IBM NetVista Personal Computer
Machine Type 2276

IBM ®

> **Note**
>
> Before using this information and the product it supports, be sure to read the "Product warranties and notices" contained in a separate document furnished with this guide.

First Edition (August 2000)

Revised October 2000

Contents

Safety information

⚠ **DANGER:**

Electrical current from power, telephone, and communication cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving or opening the covers of this product or attached devices. The power cord must be used with a properly grounded outlet.

To Connect	To Disconnect
Turn everything OFF.	Turn everything OFF.
First, attach all cables to devices.	First, remove power cord from outlet.
Attach signal cables to receptacles.	Remove signal cables from receptacles.
Attach power cord to outlet.	Remove all cables from devices.
Turn device ON.	

v
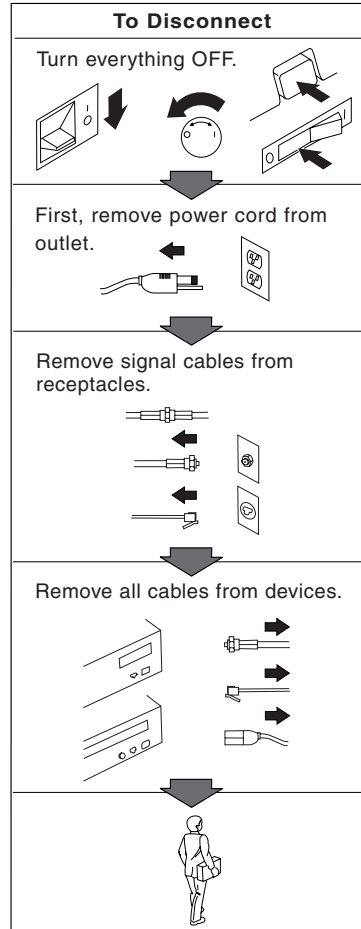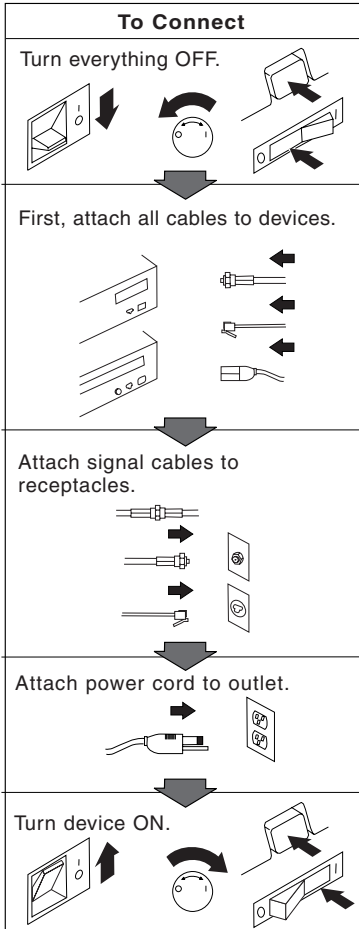
⚠ DANGER:

Le courant électrique provenant des câbles d'alimentation, télephoniques et de transmission peut présenter un danger. Pour éviter tout risque de choc électrique, connectez et déconnectez ces câbles comme indiqué ci- dessous lorsque vous installez ou déplacez ce matériel ou les unités connectées, ou que vous soulevez un carter.*

Pour connecter
Mettez tout hors tension.
Connectez d'abord tous les câbles sur les unités.
Connectez les câbles de signaux sur les prises murales.
Branchez le cordon d'alimentation sur la prise murale.
Mettez l'unité sous tension.

Pour deconnecter
Mettez tout hors tension.
Débranchez d'abord le cordon d'alimentation de la prise murale.
Déconnectez les câbles de signaux des prises murales.
Déconnectez tous les câbles de unités.

*Le cordon d'alimentation doit être branché sur un socle de prise de courant correctement mis à la terre.

Lithium battery notice

CAUTION:
Danger of explosion if battery is incorrectly replaced.

When replacing the battery, use only an equivalent type battery. 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 d'un type équivalent. 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.

DANGER

> **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.**

DANGER

> **Pour éviter tout risque de choc électrique, ne manipulez pas de câbles ni de cordons et n'effectuez pas d'opération d'installation, de maintenance ou de reconfiguration pendant un orage.**

Laser compliance statement

Some IBM Personal Computer models are equipped from the factory with a CD-ROM, DVD-ROM and CDR drives. CD-ROM, DVD-ROM and CDR drives are also sold separately as options. CD-ROM, DVD-ROM and CDR drives are laser products. These drives are certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, these drives are certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

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

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

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

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

DANGER

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

Certains modèles d'ordinateurs personnels sont équipés d'origine d'une unité de CD-ROM/DVD-ROM ou de CDR. Mais ces unités sont également vendues séparément en tant qu'options. L'unité de CD-ROM/DVD-ROM/CDR est un appareil à laser. Aux État-Unis, l'unité de CD-ROM/DVD-ROM/CDR est certifiée conforme aux normes indiquées dans le sous-chapitre J du DHHS 21CFR 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/CDR 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/CDR 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/CDR 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.**

Chapter 1. IBM PC overview

Thank you for selecting an IBM PC computer. Your computer incorporates many of the latest advances in computer technology and can be upgraded as your needs change.

This section provides an overview of the computer features, preinstalled software, and specifications.

Identifying your computer

The best way to identify your computer is through use of your machine type number, configuration identification (Config. ID) number, and serial number, which is located at the bottom of the right side panel as shown in the illustration below.

Location
of
Serial Number
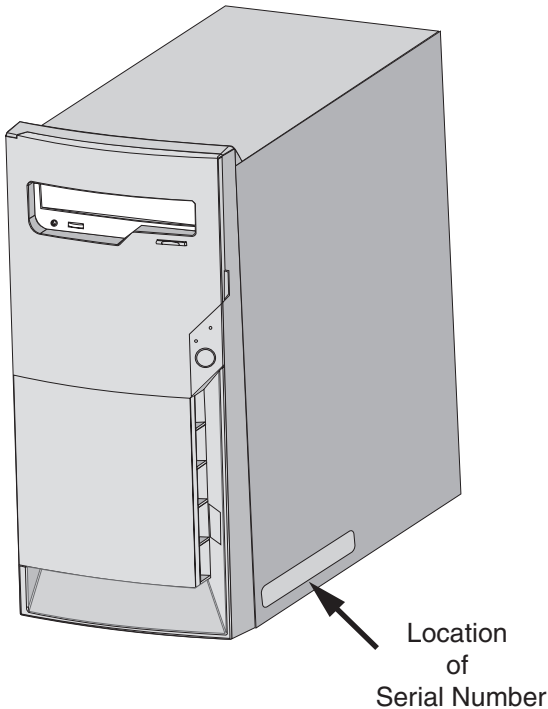
Arranging your workspace

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 also can 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. Try to keep a light touch on the keyboard and your hands and fingers relaxed. You can change the angle of the keyboard for maximum comfort by adjusting the position of the keyboard feet.
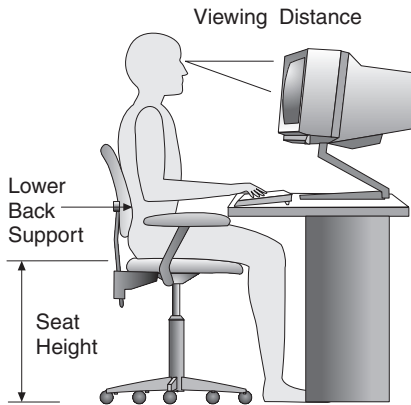
Adjust the monitor so that the top of the screen is at, or slightly below, eye level. Place the monitor at a comfortable viewing distance, usually 51 to 61 cm (20 to 24 in.), and position it so that you can view it without having to twist your body.

Glare and lighting

Position the monitor to minimize glare and reflections from overhead lights, windows, and other light sources. Place the monitor at right angles to windows and other light sources whenever possible. Reduce overhead lighting, if necessary, by turning off lights or using lower wattage bulbs. If you install the monitor near a window, use curtains or blinds to block the sunlight. You might have to adjust the Brightness and Contrast controls on the monitor as the room lighting changes throughout the day. Where it is impossible to avoid reflections or to adjust the lighting, place an antiglare filter over the screen. However, these filters might affect the clarity of the image on the screen; try them only after you have exhausted other methods of reducing glare.

Dust buildup compounds problems associated with glare. Remember to clean your monitor screen periodically using a soft cloth moistened with a nonabrasive liquid glass cleaner.

Air circulation

Your computer and monitor produce heat. The computer has a fan that pulls in fresh air and forces out hot air. The monitor lets hot air escape through vents. Blocking the air vents can cause overheating, which might result in a malfunction or damage. Place the computer and monitor so that nothing blocks the air vents; usually, 51 mm (2 in.) of air space is sufficient. Also, make sure the vented air is not blowing on someone else.

Electrical outlets and cable lengths

The location of electrical outlets and the length of power cords and cables that connect to the monitor, 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 kicked accidentally.

For more information about power cords, See "Power cord notice" on page 60.

Chapter 2. Setting up your computer

This section provides information for connecting cables to your computer and turning on the power.

Before you begin

See "Safety information" on page v before setting up your computer

---

You will need the following:

- Computer

- Computer power cord

- Keyboard

- Mouse

- Monitor (sold separately with signal cable and power cord)

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, monitor, and any other device 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.

Cable connections and switch settings

This section shows the location of the connectors on the back of your computer. You might not have all of the connectors shown.

Keyboard

USB 1

Serial 1

Video

Audio
line out

Audio
line in

Microphone

Mouse

USB 2

Parallel
(Printer)

MIDI/Joystick
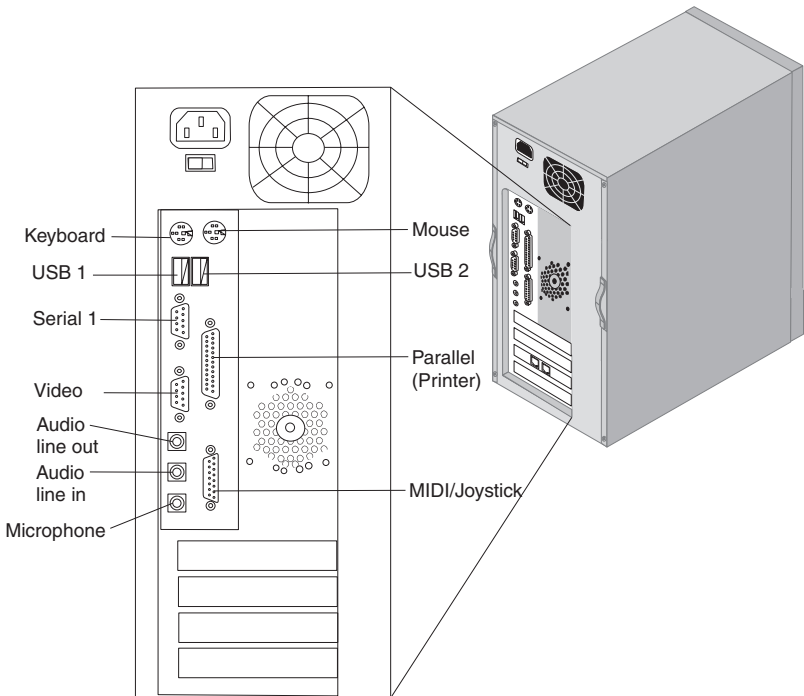
Setting the voltage-selection switch

Check the position of the voltage-selection switch. Use a ballpoint pen to slide the switch, if necessary.

- If the voltage supply range is 90–137 V ac, set the switch to 115 V. (This is the standard setting in North America.)

- If the voltage supply range is 180–265 V ac, set the switch to 230 V.
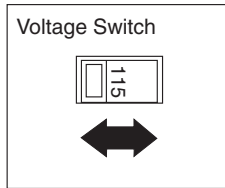
Connecting cables

The connectors on the rear of the computer have color-coded icons to help you connect the cables properly. Use the following steps to connect your cables:

1. Connect the keyboard cable to the purple keyboard connector and the mouse cable to the green mouse connector.
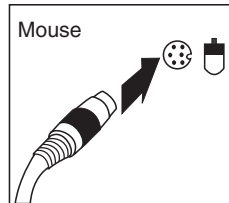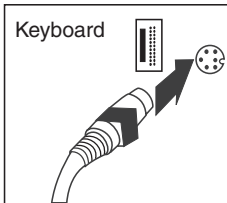
2. Connect the monitor cable to the monitor (if it is not already attached), and then to the monitor connector; tighten the attachment screws.

3. Connect any additional devices you have.

- Any printer or parallel device.
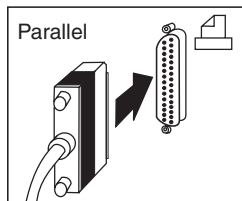
- Any serial device or external modem.

Serial
Device   IOIOI
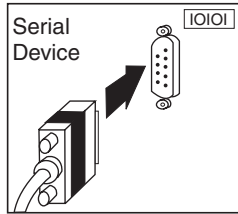
- Any Universal Serial Bus (USB) device.

USB
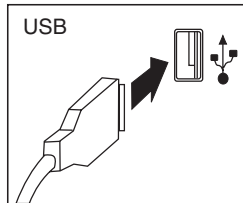
- Any optional device, such as speakers, microphones, or headphones.

Audio
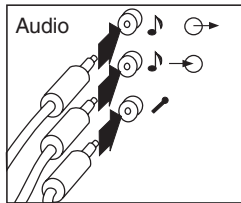
- Connect the phone line connector (for models with a modem).

- If your computer comes with an Ethernet adapter, connect the Ethernet
  cable.

Ethernet
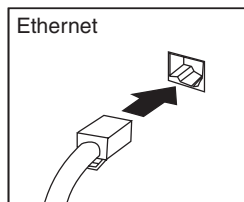
- Connect the power cord to the power connector. If there is a label covering the power connector, remove it. Connect the power cords to the computer, monitor, and other devices first, and then plug the cords into properly grounded electrical outlets.
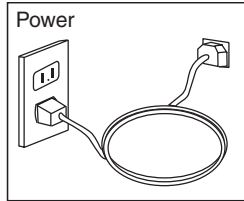
Turning on power

Turn on the monitor and other external devices first; then press and release the power switch on the computer. You see a logo screen while the computer performs a short self-test. When the task completes successfully, the logo screen disappears, the BIOS is loaded, and the software is loaded (in models with preinstalled software).

Chapter 3. Operating and caring for your computer

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

Controls and status indicators

Each button at the front of your computer is a control that enables you to perform a specific function, such as turning on the computer. The lights are status indicators that tell you when a certain device is in use, such as the diskette drive.

The following illustration shows the controls and status indicators.
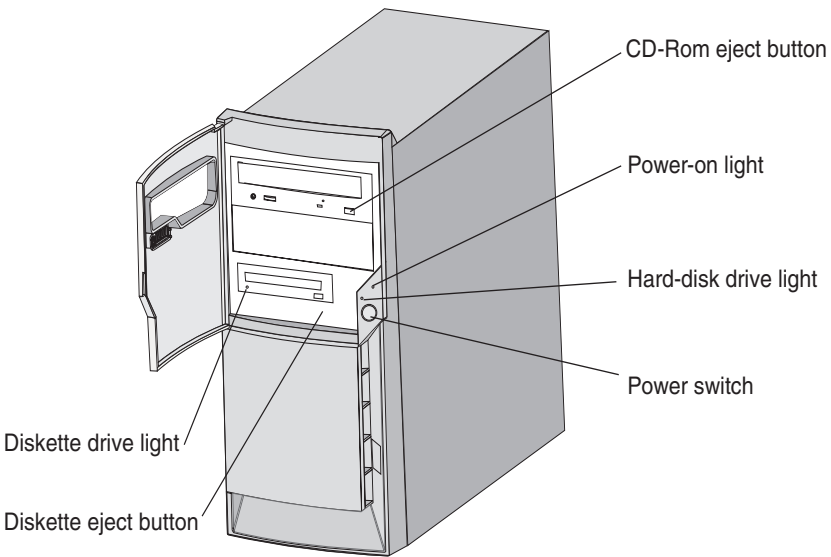
The following list describes the controls and status indicators for your computer.

- **Power switch:** Press this switch to turn your computer on or off. Do not turn off your computer if the in-use light for the hard disk drive or diskette drive is on.

    Note: The power switch normally operates with a single touch. However, in some circumstances the computer might not immediately turn off. If this happens, hold the power switch down for approximately 5 seconds, and the computer will then turn off.

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

- **Hard disk drive light:** 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.

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

- **Diskette drive light:** When this light is on, it indicates that the diskette drive heads are being positioned or that your computer is reading from or writing to a diskette.

Note: If your computer has a preinstalled CD-ROM drive, see "Using a CD-ROM drive" on page 14 for information about controls and status indicators.

Shutting down

When you are ready to turn off your computer, follow the shutdown procedure for your operating system. This prevents the loss of unsaved data or damage to your software programs. See your operating system documentation for instructions.

Using diskettes

You can use 3.5-inch diskettes in the diskette drive of your computer. The information that follows will help you use 3.5-inch diskettes.

Handling and storing diskettes

Inside the protective diskette case is a flexible disk with a magnetic-sensitive coating. This disk can be damaged by heat, dust, a magnetic field, or even a fingerprint. Use the following guidelines when handling and storing diskettes:

- Data is stored on the magnetic surface of the diskette. This surface is protected by a plastic cover. If the cover is damaged, *do not* use the diskette. A damaged diskette might damage the diskette drive.

- A protective slide on the top of a 3.5-inch diskette covers part of the magnetic surface. The diskette drive moves this slide to read data from or write data to the diskette. *Do not* move this slide because fingerprints and dust can cause loss of data.

- Never touch the magnetic disk itself.

- Keep diskettes away from magnets or devices that create a strong magnetic field, such as electric motors and generators. Diskettes are sensitive to magnets found in television sets, telephones, stereo speakers, and other such

items. A magnetic field can erase the data on your diskettes. *Do not* set diskettes on the monitor or use magnets to attach notes to your computer.

- Do not store diskettes at high temperatures, low temperatures, or in direct sunlight. Temperatures ranging from 4° to 53°C (39° to 127°F) are acceptable for 3.5-inch diskettes. Keep diskettes away from heat. The plastic outer covering might warp, damaging the diskette.

Inserting and removing diskettes

To insert a 3.5-inch diskette, hold the diskette with the label facing up and insert the end with the protective slide first. Push the diskette into the diskette drive until the diskette clicks into place.

To remove the diskette, press the eject button and slide the diskette out of the drive. Do not remove the diskette while the in-use light is on.

Write-protecting diskettes

It is possible to accidentally format a diskette or unintentionally write data to it. Important information can be written over or lost. For this reason, it is a good idea to write-protect important diskettes. You can read data from a write-protected diskette, but you cannot erase or change the data.

Most 3.5-inch diskettes have a write-protect switch that can be used to prevent data from being written to or erased from the diskette. If a 3.5-inch diskette does not have a write-protect switch, it is permanently write-protected.

The write-protect switch is located on the back of 3.5-inch diskettes.

Write-protect switch
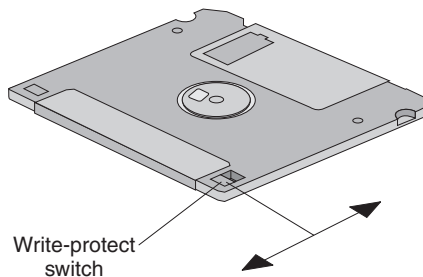
- To allow writing to the diskette, slide the switch so the write-protect window is covered.

- To prevent writing to the diskette, slide the switch so the write-protect window is open.

Using a CD-ROM drive

Some models have a preinstalled CD-ROM drive. This may be a basic CD-ROM (read only) drive, a CDR (recordable) drive, or a DVD (digital video) drive, depending on the type you chose. All types of CD-ROM drives use industry standard, 12 cm (4.75-inch) CDs.

Follow these guidelines when using a CD-ROM drive:

*   Do not place the drive where there is:

    -   High temperature

    -   High humidity

    -   Excessive dust

    -   Excessive vibration or sudden shock

    -   An inclined surface

    -   Direct sunlight

*   Do not insert any object other than a CD into the drive.

*   Before moving the computer, remove the CD from the drive.

Handling a CD

When handling a CD, follow these guidelines:

*   Hold the CD by its edges. Do not touch the surface of the side that is not labeled.

*   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.

*   Do not write or stick paper on the CD.

*   Do not scratch or mark the CD.

*   Do not place or store the CD in direct sunlight.

*   Do not use benzene, thinners, or other cleaners to clean the disk.

*   Do not drop or bend the CD.

Loading a CD

To load a CD into a CD-ROM drive:

1. Press the eject/load button. The tray slides out of the drive. (Do not manually force the tray open.)

2. Place the CD in the tray with the label facing up.

3. Close the tray by pressing the eject/load button or by gently pushing the tray forward. When the tray is closed, the indicator light on the front of the drive will activate to indicate that the drive is in use.

4. To eject the CD, press the eject/load button. When the tray slides out, carefully remove the disk.

5. Close the tray by pressing the eject/load button or by gently pushing the tray forward.

Note: If the tray does not slide out of the drive when you press the eject/load button, insert the pointed end of a large paper clip into the emergency-eject hole located on the front of the CD-ROM drive.

Using audio features

Your computer has an integrated audio controller. The audio controller provides you with the ability to record and play back sound and music and to enjoy sound with multimedia applications. Additionally, you can connect stereo speakers to the line-out connector to enjoy better sound with multimedia applications.

The audio connectors in your computer are 3.5 mm (1/8-in.) mini-jacks. A description of the connectors follows. (For the location of the connectors, see "Cable connections and switch settings" on page 6.)

Line/Headphone out

This jack is used to send audio signals from the computer to external devices, such as powered stereo speakers with built-in amplifiers, headphones, multimedia keyboards, or the audio line-in jack on a stereo system.

Audio line in

This jack is used to accept audio signals from external devices (such as line output from a stereo, television, or musical instrument) into the computer sound system.

Microphone

This jack is used to connect a microphone to your computer when you want to record voice or other sounds on the hard disk. This jack can also be used with speech recognition software.

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

Procedures for recording and playing back sound vary by operating system. See your operating system documentation for information and instructions.

Taking care of your computer

Follow these 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 allow air flow to keep your computer and monitor 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 switches 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

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

Attention: Be sure to turn off the computer and monitor before cleaning the computer and monitor screen.

Computer and keyboard

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

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:

1. Turn off the computer.

2. Disconnect the mouse cable from the computer.

3. Turn the mouse upside down. Unlock the retainer on the bottom of the mouse by moving it in the direction indicated by the arrow on the retainer.
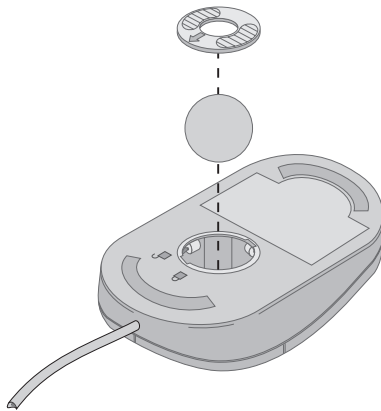
4. Turn the mouse right-side up, and the retainer and ball will drop out.

5. Wash the ball in warm, soapy water and dry it well.

6. Using a damp cloth, wipe the outside of the mouse and the retainer. Be sure to wipe the rollers inside the mouse.

7. Insert the ball and retainer. Lock the retainer by moving it in the opposite direction of the arrow.

8. Reconnect the mouse cable to the computer.

Moving your computer

Take the following precautions before moving your computer.

1. Back up all files and data from the hard disk.

    Operating systems can vary in the way they perform backup procedures. See your operating system documentation for information about software backup.

2. Remove all media (such as diskettes, compact discs, and tapes) from the drives.

3. Shut down your operating system and turn off the computer and all attached devices. Your hard disk drive automatically parks the read/write heads in a nondata area. This process prevents damage to the hard disk.

4. Unplug the power cords from electrical outlets.

5. Note where you have attached your cables to the rear of the computer; then remove them.

6. If 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. Installing options

You can expand the capabilities of your computer by adding memory, drives, or adapters. When adding an option, use these instructions along with the instructions that come with the option.

Attention

- Before you install or remove any option, read the "Safety information" on page v. These precautions and guidelines will help you work safely.

- The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the electrical outlet before opening the computer cover.

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 a metal expansion-slot cover or other 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.

Available options

The following are some available options:

- System memory, called dual in-line memory modules (DIMMs)

- Peripheral component interconnect (PCI) adapters

- Internal drives

    - CD-ROM, DVD-ROM, CD-R/W

    - Hard disk

    - Diskette drives and other removable media drives.

    - Network cards

Note: Your PC may come preinstalled with one or more of these options.

Tools required

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

> **Important**
>
> Before you install any new options, back up all the data on your PC. Be sure that you include all programs and data files in your backup.

Removing the side panel

> **Important:**
>
> See "Safety information" on page v and "Handling static-sensitive devices" on page 19 before removing the side panel.

To remove the side panel:

1. Shut down your operating system, remove any media (diskettes, CDs, or tapes) from the drives, and turn off all attached devices and the computer.

2. Unplug all power cords from electrical outlets.

3. Disconnect all cables attached to the computer. This includes power cords, input/output (I/O) cables, and any other cables connected to the computer.

4. Remove the top and bottom phillips head screws from the right side (when viewed from back) panel.

5. Grasp the handle on the side panel, and pull it towards the rear until the front retainer clips are clear of the chassis.

Attention: Proper cooling is required for the reliable performance of internal components. Do not operate your computer with the cover removed.

Working with options on the system board

This section provides instructions for installing options and setting the diskette write protect switch on the system board.

Accessing the system board

To access the system board, you must remove the computer side panel. For information on removing the computer side panel, see "Removing the side panel" on page 21. You might need to remove adapters in order to access some components of the system board. For information about expansion adapters, see "Working with adapters" on page 24. When disconnecting cables, be sure to note where they attach, so you can correctly reattach them later.

Note: For easier access to the system board, it helps to place the computer on its side.

Identifying parts on the system board

The system board, also called the *planar* or *motherboard*, is the main circuit board in your computer. It provides basic computer functions and supports a variety of devices that are IBM-installed or that you can install later. Refer to the following illustration for the location of parts on the system board.

Note: An illustration of the system board and additional information is provided on a label located inside the computer.
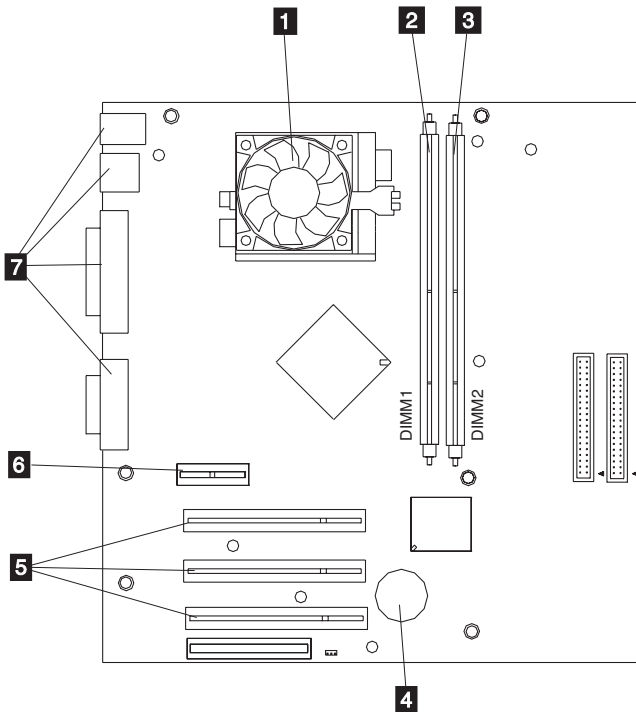
1. Fan (processor located under fan)
2. DIMM 1
3. DIMM 2
4. Battery
5. PCI adapter slots
6. MR Modem slot
7. Connectors

Working with memory

You can add memory to your computer to increase system performance. Your computer has two connectors for installing memory modules.

Your computer uses dual inline memory modules (DIMMs). The IBM-installed DIMMs that come with your computer are unbuffered, synchronous dynamic random access memory (SDRAM).

When installing or replacing DIMMs, the following rules apply:

- Fill each system memory connector sequentially, starting at *DIMM* 1.

- Use only 3.3 V, (PC 133) 168 PIN, no parity, unbuffered, SDRAM DIMMs.

- Use only 64 or 128 MB DIMMs in any combination of supported SDRAM DIMMs.

Note: To locate the memory connectors on the system board, see the illustration on page 22 or the system board label inside your computer.

Before you begin:

- See "Safety information" on page v and "Handling static-sensitive devices" on page 19.

- Read the instructions that come with the new system memory.

- Turn off the computer and all other connected devices.

- Disconnect all cables attached to the computer and remove the computer side panel (see "Removing the side panel" on page 21).

- Read "Accessing the system board" on page 21 to learn the location of the parts on the system board.

Note: You might have to remove an adapter to access the DIMM sockets on the system board.

To install a DIMM:

1. Open the module retaining clips on the DIMM socket.

2. Make sure that the notches in the DIMM are properly aligned with the connector. Push the DIMM straight down into the connector until the retaining clips close.

Notches
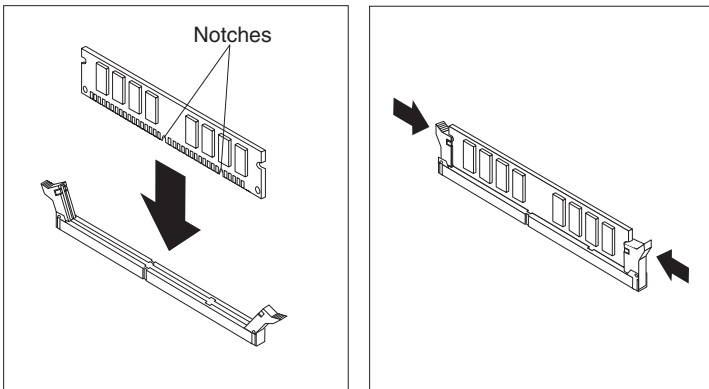
3. Reinstall any adapters that you removed. See "Installing adapters" on page 25 for instructions to reinstall the adapter.

What to do next:

- To work with another option, go to the appropriate section.

- To complete the installation, go to "Completing the installation" on page 27.

Working with adapters

This section provides information and instructions for installing and removing adapters.

PCI adapters

All adapters supported by your computer use *Plug and Play* technology that enables the computer to automatically configure the adapter. For more information, see "Updating the computer configuration" on page 28.

Adapter slots

Your computer system board has three peripheral component interconnect (PCI) expansion slots used to connect adapters to the bus. You can install an adapter up to 228 mm (9 inches) long.
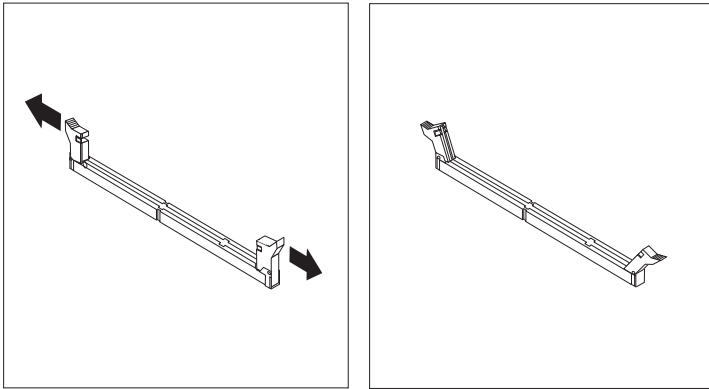
Installing adapters

Before you begin:

- Read "Safety information" on page v and "Handling static-sensitive devices" on page 19.

- Read the instructions that come with the new adapter.

- Turn off the computer and all other connected devices.

- Disconnect all cables attached to the computer and remove the computer side panel (see "Removing the side panel" on page 21).

To install an adapter:

1. Remove the screw from the slot cover plate and then remove the slot cover for the appropriate expansion slot.

2. Remove the adapter from its static-protective package.

3. Install the adapter into the appropriate slot on the system board.

4. Reinstall the slot cover plate and install the screw that secures the plate.

5. Replace the side panel and continue with "Configuring Plug and Play adapters" on page 28.

What to do next:

- To work with another option, go to the appropriate section.

- To complete the installation, go to "Completing the installation" on page 27.

Working with drive bays

This section provides information and instructions for installing internal drives.

When you install an internal drive, it is important to note the type and size of the drive you can install in each bay. Also, it is important to correctly connect the internal drive cables to the installed drive.

Internal drives

Internal drives are devices that your computer uses to read and store data. You can add drives to your computer to increase storage capacity and to enable your computer to read other types of media. Some of the different drives available for your computer are:

• Hard disk drives

• Tape drives

• CD-ROM drives

• Removable media drives

Internal drives are installed in *bay*s. In this book, bays are referred to as bay 1, bay 2, bay 3, bay 4, and bay 5. Bays 1, 2, and 3 are known as accessible bays, because they are accessible from the front of the unit.

Your computer comes with the following IBM-installed drives:

• A CD-ROM drive in bay 1 (some models).

• A 3.5-inch diskette drive in bay 3.

• A 3.5-inch hard disk drive in bay 5.

Installing internal drives

Before you begin:

- Read "Safety information" on page v and "Handling static-sensitive devices" on page 19.

- Read the instructions that come with the new adapter.

- Turn off the computer and all other connected devices.

- Disconnect all cables attached to the computer and remove the computer side panel (see "Removing the side panel" on page 21).

To install a drive in an externally accessible bay (Bays 1 or 2):

1. Remove the front panel by pulling at the bottom.

2. Remove the drive bay panel from the drive bay into which you are installing the drive.

3. Consult the documentation included with the drive for installation instructions.

4. Install the drive in the bay. Align the screw holes and insert the two screws.

5. Connect the power and signal cables to the drive.
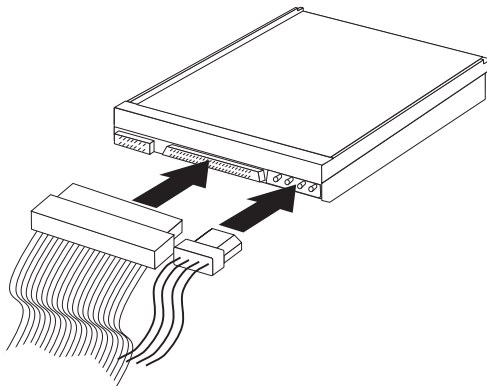
Completing the installation

After working with options, you need to reinstall any removed parts, replace the side panel, and reconnect any cables, including power cords and telephone lines.

Also, depending on the option installed, you might need to update information in the Configuration/Setup Utility program.

The following list is a quick reference to these procedures:

- "Replacing the side panel and connecting the cables" on page 28
- "Updating the computer configuration" on page 28

Replacing the side panel and connecting the cables

To replace the side panel and connect cables to your computer:

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer.

2. Clear any cables that might impede the replacement of the side panel.

3. Position the side panel with the handle at the rear.

4. Ensure that the top and bottom cover retainers align with the top and bottom slots on the chassis.

5. Slide the side panel forward so the retainer clips engage the chassis.

6. Insert the two phillips head screws into the holes at the top and bottom of the side panel and the chassis and tighten.

7. Reconnect the external cables and cords to the computer. See "Cable connections and switch settings" on page 6.

Updating the computer configuration

You might need to install device drivers after updating the configuration settings. For more information, see the instructions that come with the option to determine if device drivers are required and how to install them.

Note: For more information about error messages from resource conflicts, see Chapter 5, "Technical Troubleshooting," on page 31.

Configuring Plug and Play adapters

Along with the documentation that comes with your adapter, use the following information to help with adapter configuration.

Plug and Play is a configuration method that makes expanding your computer easier. The system board of your computer supports operating systems that use Plug and Play technology.

A Plug and Play adapter has no switches or jumpers that must be set. A Plug and Play adapter comes with configuration specifications set in the operating system. These specifications provide installation information to the computer during startup. When you install or remove Plug and Play adapters, this information is interpreted by the *basic input/output system (BIOS)*, which supports Plug and Play technology. If the required resources are available, the BIOS software automatically configures the adapter using resources *no*t already used by other devices.

Adapters designed for PCI slots are Plug and Play devices.

Note: See Chapter 5, "Technical Troubleshooting," on page 31 for information on error messages resulting from resource conflicts.

Chapter 5. Technical 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 switch, do the following:
>
> - Make sure your computer and monitor are connected to working electrical outlets.
>
> - Make sure all cables are securely connected to the correct locations.

Computer problems can be caused by hardware, software, or user error (for example, pressing the wrong key). 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.

If the hardware checks out, and you have not made a user error, you might have a software problem. If you suspect that you have a software problem 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)

- Error codes and messages

- Troubleshooting charts

Hard Disk Recovery

This section describes recovery tools for computers that have IBM preinstalled software.

These tools are:

• Emergency Recovery diskette utility

• Product Recovery program on the hard disk

Attention

Your IBM personal computer model has a Product Recovery program on a separate, hidden hard disk drive partition. Do Not delete or alter this partition.

The Product Recovery program is located in a hidden partition on the hard drive. If this partition becomes damaged or altered, you will need to order a Product Recovery CD.

A separate "Windows" or "Recovery" CD-Rom disk is not required or included with your PC. All Windows files are preloaded on the hard drive.

Note that Windows will report the total hard disk size as the actual drive size less the space used for the hidden product recovery utility. As an example, if your actual hard drive size is 10GB and the recovery utility requires 0.5GB, Windows will report the hard drive size as 9.5GB. The actual size depends on the amount of preinstalled software on your computer.

Reinstalling the Operating System

Your IBM personal computer model has a Product Recovery program on a hidden partition of the hard disk. The Product Recovery program contains an exact copy (compressed to save space) of the software that was preinstalled on your computer at the factory. Running this utility will delete all data on the hard disk drive (C:) and re-install the original factory software image.

Performing a partial or full recovery

> ┌─ Attention ───┐
> │ The Product Recovery program on the hidden hard disk drive partition will
> │ overwrite all files on the C:\ drive only.
> └──┘

Please note that a full or partial recovery will erase any data or programs that you installed since the PC was new. This information will be lost, so be sure you have a back-up copy of any important data.

A full recovery will restore the operating system, device drivers, and applications. A partial recovery will restore your operating system and device drivers without restoring applications.

To perform a recovery of the operating system, do the following:

1. If you can shut down your operating system normally, do so. If you cannot shut down, turn off your computer. If the computer will not turn off after you hold down the power button for at least four seconds, unplug the power cord, and wait a few seconds before reconnecting it.

2. Turn on your computer.

3. You will see three dots displayed quickly on the screen: ". . ." At this prompt, quickly press F11. The prompt displays for only a few seconds. If you are using a CD, wait for the Product Recovery program information to appear on the screen. You may have a choice of operating systems to recover. If so, select the operating system you want. Otherwise, select the option given. Select the recovery options you want, and follow the instructions on the screen.

Once the recovery process begins, do not turn off or restart the computer while the recovery process is underway.

When the recovery is complete, the program will prompt you to turn off or restart the computer.

Emergency Recovery Diskette Utility

In the event that the command prompt to enter the Product Recovery program on the hard disk becomes unusable, an Emergency Recovery Diskette will restore access to the Product Recovery program via the command prompt on the hidden hard disk drive partition.

You must make the Emergency Recovery Diskette for your computer. We highly recommend that you do this.

Follow the steps below to create your Emergency Recovery Diskette.

1. Restart your computer. At the ". . ." prompt, press the F11 key to enter the Product Recovery Program.

2. Use your arrow keys to select System Utilities. Press the Enter key.

3. Use your arrow keys to select Create a Recovery Repair Diskette. Press the Enter key.

4. Place a blank Floppy Disk in the drive.

5. Press any key when prompted.

6. When the process is complete, remove the floppy disk, and restart your computer.

In the future, if you need to recover your operating system but you are not prompted to press F11 to enter the Product Recovery program, use the Emergency Recovery Diskette that you created.

To use your Emergency Recovery Repair Diskette, place it in the floppy disk drive and restart the computer. The computer will boot to the floppy disk. When prompted, press any key to restore access to the Product Recovery program. You will receive confirmation that access to the Product Recovery program has been restored. Remove the Floppy Disk from the drive. Press the Ctrl, Alt, and Delete keys at the same time to restart your computer.

BIOS features

The BIOS of your PC controls the configuration and function of the internal hardware. It also performs a power-on self-test (POST) when the PC is turned on. The BIOS is preset for optimum performance and compatibility of your PC. Normally, you do not need to access or change any of the BIOS settings. You might be asked to access and change some BIOS settings by a service technician if you experience problems installing options or peripheral devices.

Accessing BIOS

To access the BIOS setup menu, hold the F1 key down while the PC is powering up. This takes you to the BIOS setup menu. If you go to the BIOS setup menu by accident, simply select the menu item **Exit without saving**.

Monitoring the power-on self-test (POST)

Your computer performs the power-on self-test everytime the PC is turned on. POST tests the memory of the PC and reports the total memory installed. It also checks the processor type and speed, the hard disk type, and the CD-ROM type. Normally, POST runs in the background and you do not see the results. To display the POST for results, press the tab key when the PC begins to power up.

Be aware that POST runs very quickly and the PC will automatically begin the startup process when POST is complete.

Most frequently asked BIOS questions:

How do I change the mode of the parallel port? Select the BIOS menu **Peripheral Setup**.

How do I change the startup sequence? Select the BIOS menu **Advanced CMOS Setup**.

How do I disable the onboard audio hardware? Select the BIOS menu **Peripheral Setup**.

How do I return the BIOS to the original factory settings? Select the menu item **Auto configure with Optimum Settings**.

Note: After you make a change to the BIOS, you must select the menu item **save settings and exit**.

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 side panel, first read
"Safety information" on page v and "Removing the side panel" on page 21
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. Reinstall the new software or new device.

The following directory will help you quickly locate problem categories in the troubleshooting charts.

Problem type	Go to:
Diskette drive	"Diskette drive problems" on page 36
General	"General problems" on page 40
Intermittent	"Intermittent problems" on page 40
Keyboard, mouse, or pointing device	"Keyboard, mouse, or pointing device problems" on page 41

Problem type	Go to:
Memory	"Memory problems" on page 42
Monitor	"Monitor problems" on page 37
Options	"Option problems" on page 43
Printer	"Printer problems" on page 45
Software	"Software problems" on page 46
Universal Serial Bus ports	"Universal Serial Bus port problems" on page 46

Diskette drive problems

Diskette drive problems	Action
Diskette drive in-use light stays on, or the system bypasses the diskette drive.	If there is a diskette in the drive, verify that: 1. The diskette drive is enabled. Use the Configuration/Setup Utility program to check this. 2. The computer is checking for the diskette drive in the startup sequence. Use the Configuration/Setup Utility program to verify this. 3. The diskette you are using is good and not damaged. Try inserting another diskette if you have one. 4. The diskette is inserted correctly, with its label up and its metal shutter end first in the drive. 5. The diskette contains the necessary files to start the computer (the diskette must be startable). 6. The diskette drive cables are properly installed and securely connected. 7. There is no problem with your software program (see "Software problems" on page 46). If this does not correct the problem, contact IBM technical support.

Monitor problems

Monitor problems	Action
General monitor problems	If you suspect a problem with your monitor, see the information supplied with the monitor for adjustment and testing instructions. If you cannot find the problem, check the other listings on monitor problems in this table. If this does not correct the problem, contact IBM technical support.
Screen flickers	Set the monitor for the highest, noninterlaced refresh rate supported by your monitor and the video controller in your computer. **Attention:** Using a resolution or refresh rate that is not supported by your monitor might damage it. You can reset the refresh rate through your operating system. See your operating system documentation for further information on monitor settings. If this does not correct the problem, contact IBM technical support.
The monitor works when you turn on the system, but goes blank when you start some application programs.	Verify that: 1. The monitor signal cable is securely connected to the monitor and to the monitor connector on the graphics adapter. For the location of the monitor connector on the graphics adapter installed in your computer, see "Cable connections and switch settings" on page 6. 2. The necessary device drivers for the application programs are installed. If this does not correct the problem, contact IBM technical support.

Monitor problems	Action
Wavy, unreadable, rolling, distorted, or jittery screen images.	If the monitor self-tests show that the monitor is working properly, verify that:

If the monitor self-tests show that the monitor is working properly, verify that:

1. The location of the monitor is appropriate. Magnetic fields around other devices, such as transformers, appliances, fluorescent lights, and other monitors might be causing the problem. To determine if the location is causing the problem:

   a. Turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.)

   b. Adjust the placement of the monitor and other devices so that they are at least 305 mm (12 in.) apart. Also, when relocating the monitor, be sure it is at least 76 mm (3 in.) from the diskette drives to prevent diskette drive read/write errors.

   c. Turn on the monitor.

2. A monitor signal cable is properly connected to the monitor and computer, and that the cable is installed securely.

3. You are not trying to run your monitor at a higher refresh rate than the monitor supports. See the documentation supplied with your monitor for supported refresh rates.

Note: An enhanced monitor signal cable with additional shielding might be available for your monitor. See your IBM reseller or marketing representative for information.

If this does not correct the problem, contact IBM technical support.

Monitor problems	Action
The monitor works when you turn on the system, 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. If this does not correct the problem, contact IBM technical support.
Blank screen.	Verify that: 1. The monitor power cord is plugged into a working electrical outlet. 2. The monitor is turned on and the Brightness and Contrast controls are adjusted correctly. 3. The monitor signal cable is securely connected to the monitor and the monitor connector on the system board. To find the monitor connector on the system board, see "Cable connections and switch settings" on page 6. If this does not correct the problem, contact IBM technical support.
Only the cursor appears.	Contact IBM technical support.
Wrong characters appear on the screen.	Contact IBM technical support.

General problems

General problems	Action
The computer does not start when you press the power switch.	Verify that: 1. All cables are securely connected to the proper connectors on the computer. For the location of the connectors, see "Cable connections and switch settings" on page 6. 2. The computer cover is properly installed. If this does not correct the problem, contact IBM technical support.
Problems such as indicator lights not working.	Contact IBM technical support.

Intermittent problems

Intermittent problems	Action
A problem occurs only occasionally and is difficult to detect.	Verify that: 1. All cables and cords are securely connected to the rear of the computer and to attached devices. 2. When the computer is turned on, the fan grill is not blocked (there is air flow around the grill), and the fans are working. If airflow is blocked or the fans are not working, the computer might overheat. If this does not correct the problem, contact IBM technical support.

Keyboard, mouse, or pointing device problems

Keyboard, mouse, or pointing-device problems	Action
All or some keys on the keyboard do not work.	Verify that: 1. The computer and the monitor are turned on. 2. The keyboard cable is securely connected to the keyboard connector on the computer. For the location of the keyboard connector, see "Cable connections and switch settings" on page 6. If this does not correct the problem, contact IBM technical support.
The mouse or pointing device does not work.	Verify that: 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 mouse or serial connector. To find the mouse and serial connectors, see "Cable connections and switch settings" on page 6. 2. The mouse is clean. See "Mouse" on page 17. 3. The device drivers for the mouse are installed correctly. If this does not correct the problem, contact IBM technical support.

Memory problems

Memory problems	Action
The amount of memory displayed is less than the amount of memory installed.	The amount of available memory shown might be somewhat less than expected because basic input/output system (BIOS) shadowing takes some random access memory (RAM) and ACPI and USB can take up to 1MB.
	In addition, this system features an integrated video system in which some memory is used by the video controller. Windows will only report the memory available for its use. For example, if the system uses 4MB of memory for video and the total system memory is 64MB, Windows will report 60MB.
	Verify that:
	1. You have installed the correct type of DIMMs for your computer. See "Working with memory" on page 23 for instructions on adding DIMMs.
	2. The DIMMs are properly installed and securely connected.
	3. If you added or removed memory, you saved the new configuration before exiting the Configuration/Setup Utility program.
	The system might have detected a bad DIMM and automatically reallocated memory to enable your computer to continue to operate.
	If this does not correct the problem, contact IBM technical support.

Option problems

Option problems	Action
An IBM option that was just installed does not work.	Verify that:

Verify that:

1. The option is designed for your computer.

2. You followed the installation instructions supplied with the option and in Chapter 4, "Installing options," on page 19.

3. All option files (if required) are installed correctly. See "Installing files from Option Diskettes" on page 47 for information about installing option files.

4. You have not loosened any 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.

If this does not correct the problem, contact IBM technical support.

Option problems	Action
An IBM option that previously worked does not work now.	Verify that all option hardware and cable connections are secure.
	If the option comes with its own test instructions, use those instructions to test the option.
	If the failing option is a SCSI option, verify that:
	1. The cables for all external SCSI options are connected correctly.
	2. The last option in each SCSI chain, or the end of the SCSI cable, is terminated correctly.
	3. All external SCSI options are turned on. External SCSI options must be turned on before the system is turned on.
	For more information, see the SCSI documentation that came with your SCSI device or devices.
	If this does not correct the problem, contact IBM technical support.

Printer problems

Printer problems	Action
The printer does not work.	Verify that: 1. The printer is turned on and is online. 2. The printer signal cable is securely connected to the correct parallel, serial, or USB port on the computer. (See"Cable connections and switch settings" on page 6). 3. You have assigned the printer port correctly in your operating system or application program. 4. If the problem persists, run the tests described in the documentation that comes with your printer. If this does not correct the problem, contact IBM technical support.

Software problems

Software problems	Action
Is your software program OK?	To determine if problems are caused by installed software, verify that:

To determine if problems are caused by installed software, verify that:

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. Other software works on your computer.

4. The software you are using works on another computer.

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.

If this does not correct the problem, contact IBM technical support.

Universal Serial Bus port problems

Universal Serial Bus port problems	Action
The Universal Serial Bus ports cannot be accessed.	Verify that the USB cable is properly installed and firmly seated. If this does not correct the problem, contact IBM technical support

Installing files from Option Diskettes

An optional device or adapter might come with a diskette. Diskettes that are included in option packages usually contain files that the system needs for recognizing and activating the options. Until you install the necessary files, the new device or adapter might cause error messages.

If your optional device or adapter comes with a diskette, you might need to install some configuration (.CFG) files or diagnostic (.EXE or .COM) files from the diskette to your hard disk. See the documentation that comes with the option to determine if you need to install files.

Replacing the battery

Your computer has a special type of memory that maintains the date, time, and settings for built-in features, such as serial and parallel port assignments (configuration). 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 lost. An error message is displayed when you turn on the computer.

See "Lithium battery notice" on page vii for information about replacing and disposing of the battery.

If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.
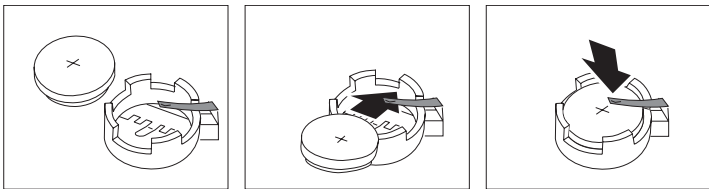
To change the battery:

1. Turn off the computer and all attached devices.

2. Unplug the power cord and remove the cover. See "Removing the side panel" on page 21.

3. Locate the battery.

4. If necessary, remove any adapters that impede access to the battery. See "Installing adapters" on page 25 for more information.

5. Remove the old battery.
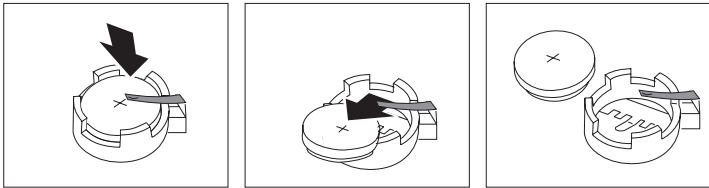
6. Install the new battery.

7. Replace any adapters that were removed to gain access to the battery. See "Installing adapters" on page 25 for instructions for replacing adapters.

8. Replace the cover and plug in the power cord.

   Note: When the computer is turned on for the first time after battery replacement, an error message might be displayed. This is normal after replacing the battery.

9. Attach all devices, and turn on the computer.

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

Chapter 6. Getting help, services, and information

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.

For example, IBM maintains pages on the World Wide Web where you can get information about IBM products and services, find the latest technical information, and download device drivers and updates. Some of these pages are:

http://www.ibm.com	Main IBM home page
http://www.ibm.com/pc	IBM Personal Computing
http://www.mynetvista.com/support	IBM NetVista Personal Computer Support
http://www.ibm.com/pc/support	Support for other IBM products and options

Help is also available from bulletin boards and online services. This section provides information about these sources.

Services available and telephone numbers listed are subject to change without notice.

Service support

With the original purchase of an IBM hardware product, you have access to extensive support coverage. During the IBM hardware product warranty period, you may call the IBM Personal Computer HelpCenter for hardware product assistance covered under the terms of the IBM hardware warranty.

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 engineering changes available that apply to your hardware.

Be sure to retain your proof of purchase to obtain warranty service.

Please have the following information ready when you call:

- Machine Type (2276)

- Serial number (please refer to page 1 for instructions on how to find your serial number)

- Description of the problem

- Exact wording of any error messages

- Hardware and software configuration information

If possible, be at your computer when you call.

The following items are not covered:

- Replacement or use of non-IBM parts or nonwarranted IBM parts

- 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's warranty terms.

Before you call for service

Many computer problems can be solved without outside assistance, by using the online help or by looking in the online or printed documentation that comes with your computer or software. Also, be sure to read the information in any README files that come with your software.

Most computers, operating systems, and application programs come with documentation that contains troubleshooting procedures and explanations of error messages.

If you suspect a software problem, consult the documentation (including README files) for the operating system or application program.

Getting customer support and service

Purchasing an IBM PC hardware product entitles you to standard help and support during the warranty period. If you need additional support and services, a wide variety of extended services are available for purchase that address almost any need.

Using the World Wide Web

On the World Wide Web, the IBM Personal Computing 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

For support on your IBM NetVista personal computer:

http://www.mynetvista.com/support

For support on other IBM products and options:

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

Getting help by telephone

During the warranty period, you can get help and information by telephone through the IBM PC HelpCenter. Expert technical-support representatives are available to assist you with questions you might have on the following:

- Setting up your computer

- 30-day, preinstalled-operating-system support

- Arranging for service

- Arranging for shipment of customer-replaceable parts

Please have the following information ready when you call:

- Machine Type (2276)

- Serial number (please refer to page 1 for instructions on how to find your serial number)

- Description of the problem

- Exact wording of any error messages

- Hardware and software configuration information for your system

If possible, be at your computer when you call.

To contact the IBM PC HelpCenter

- For the telephone number applicable to your unit, please refer to the IBM Statement of Limited Warranty included with your computer or visit our support website at: http://www.mynetvista.com/support.

Appendix

This appendix includes product trademarks, and notices.

Notices

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

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

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

> IBM Director of Licensing
> IBM Corporation
> North Castle Drive
> Armonk, NY 10504-1785
> U.S.A.

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

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

Any references in this publication to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

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

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Processing date data

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

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

The foregoing is a Year 2000 Readiness Disclosure.

Trademarks

The following terms are trademarks of the IBM Corporation in the United States or other countries or both:

HelpCenter
IBM
IntelliStation
Netfinity
NetVista

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

Electronic emission notices

Class B Notices

Federal Communications Commission (FCC) Statement

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

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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

Responsible Party:

International Business Machines Corporation

New Orchard Road
Armonk, NY 10504
Telephone: 1-919-543-2193

FC Tested To Comply
With FCC Standards

FOR HOME OR OFFICE USE

Industry Canada Class B emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Federal Communications Commission (FCC) and telephone company requirements

1. This device complies with Part 68 of the FCC rules. A label is affixed to the device that contains, among other things, the FCC registration number, USOC, and Ringer Equivalency Number (REN) for this equipment. If these numbers are requested, provide this information to your telephone company.

   Note: If the device is an internal modem, a second FCC registration label is also provided. You may attach the label to the exterior of the computer in which you install the IBM modem, or you may attach the label to the exter-nal DAA, if you have one. Place the label in a location that is easily accessi-ble, should you need to provide the label information to the telephone company.

2. The REN is useful to determine the quantity of devices you may connect to your telephone line and still have those devices ring when your number is called. In most, but not all areas, the sum of the RENs of all devices should not exceed five (5). To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your local telephone company to determine the maximum REN for your calling area.

3. If the device causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance; if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

4. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice to give you an opportunity to maintain uninterrupted service.

5. If you experience trouble with this product, contact your authorized reseller, or call IBM. In the United States, call IBM at **1-800-584-9182**. In Canada, call IBM a**t 1-800-565-334**4. You may be required to present proof of purchase.

   The telephone company may ask you to disconnect the device from the network until the problem has been corrected, or until you are sure the device is not malfunctioning.

6. No customer repairs are possible to the device. If you experience trouble with the device, contact your Authorized Reseller or see the Diagnostics section of this manual for information.

7. This device may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.

8. When ordering network interface (NI) service from the local Exchange Carrier, specify service arrangement USOC RJ11C.

Canadian Department of Communications certification label

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements documents. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION:

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Étiquette d'homologation du ministère des Communications du Canada

AVIS: L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunications. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques ou à un électricien, selon le cas.

AVIS: L'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

Power cord notice

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

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

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

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

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

Index

IBM ®