PC 300GL User Guide

Types 6267, 6277, and 6287

PC 300GL User Guide

Types 6267, 6277, and 6287

IBM

Note

Before using this information and the product it supports, be sure to read the general information under Appendix B, “Product Warranties and Notices” on page 133.

First Edition (November 1998)

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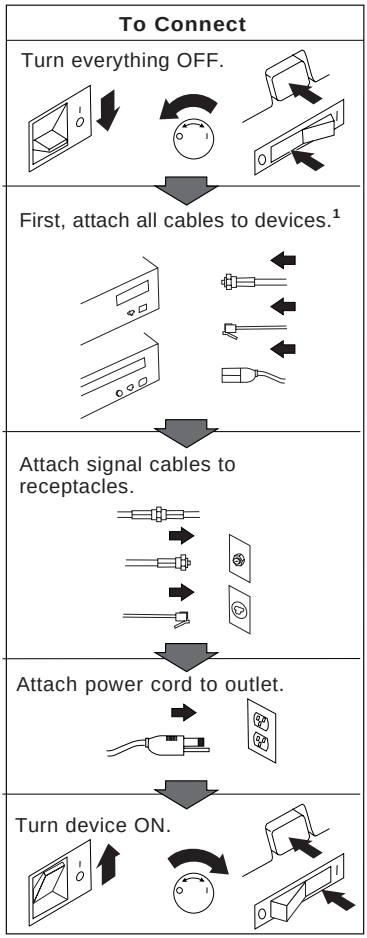
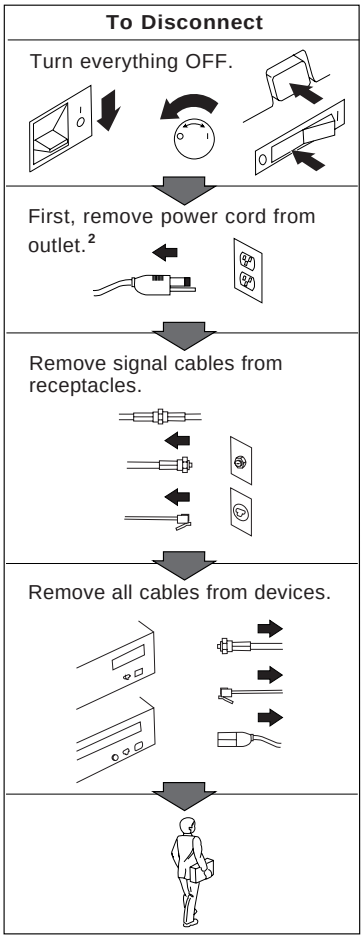
Safety Information

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.





[1] In the U.K., by law, the telephone cable must be connected after the power cord.

[2] In the U.K., by law, the power cord must be disconnected after the telephone line cable.

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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 drive. CD-ROM drives are also sold separately as options. The CD-ROM drive is a laser product. The CD-ROM drive is 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, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

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

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

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

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

DANGER

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

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 33F8354 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.

About This Book

This book will help you become familiar with your IBM Personal Computer and its features. It describes how to configure, 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.

Related Information

The following documentation contains additional information about your computer:

- *About Your Software*
  This publication (provided only with computers that have IBM-preinstalled software) contains information about the preinstalled software package.
- *Understanding Your Personal Computer*
  This online publication (provided on the *Software Selections* CD that comes with your computer) includes general information about using personal computers and in-depth information about the specific features of your computer. This document is also available as part of the IBM-preinstalled software. To access this online publication, see *About Your Software.*

The following publications contain more information about your computer.

- *Hardware Maintenance Manual*
  This publication contains information for trained service technicians. It can be found on the World Wide Web at:

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

  Click on IBM Support and Online Publications.

  This manual can also be ordered from IBM. To purchase a copy, refer to Chapter 9, “Getting help, service, and information” on page 121.
- *Technical Information Manual*
  This publication contains information for individuals who want to know more about the technical aspects of their computer. It can be found on the World Wide Web at:

  `http://www.pc.ibm.com/us/`

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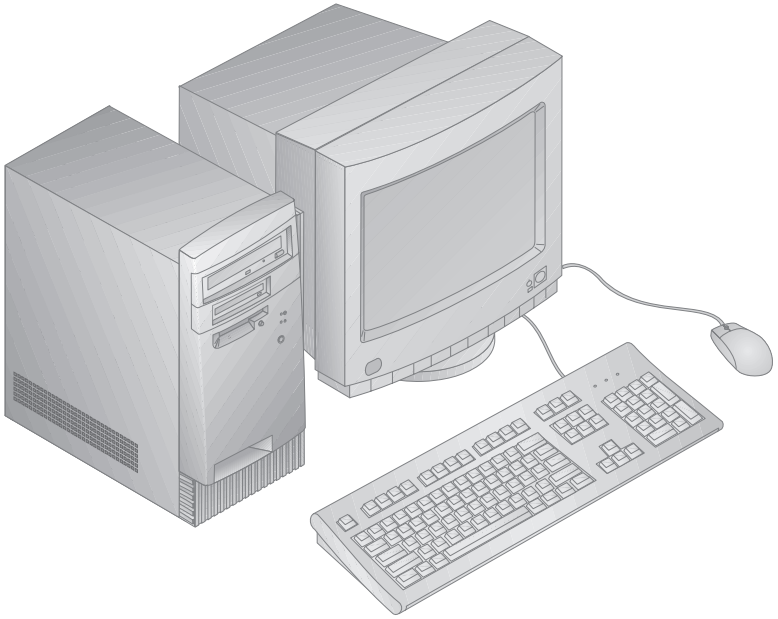
Chapter 1. IBM PC 300GL Overview



Thank you for selecting an IBM PC 300GL. 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.

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Features

System Summary

The following information covers a variety of models. For a listing of features for your specific model, refer to the System Summary screen in the Configuration/Setup Utility Program. See Chapter 5, "Using the Configuration/Setup Utility Program" on page 27 for more information.

Microprocessor

Your PC 300GL includes an Intel® Celeron™ or Pentium™ II microprocessor with up to 512KB of L2 cache memory.

Memory

- Support for:
  - 3.3 V, synchronous, 168-pin, dual inline (DIMM), unbuffered, 100 MHz nonparity SDRAM
  - A maximum of 256 MB in certain models. A maximum of 384 MB in some models.
  - 16 MB, 32 MB, 64 MB, and 128 MB unbuffered DIMMs
  - DIMM heights up to 2.5 inches
- Flash memory for system programs

Internal Drives

- Standard: One 3.5-inch, 1.44 MB diskette drive; internal hard disk drive
- Some models: One EIDE CD-ROM drive; Zip drive

Video Controller

- S3 Trio3D accelerated graphics port (AGP) video subsystem
- 64-bit, 100 MHz SGRAM memory up to a maximum of 4 MB (depending on the model)

Audio Subsystem (some models)

- Integrated audio subsystem: ESS 1938 PCI controller with an internal speaker
- 16-bit Sound Blaster Pro compatible
- 15-pin joystick and MIDI interface

Ethernet adapter with Wake on LAN capability (some models)

Internal 56K V.90 modem (some models)

System Management Features

- Remote Program Load (RPL) and Dynamic Host Configuration Protocol (DHCP)
- Wake on LAN enabled (requires Wake on LAN supported network adapter)
- Wake on ring enabled (in the BIOS, this feature is called Serial Port Ring Detect for an external modem and Modem Ring Detect for an internal modem)
- Wake on alarm
- Update POST and BIOS over the network (in the BIOS, this feature is called Remote Administration)
- Automatic power-on startup sequence
- Desktop Management Interface (DMI) BIOS and DMI software
- Store POST hardware test results

Input/Output Features

- 25-pin, ECP/EPP parallel port
- One 9-pin, 16550 UART serial port
- Two 4-pin, USB ports
- Mouse port
- Keyboard port
- 15-pin monitor port
- One 15-pin joystick/MIDI in models with an integrated audio subsystem
- Three audio connectors (headphone, line out, and microphone) in models with an integrated audio subsystem

Expansion

- Four drive bays
- Four expansion slots (three PCI, and one ISA)
- Support for PCI/ISA Plug and Play adapters

Power

- Manual switch between ranges, 145 W, 90–137/180–265 V AC
- Automatic switching, 47–53/57–63 Hz
- Built-in overload and surge protection
- Advanced Power Management support

Security Features

- Power-on and administrator passwords
- Built in loop for locking the cover using a customer supplied padlock
- Support for the addition of a U-bolt and lockable cable
- Startup sequence control
- Startup without diskette drive, keyboard, or mouse
- Unattended start mode
- Diskette and hard disk I/O control
- Serial and parallel port I/O control

IBM Preinstalled Software

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

Operating Systems (Supported)

- Microsoft Windows NT® Versions 3.51 and 4.0
- Microsoft Windows™ 95 and Windows 98

Operating Systems (Tested for Compatibility)[1]

- Novell NetWare Versions 3.2, 4.11, 5.0
- SCO OpenServer 5.0.4

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[1] The operating systems listed here are being tested for compatibility at the time this publication goes to press. Additional operating systems might be identified by IBM as compatible with your computer following the publication of this booklet. Corrections and additions to the list are available in the IBM online compatibility report, which can be found on the World Wide Web. For World Wide Web pages, see Chapter 9, “Getting help, service, and information” on page 121.

Euro Sign Support Information

The *Euro Sign* is the name given to the proposed currency symbol of the European Union. According to the European Commission, the Euro will exist as a currency beginning 1 January 1999, but will only gradually move into general use with the introduction of coins and notes in 2002.

IBM and various other personal computer industry companies plan to support the Euro Sign on products released in 1999. For support information on products released prior to that date, see the appropriate Web site for your product.

For your computer to support the Euro Sign, a proper combination of both hardware (computer, keyboard, and printer) and software (operating systems, application programs, and device drivers) is required.

There are many Web sites that provide Euro Sign information and support (some are listed below). First, determine the computer hardware and software you are using. Then, visit the Web sites that apply to your system for the latest Euro Sign information and support. In many cases, updates are available for Euro Sign support. These updates can be downloaded and installed on your computer.

- http://www.adobe.com/
- http://www.ibm.com/
- http://www.microsoft.com/europe/euro/
  (The “euro product update” is available for Windows 95 and Windows NT)

Specifications

Size

- Depth: 381 mm (15.00 in.)
- Width: 194 mm (7.625 in.)
- Height: 356 mm (14.00 in.)

Weight

- Base configuration: 8.28 kg (18.25 lb)
- Maximum configuration (as shipped): 10.2 kg (22.5 lb)

Environment

- Air temperature:
  - System on: 10° to 37°C (50° to 90°F) at altitude 0–914 m (3000 ft); 10° to 32°C (50° to 90°F) at altitude 915 m (3001ft) to 2133 m (7000 ft)
  - System off: 10° to 43°C (50° to 110°F)
- Humidity:
  - System on: 8% to 80%
  - System off: 8% to 80%

Heat Output

- Approximate heat output in British thermal units (Btu) per hour:
  - Maximum configuration (as shipped): 256 Btu/hour (75 watts)
  - Maximum configuration (theoretical)[2]: 706 Btu/hour (207 watts)

Electrical Input

- Sine-wave input (50/60 Hz) is required
- Input voltage/current:
  - Low range:
    - Minimum: 90 V AC
    - Maximum: 137 V AC
    - Current rating: 4.0 amps
  - High range:
    - Minimum: 180 V AC
    - Maximum: 265 V AC
    - Current rating: 2.0 amps
  - Input kilovolt-amperes (kVA) at maximum (configuration as shipped) approximately: 0.10 kVA

[2] Under typical maximum configurations, the heat output will be substantially below the theoretical maximum.

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

Acoustical Noise-Emission Values

- Average sound-pressure levels:
  - At operator position:
    - 38 dBA idle
    - 43 dBA operating
  - At bystander position–1 meter (3.3 ft):
    - 33 dBA idle
    - 37 dBA operating
- Declared (upper limit) sound power levels:
  - 4.3 bels idle
  - 5.0 bels operating

These levels were measured in controlled acoustical environments according to procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779, and are reported in accordance with ISO 9296.

Actual sound-pressure levels in your location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound power levels indicate an upper limit, below which a large number of computers will operate.

Chapter 2. Setting Up Your Computer

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

Before You Begin

Read “Safety Information” on page vii 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 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.

For information about arranging your computer for comfort and ease-of-use, refer to Chapter 3, “Arranging Your Workspace” on page 15.

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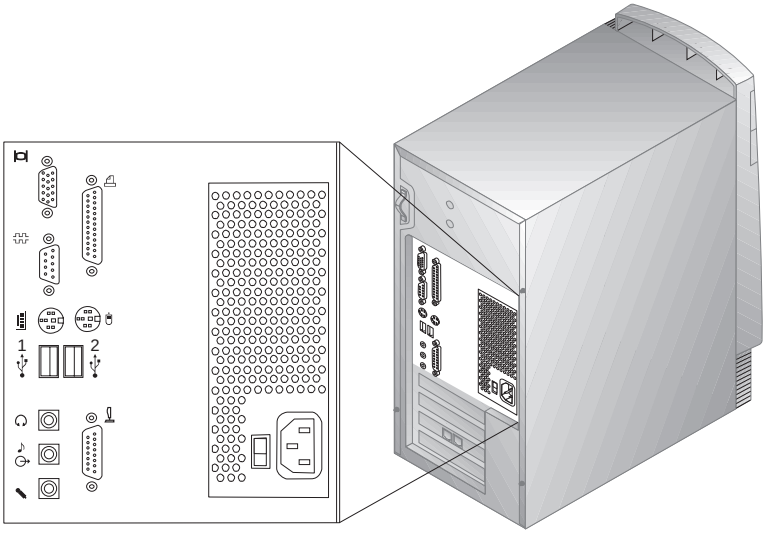
Connecting Computer Cables

When you set up your computer, you will need to know where to find the connectors. The following illustration shows the location of the connectors on the back of the computer. You might not have all of the devices shown here.



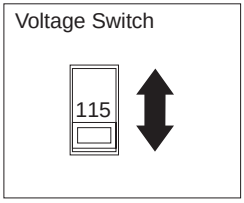
Note: Most of the connectors on the rear of the computer have icons. These will help you to determine where to connect the proper cables on your computer.

Important note for the United Kingdom

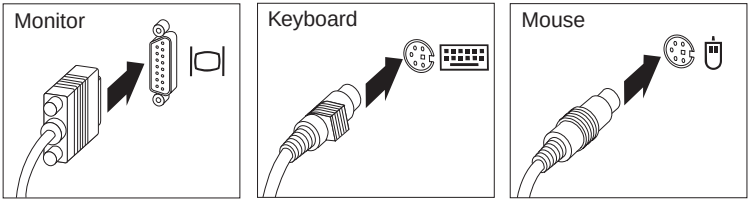
If you are in the United Kingdom, you must, by law, connect the telephone cable *after* the power cord.

Use the following steps to set up your computer.

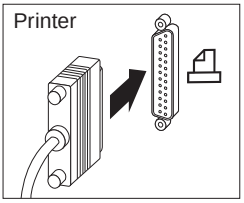
1. Check the position of the voltage–selection switch. Use a ballpoint pen to slide the switch, if necessary.
   - If the voltage supply range is 90-137 V AC, set the voltage switch to 115 or 115 V.
   - If the voltage supply range is 180-265 V AC, set the voltage switch to 230 or 230 V.



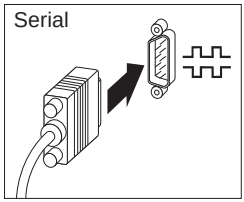
2. Connect the monitor cable to the monitor (if it is not already attached), then to the monitor connector and tighten the attachment screws. Connect the keyboard cable to the gray keyboard connector. Connect the mouse cable to the green mouse connector.



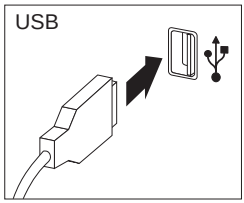
3. Connect any additional devices you have.
   - Any printer or parallel device to the parallel port connector.



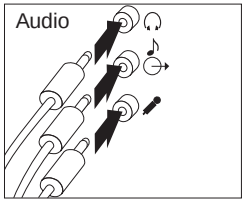
- Any serial device or external modem in the serial connector.



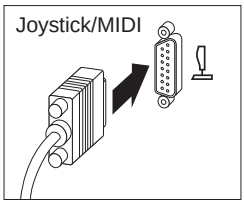
- Any universal serial bus (USB) devices.



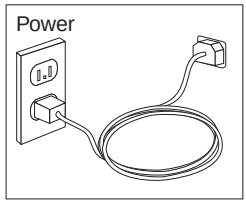
- Any optional devices, such as speakers, microphones, or headphones, for models with an audio device.



- Joystick / MIDI device for models with a joystick / MIDI connector.



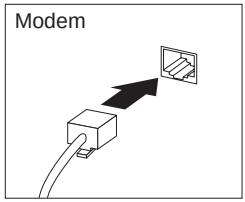
- Connect the power cord to the power connector. If there is a label covering the power connector, remove it. Connect the power cords to the computer, monitor, and other devices first, and then plug the cords into properly grounded electrical outlets.



Important:

- When the power cord is first plugged in, the computer powers on for a few seconds, then powers off. This is normal operation.
- In some circumstances, the computer might not power off immediately when the power switch is pressed. In this case, hold the power switch down until the power turns off.

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



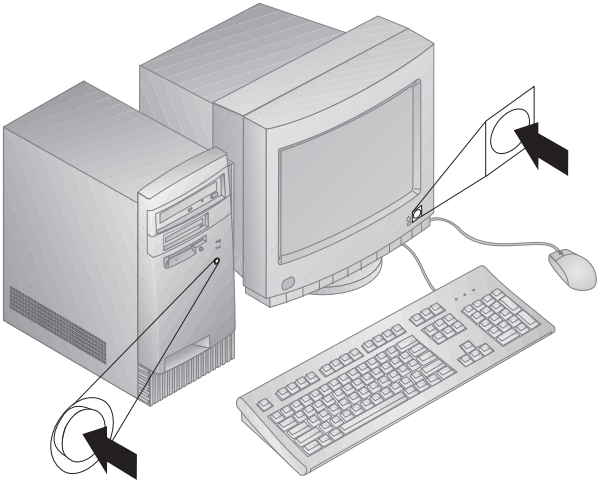
- If your computer came with an Ethernet adapter, connect the Ethernet cable.

Important Information

Class 5 Ethernet cabling must be used for operation of the system within FCC Class A limits.

Turn on Power

Turn on the monitor and other external devices first, and then turn on the computer. See the illustration below for the location of the power switches for the monitor and the computer. You see a logo screen while the computer performs a short self-test. Upon successful completion of the task the logo screen disappears, the BIOS is loaded, and the software is loaded (in models with preinstalled software).



Note: If you suspect a problem, see Chapter 8, “Troubleshooting” on page 83.

Finish the Installation

Locate identification numbers (serial and model/type) and record this information inAppendix A, “Computer Records” on page 131 .

See “Related Information” on page xi in the front of this book for sources of other information about your computer. For information about IBM-installed software, see *About Your Software* in your applications package. Additional programs and device drivers are on the *Software Selections* CD, and in some cases on other CDs and diskettes. If you install your own operating system, make sure you install the device drivers after installing your operating system. Installation instructions are provided with the media or in README files on the diskettes or CDs.

Chapter 3. Arranging Your Workspace

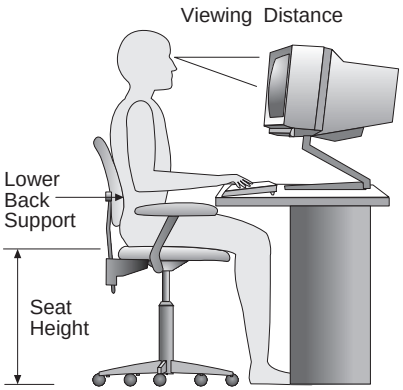
To get the most from your computer, arrange both the equipment you use and your work area to suit your needs and the kind of work you do. Your comfort is of foremost importance, but light sources, air circulation, and the location of electrical outlets also can affect the way you arrange your workspace.

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.

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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 150.

Chapter 4. Operating Your Computer

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

Important Information

- When the power cord is first plugged in, the computer might appear to power on for a few seconds, then power off. This is a normal sequence.
- The power switch will normally operate with a single touch. However, in some circumstances the computer might not power off immediately. In this case, hold the power switch down for approximately 5 seconds. The computer will then turn off.
- Always shut down your operating system before turning off the computer. Refer to your operating system documentation for the proper procedure to shut down your operating system.
- Proper cooling is required for the reliable performance of internal components. Do not operate your computer with the cover off.

Starting Your Computer

What you see and hear when you start up your computer depends on the settings in the Start Options menu of the Configuration/Setup Utility Program. The default settings are **Power On Status** [*Disabled*] and **Power On Self Test** [*Quick*].

Note: Other selections also might change what is displayed when the computer starts up.

The following briefly describes what happens in the default mode when you turn on your computer:

1. The IBM logo appears.
2. The amount of system memory and extended memory appears in the top-left corner of screen.
3. The `Press F1 for Configuration/Setup` prompt appears.
4. If any errors were detected during POST, they are displayed.
5. If you have set a power-on password, a prompt appears on the screen. If you have set both power-on and administrator passwords, you can type either password at the password prompt. When you type your password at the prompt and press **Enter**, the first screen of your operating system or application program appears.

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6. If the system hardware configuration has changed, the Configuration/Setup Utility Program menu may be displayed when you press **Enter**.

For more information, see "Power-On Self-Test (POST)" on page 84.

If **Power On Status** is [*Enabled*], and the power-on self-test (POST) finishes without detecting a problem, you hear one beep. If POST detects a problem when you start your computer, you hear multiple beeps or no beep. In most cases, an error code appears in the top-left corner of the screen, and in some cases a description of the error is displayed beside the code. (Note that the screen will sometimes display multiple error codes and descriptions.) Write down all error code numbers and descriptions.

If **Power On Self Test** is [*Enhanced*], numbers showing the amount of memory being tested appear in the top-left corner of the screen until the total amount of memory in the system is reached. Prompts for running a fast POST or accessing the Configuration/Setup Utility Program appear in the lower-left corner of the screen.

Shutting Down

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

Using System-Management Features

This section describes features that enable a network administrator or file server to remotely manage and control your computer. For more information about system management, refer to *Understanding Your Personal Computer* (provided on the *Software Selections* CD that comes with your computer).

Desktop Management Interface

Desktop Management Interface (DMI) is a method for gathering information about the hardware and software in your computer. In a network environment, network administrators can use DMI to remotely monitor and control your computer. For more information about DMI, refer to *Understanding Your Personal Computer* (provided on the *Software Selections* CD that comes with your computer).

Wake on LAN

The Wake on LAN feature requires a Wake on LAN network card. A network administrator can use this feature to turn on your computer from a remote location. When Wake on LAN is used in conjunction with network management software, such as Netfinity (provided on the *Software Selections* CD that comes with your computer), many types of functions, such as data transfers, software updates, and POST or BIOS updates to your computer can be initiated remotely. For more information, see the documentation that comes with your Ethernet adapter.

Note: If the computer power cord is plugged into a surge protector, make sure that when you turn off power you use the computer power switch and not the surge protector switch. Otherwise, the Wake on LAN feature will not work.

Wake on Ring

The wake on ring feature can be used to turn on your computer when a wake on ring supported modem receives a call from the telephone line to which it is connected. It is configured in the Configuration/Setup Utility Program.

Remote Program Load or Dynamic Host Configuration Protocol

If your computer comes with an Ethernet adapter, a network administrator can use Remote Program Load (RPL) and Dynamic Host Configuration Protocol (DHCP) to control your computer. If you use RPL in conjunction with software such as LANClient Control Manager, you can use a feature called *Hybrid RPL*, which installs hybrid images (or files) on the hard disk. Then, each time the computer starts from the network, LANClient Control Manager recognizes your computer as a Hybrid RPL client and a *bootstrap* program is downloaded to your computer hard disk. This bootstrap program is small, which helps prevent network congestion. An advantage to Hybrid RPL is that the network traffic associated with a standard RPL is avoided.

Remote Administration

A network administrator can use this feature to update remotely the POST and BIOS in your computer. Network management software, such as LANClient Control Manager, is required in order to take advantage of this feature. Refer to “Setting Remote Administration” on page 36 for configuration information.

Using Video Features

Your computer has a super video graphics array (SVGA) advanced graphics port (AGP) controller located on the system board. SVGA is a video standard for displaying text and graphic images on a monitor screen. Like other video standards, SVGA supports a variety of *video modes*. Video modes are different combinations of resolution, refresh rate, and color defined by a video standard for displaying text or graphics. For more information on video modes, refer to *Understanding Your Personal Computer* (provided on the *Software Selections* CD that comes with your computer).

Video Device Drivers

To take full advantage of the graphics adapter in your computer, some operating systems and application programs require custom 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 adapters and a README file with instructions for installing the device drivers are provided on the *Software Selections* CD that comes with your computer. If your computer has IBM-preinstalled software, video device drivers have already been installed on the hard disk. However, you can use the device driver installation instructions if you ever need to reinstall the device drivers; if you want to change video resolution, color depth, or monitor settings; or if you need information on obtaining and installing updated device drivers.

See Chapter 9, “Getting help, service, and information” on page 121 for more information.

Changing Monitor Settings

To get the best possible image on your screen and to reduce flicker, you might need to reset the resolution and refresh rate of your monitor. You can view and change monitor settings through your operating system using the instructions provided in the README files on the *Software Selections* CD that comes with your computer. Refer to your operating system documentation for further information on monitor settings.

Attention

Before you change any monitor settings, be sure to review the information that comes with your monitor. Using a resolution or refresh rate that is not supported by your monitor might cause the screen to become unreadable and could damage the monitor. The information that comes with your monitor usually includes the resolutions and refresh rates that the monitor supports. If you need additional information, contact the manufacturer of the monitor.

To minimize screen flicker and jitter, set your monitor for the highest noninterlaced refresh rate that the monitor supports. If your monitor complies with the VESA Display Data Channel (DDC) standard, it is probably already set to the highest refresh rate that the monitor and video controller can support. If you are not sure if your monitor is DDC-compliant, refer to the documentation provided with the monitor.

Using Audio Features

Some models have an integrated ESS 1938 audio controller that supports Sound Blaster applications and is compatible with the Microsoft Windows Sound System. These models also have a single internal speaker and three audio ports. The audio controller provides you with the ability to play back and capture sound and music, and with the internal speaker you can enjoy sound with multimedia applications. Optionally, you can connect two stereo speakers to the audio connectors 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, refer to “Connecting Computer Cables” on page 10.)

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

Note: The internal speaker in your computer is disabled when an external speaker is connected to the headphone port on your computer.

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

Microphone: This port is used to connect a microphone to your computer when you want to record voice or other sounds on the hard disk. This port can also be used by 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. Refer to your operating system documentation for information and instructions.

Updating System Programs

System programs are the basic layer of software built into your computer. They include the power-on self-test (POST), the basic input/output system (BIOS) code, and the Configuration/Setup Utility Program. POST is a set of tests and procedures that is performed each time you turn on your computer. BIOS is a layer of software that translates instructions from other layers of software into electrical signals that the computer hardware can understand. You can use the Configuration/Setup Utility Program to view and change the configuration and setup of your computer.

Your computer system board has a module called *electrically erasable programmable read-only memory* (EEPROM, also referred to as *flash memory*). You can easily update POST, BIOS, and the Configuration/Setup Utility Program by starting your computer using a flash update diskette or by using the Remote Administration feature, if enabled. See "Setting Remote Administration" on page 36 for more information.

As part of the continuing work to improve quality, IBM might make changes and enhancements to the system programs. When updates are released, they are available as downloadable files on the World Wide Web or through the PC Company Bulletin Board Service (see Chapter 9, "Getting help, service, and information" on page 121). Instructions for using the system programs updates are available in a README file included in the update files.

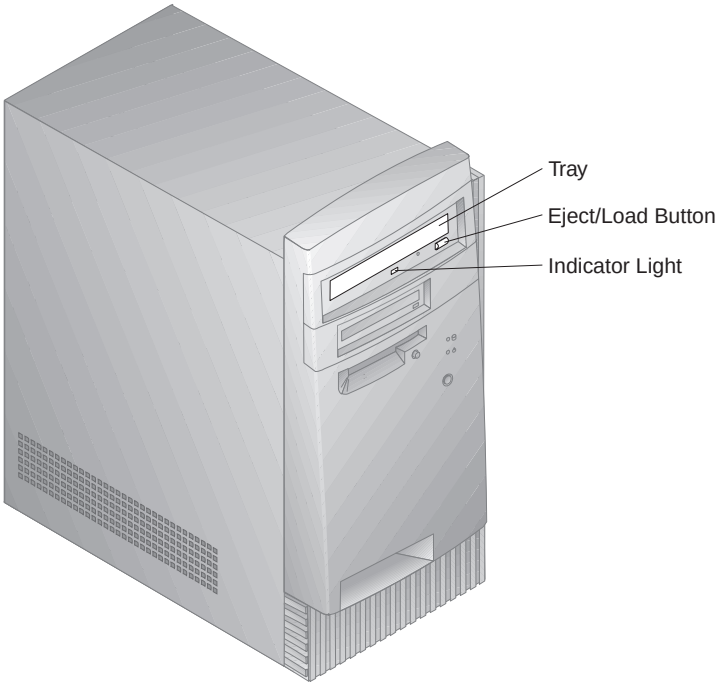
Using a CD-ROM Drive

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

Follow these guidelines when using a CD-ROM drive:

- Do not place the drive where there is:
  - High temperature
  - High humidity
  - Excessive dust
  - Excessive vibration or sudden shock
  - An inclined surface
  - Direct sunlight
- Do not insert any object other than a CD into the drive.
- Before moving the computer, remove the CD from the drive.

The following is an illustration of the front bezel of the CD-ROM drive.



Handling a CD

When handling a CD, follow these guidelines:

- Hold the CD by its edges. Do not touch the surface.
- 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 above and to the left of the CD-ROM indicator light.

Using Your Zip Drive

Some models come with a Zip drive. This section provides information to help you use a Zip drive with your computer.

To access your Zip drive, insert a Zip 100 MB capacity disk into the drive and select the drive letter assigned to the Zip drive on your computer. Store and copy files to and from the Zip drive using the same methods you use for other drives on your system.

Inserting and Ejecting a Zip Disk

Always turn on power to the computer *before* inserting a Zip disk. When you insert a Zip disk, the drive–busy light will flash momentarily and go out. (If the light continues to blink slowly, push the disk eject button to eject the Zip disk, then reinsert it.)

To eject the disk on a Windows NT system, use the software eject command. To eject the disk on a Windows 98 system, push the disk eject button or use the software eject command.

It is not necessary to remove the Zip disk from the drive when you shut down your computer; however, if you want to remove the Zip disk, do so before turning off your computer. When you remove the Zip disk from the drive, store it in the protective case.

CAUTION:
Disconnect power from the computer before using the emergency–disk eject hole. Do not try to force a Zip disk out of the drive. If the disk does not eject immediately, repeat the emergency disk–eject procedure.

The computer must be powered on for normal disk ejection from the Zip drive. If you must remove a Zip disk from the drive during a power failure, access the rear of the Zip drive and push a straightened paper clip into the emergency–eject hole which is located just above the power connector.

Drive Sleep Mode

The Zip drive has an automatic sleep mode designed to reduce power consumption and prolong the life of Zip disks. Sleep mode automatically spins down a disk after 15 minutes of inactivity, and the disk automatically spins up again when it is accessed. You can change the sleep mode time using your tools software.

Additional information might have been provided with the drive. If so, refer to the documentation that comes with the drive.

Using Security Features

To deter unauthorized use of your computer, you can lock the cover and keyboard.

Locking the Cover

Your computer comes with a built in padlock loop. You can use this loop to lock the cover to your computer with a padlock.

Locking the Keyboard

You can disable the keyboard so that others are unable to use it. If a power-on password is set, the keyboard is locked when you turn on the computer. You must type the correct password before the keyboard will unlock. You can enable the power-on password feature with the Configuration/Setup Utility Program. See Chapter 5, “Using the Configuration/Setup Utility Program” on page 27.

Some operating systems have a keyboard and mouse lock-up feature. Check the documentation that comes with your operating system for more information.

Using a Security U-Bolt

Optionally, you can install a security U-bolt on the back of your computer to keep your computer bolted to the location you have selected for your computer. For instructions on installing a security U-bolt, see “Installing a Security U-bolt” on page 75.

Chapter 5. Using the Configuration/Setup Utility Program

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

This chapter contains information about starting, using, and exiting from the Configuration/Setup Utility Program. It also contains information about passwords, startup sequence, remote administration, and power management and concise step-by-step instructions for enabling network-related settings for your computer.

Starting and Using the Configuration/Setup Utility Program

To start the Configuration/Setup Utility Program:

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. (Do not use **Ctrl+Alt+Del** to restart the computer.)
2. When the Configuration/Setup Utility Program prompt appears in the lower-left corner of the screen during startup, press **F1**. (This prompt appears on the screen for only a few seconds. You must press **F1** quickly.)
3. If you have *not* set an administrator password, the Configuration/Setup Utility Program menu appears on the screen. If you have set an administrator password, the Configuration/Setup Utility Program menu will not appear until you type your administrator password and press **Enter**. See "Power-On Password" on page 30 and "Administrator Password" on page 33 for more information.

   Note: If new system hardware has been added *and* one or more of the following statements are true, the Configuration/Setup Utility Program menu will display before control is passed to the operating system:

   - Enhanced POST is in effect
   - Power-on password is enabled
   - Administrator password is enabled

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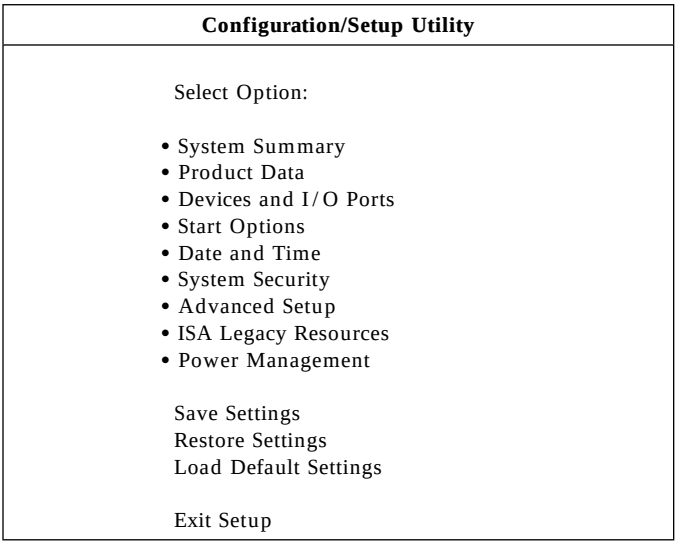
The menu you see on your computer might look slightly different from the menu shown here, but it will operate the same way.



Viewing and Changing Settings

The Configuration/Setup Utility Program menu lists items that identify system configuration topics. If a bullet **(•)** appears beside a menu item, an additional menu is available. If a right arrowhead **(►)** appears beside a menu item, a change to that item has been made or the Configuration/Setup Utility Program detected an error and attempted to correct it. The system can automatically configure new devices if Quick POST is enabled *and* no form of security (passwords) exists on the system. Also, an additional menu might follow a menu item with a ► beside it. If an asterisk **(*)** appears next to a menu item, it indicates a system resource conflict. Resolve this conflict before exiting from the Configuration/Setup Utility Program so that your computer will function properly. For information and instructions on resolving system resource conflicts, refer to the documentation that comes with the hardware you want to install and see “Adapter Configuration” on page 67.

When working with the Configuration/Setup Utility Program menu, you must use the keyboard. Refer to the following table for the keys used to accomplish various tasks.

Keys	Function
↑ ↓	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 these 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 the above keys are active on every menu.

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

Important Information:

In most cases, when you add or remove hardware from your computer or erase passwords, the BIOS (basic input/output system) detects the changes and then updates the configuration automatically. However, you must *save* these changes before the new configuration takes effect. To save the configuration, select **Save Settings** from the Configuration/Setup Utility Program menu.

Exiting from the Configuration/Setup Utility Program

When you finish viewing or changing settings in the Configuration/Setup Utility Program, follow these steps to exit the program:

1. Press **Esc** to return to the main Configuration/Setup Utility Program menu. (Depending on where you are in the program, you might have to press **Esc** several times to get back to the Configuration/Setup Utility Program menu.)
2. Before you exit the Configuration/Setup Utility Program menu, select **Save Settings** if you want to save all settings as they currently appear. If you do not complete this step, your settings will not be saved.
3. From the Configuration/Setup Utility Program menu, press **Esc**, and follow the instructions on the screen.

Passwords

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

Power-On Password

Prompt Modes

The *power-on* password feature deters unauthorized persons from gaining access to the information stored in your computer. You do not need to set a power-on password, but doing so allows you to control who can use your computer. When a power-on password is set, you must type the password at a prompt that appears as the computer starts.

When you set the power-on password, you can choose one of three password prompt modes:

On In password prompt On mode, you are prompted for the power-on password when you turn on the computer. Until the correct password is entered, the computer's operating system will not start, and the keyboard will remain locked. If you have a mouse connected to the mouse port, it also will remain locked. If you have a mouse connected to a serial port, it will be activated when the computer is started, regardless of whether a password is set.

Note: If **Remote Administration** is enabled, you cannot select **On**. In this case, select **Dual**. If you set this mode to **On**, when **Remote Administration** is enabled, it will automatically be reset to **Dual**. For more information, see "Setting Remote Administration" on page 36.

Off In password prompt off mode (sometimes referred to as unattended start mode), you are not prompted to enter your power-on password when you turn on the computer. The computer will start the operating system. However, if you have a mouse connected to the mouse port, refer to the following:

Important Information for Mouse Users

This information applies only to those who have a PS/2 mouse. A serial mouse is not affected by the password prompt Off mode.

Password prompt Off mode is useful for network servers and other computers that operate unattended. If a power failure occurs, the computer will automatically restart and resume operating when power is restored without operator intervention.

The password prompt Off mode prevents the computer from detecting a PS/2 mouse. In this mode, the mouse device driver will not be loaded automatically through the CONFIG.SYS or AUTOEXEC.BAT files. An error message informs you that the mouse connector is disabled.

If you are using Windows NT, Windows 95, or Windows 98, when the computer is started and the mouse-port-disabled error message appears, type either your power-on or administrator password to enable the keyboard. The mouse remains disabled. Use the keyboard to put a check mark in the **Do not display this message in the future** check box. When the operating system completes its loading routine, the mouse will be enabled.

If you have an operating system other than Windows 95, Windows 98, or Windows NT, check the documentation that comes with your operating system to enable the mouse on your computer.

Dual In the password prompt Dual mode, the startup behavior of the computer depends on whether the computer is started from the computer power switch or by an unattended method, such as a modem or timer.

If you start the computer by using the power switch, the computer operates the same as it does in password prompt On mode. Refer to page 30 for further information.

If the computer is started by an unattended method, such as remotely over a LAN, the computer operates the same as it does in password prompt off mode. Refer to page 31 for further information.

Once you enter your power-on password, you will be able to view limited information in the Configuration/Setup Utility Program, but you will not be able to change any settings.

The password does not appear on the screen as you type it. If you type the wrong password, you receive a screen message telling you so. If you type the wrong password three times, you must turn off the computer and start again. When you type the correct password, the keyboard and mouse unlocks, and the computer begins normal operation.

Setting, Changing, and Deleting a Power-On Password

Use the Configuration/Setup Utility Program to set or change a power-on password. You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for this password.

Attention

Keep a record of your power-on password in a secure place. When a power-on password has been set, you cannot activate the operating system without first using the password. If you lose or forget your password, you cannot change or delete it without removing the computer cover and moving a jumper on the system board. Refer to "Erasing a Lost or Forgotten Administrator Password" on page 34 for further information.

To set, change, or delete a power-on password:

1. Start the Configuration/Setup Utility Program (see "Starting and Using the Configuration/Setup Utility Program" on page 27).
2. From the Configuration/Setup Utility Program menu, select **System Security** and press **Enter**.
3. Select **Power-On Password** and press **Enter**.
4. To delete a power-on password, select **Delete Power-On Password** and go to step 9 on page 33.
5. Select **Change Power-On Password**, and follow the instructions on the screen.

6. To set a new password, type your new password and press Down Arrow (↓).
7. Type your new password again.
8. At **Password Prompt**, select **Off**, **On**, or **Dual**. Press Left Arrow (←) or Right Arrow (→) to toggle among selections.

   Note: If **Remote Administration** is enabled, you cannot select **On**. In this case, select **Dual**. If you set this mode to **On**, when **Remote Administration** is enabled, the mode will automatically be reset to **Dual**.
9. Press **Esc** twice to return to the Configuration/Setup Utility Program menu.
10. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility Program menu.
11. To exit from the Configuration/Setup Utility Program, press **Esc** and follow the instructions on the screen.

Administrator Password

Setting an administrator password deters unauthorized persons from changing configuration settings using the Configuration/Setup Utility Program. 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 appears each time you try to access the Configuration/Setup Utility Program. If you type the wrong password, you receive a message telling you so. If you type the wrong password three times in succession, you must turn the computer off and start again.

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

Setting, Deleting, or Changing an Administrator Password

Use the Configuration/Setup Utility Program to set or change an administrator password. You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the password.

Attention

Keep a record of your administrator password in a secure place. If you lose or forget the administrator password, you will not be able to access the Configuration/Setup Utility Program. You must remove the computer cover and move a jumper on the system board to regain access to the Configuration/Setup Utility Program. (Refer to "Erasing a Lost or Forgotten Administrator Password" on page 34 for more information.)

To set, change, or delete an administrator password:

1. Start the Configuration/Setup Utility Program (see "Starting and Using the Configuration/Setup Utility Program" on page 27).
2. From the Configuration/Setup Utility Program Program menu, select **System Security** and press **Enter**.
3. Select **Administrator Password** and press **Enter**.
4. To delete an administrator password, select **Delete Administrator Password** and go to step 8.
5. To set an administrator password, type your password, press Down Arrow (↓), and type your password again.
6. At **Power-On Password Changeable by User**, select **Yes** or **No**. Press Left Arrow (←) or Right Arrow (→) to toggle between selections. (If you select **Yes** and an administrator password is set, the power-on password can be changed without having to enter the administrator password. If you select **No** and an administrator password is set, the power-on password cannot be changed unless the administrator password is entered.)
7. Select **Change Administrator Password** and follow the instructions on the screen.
8. Press **Esc** until you return to the Configuration/Setup Utility Program menu.
9. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility Program menu.
10. To exit from the Configuration/Setup Utility Program, press **Esc** and follow the instructions on the screen.

Erasing a Lost or Forgotten Administrator Password

Important

If possible, record the configuration information of your computer *before* moving the CMOS jumper.

To erase a lost or forgotten administrator password:

1. Turn off the computer and all attached devices.
2. Unplug the power cord.
3. Remove the cover. See “Removing the Cover” on page 54.
4. Refer to the system board label inside the computer to locate the *CMOS Clear Jumper*. See the jumper pin settings also on this label.

   CAUTION:
   Do not touch any components while power is on.
5. Move the jumper from its normal position (pins 1 and 2) to pins 2 and 3. It might be helpful to use needlenose pliers to move the jumper, but be careful not to damage any system board components or crush the jumper.
6. Replace the cover.
7. Plug in the power cord.
8. Restart the computer. The computer will enter the Configuration/Setup Utility Program.
9. Disable the power-on or administrator password settings or set new passwords.
10. Save password settings and turn off the computer.
11. Unplug the power cord and remove the cover. See “Removing the Cover” on page 54.
12. Move the jumper back to its normal position (pins 1 and 2).
13. Replace the computer cover.
14. Plug in the power cord.

After clearing CMOS memory, you must reconfigure the computer. After reassembling the computer, use the Configuration/Setup Utility Program to reset the date and time, reset any passwords, and reconfigure the computer.

Other Settings in the Configuration/Setup Utility Program

The information in this section includes instructions for changing other settings in the Configuration/Setup Utility Program, such as the keyboard speed, the startup sequence, remote administration, and power management.

Changing Keyboard Speed

You can change the speed at which the keyboard responds when you hold down a key. This setting can be found under Start Options in the Configuration/Setup Utility Program. The normal *typematic rate* is 30 characters per second (fast rate).

Setting the Startup Sequence

Your computer can be started from several devices including the hard disk drive, diskette drive, CD-ROM drive, or from the network. The startup program looks for these devices in a selected sequence. You can use Configuration/Setup Utility Program to select the startup sequence.

To set the startup sequence:

1. Start the Configuration/Setup Utility Program (see "Starting and Using the Configuration/Setup Utility Program" on page 27).
2. Select **Start Options** and press **Enter**.
3. Select **Startup Sequence** from the Start Options menu and press **Enter**.
4. Select **First Startup Device** and press **Enter**.
5. Use the arrow keys to make your selection and press **Enter**.
6. If necessary, repeat the above steps for **Second Startup Device**, **Third Startup Device**, and **Fourth Startup Device**.
7. If **Automatic Power On Startup Sequence** is *Enabled*, select the sequence and devices from the choices provided.
8. Press **Esc** until you return to the Configuration/Setup Utility Program menu.
9. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility Program menu and press **Enter**.
10. To exit from the Configuration/Setup Utility Program, press **Esc** and follow the instructions on the screen.

Setting Remote Administration

You can remotely update the system programs, such as POST and BIOS, from a network server by enabling remote administration. If you have set an administrator password for your computer, the password does *not* have to be entered in order to remote update from the server. Consult your network administrator for information on setting up your network server to perform POST and BIOS updates.

To set remote administration, follow these steps:

1. Start the Configuration/Setup Utility Program. See "Starting and Using the Configuration/Setup Utility Program" on page 27.
2. Select **System Security** and press **Enter.**.
3. Select **Remote Administration** and press **Enter**.
4. To enable update remote administration, select **Enabled**. To disable, select **Disabled**. Press **Enter**.
5. Press **Esc** until you return to the Configuration/Setup Utility Program main menu.
6. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility Program menu.
7. To exit from the Configuration/Setup Utility Program, press **Esc** and follow the instructions on the screen.

ISA Legacy Resources

Adapters that are not Plug and Play are known as *legacy* adapters. If you install a legacy adapter, you must manually configure it by setting switches or jumpers on the adapter and by reserving its resources using the Configuration/Setup Utility Program.

In the Configuration/Setup Utility Program, the ISA Legacy Resources screen shows the computer resources that are typically required by adapters:

- Memory resources
- I/O port resources
- DMA resources
- Interrupt resources

You can select available resources for the adapter you are installing. Resources not being used by ISA legacy adapters are listed as [**Available**]. You must set the resources used by the newly installed ISA legacy adapter to [**ISA Resource]**. This notifies the Plug and Play software that these resources are in use.

To store the legacy resource information for an installed adapter:

1. Start the Configuration/Setup Utility Program (see "Starting the Configuration/Setup Utility Program" on page 80).
2. Select **ISA Legacy Resources** and press **Enter**.
3. As needed, select **Memory Resources, I/O Port Resources, DMA Resources,** or **Interrupt Resources**. See "Interrupt and DMA Resources" on page 38.

4. Set the appropriate resource to **ISA Resource** and press **Enter**.
5. Return to the Configuration/Setup Utility Program menu and select **Save Settings** to save the changes and press **Enter**. Exit from the Configuration/Setup Utility Program program.

Just as you change system resources for installed adapters, you must also change resources when you remove an ISA legacy adapter. If you remove a legacy adapter, change the resources it formerly used to [**Available**]. This allows the Plug and Play software to automatically use these resources for future configurations, or you can use these resources for future manual configurations.

Note: Refer to the documentation that comes with the adapter for information on required system resources.

For information on configuring ISA legacy adapters, see "ISA Legacy Resources" on page 37.

For information about error messages from resource conflicts, see Chapter 8, "Troubleshooting" on page 83.

Interrupt and DMA Resources

This section lists the settings for the default interrupt and direct-memory-access (DMA) resources for your computer. The interrupt and DMA settings might change when your computer is configured.

Table 1. Interrupt Resources

Interrupt Request	System Resource
0	Timer
1	Keyboard
2	Interrupt controller
3	Available
43	Serial port
5	Available
6	Diskette drive
73	Parallel port
8	Real Time Clock
9	ACPI
10	Available
11	Available
12	Mouse
13	Coprocessor
14	IDE drives on primary channel
15	IDE drives on secondary channel

Table 2. DMA Resources

DMA Request	Data Width	System Resource
0	8 bits	Available
1	8 bits	Available
2	8 bits	Diskette
3	8 bits	Available
4	–	System Resource
5	16 bits	Available
6	16 bits	Available
7	16 bits	Available

Power–Management Features

Your computer comes with built-in energy-saving capabilities. You can view and change energy-saving settings using the power–management menu in the Configuration/Setup Utility Program. This section describes the power–management features in your computer and provides instructions for using these features.

Attention

If a device, such as a monitor, does not have power–management capabilities, it can be damaged when exposed to a reduced-power state. Before you make energy-saving selections for your monitor, check the documentation that comes with your monitor to see if it supports Display Power Management Signaling (DPMS).

ACPI BIOS Mode

Automatic Configuration and Power Interface (ACPI) BIOS mode is always enabled so that the operating system can control the power-management features of your computer. Not all operating systems support ACPI BIOS mode. Refer to your operating system documentation to determine if ACPI is supported.

[3] Can be modified to alternative settings or disabled.

Setting Power–Management Features

With power–management, the computer and monitor (if the monitor supports DPMS) can be set to go into a reduced-power state if they are inactive for a specified length of time.

- **Time to Low Power:** With this option, you can specify the amount of time that the computer must be inactive before power–management features take affect. You can select from 5 minutes to 1 hour.
- **System Power:** With this option, you can select **On** if you want the computer to remain on, or **Off** if you want the computer to shut down.
- **Display:** You can use this option to select one of the following reduced-power states:
  - **Standby:** In this mode, the screen is blanked, but the screen image is restored *immediately* when any activity is detected.
  - **Suspend:** In this mode, the monitor uses less power than in Standby mode. The screen is blanked, but the screen image is restored *within a few seconds* after any activity is detected.
  - **OFF:** In this mode, the monitor power is turned off. To restore power to the monitor, you must press the monitor power switch. On some monitors, you might have to press the power switch twice.

    If *OFF* is selected, you must specify the **Time to Display 'off'**. You can select 5 minutes to 1 hour.

    Note: *Time to display off* is the amount of time after the reduced-power state begins until the display turns off.
  - **Disable:** In this mode, the monitor is unaffected by the power management settings.
- **IDE Drives**: You can use this selection to specify if the IDE drives should be enabled or disabled when power management options take affect.

To set power–management features:

1. Start the Configuration/Setup Utility Program (see “Starting and Using the Configuration/Setup Utility Program” on page 27).
2. Select **Power Management** and press **Enter**.
3. Select **APM** and press **Enter**.
4. Set **Automatic Hardware Power Management** to **Enabled**.
5. Select values for power management (time to low power, system power, processor speed, display, and time to display off), as desired.
6. Select **Activity Monitor** and press **Enter**.

7. Set to **Enabled** or **Disabled** devices you want to be monitored for power management.

   Note: If all devices are set to disabled, you must restart the computer to wake the system.

8. Set **IDE Drives** to **Enabled** or **Disabled**.
9. Press **Esc** twice to return to the Configuration/Setup Utility Program menu.
10. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility Program menu.
11. To exit from the Configuration/Setup Utility Program, press **Esc** and follow the instructions on the screen.

Setting Automatic Power-On Features

You can use the Automatic Power-On features on the Power Management menu to enable and disable features that automatically turn on your computer. You must also select the startup sequence you want to use for the type of power-on event selected.

- **Wake on LAN:** If you have remote-network-management software and a Wake on LAN supported network adapter, you can use the IBM-developed Wake on LAN feature. When you set Wake on LAN to **Enabled**, your computer will turn on when it receives a specific signal from another computer on your local area network (LAN). For more information, see the documentation that comes with your network adapter.
- **Serial Port Ring Detect:** If your computer has an *external* modem connected to a serial port and you want the computer to turn on automatically when a ring is detected on the modem, set this feature to **Enabled**. The modem must also support this feature.
- **Modem Ring Detect:** If your computer has a wake on ring supported modem and you want the computer to turn on automatically when a ring is detected on the modem, set this feature to **Enabled**.
- **Wake Up on Alarm:** With this feature, you can specify a date and time at which the computer will be turned on automatically. This can be either a single event, a daily event, or a weekly event.
- **PCI Wake Up:** If this setting enabled, your computer turns on in response to wake up requests from PCI devices that support this feature.

To set Automatic Power-On features, follow these steps:

1. Start the Configuration/Setup Utility Program (see “Starting and Using the Configuration/Setup Utility Program” on page 27).

2. Select **Power Management** and press **Enter**.
3. Select **Automatic Power On** and press **Enter**.
4. Select the menu item for the feature you want to set. Use Left Arrow (←) or Right Arrow (→) to select either **Enabled** or **Disabled**. Press **Enter**.
5. Select Startup Sequence for the feature. Use Left Arrow (←) or Right Arrow (→) to select either **Primary** or **Automatic**. If you select **Automatic**, make sure **Automatic Power On Startup Sequence** in the Startup Sequence menu is set to **enabled**. Otherwise, the system will use the **Primary** startup sequence.
6. Press **Esc** until you return to the Configuration/Setup Utility Program menu.
7. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility Program menu and press **Enter**.
8. To exit from the Configuration/Setup Utility Program, press **Esc** and follow the instructions on the screen.

Quick Reference for Network-Related Settings

Some models come with an Ethernet adapter. The following instructions are guidelines to help you if your computer is using an Ethernet adapter to network with other computers.

The following tables are not intended to help determine which settings to choose. They are only intended to help you quickly find the steps necessary to get to the choices for specific network settings. You can then view the current setting or select a different setting. When finished, you can either save the settings and exit the utility program or exit without saving the settings.

The steps in the following tables always start at the Configuration/Setup Utility Program main menu.

Table 3 (Page 1 of 5). Network-Related Settings

To Configure:	**Select:**	**Comments:**
Remote Administration	1. System Security 2. Remote Administration 3. Remote Administration a second time 4. Enabled or Disabled	Enable Remote Administration to allow POST/BIOS updates over the LAN.

Table 3 (Page 2 of 5). Network-Related Settings		
To Configure:	**Select:**	**Comments:**
Ethernet adapter	1. Startup sequence 2. Network	
Wake on LAN	1. Power Management 2. Automatic Power On 3. Wake on LAN and press Enter. 4. Enabled or Disabled. If you select Enabled, continue to the next step. 5. Startup Sequence 6. Primary or Automatic. Go back to the main menu. 7. Start Options 8. The first, second, third, and fourth primary startup devices 9. Automatic Power On Startup Sequence 10. The first, second, third, and fourth startup devices	Your model might not allow you to select four startup devices.

Table 3 (Page 3 of 5). Network-Related Settings		
To Configure:	**Select:**	**Comments:**
Serial Port Ring Detect	1. Power Management 2. Automatic Power On 3. Serial Port Ring Detect 4. Enabled or Disabled. If you select Enabled, go to the next step. 5. Startup Sequence 6. Primary or Automatic. Go back to the main menu. 7. Start Options 8. The first, second, third, and fourth primary startup devices 9. Automatic Power On Startup Sequence 10. The first, second, third, and fourth startup devices	Your model might not allow you to select four startup devices.

Table 3 (Page 4 of 5). Network-Related Settings		
To Configure:	**Select:**	**Comments:**
Modem Ring Detect	1. Power Management 2. Automatic Power On 3. Modem Ring Detect 4. Enabled or Disabled. If you select Enabled, go to the next step. 5. Startup Sequence 6. Primary or Automatic. Go back to the main menu. 7. Start Options 8. The first, second, third, and fourth primary startup devices 9. Automatic Power On Startup Sequence 10. The first, second, third, and fourth startup devices	Your model might not allow you to select four startup devices.

Chapter 6. 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 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.

CAUTION:
Be sure to turn the computer and monitor power switches off 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.

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Monitor Screen

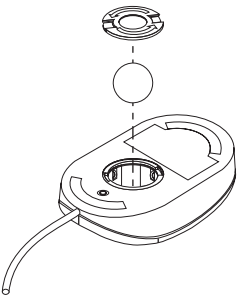
Do not use abrasive cleaners when cleaning the surface of the monitor screen. The screen surface is easily scratched, so avoid touching it with pens, pencil points, and erasers.

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

Mouse

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

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. Refer to your operating system documentation for information about software backup.

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

3. 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.

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.

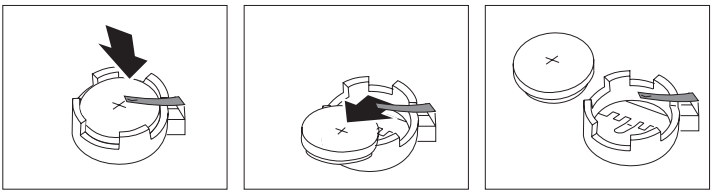
Refer to “Lithium battery notice” on page ix for information about replacing and disposing of the battery.

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.

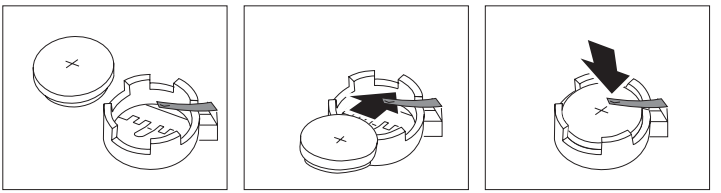
For further information on battery disposal, call IBM at 1-800-IBM-4333 (1-800-426-4333) in the U.S. For information outside of the U.S., contact your IBM reseller or marketing representative.

To change the battery

1. Turn off the computer and all attached devices.
2. Unplug the power cord and remove the cover. See "Removing the Cover" on page 54.
3. Locate the battery. Refer to the system board label inside your computer or see "Identifying Parts on the System Board" on page 60.
4. If necessary, remove any adapters that impede access to the battery. See "Installing Adapters" on page 66 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 66 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. Turn on the computer and all attached devices.
10. Use the Configuration/Setup Utility Program to set the date and time and any passwords.
11. Dispose of the old battery as required by local ordinances or regulations.

Chapter 7. 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.

Important:
Before you install or remove any option, read the "Safety Information" on page vii. These precautions and guidelines will help you work safely.

Attention

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

CAUTION:
For your safety and to prevent damage to your computer, always do the following *before* removing the cover:

1. **Shut down all programs as described in your operating system documentation.**
2. **Turn off the computer and any attached devices, such as printers, monitors, and external drives.**

   Note: Computer users in the United Kingdom who have a modem or fax machine attached to their computer must disconnect the telephone line from the computer *before* unplugging any power cords (also known as power cables). When the computer is reassembled, users must reconnect the telephone line *after* plugging in the power cords.
3. **Unplug all power cords from electrical outlets.**
4. **Disconnect all communication cables from external receptacles.**
5. **Disconnect all cables and power cords from the back of the computer.**

   Note: Do not reconnect any cables or power cords until you reassemble the computer and put the cover back on.

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Handling Static-Sensitive Devices

Static electricity, although harmless to you, can seriously damage computer components and options.

Important

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)
- Expansion adapters
  - Industry standard architecture (ISA) adapters
  - Peripheral component interconnect (PCI) adapters
- Internal drives
  - CD-ROM
  - Hard disk
  - Diskette drives, Zip drives, and other removable media drives.

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

`http://www.pc.ibm.com/us/options/`
`http://www.pc.ibm.com/support/`

You can also obtain information by calling the following telephone numbers:

- 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 a flat-blade screwdriver. Additional tools might be needed for certain options. See the instructions that come with the option.

Removing the Cover

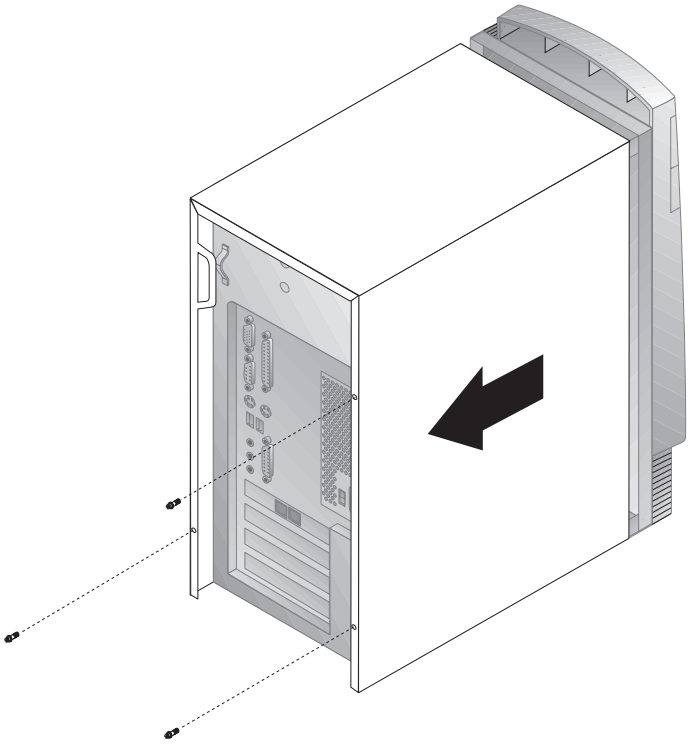
Important:

Read "Safety Information" on page vii and "Handling Static-Sensitive Devices" on page 52 before removing the cover.

To remove the cover:

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. If you have a modem or fax machine attached to your computer, disconnect the telephone line from the wall outlet and the computer.
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 three thumbscrews located on the rear of the computer that hold the cover onto the chassis. Use a coin or screw driver to loosen the thumbscrews if necessary.

5. Slide the cover straight toward the rear approximately one inch until it stops and lift the cover from the chassis.



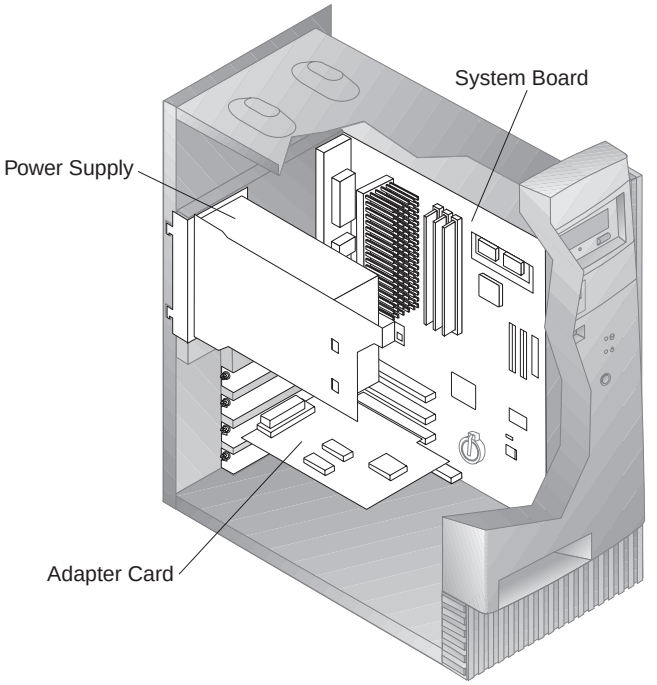
Attention

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

Locating Components

To install options in your computer, you will need to remove the cover. See“Removing the Cover” on page 54 . You also will need to locate components inside your computer.

The following illustration will help you locate the various components in your computer.



Note: If you prefer, you can place the computer on its side to install or remove options.

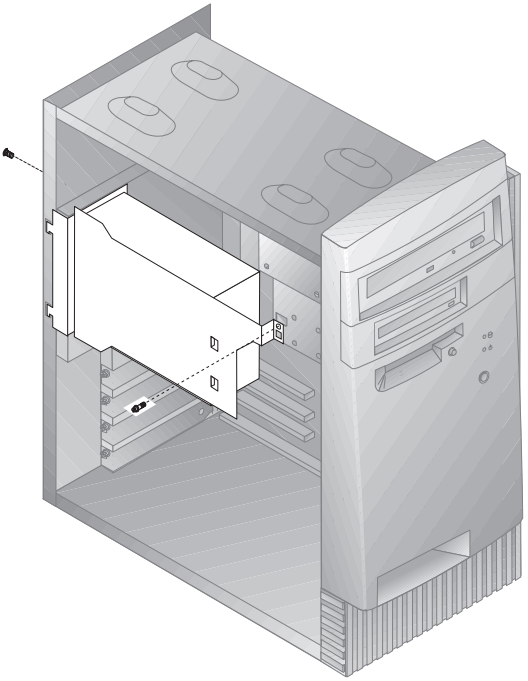
Moving the Power Supply

To perform some operations inside the computer, you might need to move the power supply to access parts of the system board that are difficult to see or hard to reach. Use the following procedure to provide easier access to the system board: Be sure to see “Safety Information” on page vii.

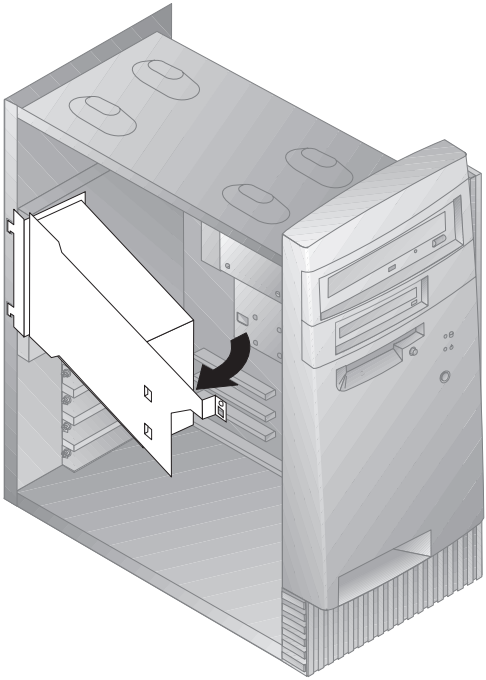
DANGER

> **Do not detach the power supply bracket from the power supply or remove any of the power supply screws.**

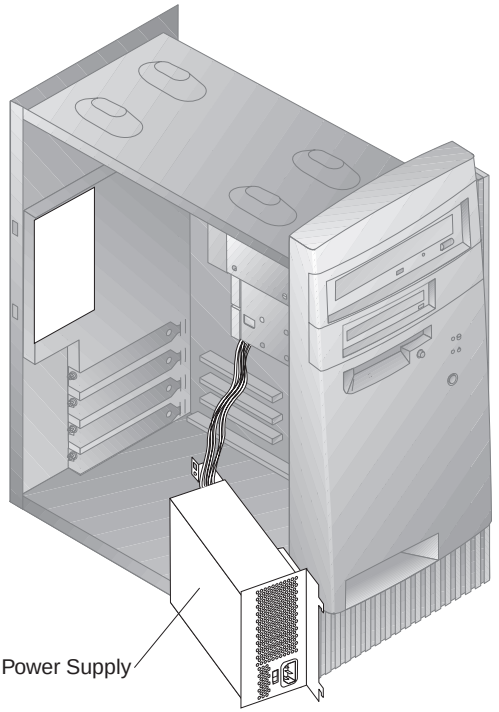
1. Remove the two screws securing the power supply to the chassis and the drive bays.
2. Slide the power supply unit up toward the top of the chassis.



3. Rotate the power supply toward you slightly.



4. Pull the power supply forward and carefully rotate it toward the front of the chassis. Lay it to the side.



5. To replace the power supply, reverse these steps.

Working with Options on the System Board

This section provides instructions for installing, removing, and replacing system memory.

Accessing the System Board

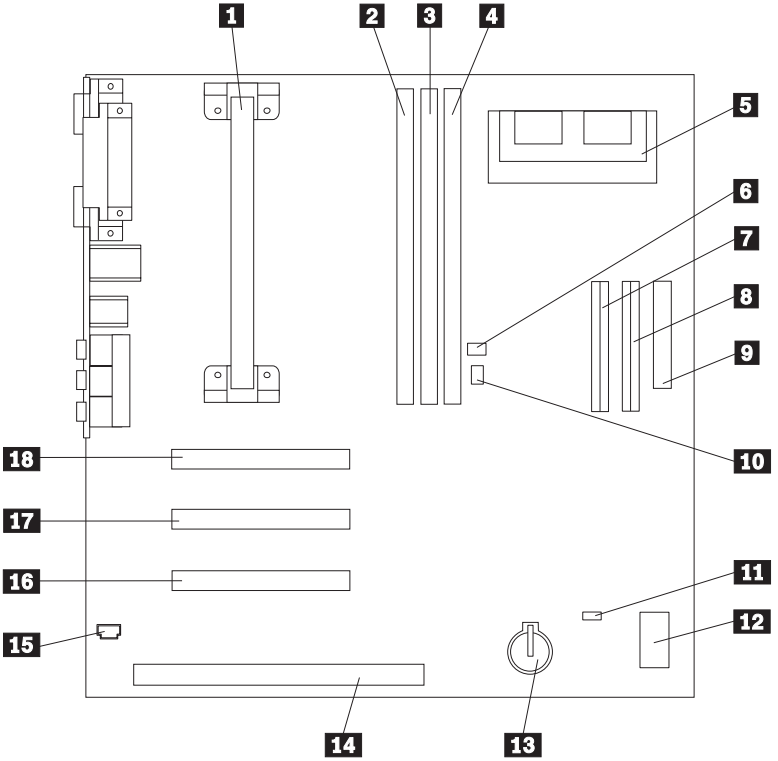
To access the system board, you must remove the computer cover. For information on removing the computer cover, see “Removing the Cover” on page 54. You might need to remove adapters in order to access some components of the system board. For information about expansion adapters, see “Working with Adapters” on page 66. 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 on a table.

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 on the inside of the computer chassis.



1 Microprocessor
2 DIMM 0
3 DIMM 1
4 DIMM 2 (in some models)
5 Video memory upgrade connector (in some models)
6 Wake on LAN connector
7 Primary EIDE connector
8 Secondary EIDE connector
9 Diskette connector
10 Wake on Ring connector
11 CMOS clear jumper
12 Rocker switches
13 Battery
14 ISA adapter slot
15 Audio connector for CD-ROM
16 PCI adapter slot 3
17 PCI adapter slot 2
18 PCI adapter slot 1

Working with System Memory

You can add memory to your computer to increase system performance. Your computer has either two or three connectors (depending on the model) for installing memory modules that provide up to a maximum of 256 MB or 384 MB (depending on the model).

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 0*.
- Use only 3.3 V, 100 MHz, unbuffered, SDRAM DIMMs
- Use only 16, 32, 64, or 128 MB DIMMs in any combination of supported SDRAM DIMMs.

Note: To locate the memory connectors on the system board, see "Identifying Parts on the System Board" on page 60.

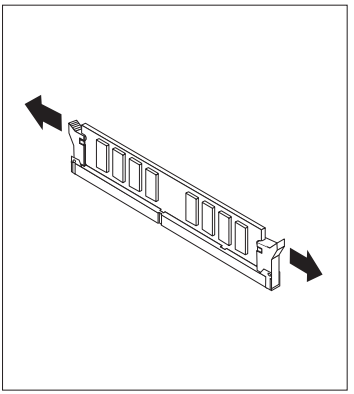
Installing and Removing a DIMM

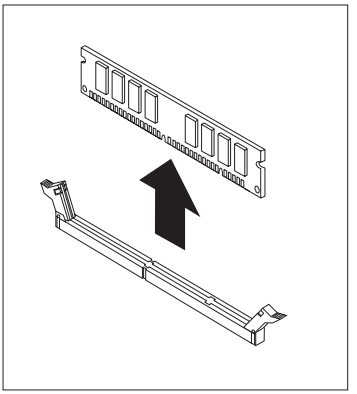
Before you begin:

- Read "Safety Information" on page vii and "Handling Static-Sensitive Devices" on page 52.
- 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 cover (see "Removing the Cover" on page 54).
- Read "Accessing the System Board" on page 60 to learn the location of the parts on the system board.

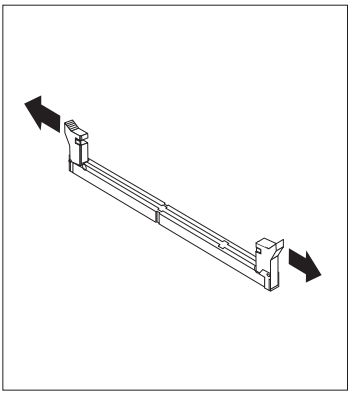
To Install a DIMM:

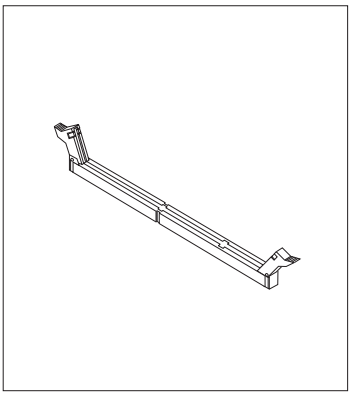
1. You may need to remove the power supply to gain access to the DIMM sockets. See “Moving the Power Supply” on page 57.
2. If you are replacing a DIMM that is already installed, press the retaining clips down and lift the DIMM out of the socket.



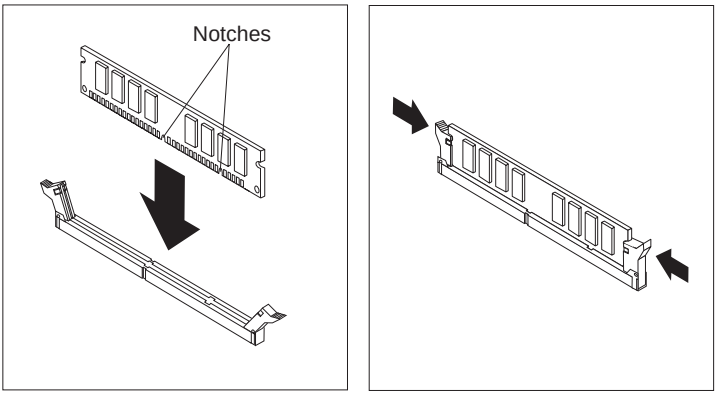


3. If the retaining clips are not already open, open them.





4. Install the DIMM straight down into the connector until the retaining clips close.



5. Reinstall the power supply if you removed it.

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 77.

Working with Video Memory

This section provides information and instructions for installing and removing video memory from the video memory connector on the system board of some models.

For some models, you can add video memory to your computer to increase the video performance, resolution, and graphics capabilities. These models have a connector for installing a memory module that provides up to a maximum of 4 MB of video memory. Models without the connector already have 4 MB of video memory.

Installing a Video Memory Module

Before you begin:

- Read "Safety Information" on page vii and "Handling Static-Sensitive Devices" on page 52.
- Read the instructions that come with the new video memory.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer and remove the computer cover (see "Removing the Cover" on page 54).
- Read "Accessing the System Board" on page 60 to learn the location of parts on the system board.

To install a video memory module:

1. Note the position of the power supply so that it can be reinstalled later. Move the power supply aside to gain access to the video memory socket. See "Moving the Power Supply" on page 57.
2. Install the video memory module into the connector at a 45 degree angle and then push it down until it snaps into place.
3. Reinstall the power supply. See "Moving the Power Supply" on page 57.

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 77.

Working with Adapters

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

When installing or removing adapters, you must resolve any resource conflicts that are created as a result. For example, if you install an ISA legacy adapter, you might need to manually configure the adapter by setting a variety of switches on the adapter and by using the Configuration/Setup Utility Program program. For more information on using the Configuration/Setup Utility Program to configure adapters, see "Legacy Adapters" on page 68.

Adapter Types

Many adapters now use *Plug and Play* technology that enables the computer to automatically configure the adapter, provided that the required resources are available. Refer to the instructions that come with your adapter to determine if it is Plug and Play. For more information, see "Adapter Configuration" on page 67.

Adapter Slots

Your computer system board has expansion slots used to connect adapters to the industry standard architecture (ISA) and peripheral component interconnect (PCI) buses. Slots 1 through 3 are designed for PCI adapters. Slot 4 is an ISA slot. You can install an adapter up to 228 mm (9 inches) long in your computer.

Installing Adapters

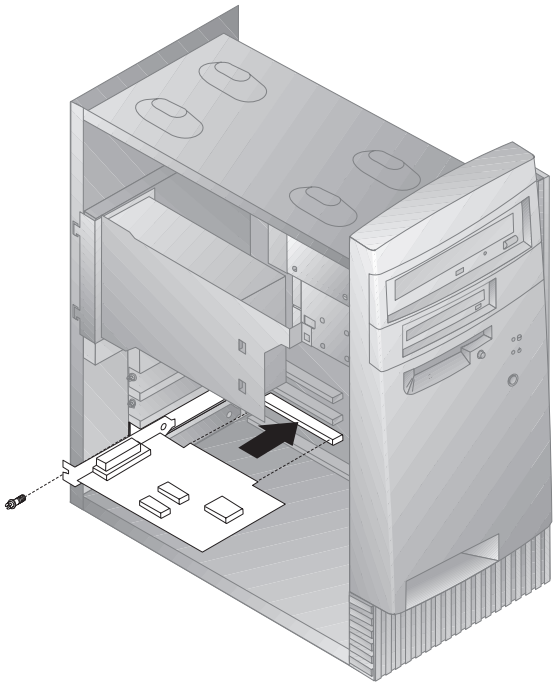
Before you begin:

- Read "Safety Information" on page vii and "Handling Static-Sensitive Devices" on page 52.
- 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 cover (see "Removing the Cover" on page 54).

To install an adapter in a PCI or ISA expansion slot:

1. Review the instructions that come with the adapter to determine if it must be installed in an ISA or PCI expansion slot.

2. Move the power supply aside if necessary. See “Moving the Power Supply” on page 57.
3. Remove the screw and slot cover for the appropriate expansion slot.



4. Remove the adapter from its static-protective package.
5. Install the adapter into the appropriate slot on the system board.
6. Install the screw that secures the adapter.

   Note: If you are installing a wake on LAN supported network adapter, attach the wake on LAN cable that came with the adapter to the wake on LAN connector on the system board. For the location of this connector, see the diagram of the system board on the inside of your computer.
7. If you moved the power supply aside, replace it. See “Moving the Power Supply” on page 57.
8. Replace the cover and continue with adapter configuration.

Adapter Configuration

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

Plug and Play Adapters

Plug and Play is a configuration method that makes expanding your computer easier. Support for Plug and Play is built into the system board of your computer.

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 memory. 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 *not* already used by other devices.

Adapters designed for PCI slots are Plug and Play devices. Most ISA adapters are not Plug and Play and are referred to as *legacy* adapters. See "Legacy Adapters."

Note: See Chapter 8, "Troubleshooting" on page 83 for information on error messages resulting from resource conflicts.

Legacy Adapters

Adapters that are not Plug and Play are known as *legacy adapters.* If you install a legacy adapter, you must manually configure it by setting switches or jumpers on the adapter and by reserving its resources using the Configuration/Setup Utility Program.

In the Configuration/Setup Utility Program, the ISA Legacy Resources screen shows the computer resources that are typically required by adapters:

- Memory resources
- I/O port resources
- DMA resources
- Interrupt resources

See "ISA Legacy Resources" on page 37 for instructions to use the Configuration/Setup Utility Program to configure legacy adapters to work in your computer.

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 77.

Working with Internal Drives

This section provides information and instructions for installing and removing internal drives.

When you install an internal drive, it is important to note what type and size of 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:

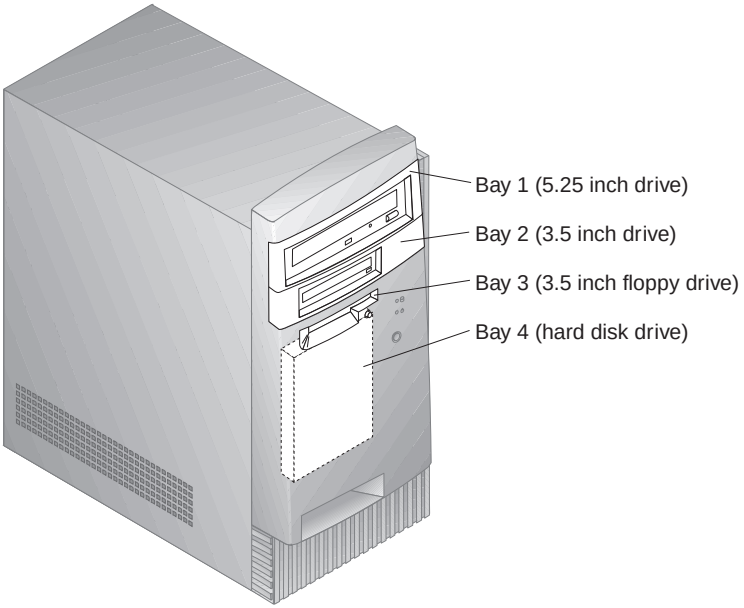
- Diskette drives
- Hard disk drives
- Tape drives
- CD-ROM drives
- Zip drives and other removable media drives

Internal drives are installed in *bays*. Within this book, the bays are referred to as bay 1, bay 2, and so on.

Your computer comes with the following IBM-installed drives:

- A CD-ROM drive in bay 1 (some models).
- A Zip drive in bay 2 (some models).
- A 3.5-inch diskette drive in bay 3.
- A 3.5-inch hard disk drive in bay 4.

Models that do not have drives installed in bays 1 and 2 have a static shield and bay panel installed.



Drive Specifications

The following table describes some of the drives you can install in each bay and their height requirements.

Bay 1 - Max Height: 41.3mm (1.6 in.)	CD-ROM drive 5.25-inch tape backup drive 5.25-inch hard disk drive
Bay 2 - Max Height: 41.3mm (1.6 in.)	3.5-inch tape backup drive 3.5-inch hard disk drive Zip drive
Bay 3 - Max Height: 25.4mm (1.0 in.)	3.5-inch diskette drive
Bay 4 - Max Height: 25.4mm (1.0 in.)	3.5-inch hard disk drive

Notes:

1. Drives that are greater than 41.3 mm (1.6 in.) high cannot be installed.
2. Install removable media (diskettes, tapes, or CDs) drives in the accessible bays: bays 1 or 2.

Power and Signal Cables for Internal Drives

Your computer uses cables to connect integrated drive electronics (IDE) drives to the power supply and system board. The following cables are provided:

- Four-wire *power cables* connect most drives to the power supply. At the end of these cables are plastic connectors that attach to different drives; these connectors vary in size. Also, certain power cables attach to the system board.
- Flat *signal cables*, also called *ribbon cables*, for connecting IDE and diskette drives to the system board. There are two sizes of ribbon signal cables that come with your computer:
  - The wider signal cable has two or three connectors.
    - If the cable has three connectors, one of these connectors is attached to the drive, one is a spare, and the third attaches to the secondary IDE connector on the system board.
    - If the cable has two connectors, one of these connectors is attached to the hard disk drive, and the other attaches to the primary IDE connector on the system board.

      Note: If you want to add another device, and the signal cable has only two connectors, you will need a signal cable with three connectors.
  - The narrower signal cable has two connectors for attaching the diskette drive to the diskette-drive connector on the system board.

Note: To locate connectors on the system board, see "Identifying Parts on the System Board" on page 60.

The following are some important points to remember when connecting power and signal cables to internal drives:

- The drives that are preinstalled in your computer come with power and signal cables attached. If you replace any drives, it is important to remember which cable is attached to which drive.
- When you install a drive, ensure that the drive connector at the *end* of the signal cable is always connected to a drive; also, ensure that the drive connector at the other end is connected to the system board. This reduces electronic noise from the computer.
- If two IDE devices are used on a single cable, one must be designated as the primary or master device and the other as the secondary or subordinate device; otherwise, some of the IDE devices might not be recognized by the system. The primary or secondary designation is determined by switch or jumper settings on each IDE device.

- If two IDE devices are on a single cable, and only one is a hard disk drive, the hard disk drive must be set as the master device.
- If you have only one IDE device on a cable, it must be set as master.

For help in selecting drives, cables, and other options for your computer, do one of the following:

- Within the United States, call 1-800-IBM-2YOU (1-800-426-2968), your IBM reseller, or your 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.

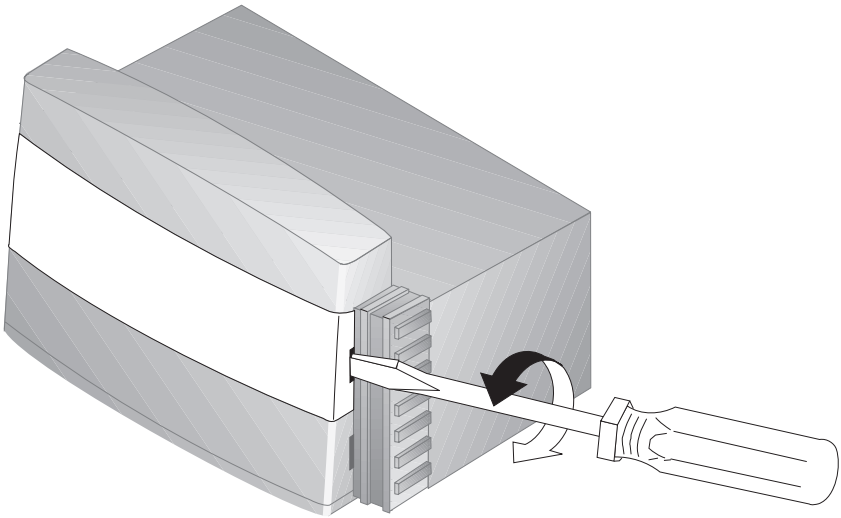
Installing Internal Drives

Before you begin:

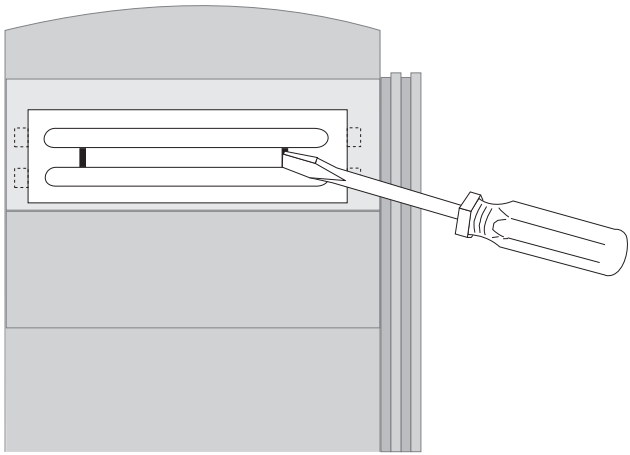
- Read "Safety Information" on page vii and "Handling Static-Sensitive Devices" on page 52.
- Turn off the computer and all other connected devices.
- Disconnect all external cables and power cords, and then remove the computer cover (see "Removing the Cover" on page 54).

To install an internal drive:

1. Place a medium flat–head screwdriver into the notch on the right side of the bay panel covering the bay where you want to install the drive and twist the screwdriver to pop the bay panel out of the bay.



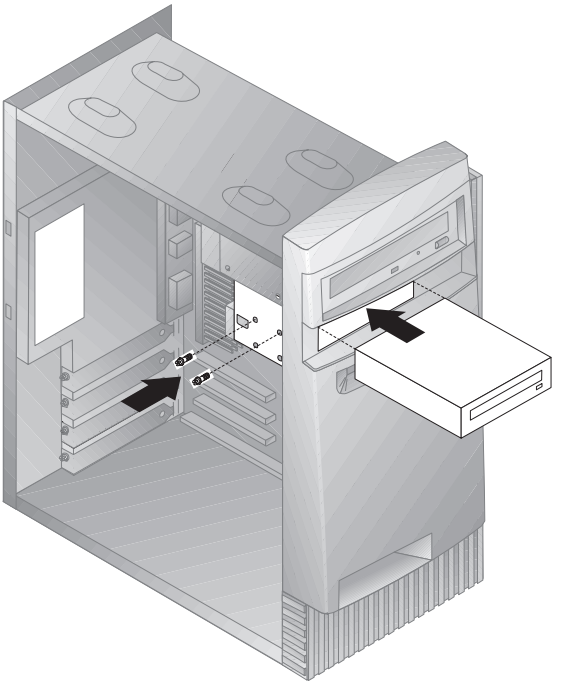
2. Insert a flat–head screwdriver into one of the slots on the static shield and pry the static shield loose from the drive bay.



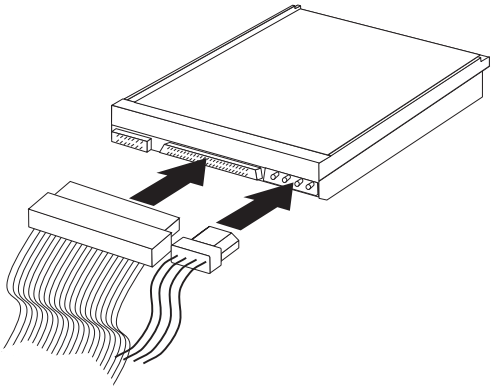
3. Inside the computer are one or two picture frame panels for use when you have installed a drive into one of the bays. The picture frame panel for the 3.5-inch drive bay is attached to the outside of the chassis.

The picture frame panel for the 5.25-inch drive bay is attached to the inside of the chassis. Remove the picture frame panel that was packed on the inside of the chassis to make room for installing the drive.

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



5. If the drive you installed has nonremovable media (such as a hard disk drive), replace the bay panel.
   If the drive you installed is a removable media drive (such as a Zip drive), place the picture frame that came with your computer over the drive bay.
6. Connect the power and signal cables to the drive.



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 77.

Installing a Security U-bolt

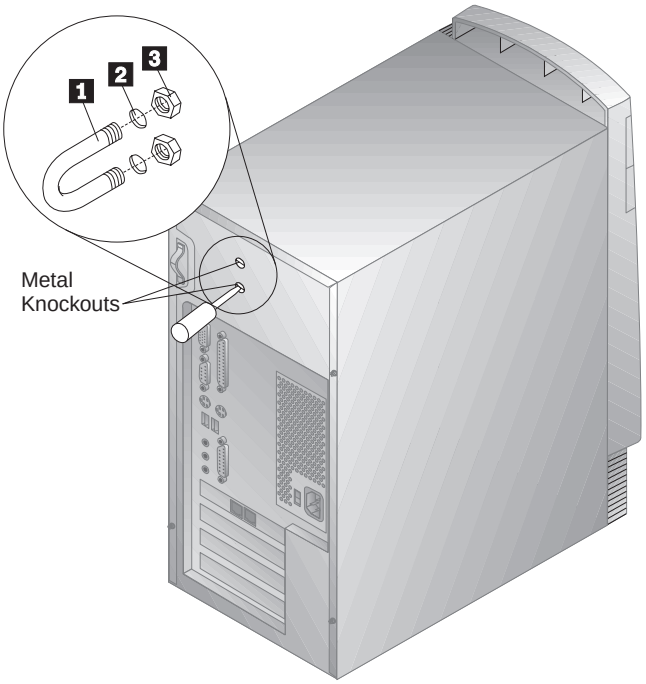
To help prevent hardware theft you can use the cover lock and add a security U-bolt and cable to your computer. After you add the security cable, make sure that it does not interfere with other cables that are connected to the computer.

Before you begin:

- Obtain the following:
  - A 19-mm (3/4 in.) U-bolt and threaded nuts that fit the U-bolt
  - A security cable
  - A lock, such as a combination lock or padlock
  - An appropriately sized or adjustable wrench
  - A small, flat-blade screwdriver
- Read "Safety Information" on page vii and "Handling Static-Sensitive Devices" on page 52.
- Turn off the computer and all other connected devices.
- Disconnect all external cables and power cords and remove the computer cover (see "Removing the Cover" on page 54).

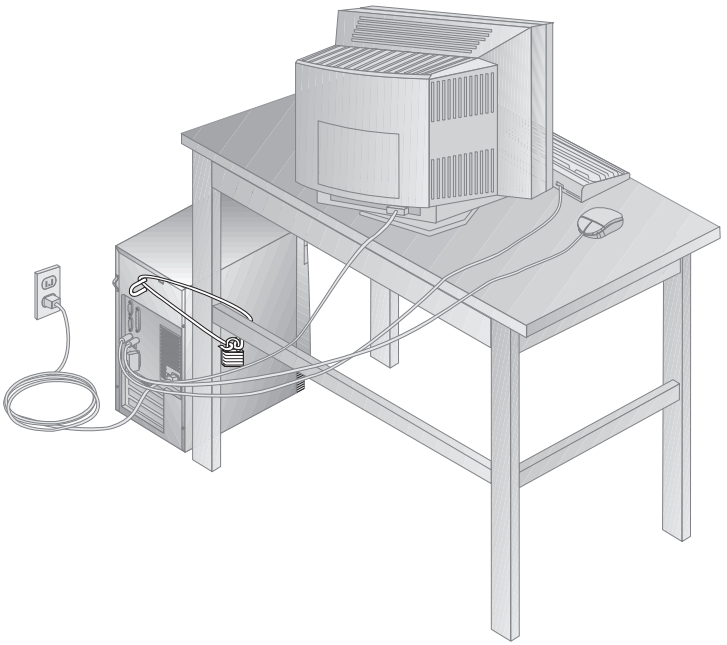
To install a U-bolt:

1. Use a tool, such as a screwdriver, to remove the two metal knockouts.



2. Insert the U-bolt **1** through the rear panel **2**; then attach and tighten the nuts **3** with an appropriately sized or adjustable wrench.
3. Replace the computer cover. For more information, see "Replacing the Cover and Connecting the Cables" on page 77.
4. Thread the cable through the U-bolt and around an object that is not a part of or permanently secured to the building structure or foundation, and from which it cannot be removed; then fasten the cable ends together with a lock.

   The following illustration shows an example of how this might work.



Completing the Installation

After working with options, you need to install any removed parts, replace the cover, 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 program.

The following list is a quick reference to these procedures:

- "Replacing the Cover and Connecting the Cables"
- "Updating the Computer Configuration" on page 79

Replacing the Cover and Connecting the Cables

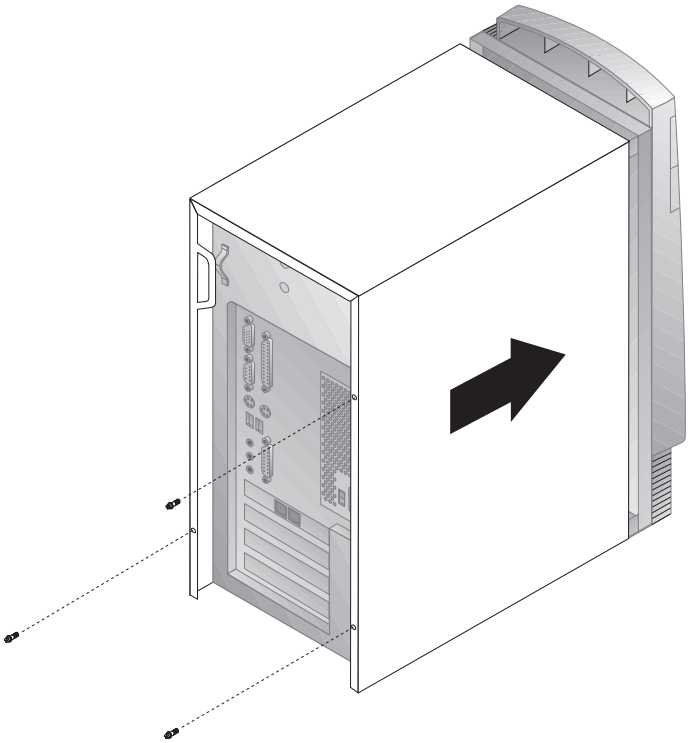
To replace the cover and connect cables to your computer:

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 cover.
3. Position the cover over the chassis so that the front edge is approximately one inch away from the front bezel.

There are several rail guides at the bottom of the cover. To install the cover properly, these rail guides must engage the metal rails at the bottom of the chassis.

4. Lower the cover down over the chassis so that the rail guides engage the rails.
5. Slide the cover forward.

   You might need to lift the front of the cover slightly to align it properly.



6. Insert the three thumbscrews into the holes in the cover and the chassis and tighten.
7. Reconnect the external cables and cords to the computer. See "Connecting Computer Cables" on page 10.

Important Information:

When the power cord is first plugged in, the computer might appear to power on for a few seconds, then power off. This is a normal sequence to enable the computer to self–initialize.

Important:

If you are in the U.K., plug in the power cords first and then connect the telephone line to the wall outlet and the computer. If you have a modem or fax machine attached to the computer, and you are not in the U.K., reconnect the telephone line to the wall outlet and the computer and then plug the power cords into properly grounded electrical outlets.

Updating the Computer Configuration

Important:

The configuration information in this section applies to installing options. For more information on using the Configuration/Setup Utility Program, see the Chapter 5, "Using the Configuration/Setup Utility Program" on page 27.

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. Device drivers are included on the *Software Selections* CD that comes with your computer.

After adding, removing, or replacing options, the configuration settings must be updated. In most cases, this configuration is performed automatically using system programs. If the settings are not updated automatically, you can use the Configuration/Setup Utility Program program to reconfigure the appropriate settings. In either case, you must save the settings before exiting the Configuration/Setup Utility Program program.

For example, when you start your computer after adding most internal hard disk drives, the settings might be updated. If the settings are not updated, use the Configuration/Setup Utility Program to make and save those changes. However, if a resource conflict arises after an ISA legacy adapter is installed or removed, you must manually update the computer configuration and save the information. For instructions, see "ISA Legacy Resources" on page 37.

Note: For more information on error messages from resource conflicts, see Chapter 8, "Troubleshooting" on page 83.

Starting the Configuration/Setup Utility Program

When you restart the computer for the first time after working with most options, a message may appear indicating that a configuration change has occurred. If such a message appears, you are then prompted to enter the Configuration/Setup Utility Program program to manually update the configuration settings or to confirm and save the settings that were automatically updated by the system programs.

After you change an option and restart the computer, the following screen might appear.

```
                    POST Startup Error(s)

The following error(s) were detected when the system was
started:

162 Configuration Change Has Occurred

Select one of the following:

Continue
Exit Setup
```

Note: Depending on the configuration changes that occurred, the error message you see might be different from the one shown here. If the preceding screen appears, select **Continue** until you reach the Configuration/Setup Utility Program menu (see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27).

If the preceding screen does not appear, then see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27.

Configuring an ISA Legacy Adapter

To configure an installed ISA legacy adapter, you might need to alter switch or jumper settings on the adapter. Also, you must use the Configuration/Setup Utility Program program to identify the ISA legacy resource requirements, such as memory locations, I/O assignments, and DMA and interrupt assignments.

Note: For more information about required resources and switch settings, refer to the documentation that comes with the adapter.

If you remove an ISA legacy adapter, you must set the system resources that are no longer being used to **Available**. To do this, follow the procedures in Chapter 5, "Using the Configuration/Setup Utility Program" on page 27 and select **Available** at step 4.

Note: For more information on adapters and resolving conflicts, see "Adapter Configuration" on page 67 and "Interrupt and DMA Resources" on page 38.

For more detailed instructions on configuring ISA legacy adapters, see "ISA Legacy Resources" on page 37.

Configuring Startup Devices

When your computer is turned on, it looks for an operating system. The order in which it searches devices for the operating system is the startup sequence. After adding new devices to the computer, you might want to change the startup sequence. You can use the Configuration/Setup Utility Program program to configure startup devices. See "Setting the Startup Sequence" on page 36.

Chapter 8. Troubleshooting

This chapter describes diagnostic tools that are available to you. You can use these tools 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 all cables are securely connected to the correct locations.
- Make sure the computer cover is installed properly (pushed all the way on).

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

Using Diagnostic Tools

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. You can also use the diagnostic programs provided with your computer (see "IBM Enhanced Diagnostics" on page 116 for a description of these programs).

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 and your computer came with IBM-preinstalled software, see the *About Your Software* publication and 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:

- Error messages
- Power-on self-test (POST)
- Troubleshooting charts
- Diagnostic programs

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Power-On Self-Test (POST)

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

POST does the following:

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

If **Power-On Self-Test** is set to [*Enhanced*], numbers showing the amount of memory being tested appear in the top-left corner of the screen until the total amount of memory in the system is reached. Options for running a quick POST or accessing the Configuration/Setup Utility Program appear in the lower-left corner of the screen. Quick mode is the default mode of operation.

Note: The amount of available memory shown might be somewhat less than expected because of basic input/output system (BIOS) shadowing in random access memory (RAM).

If POST finishes without detecting any problems, the first screen of your operating system or application program appears if you have not set a power-on password. If you have set a power-on password, a password prompt appears. You must enter your password before the first screen of your operating system or application program will appear. (For more information on using passwords, see "Power-On Password" on page 30.)

If **Power On Status** is *Enabled* and POST detects a problem, you will hear multiple beeps or no beep. In most cases, an error code appears in the top left corner of the screen, and in some cases a description of the error is displayed beside the code. (Note that the screen will sometimes display multiple error codes and descriptions.) For more information about what caused an error message to appear and what action to take, see "Solving POST Error Message Problems" on page 86 and "POST Message Charts" on page 88.

If you hear no beep at all during POST, see "Troubleshooting Charts" on page 105. You might need to have your computer serviced.

Error Messages

Error messages that appear on the screen might be text, numeric, or both. There are several types of error messages.

POST error messages

These messages appear when POST finds problems with the hardware during startup or when a change in the hardware configuration is found. POST error messages are 3-, 4-, 5-, 8-, or 12-character alphanumeric messages and include brief explanations (except I999XXXX errors).

For more information about what caused an error message to appear and what action to take, see “Solving POST Error Message Problems” on page 86 and “POST Message Charts” on page 88.

Software-generated error messages

These messages appear if a problem or conflict is detected by the application program, the operating system, or both. Error messages for operating-system and other software problems are usually text messages, but they also can be numeric messages. For information about these software error messages, see the information supplied with the operating system and application program.

Diagnostic error codes and messages

These codes and messages appear if a hardware problem is detected by one of the IBM Enhanced Diagnostics test programs. Along with error codes, the messages present text information that can be used to identify a failing part. See “IBM Enhanced Diagnostics” on page 116.

Solving POST Error Message Problems

If you receive an error message during the POST, you might be able to solve the problem by completing the steps outlined in this section.

Note

If you have just added, removed, or changed the location of a device and you receive an error message, make sure you save the configuration before exiting the Configuration/Setup Utility Program. If this does not eliminate the error message, then proceed with the following instructions.

1. Write down all error-code numbers and descriptions that appear on the screen as you start your computer. Note that a single problem can cause several error messages to appear. When you correct the cause of the first error message, the other error messages probably will not appear on the screen the next time you turn on your computer.
2. If you have set a power-on password, a password prompt appears. If you have set both power-on and administrator passwords, you can type either of the passwords at the password prompt. However, if you think you might need to change any settings in the Configuration/Setup Utility Program, you must type your administrator password at the password prompt.
3. In the case of most errors, the Configuration/Setup Utility Program starts automatically so that you can attempt to identify and correct the problem. When the Configuration/Setup Utility Program starts, a screen titled POST Startup Errors appears. (Note that the POST Startup Errors screen does not appear immediately. You must wait approximately one minute.) If the POST Startup Errors screen does not appear, proceed to step 6.
4. At the POST Startup Errors screen, select **Continue** if you want to access the Configuration/Setup Utility Program menu. Select **Exit Setup** if you want to exit the Configuration/Setup Utility Program. (See the **Important** text box in step 5 for information on exiting the Configuration/Setup Utility Program without making any changes to current settings.) To select an item, press Up Arrow (↑) or Down Arrow (↓) to highlight the item, and then press **Enter**.
5. If you selected **Continue** in step 4, the Configuration/Setup Utility Program menu appears on the screen. You will see a pointer next to any menu items that are malfunctioning or that have been changed since the last time you turned on your computer. If you did not knowingly make a change to a flagged menu item, there is probably a malfunction in that item. If you made a change, continue here. If you

did not make a change, go to the **Important** text box which follows step 5d.

To use the Configuration/Setup Utility Program, do the following:

a. Select the menu item that is flagged (or that you wish to view) by pressing Up Arrow (↑) or Down Arrow (↓), and then press **Enter**.

b. A new menu specific to the item that you selected appears. Press Left Arrow (←) or Right Arrow (→) to toggle between choices for a menu item. (Note that each menu item has a Help screen. To view the Help screen, select the menu item, and then press **F1**.)

c. When you finish viewing and changing settings, press **Esc** to return to the Configuration/Setup Utility Program menu.

d. Before you exit from the program, select **Save Settings**. When you exit from the Configuration/Setup Utility Program menu (see step 5e), your operating system will start automatically (unless there is an unresolved problem with the startup device).

Important

If you did *not* change any settings in the Configuration/Setup Utility Program, note the following:

- You will get an error message if you exit from the Configuration/Setup Utility Program without selecting **Save Settings**. Your operating system will not start, but the computer will automatically restart. When the computer restarts, you will get a POST error message, and then the Configuration/Setup Utility Program will again start automatically.
- You will *not* get an error message if you select **Save Settings**, and then exit from the Configuration/Setup Utility Program. Your system saves all settings as they currently appear in the Configuration/Setup Utility Program and your operating system starts (unless there is an unresolved problem with the startup device).

e. To exit the Configuration/Setup Utility Program, press **Esc** and follow the instructions on the screen.

6. For more information about what caused an error message to appear and what action to take, see the following chart.

Problem	Go to:
POST error code or message appears.	"POST Message Charts" on page 88.
After more than one beep, application program or operating system appears.	"IBM Enhanced Diagnostics" on page 116.
Blank screen, unreadable screen, or other unusual response occurs.	"Troubleshooting Charts" on page 105.

If you are unable to resolve a problem and need assistance, see Chapter 9, "Getting help, service, and information" on page 121.

POST Message Charts

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 appears on your computer screen. Note that, in these charts, "X" can be any alphanumeric character.

Important

If you find it necessary to remove the computer cover, first read "Safety Information" on page vii and "Removing the Cover" on page 54 for important safety information and instructions.

POST Message	Description
101 102 106	A failure occurred during testing of the system board and microprocessor. **Action:** Have the computer serviced.
114	An adapter read-only memory (ROM) error occurred. **Action:** Remove all adapters that are not required for system startup and reinstall them one at a time, powering on after each is reinstalled. When this message displays, replace the adapter just installed. If the problem cannot be corrected, have the computer serviced.
121	A hardware error occurred. **Action:** Have the computer serviced.
151	A real-time clock error occurred. **Action:** Have the computer serviced.

POST Message	Description
161	The battery on the system board is dead. **CAUTION:** **Danger of explosion if lithium battery is incorrectly replaced.** **Replace the battery with the same or equivalent type recommended by the manufacturer. Dispose of batteries as required by local ordinances or regulations. (See "Lithium battery notice" on page ix and "Replacing the Battery" on page 49 for important information on battery use, disposal, and replacement.)** **Action:** Replace the battery **Note:** The computer can be used until you replace the battery.

POST Message	Description
162	A change in device configuration occurred. This message displays under one or more of the following conditions: • A new device has been installed. • A device has been moved to a different location or cable connection. • A device has been removed or disconnected from a cable. • A device is failing and is no longer recognized by the computer. • An external device is not turned on. • Processor update code has not been installed or cannot be found. • The *Erasing Lost or Forgotten Passwords* procedure was performed. This also erases configuration data. • An invalid checksum is detected in CMOS memory (nonvolatile RAM). **Action:** 1. Verify that all external devices are turned on. External devices must be turned on before the computer is turned on. 2. Verify that all devices are properly installed and securely connected. 3. If you added, removed, or changed the location of a device, or you erased passwords, you must save the new configuration before exiting from the Configuration/Setup Utility Program. 4. If you added or changed a microprocessor, you must update system programs. See "Updating System Programs" on page 22 for instructions. 5. If you did not add, remove, or change the location of a device, the device is probably failing. Running the diagnostic programs might isolate the failing device. See "IBM Enhanced Diagnostics" on page 116 for more information. If the problem cannot be corrected, have the computer serviced.
163	The clock is not working correctly. **Action:** Set the correct date and time. If the date and time are set correctly and saved and the message reappears, replace the battery. If this does not correct the problem, have the computer serviced. **Note:** The computer can be used until it is serviced, but any application programs that use the date and time will be affected.

POST Message	Description
164	A change in the memory configuration occurred. This error can be caused by adding, removing, or incorrectly installing memory. **Note:** The computer can be used with decreased memory capacity until the error is corrected. **Action**: 1. If you added memory, see "Working with System Memory" on page 62 to verify that the new memory is correct for your computer and that it is installed correctly. 2. If you added or removed memory, you must save the new configuration before exiting from the Configuration/Setup Utility Program. 3. Running the diagnostic programs might isolate the location of the problem DIMM and provide additional information. See "IBM Enhanced Diagnostics" on page 116 for more information. If the problem cannot be corrected, have the computer serviced.
167	A microprocessor was installed that is not supported by the current POST/BIOS (system programs). **Action**: 1. Obtain the latest POST/BIOS flash update diskette image. See "Updating System Programs" on page 22. 2. Perform the POST/BIOS flash update procedure. If the problem cannot be corrected, have the computer serviced.
175	A failure occurred during testing of the system board and microprocessor. **Action**: Have the computer serviced.
183	A password message is received if an administrator password is set. **Action**: You must enter the administrator password to clear this POST message. If the message recurs, have the computer serviced.

POST Message	Description
187	A problem occurred with the administrator password and startup sequence. POST message 167 will normally display, also. **Action:** Use the Configuration/Setup Utility program to: 1. Clear the startup sequence (Start Options, Startup sequence). 2. Clear the administrator password. For instructions, see "Administrator Password" on page 33. 3. Reload the default settings (Load Default Settings). 4. Reset an administrator password. For instructions, see "Setting, Deleting, or Changing an Administrator Password" on page 33. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27.
20X	A failure occurred during the testing of memory. This error can be caused by incorrectly installed memory, a failing DIMM, or a system-board failure. **Action:** 1. If you have added memory, see "Working with System Memory" on page 62 and Chapter 5, "Using the Configuration/Setup Utility Program" on page 27 to verify that the new memory is correct for your computer, and that it is installed and configured correctly. 2. Run the diagnostic programs to verify the problem. See "IBM Enhanced Diagnostics" on page 116 for more information. If the problem cannot be corrected, have the computer serviced.
301 303	A failure occurred during testing of the keyboard and keyboard controller. These error messages also might be accompanied by continuous beeping. **Action:** Ensure that: 1. Nothing is resting on the keyboard and pressing a key. 2. No key is stuck. 3. The keyboard cable is securely attached to the keyboard connector on the computer. See "Connecting Computer Cables" on page 10 for the keyboard connector location. **Note:** If you have just connected a new mouse or other pointing device, turn off the computer and disconnect that device. Wait at least 5 seconds, and then turn on the computer. If the error message goes away, replace the device. If the error message remains, have the keyboard and cable or the computer serviced.

POST Message	Description
601	A failure occurred during testing of the diskette drive and diskette-drive controller. This error can be caused by a loose or incorrectly connected cable, a failing drive, or a failing system board. The computer can be used, but one or more diskette drives might not work. **Action**: Verify that all diskette drive cables are properly installed and securely connected. Running the diagnostic programs might isolate the diskette drive that failed, but you must have your computer serviced. See "IBM Enhanced Diagnostics" on page 116 for more information.
602	The computer is not able to start the diskette in the drive. The diskette might be damaged or formatted incorrectly. **Action**: Try another startable diskette that is formatted correctly and is in good condition. For information and instructions on formatting diskettes, see your operating system documentation. If this does not correct the problem, have the computer serviced.
604	A failure occurred during the testing of a diskette drive. **Action**: 1. Verify that the Configuration/Setup Utility Program correctly reflects the type of diskette drive you have installed. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Run the diagnostic programs. See "IBM Enhanced Diagnostics" on page 116 for more information. 3. If the diagnostic programs detect a failure, replace the diskette drive. If the problem cannot be corrected, have the computer serviced.
662	A diskette drive configuration error occurred. **Action**: 1. Verify that the Configuration/Setup Utility Program correctly reflects the number of diskette drives you have installed. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. If you installed or removed a diskette drive, you must save the new configuration before exiting the Configuration/Setup Utility Program. If this does not correct the problem, have the computer serviced.
762	A math coprocessor configuration error. **Action**: Have the computer serviced.

POST Message	Description
11XX	Serial port error (XX=serial port number) **Action:** Have the computer serviced.
1762	A hard disk configuration error occurred. **Action:** 1. Verify that the Configuration/Setup Utility Program correctly reflects the number of hard disk drives you have installed. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27.) 2. If you added or removed a hard disk drive, you must save the new configuration before exiting the Configuration/Setup Utility Program. If the problem cannot be corrected, have the computer serviced.
178X	A failure occurred during testing of the hard disk drive or a primary or secondary IDE device. **Action:** 1. Run the diagnostic programs. See "IBM Enhanced Diagnostics" on page 116 for more information. 2. If the diagnostic programs detect a failure, replace the defective hard disk drive or the primary or secondary IDE or EIDE device. If the problem cannot be corrected, have the computer serviced.

POST Message	Description
1800	A PCI adapter has requested a hardware interrupt that is not available. **Action**: 1. Make sure that all ISA legacy adapters are set correctly in the Configuration/Setup Utility Program. If the hardware interrupt settings are not correct, change and save the settings. Setting the resources used by ISA legacy adapters to **ISA Resource** enables the Plug and Play function to configure around the legacy adapters. For background information on PCI, ISA, Plug and Play, and legacy adapters, see "Adapter Configuration" on page 67. For information about required interrupt resource settings for ISA legacy adapters, see the documentation supplied with these adapters. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, see the documentation supplied with the ISA legacy adapters. 3. If all hardware interrupts are being used by ISA legacy adapters, you might need to remove an ISA legacy adapter to make an interrupt available to the PCI adapter you want to install. For instructions on removing adapters, see "Working with Adapters" on page 66. **Note:** If you remove an ISA legacy adapter, set the hardware interrupt used by the removed adapter to **Available** before installing another adapter. 4. If you have other PCI or Plug and Play adapters installed, you might need to remove one of these adapters to make an interrupt available to the PCI adapter you want to install. If the problem cannot be corrected, have the computer serviced.

POST Message	Description
1801	A PCI adapter has requested memory resources that are not available. **Action:** 1. Make sure that all ISA legacy adapters are set correctly in the Configuration/Setup Utility Program. If the memory resource settings are not correct, change and save the settings. Setting the resources used by ISA legacy adapters to **ISA Resource** enables the Plug and Play function to configure around the legacy adapters. For background information on PCI, ISA, Plug and Play, and legacy adapters, see "Adapter Configuration" on page 67. For information about required memory resource settings for ISA legacy adapters, see the documentation supplied with these adapters. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, see the documentation supplied with the ISA legacy adapters. 3. If all memory resources are being used by ISA legacy adapters, you might need to remove an ISA legacy adapter to make memory available to the PCI adapter you want to install. For instructions on removing adapters, see "Working with Adapters" on page 66. **Note:** If you remove an ISA legacy adapter, set the memory resources used by the removed adapter to **Available** before installing another adapter. 4. If you have other PCI or Plug and Play adapters installed, you might need to remove one of these adapters to make memory available to the PCI adapter you want to install. If the problem cannot be corrected, have the computer serviced.

POST Message	Description
1802	A PCI adapter has requested an I/O address that is not available, or the PCI adapter might be defective. **Action**: 1. Make sure that all ISA legacy adapters are set correctly in the Configuration/Setup Utility Program. If the I/O address settings are not correct, change and save the settings. Setting the resources used by ISA legacy adapters to **ISA Resource** enables the Plug and Play function to configure around the legacy adapters. For background information on PCI, ISA, Plug and Play, and legacy adapters, see "Adapter Configuration" on page 67. For information about required I/O resource settings for ISA legacy adapters, see the documentation supplied with these adapters. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, see the documentation supplied with the ISA legacy adapters. 3. If all I/O addresses are being used by ISA legacy adapters, you might need to remove an ISA legacy adapter to make an I/O address available to the PCI adapter you want to install. For instructions on removing adapters, see "Working with Adapters" on page 66. **Note:** If you remove an ISA legacy adapter, set the I/O address used by the removed adapter to **Available** before installing another adapter. 4. If you have other PCI or Plug and Play adapters installed, you might need to remove one of these adapters to make an I/O address available to the PCI adapter you want to install. If the problem cannot be corrected, have the computer serviced.

POST Message	Description
1803, 1804	A PCI adapter has requested a memory address that is not available, or the PCI adapter might be defective. **Action:** 1. Make sure that all ISA legacy adapters are set correctly in the Configuration/Setup Utility Program. If the memory address settings are not correct, change and save the settings. Setting the resources used by ISA legacy adapters to **ISA Resource** enables the Plug and Play function to configure around the legacy adapters. For background information on PCI, ISA, Plug and Play, and legacy adapters, see "Adapter Configuration" on page 67. For information about required memory resource settings for ISA legacy adapters, see the documentation supplied with these adapters. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, see the documentation supplied with the ISA legacy adapters. 3. If all memory addresses are being used by ISA legacy adapters, you might need to remove an ISA legacy adapter to make a memory address available to the PCI adapter you want to install. For instructions on removing adapters, see "Working with Adapters" on page 66. **Note:** If you remove an ISA legacy adapter, set the memory address used by the removed adapter to **Available** before installing another adapter. 4. If you have other PCI or Plug and Play adapters installed, you might need to remove one of these adapters to make a memory address available to the PCI adapter you want to install. If the problem cannot be corrected, have the computer serviced.

POST Message	Description
1880	A Plug and Play adapter has requested a hardware interrupt that is not available. **Action**: 1. Make sure that all ISA legacy adapters are set correctly in the Configuration/Setup Utility Program. If the hardware interrupt settings are not correct, change and save the settings. Setting the resources used by ISA legacy adapters to **ISA Resource** enables the Plug and Play function to configure around the legacy adapters. For background information on PCI, ISA, Plug and Play, and legacy adapters, see "Adapter Configuration" on page 67. For information about required interrupt resource settings for ISA legacy adapters, see the documentation supplied with these adapters. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, see the documentation supplied with the ISA legacy adapters. 3. If all hardware interrupts are being used by ISA legacy adapters, you might need to remove an ISA legacy adapter to make an interrupt available to the Plug and Play adapter you want to install. For instructions on removing adapters, see "Working with Adapters" on page 66. **Note:** If you remove an ISA legacy adapter, set the hardware interrupt used by the removed adapter to **Available** before installing another adapter. 4. If you have other PCI or Plug and Play adapters installed, you might need to remove one of these adapters to make an interrupt available to the Plug and Play adapter you want to install. If the problem cannot be corrected, have the computer serviced.

POST Message	Description
1881	A Plug and Play adapter has requested memory resources that are not available. **Action:** 1. Make sure that all ISA legacy adapters are set correctly in the Configuration/Setup Utility Program. If the memory resource settings are not correct, change and save the settings. Setting the resources used by ISA legacy adapters to **ISA Resource** enables the Plug and Play function to configure around the legacy adapters. For background information on PCI, ISA, Plug and Play, and legacy adapters, see "Adapter Configuration" on page 67. For information about required memory resource settings for ISA legacy adapters, see the documentation supplied with these adapters. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, see the documentation supplied with the ISA legacy adapters. 3. If all memory resources are being used by ISA legacy adapters, you might need to remove an ISA legacy adapter to make memory available to the Plug and Play adapter you want to install. For instructions on removing adapters, see "Working with Adapters" on page 66. **Note:** If you remove an ISA legacy adapter, set the memory resources used by the removed adapter to **Available** before installing another adapter. 4. If you have other PCI or Plug and Play adapters installed, you might need to remove one of these adapters to make memory available to the Plug and Play adapter you want to install. If the problem cannot be corrected, have the computer serviced.

POST Message	Description
1882	A Plug and Play adapter has requested an I/O address that is not available, or the Plug and Play adapter might be defective. **Action**: 1. Make sure that all ISA legacy adapters are set correctly in the Configuration/Setup Utility Program. If the I/O address settings are not correct, change and save the settings. Setting the resources used by ISA legacy adapters to **ISA Resource** enables the Plug and Play function to configure around the legacy adapters. For background information on PCI, ISA, Plug and Play, and legacy adapters, see "Working with Adapters" on page 66. For information about required I/O resource settings for ISA legacy adapters, see the documentation supplied with these adapters. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, see the documentation supplied with the ISA legacy adapters. 3. If all I/O addresses are being used by ISA legacy adapters, you might need to remove an ISA legacy adapter to make an I/O address available to the Plug and Play adapter you want to install. For instructions on removing adapters, see "Working with Adapters" on page 66. **Note:** If you remove an ISA legacy adapter, set the I/O address used by the removed adapter to **Available** before installing another adapter. 4. If you have other PCI or Plug and Play adapters installed, you might need to remove one of these adapters to make an I/O address available to the Plug and Play adapter you want to install. If the problem cannot be corrected, have the computer serviced.

POST Message	Description
1883, 1884	A Plug and Play adapter has requested a memory address that is not available, or the Plug and Play adapter might be defective. **Action:** 1. Make sure that all ISA legacy adapters are set correctly in the Configuration/Setup Utility Program If the memory address settings are not correct, change and save the settings. Setting the resources used by ISA legacy adapters to **ISA Resource** enables the Plug and Play function to configure around the legacy adapters. For background information on PCI, ISA, Plug and Play, and legacy adapters, see "Adapter Configuration" on page 67. For information about required memory resource settings for ISA legacy adapters, see the documentation supplied with these adapters. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, see the documentation supplied with the ISA legacy adapters. 3. If all memory addresses are being used by ISA legacy adapters, you might need to remove an ISA legacy adapter to make a memory address available to the Plug and Play adapter you want to install. For instructions on removing adapters, see "Working with Adapters" on page 66. **Note:** If you remove an ISA legacy adapter, set the memory address used by the removed adapter to **Available** before installing another adapter. 4. If you have other PCI or Plug and Play adapters installed, you might need to remove one of these adapters to make a memory address available to the Plug and Play adapter you want to install. If the problem cannot be corrected, have the computer serviced.
1885	A Plug and Play adapter read-only memory (ROM) error occurred. **Action:** Remove all of the Plug and Play adapters that are not required for system startup and reinstall them one at a time, powering on after each is reinstalled. When this message displays, replace the adapter just installed. If the problem cannot be isolated and corrected, have the computer serviced.

POST Message	Description
1886	A Plug and Play adapter has requested a DMA address that is not available. **Action**: 1. Make sure that all ISA legacy adapters are set correctly in the Configuration/Setup Utility Program. If the DMA address settings are not correct, change and save the settings. Setting the resources used by ISA legacy adapters to **ISA Resource** enables the Plug and Play function to configure around the legacy adapters. For background information on PCI, ISA, Plug and Play, and legacy adapters, see "Adapter Configuration" on page 67. For information about required DMA resource settings for ISA legacy adapters, see the documentation supplied with these adapters. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, see the documentation supplied with the ISA legacy adapters. 3. If all DMA addresses are being used by ISA legacy adapters, you might need to remove an ISA legacy adapter to make a DMA address available to the Plug and Play adapter you want to install. For instructions on removing adapters, see "Working with Adapters" on page 66. **Note:** If you remove an ISA legacy adapter, set the DMA address used by the removed adapter to **Available** before installing another adapter. 4. If you have other PCI or Plug and Play adapters installed, you might need to remove one of these adapters to make a DMA address available to the Plug and Play adapter you want to install. If the problem cannot be corrected, have the computer serviced.

POST Message	Description
1962	A startup sequence error occurred. **Action:** 1. Make sure the startup options are set correctly in the Configuration/Setup Utility Program. If the settings are not correct, change and save them. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 2. Make sure the primary IDE or SCSI cable is properly installed and securely connected. 3. Make sure all adapters are installed correctly. For instructions on adding adapters, see "Working with Adapters" on page 66. If the problem cannot be corrected, have the computer serviced.
8603	A pointing device or system–board error occurred. **Action:** Have the computer serviced.
I9990301	A hard disk failure occurred. **Action:** Have the computer serviced.
Other Numbers	The computer POST found an error. **Action:** Follow the instructions on the screen.

Troubleshooting Charts

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

Important

If you find it necessary to remove the computer cover, first read "Safety Information" on page vii and "Removing the Cover" on page 54 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:

- Remove the software or device you just added.
- Run the diagnostic programs to determine if your computer is running correctly. (See "IBM Enhanced Diagnostics" on page 116 for information about diagnostic programs provided with your computer.)
- Reinstall the new software or new device.

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. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 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 cable is properly installed and securely connected. 7. There is no problem with your software program (see "Software Problem" on page 115). If the problem cannot be corrected, have the computer serviced.

Monitor Problems

Monitor Problems	Action
General monitor problems.	Some IBM monitors have their own self-tests. 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 the problem cannot be corrected, have the monitor and computer serviced.
Wavy, unreadable, rolling, distorted, or jittery screen images.	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 75 mm (3 in.) from the diskette drives to prevent diskette drive read/write errors. c. Turn on the monitor. 2. An IBM monitor signal cable is properly connected to the monitor and computer, and that the cable is installed securely. Non-IBM monitor signal cables might cause unpredictable problems. 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 the problem cannot be corrected, have the monitor and computer serviced.

Monitor Problems	Action
Screen flickers.	Set the monitor for the highest, noninterlaced refresh rate supported by your monitor and the video controller in your computer. For more information, see the documentation supplied with your monitor and the README files for the S3 Incorporated Trio3D. **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, using the instructions provided in the README files. See your operating system documentation for further information on monitor settings. If this does not correct the problem, have the monitor and computer serviced.
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 the monitor connector on the graphics adapter. For the location of the monitor connector on the graphics adapter installed in your computer, see “Connecting Computer Cables” on page 10. 2. The necessary device drivers for the application programs are installed. If the problem cannot be corrected, have the monitor and computer serviced.
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 with the Advanced Power Management (APM) feature. If the APM feature is enabled, disabling APM or changing APM settings might solve the problem (see “Power–Management Features” on page 39). If the problem cannot be corrected, have the computer serviced.
Blank screen.	Verify that: 1. The computer power cord is plugged into the computer and 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 “Connecting Computer Cables” on page 10. If the problem cannot be corrected, have the monitor and computer serviced.

Monitor Problems	Action
Only the cursor appears.	Have the computer serviced.
Wrong characters appear on the screen.	Have the computer serviced.

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 “Connecting Computer Cables” on page 10. 2. The computer cover is properly installed. If the problem cannot be corrected, have the computer serviced.
Other problems.	Have the computer serviced.

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 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. 3. If SCSI devices are installed, the last external device in each SCSI chain is terminated correctly. (See your SCSI documentation.) If the problem cannot be corrected, have the computer serviced.

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 “Connecting Computer Cables” on page 10. If the problem cannot be corrected, have the keyboard and computer serviced.
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 “Connecting Computer Cables” on page 10. 2. The device drivers for the mouse are installed correctly. If the problem cannot be corrected, have the computer and the device serviced.

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 of basic input/output system (BIOS) shadowing in random access memory (RAM). Verify that: 1. You have installed the correct type of DIMMs for your computer. See "Working with System Memory" on page 62 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. If the problem persists, run the memory test from the diagnostic program supplied with your computer. (See "IBM Enhanced Diagnostics" on page 116 for further information.) The system might have detected a bad DIMM and automatically reallocated memory to enable your computer to continue to operate. If the problem cannot be corrected, have the computer serviced.

Option Problems

Option Problems	Action
An IBM option that was just installed does not work.	Verify that: 1. The option is designed for your computer. 2. You followed the installation instructions supplied with the option and in Chapter 7, "Installing Options" on page 51. 3. All option files (if required) are installed correctly. See "Installing Files from Option Diskettes" on page 120 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. 6. You updated the configuration information in the Configuration/Setup Utility Program, if necessary, and have no conflicts. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27.) If the problem persists, run the diagnostic programs. (See "IBM Enhanced Diagnostics" on page 116 for information about diagnostic programs provided with your computer.) If the problem cannot be corrected, have the computer and the option serviced.

Option Problems	Action
An IBM option that previously worked does not work now.	Verify that all of the 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 your SCSI documentation. If the problem cannot be corrected, have the computer and option serviced.

Parallel Port Problems

Parallel Port Problems	Action
Parallel port cannot be accessed.	Verify that: 1. Each port is assigned a unique address. 2. The parallel-port adapter, if you added one, is properly installed and firmly seated. See Chapter 7, “Installing Options” on page 51 for instructions on adding adapters. If the problem cannot be corrected, have the computer serviced.

Serial Port Problems

Serial Port Problems	Action
Serial port cannot be accessed.	Verify that: 1. Each port is assigned a unique address. 2. The serial-port adapter, if you added one, is properly installed and firmly seated. See Chapter 7, “Installing Options” on page 51 for instructions on adding adapters. If the problem cannot be corrected, have the computer serviced.

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 "Connecting Computer Cables" on page 10 for the location of the parallel, serial, and USB ports.) **Note:** Non-IBM printer signal cables might cause unpredictable problems. 3. You have assigned the printer port correctly in your operating system or application program. 4. You have assigned the printer port correctly in the Configuration/Setup Utility Program. For more information, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 27. 5. If the problem persists, run the tests described in the documentation that comes with your printer. If the problem cannot be corrected, have the computer and printer serviced.

Software Problem

Software Problem	Action
Is your software program OK?	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 the problem cannot be corrected, have the computer serviced.

Universal Serial Bus Port Problems

Universal Serial Bus Port Problems	Action
The Universal Serial Bus ports cannot be accessed.	Verify that the USB device is properly installed and firmly seated. If the problem cannot be corrected, have the computer serviced.

IBM Enhanced Diagnostics

IBM Enhanced Diagnostics is provided on your hard disk drive and on the *Product Recovery* CD. It is a self-extracting file that runs independently of the operating system. You can run *IBM Enhanced Diagnostics* to diagnose hardware and some software problems. The user interface for running these diagnostic and utility programs is provided by WaterGate Software PC Doctor.

The IBM Enhanced Diagnostics will isolate your computer hardware from software that was preinstalled (or that you have installed) on your hard disk. The programs run independently of the operating system, and must be run either from CD or diskette.

You can use this program to test the hardware (and some software) components of your computer. This method of testing is generally used when other methods are not accessible or have not been successful in isolating a problem suspected to be hardware related.

To create a startable diagnostic diskette from the pre-installed program on your hard disk drive:

1. From the Windows 98 desktop, double-click on **IBM Welcome Center**.
2. In the IBM Welcome Center window, click on **Customize your system software**
3. Click on **Run the Software Selections program from the hard drive**. The program initializes.
4. Click on **Install Software**.
5. Check **IBM Enhanced Diagnostics** in the menu box.
6. Click on **Install** in the bottom right corner of the screen.
7. click on **Install** in the Software Selections Install Progress menu box. A DOS window appears.
8. Press **Enter** to continue and read the license information. Follow the instructions that appear at the bottom of the window.
9. When prompted, insert a blank, high-density diskette into the diskette drive and press **Enter**.
10. When the process is complete, remove the diskette and label it.
11. Click on **Return**.

To download the latest image of the IBM Enhanced Diagnostics from the Web site and create a startable Enhanced Diagnostics Diskette:

1. Go to the following Web site:

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

2. Download the .EXE file to a hard disk directory (not to a diskette).
3. Go to a DOS prompt and change the directory to where the file was downloaded.
4. Insert a blank high-capacity diskette in diskette drive A.
5. Type the following and press Enter:

   filename a:

   Where filename is the name of the file you downloaded from the Web.

The downloaded file is self-extracting and will be copied to the diskette. When the copy completes you have a startable *IBM Enhanced Diagnostics* diskette.

To start the IBM Enhanced Diagnostics program using the diagnostic diskette, do the following:

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

Other Diagnostic Programs on the *Software Selections* CD:
The *Software Selections* CD supplied with your computer also contains diagnostic programs designed specifically for certain operating environments (Windows 95, Windows 98, and Windows NT). Because these versions work with the operating system, they not only test the hardware, but also analyze certain software components of your computer. They are especially useful in isolating problems related to the operating system and device drivers.

To start the IBM Enhanced Diagnostics program using the *Product Recovery* CD, do the following:

1. Turn off your computer and any attached devices.
2. Turn on all attached devices; then turn on your computer.
3. When you see `Press F1 For Configuration/Setup`, press the **F1** key.
4. When the Configuration/Setup Utility Program menu appears, select **Start Options**.
5. Select **Startup Sequence** and press **Enter**.
6. Write down the device currently selected as the First Startup Device. Then write down the devices selected as Second Startup Device, Third Startup Device, and Fourth Startup Device. You must restore these settings when you finish running diagnostics.
7. Select the First Startup Device. To start from the CD, select **CD-ROM**.
8. Press **Esc** two times to return to the Configuration/Setup Utility Program menu.
9. Select **Save Settings** and follow the prompts.
10. Select **Exit Setup** and follow the prompts.
11. Place the *Product Recovery* CD in the CD-ROM drive.
12. Shut down and restart the computer. The *Product Recovery* CD will load.
13. Select Diagnostics on the option menu and press **Enter**.
14. When you finish running the diagnostic program, press **Esc**, remove the CD from the CD-ROM drive, and turn off the computer. You must restore the First Startup Device back to the original setting. Follow steps 2 through 9

To start the enhanced diagnostic program:

1. Shut down Windows 95 (or Windows NT) and turn off the computer.
2. Turn off any attached devices.
3. Insert the *IBM Enhanced Diagnostic* diskette into drive A.
4. Turn on all attached devices; then turn on your computer.
5. Follow the instructions that appear on the screen. For help, press F1.

CoSession Remote for UMA

CoSession availability varies by computer model and country. CoSession is a remote-control program that can be used by another individual, such as your in-house administrator, to help diagnose problems with your computer from a remote location. CoSession is part of the Universal Management Agent (UMA) Plus software provided on the *Software Selections* supplied with your computer. To use CoSession, this program must be installed in your computer, and your computer must have a modem or a LAN connection.

Important

Before attempting to use CoSession, contact IBM or your in-house administrator for specific instructions on setting up and using the program.

Recovering From a POST/BIOS Update Failure

If power to your computer is interrupted while POST/BIOS is being updated (flash update), your computer might not restart correctly. If this happens, perform the following procedure to recover:

1. Turn off the computer and any attached devices, such as printers, monitors, and external drives.
2. Unplug all power cords from electrical outlets and remove the cover. See "Removing the Cover" on page 54.

   CAUTION:
   Do not touch internal components of the computer while the power is on.
3. Locate the ROM Recovery switch (Switch 5 on the rocker switch) on the system board, removing any adapters that impede access to the rocker switch. See the system board label inside your computer for the location of the switch. See also "Working with Options on the System Board" on page 60.
4. Move the ROM Recovery switch to the **on** position.
5. Replace any adapters that were removed and replace the cover. See "Replacing the Cover and Connecting the Cables" on page 77.
6. Reconnect the power cords for the computer and monitor to electrical outlets.
7. Insert the POST/BIOS update (flash) diskette into drive A and turn on the computer and the monitor.

8. After the update session completes, turn off the computer and monitor.
9. Unplug the power cords from electrical outlets.
10. Remove the diskette from drive A.
11. Remove the cover. See “Removing the Cover” on page 54.
12. Remove any adapters that impede access to the switch.
13. Move the ROM Recovery switch to the **off** position.
14. Replace any adapters that were removed.
15. Install the cover and reconnect any cables that were disconnected.
16. Turn on the computer to restart the operating system.

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 files (.EXE or .COM) from the diskette to your hard disk. See the documentation that comes with the option to determine if you need to install files.

Chapter 9. Getting help, service, 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.pc.ibm.com	IBM Personal Computing
http://www.pc.ibm.com/support	IBM Personal Computing Support
http://www.pc.ibm.com/us/desktop/	IBM Commercial Desktop (U.S.)
http://www.pc.ibm.com/us/intellistation/	IBM IntelliStation (U.S.)
http://www.pc.ibm.com/us/netfinity/	IBM Netfinity and PC Servers (U.S.)
http://www.pc.ibm.com/us/options/	IBM Options (U.S.)

You can select a country-specific Web site from these pages.

Help is also available from bulletin boards and online services, as well as by fax and telephone. 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 (1-800-772-2227 in the U.S.) for hardware product assistance covered under the terms of the IBM Statement of Limited Warranty. See “Getting help by telephone” on page 125 for HelpCenter telephone numbers in other countries.

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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 (ECs) 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 and Model
- Serial numbers of your IBM hardware products
- 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

  Note: All warranted parts contain a 7-character identification in the format IBM FRU XXXXXXX.

- 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 the IBM Statement of Limited 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. The documentation that comes with your computer also contains information about the diagnostic tests you can perform.

If you receive a POST error code when you turn on your computer, refer to the POST error-message charts in your hardware documentation. If you do not receive a POST error code, but suspect a hardware problem, refer to the troubleshooting information in your hardware documentation or run the diagnostic tests.

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.pc.ibm.com`

You can find support information for your IBM products, including supported options, on the IBM Personal Computing Support page at:

`http://www.pc.ibm.com/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. You will have the information you need, all in one place. In addition, you can choose to receive e-mail notifications whenever new information becomes available about your registered products. You

also can access online support forums, which are community sites monitored by IBM support staff.

For information about specific Personal Computer products, visit the following pages:

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

http://www.pc.ibm.com/us/desktop/

http://www.pc.ibm.com/us/netfinity/

http://www.pc.ibm.com/us/thinkpad/

http://www.pc.ibm.com/us/options/

http://www.pc.ibm.com/us/aptiva/

You can select a country-specific Web site from these pages.

Using electronic support services

If you have a modem, you can get help from several popular services. Bulletin boards and online information services provide assistance through question-and-answer message areas, live chat rooms, searchable databases, and more.

Technical information is available on a wide range of topics, such as:

- Hardware setup and configuration
- Preinstalled software
- OS/2, DOS, and Windows
- Networking
- Communications
- Multimedia

In addition, the latest device driver updates are available.

The IBM Bulletin Board System (BBS) can be reached 24 hours a day, 7 days a week. Modem speeds of up to 14400 baud are supported. Long distance telephone charges might apply. To access the IBM BBS:

- In the U.S., call 1-919-517-0001.
- In Canada:
  - In Montreal, call 514-938-3022.
  - In Toronto, call 905-316-4255 or 416-956-7877.
  - In Vancouver, call 604-664-6464.
- In the U.K., call 01256 336655.

Commercial online services, such as America Online (AOL), contain information about IBM products. (For AOL, use the "Go to" keyword **IBM Connect**.)

Getting information by fax

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

To access the IBM Automated Fax System, do the following:

- In the U.S., call 1-800-426-3395.
- In Canada, call 1-800-465-3299.

Getting help online

Online Housecall is a remote communication tool that allows an IBM technical-support representative to access your PC by modem. Many problems can be remotely diagnosed and corrected quickly and easily. In addition to a modem, a remote-access application program is required. This service is not available for servers. There might be a charge for this service, depending on the request.

For more information about configuring your PC for Online Housecall:

- In the U.S., call 1-800-772-2227.
- In Canada, call 1-800-565-3344.
- In all other countries, contact your IBM reseller or IBM marketing representative.

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 and IBM monitor
- Installing and setting up IBM options purchased from IBM or an IBM reseller
- 30-day, preinstalled-operating-system support
- Arranging for service (on-site or carry-in)
- Arranging for overnight shipment of customer-replaceable parts

In addition, if you purchased an IBM PC Server or IBM Netfinity Server, you are eligible for IBM Start Up Support for 90 days after installation. This service provides assistance for:

- Setting up your network operating system
- Installing and configuring interface cards
- Installing and configuring network adapters

Please have the following information ready when you call:

- Machine Type and Model
- Serial numbers of your computer, monitor, and other components, or your proof of purchase
- 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.

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.[4]

Country		**Telephone number**
Austria	Österreich	1-546 585 075
Belgium - Dutch	Belgie	02-717-2504
Belgium - French	Belgique	02-717-2503
Canada	Canada	1-800-565-3344
Denmark	Danmark	03-525-6905
Finland	Suomi	9-22-931805
France	France	01-69-32-40-03
Germany	Deutschland	069-6654-9003
Ireland	Ireland	01-815-9207
Italy	Italia	02-4827-5003
Luxembourg	Luxembourg	298-977-5060
Netherlands	Nederland	020-504-0531
Norway	Norge	2-305-3203

[4] Response time will vary depending on the number and complexity of incoming calls.

Country		Telephone number
Portugal	Portugal	01-791-5147
Spain	España	091-662-4270
Sweden	Sverige	08-632-0063
Switzerland - German	Schweiz	01-212-1810
Switzerland - French	Suisse	022-310-0418
Switzerland - Italian	Svizzera	091-971-0523
United Kingdom	United Kingdom	01475-555555
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.

Getting help around the world

If you travel with your computer or need to move it to another country, you can register for International Warranty Service. When you register with the International Warranty Service Office, you will receive an International Warranty Service Certificate that is honored virtually worldwide, wherever IBM or IBM resellers sell and service IBM PC 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.

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 name might vary by country.

Enhanced PC support line

Enhanced PC Support is available for desktop and mobile IBM computers that are not connected to a network. Technical support is provided for IBM computers and IBM or non-IBM options, operating systems, and application programs on the Supported Products list.

This service includes technical support for:

- Installing and configuring your out-of-warranty IBM computer
- Installing and configuring non-IBM options in IBM computers
- Using IBM operating systems in IBM and non-IBM computers
- Using application programs and games
- Tuning performance
- Installing device drivers remotely
- Setting up and using multimedia devices
- Identifying system problems
- Interpreting documentation

You can purchase this service on a per-call basis, as a multiple-incident package, or as an annual contract with a 10-incident limit. For more information about purchasing Enhanced PC Support, see “Ordering support line services” on page 129.

900-number operating system and hardware support line

In the U.S., if you prefer to obtain technical support on a pay-as-you go basis, you can use the 900-number support line. The 900-number support line provides support for IBM PC products that are out of the warranty period.

To access this support, call 1-900-555-CLUB (2582). You will be notified of the charge per minute.

Network and server support line

Network and Server Support is available for simple or complex networks made up of IBM servers and workstations using major network operating systems. In addition, many popular non-IBM adapters and network interface cards are supported.

This service includes all of the features of the Enhanced PC Support Line, plus:

- Installing and configuring client workstations and servers

- Identifying system problems and correcting problems on the client or the server
- Using IBM and non-IBM network operating systems
- Interpreting documentation

You can purchase this service on a per-call basis, as a multiple-incident package, or as an annual contract with a 10-incident limit. For more information about purchasing Network and Server Support, see "Ordering support line services."

Ordering support line services

Enhanced PC Support Line and Network and Server Support Line services are available for products on the Supported Products list. To receive a Supported Products list:

- In the U.S.:
  1. Call 1-800-426-3395.
  2. Select document number 11683 for Network and Server support.
  3. Select document number 11682 for Enhanced PC support.
- In Canada, contact IBM Direct at 1-800-465-7999, or:
  1. Call 1-800-465-3299.
  2. Select the HelpWare catalog.
- In all other countries, contact your IBM reseller or IBM marketing representative.

For more information or to purchase these services:

- In the U.S., call 1-800-772-2227.
- In Canada, call 1-800-465-7999.
- In all other countries, contact your HelpCenter.

Warranty and repair services

You can upgrade your standard hardware warranty service or extend the service beyond the warranty period.

Warranty upgrades in the U.S. include:

- Carry-in service to on-site service

  If your warranty provides carry-in repair service, you can upgrade to on-site repair service, either standard or premium. The standard upgrade provides a trained servicer within the next business day (9 a.m. to 5 p.m., local time, Monday though Friday). The premium upgrade provides 4-hour average response, 24 hours a day, 7 days a week.

- On-site service to premium on-site service

  If your warranty provides for on-site service, you can upgrade to premium on-site service (4-hour average on-site response, 24 hours a day, 7 days a week).

You also can extend your warranty. Warranty and Repair Services offers a variety of post-warranty maintenance options, including ThinkPad EasyServ Maintenance Agreements. Availability of the services varies by product.

For more information about warranty upgrades and extensions:

- In the U.S., call 1-800-426-4968.
- In Canada, call 1-800-465-7999.
- In all other countries, contact your IBM reseller or IBM marketing representative.

Ordering publications

Additional publications are available for purchase from IBM. For a list of publications available in your country:

- In the U.S., Canada, and Puerto Rico, call 1-800-879-2755.
- In other countries, contact your IBM reseller or IBM marketing representative.

Appendix A. Computer Records

This appendix contains forms for recording information about your computer, which can be helpful if you decide to install additional hardware, or if you ever need to have your computer serviced.

Serial Numbers and Keys

Record and retain the following information.

Product Name	PC 300GL
Model/Type (M/T)	_____
Serial Number (S/N)	_____

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

Device Records

Use the following tables to keep a record of the options in or attached to your computer. This information can be helpful when you install additional options, or if you ever need to have your computer serviced.

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Location	Option Description
System Memory	
(Mem 1 DIMM)	□ 16 MB □ 32 MB □ 64 MB □ 128 MB
(Mem 2 DIMM)	□ 16 MB □ 32 MB □ 64 MB □ 128 MB
(Mem 3 DIMM)	□ 16 MB □ 32 MB □ 64 MB □ 128 MB
Expansion Slot 1 (PCI)	_____
Expansion Slot 2 (PCI)	_____
Expansion Slot 3 (PCI)	_____
Expansion Slot 4 (ISA)	_____
Microprocessor	□ Intel _____ MHz
Parallel Connector	_____
Serial Connector	_____
USB Connector 1	_____
USB Connector 2	_____
Monitor Connector	_____
Audio Connectors	_____
Keyboard Connector	104-key keyboard □ Other _____
Mouse Connector	□ Scroll Point mouse □ 2-button mouse □ Other: _____
5.25-Inch Bay 1	□ IDE CD-ROM drive □ Other: _____
3.5-Inch Bay 2 □ Other: _____	□ Zip drive _____
3.5-Inch Bay 3	□ 1.44 MB diskette drive
3.5-Inch Bay 4	EIDE hard disk drive □ Other: _____

Appendix B. Product Warranties and Notices

This appendix includes product warranties, trademarks, and notices.

Warranty Statements

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

- **United States, Puerto Rico, and Canada (Z125-4753-05 11/97)**
  (Part 1 - General Terms on page 133)
- **Worldwide except Canada, Puerto Rico, Turkey, and United States (Z125-5697-01 11/97)**
  (Part 1 - General Terms on page 136)
- **Worldwide Country-Unique Terms**
  (Part 2 - Country-Unique Terms on page 139)

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

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

Machine - PC 300GL Types 6277 and 6287

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

IBM will provide warranty service without charge for:

1. parts and labor during the first year of the warranty period
2. parts only, on an exchange basis, in the second and third years of the warranty period.

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

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

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

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

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

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

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

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

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

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

Warranty Service

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

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

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

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

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

You also agree to

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

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

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

Production Status

Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed.

Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

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

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

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

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

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

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

Machine - PC 300GL Types 6277 and 6287

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

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

The IBM Warranty for Machines

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

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

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

Extent of Warranty

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

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

Items Not Covered by Warranty

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

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

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

Warranty Service

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

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

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

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

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

You also agree to

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

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

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

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

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

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

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

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

Part 2 - Worldwide Country-Unique Terms

ASIA PACIFIC

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

Extent of Warranty: The following replaces the first and second sentences of this Section:
The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment,

operation in other than the Specified Operating Environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible.

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

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

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

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

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

EUROPE, MIDDLE EAST, AFRICA (EMEA)

The following terms apply to all EMEA countries.

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

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

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

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

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

The following terms apply to the country specified:

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

Applicability of suppliers and resellers (unchanged).

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

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

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

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

Extent of Warranty: The second paragraph does not apply.

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

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

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

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

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

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

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

Applicability of suppliers and resellers (unchanged).

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

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

Applicability of suppliers and resellers (unchanged).

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

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

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

UNITED KINGDOM: Limitation of Liability: The following replaces items 1 and 2 of the first paragraph of this Section:
1. death or personal injury or physical damage to your real property solely caused by IBM's negligence;

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

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

Applicability of suppliers and resellers (unchanged).

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

NORTH AMERICA

CANADA: Warranty Service: The following is added to this Section:
To obtain warranty service from IBM, call **1-800-465-6666**.

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

Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. 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. Subject to IBM's valid intellectual property or other legally protectable rights, any functionally equivalent product, program, or service may be used instead of the IBM product, program, or service. The evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, are the responsibility of the user.

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:

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Armonk, NY 10504-1785
U.S.A.

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.

Year 2000 Readiness and Instructions

A product is Year 2000 Ready if the product, when used in accordance with its associated documentation, is capable of correctly processing, providing and/or receiving date data within and between the 20th and 21st centuries, provided all other products (for example, software, hardware, and firmware) used with the product properly exchange date data with it.

This IBM PC hardware product has been designed to process four-digit date information correctly within and between the 20th and 21st centuries. If your IBM computer is on when the century changes, you should turn it

off and then back on again once, or restart the operating system, to ensure that the internal clock resets itself for the new century.

This IBM PC product cannot prevent errors that might occur if software you use or exchange data with is not ready for the Year 2000. IBM software that comes with this product is Year 2000 Ready. However, software from other companies might come with this IBM PC product. IBM cannot take responsibility for the readiness of that software. You should contact the software developers directly if you wish to verify readiness, understand limitations, or look for any software updates.

To learn more about IBM PC products and the Year 2000, visit our Web site at http://www.pc.ibm.com/year2000. The information and tools there can help you with your Year 2000 transition plan, especially if you have multiple IBM PCs. IBM encourages you to check periodically for updated information.

Trademarks

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

HelpCenter
HelpWare
IBM
IntelliStation
LANClient Control Manager
Netfinity
OS/2
ThinkPad
ViaVoice
Wake on LAN

Intel, Pentium, and LANDesk are trademarks or registered trademarks of Intel Corporation.

Microsoft, Windows, and Windows NT are trademarks or registered trademarks of Microsoft Corporation.

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

Electronic Emission Notices

This computer is classified as a Class B digital device. However, if this computer includes a preinstalled network interface controller (NIC), this computer is considered a Class A digital device when the NIC is in use. The Class A digital device rating and compliance notice are primarily because the inclusion of certain Class A options or Class A NIC cables changes the overall rating of the computer to Class A.

Cet ordinateur est enregistré comme un appareil numérique de classe B. Toutefois, lorsque la carte réseau qu'il contient est utilisée, il est considéré comme un appareil de classe A. Il a été déclaré de classe A dans l'avis de conformité car la présence de certaines options de classe A ou de câbles de carte réseau de classe A modifie ses caractérisques et le rend conforme aux normes de la classe A.

Class B Notices

PC 300GL Types 6267, 6277 and 6287

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

Industry Canada Class B emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Class A Notices

Federal Communications Commission (FCC) Statement

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

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

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

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

Other Notices

European community directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

European community directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements

resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

Taiwan Class A Electronic Emission Statement

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

Power Cord Notice

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

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

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

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

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

IBM power cords for a specific country are usually available only in that country:

IBM Power Cord Part Number	Used in These Countries
13F9940	Argentina, Australia, China (PRC), New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa
13F9979	Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Macau, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe
13F9997	Denmark
14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka
14F0033	Antigua, Bahrain, Brunei, Channel Islands, Cyprus, Dubai, Fiji, Ghana, Hong Kong, India, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Ethiopia, Italy, Libya, Somalia
14F0087	Israel
1838574	Thailand
62X1045	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela

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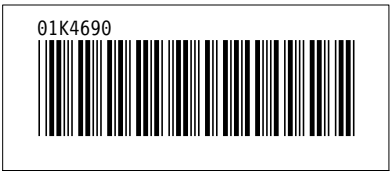
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