBM Enhanced Diagnostics program" on page 57). If you need technical assistance, see "Chapter 7. IBM HelpWare support and services," on page 59.</p>
No audio when you play DOS games or use DOS programs	<ol style="list-style-type: none"> <li>1. Make sure the game or program is configured to use Sound Blaster Pro or Sound Blaster emulation. Refer to the documentation that came with your DOS program for instructions on selecting sound adapter settings.</li> <li>2. Shut down and restart your computer in MS-DOS mode. Then try to run the program again.</li> </ol> <p>If these actions do not correct the problem, run the diagnostic programs (see "Running the IBM Enhanced Diagnostics program" on page 57). If you need technical assistance, see "Chapter 7. IBM HelpWare support and services," on page 59.</p>

## CD-ROM drive problems

Symptom	Action
<p>An audio or AutoPlay- enabled disc does not automatically play when inserted into the drive.</p>	<p>Make sure you have the Windows AutoPlay feature enabled. To enable the AutoPlay feature, do the following:</p> <ol style="list-style-type: none"> <li>1. From the Windows desktop, double-click <b>My Computer</b>.</li> <li>2. In the My Computer window, double-click <b>Control Panel</b>.</li> <li>3. In the Control Panel window, double-click <b>System</b>.</li> <li>4. In the System Properties window, click the <b>Device Manager</b> tab.</li> <li>5. Double-click the <b>CD-ROM</b> list item and then double-click the listed <b>CD-ROM</b> option.</li> <li>6. In the Properties window, click the <b>Settings</b> tab.</li> <li>7. Under Options, select the <b>Auto insert notification</b> check box.</li> <li>8. Click <b>OK</b> to exit from the Properties window and save the setting.</li> </ol> <p>If this procedure does not correct the problem, run the diagnostic programs (see "Running the IBM Enhanced Diagnostics program" on page 57). If you need technical assistance, see "Chapter 7. IBM HelpWare support and services," on page 59.</p>
<p>A CD does not work.</p>	<ul style="list-style-type: none"> <li>• Verify that the disc is inserted correctly, with its label up.</li> <li>• Make sure that the disc you are using is clean. To remove dust or fingerprints, wipe the CD with a clean, soft cloth from the center to the outside. Wiping the CD in a circular direction might cause loss of data.</li> <li>• Verify that the disc you are using is good and not scratched or damaged. Try inserting another disc that you know is good. If you cannot read from a known-good disc, you might have a problem with your drive. Check that the power-supply cable and signal cable are securely connected to the drive (see "Chapter 5. Installing options," on page 33 for cover removal instructions).</li> <li>• Use the Configuration/Setup Utility program to verify that the drive is enabled (see "Chapter 4. Using the Configuration/Setup Utility program," on page 27).</li> </ul> <p>If these actions do not correct the problem, run the diagnostic programs (see "Running the IBM Enhanced Diagnostics program" on page 57). If you need technical assistance, see "Chapter 7. IBM HelpWare support and services," on page 59.</p>

## Display/monitor problems

Symptom	Action
General monitor problems	<ol style="list-style-type: none"><li>1. Make sure the brightness controls are adjusted correctly.</li><li>2. Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, see "Running the IBM Enhanced Diagnostics program" on page 57 and run diagnostics on the monitor.</li></ol> <p>If you cannot find the problem, check the other listings on monitor problems in this table.</p>
Blank screen	<p>Verify that the brightness controls are adjusted correctly.</p> <p>If you cannot correct the problem, have the computer serviced.</p>
Unreadable characters	<p>Have the computer serviced.</p>
The monitor works when you turn on the computer, but goes blank after some period of computer inactivity.	<p>The computer is probably set for energy savings, using one of the power management settings. If the power management features are enabled, disabling or changing the settings might solve the problem (see "Other settings in the Configuration/Setup Utility program" on page 31).</p>

## General problems

Symptom	Action
The computer does not start when you press the power button.	<p>Verify that:</p> <ol style="list-style-type: none"><li>1. All cables are securely connected to the proper connectors on the computer. For the location of the connectors, see "Connecting cables" on page 9.</li><li>2. The computer cover is properly installed.</li></ol> <p>If you cannot correct the problem, have the computer serviced.</p>

## Intermittent problems

Symptom	Action
A problem occurs only occasionally and is difficult to repeat.	<p>Verify that:</p> <ol style="list-style-type: none"> <li>1. All cables and cords are securely connected to the computer and attached devices.</li> <li>2. When the computer is turned on, the fan grill is not blocked (there is airflow around the grill), and the fans are working. If air flow is blocked or the fans are not working, the computer might overheat.</li> </ol> <p>If you cannot correct the problem, have the computer serviced.</p>

## Keyboard, mouse, or pointing device problems

Symptom	Action
All or some keys on the keyboard do not work.	<p>Verify that:</p> <ol style="list-style-type: none"> <li>1. The computer is turned on.</li> <li>2. The keyboard cable is securely connected to a USB connector on the computer. For the location of the USB connectors, see “Connecting cables” on page 9.</li> <li>3. If one or more of the Rapid Access buttons are the only keys that are not working, you might have these buttons disabled or not assigned to a function. Use the help system in the Rapid Access Customization Keyboard program to help diagnose problems with Rapid Access Buttons. To access the program and start the help system:               <ol style="list-style-type: none"> <li>a. From the Windows desktop, click <b>Start</b>.</li> <li>b. Select <b>Settings</b>, and then click <b>Control Panel</b>.</li> <li>c. Double-click <b>Keyboard (Rapid Access)</b>. The Rapid Access Keyboard Customization program starts.</li> <li>d. Click <b>Help</b>.</li> </ol> </li> </ol> <p>If you cannot correct the problem, have the computer serviced.</p>
The mouse or pointing device does not work.	<p>Verify that:</p> <ol style="list-style-type: none"> <li>1. The mouse or pointing-device cable is securely attached to a USB connector on the computer. To find the USB connectors, see “Connecting cables” on page 9.</li> <li>2. The device drivers for the mouse are installed correctly.</li> </ol> <p>If you cannot correct the problem, have the computer serviced.</p>



## Memory problems

Symptom	Action
The amount of memory displayed is less than the amount of memory installed.	<p>The amount of available memory shown might be somewhat less than expected because of basic input/output system (BIOS) shadowing and other resource requirements (such as ACPI and USB). Verify that:</p> <ol style="list-style-type: none"> <li>1. You have installed the correct type of DIMMs for your computer. See "Installing memory" on page 37.</li> <li>2. The DIMMs are properly installed and securely connected.</li> <li>3. If you added or removed memory, you saved the new configuration before exiting from the Configuration/Setup Utility program.</li> </ol> <p>If the problem persists, run the memory test from the diagnostic program supplied with your computer. (See "Running the IBM Enhanced Diagnostics program" on page 57 for further information.) The computer might have detected a bad DIMM and automatically reallocated memory so that it could continue to operate.</p> <p>If you cannot correct the problem, have the computer serviced.</p>

## Modem problems

Symptom	Action
When you try to use the modem, your computer or modem is unable to detect a dial tone.	<ol style="list-style-type: none"> <li>1. Make sure the telephone line is correctly connected to your computer. If you are using other communication devices in conjunction with the modem, such as an asymmetric digital subscriber line (ADSL) adapter or home networking adapter, refer to the documentation for those devices to ensure the cords are properly connected.</li> <li>2. Make sure no one is using the telephone.</li> <li>3. Make sure the telephone line is working.</li> <li>4. Add the modem command x3 to the initialization string for the communication program you are using. For help with changing the initialization string, refer to the documentation that comes with your communications program.</li> </ol>

Symptom	Action
<p>General modem/communication problems.</p>	<ol style="list-style-type: none"> <li>1. Make sure the telephone cords are connected correctly and securely. Connections for a standard modem are shown in "Disconnecting cables" on page 36. If you are using other communication devices in conjunction with the modem, such as an asymmetric digital subscriber line (ADSL) adapter or home networking adapter, refer to the documentation for those devices to ensure the cords are properly connected.</li> <li>2. Make sure the telephone line works. If you have a telephone connected to the modem, try making a call. If you do not have a telephone connected to the modem, plug a telephone into the same telephone outlet that the computer is plugged into (remember to reconnect the computer to the telephone outlet after verifying that the line is working).</li> <li>3. Make sure you are calling the correct number and that you are using the correct communications settings. For additional help, refer to the documentation for your communications software.</li> <li>4. Make sure no one else is using the telephone while you are communicating with another computer.</li> <li>5. If you have Call Waiting, make sure it is disabled.</li> <li>6. If some communications programs work but others do not, there might be a configuration problem. For additional help, refer to the documentation for your communications software.</li> <li>7. Make sure your modem cord is attached to an analog telephone line. The local telephone company can determine the type of telephone line.</li> <li>8. Make sure the modem is securely installed inside the computer. (See "Removing the computer cover" on page 36.)</li> </ol> <p>If these actions do not correct the problem, run the diagnostic programs (see "Running the IBM Enhanced Diagnostics program" on page 57). If you need technical assistance, see "Chapter 7. IBM HelpWare support and services," on page 59.</p>

Symptom	Action
<p>When you try to use the modem, it does not work.</p>	<ol style="list-style-type: none"> <li>1. If you added, changed, or reinstalled a modem, make sure it is installed correctly.</li> <li>2. Make sure your communications program is configured correctly. The following settings are generally compatible: <ul style="list-style-type: none"> <li>• Modem settings: <ul style="list-style-type: none"> <li>— Generic Hayes-type modem</li> <li>— Hayes-compatible error correcting</li> <li>— Hayes-compatible high speed</li> <li>— User-defined modem</li> <li>— Hayes modem</li> <li>— Other</li> </ul> <p>If you select a modem type of Other, you must include the proper modem initialization string. For most programs, the initialization string AT&amp;F will work.</p> </li> <li>• Baud rate: 115200 Kbps or the maximum setting offered by your communications software</li> <li>• COM port: COM1</li> </ul> <p>For help with configuring your communications program, refer to the documentation that comes with your communications program.</p> <p>If these actions do not correct the problem, run the diagnostic programs (see "Running the IBM Enhanced Diagnostics program" on page 57). If you need technical assistance, see "Chapter 7. IBM HelpWare support and services," on page 59.</p> </li> </ol>

## Optional-device problems

Symptom	Action
<p>An IBM option that was just installed does not work.</p>	<p>Verify that:</p> <ol style="list-style-type: none"> <li>1. The option is designed for your computer.</li> <li>2. You followed the installation instructions supplied with the option and in "Chapter 5. Installing options," on page 33.</li> <li>3. All option files (if required) are installed correctly. See "Chapter 5. Installing options," on page 33 for information about installing option files.</li> <li>4. You have not loosened other installed options or cables.</li> <li>5. If the option is an adapter, you have provided enough hardware resources for the adapter to function correctly. See the documentation supplied with the adapter (as well as the documentation for any other installed adapters) to determine the resources required for each adapter.</li> <li>6. You updated the configuration information in the Configuration/Setup Utility program, if necessary, and have no conflicts. For more information, see "Chapter 4. Using the Configuration/Setup Utility program," on page 27.</li> </ol> <p>If the problem persists, run the diagnostic programs. (See "Running the IBM Enhanced Diagnostics program" on page 57 for information about diagnostic programs provided with your computer.)</p> <p>If you cannot correct the problem, have the computer and the option serviced.</p>
<p>An IBM option that previously worked does not work now.</p>	<p>Verify that all option hardware and cable connections are secure.</p> <p>If the option comes with its own test instructions, use those instructions to test the option.</p> <p>If you cannot correct the problem, have the computer serviced.</p>

## Software problems

Symptom	Action
Software does not work as expected.	<p>To determine if problems are caused by installed software, verify that:</p> <ol style="list-style-type: none"><li>1. Your computer has the minimum memory requirements needed to use the software. See the information supplied with the software to verify memory requirements.</li></ol> <p><b>Note:</b> If you have just installed an adapter or memory, you might have a memory-address conflict.</p> <ol style="list-style-type: none"><li>2. The software is designed to operate on your computer.</li><li>3. The software you are using works on another computer.</li></ol> <p>If you received any error messages while using the software program, see the information supplied with the software for a description of the messages and solutions to the problem.</p> <p>If you cannot correct the problem, have the computer serviced.</p>

## Universal Serial Bus (USB) problems

Symptom	Action
A Universal Serial Bus (USB) device does not work.	Verify that the USB device is properly installed and firmly seated. If you cannot correct the problem, have the computer serviced.

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## IBM Enhanced Diagnostics

The *IBM Enhanced Diagnostics* program runs independently of the operating system. You can use this program to test the hardware components of your computer. This method of testing is generally used when other methods are not available or have not been successful in isolating a problem suspected to be hardware related.

You can run the IBM Enhanced Diagnostics program using the Product Recovery CD that comes with your computer.

## Running the IBM Enhanced Diagnostics program

Use the following steps to run diagnostics from the *Product Recovery CD*.

1. Insert the *Product Recovery CD* into the CD-ROM.
2. Restart your computer. If your computer does not start from the CD, then you need to change the startup sequence (for further information, see “Changing the startup sequence” on page 32) below, and then restart your computer.
3. Wait for the main menu to open.
4. From the main menu, select **System Utilities**.
5. From the System Utilities menu, select **Run Diagnostics**. The IBM Enhanced Diagnostics program starts.
6. When you finish running the diagnostics, remove the CD from the CD-ROM drive and turn off the computer.
7. If you changed the First Startup Device in the Primary Startup Sequence, then restore it to the original setting. See “Changing the startup sequence” on page 32.

---

## Replacing the battery

Your computer has a special type of memory that maintains the date, time, and settings for built-in features. A battery keeps this information active when you turn off the computer.

The battery requires no charging or maintenance throughout its life; however, no battery lasts forever. If the battery fails, the date, time, and configuration information (including passwords) are no longer set. An error message is displayed when you turn on the computer.

### **CAUTION:**

**Danger of explosion if battery is incorrectly replaced.**

**When replacing the battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.**

### ***Do not:***

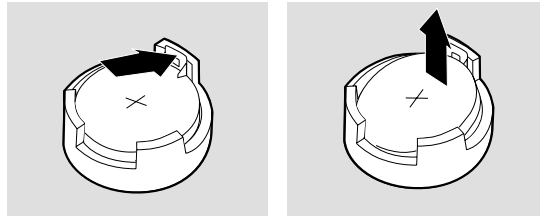
- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

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

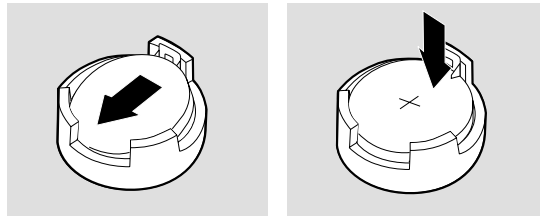
For further information on battery disposal, call IBM at 1-800-IBM-4333 (1-800-426-4333) in the U.S. For information outside of the U.S., contact your IBM reseller or marketing representative.

To change the battery, do the following:

1. Turn off the computer and all attached devices.
2. Remove the computer cover. See “Removing the computer cover” on page 36.
3. Remove the CD-ROM drive. See “Removing the CD-ROM drive” on page 39.
4. Locate the battery. See “System board” on page 35.
5. Remove the old battery.



6. Install the new battery.



7. Reinstall the CD-ROM drive.
8. Replace the cover, and plug in the power cord.  
**Note:** When the computer is turned on for the first time after battery replacement, an error message might be displayed. This is normal after the battery is replaced.
9. Turn on the computer and all attached devices.
10. Use the Configuration/Setup Utility program to set the date and time and any passwords.
11. Dispose of the old battery as required by local ordinances or regulations.

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## Chapter 7. IBM HelpWare support and services

IBM HelpWare® services are available from IBM whenever you need help, for as long as you own your IBM computer. They include a variety of services, options, and solutions. When your warranty period expires, HelpWare services are available for purchase.

There are two ways to get help quickly from IBM:

- **On the World Wide Web.** Refer to “Using electronic services” on page 60 for the address of your country- or region-specific IBM Support Web page.
- **By telephone.** Refer to “Getting help by telephone” on page 61 for information about HelpWare telephone services.

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### Before you call for service

Many computer problems can be solved without outside assistance, by using the online help or by looking in the online or printed documentation that comes with your computer or software. Following are some methods you can use to solve problems yourself.

#### Printed documentation

The documentation that comes with your computer contains information about how to troubleshoot hardware and software problems. Match the description or error codes with the symptom, and follow the instructions to solve the problem.

#### Online documentation

Your computer also comes with online documentation, such as Help and README files installed on your hard disk, which you can use to solve problems.

#### Help files

The operating system and most preinstalled programs on your computer contain online help files. Most help files contain information about solving problems and preventing future problems.

#### README files

Most operating system and software programs also come with a file named README.TXT. This is a text file that contains important information about the program. You can read README.TXT files by opening them in any text file editor on your computer.



## Software

Your computer comes with several software programs to help you solve problems or find answers to your questions.

### Diagnostic programs provided with your computer

Your computer comes with a set of diagnostic programs to help you identify computer problems: PC-Doctor for Windows and IBM Enhanced Diagnostics.

PC-Doctor for Windows works through the Windows operating system to diagnose hardware and report operating-system-controlled settings that can cause hardware problems. You might have to install PC-Doctor for Windows from the *Software Selections CD* before you can use it. IBM Enhanced Diagnostics is an enhanced version of the DOS-based PC-Doctor program. IBM Enhanced Diagnostics performs tests directly on the hardware, independent of the Windows operating system. You run IBM Enhanced Diagnostics directly from the *Product Recovery CD*. Make sure you run both of these programs before you contact the IBM PC HelpCenter® for technical support. For more information about installing or using the diagnostic programs, see the "Troubleshooting" information in the documentation that comes with your computer.

### IBM Update Connector

With IBM Update Connector, you can connect to the IBM PC HelpCenter technical-support center to receive and download updates for some of the software that comes with your computer. After you have received the files, you can begin the automated installation process. IBM Update Connector is available to registered IBM customers during the warranty period at no charge. Telephone line charges might apply.

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## Using electronic services

There are many ways to receive technical support and information. When you use electronic support, the only charges that typically apply are the ones you pay to your telephone company or to the company you use to log onto the World Wide Web (your Internet service provider). Here are some of the electronic support options that you can use.

### The World Wide Web

You can link to the IBM Personal Computing Support page to search for technical tips, download device-driver updates, and find out about many other things.

The address for the IBM Personal Computing Support page is:

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

From the IBM Personal Computing Support page, in the **Quick Path** field, type your four-digit machine type, and click **Go**.

You can access the IBM Online Assistant from the Web page for your machine type. The IBM Online Assistant is a tool that you can use to diagnose common technical problems. To use the IBM Online Assistant, you must first connect to the IBM Support Web page for your machine type and complete a personal profile. Use the IBM Online Assistant for troubleshooting and step-by-step solutions.

### **Getting information by fax**

If you have a touch-tone telephone and access to a fax machine, in the U.S. and Canada you can receive by fax marketing and technical information on many topics, including hardware, operating systems, and local area networks (LANs). You can call the IBM Automated Fax System 24 hours a day, 7 days a week. Follow the recorded instructions, and the requested information will be sent to your fax machine.

To access the IBM Automated Fax System, call 1-800-426-3395.

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### **Getting help by telephone**

During the warranty period, you can get help and information by telephone through the IBM PC HelpCenter technical-support center. Expert technical-support representatives are available to assist you. You might be charged for some calls and not for others, depending upon the type of problem. You must register your computer to receive telephone support.

The following services are available by telephone.

#### **30-day "Up and Running" support**

During the first 30 days after you purchase your computer, you can call the IBM HelpCenter technical-support center at no charge to ask questions about:

- Setting up your computer and attaching a monitor and printer
- Starting the preinstalled operating system
- Starting the preinstalled software programs and the software programs that come with your computer

Long distance telephone charges might apply.

#### **Technical support for software**

If you need help setting up or installing the preinstalled software programs or the software programs that come with your computer during the 30-day "Up and Running" support period, technical-support representatives can help you install (or reinstall) the software that comes with your computer, if necessary. Answers to your "how to" questions about software programs are available for a fee. For more information, or for help with installing, configuring, or using software, see "Purchasing additional support" on page 64.

## Hardware warranty service

If the IBM computer that you purchased does not function as warranted, during the period of your warranty, the IBM PC HelpCenter technical-support center will provide warranty service for IBM factory-installed hardware.

**Note:** Make sure that you write down your date of purchase and keep your receipt in a safe place. You will be required to present your proof of purchase to receive service under your IBM warranty.

Your IBM computer is subject to the terms of your IBM warranty and the IBM International License Agreement for Non-Warranted Programs, which are included with your computer. Please read these terms carefully.

If your computer needs to be serviced, please provide the servicer with the *Product Recovery and Diagnostics* CD that comes with your computer. This will help the servicer to complete the required service.

If your computer is having a problem that is not covered by your IBM warranty, see "Purchasing additional support" on page 64.

## What to do before you call

**Note:** If your call is not covered by 30-day "Up and Running" support or by your IBM warranty, you will be required to provide a major credit-card number for support.

By doing the following items, you will help the IBM PC HelpCenter technical-support representative handle your call, and you will help reduce the amount of time it takes to diagnose problems and answer your questions.

1. Register your computer through the IBM Product Registration program that comes installed on your computer.
2. If possible, run both the DOS version and the Windows version of PC-Doctor diagnostics. Save and print the log files created by both the DOS and Windows versions of diagnostics so that you can provide these to the technical-support representative. (The log file created in the Windows version is automatically saved in C:\PCDR\DETAILED.TXT.) For information about how to use the PC-Doctor diagnostics, refer to the "Troubleshooting" information in the documentation that comes with your computer.

When you call the IBM HelpCenter, you will be required to provide the following information:

- Name
- Address
- Telephone number
- Machine type, model, and serial number
- Registration number (when you receive one)
- Date of purchase
- A description of the problem
- The exact wording of any error messages

- Hardware and software configuration information for your computer

If your call is not covered by 30-day "Up and Running" support or by your IBM warranty, you might be required to provide a major credit-card number for support. You will not be billed if it is determined that your call is covered under "Up and Running" support or by your IBM warranty.

Please be at your computer when you call.

Country or region	Phone number	Hours of operation
Australia	13-14-26	9 a.m. to 9 p.m. (EST - Australia), 365 days a year
Austria	1 546 325 102	10 a.m. to 1 p.m. and 2 p.m. to 7 p.m. CET Monday - Friday
Belgium (Dutch)	02-714-3504	9 a.m. to 9 p.m. CET Monday - Friday
Belgium (French)	02-714-3503	9 a.m. to 9 p.m. CET Monday - Friday
Canada	1-800-565-3344	24 hours a day, 7 days a week (excluding holidays)
Denmark	3525-6904	9 a.m. to 9 p.m. CET Monday - Friday; 10 a.m. to 7 p.m. CET Saturday
Finland	(09) 2294 3004	8 a.m. to 8 p.m. CET Monday - Friday
France	01-6932-4004	9 a.m. to 9 p.m. CET Monday - Friday
Germany	069-6654-9004	10 a.m. to 1 p.m. and 2 p.m. to 7 p.m. CET Monday - Friday
Ireland	01-8159208	9 a.m. to 9 p.m. GMT Monday - Friday
Italy	02-4827-7003	10 a.m. to 1 p.m. and 2 p.m. to 7 p.m. CET Monday - Friday
Luxembourg	298-977-5058	9 a.m. to 9 p.m. CET Monday - Friday
Netherlands	020-504-0530	9 a.m. to 9 p.m. CET Monday - Friday
New Zealand	0800-446-149	9 a.m. to 9 p.m. (EST - Australia), 365 days a year
Norway	2-305-0304	9 a.m. to 9 p.m. CET Monday - Friday; 12 noon to 5:30 p.m. CET Saturday and Sunday
Portugal	01 791-5147	Voice mail only
Spain	91-662-4261	10 a.m. to 1 p.m. and 2 p.m. to 7 p.m. CET Monday - Friday
Sweden	08-632-0051	9 a.m. to 9 p.m. CET Monday - Friday
Switzerland (French)	0848 80 55 00	9 a.m. to 9 p.m. CET Monday - Friday

Country or region	Phone number	Hours of operation
Switzerland (German)	0848 80 55 00	10 a.m. to 1 p.m. and 2 p.m. to 7 p.m. CET Monday - Friday
Switzerland (Italian)	0848 80 55 00	10 a.m. to 1 p.m. and 2 p.m. to 7 p.m. CET Monday - Friday
United Kingdom	01475-555 001	9 a.m. to 9 p.m. GMT Monday - Friday
U.S.A. and Puerto Rico	1-800-772-2227	24 hours a day, 365 days a year (response times may vary)

In the United States and Canada, the technical-support representative might also be able to fax or mail additional technical or product information to you, such as:

- Sales information
- Product brochures
- Locations of IBM resellers
- Services available through IBM

If you need help with a specific program or if you need help after your warranty has ended, these services are available for a fee. For more information about additional services, see “Purchasing additional support” on page 64.

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## Purchasing additional support

During and after the warranty period for your computer, you can purchase additional HelpWare services. Enhanced PC Support Line service includes assistance with the following items:

- Assistance with installing, configuring, and using selected software applications
- Using the operating system
- Setting up and using multimedia device drivers
- Installing and configuring out-of-warranty IBM PC products

## How to purchase additional support

You can purchase support in the following ways. All of the following support options are available in all countries unless otherwise noted.

### 900 number

In the United States and Canada, you can call the 900 number to receive immediate support from an IBM PC HelpCenter technical-support representative. Your local telephone company will bill you by the minute for each call. Persons under age 18 must have permission of a parent or legal guardian prior to placing the call.

Country	Phone number	Hours of operation	Cost
United States	For installing and configuring in-warranty IBM products: 1-900-555-HELP(4357)	Monday - Friday, 9 a.m. to 9 p.m. Eastern time	\$2.99 (U.S. currency) per minute beginning after the first minute
United States	For using application software and for out-of-warranty IBM products: 1-900-555-CLUB(2582)	Monday - Friday, 9 a.m. to 9 p.m. Eastern time	\$2.99 (U.S. currency) per minute beginning after the first minute
Canada	1-900-565-9988	24 hours a day	\$3.50 (Canadian currency) per minute

### Flat rate

You can call the IBM PC HelpCenter technical-support center to purchase support for a single incident or multiple incidents (in Canada, call 1-800-565-3344). The flat-rate option is not available in Australia or New Zealand.

### Single incident

The single-incident option allows you to pay a flat fee for each individual problem you need to resolve.

### Multiple-incident packs

With multiple-incident packs, you can purchase a block of problem resolutions at a discount from the single-incident price. Each pack expires one year from the date of purchase. The following multiple-incident packs are available:

- 3-incident pack
- 5-incident pack (Australia and New Zealand only)
- 10-incident pack

In most countries, all available options are payable by credit card only. In Australia, all options are payable by credit card, cheque, or money order.

An incident is a request for telephone assistance about a single question or problem. An incident can involve multiple conversations or actions that might include (but are not limited to):

- Your initial request
- Research by IBM
- A call back from IBM to you

Requests for assistance on multiple questions or problems will be considered as multiple incidents.

To order additional support packages, refer to “What to do before you call” on page 62 for the phone numbers and hours of operation in your country or region. In the United States and Canada, use the following part numbers when you call.

Support package	U.S. part number	Canadian part number
Single incident	2419720	EPCS1
3-incident pack	2419721	EPCS3
10-incident pack	2419722	EPCS10

## Getting more information

Enhanced PC Support Line services are available for products on the Supported Products list. To receive a brochure of Enhanced PC Support Line services or a Supported Products list:

- In the U.S. and Canada:
  1. Call 1-800-426-3395.
  2. Select option 1.
  3. Select option 1.
  4. Select a document:
    - For a brochure, select document number 11690.
    - For a Supported Products list, select document number 11682.
  5. When you have finished, press 1.
  6. Enter your fax number and press the # key.
- In all other countries, contact your IBM reseller or IBM marketing representative.

## International Warranty Service

International Warranty Service (IWS) is an IBM program that is available on selected IBM Commercial PC products. IWS allows customers who travel or need to move products to another country to register the products with IBM's International Warranty Service Office (IWSO). Upon registering the product with the IWSO, IBM will issue a certificate that will be honored wherever IBM or IBM resellers sell and service IBM Commercial PC products.

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## Appendix A. Computer records

This appendix contains a form for recording information about your computer, which can be helpful if you ever need to have your computer serviced.

Record and retain the following information:

Product name	IBM Computer Type 6644, 6645, or 6646
Machine type (M/T) - model	_____
Serial number (S/N)	_____
Date of purchase	_____
Registration number	_____

The machine type (M/T) and model numbers and the serial number (S/N) for your computer are located on a label on the rear of the computer and also on a label on the front of the computer.

The registration number is required for service or support. You can register your computer by telephone when you call for service or support. See *About Your Software* for more information about registering your computer.





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## Product warranty and notices

This section contains product warranties and notices.

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### Warranty Statements

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

- **United States, Puerto Rico, and Canada (Z125-4753-05 11/97)** (“IBM Statement of Limited Warranty for United States, Puerto Rico, and Canada (Part 1 - General Terms)”)
- **Worldwide except Canada, Puerto Rico, Turkey, and United States (Z125-5697-01 11/97)** (“IBM Statement of Warranty Worldwide except Canada, Puerto Rico, Turkey, United States (Part 1 - General Terms)” on page 73)
- **Worldwide Country-Unique Terms** (“Part 2 - Worldwide Country-Unique Terms” on page 76)

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

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

**Machine** - NetVista Type 6644

**Warranty Period\*** - Parts: One (1) Year, Labor: One (1) Year

IBM will provide warranty service without charge for:

1. Parts and labor during the first year of the warranty period.

**Machine** - NetVista Type 6645

**Warranty Period\*** - Parts: Three (3) Years, Labor: One (1) Year\*\*

\*\*IBM will provide warranty service without charge for:

1. Parts and labor during the first year of the warranty period.

2. Parts only, on an exchange basis, in the second and third years of the warranty period.

**Machine** - NetVista Type 6646

**Warranty Period\*** - Parts: Three (3) Years, Labor: Three (3) Years\*\*

\*\*IBM will provide warranty service without charge for:

1. Parts and labor during the three years of the warranty period.

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

### **The IBM Warranty for Machines**

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

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

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

### **Extent of Warranty**

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

**THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME**

**JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.**

#### **Items Not Covered by Warranty**

IBM does not warrant uninterrupted or error-free operation of a Machine.

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

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

#### **Warranty Service**

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

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

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

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

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

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided

- a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,
- b. secure all programs, data, and funds contained in a Machine,
- c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and
- d. inform IBM or your reseller of changes in a Machine's location.

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

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

### **Production Status**

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

### **Limitation of Liability**

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

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the greater of U.S. \$100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

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

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

## **IBM Statement of Warranty Worldwide except Canada, Puerto Rico, Turkey, United States (Part 1 - General Terms)**

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

**Machine** - NetVista Type 6644

**Warranty Period\*** - Parts: One (1) Year Labor: One (1) Year

IBM will provide warranty service without charge for:

1. Parts and labor during the first year of the warranty period.

IBM will charge you for any labor it provides in performance of the repair or replacement.

**Machine** - NetVista Type 6645

**Warranty Period\*** -

EMEA and Argentina - Parts: Three (3) Years Labor: Three (3) Years

Japan - Parts: One (1) Year Labor: One (1) Year

All other countries not listed - Parts: Three (3) Years Labor: One (1) Year\*\*

\*\*IBM will provide warranty service without charge for:

1. Parts and labor during the first year of the warranty period.

2. Parts only, on an exchange basis, in the second and third years of the warranty period.

IBM will charge you for any labor it provides in performance of the repair or replacement.

**Machine** - NetVista Type 6646

**Warranty Period\*** -

Bangladesh, China, Hong Kong, India, Indonesia, Malaysia, Philippines, Singapore, Sri

Lanka, Taiwan, Thailand, and Vietnam - Parts: Three (3) Years Labor: One (1) Year\*\*

Japan - Parts: One (1) Year Labor: One (1) Year

All other countries not listed - Parts: Three (3) Years Labor: Three (3) Years

\*\*IBM will provide warranty service without charge for:

1. Parts and labor during the three years of the warranty period.

2. Parts only, on an exchange basis, in the second and third years of the warranty period.

IBM will charge you for any labor it provides in performance of the repair or replacement.

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

### **The IBM Warranty for Machines**

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

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

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

#### **Extent of Warranty**

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

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

#### **Items Not Covered by Warranty**

IBM does not warrant uninterrupted or error-free operation of a Machine.

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

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

#### **Warranty Service**

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

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the

available types of service for a Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

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

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

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

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided
  - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,
  - b. secure all programs, data, and funds contained in a Machine,
  - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and
  - d. inform IBM or your reseller of changes in a Machine's location.

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

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

### **Production Status**

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

### **Limitation of Liability**



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

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the greater of U.S. \$100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

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

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

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## **Part 2 - Worldwide Country-Unique Terms**

### **ASIA PACIFIC**

**AUSTRALIA: The IBM Warranty for Machines:** The following paragraph is added to this Section:

The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other legislation and are only limited to the extent permitted by the applicable legislation.

**Extent of Warranty:** The following replaces the first and second sentences of this Section:

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, operation in other than the Specified Operating Environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible.

**Limitation of Liability:** The following is added to this Section:

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

**PEOPLE'S REPUBLIC OF CHINA: Governing Law:** The following is added to this Statement:

The laws of the State of New York govern this Statement.

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

1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence;
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

**NEW ZEALAND: The IBM Warranty for Machines:** The following paragraph is added to this Section:

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

**Limitation of Liability:** The following is added to this Section:

Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this Section are subject to the limitations in that Act.

#### **EUROPE, MIDDLE EAST, AFRICA (EMEA)**

**The following terms apply to all EMEA countries.**

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

#### **Warranty Service**

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

If you purchased an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

The applicable laws, Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being

provided. However, the laws of Austria govern this Statement if the warranty service is provided in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Federal Republic of Yugoslavia, Georgia, Hungary, Kazakhstan, Kirghizia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine.

**The following terms apply to the country specified:**

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

Applicability of suppliers and resellers (unchanged).

**FRANCE: Limitation of Liability:** The following replaces the second sentence of the first paragraph of this Section:

In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: (items 1 and 2 unchanged).

**GERMANY: The IBM Warranty for Machines:** The following replaces the first sentence of the first paragraph of this Section:

The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this Section:

The minimum warranty period for Machines is six months.

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

**Extent of Warranty:** The second paragraph does not apply.

**Warranty Service:** The following is added to this Section:

During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

**Production Status:** The following paragraph replaces this Section:

Each Machine is newly manufactured. It may incorporate in addition to new parts, re-used parts as well.

**Limitation of Liability:** The following is added to this Section:

The limitations and exclusions specified in the Statement of Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

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

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

**IRELAND: Extent of Warranty:** The following is added to this Section:  
Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

**Limitation of Liability:** The following replaces items one and two of the first paragraph of this Section:

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

Applicability of suppliers and resellers (unchanged).

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

**ITALY: Limitation of Liability:** The following replaces the second sentence in the first paragraph:

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

Applicability of suppliers and resellers (unchanged).

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

**SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND:**

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

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

**UNITED KINGDOM: Limitation of Liability:** The following replaces items 1 and 2 of the first paragraph of this Section:

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence;

2. the amount of any other actual direct damages or loss, up to the greater of Pounds Sterling 150,000 or 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

The following item is added to this paragraph:

3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

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

### **NORTH AMERICA**

**CANADA: Warranty Service:** The following is added to this section:

To obtain warranty service from IBM, call **1-800-565-3344**.

**UNITED STATES OF AMERICA: Warranty Service:** The following is added to this section:

To obtain warranty service from IBM, call **1-800-772-2227**.

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## **Processing date data**

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

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

The foregoing is a Year 2000 Readiness Disclosure.

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## **Trademarks**

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- HelpCenter
- HelpWare
- NetVista
- Rapid Access

- ScrollPoint
- Wake on LAN

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Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries, or both.

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

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### Power cord notice

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
13F9978	Belgium, Bosnia, Croatia, Finland, France, Egypt, Germany, Greece, Hungary, Latin America (High Voltage), Norway, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Turkey
6952301	Bolivia, Canada, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Latin America (Low Voltage), Mexico, Nicaragua, Panama, Peru, Saudi Arabia, Taiwan, Thailand, United States of America, Venezuela

<b>IBM power cord part number</b>	<b>Used in these countries and regions</b>
14F0032	Hong Kong, Singapore, United Arab Emirates (Dubai), United Kingdom
13F9996	Denmark
14F0086	Israel
14F0068	Italy, Chile
14F0014	South Africa
14F0050	Switzerland





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