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User Guide

Type 2283

Type 6274



Note

Before using this information and the product it supports, be sure to read “Safety notices” on page vii and “Notices and Trademarks” on page 75.

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Safety notices

DANGER

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

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

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

DANGER

Le courant électrique provenant de l'alimentation, du téléphone et des câbles de transmission peut présenter un danger.

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, que vous déplacez, ou que vous manipulez 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"> 1. Mettez les unités hors tension. 2. Commencez par brancher tous les cordons sur les unités. 3. Branchez les câbles d'interface sur des connecteurs. 4. Branchez les cordons d'alimentation sur des prises. 5. Mettez les unités sous tension. 	<ol style="list-style-type: none"> 1. Mettez les unités hors tension. 2. Débranchez les cordons d'alimentation des prises. 3. Débranchez les câbles d'interface des connecteurs. 4. Débranchez tous les câbles des unités.

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.

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.

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.

Laser compliance statement

Some IBM Personal Computer models are equipped from the factory with an optical drive. Optical drives are also sold separately as options. Optical 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 an optical drive is installed, note the following handling instructions.

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 optical drive could result in exposure to hazardous laser radiation. There are no serviceable parts inside the optical drive. **Do not remove the drive covers.**

Some optical drives contain an embedded Class 3A or Class 3B laser diode. Note the following statement.

<p>DANGER</p>

<p>Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.</p>
--

DANGER

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.

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
DANGER	A DANGER notice is used to call attention to a situation that is potentially lethal or extremely hazardous to people.
CAUTION	A CAUTION notice is used to call attention to a situation that is potentially hazardous to people.
Attention	An Attention notice contains important information that can help you avoid damage to the hardware or software that comes with your computer.
Note:	A Note contains information you might find especially useful.
Important	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
Bold	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.

Related information

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

- *Access IBM*

This is a desktop application with links to helpful information about your computer. It can be opened by clicking the *Access IBM* icon or Start -> Access IBM on your desktop.

- *Quick Reference*

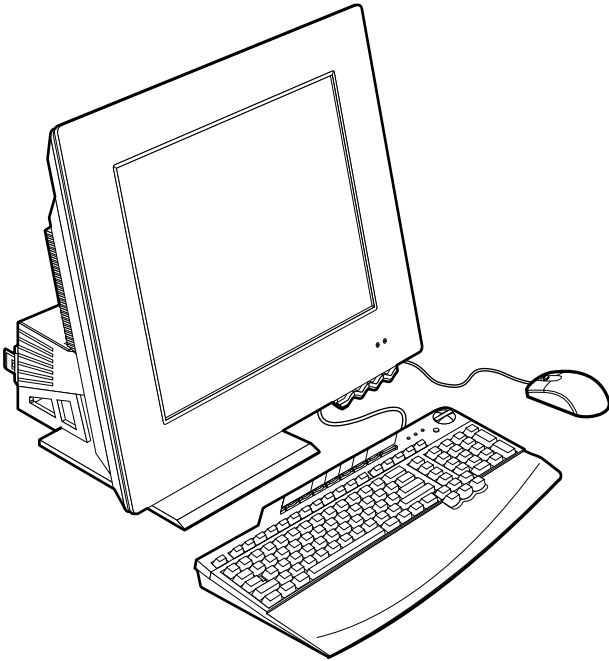
This hard copy publication contains information about setting up your computer, troubleshooting problems, and product recovery software.

- *Hardware Maintenance Manual*

This publication, for trained service technicians, can be downloaded from the World Wide Web as a PDF file. For more information, see Chapter 7, "Getting information, help, and service," on page 69.

Chapter 1. Product overview

Thank you for selecting an IBM NetVista X computer. Your computer incorporates many of the latest advances in computer technology. This chapter provides an overview of the computer, features, and preinstalled software.



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 right side of your computer. An example of a machine type/model number is 6274-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 IBM Setup Utility. For more information, see Chapter 4, "Using the IBM Setup Utility program," on page 27.

Microprocessor

- Intel® Pentium® 4 microprocessor
- Internal L2 cache memory size varies by model
- Front side bus (FSB) speed varies by model

Memory

- Two dual inline memory module (DIMM) sockets
- 133 MHz synchronous dynamic random access memory (SDRAM)
- 128 or 256 MB non-parity, non-ECC DIMMs (standard)
- 256 MB, 512 MB, or 1 GB non-parity, non-ECC DIMMs (optional)
- 2 GB maximum SDRAM supported
- Flash memory for system programs

Internal drives

- One EIDE hard disk drive
- One optical drive

Graphics subsystem

- Integrated high-performance graphics controller
- 16 MB of dedicated frame buffer memory

Audio subsystem

- Integrated, SoundMAX with SPX, digital audio
- A pair of built in stereo speakers to support multimedia applications

Communications

- Integrated 10/100 Ethernet
- Peripheral Component Interconnect (PCI) modem (some models only)

System management features

- Wake on LAN[®]
- Wake on Ring
- Wake on Alarm
- Automatic power-on startup
- System Management BIOS and software

Keyboard and mouse features

- IBM ScrollPoint[®] III mouse (some models)
- IBM Rapid Access[®] IIIe, Universal Serial Bus (USB), keyboard (some models)
- IBM Rapid Access Wireless keyboard and mouse (some models)
- IBM Preferred USB keyboard (some models)

Expansion capability

- Two low-profile PCI adapter expansion slots
- Six USB connectors
- Two DIMM sockets
- Parallel port
- Audio ports

Power

- 160 Watt power adapter
- Automatic switching between ranges, 88 and 269 Volts ac
- Automatic switching between 47 and 63 Hz input frequency range
- Built-in overload and surge protection
- Advanced Power Management support
- Advanced Configuration and Power Interface (ACPI) support

Security features

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

Supported operating systems

- Microsoft® Windows® XP Professional Edition
- Microsoft Windows XP Home Edition
- Microsoft Windows 2000 Professional

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.

Additional software

Your computer comes with a *Software Selections CD* that includes additional software that you might choose to install. Go to Access IBM for information about installing software from the *Software Selections CD*.

Access IBM

The Access IBM program is preinstalled on your computer and is accessible from the Start menu on the Windows desktop. It provides valuable information about using 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 notices” on page vii.

You will need the following:

- Computer
- Power adapter
- Power cord
- Keyboard
- Mouse

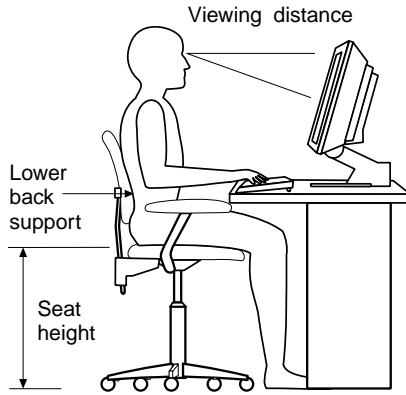
If you are missing an item, contact your place of purchase.

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.

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.

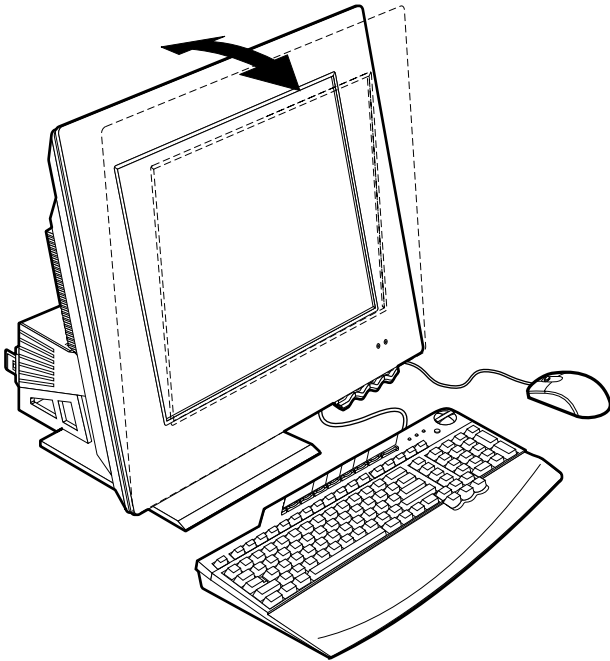
When using the keyboard, keep your forearms parallel to the floor and your wrists in a neutral, comfortable position.

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. The following illustrates tilting the monitor.



Dust buildup compounds problems associated with glare. Remember to clean your display screen periodically using a soft cloth. For smudges and grease, use a damp cloth and mild detergent (no solvents or abrasives). Always apply liquid to the cloth first, never directly to the display.

Air circulation

Your computer and monitor produce heat. The computer has two fans that pull 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.

Connecting cables

Read the following before connecting cables:

- Connect all device cables before plugging any power cords into an electrical outlet.
- Connect the power adapter cord to the computer **10** (see Figure 1 on page 9) 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 six USB connectors on your computer (see Figure 1 on page 9): four at the rear **9** and two on the top side **5** of the monitor.

If your computer comes with a USB keyboard and mouse, plug them into the USB ports at the rear of the computer near the power cord connector. These cables can be relocated to other USB connectors at a later time if desired.

If your computer comes with an IBM Dual Wireless Receiver, plug the receiver into one of the USB connectors at the rear of the computer. The Rapid Access Wireless Keyboard and the ScrollPoint Wireless Mouse operate with this receiver.

Notes:

1. Cable connectors from USB devices are keyed so that they cannot be connected incorrectly.
2. Do not place the IBM Dual Wireless Receiver on top of the power supply.

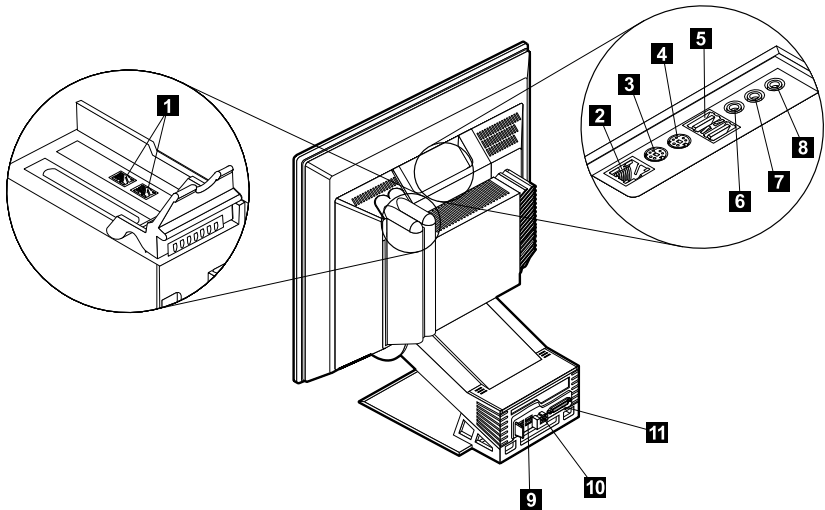


Figure 1. Connectors

- | | | | |
|----------|-------------------------|-----------|--------------------------|
| 1 | Modem connector | 7 | Audio line-out connector |
| 2 | Ethernet connector | 8 | Microphone connector |
| 3 | PS/2 mouse connector | 9 | USB connectors (rear) |
| 4 | PS/2 keyboard connector | 10 | Power adapter connector |
| 5 | USB connectors (top) | 11 | Parallel connector |
| 6 | Audio line-in connector | | |

Audio connectors

The audio connectors located at the top side of the monitor are audio line in **6**, audio line out **7**, and microphone **8**.

Other connectors

The illustration above also shows the connectors for optional devices that you might want to connect. This includes connectors for PS/2 mouse **3**, PS/2 keyboard **4**, Ethernet **2**, parallel devices **10**, and modem **1**. Your computer model might not have all connectors shown.

Starting the computer

Go to the *Quick Reference* for information about how to turn on your computer and see Chapter 3, “Operating and caring for your computer,” on page 11.

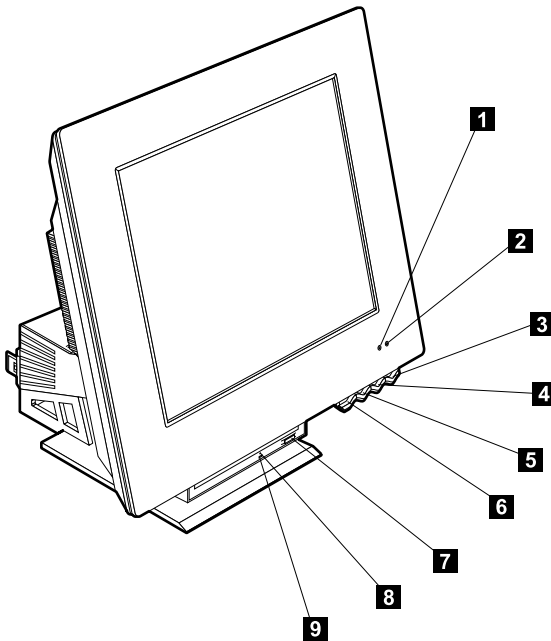
Note: If you suspect a problem, see Chapter 6, “Troubleshooting,” on page 43.

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 diskette drive, is in use.



- | | | | |
|----------|----------------------------------|----------|------------------------------------|
| 1 | Hard disk drive in-use indicator | 6 | Device bay release button |
| 2 | Power/standby indicator | 7 | Optical drive eject button |
| 3 | Power button | 8 | Optical drive emergency eject hole |
| 4 | LCD brightness increase button | 9 | Optical drive in use indicator |
| 5 | LCD brightness decrease button | | |

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

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.

Power/standby indicator: This status indicator is on when power to your computer is turned on.

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 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.

LCD brightness decrease button: Press and hold this switch until the monitor brightness is decreased to the desired level.

LCD brightness increase button: Press and hold this switch until the monitor brightness is increased to the desired level.

Device bay release button: Press this button to lower the device bay for access to the optical drive. To close it, push upwards on the device bay until it latches in the closed position.

Optical drive eject button: Press this button on the optical drive to open the tray for inserting or removing a disc.

Optical drive emergency eject hole: Insert a paper clip into this hole if you cannot open the tray using the optical drive eject button.

Optical drive in-use indicator: When this light is on, it indicates that your computer is reading from a disc.

Starting your computer

What you see and hear when you turn on your computer depends on the settings in the Startup menu of the IBM Setup Utility program. For more information, see Chapter 4, "Using the IBM Setup Utility program," on page 27.

If any errors are detected during POST, error messages are displayed. If a user password is set, a password prompt is displayed on the screen. If you have set both user 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 **Shut Down...** or **Turn off computer** (in Windows XP).
3. Click **Shut down** or **Turn Off** (in Windows XP).
4. Click **OK**.

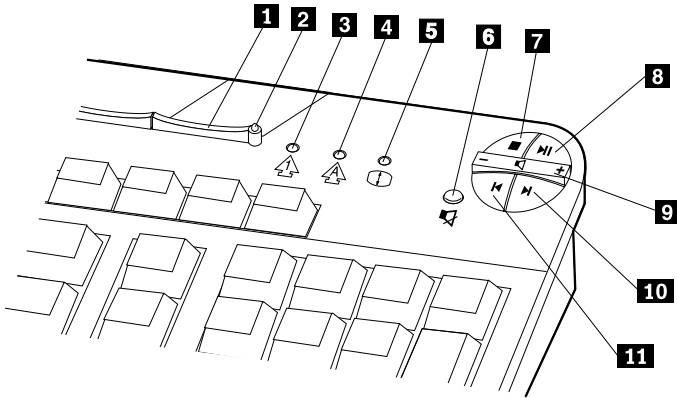
Using the Rapid Access keyboard

There are two types of Rapid Access keyboards for your computer, the Rapid Access IIIe (RAK IIIe) and the Rapid Access Wireless keyboard. There are some differences that will be discussed later. However, from an operational standpoint, they are the same.

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 optical drive 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.



- | | | | |
|----------|---------------------------------|-----------|-----------------------|
| 1 | Standby button | 6 | Mute button |
| 2 | Standby LED (RAK IIIe only) | 7 | Stop button |
| 3 | Num Lock LED (RAK IIIe only) | 8 | Play/Pause button |
| 4 | Caps Lock LED (RAK IIIe only) | 9 | Volume control |
| 5 | Scroll Lock LED (RAK IIIe only) | 10 | Next track button |
| | | 11 | Previous track button |

Multimedia controls

Customizing a Rapid Access Button

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**.

Rapid Access Wireless keyboard and mouse

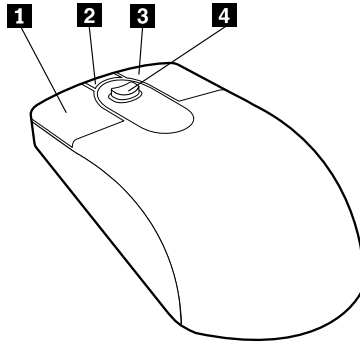
The Rapid Access Wireless keyboard and mouse operate by radio frequency (RF) communications with the IBM Dual Wireless Receiver that is connected to one of the USB connectors on the computer. When the wireless receiver is installed, a

software utility provides status icons and help information in the lower right corner of your desktop, just above the default Windows Taskbar. Click ? (help) to find more information about the wireless keyboard.

Using the IBM ScrollPoint mouse

There are two types of mice for your computer, the ScrollPoint III and the ScrollPoint Wireless mouse. There are some differences that will be discussed later. However, from an operational standpoint, they are the same.

The ScrollPoint 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.

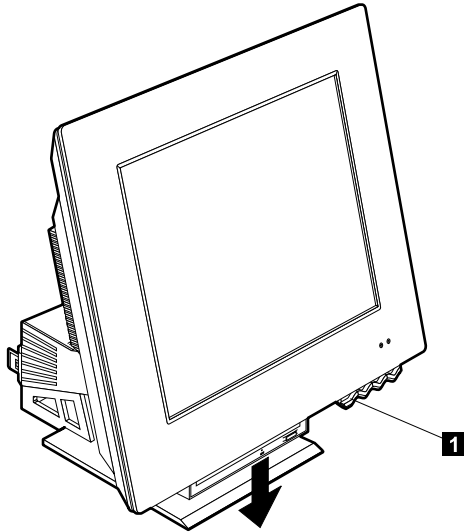
3 Context menu button: Use this button to display a menu for the active program, icon, or object.

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.

Accessing the optical drive

The optical drive is located in a drop-down device bay. To lower the device bay for access to the optical drive, press the device bay release button **1**. To close the device bay, push upwards on the device bay until it latches in the closed position.



Using an optical drive

Your computer has a preinstalled optical drive. The CD-ROM and DVD-ROM drives can play back or read from a CD or DVD disc but cannot write information to it. A CD-RW drive is capable of writing to a CD disc. The DVD/CD-RW drive can play back or read from a CD or DVD disc and can also write information to a CD. CD drives use industry-standard, 12 cm (4.75-inch) CDs.

Follow these guidelines when using an optical 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 disc into the drive.
- Before moving the computer, remove the disc from the drive.

Handling a disc

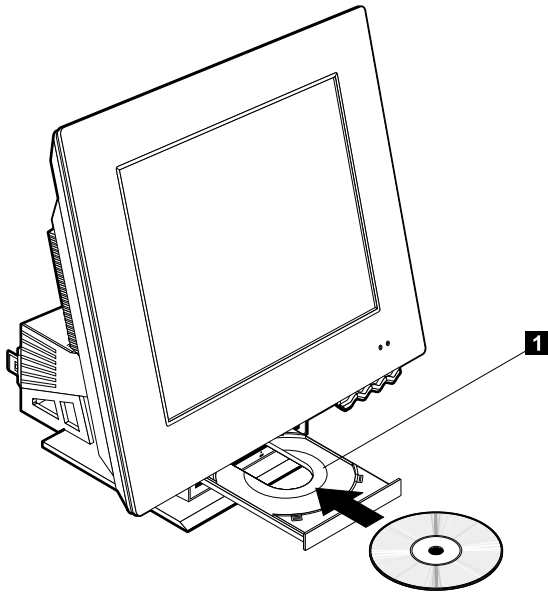
When handling a disc, follow these guidelines:

- 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 disc

To insert a disc:

1. Press the device bay release button to lower the device bay. See “Accessing the optical drive” on page 17.
2. With the computer turned on, press the eject button.
3. Place the disc in the tray with the label facing up **1**.
4. 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. Press the device bay release button to lower the device bay. See “Accessing the optical drive” on page 17.
2. With the computer turned on, press the eject button. When the tray slides out, carefully remove the disc.
3. 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 at the front of the optical drive.

Using video features

Your computer has a super video graphics array (XGA) graphics controller. XGA 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 Program* located on the hard disk drive.

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.

Using audio features

Your computer has a digital audio controller built into the system board. The system-board audio controller supports applications written for SoundMAX with SPX 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, and the power/standby indicator on the computer flashes to indicate that the computer is in Standby mode.

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** or **Turn off computer** (in Windows XP).
3. Click **Stand by** or **Stand By** (in Windows XP).
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.

To bring the computer out of Standby mode, 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 the computer power button for less than four seconds. 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 shutdown. 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. Windows XP and

Windows 2000 Professional use slightly different terminology as noted below. 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** (Windows 2000 Professional) or click **Power and Maintenance** then click **Power Options** (Windows XP). 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, pressing the power button or an incoming modem ring, brings the computer out of the Standby mode.

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 user password through the IBM 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 user password, the keyboard is locked when you turn on the computer. You must type the correct password before the keyboard will unlock. Use the IBM Setup Utility program to set a user 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 sticky and 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.

CAUTION:

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. Always apply liquid to the cloth first, never directly to the display.

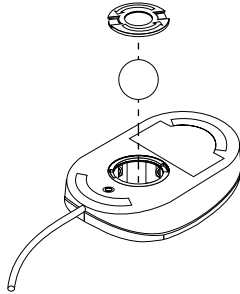
Mouse

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. Shut down the operating system and 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.

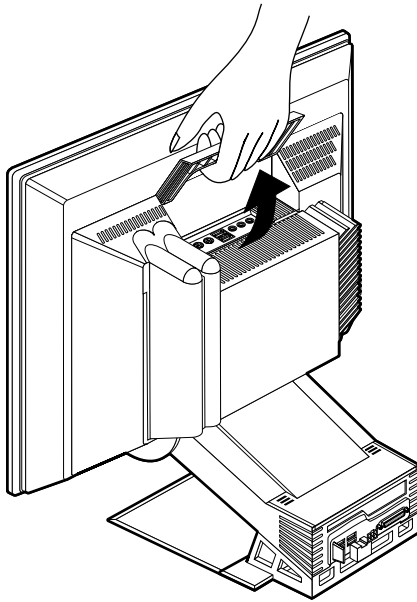


4. Place your hand over the retainer and turn the mouse right-side up. The retainer and ball will drop out into your hand.
5. Using a damp cloth, wipe the outside of the mouse and the retainer. Be sure to wipe the rollers inside the mouse.
6. Insert the ball and retainer. Lock the retainer by rotating 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 (diskettes, compact discs, tapes, and so on) 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 modem or network cables, from the phone line or network first, and then disconnect the other ends of cables from the computer.
5. Disconnect all cables connecting external devices such as a 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 IBM Setup Utility program

The IBM Setup Utility program is stored in the electrically erasable programmable read-only memory (EEPROM) of your computer. You can use the IBM 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 IBM Setup Utility program.

Starting and using the IBM Setup Utility program

To start the IBM Setup Utility program, do the following:

1. Turn on your computer. If your computer is already on when you start this procedure, you must shut down the operating system, turn off the computer, wait a few seconds until all in-use lights go off, and restart the computer.
2. When the IBM Setup Utility prompt displays in the lower-left corner of the screen during startup, press F1. (This prompt is displayed for only a few seconds. You must press F1 quickly.) If you have not set a password, the IBM Setup Utility program menu is displayed. If you have set a password, the IBM 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 IBM 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 IBM Setup Utility menu displayed by your computer might look slightly different from the menu shown here, but it will operate the same way.

IBM Setup Utility

Main Devices Startup Advanced Security Power Exit

> System Summary

Product Data:

Machine Type / Model	XXXX / XXXX
Flash EEPROM Revision Level	22KT05AUS
Boot Block Revision Level	2205A
System Board Identifier	XXXXXXXXXX
System Serial Number	XXXXXXXXXX
BIOS Date (MM/DD/YY)	XX/XX/XX

> System UUID

System Time (HH:MM:SS):	[XX:XX:XX]
System Date (MM/DD/YYYY):	[XX/XX/XXXX]
Language:	[English (US)]

F1: Help ↑↓: Up/Down -/+ : Select Values F9: Setup Defaults
Esc: Exit ←→: Left/Right Enter: Select F10: Save & Exit

The 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 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 program so that your computer will function properly.
- [] In the program menus, the information you can change is enclosed in brackets like these. You cannot change information that is not enclosed in brackets.

When working with the 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.

- | | |
|--------------|---|
| Enter | Press this key to select a highlighted menu item. |
| Esc | 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. |
| 0 - 9 | Use the number keys in some menus to change the numerical value of a setting. |
| F1 | Press this key for help on a selected menu item. |
| F9 | 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. |
| F10 | 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 IBM Setup Utility program

When you finish viewing or changing settings, press Esc to go to the **Exit** 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 user 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.

User password

The user password feature deters unauthorized persons from gaining access to your computer.

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 IBM 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 user 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 user password, an administrator password must be set.

1. Start the IBM Setup Utility program (see “Starting and using the IBM Setup Utility program” on page 27).
2. From the IBM 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

Security Profile by Device is used to enable or disable user access to the following devices:

IDE controller	When this feature is set to Disabled , all devices connected to the IDE controller (such as hard disk drives) are disabled and will not be displayed in the system configuration.
Diskette Drive Access	When this feature is set to Disabled , the diskette drive cannot be accessed.
Diskette Write Protect	When this feature is set to Enabled , all diskettes are treated as if they are write-protected.

To set Security Profile by Device, do the following:

1. Start the IBM Setup Utility program (see “Starting and using the IBM Setup Utility program” on page 27).
2. From the IBM 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 IBM Setup Utility program menu.
6. Select **Save Settings** from the **Exit** menu and press Enter. Then press Esc and follow the instructions on the screen to exit from the IBM Setup Utility program.

Other settings in the IBM Setup Utility program

The information in this section contains instructions for changing the startup sequence.

The startup sequence

Your computer can be started from several devices including the hard disk drive, diskette drive, and CD ROM or DVD-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 program is used to select the IBM Setup Utility 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 IBM Setup Utility program (see “Starting and using the IBM Setup Utility program” on page 27).
2. Select **Startup**.
3. Select **Startup Sequence** from the Startup menu and press Enter.
4. Use the arrow keys to make your selections, and press Esc until you return to the IBM Setup Utility program menu.
5. Select **Save Settings** from the **Exit** menu and press Enter; then press Esc and follow the instructions on the screen to exit from the IBM Setup Utility program.

If you have changed these settings and want to return to the default settings, select **Load Default Settings** on the **Exit** menu.

Chapter 5. Installing options

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

This chapter includes information about removing the rear 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.

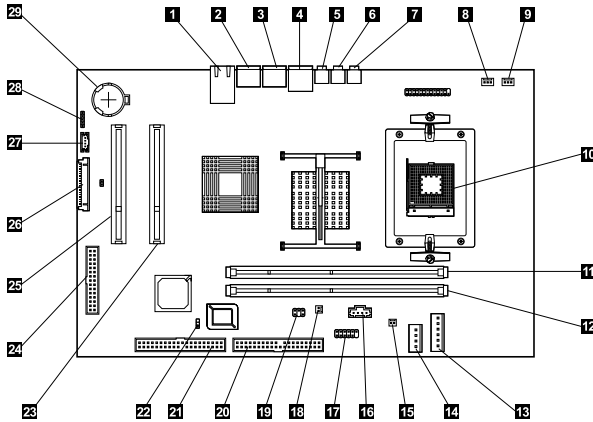
Tools required

To install or remove some options in your computer, you will need Phillips-head and a flat-blade screwdrivers. 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



- | | | | |
|-----------|---|-----------|-----------------------------------|
| 1 | Ethernet connector | 16 | Optical drive audio connector |
| 2 | PS/2 mouse connector | 17 | Serial connector |
| 3 | PS/2 keyboard connector | 18 | Touch panel power connector |
| 4 | USB connectors (two) | 19 | Touch panel signal connector |
| 5 | Audio line-in connector | 20 | USB/parallel port connector |
| 6 | Audio line-out connector | 21 | Optical/hard disk drive connector |
| 7 | Microphone connector | 22 | CMOS clear jumper |
| 8 | CPU fan connector | 23 | PCI expansion slot |
| 9 | System fan connector | 24 | POV card connector |
| 10 | Microprocessor | 25 | PCI expansion slot |
| 11 | DIMM socket (SDRAM) | 26 | TMDS connector |
| 12 | DIMM socket (SDRAM) | 27 | TMDS signal |
| 13 | Power connector | 28 | Internal speaker connector |
| 14 | Optical/hard disk drive power connector | 29 | Battery |
| 15 | Solenoid connector | | |

Disconnecting cables

To disconnect cables, do the following:

1. Remove any media (diskettes or CDs) from the drives and shut down your operating system.
2. Read the “Safety notices” 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.

Removing the rear cover

You must remove the rear cover to install internal options such as memory and PCI adapters.

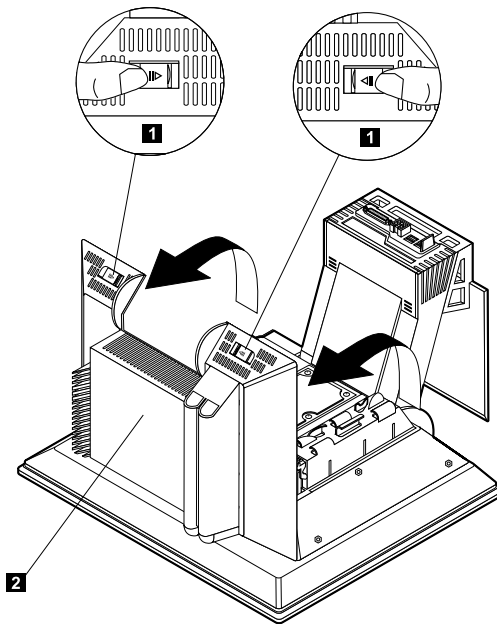
Attention: Proper cooling is necessary to avoid damage to your computer. Do not operate your computer without all covers in place.

To remove the rear cover, do the following:

1. Disconnect all cables attached to your computer. See “Disconnecting cables” on page 36.
2. Place the computer on a padded surface in the position shown in the following illustration.

Attention: Be sure to use a soft, padded surface such as cloth or paper towels when positioning the computer for service. The monitor or monitor bezel might be scratched if placed on a hard surface.


3. Slide and hold latches **1**; then pull and rotate the cover up until it clears the base **2**. Then remove the cover and put it in a safe place.

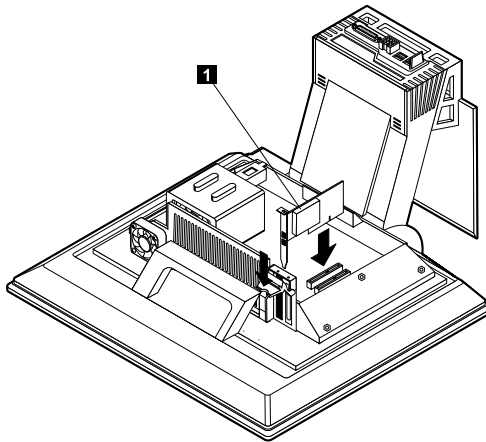


Installing an adapter

Your computer system board has two 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.

To install an adapter, do the following:

1. Remove the rear cover. See “Removing the rear cover” on page 37.
2. Rotate the card retainer down using the blue handle.
3. Remove the slot cover for the expansion slot.
4. Install the adapter  into the expansion slot on the system board.



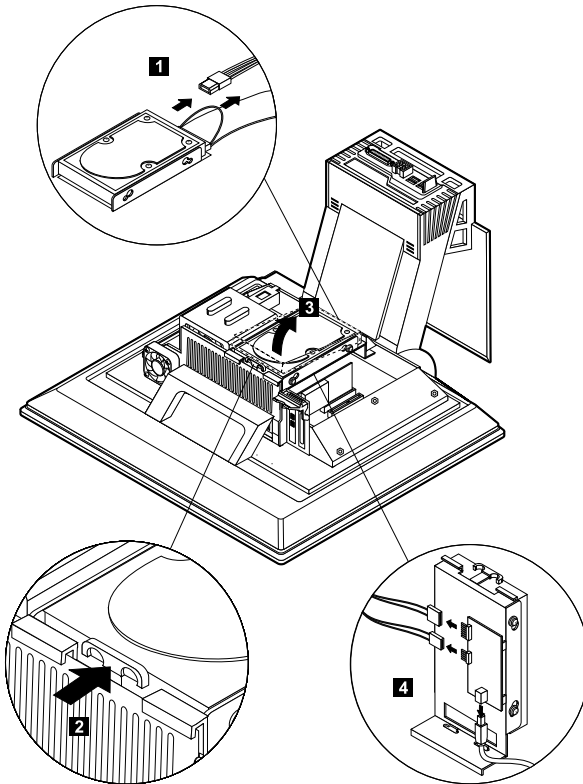
5. Rotate the card retainer up.
6. Replace the rear cover.

Removing the hard disk drive

The hard disk drive must be removed before you can install memory DIMMs.

To remove the hard disk drive, do the following:

1. Remove the rear computer cover. See “Removing the rear cover” on page 37.
2. Disconnect the power cable and signal cable from the hard disk drive **1**; then push connectors down through the opening in the hardfile bracket.
3. Release the hardfile bracket by pushing on the blue handle **2**; then rotate the bracket up **3**.
4. Unplug the remaining cables from the hardfile bracket **4**; then remove the bracket and place in a safe place.

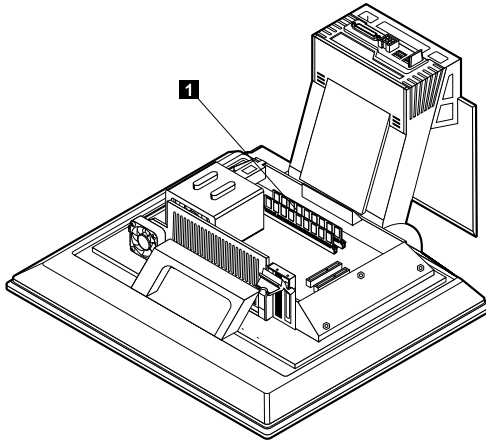


Installing memory

You can add memory to your computer to increase system performance. Your computer has two DIMM connectors **1** for installing memory. The maximum amount of SDRAM memory is 2 GB.

To install a DIMM, do the following:

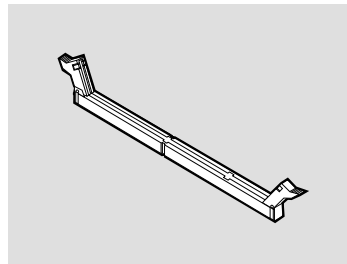
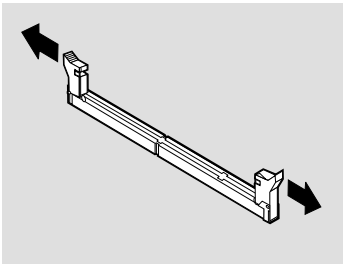
1. Remove the rear computer cover. See “Removing the rear cover” on page 37.
2. Remove the hard disk drive. See “Removing the hard disk drive” on page 39.



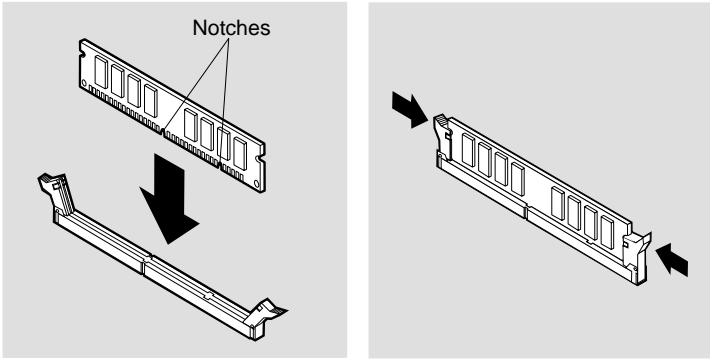
3. Locate the DIMM sockets on the system board. See “System board” on page 35.

4. Open the module retaining clips on one of the DIMM sockets.

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



5. 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.

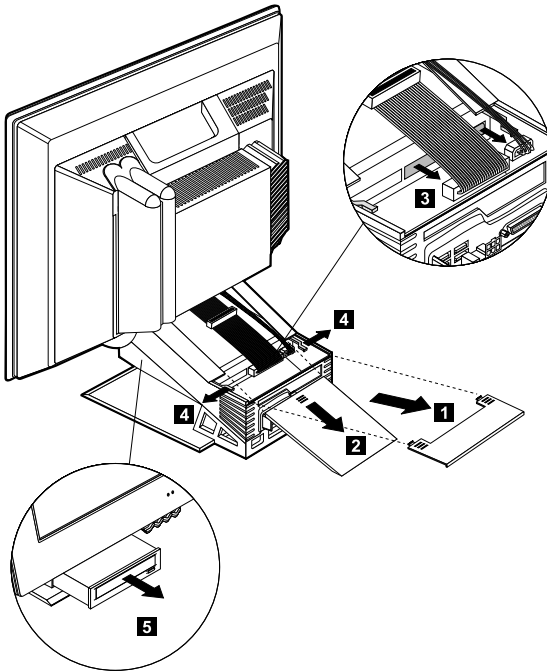


6. Replace the hard disk drive.
7. Replace the rear cover.

Removing the optical drive

To remove the optical drive, do the following:

1. Drop down the device bay. See “Accessing the optical drive” on page 17.
2. Press down and slide out the back cover **1**; then press down and slide out the optical drive top cover **2**.
3. Disconnect the power cable and signal cable from the optical drive **3**.
4. Pull out the release latches **4**; then slide out the optical drive **5**.



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 64 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 64 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 all diskettes and discs 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 66 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 48.

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

Is an error message displayed?

No - Continue at step 3 on page 44.

Yes - Refer to "POST error codes" on page 45 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 48. Find the symptom that best describes the problem, and take the appropriate action. If the problem persists, have the computer serviced.

4. **Did the IBM 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 45.

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 IBM 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 IBM Setup Utility program
- Starts the video operation
- Verifies that the diskette drives are working
- Verifies that the hard disk drive and the optical 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
151	Real time clock failure	<p>Go to “Starting and using the IBM Setup Utility program” on page 27, and follow the instructions to reset the time and date.</p> <p>If the problem persists, have the computer serviced.</p>
161	Defective CMOS Battery	<p>Replace the battery. See “Replacing the battery” on page 66.</p>
162	A change in the device configuration occurred	<p>Go to “Starting and using the IBM Setup Utility program” on page 27, and follow the instructions to load the Default Settings.</p> <p>If the problem persists, have the computer serviced.</p>
163	Clock not updating	<p>Go to “Starting and using the IBM Setup Utility program” on page 27, and follow the instructions to reset the time and date.</p> <p>If the problem persists, have the computer serviced.</p>
164	CMOS RAM memory size does not match	<p>This is expected if you have removed memory. Otherwise,</p> <p>Go to “Running the IBM Enhanced Diagnostics program” on page 66 for instructions on running memory diagnostics.</p>
301	Keyboard error	<ol style="list-style-type: none"> 1. Make sure the keyboard is properly connected. 2. If the keyboard is properly connected, have the computer serviced.

Code	Description	Action
662	Diskette drive configuration error	<ol style="list-style-type: none"> 1. Go to "Starting and using the IBM Setup Utility program" on page 27, and follow the instructions to verify the diskette drive configuration. 2. Run the diagnostic program for the diskette drive. See "Running the IBM Enhanced Diagnostics program" on page 66. 3. If the problem persists, have the computer serviced.
1762	Hard disk configuration error	<ol style="list-style-type: none"> 1. Go to "Starting and using the IBM Setup Utility program" on page 27, and follow the instructions to verify the hard disk configuration. 2. If the problem persists, have the computer serviced.
178x	Hard disk or IDE device failed	<ol style="list-style-type: none"> 1. Go to "Running the IBM Enhanced Diagnostics program" on page 66, and follow the instructions for running the diagnostic program for the hard disk drive and IDE devices. 2. If the problem persists, have the computer serviced.
18xx	A PCI adapter has requested an unavailable resource	Go to "Starting and using the IBM 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"> 1. Go to "Starting and using the IBM Setup Utility program" on page 27 and follow the instructions to verify that the startup sequence is configured properly. 2. If the problem persists, have the computer serviced.
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"> 1. Make sure that the pointing device is properly attached. 2. If the problem persists, have the computer serviced.

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 notices” on page vii for important safety information and instructions.

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 66 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.

Problem type	Go to
Audio problems	“Audio problems” on page 50
Optical drive	“Optical drive problems” on page 51
Display/monitor	“Display/monitor problems” on page 53
DVD disc	“DVD disc problems” on page 52
General	“General problems” on page 53
Intermittent	“Intermittent problems” on page 54
Rapid Access III keyboard	“Rapid Access IIIe Keyboard problems” on page 55
Rapid Access Wireless keyboard	“Rapid Access Wireless Keyboard problems” on page 56
ScrollPoint III mouse	“ScrollPoint III Mouse problems” on page 57
ScrollPoint Wireless mouse	“ScrollPoint Wireless Mouse problems” on page 58
Memory	“Memory problems” on page 59
Modem	“Modem problems” on page 60
Optional device	“Optional-device problems” on page 63
Software	“Software problems” on page 64
Universal Serial Bus (USB) device	“Universal Serial Bus (USB) problems” on page 64

Audio problems

Symptom	Action
No audio in Windows	<ol style="list-style-type: none"> 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"> a. From the Windows desktop, click Start. b. Select Programs. c. Select Accessories. d. Select Multimedia. e. Click Volume Control. 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. <p>If these actions do not correct the problem, run the diagnostic programs (see "Running the IBM Enhanced Diagnostics program" on page 66). If you need technical assistance, see Chapter 7, "Getting information, help, and service," on page 69.</p>
No audio when you play DOS games or use DOS programs	<ol style="list-style-type: none"> 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. 2. Shut down and restart your computer in MS-DOS mode. Then try to run the program again. <p>If these actions do not correct the problem, run the diagnostic programs (see "Running the IBM Enhanced Diagnostics program" on page 66). If you need technical assistance, see Chapter 7, "Getting information, help, and service," on page 69.</p>

Optical 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"> 1. From the Windows desktop, double-click My Computer. 2. In the My Computer window, double-click Control Panel. 3. In the Control Panel window, double-click System. 4. In the System Properties window, click the Device Manager tab. 5. Double-click the CD-ROM, DVD-ROM, or CD-RW list item and then double-click the listed CD-ROM option. 6. In the Properties window, click the Settings tab. 7. Under Options, select the Auto insert notification check box. 8. Click OK to exit from the Properties window and save the setting. <p>If this procedure does not correct the problem, run the diagnostic programs (see “Running the IBM Enhanced Diagnostics program” on page 66). If you need technical assistance, see Chapter 7, “Getting information, help, and service,” on page 69.</p>
<p>A CD disc does not work.</p>	<ul style="list-style-type: none"> • Verify that the disc is inserted correctly, with its label up. • 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. • 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). • Use the IBM Setup Utility program to verify that the drive is enabled (see Chapter 4, “Using the IBM Setup Utility program,” on page 27). <p>If these actions do not correct the problem, run the diagnostic programs (see “Running the IBM Enhanced Diagnostics program” on page 66). If you need technical assistance, see Chapter 7, “Getting information, help, and service,” on page 69.</p>

DVD disc problems

Symptom	Action
Black screen instead of DVD video	<ol style="list-style-type: none">1. Restart the DVD player program.2. Shut down Windows, and restart your computer. <p>If you need technical assistance, see Chapter 7, “Getting information, help, and service,” on page 69.</p>
DVD movie will not play.	<ol style="list-style-type: none">1. Make sure that the disc surface is clean and not scratched.2. Check the disc or package for regional coding. You might need to purchase a disc with coding for the region for which your DVD-ROM drive was manufactured. <p>If you need technical assistance, see Chapter 7, “Getting information, help, and service,” on page 69.</p>
No audio or intermittent audio while playing DVD movie	<ol style="list-style-type: none">1. Check the volume control settings in Windows and on your speakers.2. Make sure that the disc surface is clean and not scratched.3. Check all cable connections to and from the speakers.4. Select a different audio track. <p>If you need technical assistance, see Chapter 7, “Getting information, help, and service,” on page 69.</p>
Playback is very slow or choppy.	<ol style="list-style-type: none">1. Disable any background programs, such as antivirus or desktop themes.2. Ensure that video resolution is set to less than 1152 x 864.3. Make sure that the DMA check box is selected in Device Manager for the DVD-ROM drive. <p>If you need technical assistance, see Chapter 7, “Getting information, help, and service,” on page 69.</p>
Invalid disc or no disc found message	<ol style="list-style-type: none">1. Ensure that a DVD disc is in the drive with the label side of the disc facing up.2. Ensure that video resolution is set to less than 1152 x 864.3. On a computer with a CD-ROM as well as a DVD-ROM drive, make sure that the DVD is in the drive labeled DVD. <p>If you need technical assistance, see Chapter 7, “Getting information, help, and service,” on page 69.</p>

Display/monitor problems

Symptom	Action
General monitor problems	<ol style="list-style-type: none">1. Make sure the brightness controls are adjusted correctly.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 66 and run diagnostics on the monitor. <p>If you cannot find the problem, check the other listings on monitor problems in this table.</p>
Blank screen	Verify that the brightness controls are adjusted correctly. If you cannot correct the problem, have the computer serviced.
Unreadable characters	Have the computer serviced.
The monitor works when you turn on the computer, but goes blank after some period of computer inactivity.	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 IBM Setup Utility program" on page 31).

General problems

Symptom	Action
The computer does not start when you press the power button.	Verify that: <ol style="list-style-type: none">1. All cables are securely connected to the proper connectors on the computer. For the location of the connectors, see "Connecting cables" on page 8.2. The computer cover is properly installed. <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>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. <p>If you cannot correct the problem, have the computer serviced.</p>

Rapid Access IIIe Keyboard problems

Symptom	Action
All or some keys on the keyboard do not work.	<p>Verify that:</p> <ol style="list-style-type: none">1. The computer is turned on.2. The keyboard cable is securely connected to the keyboard connector on the computer. For the location of the keyboard connector, see “Connecting cables” on page 8.3. 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">a. From the Windows desktop, click Start.b. Select Settings, and then click Control Panel.c. Double-click Keyboard (Rapid Access). The Rapid Access Keyboard Customization program starts.d. Click Help. <p>If you cannot correct the problem, have the computer serviced.</p>

Rapid Access Wireless Keyboard problems

When the wireless receiver is installed, a software utility provides status icons and help information in the lower right corner of your desktop just above the default Windows Taskbar. Click ? (help) to find more information about the wireless keyboard.

Symptom	Action
All or some keys on the keyboard do not work.	<ol style="list-style-type: none"> 1. Change the batteries in the keyboard. 2. Change the channel on the keyboard. <p>If you cannot correct the problem, have the computer serviced.</p>
Cannot use the advanced functions (hot buttons).	<ol style="list-style-type: none"> 1. Reload the keyboard driver from the CD or from c:\IBMTOOLS\DRIVER 2. 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"> a. From the Windows desktop, click Start. b. Select Settings, and then click Control Panel. c. Double-click Keyboard (Rapid Access). The Rapid Access Keyboard Customization program starts. d. Click Help.
Poor keyboard performance (loss of characters).	<ol style="list-style-type: none"> 1. Change the batteries in the keyboard. 2. Change the channel on the keyboard. 3. Move the keyboard away from any large metal objects or replace the desk with a non-metallic desk. 4. Move the Dual Wireless Receiver away from any large metal objects. 5. Verify that the keyboard is within 2 meters (6 feet) of the Dual Wireless Receiver.
Keyboard data transmission LED on the Dual Wireless Receiver is constantly illuminated.	Change the channel on the keyboard.

ScrollPoint III Mouse problems

Symptom	Action
The mouse or pointing device does not work.	<p>Clean the mouse. See “Mouse” on page 24.</p> <p>Verify that:</p> <ol style="list-style-type: none"><li>1. The mouse or pointing-device cable is securely attached to the proper connector on the computer. Depending on the type of mouse you have, the mouse cable will connect to either the USB or PS/2 mouse connector. To find the mouse connector, see “Connecting cables” on page 8.<li>2. The device drivers for the mouse are installed correctly. <p>If you cannot correct the problem, have the computer serviced.</p>

ScrollPoint Wireless Mouse problems

When the wireless receiver is installed, a software utility provides status icons and help information in the lower right corner of your desktop just above the default Windows Taskbar. Click ? (help) to find more information about the wireless mouse.

Symptom	Action
The mouse does not move the cursor.	<ol style="list-style-type: none">1. Clean the mouse. See "Mouse" on page 24.2. Change the batteries in the mouse.3. Change the channel on the mouse. <p>If you cannot correct the problem, have the computer serviced.</p>
The advanced mouse functions (scroll stick) do not work.	Reload the mouse driver from the CD or from c:\IBMTOOLS\DRIVER
Poor mouse performance (cursor skips).	<ol style="list-style-type: none">1. Clean the mouse ball and cage. See "Mouse" on page 24.2. Change the batteries in the mouse.3. Change the channel on the mouse.4. Move the mouse away from any large metal objects or replace the desk with a non-metallic desk.5. Move the Dual Wireless Receiver away from any large metal objects.6. Verify that the mouse is within 2 meters (6 feet) of the Dual Wireless Receiver.
Mouse data transmission LED on the Dual Wireless Receiver is constantly illuminated.	Change the channel on the mouse.

Memory problems

Symptom	Action
<p>The amount of memory displayed is less than the amount of memory installed.</p>	<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 40.<li>2. The DIMMs are properly installed and securely connected.<li>3. If you added or removed memory, you saved the new configuration before exiting from the IBM Setup Utility program. <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 66 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
<p>When you try to use the modem, your computer or modem is unable to detect a dial tone.</p>	<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>2. Make sure no one is using the telephone.<li>3. Make sure the telephone line is working.<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.

Symptom	Action
<p>General modem/communication problems.</p>	<ol style="list-style-type: none"> 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. 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). 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. 4. Make sure no one else is using the telephone while you are communicating with another computer. 5. If you have Call Waiting, make sure it is disabled. 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. 7. Make sure your modem cord is attached to an analog telephone line. The local telephone company can determine the type of telephone line. 8. Make sure the modem is securely installed inside the computer. (See "Removing the rear cover" on page 37.) <p>If these actions do not correct the problem, run the diagnostic programs (see "Running the IBM Enhanced Diagnostics program" on page 66). If you need technical assistance, see Chapter 7, "Getting information, help, and service," on page 69.</p>

Symptom	Action
<p>When you try to use the modem, it does not work.</p>	<ol style="list-style-type: none"> 1. If you added, changed, or reinstalled a modem, make sure it is installed correctly. 2. Make sure your communications program is configured correctly. The following settings are generally compatible: <ul style="list-style-type: none"> • Modem settings: <ul style="list-style-type: none"> — Generic Hayes-type modem — Hayes-compatible error correcting — Hayes-compatible high speed — User-defined modem — Hayes modem — Other <p>If you select a modem type of Other, you must include the proper modem initialization string. For most programs, the initialization string</p> <p>AT&F</p> <p>will work.</p> <ul style="list-style-type: none"> • Baud rate: 115200 Kbps or the maximum setting offered by your communications software • COM port: COM1 <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 66). If you need technical assistance, see Chapter 7, "Getting information, help, and service," on page 69.</p>

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"> 1. The option is designed for your computer. 2. You followed the installation instructions supplied with the option and in Chapter 5, "Installing options," on page 33. 3. All option files (if required) are installed correctly. See Chapter 5, "Installing options," on page 33 for information about installing option files. 4. You have not loosened other installed options or cables. 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. 6. You updated the configuration information in the IBM Setup Utility program, if necessary, and have no conflicts. For more information, see Chapter 4, "Using the IBM Setup Utility program," on page 27. <p>If the problem persists, run the diagnostic programs. (See "Running the IBM Enhanced Diagnostics program" on page 66 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">1. Your computer has the minimum memory requirements needed to use the software. See the information supplied with the software to verify memory requirements. Note: If you have just installed an adapter or memory, you might have a memory-address conflict.2. The software is designed to operate on your computer.3. The software you are using works on another computer. <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.

IBM Enhanced Diagnostics

IBM provides programs that you can run to diagnose hardware problems and some software problems. Several utility programs that provide helpful information about your computer are also included. The user interface for running these diagnostic and utility programs is provided by PC-Doctor.

The *IBM Enhanced Diagnostics* program will isolate your computer hardware from software that was preinstalled (or that you have installed) on your hard disk. These programs run independently of the operating system and are generally used when other methods are not available or have not been successful in isolating a problem suspected to be hardware related.

The *IBM Enhanced Diagnostics* are available on:

- The *Product Recovery* program on the hard disk
- The World Wide Web

Important

To determine if your computer has the *Product Recovery* program on the hard disk, look for the following prompt when you start your computer:

To start the IBM Product Recovery Program, press F11

If this prompt is displayed at startup, the *Product Recovery* program is installed.

If your computer does not have the *Product Recovery* program installed, and you do not have a *Product Recovery CD(s)* for your operating system, contact the IBM HelpCenter for more information about obtaining a *Product Recovery CD*.

You can create an IBM Enhanced Diagnostics diskette or you can run the diagnostics directly from the product recovery program.

Creating an IBM Enhanced Diagnostics diskette

To download the IBM Enhanced Diagnostics diskette image from the World Wide Web, do the following:

1. Go to <http://www.ibm.com/pc/support> on the World Wide Web.
2. Type your machine type and model, and click **Go**.
3. Select **Downloadable files**.
4. Download the .EXE file to a hard disk directory (not to a diskette).
5. Go to a DOS prompt and change to the directory where the file was downloaded.
6. Insert a blank high-capacity diskette into the diskette drive A.
7. Type the following and press Enter:

filename a:

where *filename* is the name of the file you downloaded from the Web.

The self-extracting downloaded file is copied to the diskette, and a startable *IBM Enhanced Diagnostics* diskette is created.

Running the IBM Enhanced Diagnostics program

You can run the *IBM Enhanced Diagnostics* program from the *IBM Enhanced Diagnostics* diskette or you can use the *Product Recovery* program.

To run diagnostics from the IBM Enhanced Diagnostics diskette:

1. Turn off your computer and any attached devices.
2. Insert the *IBM Enhanced Diagnostics* diskette into the diskette drive.
3. Turn on all attached devices; then turn on your computer.
4. Follow the instructions on the screen.

To run diagnostics from the Product Recovery CD or program:

Important

If you are running diagnostics from the product recovery CD and you have more than one CD, always start with *Product Recovery CD 1*.

1. If you have a product recovery CD, open the optical drive, insert the CD, and close the drive. If you do not have a product recovery CD, go to step 2.
2. Shut down your operating system and turn off the computer.
3. Turn on your computer.

Note: If you are using the *Product Recovery* program, quickly press F11 when the prompt displays during startup (the prompt displays for only a few seconds).

Wait for the product recovery menu to display.

4. Depending on your operating system, you might be prompted to select a system setting. If no prompt displays, go to the next step.
5. When the main menu appears, select **System Utilities**.
6. From the System Utilities menu, select **Run Diagnostics**. The IBM Enhanced Diagnostics Program starts. When you are finished running diagnostics, you will be returned to the Product Recovery program main menu.
7. Remove any CD from the optical drive and restart the computer.

Replacing the battery

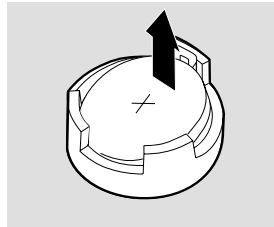
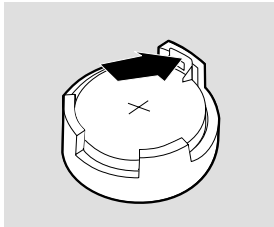
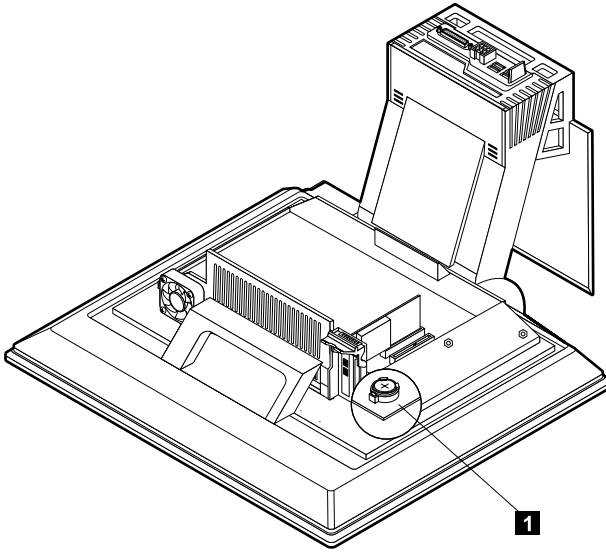
Your computer has a special type of memory that maintains the date, time, and settings for built-in features. A battery keeps this information active when you turn off the computer.

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

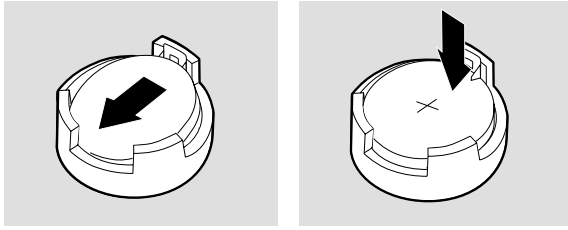
displayed when you turn on the computer. See “Lithium battery notice” on page viii.

To change the battery, do the following:

1. Turn off the computer and all attached devices.
2. Remove the rear cover. See “Removing the rear cover” on page 37.
3. Remove the old battery **1**.



4. Install the new battery.



5. 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.

6. Turn on the computer and all attached devices.
7. Use the IBM Setup Utility program to set the date and time and any passwords.
8. Dispose of the old battery as required by local ordinances or regulations.

Chapter 7. Getting information, help, and service

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

Getting information

Information about your IBM computer and preinstalled software, if any, is available in the documentation that comes with your computer. That documentation includes printed books, online books, README files, and help files. In addition, information about IBM products is available on the World Wide Web and through the IBM Automated Fax System.

Using the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM Personal Computer products and support. The address for the IBM Personal Computing home page is <http://www.ibm.com/pc>.

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

If you select Profile from the support page, you can create a customized support page that is specific to your hardware, complete with Frequently Asked Questions, Parts Information, Technical Hints and Tips, and Downloadable Files. In addition, you can choose to receive e-mail notifications whenever new information becomes available about your registered products.

You also can order publications through the IBM Publications Ordering System at <http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

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. In the U.S. and Canada, to access the IBM Automated Fax System, call 1-800-426-3395.

Getting help and service

If you have a problem with your computer, you will find a wide variety of sources available to help you.

Using the documentation and diagnostic programs

Many computer problems can be solved without outside assistance. If you experience a problem with your computer, the first place to start is the troubleshooting information of your computer documentation. If you suspect a software problem, see the documentation, including README files and online help, that comes with the operating system or application program.

Most IBM computers and servers come with a set of diagnostic programs that you can use to help you identify hardware problems. See the troubleshooting information of your computer documentation for instructions on using the diagnostic programs.

The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/pc/support/> and follow the instructions.

Calling for service

If you have tried to correct the problem yourself and still need help, during the warranty period, you can get help and information by telephone through the IBM PC HelpCenter. The following services are available during the warranty period:

- Problem determination - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.
- IBM hardware repair - If the problem is determined to be caused by IBM hardware under warranty, trained service personnel are available to provide the applicable level of service.
- Engineering change management - Occasionally, there might be changes that are required after a product has been sold. IBM or your reseller, if authorized by IBM, will make selected Engineering Changes (ECs) available that apply to your hardware.

The following items are not covered:

- Replacement or use of non-IBM parts or nonwarranted IBM parts
Note: All warranted parts contain a 7-character identification in the format IBM FRU XXXXXXXX.
- Identification of software problem sources
- Configuration of BIOS as part of an installation or upgrade
- Changes, modifications, or upgrades to device drivers

- Installation and maintenance of network operating systems (NOS)
- Installation and maintenance of application programs

Refer to your IBM hardware warranty for a full explanation of IBM warranty terms. Be sure to retain your proof of purchase to obtain warranty service.

In the U.S. and Canada, these services are available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9:00 a.m. to 6:00 p.m.

Note: Response time will vary depending on the number and complexity of incoming calls.

If possible, be at your computer when you call. Please have the following information ready:

- Machine Type and Model
- Serial numbers of your IBM hardware products
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information

Phone numbers are subject to change without notice. For the most up-to-date phone numbers, go to <http://www.ibm.com/pc/support/> and click **Support Phone List**.

Country		Telephone number
Austria	Österreich	01-24 592 5901
Belgium - Dutch	Belgie	02-210 9820
Belgium - French	Belgique	02-210 9800
Canada	Toronto only	416-383-3344
Canada	Canada - all other	1-800-565-3344
Denmark	Danmark	35 25 02 91
Finland	Suomi	09-22 931 840
France	France	02 38 55 74 50
Germany	Deutschland	07032-1549 201
Ireland	Ireland	01-815 9200
Italy	Italia	02-4827 5040
Luxembourg	Luxembourg	298-977 5063
Netherlands	Nederland	020-514 5770
Norway	Norge	23 05 32 40
Portugal	Portugal	21-791 51 47
Spain	España	91-662 49 16
Sweden	Sverige	08-751 52 27
Switzerland	Schweiz/Suisse/Svizzera	0848-80-52-52
United Kingdom	United Kingdom	01475-555 055
U.S.A. and Puerto Rico	U.S.A. and Puerto Rico	1-800-772-2227

In all other countries, contact your IBM reseller or IBM marketing representative.

Other services

IBM Update Connector is a remote communication tool that you can use with some IBM computers to communicate with the HelpCenter. Update Connector enables you to receive and download updates for some of the software that might come with your computer.

With some computer models, you can register for International Warranty Service. If you travel with your computer or need to move it to another country, you might be able to receive an International Warranty Service Certificate that is honored virtually worldwide, wherever IBM or IBM resellers sell and service IBM products.

For more information or to register for International Warranty Service:

- In the U.S. or Canada, call 1-800-497-7426.
- In Europe, call 44-1475-893638 (Greenock, U.K.).
- In Australia and New Zealand, call 61-2-9354-4171.
- In all other countries, contact your IBM reseller or IBM marketing representative.

IBM Integrated Technology Services offers a broad range of information technology support, implementation, and management services. For more information about these services, refer to the Integrated Technology Services Web site at <http://www.ibm.com/services/its/>.

For technical assistance with the installation of, or questions related to, Service Packs for your preinstalled Microsoft Windows product, refer to the Microsoft Product Support Services Web site at <http://support.microsoft.com/directory/>, or you can contact the IBM HelpCenter. Some fees might apply.

Purchasing additional services

During and after the warranty period, you can purchase additional services, such as support for IBM and non-IBM hardware, operating systems, and application programs; network setup and configuration; upgraded or extended hardware repair services; and custom installations. Service availability and service name might vary by country.

For more information about these services, see the online information.

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