

IntelliStation E Pro

User Guide

Professional Workstation (Type 6893)

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Note

Before using this information and the product it supports, be sure to read the general information under Appendix C, "Product Warranties and Notices" on page 151.

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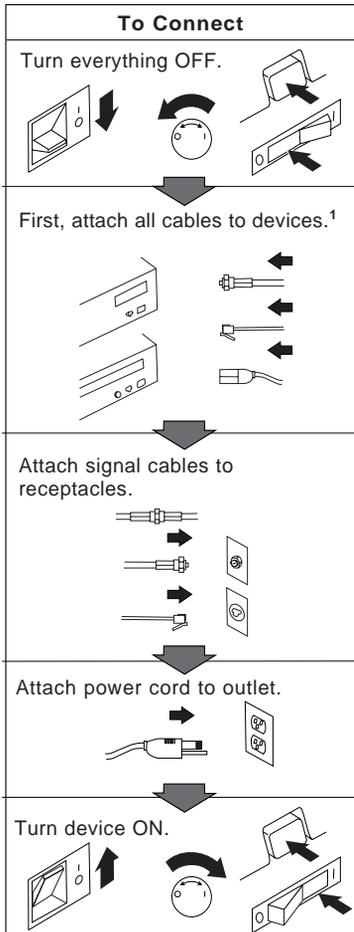
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Safety Information

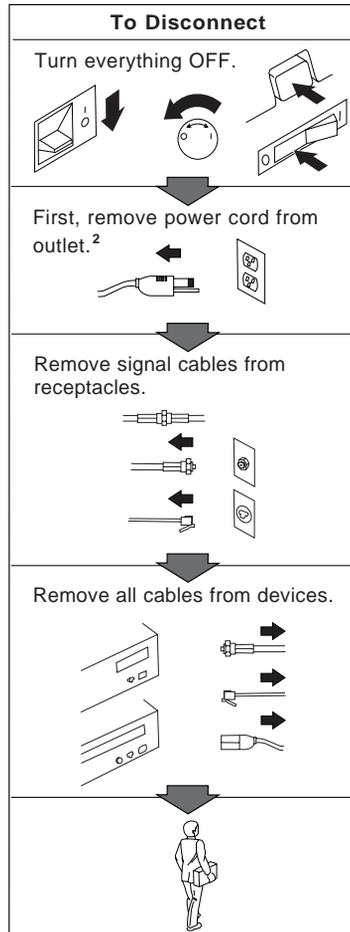


DANGER:

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.

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.

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

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

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.

Related Information

The following documentation together with this document, contain information about your computer.

- *Installing Options in Your IntelliStation E Pro*
This online publication (provided on the Ready-to-Configure Utility program CD supplied with your computer) includes information for adding memory, adapters, drives, and other options to your computer. It is also available as a printable file (.PDF) on the Ready-to-Configure Utility program CD and from the World Wide Web at:
<http://www3.pc.ibm.com/support?page=IBM+IntelliStation>
- *Understanding Your IntelliStation E Pro*
This online publication (provided on the Ready-to-Configure Utility program CD supplied 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.
- *About Your Software*
This publication (provided only with computers that have IBM-preinstalled software) contains information about the preinstalled software package.
- Graphics Adapter README Files
These files on the *Ready-to-Configure Utility Program CD* contain instructions for installing device drivers for the Matrox Millennium G200 AGP graphics adapter installed in some models.
- IBM Audio Feature README File
This file on the *Ready-to-Configure Utility Program CD* contains instructions for installing device drivers for the integrated audio controller.
- Ethernet Feature README File
This file on the *Ready-to-Configure Utility Program CD* contains instructions for installing device drivers for the integrated Ethernet controller.
- *Netfinity Services User's Guide*
This publication contains detailed information on how to use each of the applications included with IBM Netfinity Services.
- *Adaptec SCSI Documentation*
This documentation, included on the *Ready-to-Configure Utility Program CD*, contains information about installing SCSI device drivers, configuring the SCSI adapter, and instructions for installing and configuring SCSI devices.

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://www3.pc.ibm.com/support?page=IBM+IntelliStation>

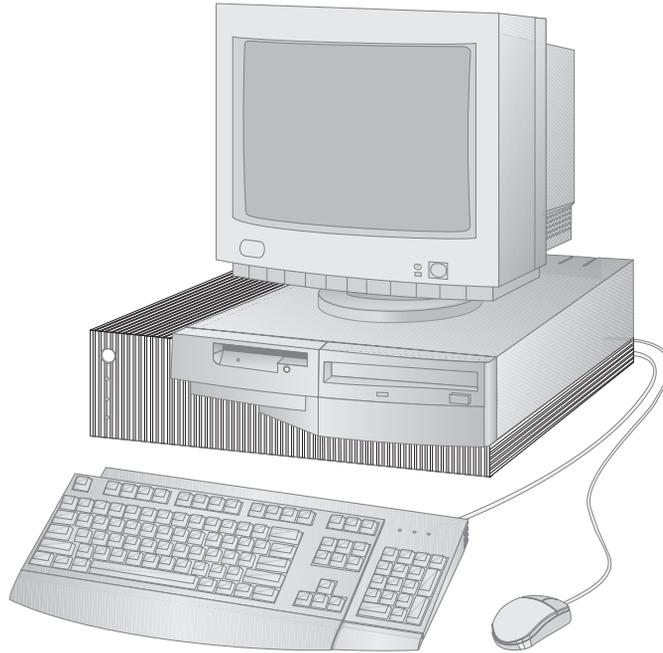
It can also be ordered from IBM. To purchase a copy, refer to Chapter 9, “Getting Help, Service, and Information” on page 131.

- *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://www3.pc.ibm.com/support?page=IBM+IntelliStation>

Chapter 1. IBM IntelliStation E Pro Overview



Thank you for selecting an IBM IntelliStation E Pro. Your computer incorporates many of the latest advances in personal computer technology and is easy to expand and upgrade as your needs change. With its enhanced video and system-management capabilities, your computer is particularly suited for your corporate intranet environment.

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

Features at a Glance

For a list of the system features in your computer, see “Viewing the System Summary” on page 46.

Microprocessor

- Intel® Pentium® II microprocessor with MMX™ technology with 100 MHz FSB
- 512 KB of L2 cache with ECC

System Memory

- Expandable to 768 MB
- Three 168-pin DIMM sockets, 3.3 V
- ECC SDRAM supported
- 100 MHz DIMMs supported
- See “Memory DIMM Options” on page 85 for more information.

Diskette Drive

- One 3.5-inch, 1.44 MB drive

Hard Disk Drive

- One EIDE or one SCSI

CD-ROM Drive

- 32X Max IDE CD-ROM drive

Mouse

- Three-button

Network Connection

- Intel EtherExpress Pro/100B Ethernet
- Wake on LAN
- Alert on LAN
- DHCP and RPL support
- 10Base-T and 100-Base TX Connectivity

Graphics (AGP Technology)

- Matrox Millenium G200 AGP graphics adapter
- Matrox Millennium II AGP graphics adapter
- STB GLyder MAX-2+ AGP graphics adapter

Audio Subsystem

- Integrated Crystal 4235 audio subsystem
- SoundBlaster application supported

Keyboard

- 104-key keyboard
- Euro Sign keyboard support

Input/Output Features

- ECP/EPP parallel port
- Two serial ports
- Two USB ports
- Mouse port
- Keyboard port
- Monitor port
- Microphone jack
- Audio line-out jack
- Audio line-in jack
- RJ-45 Ethernet port

System Management

- Support for IBM SystemCare
- Wake on LAN, Wake on Ring, Wake on Alarm
- Alert on LAN
- DMI BIOS and DMI software
- Asset ID
- System-management controller
- Year 2000-compliant
- Update POST and BIOS over the network
- Remote reset from network

Asset Security

- Support for IBM SystemCare
- Enhanced security
- Asset ID
- Security U-bolt option
- Cover lock standard
- Power-on and Administrator Passwords
- Startup sequence control
- Chassis-intrusion detector

IBM-Preinstalled Software

- Available in specific models only. For details, see *About Your Software*.

Power

- 145 W, 115/230 V ac, 50/60 Hz
 - Built-in overload and surge protection
 - Power Management features
 - Wake on LAN enabled
-

System Specifications

System specifications are provided to assist you with the setup of your computer.

Dimensions

- Height: 128 mm (5.0 in.)
- Width: 450 mm (17.7 in.)
- Depth: 440 mm (17.7 in.)

Weight

- Minimum configuration as shipped: 9.9 kg (22 lb)
- Maximum configuration: 11.3 kg (25 lb)

Environment

- Air temperature:
 - System on: 10° to 32°C (50° to 90°F)
 - System off: -40° to 70°C (-40° to 158deg.F)
- Humidity:
 - System on: 8% to 80%
 - System off: 8% to 80%
- Maximum altitude: 2134 m (7000 ft)

Electrical Input

- Sine-wave input (50 to 60 Hz) is required
- Input voltage:
 - Low range:
 - Minimum: 90 V ac
 - Maximum: 137 V ac
 - Voltage switch setting: 115 or 115 V
 - High range:
 - Minimum: 180 V ac
 - Maximum: 265 V ac
 - Voltage switch setting: 230 or 230 V
- Input kilovolt-amperes (kVA) (approximately):
 - Minimum configuration as shipped: 0.08 kVA
 - Maximum configuration: 0.52 kVA

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

Heat Output

- Approximate heat output in British thermal units (Btu) per hour:
 - Minimum configuration: 245 Btu/hr (70 watts)
 - Maximum configuration: 700 Btu/hr (204 watts)

Airflow

- Approximately 0.56 cubic meters per minute (20 cubic feet per minute)

Acoustical Noise-Emission Values

- Average sound-pressure levels:
 - At operator position:
 - 34 dBA idle
 - 37 dBA operating
 - At bystander position-1 meter (3.3 ft):
 - 29 dBA idle
 - 32 dBA operating
- Declared (upper limit) sound power levels:
 - 4.5 bels idle
 - 4.9 bels operating

Note: 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.

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 Window NT)

Chapter 2. Setting Up Your Computer

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

Attention

Be sure to 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.

Installing Options

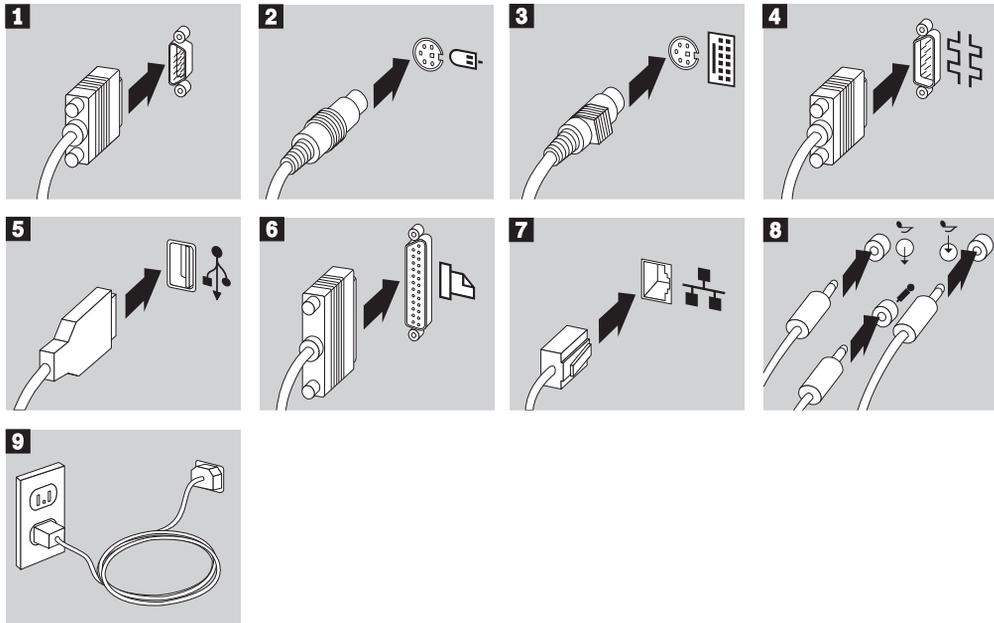
Set up and start your computer before installing any internal options (such as memory or an adapter). For option installation information, see Chapter 7, “Installing Options Overview” on page 81

Important: Be sure that you set up any additional devices according to the manufacturer's instructions before you attach any cables to the connectors.

Locating Your Computer

Make sure you have an adequate number of properly grounded 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.

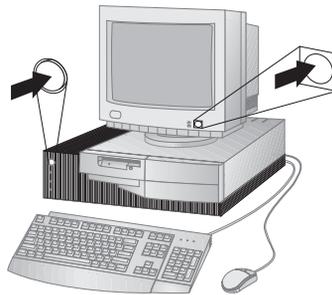
For information about arranging your computer for comfort and ease-of-use, refer to Chapter 3, “Arranging Your Workspace” on page 9.



Important Information:

- For operation on the system within FCC Class A limits, Class 5 Ethernet cabling must be used.
- If there is a label covering the power connector, remove it. Connect the power cords to the computer, monitor, and other devices first, then plug the cords into properly grounded electrical outlets.
- 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.

Turning on Power

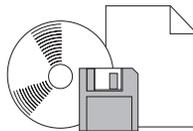


Turn on the monitor and other external devices first, and then turn on the computer. You see a logo screen while the computer performs a short self-test. Upon successful completion, the logo screen disappears the BIOS is loaded, and the software is loaded (in models with preinstalled software).

Note:

If you suspect a problem, see Chapter 8, “Solving Problems” on page 93.

Finishing the Installation



Your computer has identification numbers (serial and model/type) that you might need if you ever have your computer serviced. To locate these numbers, and record this information, see Appendix A, “Computer Records” on page 141.

For information about IBM-installed software, see *About Your Software* in your applications package. Additional programs and device drivers are on the *Ready-to-Configure Utility Program CD* and in some cases on other CDs and diskettes. If you are installing you own operating system, make sure you install the device drivers after you install your operating system. Installation instructions are provided with the media or README files on the diskettes or CDs.

Chapter 3. Arranging Your Workspace

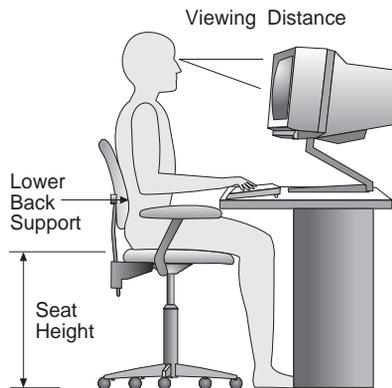
To get the most from your computer, arrange both the equipment you use and your work area to suit your needs and the kind of work you do. Your comfort is of foremost importance, but light sources, air circulation, and the location of electrical outlets also can affect the way you arrange your workspace.

Comfort

Although no single working position is ideal for everyone, here are a few guidelines to help you find a position that suits you best.

Sitting in the same position for a long time causes fatigue. A good chair can make a big difference. 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 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 you can view it without having to twist your body.

Glare and Lighting

Position the monitor to minimize glare and reflections from overhead lights, windows, and other light sources. Place the monitor at right angles to windows and other light sources, when 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, an antiglare filter placed over the screen might be helpful. 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. When 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 get kicked accidentally.

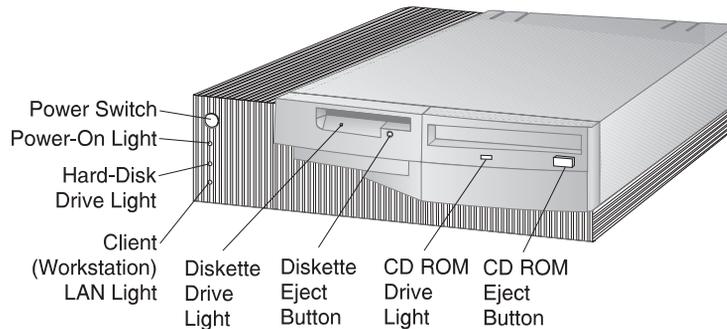
For more information about power cords, see “Power Cord Notice” on page 166.

Chapter 4. Operating Your Computer

This chapter provides information to help you in the day-to-day use of your computer. It includes instructions for starting and shutting down your computer, and information on using audio, video, system-management, and security features.

Using Controls and Status Indicators

Look at the front of your computer. The buttons are controls that allow you to perform a specific function, such as powering on the computer. The lights are status indicators that tell you when a certain function, such as the diskette drive or the CD-ROM drive is in use. For more information, see “Using a CD-ROM Drive” on page 20.



- **Power Switch:** Press this switch to turn your computer on or off. Do not turn off your computer if the in-use light for the hard disk drive or diskette drive is on.
Note: The power switch normally operates with a single touch. However, in some circumstances the computer might not immediately power off. If this happens, hold the power switch down for approximately 5 seconds, and the computer will then power off.
- **Power-On Light:** This status indicator lights when you turn on your computer.
- **Hard-Disk Drive Light:** When this light is on, it indicates that the hard disk drive heads are being positioned or that your computer is reading from or writing to the hard disk.
- **Client (Workstation) LAN Light:** This light indicates when there is network activity.

- **Diskette Eject Button:** Push this button to release a diskette from the drive.
- **Diskette-Drive Light:** When this light is on, it indicates that the diskette drive heads are being positioned or that your computer is reading from or writing to a diskette.
- **CD-ROM Drive Light:** When this light is on, it indicates that the CD-ROM drive is reading the CD.
- **CD-ROM Eject Button:** Push this button to release the CD-ROM tray for inserting or removing a CD-ROM.

Starting Your Computer

Before you begin

Please observe the following:

- When the power cord is first plugged in, the computer appears to power on for a few seconds, and then power off. This is a normal sequence to enable the computer to self initialize.
- What you see and hear when you start up your computer depends upon settings in the Configuration/Setup Utility program. See “Settings that Affect the Startup Procedure” on page 16 for more information.
- If you plan to start your computer over a network, see “Starting Your Computer Over a Network” on page 17.

To start your computer

1. Turn on all devices connected to the computer.
2. Press and release the power switch on your computer. If you have changed settings for features (such as passwords or the startup sequence) in the Configuration/Setup Utility program, see “Settings that Affect the Startup Procedure” on page 16 for important information.

If you have not changed any settings in the Configuration/Setup Utility program, the following actions occur:

- The video BIOS is installed.
 - The IBM logo appears on the screen.
 - The power-on self-test (POST) is performed. If POST detects a problem, you hear multiple beeps (or no beep) and an error message appears on the screen. Write down any error code numbers and descriptions.
 - The computer allows you to enter the Configuration/Setup Utility program (by pressing **F1**) or run a fast POST (by pressing **Esc**).
 - If you have a SCSI model, the SCSI BIOS is installed.
3. A DHCP (Dynamic Host Configuration Protocol) request is sent to the network, and one of the following events occurs:
 - If you are properly connected to a network, a DHCP server dynamically assigns an IP (internet protocol) address to your computer and then loads a startup image onto your computer.
 - If the DHCP request is unsuccessful, the following message appears:

No IP address found for DHCP or BOOTP

and the operating system and application programs are loaded from the hard disk drive.

- If you have not plugged an Ethernet cable into the Ethernet connection on your computer, the following message appears:

Media test failed; check cable

and the operating system and application programs are loaded from the hard disk drive.

Startup Sequence Information

In keeping with IBM's commitment to provide computers designed to enhance network manageability and control, the startup sequence of your computer has been preset to automatically send a DHCP request when your computer starts. This feature makes it easier for a network administrator to set up and manage computers using network-management software such as IBM LANClient Control Manager (see "Information for Network Administrators" on page 15).

With the preset startup sequence, when you start your computer with the Ethernet cable attached and no startup diskette in the diskette drive, your computer sends a DHCP request over the network. If the DHCP request is successful, an IP address is assigned to your computer, and the operating system and other software is loaded.

The IntelliStation E Pro is shipped with this preset startup sequence:

| | |
|-----------------------|-------------------|
| First startup device | [Diskette drive] |
| Second startup device | [Network] |
| Third startup device | [Hard disk drive] |
| Fourth startup device | [Disabled] |

If you want to change the startup-sequence settings for your computer, such as removing Network from the startup sequence, see “Setting the Startup Sequence” on page 55.

Note: The preceding startup sequence is not the *default* startup sequence for your computer. If you change the settings in the Configuration/Setup Utility program to default, the preceding settings will change.

If you load the Default settings or if you move the Clear CMOS Request jumper, the default settings for the startup sequence are shown here:

| | |
|-----------------------|-------------------|
| First startup device | [Diskette drive] |
| Second startup device | [Hard disk drive] |
| Third startup device | [Network] |
| Fourth startup device | [Disabled] |

Your computer also supports RPL (remote program load), which you can select instead of DHCP for the network startup of the integrated Ethernet. For more information, see “Built-in Network Protocols” on page 30.

Information for Network Administrators

IBM LANClient Control Manager (LCCM) is a new class of PC-management software for Windows NT servers. LCCM is an easy-to-use, graphical, server-based application that supports the setup and management of IBM PCs over a network. For more on LCCM, visit our Web site at:

<http://www.pc.ibm.com/us/desktop/lccm>

Settings that Affect the Startup Procedure

Settings for the following features in the Configuration/Setup Utility program can affect the startup procedure for your computer:

- Start Options, including the startup sequence, power-on status, power-on self-test.
- Security options, including the administrator and power-on passwords. For more information, see “System Security” on page 67, “Using a Power-On Password” on page 47, and “Using an Administrator Password” on page 51.

For more information on these settings, see Chapter 5, “Using the Configuration/Setup Utility Program” on page 41.

Important

If **Power-On Self-Test** is set to *Enhanced*, information about memory configuration and test results are shown in the upper-left corner. 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.

If **Power On Status** is set to *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, refer to “Solving POST Error Message Problems” on page 95 and “POST Message Charts” on page 98.

If you have enabled Power On status and you hear no beep at all during POST, refer to “Troubleshooting Charts” on page 116. You might need to have your computer serviced.

Starting Your Computer Over a Network

Your computer can "wake up" and be started remotely over a network, since it has a properly configured network connection to either the integrated Ethernet or a network adapter with Wake on LAN.

For more information, see "Wake on LAN" on page 28 and "Setting the Startup Sequence" on page 55.

Shutting Down Your Computer

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.

Some operating systems allow you to set up the computer to automatically turn off after the operating system has shut down. If you are not using this feature, you must manually turn off the computer by pressing and releasing the power switch.

Important

Please observe the following:

- If you plan to restart your computer, do not press **Ctrl+Alt+Del** to shut down the computer while the operating system is running. Instead, follow the shutdown procedure for your operating system, turn off the computer by pressing and releasing the power switch, wait a few seconds until all the status-indicator lights are off, and then restart your computer.
- The power switch normally operates with a quick touch. However, in some circumstances the computer might not immediately power off with a quick touch. If this happens, hold the power switch down for approximately five seconds, and the computer will then power off.

Using Mouse Features

The mouse supplied with your computer attaches with a cable to the mouse connector on the back of the computer.

Note: A mouse device designed to be used through a serial port or USB connection can also be used with your computer.

Mouse Basics

To set up the mouse, place the mouse beside the keyboard on a flat surface or *mouse pad*. A mouse pad is a flat, smooth foam-rubber pad available at most computer stores. The mouse has a ball on the bottom, so working on a flat, smooth surface is important. Most operating systems allow you to configure the mouse buttons for either right-hand or left-hand operation. The mouse that comes with your computer has three buttons, and when it is configured for right-handed user, the left button is used for most tasks. When a mouse is configured for a left-handed user, the right button is used for most tasks. For information about using the other mouse buttons, see your operating system documentation.

To use the mouse, slide it from side to side and forward and backward over a flat surface. When you see an item that you want to select on the screen, simply move the pointer to that item (this is called *pointing*), and press and release either the left or right button on the mouse (this is called *clicking*).

To learn how to use the mouse with the software in your computer, see the documentation accompanying the software. Some programs support only one mouse button, others support two, and some support three. Despite the differences, some terms are fairly standard throughout the industry.

| | |
|---------------------|--|
| Point | Move the mouse so the pointer is on the object you want. |
| Click | Press and release the mouse button once. |
| Double-click | Rapidly press and release the mouse button twice. |
| Drag | Point to an object, press the mouse button, and hold it down as you move the mouse to relocate the object. |
| Drop | After dragging an object to a new location, release the mouse button. |

Using Audio Features

With the audio feature of your computer, you can play and record sound and music. The audio controller supports SoundBlaster applications and is compatible with the Microsoft Windows Sound System. The following ports are available at the rear of the computer. The audio ports are 3.5 mm (1/8") mini-jacks.

- **Microphone** or **MIC**: This audio port is used to connect a microphone to your computer when you want to record voice or other sounds. 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).

- **Audio Line In** or **LINE IN**: This audio port is used to send audio signals from an external device (such as a CD player or stereo) to your computer so that the signals can be recorded on the computer. (Use the audio mixer software provided in your operating system to set the input level accordingly.)
- **Audio Line Out** or **OUT**: This audio port is used to send audio signals from the computer to stereo external devices, such as powered speakers with built-in amplifiers, headphones, multimedia keyboards, or the Audio Line-In connector on a stereo system.

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

Procedures for playing and recording sound vary by operating system. Refer to your operating system documentation for information and instructions.

Using a CD-ROM Drive

All IntelliStation E Pro models come with a preinstalled CD-ROM drive. CD-ROM (compact disc read-only memory) technology offers quick access to large amounts of information. A compact disc can store more than 650 MB of data, such as the large files needed for audio, still and full-motion video, and still and animated graphics. A CD-ROM drive can play back or read from a CD, but it cannot write information to it. CD-ROM drives use industry-standard, 12 cm (4.75-inch) CDs.

Follow these guidelines when using a CD-ROM drive:

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

Handling a CD

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 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 CD.
- Do not drop or bend the CD.

Loading a CD

To load a disk 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 disk 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 disk, 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.

Loading a CD into a Vertically Positioned Computer

The instructions in this section are for a computer that is placed in a vertical position on an optional pedestal or floor stand. If your computer is not in the vertical position, use the instructions in “Loading a CD” on page 21 when using the CD-ROM drive.

Note: If you place the computer in a vertical position, use a pedestal or floor stand to prevent damage to the computer due to overheating. An optional floor stand is available from IBM. Look for more information on the World Wide Web at:

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

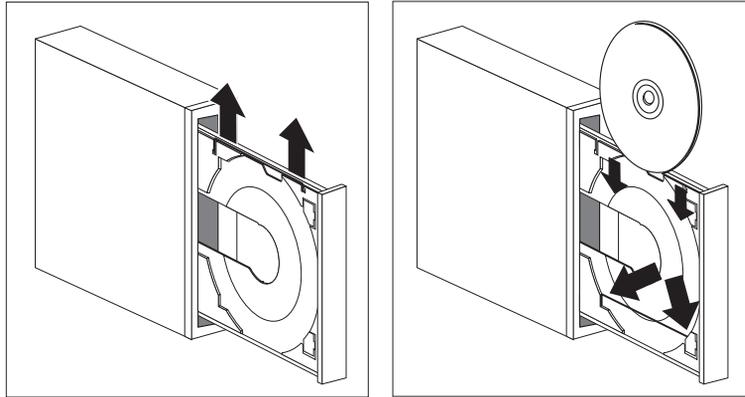
A CD-ROM drive in a vertically positioned computer is placed on its side. In order to load a CD into the drive securely, you must use the specific support mechanisms, such as extendable tabs or a support wire, provided with the drive.

There are several CD-ROM drives available for your computer. They are alike except for the support mechanisms used to hold the CD in place when it is inserted into the CD-ROM drive. Use the information on the following pages to identify the CD-ROM drive in your computer and then use the accompanying instructions for loading and unloading a CD.

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.

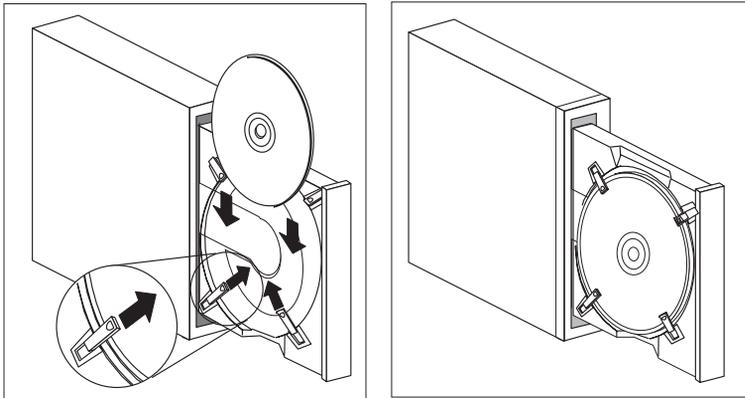
- To load a CD into a CD-ROM drive with a support wire:
 1. Press the Eject/Load button. The tray slides out of the drive. (Do not manually force the tray open.)
 2. Locate the wire that is installed in the right edge of the tray.
 3. Gently flex the wire until you can remove each end from its socket.
 4. Locate the two holes near the edge of the tray. (One hole is in the notch on the inner end of the tray, and the other is in a spring-tab at the outer end.)

5. Insert the wire into the inner hole first, then flex the wire until you can insert the other end of it into the spring-tab. When the wire is inserted correctly, it is parallel to the edge of the tray and approximately 20 mm (0.75 in.) in from the outside edge.



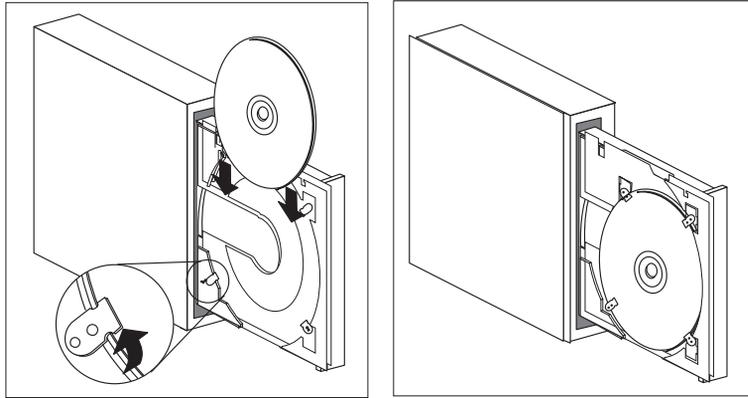
6. Because of the spring-tab, you can lift the support wire when you insert a CD and let it hold the CD in place. Close the tray by pressing the Eject/Load button, or by gently pushing the tray forward. When the tray is closed, the indicator light on the front of the drive will activate to indicate that the drive is in use.
7. To eject the CD, press the Eject/Load button. When the tray slides out, carefully remove the CD. (If the wire on the tray is extended, retract it to remove the CD.)
8. Close the tray by pressing the Eject/Load button, or by gently pushing the tray forward.

- To load a CD into a CD-ROM with tabs that slide out:
 1. Press the Eject/Load button. The tray slides out of the drive. (Do not manually force the tray open.)
 2. Extend the bottom two tabs on the tray.
 3. Place the CD in the tray (with the label facing up) underneath the two extended tabs, and hold the CD in place.
 4. Extend the top two tabs over the top of the CD.



5. 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.
6. To eject the CD, press the Eject/Load button. When the tray slides out, retract the tabs to remove the CD.
7. Close the tray by pressing the Eject/Load button, or by gently pushing the tray forward.

- To load a CD into a CD-ROM with rotating tabs:
 1. Press the Eject/Load button. The tray slides out of the drive. (Do not manually force the tray open.)
 2. Rotate the bottom two tabs on the tray.
 3. Place the CD in the tray (with the label facing up) underneath the two rotated tabs, and hold the CD in place.
 4. Rotate the top two tabs over the top of the CD.



5. 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.
6. To eject the CD, press the Eject/Load button. When the tray slides out, rotate the tabs to remove the CD.
7. Close the tray by pressing the Eject/Load button, or by gently pushing the tray forward.

Using Video Features

Your computer has an AGP SVGA (super video graphics array) adapter installed. 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 depth defined by a video standard for displaying text or graphics. (For general information on video modes, refer to *Understanding Your IntelliStation E Pro*.)

SVGA provides higher-resolution graphics, faster refresh rates, and more colors than previous video standards, such as video graphics array (VGA). At the same time, SVGA supports all standard VGA modes.

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. Instructions for doing this are included in a README file that is provided on the *Ready-to-Configure Utility Program CD* supplied with your computer.

Refer to your operating-system documentation for further information on monitor settings.

Important

Before you change any monitor settings, be sure to review the information supplied with your monitor. Using a resolution or refresh rate that is not supported by your monitor might cause the screen to become unreadable and damage the monitor. The information supplied 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 non-interlaced 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.

Video Device Drivers

To take full advantage of the video controller 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.

The video device drivers are provided on the *Ready-to-Configure Utility Program CD* for your computer. Instructions for installing the device drivers are provided on the *Ready-to-Configure Utility Program CD* in the README file that corresponds to your AGP graphics adapter. IBM also maintains the latest versions of video device drivers for all IBM-manufactured computers on the World Wide Web.

If your computer has IBM-preinstalled software, video device drivers have already been installed on the hard disk in your computer. However, the device driver installation instructions in the README file will be helpful 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.

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 *Ready-to-Configure Utility Program CD* supplied 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 supplied with your monitor. Using a resolution or refresh rate that is not supported by your monitor might cause the screen to become unreadable and damage the monitor. The information supplied 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 System-Management Features

Note: Although this section is intended primarily for network administrators, it also provides useful information for the personal computer user.

This section describes system-management features that make it possible for a network administrator to remotely manage and control the IBM personal computer when it is linked to a network.

System management is a general term for the group of hardware and software features that provide enhanced value for a computer remotely managed over a network. When used in conjunction with the appropriate network-management software, the system-management features provide network administrators with the tools necessary to remotely manage and monitor a networked computer. The system-management features discussed in this section usually perform one or more of the following functions:

- Power on the computer
- Monitor and relay system information about the computer
- Track, control, and secure computer assets
- Load software onto the computer

Note: In order to fully use some of the system-management features, additional hardware or software (supplied by IBM or other manufacturers) might be required.

Wake on LAN

The Wake on LAN feature can be used by a network administrator to turn on your computer remotely from an administrator console. When Wake on LAN is used in conjunction with network-management software, such as TME 10 Netfinity Version 4 (provided on the *Ready-to-Configure Utility Program* CD for your computer), many types of functions, such as data transfers, software updates, and POST and BIOS updates can be performed remotely on your computer and other computers enabled for Wake on LAN that are linked to your network. This updating can be done after hours and on weekends, which saves time and increases productivity. Users are not interrupted during normal working hours and LAN traffic is kept to a minimum.

Your computer supports Wake on LAN, and the integrated Ethernet feature has built-in support for Wake on LAN (and Alert on LAN). It also supports the installation of Wake on LAN network adapters. For information on installing adapters, see Chapter 7, "Installing Options Overview" on page 81.

Note: You can view the Media Access Control (MAC) address through the Configuration/Setup Utility program.

Alert on LAN Support

Support for Alert on LAN is built into your computer. Alert on LAN technology provides notification of changes in the computer system even if the computer is powered off. Working with DMI and Wake on LAN technologies, Alert on LAN helps to manage and monitor the hardware and software features of your computer.

Examples of when Alert on LAN generates notifications are:

- The computer cover has been removed
- Internal computer components are removed
- POST fails during a Wake on LAN attempt
- The computer is disconnected from the network or unplugged from the power outlet

Alert on LAN can be integrated with network-management software such as Intel® LANDesk® Client Manager and IBM Client Services for Netfinity Manager.

Alert on LAN

Alert on LAN is a new hardware and software technology supported on some models of your computer. It immediately alerts network administrators when a computer has a problem, even if the power is off or has no operating system running. For system management, Alert on LAN helps the network administrator to react quickly and effectively when problems occur, rather than waiting for input from the user.

For more information about Alert on LAN, go to the World Wide Web at:

<http://www.pc.ibm.com/us/desktop/alertonlan/index.html>

RPL or DHCP

RPL (Remote Program Load) and DHCP (Dynamic Host Configuration Protocol) enable a network administrator 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*. Using LANClient Control Manager, you set up your computer by installing 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. This bootstrap program is small and helps prevent network congestion. Working from the hybrid images, the bootstrap program initiates the startup process from the hard disk of your computer. An advantage to Hybrid RPL is that the network load associated with standard RPL is avoided.

DMI BIOS

The BIOS (basic input output system) of your computer supports an interface called DMI (Desktop Management Interface). DMI is software used to gather information about the hardware and software in your computer so that network administrators can remotely monitor and control your computer. DMI can be used to remotely track many types of information about networked computers, including serial numbers, memory attributes, product-specific characteristics of installed peripherals, and operating system configuration information. This information can be accessed using a DMI browser. DMI browsers are provided by all major operating systems and all major LAN management packages (including TME 10 Netfinity, and Intel LANDesk).

System-Management Controller

Your computer is equipped with a system-management controller (LM80) integrated with the system board. This controller provides hardware monitoring for system-board temperatures, fan speed, power supply and processor voltages, and the detection of the removal of the computer cover (see Chassis-Intrusion Detector). Used with the DMI BIOS of the computer, the system-monitor controller can also store the hardware test results from the power-on self-test (POST).

Computers with preinstalled software can use this feature with the IBM PC System Monitor software provided with the preinstalled software. Also, to view the system monitor information, use the Netfinity DMI browser that is provided with your preinstalled software. For information on these software features, see *About Your Software*.

DMI Information

The BIOS (basic input output system) of your computer supports the Desktop Management Interface (DMI). DMI provides an industry-standard mechanism for gathering system information so network administrators can remotely monitor and control hardware and software components. DMI might be compared to with other management interfaces such as Simple Network Management Protocol (SNMP). DMI has the advantage of being supported across all major operating systems and by all major network-management packages, including TME 10 Netfinity and Intel LANDesk Client Manager.

Built-in Network Protocols

Networking features such as remote program load (RPL) and dynamic host configuration protocol (DHCP) help a network administrator control your computer remotely. The integrated Ethernet supports both of these features.

Contact your network administrator to determine how your computer should be configured for your specific network environment.

Asset ID Capability

For the latest information on personal computer security features, visit the IBM Asset ID home page at:

<http://www.pc.ibm.com/us/desktop/assetid>

IBM provides the basis for Asset ID¹ support in your computer. Asset ID provides the capability to access information about your computer that is stored in an EEPROM module on the system board using a radio-frequency-enabled portable scanner.

The Asset ID EEPROM contains pre-recorded information about the system, including its configuration and the serial numbers of key components. The Asset ID EEPROM also includes a number of blank fields you can record with your choice of user information. The Asset ID can be scanned from a short distance. The scanning of the Asset ID does not require the computer cover to be removed or even require the computer being removed from the box it is shipped in. This type of wireless tracking enables quicker system deployment and improved asset control.

Remote Administration

The system programs (POST/BIOS) of your computer can be updated remotely across a network. A setting in the Configuration/Setup Utility program allows you to enable the computer for remote administration. See “Setting Remote Administration” on page 56.

IBM System Management Tools

IBM System Management Tools are provided on the *Ready-to-Configure Utility Program* CD that comes with your computer. If your computer comes with IBM-preinstalled software, IBM System Management Tools are also provided in a ready-to-install form on the hard disk. The IBM System Management Tools package includes the following components:

- Desktop Management Interface (DMI) Service Provider 2.0

¹ Asset ID allows your personal computer to be scanned by various radio frequency-emitting devices supplied by independent companies. Asset ID is intended for use only with radio frequency equipment that meets ANSI/IEEE C95.1 1991 RF Radiation Limits.

- Desktop Management (DM) BIOS 2.0 Instrumentation
- IBM PC System Monitor Instrumentation
- IBM SystemCare
- IBM Alert on LAN
- IBM SMART Reaction Client
- Intel® LANDesk® Client Manager 3.1

For detailed information on the IBM System Management Tools package and how to install it, refer to the Overview section on the *Ready-to-Configure Utility Program* CD. If your computer comes with IBM-preinstalled software, information on IBM System Management Tools and instructions for installation are also provided in the *About Your Software* booklet supplied with your computer.

Using Security Features

The security features provided by IBM are part of the on-going effort to help protect the personal computer from theft or inappropriate access, and to maintain the integrity of important data stored on the computer.

IBM provides many security features for the personal computer. Some of the features are hardware-related, such as a cover lock or support for a security U-bolt; others are specific to the software provided with the computer such as administrator or power-on passwords. For the latest information on personal computer security features, visit the IBM AssetCare home page at:

<http://www.pc.ibm.com/us/desktop/assetid>

Note: The features in this section might not be available for all IBM personal computers.

Security Provided through the Configuration/Setup Utility Program

Security features provided through the Configuration/Setup Utility program include:

- Enhanced Security enablement
- Startup sequence control
- Asset ID enablement
- SystemCare enablement
- Administrator and power-on password protection
- Startup without keyboard or mouse access
- Hard disk drive and diskette drive access control
- Input/output port control
- Virus protection

More information about these features is included in Chapter 5, “Using the Configuration/Setup Utility Program” on page 41.

Security U-Bolt

Your computer supports the installation of a security U-bolt that helps protect against the theft of the computer. Used with a steel cable and a lock, the security U-bolt can secure your computer to a desk, table, or other fixture. The security U-bolt is an optional feature available from IBM. For information on ordering a security U-bolt, see us on the World Wide Web at:

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

Information about installing a security U-bolt is provided in *Installing Options in Your IntelliStation E Pro*.

Anti-Intrusion Features

IBM provides different anti-intrusion features that protect against unauthorized access inside your computer. These features help protect against the theft of computer components, such as the microprocessor, system-memory modules, or drives.

A cover lock is built into the chassis of the IntelliStation E Pro computers to prevent the cover from being removed. Two identical keys for the cover lock are also supplied. A tag attached to the keys has the key serial number and the address of the key manufacturer.

Important

Record the serial number and the manufacturer address in the space provided in Appendix A, “Computer Records” on page 141, and store the tag in a safe place. Because locksmiths are not authorized to duplicate the cover-lock keys, you must order replacement keys from the key manufacturer. When ordering replacement keys, you will need the key serial number.

A chassis-intrusion detector inside your computer can be set to alert the system administrator each time the computer cover is removed. This detector is enabled after you set an administrator password in the Configuration/Setup Utility program. After the password is set, and after the computer cover is removed, a POST error message (176) displays on the computer screen the next time the computer is plugged in and powered on. You must enter the correct administrator password in order to start up the computer. For information on setting passwords, see Chapter 5, “Using the Configuration/Setup Utility Program” on page 41.

If you have installed IBM System Management Tools from the software provided with your computer, a DMI-compliant message will also display on the computer screen, after the operating system is loaded. (For more information on IBM System Management Tools, see the Overview section on the *Ready-to-Configure Utility Program* CD, or refer to *About Your Software*.) Also, if your computer uses Alert on LAN, and you are connected to a network that uses Intel LANDesk® Desktop Manager or Intel® LANDesk Client Manager, a message is also sent to the network administrator console notifying that the computer cover has been removed. For more information, see “Alert on LAN Support” on page 29 and contact your network administrator.

Data Protection

You can lose data from the hard disk drive for a variety of reasons. Security violations, viruses, or hard disk drive failure can all contribute to the destruction of data files. To protect against the loss of valuable information, IBM has incorporated many data-saving features within your computer.

SMART Reaction: To help back up important data, IBM provides SMART Reaction software on computers with preinstalled software and also on the *Ready-to-Configure Utility Program* CD. SMART Reaction is a client/server software application that helps users and administrators respond effectively to a warning issued by the SMART hard disk drive. For more information on SMART Reaction, see “IBM System Management Tools” in the Overview section on the *Ready-to-Configure Utility Program* CD, or refer to *About Your Software*.

SMART Hard Disk Drive: Your computer comes with a SMART (Self-Monitoring, Analysis, and Reporting Technology) hard disk drive that is enabled to report potential hard drive failures. If the hard drive detects an error, a DMI-compliant warning message is sent to the computer screen, and, if the computer is part of a SMART enabled network, to an administrator console. Once an error is detected, the data on the hard disk drive can be backed up and the drive replaced.

Virus Protection: Your computer has built-in virus protection that can be enabled through the Configuration/Setup Utility program. Also, the antivirus program is loaded on the hard disk drive of computers that have preinstalled software. The antivirus program is also available on the *Ready-to-Configure Utility Program CD*.

Enhanced Security

Your computer has a new, enhanced security feature that provides extra protection for your administrator password, as well as your startup sequence settings. With enhanced security, your administrator password and startup sequence are stored in a highly-protected, nonvolatile, security EEPROM module that is separate from CMOS memory and the EEPROM module that stores system programs. When your administrator password and security sequence are protected by enhanced security, they remain intact even if the battery in your computer expires or is removed by someone.

Enhanced security can be enabled or disabled only when you update system programs. The procedure for enabling enhanced security is explained under “Enabling and Disabling Enhanced Security” on page 36.

If enhanced security is enabled and you have not set an administrator password, your computer will operate as if enhanced security were disabled.

If enhanced security is enabled and you have set an administrator password, your computer will operate as follows:

- The contents of the security EEPROM (your administrator password and boot sequence) will be protected from failure of the battery and CMOS memory.
- The security EEPROM will be protected from unauthorized access because it locks after your computer is turned on and the system programs have completed their startup routine. Once it is locked, the security EEPROM cannot be read from or written to by any software application or system software until the computer is turned off and back on again. In a networking environment, this might prevent certain functions from being performed remotely on your computer.

There is an extra measure of protection for the system programs in your computer. Normally, the entire contents of the system programs EEPROM is write protected with a *soft lock*. A soft lock allows the Remote Administration utility to function in a network environment. Enhanced security adds a *hard lock*. With a hard lock, when your computer is turned on and the system programs startup routine is completed, the Remote Administration update utility is locked and cannot be unlocked until the computer is turned off and back on again and the administrator password is entered. Note that, in a networking environment, this prevents the system programs in your computer from being updated remotely. Someone must be present at your computer to turn it on and off and enter the administrator password.

- A chassis-intrusion feature will alert you if the cover of your computer has been removed. This feature will work whether your computer is on or off when the cover is removed. If the cover has been removed, a prompt for your administrator password will appear on the screen, and your computer will remain in a suspended state until your administrator password is entered.
- As with nonenhanced security, your configuration settings are protected. The settings cannot be changed in the Configuration/Setup Utility program until your administrator password is entered. This means that any changes in computer hardware that are detected by the system programs in your computer, such as removal of a memory DIMM, will generate a configuration error until the administrator password is entered.

Enabling and Disabling Enhanced Security: Enhanced security can be enabled or disabled only when you update the system programs in your computer.

To enable or disable enhanced security:

1. Insert a system programs update diskette into drive A in your computer. System programs updates are available on the World Wide Web.
2. Turn on the computer. If it is on already, you must turn it off and back on again.
3. The update begins, your computer halts, and you are prompted for your administrator password (if you have set an administrator password). The computer remains in a halted state until you enter the administrator password.
4. When you enter the administrator password, the update diskette will continue to run, and you are given the option of enabling or disabling enhanced security. Your choice is automatically recorded in the System Security menu of the Configuration/Setup Utility program.

Setting, Changing, and Deleting an Administrator Password Protected by Enhanced Security: To set, change, or delete an administrator password protected by enhanced security, do the following:

1. Turn off all attached devices and the computer.
2. Refer to Chapter 7, “Installing Options Overview” on page 81 for instructions on safety, disconnecting all cables attached to the computer, and removing the computer cover.
3. Locate the switch marked as 7 on the rocker switches on the system board. Refer to the system board label inside the computer for the location of the switch. Move the switch to the **ON** position. (To do this, push on the **ON** side.)
4. Set, change, or delete your administrator password in the Configuration/Setup Utility program. Refer to “Setting or Changing an Administrator Password” on page 52 or “Deleting an Administrator Password” on page 54 for instructions.
Note: You must know the administrator password to change or delete it.
5. Move the switch back to the **OFF** position after you have set, changed, or deleted your password.
6. Replace the cover, and then turn on the computer.

Erasing a Lost or Forgotten Administrator Password Protected by Enhanced Security:

Attention

When enhanced security is enabled, it is vital that you keep a record of your administrator password in a secure place. If you forget or lose the administrator password, the system board in your computer must be replaced in order to regain access to the Configuration/Setup Utility program.

Updating System Programs

System programs are the basic layer of software built into every IBM 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 every time you turn on your computer. The BIOS is a layer of software that translates instructions from other layers of software into instructions that the computer hardware can understand. The Configuration/Setup Utility program enables you to view and change the configuration and setup of your computer.

In the past, the system programs were contained in a read-only memory (ROM) module on the system board. If you wanted to update POST routines, BIOS instructions, and the Configuration/Setup Utility program, you had to disassemble the computer and replace modules, or you had to replace the system board. Now, the system programs are stored in an *EEPROM (electrically erasable programmable read-only memory)* module, which is also referred to as a *flash memory*. The contents can be easily updated with an update (flash) diskette. The process of updating the system programs EEPROM is often referred to as *flashing the BIOS*.

As part of the continuing work to improve quality, IBM might make changes and enhancements to the system programs. When updates are released, they will be available on the World Wide Web at

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

or through the PC Company Bulletin Board Service (see “Using Electronic Support Services” on page 133) in files that can be downloaded onto a diskette. Updates on the Web site or BBS will have the file name NZKTnnA.EXE, where *nn* is a release number. Instructions for using the system programs updates will be available in a README file included in the downloaded files. When updating system programs with a flash diskette, note the following:

If you have set an administrator password, your computer will halt and request the administrator password. The update process will not begin until you enter the password. If you have set an administrator password, the system programs update will run only if you first perform a cold startup (the computer is turned off and then turned on).

If your computer is connected to a network, the system programs can be updated remotely using network-management software, such as IBM LANClient Control Manager. See “Remote Administration” on page 31 for more information.

Important Information - Flash ROM Recovery Procedure

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

1. Turn off the computer.
2. Remove the computer cover. Refer to Chapter 7, “Installing Options Overview” on page 81 for safety information and the cover removal procedure.
3. Locate the row of eight switches on the system board. See the label on the underside of the computer cover for an illustration of the switches. The ROM recovery jumper is switch number 5.
4. To enable ROM recovery, turn on the switch (ROM recovery mode).
5. Insert the POST/BIOS update (flash) diskette into drive A.
6. Turn on the computer and follow the instructions on the monitor for *flash update*.
7. After the update session completes, turn off the computer and remove the diskette from drive A.
8. Move the switch to the off position (normal ROM operation).
9. Install the cover and reconnect any cables that were disconnected.
10. Turn on the computer to restart the operating system.

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.

The following is a list of the options that appear in the main menu of the Configuration/Setup Utility program.

- System Summary
- Product Data
- Devices and I/O Ports
- Start Options
- Date and Time
- System Security
- Advanced Setup
- ISA Legacy Resources
- Power Management

This chapter contains the following sections:

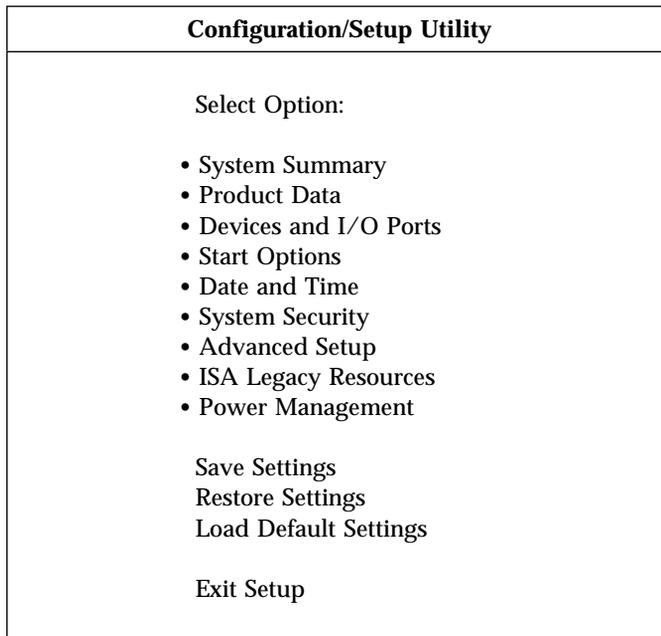
- “Starting and Using the Program” on page 42, which contains information about starting, using, and exiting the Configuration/Setup Utility.
- “Instructions for Most Frequently Used Procedures” on page 46, which contains more detailed instructions and information for performing some of the more common configuration tasks.
- “Configuration/Setup Utility Options” on page 60, which contains descriptions of all items within the Configuration/Setup Utility Program.
- “Quick Reference for Network-Related Settings” on page 75, which contains concise step-by-step instructions for enabling network-related settings for your computer.

Starting and Using the 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**. (The Configuration/Setup Utility program 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 at the password prompt and press **Enter**. See “Using a Power-On Password” on page 47 and “Using an Administrator Password” on page 51 for more information.

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, then an additional menu is available. If a right arrowhead (▶) appears beside a menu item, then a change to that item has been made or the Configuration/Setup Utility program detected an error and attempted to correct it. 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 *Installing Options in Your IntelliStation E Pro* and the documentation supplied with the hardware you want to install.

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 between menu items until the item you want is highlighted. |
| ← → | Use these arrow keys to display and toggle between 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 with 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 about Saving Configuration Settings —

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. Although the computer changes the configuration settings automatically, you must *save* these changes in the Configuration/Setup Utility program for the new configuration to take effect. If you do not save the new settings, your operating system will not start. To save the configuration after adding, removing hardware, or erasing passwords, complete the following steps.

1. When you turn on the computer, an error message indicating that a configuration change has occurred appears approximately 30 seconds after the memory count numbers stop cycling in the top-left corner of the screen. When the configuration error message disappears, the POST Startup Errors screen appears, and you are prompted to **Continue** or **Exit Setup**. Select **Continue**. (If you select **Exit Setup**, you will get another error message.)
2. The Configuration/Setup Utility program menu appears with a right arrowhead (▶) next to the menu category in which the configuration change has occurred. Select this menu item if you want to view the new configuration settings, and then press **Esc** to return to the Configuration/Setup Utility program menu.
3. Select **Save Settings** from the Configuration/Setup Utility program menu.
4. Press **Esc** to exit from the Configuration/Setup Utility program, and follow the instructions on the screen.

Exiting the Program

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

1. Press **Esc** to return to the 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 from 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.

Instructions for Most Frequently Used Procedures

This section contains step-by-step instructions for some of the most frequently used configuration and setup procedures for your computer.

Viewing the System Summary

You can use the Configuration/Setup Utility program to view a summary of the options and features in your computer. To view the system summary:

1. Start the Configuration/Setup Utility program (see “Starting and Using the Program” on page 42).
2. Select **System Summary** from the Configuration/Setup Utility program menu. The System Summary screen appears.

Depending on your model and configuration, your screen might appear slightly different from the one shown here.

| System Summary | |
|--------------------|----------------------|
| Processor | Pentium II |
| Processor Speed | 450 MHz ² |
| Cache Size | 512 KB |
| Cache State | Enabled |
| System Memory | 64 MB |
| Memory Type | ECC |
| Video Controller | Disabled |
| Ethernet Support | Enabled |
| Audio Support | Enabled |
| Diskette Drive A: | 1.44 MB, 3.5" |
| Diskette Drive B: | Not Installed |
| IDE CD-ROM Drive 0 | Installed |
| Hard Disk Drive 1 | Not Installed |
| Hard Disk Drive 2 | Not Installed |
| Hard Disk Drive 3 | Not Installed |

² MHz only denotes the internal clock speed of the microprocessor, not application performance; many factors affect application performance.

Setting the Date and Time

Your computer has an internal clock that maintains the date and time. A battery keeps the clock active when you turn off the computer.

To set the date and time:

1. Start the Configuration/Setup Utility program (see “Starting and Using the Program” on page 42).
2. Select **Date and Time** from the Configuration/Setup Utility program menu.
3. Type the date and time in the appropriate fields.
4. Press **Esc** to return to the Configuration/Setup Utility program menu.
5. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu and press **Enter**.
6. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

Your operating system might also have a function for setting the date and time. Refer to your operating system documentation for more information.

Using a Power-On Password

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 you should select **Dual**. If it is set to **On** when **Remote Administration** is enabled, it will automatically be reset to **Dual**.

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 text box.

Important Information for Mouse Users

This information applies only to those who have a mouse connected to the mouse port; a serial mouse is not affected by the password prompt Off mode.

The password prompt Off mode prevents the computer from detecting that a mouse is attached. Because the mouse device driver will not be loaded automatically through the CONFIG.SYS or AUTOEXEC.BAT files in this mode, an error message that the mouse port is disabled will appear, and the computer will halt. To enable the operating system to load without displaying the error message, read the information below that applies to your operating system.

If you are using OS/2, do one of the following before enabling password prompt Off mode:

- Set the CONFIG.SYS file so the operating system does not stop on a device-driver error. To do this, put the command "PAUSEONERROR=NO" near the top of the CONFIG.SYS file.

or

- Remove the mouse driver statement from the CONFIG.SYS file.

If you are using Windows NT or Windows 95, do the following:

- 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. Then use the keyboard to put a check mark in the Do not display this message in the future check box.

Once the operating system starts in password prompt Off mode, the keyboard will remain locked. If you have a mouse connected to the mouse port, it also will remain locked.

Although you are not prompted to type a password in this mode, you can type either your power-on or administrator password anytime after POST has completed, even after the operating system has loaded. If you type a password, the keyboard will unlock, but the mouse connected to the mouse port will remain disabled.

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 in this mode when power is restored, without operator intervention.

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 47 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 48 for further information.

If both a power-on and administrator password are set, you can type either password at the password prompt *that appears as you start your computer*. However, if you want to change any settings in the Configuration/Setup Utility program, you must type your administrator password at the password prompt *that appears when you try to access the Configuration/Setup Utility program*. If you type your power-on password at this prompt, 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 the computer off and start again. When you type the correct password, the keyboard and mouse will unlock, and the computer will begin normal operation.

Setting and Changing 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.

You cannot use the numeric keypad to set the password, but must use the numbers across the top of the alphanumeric keypad.

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 keyboard and mouse 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 54 for further information.

To set or change a power-on password:

1. Start the Configuration/Setup Utility program (see “Starting and Using the Program” on page 42).
2. Select **System Security** from the Configuration/Setup Utility program menu.
3. Select **Power-On Password**.
4. Type your password and press Down Arrow (↓).
5. Type your password again.
6. At **Password Prompt**, select **Off**, **On**, or **Dual**. Press Left Arrow (←) or Right Arrow (→) to toggle between selections.
Note: If **Remote Administration** is enabled, you cannot select **On**. In this case you should select **Dual**. If it is set to **On** when **Remote Administration** is enabled, it will automatically be reset to **Dual**.
7. Select **Change Power-On Password**, and follow the instructions on the screen.
8. Press **Esc** twice to 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.

Deleting a Power-On Password: Use the Configuration/Setup Utility program to delete a power-on password.

To delete a power-on password:

1. Start the Configuration/Setup Utility program (see “Starting and Using the Program” on page 42).
2. Select **System Security** from the Configuration/Setup Utility program menu.
3. Select **Power-On Password**.
4. Select **Delete Power-On Password** and follow the instructions on the screen.
5. Press **Esc** twice to return to the Configuration/Setup Utility program 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.

Using an Administrator Password

Important

If you have enhanced security enabled on your computer, see “Enhanced Security” on page 35 for important information about the administrator password.

When enhanced security is enabled, it is vital that you keep a record of your administrator password in a secure place. If you forget or lose the administrator password, the system board in your computer must be replaced in order to regain access to the Configuration/Setup Utility program.

Setting an administrator password deters unauthorized persons from changing settings in the Configuration/Setup Utility program. When an administrator password is set, you can change settings in the Configuration/Setup Utility program only after typing the administrator password at the password prompt that appears when you try to access the Configuration/Setup Utility program.

If you are responsible for maintaining the settings of several computers, you might want to set an administrator password.

When you set an administrator password, a password prompt appears each time you try to access the Configuration/Setup Utility program. 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 the computer off and start again. When you type the correct password, the Configuration/Setup Utility program menu appears.

If both a power-on and administrator password are set, you can type either of the passwords at the password prompt *that appears as you start your computer*. However, if you want to change any settings in the Configuration/Setup Utility program, you must type your administrator password at the password prompt that appears when you try to access the *Configuration/Setup Utility program*. If you type your power-on password at this prompt, you will be able to view limited information in the Configuration/Setup Utility program, but you will not be able to change any settings.

Important Information

If you have set an administrator password, read the following:

The SystemCare and Asset ID settings in the Configuration/Setup Utility program are enabled when your computer is shipped. If you set an administrator password with the SystemCare and Asset ID settings enabled, the following occurs:

- The chassis-intrusion feature of your computer is enabled. Each time you remove the computer cover and subsequently power on the computer, the Power-On Self-Test (POST) notifies you that the cover has been removed. The message displayed on the computer screen is the POST message 176.
To bypass the message, you must enter the correct administrator password.
- Each time a component that is protected by asset security is removed and the computer is powered on, a POST message notifies you of the removal. Examples of such components are system-memory modules and the microprocessor. The message that displays is the POST message 177.
To bypass the message, you must enter the correct administrator password.
- Each time the computer passes through an access control checkpoint that reads Asset ID information, a POST message notifies the system manager that there has been a security breach when the computer is powered on, if the movement of the PC was unauthorized. To bypass the message, you must enter the correct administrator password.

Setting 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, and you will not be able to erase and reset an administrator password. If you lose or forget your password, you must complete *one* of the following steps in order to regain access to the Configuration/Setup Utility program:

1. If enhanced security is disabled (default setting), you must remove the computer cover and move a jumper on the system board. (Refer to “Erasing a Lost or Forgotten Administrator Password” on page 54 for further information.)
2. If enhanced security is enabled, you must replace the system board in your computer.

To set or change an administrator password:

1. Start the Configuration/Setup Utility program (see “Starting and Using the Program” on page 42).
2. Select **System Security** from the Configuration/Setup Utility program menu.
3. Select **Administrator Password**.
4. Type your password and press Down Arrow (↓).
5. 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.

Deleting an Administrator Password: Use the Configuration/Setup Utility program to delete an administrator password.

To delete an administrator password:

1. Start the Configuration/Setup Utility program (see “Starting and Using the Program” on page 42).
2. Select **System Security** from the Configuration/Setup Utility program menu.
3. Select **Administrator Password**.
4. Select **Delete Administrator Password** and follow the instructions on the screen.
5. Press **Esc** until you return to the Configuration/Setup Utility program 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.

Erasing a Lost or Forgotten Administrator Password: This section applies to lost or forgotten administrator passwords that are *not* protected by enhanced security. For information on lost or forgotten passwords that *are* protected by enhanced security, refer to “Erasing a Lost or Forgotten Administrator Password Protected by Enhanced Security” on page 38.

If you have lost or forgotten your administrator password and enhanced security is disabled, you must remove the computer cover and move the Clear CMOS Request jumper (also referred to as the *password* jumper) on the system board in order to erase the password so that you can regain access to the Configuration/Setup Utility program.

See Chapter 7, “Installing Options Overview” on page 81 for instructions on removing the computer cover and moving jumpers. Refer to the system board label inside the computer for the location of the Clear CMOS Request jumper.

Important

If you move the Clear CMOS Request jumper, you will lose all setup data stored in the computer, and you will need to reconfigure the computer. Use the Configuration/Setup Utility program to reconfigure the computer and to set a new password.

Setting the Startup Sequence

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

Note: The hard disk drive is the default startup device when no other devices are ready. It does not appear in the choices provided by the Configuration/Setup Utility program.

To set the startup sequence:

1. Start the Configuration/Setup Utility program (see “Starting and Using the Program” on page 42).
2. Select **Start Options** from the Configuration/Setup Utility program menu.
3. Select **Startup Sequence** from the Start Options menu.
4. Select the sequence and devices from the choices provided.
5. If **Automatic Power On Startup Sequence** is *Enabled*, select the sequence and devices from the choices provided.
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.

Setting Remote Administration

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

To access remote administration:

1. Start the Configuration/Setup Utility program. See “Starting and Using the Program” on page 42.
2. Select **System Security**.
3. Select **Remote Administration**.
4. Press Enter.
5. To enable update remote administration, select **Enabled**. To disable, select **Disabled**.
6. Press **Esc** until you return to the Configuration/Setup Utility main menu.
7. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
8. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

Setting Power Management Features

Your computer comes with built-in energy-saving capabilities. Power management features included with your computer are Advanced Power Management (APM) and Advanced Configuration and Power Interface (ACPI) BIOS modes, and Automatic Power On. 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 supplied with your monitor to see if it supports Display Power Management Signaling (DPMS).

Setting ACPI BIOS Mode: When Automatic Configuration and Power Interface (ACPI) BIOS Mode BIOS mode is enabled, the operating system is allowed to control the power management features of your computer and the settings for APM

BIOS mode are ignored. Not all operating systems support ACPI BIOS mode. Refer to your operating system documentation to determine if ACPI is supported.

To set ACPI BIOS mode, complete the following steps.

1. Start the Configuration/Setup Utility program (see “Starting and Using the Program” on page 42).
2. Select **Power Management** from the Configuration/Setup Utility program menu.
3. Set **ACPI BIOS Mode** to **Enabled** or **Disabled** as desired using the Left Arrow (←) or Right Arrow (→).
4. Press **Esc** to return to the Configuration/Setup Utility program menu.
5. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
6. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

Setting APM Features: With APM (Advanced 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 options begin to 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:** With this option, you can 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 before the display enters the off state.

– **Disable:** In this mode, the monitor is unaffected by the power management settings.

- **IDE Drives:** This selection enables you to specify if the IDE drives should be enabled or disabled when power management options take affect.

To set APM features:

1. Start the Configuration/Setup Utility program (see “Starting and Using the Program” on page 42).
2. Select **Power Management** from the Configuration/Setup Utility program menu.
3. Select **APM**.
4. Set **APM BIOS Mode** to **Enabled**.
5. Select values for power management (time to low power, system power,, processor speed, display, and time to display off), as necessary.
6. Set **IDE Drives** to **Enabled** or **Disabled**.

Note: SCSI drives are not affected by APM.

7. Press **Esc** twice to return to the Configuration/Setup Utility program menu.
8. Before you exit from the program, select **Save Settings** from the Configuration/Setup Utility program menu.
9. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

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

- **Wake on LAN:** The Wake on LAN feature built into your computer can be used with network connections that support this feature. If your computer has an integrated Ethernet connection, it supports Wake on LAN. Also, you can install a PCI Wake on LAN network card in your computer. The network card must connect to the Wake on LAN connector on the riser card inside your computer. See Chapter 7, “Installing Options Overview” on page 81 for more information. Also, you must set **PCI Wake Up** to enabled.

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).

- **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**.
- **MODEM Ring Detect:** If your computer has an internal modem 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 support this feature and must be attached to the Modem Ring Detect connector on the riser card in your computer. See Chapter 7, “Installing Options Overview” on page 81 for more information.
- **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 enabled, this setting allows your system to power on in response to wake up requests from PCI devices that support this feature.

To set Automatic Power-On features:

1. Start the Configuration/Setup Utility program (see “Starting and Using the Program” on page 42).
2. Select **Power Management** from the Configuration/Setup Utility program menu.
3. Select **Automatic Power On**.
4. Select the menu item for the feature you want to set. Use Left Arrow (←) or Right Arrow (→) to select either *Enabled* or *Disabled*.
5. Select Startup Sequence for the feature. Use Left Arrow (←) or Right Arrow (→) to select either *Primary* or *Automatic*.
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.
8. To exit from the Configuration/Setup Utility program, press **Esc** and follow the instructions on the screen.

Configuration/Setup Utility Options

This section contains descriptions of the configuration options according to category.

System Summary

If you select the System Summary option from the Configuration/Setup Utility main menu, you can view the following information about the features of your computer. The Configuration/Setup Utility changes this information automatically if you add or remove options, unless otherwise stated.

| Item | Description |
|-----------------------|---|
| Processor | Indicates the type of microprocessor. |
| Processor Speed | Indicates the microprocessor internal clock speed. |
| Cache Size | Indicates the amount of cache memory in Kilobytes. Cache memory is special buffer storage that holds frequently used instructions and data, and works faster than main memory. |
| Cache State | Indicates the state of cache memory, enabled or disabled. |
| System Memory | Indicates the amount of synchronous dynamic random access memory (SDRAM). |
| Memory Type | Indicates the type of memory, such as nonparity or error checking and correction (ECC). |
| Video Controller | Indicates the type of video controller, which processes images on your monitor. |
| Ethernet Support | Indicates the type of Ethernet controller. |
| Audio Support | Indicates the type of audio controller. |
| Diskette Drive A | Shows if diskette drive A is installed. The default is: Drive A — 1.44 MB 3.5". To specify the drive capacity, see Devices and I/O Ports on page 62. |
| Diskette Drive B | Shows if diskette drive B is installed. The program cannot detect the storage capacity of the drives. The default is: Drive B — 1.2 MB 5.25". To specify the drive capacity, see Devices and I/O Ports on page 62. |
| IDE Hard Disk Drive 0 | Shows if an IDE device is installed. |
| IDE Hard Disk Drive 1 | Shows if an IDE device is installed. |
| IDE CD-ROM Drive 2 | Shows if a CD-ROM drive is installed. |
| IDE Hard Disk Drive 3 | Shows if an IDE device is installed. |

Product Data

If you select the Product Data option from the Configuration/Setup Utility main menu, you can view the following information about your computer model. The Configuration/Setup Utility changes this information automatically if the EEPROM (electrically erasable programmable read-only memory) or BIOS (basic input/output system) code is upgraded.

| Item | Description |
|-----------------------------|--|
| Machine Type/Model | Shows the type and model of the computer. |
| Flash EEPROM Revision Level | Indicates the revision level of the software installed in the electrically erasable programmable read-only memory (EEPROM). |
| Boot Block Revision Level | Indicates the revision level of the boot (startup) record that is flashed in at manufacturing. |
| System Board Identifier | Shows the ID number of the system board. |
| System Serial Number | Shows the serial number of the computer. |
| System UUID | Shows a universally unique identifier for your computer. |
| BIOS Date | Shows the date of the Basic Input/Output System code that contains such basic hardware operations as interaction with diskette drives, hard disk drives, and the keyboard. |
| BIOS Mode | Shows the mode (Desktop) of the Basic Input/Output System code. |

Devices and I/O Ports

If you select the Devices and I/O Ports option from the Configuration/Setup Utility main menu, you can *view* and, in some cases, *change* device or port settings.

Note: The specific device options might vary, depending on the computer model.

You can change port assignments or disable ports if you want to prevent unauthorized transmission of data to any devices attached to the ports.

| Item | Description |
|---|---|
| Mouse | You must select whether the mouse is installed or not in this field. |
| Diskette Drive A | If a drive is installed, this field shows the diskette storage capacity of the drive. If you change or add a diskette drive, you might need to use this option to set the correct type. |
| Diskette Drive B | If a drive is installed, this field shows the diskette storage capacity of the drive. If you change or add a diskette drive, you might need to use this option to set the correct type. |
| Serial Port Setup Serial Port A Address Serial Port A IRQ Serial Port B Address Serial Port B IRQ | The Serial Port Setup menu shows the addresses and interrupts for the built-in serial ports. If you add adapter cards with serial ports, an error message will notify you if you have an address conflict among the serial ports. Ensure that each serial port has a different address. If you change serial port addresses in this menu, you might also need to make changes in the software that uses serial ports. For instructions on changing your software, see the user's guide or online information supplied with the software. |
| USB Setup USB Support USB Keyboard/Mouse Support | The USB Setup menu lets you enable or disable the Universal Serial Bus feature. Select Autodetect for USB Keyboard/Mouse Support if you want this support to be enabled when a USB keyboard or a USB mouse is detected after the computer is started. Select Disabled if you will not be using a USB keyboard or USB mouse. |

| Item | Description |
|---|---|
| Parallel Port Setup Parallel Port Parallel Port Mode Parallel Port Extended Mode Parallel Port Extended Mode DMA Parallel Port IRQ | <p>The Parallel Port Setup menu shows the address, mode, interrupt, and other settings for the built-in parallel port. The parallel port address can also be set to Disabled if you want to prevent unauthorized transmission of data to devices attached to the port.</p> <p>If you add adapter cards with parallel ports, an error message will notify you if you have an address conflict among the parallel ports. Ensure that each parallel port has a different address. If you change parallel port addresses in this menu, you might also need to make changes in the software that uses parallel ports. For instructions on changing your software, see the user's guide or online information supplied with the software.</p> <p>If the Parallel Port field is not set to Disabled, you can choose an operational mode for the parallel port. You can choose either Standard mode or one of the extended modes (ECP, EPP, ECP and EPP, or Bidirectional). In standard mode, you are limited to write-only (unidirectional) mode. The extended modes are bidirectional and will increase the efficiency of your parallel port; however, the extended modes use recent technology, which is not supported by some hardware. The extended modes are:</p> <ul style="list-style-type: none"> • ECP: The extended capabilities port (ECP) mode provides higher speed data transfers than the Standard mode. The ECP mode is used for high-speed printers and other devices. • EPP: The enhanced parallel port (EPP) mode also provides high speed data transfers. The EPP mode is used for LAN adapters, disk drives, and tape backups. • ECP and EPP: This mode combines the capabilities of the Extended Capabilities Port and Enhanced Parallel Port modes. Select this mode if you have both ECP and EPP devices connected to the parallel port. • Bidirectional: This mode is used for data transfer to other computers and supported devices. <p>The Parallel Port Extended Mode DMA field shows the channel assignment for direct memory access (DMA). The parallel port can use DMA data transfer when the extended mode is set to either ECP or ECP and EPP.</p> <p>The Parallel Port IRQ field shows the interrupt request number.</p> |

| Item | Description |
|---|---|
| Video Setup Video Controller Video Memory Video Aperture Palette Snooping Video Interrupt | <p>The Video Setup menu displays the type of video controller, the amount of video memory, and the size of the video aperture, if applicable. You can also enable or disable Palette (color) Snooping and Video interrupt.</p> <p>Enable Palette Snooping if your system has an ISA video multimedia adapter installed and incorrect colors are displayed on the screen AND your system has a PCI video adapter installed that supports palette snooping.</p> <p>Enable Video Interrupt if you are using an application that requires this support.</p> |
| IDE Drives Setup IDE Hard Disk Drive 0 IDE Hard Disk Drive 1 IDE CD-ROM Drive 2 IDE Hard Disk Drive 3 | <p>The IDE Drives Setup menu displays the hard disk and CD-ROM drives that either are already installed or can be installed in your computer.</p> <p>If a hard disk is installed, it shows the size and selectable performance. If a CD-ROM drive is installed, it shows the selectable performance. The performance indicates the speed at which the drive will transfer data. To get better disk performance, run IDE hard disk and CD-ROM drives in High Performance mode.</p> <p>If an IDE drive is set to High Performance mode, you can enable Drive Prefetch for maximum drive performance.</p> <p>Note: IDE CD-ROM devices and some operating systems might not work properly with the Drive Prefetch feature enabled.</p> |
| Audio Setup Audio Support | <p>You can use the Audio Setup menu to enable or disable this feature.</p> |
| Ethernet Setup Ethernet Support Alert on LAN Network Boot MAC Address | <p>You can use the Ethernet Setup menu to enable or disable the Ethernet feature and view or change related settings.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. If you install an optional network adapter, you must disable Ethernet support. 2. If an optional network adapter is installed you do not have the option of selecting RPL or DHCP. Also, you do not have the viewable MAC address feature. |

Start Options

If you select the Start Options option from the Configuration/Setup Utility main menu, you can *view* and *change* settings for device startup sequence, keyboard speed, virus detection, various power-on options, and other features of your computer.

| Item | Description |
|--|--|
| Startup Sequence Primary Startup Sequence Automatic Power On Startup Sequence Error Startup Sequence | <p>The Startup Sequence menu lets you specify the order in which the computer searches devices for the operating system files when you start up the computer.</p> <p>Primary Startup Sequence: Your computer has a default primary startup sequence. Use this option if you want to view or change the sequence.</p> <p>Automatic Power On Startup Sequence: Select Enabled for this option if you want to use a different startup sequence when your system is started using automatic power-on features.</p> <p>Error Startup Sequence: Select Disabled for this option if you want to automatically start the Configuration/Setup Utility whenever a POST error occurs. Select another option if you want the system to bypass the Configuration/Setup Utility and use a different startup sequence when a POST error occurs. You will still be able to access the Configuration/Setup Utility using the F1 key or the POST error menu.</p> |
| Keyboard NumLock State | <p>This option indicates whether or not the NumLock feature on the keyboard turns on automatically each time you start up the computer. When NumLock is set to On, the keys on the keypad act as numeric keys. When NumLock is set to Off, the keys on the keypad act as cursor keys.</p> |
| Keyboard Speed | <p>This option indicates the speed at which your keyboard responds when you hold down a key (typematic rate). The Normal rate is 10 characters per second. The fast rate is 30 characters per second.</p> |
| Disketteless Operation | <p>When enabled, this option allows the computer to startup and run without a diskette drive.</p> <p>Note: To disable diskette drive access, see the System Security option on the Configuration/Setup Utility main menu.</p> |

| Item | Description |
|-----------------------------|---|
| Keyboardless Operation Mode | When enabled, this option allows the computer to startup and run without a keyboard. If you enable this option, you must disable your power-on password, which can be done using the System Security option on the Configuration/Setup Utility main menu. |
| Power-On Self-Test | This option lets you set the level of power-on self testing (Quick or Enhanced) that will be done during the power-on sequence. Note: The Quick setting reduces the amount of testing; however, Quick setting is not recommended when using an unattended start mode. |
| Power on Logos | This option lets you control whether or not logos are displayed during the power-on sequence. |
| Power On F1/Esc Option | This option lets you control whether or not the F1 and Esc key options are displayed during the power-on sequence. This setting does not affect the behavior of these keys, only the display of the options. |
| Power On Status | This option lets you control whether or not power-on status indicators (such as memory count and system check points) are displayed during the power-on sequence. This option also controls the power-on beeps. |
| Virus Detection | This option lets you specify if you want the virus checker supplied with your computer's BIOS to check for viruses each time you turn on your computer. When virus detection is enabled, your computer checks the master boot record to see if the information has changed since the last time you turned on the computer. If the information has changed, the BIOS will display a message which warns that your system might contain a virus. Note: This option does not have an effect on the antivirus program or on additional virus checking programs you may have purchased. It also does not remove viruses from your computer. |

Date and Time

If you select the Date and Time option from the Configuration/Setup Utility main menu, you can *view* and *change* the date and time of the internal clock in your computer.

Your computer is Year 2000 enabled.

| Item | Description |
|------|--|
| Time | Time shows the time in a 12- or 24-hour format. In a 24-hour 12 midnight is 00:00:00; 12 noon is 12:00:00; 1 p.m. is 13:00:00. |
| Date | Date displays the set date in MM/DD/YYYY format. Note: Different countries have different date formats. |

System Security

If you select the System Security option from the Configuration/Setup Utility main menu, you can *view* and, in some cases, *change* the system security settings for your computer. You can use this menu to control access to the hard disk and diskette drives. You can also set, change, and delete power-on and administrator passwords.

| Item | Description |
|-------------------|--|
| Enhanced Security | <p>If your model has the Enhanced Security feature, this option on the System Security menu shows the current setting for enhanced security. Enhanced security can only be enabled or disabled when you update system programs, as further explained under “Enabling and Disabling Enhanced Security” on page 36.</p> <p>Enhanced security provides extra protection for your administrator password and startup (boot) sequence settings. When enhanced security is enabled, your administrator password and startup sequence are stored in a highly-protected, nonvolatile, security EEPROM module that is separate from CMOS memory and the EEPROM module that stores system programs. When your administrator password and startup sequence are locked in the security EEPROM, they remain intact even if the battery in your computer expires or is removed by someone.</p> |

| Item | Description |
|---|---|
| Secure IDE Devices and Diskette Drives IDE Controller Diskette Drive Access | <p>This option lets you enable or disable access to your IDE hard disk drives and diskette drives.</p> <p>All IDE devices (such as hard disk and CD-ROM drives) attached to the IDE controller can be disabled using the IDE Controller field.</p> <p>Diskette drives attached to the system board or riser card can be disabled using the Diskette Drive Access field.</p> <p>If Diskette Write Protect is enabled, diskette drives attached to the system board or riser card will operate in a read-only mode.</p> |
| Remote Administration | <p>Select Enabled for this option if you want to allow remote administration, such as the POST/BIOS Update Utility program, to be run from a remote system without requiring the entry of your administrator password. If the power-on Password Prompt option is set to On, the prompt option will be reset to Dual when Remote Administration is set to Enabled.</p> |
| Power-On Password | <p>This options lets you <i>set</i>, <i>change</i>, or <i>delete</i> a power-on password. You can also set Password Prompt to On, Off, or Dual.</p> <p>For additional information about the power-on password, see “Using a Power-On Password” on page 47.</p> |
| Administrator Password | <p>This options lets you <i>set</i>, <i>change</i>, or <i>delete</i> an administrator password. You can also set Power-on password changeable by user to No or Yes.</p> <p>For additional information about the administrator password, see “Using an Administrator Password” on page 51.</p> |
| Adapter ROM Security | <p>If this option is set to Yes, the keyboard will be locked during adapter ROM initialization. This can be used in conjunction with an administrator password to prevent the use of adapter ROM-based utility programs.</p> |
| SystemCare | <p>This option enables or disables the wireless radio-frequency communication feature in your computer. This feature is standard on some models only. See “Using Security Features” on page 32 for general information on security features.</p> |

| Item | Description |
|----------|---|
| Asset ID | This option enables or disables POST notification each time an asset control violation occurs. See “Asset ID Capability” on page 31 for general information about Asset ID. |

Advanced Setup

If you select the Advanced Setup option from the Configuration/Setup Utility main menu, you can *view* and, in some cases, *change* settings for advanced hardware features, including ROM shadowing, PCI control, and Plug and Play Control. These settings must be configured correctly; otherwise, your computer might malfunction.

| Item | Description |
|--|---|
| Cache Control Cache State Cache Size | <p>The Cache Control menu shows how much cache memory is installed and lets you enable or disable its use.</p> <p>Cache memory is special buffer storage that holds frequently used instructions and data, and works faster than main memory. With cache memory enabled, most of your programs will run faster. If you run programs that require slower speeds, you can disable cache memory to slow down your computer.</p> |
| ROM Shadowing | <p>The ROM Shadowing menu shows which system devices are using read-only memory (ROM) shadowing. With ROM shadowing, your computer stores data from the specified device in random access memory (RAM). Because your computer can access data in RAM faster than it can access data from ROM, programs run faster when ROM shadowing is enabled.</p> <p>If you install an adapter that has its own ROM, you can enable the ROM shadowing option for that adapter to speed up its performance.</p> <p>Note: The ROM Shadowing option might not work on adapters that use memory-mapped I/O, such as network adapters.</p> |

| Item | Description |
|---|---|
| PCI Control PCI Parity Network Adapters Mass Storage Adapters Display Adapters Multimedia Devices Communication Adapters Serial Adapters | <p>The PCI Control menu allows you to enable or disable PCI parity and bus mastering for the PCI adapters installed in your computer.</p> <p>PCI parity allows parity checking of data across the PCI bus. Some adapters do not generate parity and will require the PCI Parity option be set to Disabled.</p> <p>Bus mastering lets installed bus master PCI adapters process information without using the microprocessor. Enable bus master if your device or adapter must have the bus master function enabled when the computer is turned on. Some devices or adapters might not work properly if the bus master function is enabled when the system is restarted.</p> <p>Note: If PCI adapters do not operate properly, you might need to disable the PCI Bus Master option.</p> |
| Plug and Play Control Set Device Node Address Decode Plug and Play Operating System | <p>The Plug and Play Control menu lets you change certain settings for Plug and Play devices.</p> <p>Set Device Node: When this option is disabled, programs will not be able to make changes to the power-on configuration.</p> <p>Address Decode: Most Plug and Play adapters use 16-bit address decoding. If you are experiencing problems with a Plug and Play adapter, changing the address decode setting to 10-bit might fix the problem.</p> <p>Plug and Play Operating System: Select Yes for this option if you are experiencing POST errors numbered 185x and your startup operating system is Plug and Play compliant. See your operating system documentation to determine if your operating system supports this function.</p> |
| Processor Speed Processor ID Processor Updating | <p>This indicates the processor speed. Ensure that you set the correct speed.</p> <p>The Processor ID is displayed.</p> <p>Enabling or disabling Processor Updating determines whether the BIOS will apply microprocessor updates when the computer starts.</p> |

ISA Legacy Resources

If you select the ISA Legacy Resources option from the Configuration/Setup Utility main menu, you can configure non-Plug and Play adapters, which are not automatically detected by your computer. You must identify the following ISA Legacy resources as dedicated to your new adapter so the BIOS does not attempt to assign them to Plug and Play adapters:

- Memory Resources
- I/O Port Resources
- DMA Resources
- Interrupt Resources

Each of the options on the ISA Legacy Resources menu opens another menu.

| Item | Description |
|--------------------|---|
| Memory Resources | <p>The Memory Resources menu lets you allocate system memory regions for an adapter. The menu lists the hexadecimal addresses of the available memory regions. You allocate memory to an adapter by selecting the ISA Resource setting for an available hexadecimal address.</p> <p>Be sure to read the documentation supplied with your adapter. You might need to make changes to the adapter to accommodate the selections you make for Memory Resources. For example, you might have to move jumpers or switches on the adapter, or make changes to the software supplied with the adapter.</p> |
| I/O Port Resources | <p>The I/O Port Resources menu lets you allocate input/output ports for an adapter. The menu lists the hexadecimal addresses of the available I/O ports. You allocate I/O ports to an adapter by selecting the ISA Resource setting for an available hexadecimal address.</p> <p>Be sure to read the documentation supplied with your adapter. You might need to make changes to the adapter to accommodate the selections you make for I/O Port Resources. For example, you might have to move jumpers or switches on the adapter, or make changes to the software supplied with the adapter.</p> |

| Item | Description |
|---------------------|---|
| DMA Resources | <p>The DMA Resources menu lets you allocate direct memory access (DMA) channels for an adapter. The menu lists the channel assignments for DMA, which allows I/O devices to transfer data to and from memory. You allocate DMA channels to an adapter by selecting the ISA Resource setting for an available channel.</p> <p>Be sure to read the documentation supplied with your adapter. You might need to make changes to the adapter to accommodate the selections you make for DMA Resources. For example, you might have to move jumpers or switches on the adapter, or make changes to the software supplied with the adapter.</p> |
| Interrupt Resources | <p>The Interrupt Resources menu lets you allocate interrupt requests (IRQs) for an adapter. The menu lists the system IRQs and their functions. You allocate IRQs to an adapter by selecting the ISA Resource setting for an available IRQ.</p> <p>Be sure to read the documentation supplied with your adapter. You might need to make changes to the adapter to accommodate the selections you make for Interrupt Resources. For example, you might have to move jumpers or switches on the adapter, or make changes to the software supplied with the adapter.</p> |

Power Management

If you select the Power Management option from the Configuration/Setup Utility main menu, you can *view* and, in some cases, *change* settings that affect the energy-saving features of your computer, including the automatic power-on feature and advanced configuration and power interface (ACPI). With Power Management, your computer and monitor (if your monitor supports Display Power Management Signaling, DPMS) can be set to go into a reduced-power state if they are inactive for a specified length of time.

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 supplied with your monitor to see if it supports Display Power Management Signaling (DPMS).

| Item | Description |
|---|---|
| ACPI BIOS Mode | ACPI BIOS Mode: When ACPI (automatic configuration and power interface) BIOS mode is enabled, the operating system is allowed to 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. |
| APM APM BIOS Mode Automatic Hardware Power Management Time to Low Power IDE Drives Activity Monitor PS/2 Keyboard PS/2 Mouse Diskette Serial Port A Serial Port B Parallel Port IDE Hard Disks IDE CD-ROM | <p>The APM features allow automatic power reduction through monitoring of your computer's hardware. These features can be used independent of APM BIOS features controlled by your operating system.</p> <p>APM BIOS Mode: Enable this function if your operating system supports APM enabled machines.</p> <p>Automatic Hardware Power Management: Enable this function and the related settings to reduce power consumption during periods of hardware inactivity.</p> <p>Activity Monitor: This option lets you set up the system activities that you want monitored for automatic power management.</p> |

| Item | Description |
|---|--|
| <p>Automatic Power On</p> <p>Wake on LAN</p> <p>Serial Port A Ring Detect</p> <p> Startup Sequence</p> <p>MODEM Ring Detect</p> <p> Startup Sequence</p> <p>Wake Up On Alarm</p> <p> Event or Disabled</p> <p> Alarm day of month</p> <p> Alarm Time</p> <p> Alarm day of week</p> <p> Startup Sequence</p> <p>PCI Wake Up</p> <p> Startup Sequence</p> | <p>The Automatic Power On option lets you enable and disable features that automatically turn on your computer.</p> <p>You must also select the startup sequence you want to use for the type of power-on event selected. 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.</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. The available automatic power-on options might vary, depending on the computer model. 2. For additional information about the power management options, see “Power Management.” |

Quick Reference for Network-Related Settings

Use this table to access the network settings within the Configuration/Setup Utility Program.

The steps in the following table always starts at the Configuration/Setup Utility main menu.

| To Configure | Select | Comments |
|---------------------|--|---|
| Integrated Ethernet | <ol style="list-style-type: none"> 1. Devices and I/O Ports 2. Ethernet Setup 3. Enabled or Disabled 4. Network Boot 5. DHCP or RPL | <p>You can also view the MAC address of the integrated Ethernet in the Ethernet Setup menu.</p> <p>If you install an optional network adapter, you must disable Ethernet support.</p> |
| Wake on LAN | <ol style="list-style-type: none"> 1. Power Management 2. Automatic Power On 3. Wake on LAN 4. Enabled or Disabled. If you select Enabled, perform the remaining steps. 5. Startup Sequence 6. Primary or Automatic 7. Press Esc twice. 8. Start Options 9. Startup Sequence 10. The first, second, third, and fourth primary startup devices 11. Automatic Power On Startup Sequence 12. The first, second, third, and fourth startup devices | <p>Your model might not allow you to select four startup devices.</p> |

| To Configure | Select | Comments |
|-------------------------|--|---|
| Serial Port Ring Detect | <ol style="list-style-type: none"> 1. Power Management 2. Automatic Power On 3. Serial Port Ring Detect 4. Enabled or Disabled. If you select Enabled, perform the remaining steps. 5. Startup Sequence 6. Primary or Automatic 7. Press Esc twice. 8. Start Options 9. Startup Sequence 10. The first, second, third, and fourth primary startup devices 11. Automatic Power On Startup Sequence 12. The first, second, third, and fourth startup devices | Your model might not allow you to select four startup devices. |
| Modem Ring Detect | <ol style="list-style-type: none"> 1. Power Management 2. Automatic Power On 3. Modem Ring Detect 4. Enabled or Disabled. If you select Enabled, perform the remaining steps. 5. Startup Sequence 6. Primary or Automatic 7. Press Esc twice. 8. Start Options 9. Startup Sequence 10. The first, second, third, and fourth primary startup devices 11. Automatic Power On Startup Sequence 12. The first, second, third, and fourth startup devices | Your model might not allow you to select four startup devices. |
| Remote Administration | <ol style="list-style-type: none"> 1. System Security 2. Remote Administration 3. Remote Administration a second time 4. Enabled or Disabled | Enable Remote Administration to perform remote POST/BIOS updates on the computer. |

Chapter 6. Taking Care of Your Computer

This chapter 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 shut down the operating system and turn off the computer and monitor power switches 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.

Monitor Screen

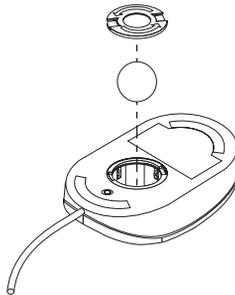
Do not use abrasive cleaners when cleaning the surface of the monitor screen. The screen surface is easily scratched, so avoid touching it with pens, pencil points, and erasers.

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. In addition, an anti-static cleaner can be used to slow the buildup of dust on the screen surface.

Mouse

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

1. Shut down the operating system and turn off the computer.
2. Disconnect the mouse cable from the computer.
3. Turn the mouse upside down. Unlock the retainer on the bottom of the mouse by 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.

Replacing the Battery

Your computer has a special type of memory that maintains the date, time, and the 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 of this publication and *Installing Options in Your IntelliStation E Pro* for information about replacing 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.

Moving Your Computer

Important

Do not move the computer while it is on. Sudden movements, such as bumps, jerks, and drops, can cause the read/write head of the hard disk drive to bounce against the surface of the disk itself. This can cause loss of data and a variety of hard disk errors. Always turn off the computer before you move it. When the computer is off, the read/write head automatically parks itself over a nondata area of the hard disk. This process can help to prevent damage to the hard disk.

If your computer has a hard disk drive, take the following precautions:

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

Operating systems can vary in the way they perform backup procedures. Some operating systems save only data files, while others make copies of application program files *and* data files. 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. Shut down the operating system and turn off the computer and all attached devices.
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 any damage.

Chapter 7. Installing Options Overview

You can easily expand the capabilities of your computer by adding memory, drives, adapters, or an additional microprocessor. If you have installed options before, you might be able to perform some activities without detailed instructions.

For detailed instructions on installing options, refer to *Installing Options in Your IntelliStation E Pro* which is available on the *Ready-to-Configure Utility Program CD* supplied with your computer. It is also available as a printable file (.PDF) on the *Ready-to-Configure Utility Program CD* and on the World Wide Web at:

<http://www3.pc.ibm.com/support?page=IBM+IntelliStation>

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.

Electrical Safety

CAUTION:

Electrical current from power, telephone, and communication cables can be hazardous. To avoid any shock hazard, disconnect all power cords and cables as described in the following information.

For your safety, always do the following *before* removing the cover:

1. Shut down all programs as described in your operating-system documentation.
2. Turn the computer and any attached devices off, 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.

CAUTION:

Never remove the cover on the power supply. If you have a problem with the power supply, have your computer serviced.

Handling Static-Sensitive Devices

Have you ever walked across a carpeted floor, then touched an object and received a small electrical shock? That's static electricity, and although harmless to you, it 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 are installing 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

Following are some of the available options:

- System memory, called dual in-line memory modules (DIMMs). See “Memory DIMM Options” on page 85 for more information.
- Microprocessor upgrades
- Expansion adapters
 - Accelerated Graphics Port (AGP) adapters
 - Industry standard architecture (ISA) adapters
 - Peripheral component interconnect (PCI) adapters
 - Adaptec SCSI PCI adapters
- Internal drives
- Cover lock
- Security U-bolt
- Floor stand

The optional floor stand is available from IBM for the IntelliStation E Pro. This allows the computer to be placed in a vertical position. Refer to the documentation provided with the floor stand option for additional information.

For the latest information about available options:

- Look on the following World Wide Web pages:
 - <http://www.pc.ibm.com/us/options/>
 - <http://www3.pc.ibm.com/support?page=IBM+IntelliStation>
- 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.

Memory DIMM Options

Important

Be sure to observe the following guidelines when adding memory DIMM options to your computer.

- The IntelliStation E Pro does not support EDO memory.
- Only 168-pin, 100 MHz, 3.3v industry standard memory DIMMs are supported.
- There are two types of memory DIMMs available for the IntelliStation E Pro computer: *Registered Memory* technology and *Unregistered Memory* technology.
- Registered Memory DIMMs are not compatible with Unregistered Memory DIMMs.
- The 256 MB ECC Memory DIMM is *Registered Memory* technology.
- Only the 256 MB ECC Registered Memory DIMM (IBM OBI Part Number 01K1132) is supported on the IntelliStation E Pro computer.
- The 32 MB, 64 MB, and 128 MB DIMMs are *Unregistered Memory* technology.
- When adding additional memory DIMMs, be sure that all installed memory DIMMs are of the same type. For example:
 - All installed DIMMs are Registered Memory
 - or –
 - All installed DIMMs are Unregistered Memory

Locating Components

The following information helps you locate components and serves as a reference when you need to install options or connect input/output devices.

Your computer comes with the following adapters and devices preinstalled:

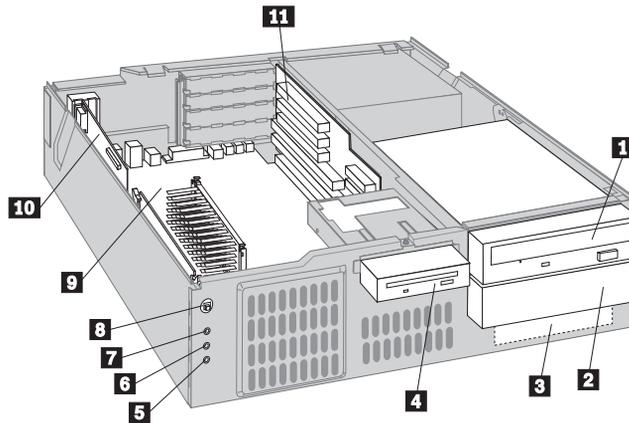
- An AGP graphics adapter
- A CD-ROM drive in drive bay 1
- A diskette drive in drive bay 4

Internal View

The following illustration shows the internal view of your computer as seen from the front.

Note: The following illustration is for reference only.

- 1** Drive bay 1
- 2** Drive bay 2
- 3** Drive bay 3
- 4** Drive bay 4
- 5** Client LAN light³
- 6** Hard disk drive light
- 7** Power-on light
- 8** On-off switch
- 9** System board
- 10** AGP adapter
- 11** Riser card with expansion slots



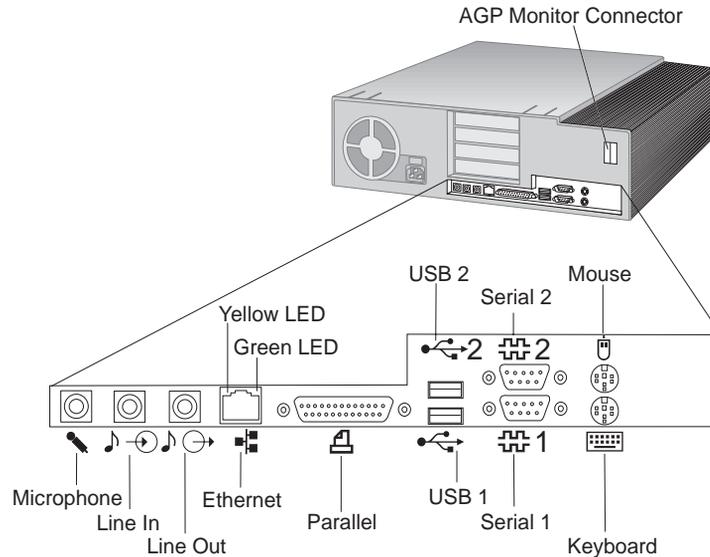
Your computer comes with a diskette drive installed in bay 4 and a hard disk drive installed in bay 3. The CD-ROM drive is installed in bay 1.

³ This light is only used in systems that have an integrated Ethernet on the system board.

Input/Output Device Connectors

Input/output (I/O) connectors provide ports for transferring information into and out of your computer. You can connect a variety of I/O devices to your computer, including a monitor, keyboard, mouse, and printer.

At the rear of your computer is a panel that provides access to I/O connectors. Adapters installed in expansion slots might also provide I/O connectors. Note that the monitor connector for the computer is located on the graphics adapter installed in the AGP expansion slot instead of on the I/O connector panel. The following illustration shows the location of the external connectors.

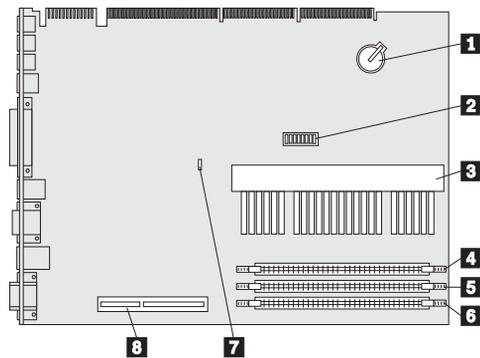


Identifying Parts on the System Board

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.

If you plan to install, remove, or replace hardware in your computer, you will need to know the layout of the system board. The following illustration shows the layout of the system board in your computer. The numbered pointers show the components that are discussed in this book.

- 1** Battery
- 2** Microprocessor-speed switches
- 3** Microprocessor connector
- 4** DIMM 0
- 5** DIMM 1
- 6** DIMM 2
- 7** Clear CMOS Request jumper
- 8** AGP expansion slot



Note: An illustration of the system board and additional information is also provided on a label located inside the computer cover.

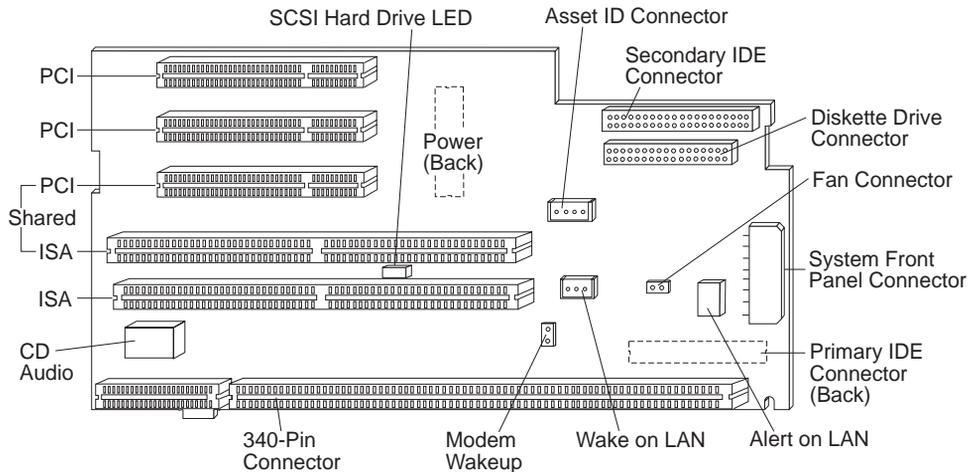
Adapters and the Riser Card

Your computer uses a riser card for expansion. The riser card contains expansion slots that connect adapters to the industry standard architecture (ISA) and peripheral component interconnect (PCI) buses.

You can install a variety of adapters in the expansion slots on the riser card. For information on locating the riser card, see “Locating Components” on page 86.

The riser card in your computer has one dedicated ISA slot and two dedicated PCI slots and one shared ISA/PCI slot.

The following illustration shows the expansion slots and connectors on the riser card.



Notes:

1. The diskette and IDE drive connectors are also on the riser card. When installing optional drives, refer to this illustration.
2. If you attach a 4-position cable connector to the 2-pin modem wakeup connector, ensure that the unused positions (of the cable connector) are *next to the bottom of the riser card*. If you incorrectly attach the cable connector to the modem wakeup feature, the computer might automatically restart each time you power down.
3. The front fan is controlled by the system management controller, and if the temperature of the box is at a low state, then the system management controller will turn the fan off.

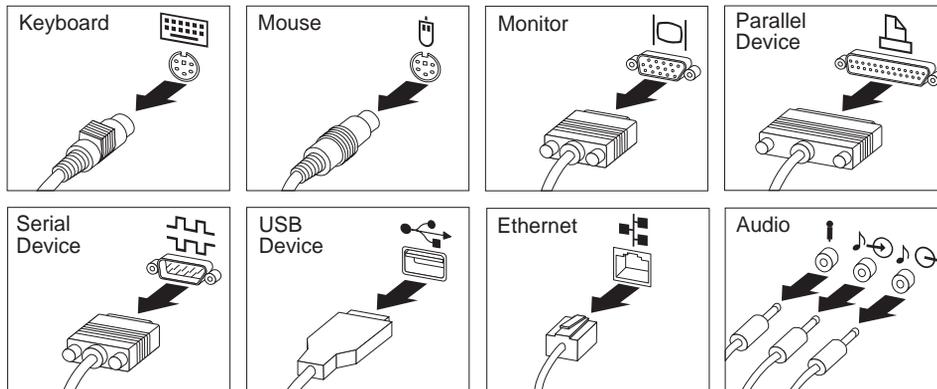
Disconnecting Cables and Removing the Cover

Before you begin:

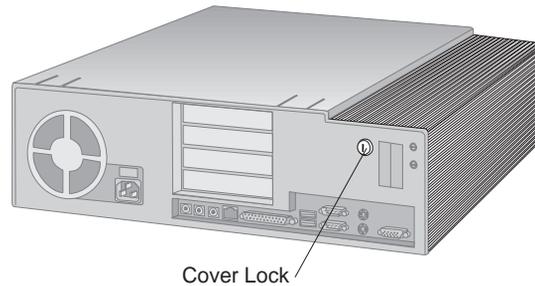
- Read “Electrical Safety” on page 82 and “Handling Static-Sensitive Devices” on page 83.
- Remove any media (diskettes, compact discs, or tapes) from the drives, and then turn off all attached devices and the computer.

- 1** 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.
- 2** Disconnect all cables attached to the computer; this includes power cords, input/output (I/O) cables, and any other cables connected to the computer.

Note: For more information on ports, including universal serial bus (USB), refer to *Setting Up Your IntelliStation E Pro*.



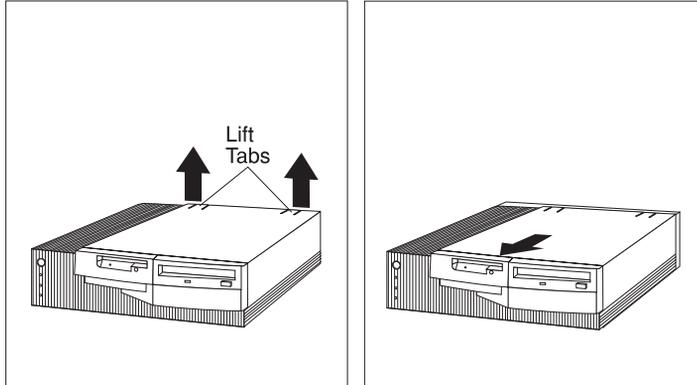
- 3** If a cover lock is present, unlock the computer cover. (The cover lock is located on the rear of the computer in some models.)



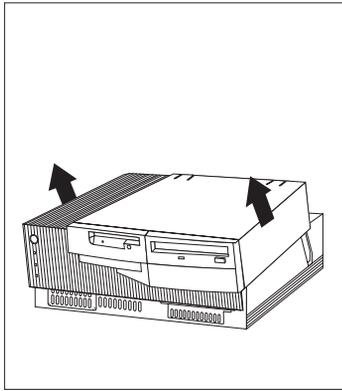
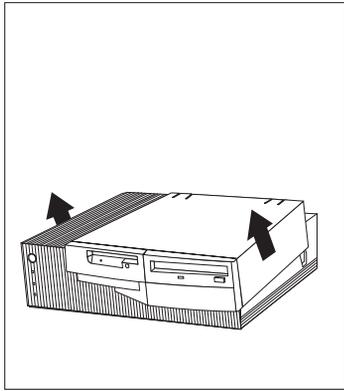
Attention:

If you have set an administrator password, read the important information in “Disconnecting Cables and Removing the Cover” on page 90 before removing the computer cover.

- 4** Find the tabs on the rear of the computer cover and lift them up; then gently pull the cover toward you to release the back edge. Next, hold the cover by the sides and pull it forward about half an inch.



5 Lift the back edge and slide the cover forward until it comes free.



Chapter 8. Solving Problems

This chapter presents an overview of diagnostic tools 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 terminate-and-stay-resident (TSR) programs.

Important

If you have just added new software or a new computer option and your computer is not working, do the following before using the other information in the chapter:

- 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 126 for information about diagnostic programs provided with your computer.)
- Reinstall the new software or new device.

Using Diagnostic Tools

Computer problems can be caused by hardware, software, or user error (for example, pressing the wrong key). Using the diagnostic aids discussed in this chapter, you might be able to 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 126 for a description of these programs).

If the hardware checks out OK, 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, refer to *About Your Software* and the operating-system documentation supplied with your computer. If you have installed software applications yourself, consult the documentation supplied with the software.

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

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

Note: In addition to the preceding tools, if you have access to the World Wide Web, you can also view or download the latest problem-solving tips at <http://www.pc.ibm.com/us/intellistation>.

Descriptions of the diagnostic tools follow.

Power-On Self-Test (POST)

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

Note

If your computer starts but does not boot when you press the power switch, do the following:

- Make sure all cables are securely connected to the correct locations.
- Check to see if the voltage-selection switch is set to the correct position for your country.

For additional information, see *Setting Up Your IntelliStation E Pro*.

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 the presence of diskette drives, hard disk drives, and the CD-ROM drive (if installed)

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

Messages that 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, refer to “Solving POST Error Message Problems” and “POST Message Charts” on page 98.

- Software-generated error messages

Messages that 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 generally text messages, but they also can be numeric messages. For information about these software error messages, refer to the information supplied with the operating system or application program.

- Diagnostic error messages

Messages that appear if a hardware problem is detected by a diagnostic test program. The messages present text information that can be used to identify a failing part.

Solving POST Error Message Problems: If you receive an error message during the power-on-self-test (POST), completing the steps outlined in this section might enable you to resolve the problem.

Note

If you have just added, removed, or changed the location of a device and you receive an error message, follow the procedure described in the **Important** text box on page 44. If the procedure on page 44 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 password at the password prompt. However, if you think you might need to change any settings in the Configuration/Setup Utility program, type your administrator password at the password prompt. If you type your power-on password, you will be able to view error codes and error code descriptions displayed on the POST Startup Errors screen, and you will also be able to view limited information in the Configuration/Setup Utility program. However, you will not be able to change any settings.
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 labeled 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 following **Important** text box 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**.

Important

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.

If you select **Save Settings** and then exit the Configuration/Setup Utility program, your system will save all settings as they currently appear in the Configuration/Setup Utility program and your operating system will start (unless there is an unresolved problem with an IDE device).

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 likely 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 on page 96.

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 have finished viewing and changing settings, press **Esc** to return to the Configuration/Setup Utility menu.
 - d. Before you exit from the program, select **Save Settings**.
 - e. To exit from the Configuration/Setup Utility, press **Esc** and follow the instructions on the screen. When you exit from the Configuration/Setup Utility menu, your new settings will be saved and your operating system will start automatically (unless there is an unresolved problem with an IDE device).
6. For more information about what caused an error message to appear and what action to take, refer to the following chart.

| Problem | Go to: |
|--|---|
| POST error code or message appears. | “POST Message Charts” on page 98. |
| After more than one beep, application program or operating system appears. | “IBM Enhanced Diagnostics” on page 126. |
| Blank screen, unreadable screen, or other unusual response occurs. | “Troubleshooting Charts” on page 116. |

If you are unable to resolve a problem and need assistance, refer to Chapter 9, “Getting Help, Service, and Information” on page 131.

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, see Chapter 7, “Installing Options Overview” on page 81 for more information.

| POST Message | Description |
|-------------------|---|
| 101 102 106 | A failure occurred during testing of the system board and microprocessor. Action: Have the computer serviced. |
| 110 111 | A memory parity failure occurred during testing of the system board. Action: Run the diagnostic programs to verify that a problem exists in a DIMM. See “IBM Enhanced Diagnostics” on page 126. If you cannot identify the defective DIMM in this way, 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, retesting after each is reinstalled. When an adapter fails, replace it. If the problem cannot be isolated and corrected, have the computer serviced. |
| 151 | A real-time clock (RTC) error occurred. Action: Have the computer serviced. |
| 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 79 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 | <p data-bbox="539 213 1218 262">A change in device configuration occurred. This message is displayed under one or more of the following conditions:</p> <ul data-bbox="554 279 1268 586" style="list-style-type: none"> <li data-bbox="554 279 893 302">• A new device has been installed. <li data-bbox="554 319 1236 341">• A device has been moved to a different location or cable connection. <li data-bbox="554 359 1133 381">• A device has been removed or disconnected from a cable. <li data-bbox="554 399 1218 447">• A device is failing and is no longer recognized by the computer as being installed. <li data-bbox="554 465 925 487">• An external device is not turned on. <li data-bbox="554 505 1243 553">• The Erasing or Forgotten Passwords Procedure was performed. This procedure also erases configuration data. <li data-bbox="554 571 1268 593">• An invalid checksum is detected in CMOS memory (nonvolatile RAM). <p data-bbox="539 611 611 633">Action:</p> <ol data-bbox="554 651 1268 973" style="list-style-type: none"> <li data-bbox="554 651 1268 699">1. Verify that all external devices are turned on. External devices must be turned on before the computer is turned on. <li data-bbox="554 716 1236 739">2. Verify that all devices are properly installed and securely connected. <li data-bbox="554 756 1268 857">3. If you added, removed, or changed the location of a device, you must save the new configuration in the Configuration/Setup Utility program. Refer to the Important text box on page 44 for further information and instructions on saving the configuration. <li data-bbox="554 874 1268 973">4. If you did not add, remove, or change the location of a device, a device is probably failing. Running the diagnostic programs might isolate the failing device. (See “IBM Enhanced Diagnostics” on page 126 for information about diagnostic programs provided with your computer.) <p data-bbox="539 991 1186 1038">If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| 163 | <p data-bbox="539 1055 872 1078">The clock is not working correctly.</p> <p data-bbox="539 1095 1203 1170">Action: Set the correct date and time. If the date and time are set correctly and saved and the 163 error message reappears, replace the battery.</p> <p data-bbox="539 1187 1162 1209">If this does not correct the problem, have the computer serviced.</p> <p data-bbox="539 1227 1243 1277">Note: The computer can be used until it is serviced, but any application programs that use the date and time will be affected.</p> |

| POST Message | Description |
|--------------|--|
| 164 | <p>A change in the memory configuration occurred. This error can be caused by adding, removing, or incorrectly installing memory.</p> <p>Note: The computer can be used with decreased memory capacity until the error is corrected.</p> <p>Action:</p> <ol style="list-style-type: none"> 1. If you added memory, see “Memory DIMM Options” on page 85 to verify that the new memory is correct for your computer, and that it is installed and configured correctly. 2. If you added or removed memory, you must save the new configuration in the Configuration/Setup Utility program. Refer to the Important text box on page 44 for further information and instructions on saving the configuration. 3. Running the diagnostic programs might isolate the location of the problem DIMM and provide additional information. (See “IBM Enhanced Diagnostics” on page 126 for information about diagnostic programs provided with your computer.) <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| 167 | <p>A different microprocessor was installed that is not supported by the current POST/BIOS (system programs).</p> <p>Action:</p> <ol style="list-style-type: none"> 1. Obtain the latest POST/BIOS flash update diskette image. See “Updating System Programs” on page 38. 2. Perform the POST/BIOS flash update procedure. <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| 168 | <p>Alert on LAN is not working correctly.</p> <p>Action: Set Alert on LAN to enabled in the Configuration/Setup Utility program. See Chapter 5, “Using the Configuration/Setup Utility Program” on page 41. Verify that the Ethernet cable is attached to both client and server and that the appropriate software is installed on both the client and the server.</p> <p>If this does not correct the problem, have the computer serviced.</p> |
| 175 | <p>The primary copy of secure data is damaged. This can occur if the computer is turned off while the Configuration/Setup Utility program is updating the administrator password or startup sequence.</p> <p>Action: POST will attempt to use the alternate copy of secure data to correct the primary copy. If the operation is successful, the administrator password and startup sequence will remain as they were before the Configuration/Setup Utility program was invoked and this error will not appear during the next power-on. If the operation is not successful, other POST errors might appear and the system board must be replaced.</p> |

| POST Message | Description |
|--------------|--|
| 176 | <p>The computer was tampered with. This indicates that the cover has been removed and the chassis-intrusion detector has not been cleared by entering the administrator password. Note that chassis-intrusion can be detected only if the chassis-intrusion detector feature is activated, which occurs when enhanced security is enabled and an administrator password is set.</p> <p>Action: You must enter the administrator password to clear this POST message. If the message recurs when the cover has not been removed, have the computer serviced.</p> |
| 177 | <p>An inventory violation occurred. This error message is part of the SystemCare and Asset ID features of your computer.</p> <p>Action: You must enter the administrator password to clear this POST message.</p> |
| 183 | <p>Password message received if administrator password is set.</p> <p>Action: You must enter the administrator password to clear this POST message. If the message recurs when the cover has not been removed, have the computer serviced.</p> |
| 184 | <p>Asset control antenna not detected.</p> <p>Action: You must enter the administrator password to clear this POST message. If the message recurs and the cover has not been removed, have the computer serviced.</p> |
| 186 | <p>Security hardware control logic error. The security data could either not be read or written and the administrator password and startup sequence are not reliable.</p> <p>Action: If your computer is in enhanced security mode, the startup process will not continue. The system board must be replaced.</p> |
| 187 | <p>A problem occurred with the administrator password and startup (boot) sequence. POST message 167 will normally display, also.</p> <p>Action: If enhanced security is not enabled, use the Configuration/Setup Utility program to:</p> <ol style="list-style-type: none"> 1. Clear the startup sequence (Start Options, Startup sequence). 2. Clear the administrator password. For instructions, see “Deleting an Administrator Password” on page 54. 3. Reload the default settings (Load Default Settings). 4. Reset an administrator password. For instructions, see “Setting or Changing an Administrator Password” on page 52. <p>For instructions on using the Configuration/Setup Utility program, see Chapter 5, “Using the Configuration/Setup Utility Program” on page 41.</p> |
| 190 | <p>The computer chassis-intrusion detector was cleared. This is an informational message. No action is required.</p> |

| POST Message | Description |
|--------------|--|
| 20X | <p>A failure occurred during testing of the memory. This error can be caused by incorrectly installed memory, a failing DIMM, or a system-board failure.</p> <p>Action:</p> <ol style="list-style-type: none"> 1. If you have added memory, see “Memory DIMM Options” on page 85 and Chapter 5, “Using the Configuration/Setup Utility Program” on page 41 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 126 for information about diagnostic programs provided with your computer.) <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| 301 303 | <p>A failure occurred during testing of the keyboard and keyboard controller. These error messages also might be accompanied by continuous beeping.</p> <p>Action:</p> <p>Ensure that:</p> <ol style="list-style-type: none"> 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. (For the location of the keyboard connector, refer to Chapter 2, “Setting Up Your Computer” on page 5.) <p>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.</p> |
| 601 | <p>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.</p> <p>Note: The computer can be used, but one or more diskette drives might not work.</p> <p>Action: Verify that all diskette drive cables are properly installed and securely connected.</p> <p>Running the diagnostic programs might isolate the diskette drive that failed, but you must have your computer serviced. (See “IBM Enhanced Diagnostics” on page 126 for information about diagnostic programs provided with your computer.)</p> |
| 602 | <p>The computer is not able to start the diskette in the drive. The diskette might be damaged or formatted incorrectly.</p> <p>Action: Try another startable diskette that is formatted correctly and is in good condition. (For information and instructions on formatting diskettes, refer to <i>Understanding Your IntelliStation E Pro</i> and your operating-system documentation.)</p> <p>If this does not correct the problem, have the computer serviced.</p> |

| POST Message | Description |
|--------------|--|
| 604 | <p>A failure occurred during the testing of a diskette drive.</p> <p>Action:</p> <ol style="list-style-type: none"> 1. Verify that the Configuration/Setup Utility program correctly reflects the type of diskette drive you have installed. (For instructions on using the Configuration/Setup Utility program, refer to Chapter 5, "Using the Configuration/Setup Utility Program" on page 41.) 2. Run the diagnostic programs. (See "IBM Enhanced Diagnostics" on page 126 for information about diagnostic programs provided with your computer.) 3. If the diagnostic programs detect a failure, replace the diskette drive. <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| 662 | <p>A diskette drive configuration error occurred.</p> <p>Action:</p> <ol style="list-style-type: none"> 1. Verify that the Configuration/Setup Utility program correctly reflects the number of diskette drives you have installed. (For instructions on using the Configuration/Setup Utility program, refer to Chapter 5, "Using the Configuration/Setup Utility Program" on page 41.) 2. If you installed or removed a diskette drive, you must save the new configuration in the Configuration/Setup Utility program. Refer to the Important text box on page 44 for further information and instructions on saving the configuration. Run the diagnostic programs. <p>If this does not correct the problem, have the computer serviced.</p> |
| 1762 | <p>A hard disk configuration error occurred.</p> <p>Action:</p> <ol style="list-style-type: none"> 1. Verify that the Configuration/Setup Utility program correctly reflects the number of hard disk drives you have installed. (For instructions on using the Configuration/Setup Utility program, refer to Chapter 5, "Using the Configuration/Setup Utility Program" on page 41.) 2. If you added or removed a hard disk drive, you must save the new configuration in the Configuration/Setup Utility program. Refer to the Important text box on page 44 for further information and instructions on saving the configuration. <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| POST Message | Description |
|--------------|--|
| 178X | <p>A failure occurred during testing of the hard disk drive or a primary or secondary IDE device.</p> <p>Action:</p> <ol style="list-style-type: none"> 1. Run the diagnostic programs. (See “IBM Enhanced Diagnostics” on page 126 for information about diagnostic programs provided with your computer.) 2. If the diagnostic programs detect a failure, replace the defective hard disk drive or primary or secondary IDE or EIDE device. <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| 1800 | <p>A PCI adapter has requested a hardware interrupt that is not available.</p> <p>Action:</p> <ol style="list-style-type: none"> 1. Make sure that settings for all ISA legacy adapters are correct 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 (non-Plug and Play) adapters, refer to <i>Installing Options in Your IntelliStation E Pro</i>. For information about required interrupt resource settings for ISA legacy adapters, refer to the documentation supplied with these adapters. For instructions on using the Configuration/Setup Utility program, see Chapter 5, “Using the Configuration/Setup Utility Program” on page 41. 2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, refer to 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 Chapter 7, “Installing Options Overview” on page 81. 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. <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| POST Message | Description |
|--------------|---|
| 1801 | <p data-bbox="539 213 1215 236">A PCI adapter has requested memory resources that are not available.</p> <p data-bbox="539 251 615 274">Action:</p> <ol data-bbox="554 289 1268 1046" style="list-style-type: none"> <li data-bbox="554 289 1268 421">1. Make sure that settings for all ISA legacy adapters are correct 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 (non-Plug and Play) adapters, refer to <i>Installing Options in Your IntelliStation E Pro</i>. For information about required memory resource settings for ISA legacy adapters, refer to the documentation supplied with these adapters. For instructions on using the Configuration/Setup Utility program, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="554 637 1233 716">2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, refer to the documentation supplied with the ISA legacy adapters. <li data-bbox="554 730 1243 862">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 Chapter 7, "Installing Options Overview" on page 81. Note: If you remove an ISA legacy adapter, set the memory resources used by the removed adapter to Available before installing another adapter. <li data-bbox="554 970 1268 1046">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. <p data-bbox="539 1060 1186 1107">If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| POST Message | Description |
|--------------|--|
| 1802 | <p data-bbox="429 213 1125 262">A PCI adapter has requested an I/O address that is not available, or the PCI adapter might be defective.</p> <p data-bbox="429 279 501 300">Action:</p> <ol data-bbox="429 317 1159 1072" style="list-style-type: none"> <li data-bbox="429 317 1159 447">1. Make sure that settings for all ISA legacy adapters are correct 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 (non-Plug and Play) adapters, refer to <i>Installing Options in Your IntelliStation E Pro</i>. For information about required I/O resource settings for ISA legacy adapters, refer to the documentation supplied with these adapters. For instructions on using the Configuration/Setup Utility program, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="429 664 1125 743">2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, refer to the documentation supplied with the ISA legacy adapters. <li data-bbox="429 760 1159 890">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 Chapter 7, "Installing Options Overview" on page 81. Note: If you remove an ISA legacy adapter, set the I/O address used by the removed adapter to Available before installing another adapter. <li data-bbox="429 994 1159 1072">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. <p data-bbox="429 1090 1076 1138">If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| POST Message | Description |
|--------------|---|
| 1803 1804 | <p data-bbox="539 213 1268 262">A PCI adapter has requested a memory address that is not available, or the PCI adapter might be defective.</p> <p data-bbox="539 279 611 302">Action:</p> <ol data-bbox="554 319 1253 887" style="list-style-type: none"> <li data-bbox="554 319 1253 453">1. Make sure that settings for all ISA legacy adapters are correct 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 (non-Plug and Play) adapters, refer to <i>Installing Options in Your IntelliStation E Pro</i>. For information about required memory resource settings for ISA legacy adapters, refer to the documentation supplied with these adapters. For instructions on using the Configuration/Setup Utility program, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="554 666 1229 743">2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, refer to the documentation supplied with the ISA legacy adapters. <li data-bbox="554 760 1253 887">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 Chapter 7, "Installing Options Overview" on page 81. <p data-bbox="579 904 1253 980">Note: If you remove an ISA legacy adapter, set the memory address used by the removed adapter to Available before installing another adapter.</p> <ol data-bbox="554 998 1253 1074" style="list-style-type: none"> <li data-bbox="554 998 1253 1074">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. <p data-bbox="539 1091 1186 1142">If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| 1805 | <p data-bbox="539 1159 1082 1182">A PCI adapter read-only memory (ROM) error occurred.</p> <p data-bbox="539 1199 1253 1275">Action: Remove all of the PCI adapters that are not required for system startup and reinstall them one at a time, retesting after each is reinstalled. When an adapter fails, replace it.</p> <p data-bbox="539 1293 1186 1340">If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| POST Message | Description |
|--------------|---|
| 1880 | <p data-bbox="429 213 1118 262">A Plug and Play adapter has requested a hardware interrupt that is not available.</p> <p data-bbox="429 279 501 300">Action:</p> <ol data-bbox="429 317 1118 1177" style="list-style-type: none"> <li data-bbox="429 317 1118 447">1. Make sure that settings for all ISA legacy adapters are correct 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 (non-Plug and Play) adapters, refer to <i>Installing Options in Your IntelliStation E Pro</i>. For information about required interrupt resource settings for ISA legacy adapters, refer to the documentation supplied with these adapters. For instructions on using the Configuration/Setup Utility program, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="429 664 1118 743">2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, refer to the documentation supplied with the ISA legacy adapters. <li data-bbox="429 760 1118 890">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 Chapter 7, "Installing Options Overview" on page 81. Note: If you remove an ISA legacy adapter, set the hardware interrupt used by the removed adapter to Available before installing another adapter. <li data-bbox="429 994 1118 1072">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. <li data-bbox="429 1090 1118 1138">5. If your system will be loading a Plug and Play operating system, ensure that Plug and Play Operating System is set to Yes. <li data-bbox="429 1156 1118 1177">6. Ensure that the address decode value for the adapter is properly set. <p data-bbox="429 1194 1075 1242">If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| POST Message | Description |
|--------------|---|
| 1881 | <p data-bbox="539 213 1219 262">A Plug and Play adapter has requested memory resources that are not available.</p> <p data-bbox="539 279 615 298">Action:</p> <ol data-bbox="554 317 1258 1177" style="list-style-type: none"> <li data-bbox="554 317 1258 447">1. Make sure that settings for all ISA legacy adapters are correct 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 (non-Plug and Play) adapters, refer to <i>Installing Options in Your IntelliStation E Pro</i>. For information about required memory resource settings for ISA legacy adapters, refer to the documentation supplied with these adapters. For instructions on using the Configuration/Setup Utility program, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="554 664 1229 743">2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, refer to the documentation supplied with the ISA legacy adapters. <li data-bbox="554 760 1248 890">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 Chapter 7, "Installing Options Overview" on page 81. Note: If you remove an ISA legacy adapter, set the memory resources used by the removed adapter to Available before installing another adapter. <li data-bbox="554 994 1262 1072">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. <li data-bbox="554 1090 1200 1138">5. If your system will be loading a Plug and Play operating system, ensure that Plug and Play Operating System is set to Yes. <li data-bbox="554 1156 1236 1177">6. Ensure that the address decode value for the adapter is properly set. <p data-bbox="539 1194 1186 1236">If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| POST Message | Description |
|--------------|--|
| 1882 | <p data-bbox="429 213 1065 262">A Plug and Play adapter has requested an I/O address that is not available, or the Plug and Play adapter might be defective.</p> <p data-bbox="429 279 501 298">Action:</p> <ol data-bbox="429 317 1159 1177" style="list-style-type: none"> <li data-bbox="429 317 1159 447">1. Make sure that settings for all ISA legacy adapters are correct 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 (non-Plug and Play) adapters, refer to <i>Installing Options in Your IntelliStation E Pro</i>. For information about required I/O resource settings for ISA legacy adapters, refer to the documentation supplied with these adapters. For instructions on using the Configuration/Setup Utility program, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="429 664 1122 743">2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, refer to the documentation supplied with the ISA legacy adapters. <li data-bbox="429 760 1159 890">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 Chapter 7, "Installing Options Overview" on page 81. Note: If you remove an ISA legacy adapter, set the I/O address used by the removed adapter to Available before installing another adapter. <li data-bbox="429 994 1159 1072">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. <li data-bbox="429 1090 1093 1138">5. If your system will be loading a Plug and Play operating system, ensure that Plug and Play Operating System is set to Yes. <li data-bbox="429 1156 1126 1177">6. Ensure that the address decode value for the adapter is properly set. <p data-bbox="429 1194 1076 1242">If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| POST Message | Description |
|--------------|--|
| 1883 1884 | <p data-bbox="539 213 1206 262">A Plug and Play adapter has requested a memory address that is not available, or the Plug and Play adapter might be defective.</p> <p data-bbox="539 279 611 302">Action:</p> <ol data-bbox="554 319 1268 1177" style="list-style-type: none"> <li data-bbox="554 319 1268 447">1. Make sure that settings for all ISA legacy adapters are correct 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 (non-Plug and Play) adapters, refer to <i>Installing Options in Your IntelliStation E Pro</i>. For information about required memory resource settings for ISA legacy adapters, refer to the documentation supplied with these adapters. For instructions on using the Configuration/Setup Utility program, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="554 666 1229 743">2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, refer to the documentation supplied with the ISA legacy adapters. <li data-bbox="554 760 1268 888">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 Chapter 7, "Installing Options Overview" on page 81. Note: If you remove an ISA legacy adapter, set the memory address used by the removed adapter to Available before installing another adapter. <li data-bbox="554 996 1243 1072">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. <li data-bbox="554 1090 1200 1138">5. If your system will be loading a Plug and Play operating system, ensure that Plug and Play Operating System is set to Yes. <li data-bbox="554 1156 1236 1177">6. Ensure that the address decode value for the adapter is properly set. <p data-bbox="539 1194 1186 1241">If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| 1885 | <p data-bbox="539 1258 1182 1281">A Plug and Play adapter read-only memory (ROM) error occurred.</p> <p data-bbox="539 1298 1268 1374">Action: Remove all of the Plug and Play adapters that are not required for system startup and reinstall them one at a time, retesting after each is reinstalled. When an adapter fails, replace it.</p> <p data-bbox="539 1392 1186 1437">If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| POST Message | Description |
|--------------|--|
| 1886 | <p data-bbox="429 213 1068 262">A Plug and Play adapter has requested a DMA address that is not available.</p> <p data-bbox="429 279 501 302">Action:</p> <ol data-bbox="429 319 1160 1177" style="list-style-type: none"> <li data-bbox="429 319 1160 447">1. Make sure that settings for all ISA legacy adapters are correct 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 (non-Plug and Play) adapters, refer to <i>Installing Options in Your IntelliStation E Pro</i>. For information about required DMA resource settings for ISA legacy adapters, refer to the documentation that comes with these adapters. For instructions on using the Configuration/Setup Utility program, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="429 666 1122 743">2. Make sure that switches on all ISA legacy adapters are set correctly. For information about switch settings, refer to the documentation supplied with the ISA legacy adapters. <li data-bbox="429 760 1160 888">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 Chapter 7, "Installing Options Overview" on page 81. Note: If you remove an ISA legacy adapter, set the DMA address used by the removed adapter to Available before installing another adapter. <li data-bbox="429 996 1133 1072">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. <li data-bbox="429 1090 1093 1138">5. If your system will be loading a Plug and Play operating system, ensure that Plug and Play Operating System is set to Yes. <li data-bbox="429 1156 1125 1177">6. Ensure that the address decode value for the adapter is properly set. <p data-bbox="429 1194 1076 1242">If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| POST Message | Description |
|---------------|---|
| 1962 | <p>A startup sequence error occurred.</p> <p>Action:</p> <ol style="list-style-type: none"> 1. Make sure the settings for startup options are correct in the Configuration/Setup Utility program. If the settings are not correct, change and save them. For instructions, see Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. 2. Make sure the primary IDE (or, if applicable, SCSI) cable is properly installed and securely connected. 3. Make sure all adapters are installed correctly. For instructions on adding adapters, see Chapter 7, "Installing Options Overview" on page 81. <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| 2462 | <p>A video configuration error occurred.</p> <p>Action:</p> <ol style="list-style-type: none"> 1. Make sure the monitor signal cable is securely attached to the monitor connector. (For the location of the monitor connector, refer to Chapter 2, "Setting Up Your Computer" on page 5.) 2. If you just added or removed video memory, you must save the new configuration in the Configuration/Setup Utility program. Refer to the Important text box on page 44 for further information and instructions on saving the configuration. <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| 8601 8603 | <p>A pointing device or system board error occurred.</p> <p>Action: Have the computer serviced.</p> |
| I9990301 | <p>A hard disk failure occurred.</p> <p>Action: Have the computer serviced.</p> |
| Other Numbers | <p>The computer POST found an error.</p> <p>Action: Follow the instructions on the screen.</p> |

POST Beep Codes

One beep and the appearance of text on the monitor indicate successful completion of POST. More than one beep indicates that POST detected an error.

Beep codes are sounded in a series of two or three sets of beeps. The duration of each beep is constant, but the length of the pause between the beeps varies. For example, a 1-2-4 beep code sounds like one beep, a pause, two consecutive beeps, another pause, and four more consecutive beeps.

It is possible to misinterpret beep codes if you do not understand exactly how they work. Keeping in mind that POST beep codes vary in the length of the pause, and not the duration of the beep tones, will help you to distinguish the beeps.

POST Beep Code Table

For the following beep codes, the numbers indicate the sequence and number of beeps. For example, a “2-3-2” error symptom (a burst of two beeps, three beeps, then two beeps) indicates a memory module problem. An x in an error message can represent any number.

If the following beep codes occur, have the system serviced.

| Beep Code | Probable Cause |
|------------------|--|
| 1-1-3 | CMOS write/read failure |
| 1-1-4 | BIOS ROM checksum failure |
| 1-2-1 | Programmable interval timer test failure |
| 1-2-2 | DMA initialization failure |
| 1-2-3 | DMA page register write/read test failure |
| 1-2-4 | RAM refresh verification failure |
| 1-3-1 | First 64 K RAM test failure |
| 1-3-2 | First 64 K RAM parity test failure |
| 2-1-1 | Secondary DMA register test in progress or failure |
| 2-1-2 | Primary DMA register test in progress or failure |
| 2-1-3 | Primary interrupt mask register test failure |
| 2-1-4 | Secondary interrupt mask register test failure |
| 2-2-2 | Keyboard controller test failure |
| 2-3-2 | Screen memory test in progress or failure |

| Beep Code | Probable Cause |
|------------------|---|
| 2-3-3 | Screen retrace tests in progress or failure |
| 3-1-1 | Timer tick interrupt test failure |
| 3-1-2 | Interval timer channel 2 test failure |
| 3-1-4 | Time-of-day clock test failure |
| 3-2-4 | Comparing CMOS memory size against actual |
| 3-3-1 | Memory size mismatch occurred |

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, see Chapter 7, “Installing Options Overview” on page 81 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 126 for information about diagnostic programs provided with your computer.)
 - Reinstall the new software or new device.

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

| Problem Type | Go to: |
|-------------------------------------|---------------|
| Diskette Drive | Page 117 |
| General | Page 120 |
| Intermittent | Page 121 |
| Keyboard, Mouse, or Pointing-Device | Page 121 |
| Memory | Page 122 |
| Monitor | Page 117 |
| Option | Page 123 |
| Parallel Port | Page 124 |
| Printer | Page 125 |
| Serial Port | Page 124 |
| Software | Page 125 |

| Diskette Drive Problems | Action |
|--|---|
| Diskette drive in-use light stays on, or the system bypasses the diskette drive. | <p data-bbox="539 249 1019 274">If there is a diskette in the drive, verify that:</p> <ol data-bbox="554 296 1268 887" style="list-style-type: none"> <li data-bbox="554 296 1268 413">1. The diskette drive is enabled. Use the Configuration/Setup Utility program to check the setting. For instructions, refer to Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="554 430 1268 517">2. The computer is checking for the diskette drive in the startup sequence. Use the Configuration/Setup Utility program to verify this. <li data-bbox="554 534 1268 586">3. The diskette you are using is good and not damaged. Try inserting another diskette if you have one. <li data-bbox="554 604 1268 656">4. The diskette is inserted correctly, with its label up and its metal-shutter end first in the drive. <li data-bbox="554 673 1268 743">5. The diskette contains the necessary files to start the computer (the diskette must be startable). <li data-bbox="554 760 1268 812">6. The diskette drive cable is properly installed and securely connected. <li data-bbox="554 829 1268 887">7. There is no problem with your software program (see Software Problem on page 125). <p data-bbox="539 904 1268 956">If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| Monitor Problems | Action |
|---------------------------|---|
| General monitor problems. | <p data-bbox="539 1069 1268 1156">Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, refer to the information supplied with the monitor for adjustment and testing instructions.</p> <p data-bbox="539 1173 1268 1225">If you cannot find the problem, check the other listings on monitor problems in this table.</p> <p data-bbox="539 1242 1268 1295">If the problem cannot be isolated and corrected, have the monitor and computer serviced.</p> |

| Monitor Problems | Action |
|---|--|
| Wavy, unreadable, rolling, distorted, or jittery screen images. | <p data-bbox="429 217 1153 274">If the monitor self-tests show that the monitor is working properly, verify that:</p> <ol data-bbox="429 291 1153 933" style="list-style-type: none"> <li data-bbox="429 291 1153 413">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 this is the difficulty: <ol data-bbox="482 430 1153 690" style="list-style-type: none"> <li data-bbox="482 430 1153 482">a. Turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.) <li data-bbox="482 499 1153 647">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. <li data-bbox="482 664 743 690">c. Turn on the monitor. <li data-bbox="429 708 1153 829">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. <li data-bbox="429 847 1153 933">3. You are not trying to run your monitor at a higher refresh rate than the monitor supports. Refer to the documentation supplied with your monitor for supported refresh rates. <p data-bbox="429 951 1153 1038">Note: An enhanced monitor signal cable with additional shielding might be available for your monitor. See your IBM reseller or IBM marketing representative for information.</p> <p data-bbox="429 1055 1153 1107">If the problem cannot be isolated and corrected, have the monitor and computer serviced.</p> |

| Monitor Problems | Action |
|--|--|
| Screen flickers. | <p>Set the monitor for the highest, noninterlaced refresh rate supported by the monitor and the video controller in your computer. Refer to the documentation supplied with your monitor and the README file that is provided on the <i>Ready-to-Configure Utility Program</i> CD for your computer for information on the refresh rates supported by your monitor and the video controller in your computer.</p> <p>Important: Using a resolution or refresh rate that is not supported by your monitor might damage it.</p> <p>You can reset the refresh rate through your operating system. Instructions for doing this are included in the README file that corresponds to your operating system, which is provided on the <i>Ready-to-Configure CD</i>. Refer to your operating-system documentation for further information on monitor settings.</p> <p>If this does not correct the problem, have the monitor and computer serviced.</p> |
| <p>The monitor works when you turn on the system, but goes blank when you start some application programs.</p> | <p>Verify that:</p> <ol style="list-style-type: none"> 1. The monitor signal cable is securely connected to the monitor and the monitor connector on the computer. For the location of the monitor connector, see Chapter 2, "Setting Up Your Computer" on page 5. 2. The necessary device drivers for the application programs are installed. <p>If the problem cannot be isolated and corrected, have the monitor and computer serviced.</p> |
| <p>The monitor works when you turn on the system, but goes blank after some period of computer inactivity.</p> | <p>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 "Setting Power Management Features" on page 56).</p> <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| Monitor Problems | Action |
|---|---|
| Blank screen. | <p>Verify that:</p> <ol style="list-style-type: none"> 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 computer. For the location of the monitor connector, see Chapter 2, "Setting Up Your Computer" on page 5. <p>If the problem cannot be isolated and corrected, have the monitor and computer serviced.</p> |
| Only the cursor appears. | Have the computer serviced. |
| Wrong characters appear on the screen. | Have the computer serviced. |
| General Problems | Action |
| The computer does not start when you press the power switch. | <p>Verify that:</p> <ol style="list-style-type: none"> 1. The computer power cord is plugged into the computer and a working electrical outlet. 2. All cables are securely connected to the proper connectors on the computer. For the location of the connectors, refer to Chapter 2, "Setting Up Your Computer" on page 5. 3. The voltage-selection switch is set to the correct position. <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| Problems such as a broken cover lock or indicator lights not working. | Have the computer serviced. |

| Intermittent Problems | Action |
|--|---|
| A problem occurs only occasionally and is difficult to detect. | <p>Verify that:</p> <ol style="list-style-type: none"> 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 an optional SCSI adapter and SCSI devices are installed, the last external device in each SCSI chain is terminated correctly. (See your SCSI documentation.) <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| Keyboard, Mouse, or Pointing-Device Problems | Action |
| All or some keys on the keyboard do not work. | <p>Verify that:</p> <ol style="list-style-type: none"> 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 Chapter 2, "Setting Up Your Computer" on page 5. <p>If the problem cannot be isolated and corrected, have the keyboard and computer serviced.</p> |
| The mouse or pointing device does not work. | <p>Verify that:</p> <ol style="list-style-type: none"> 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, it will connect to either the mouse or serial connector. To find the mouse and serial connectors, see Chapter 2, "Setting Up Your Computer" on page 5. 2. The device drivers for the mouse are installed correctly. <p>If the problem cannot be isolated and corrected, have the computer and the device serviced.</p> |

| Memory Problems | Action |
|---|--|
| The amount of memory displayed is less than the amount of memory installed. | <p>The amount of available memory shown might be somewhat less than expected because of basic input/output system (BIOS) shadowing in random access memory (RAM).</p> <p>Verify that:</p> <ol style="list-style-type: none"> 1. You have installed the correct type of DIMMs for your computer. Refer to “Memory DIMM Options” on page 85 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 in the Configuration/Setup Utility program. See the Important text box on page 44 for instructions on saving the configuration. <p>If the problem persists, run the memory test from the diagnostic program supplied with your computer. (See “IBM Enhanced Diagnostics” on page 126 for further information.) The system might have detected a bad DIMM and automatically reallocated memory to enable you to continue to operate.</p> <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |
| Not enough memory message is displayed. | <p>Verify that terminate-and-stay-resident programs (TSRs) are not taking up memory. (See “Managing TSR Programs (DOS or Microsoft Windows 3.1x)” on page 129.)</p> |

| Option Problems | Action |
|---|--|
| An IBM option that was just installed does not work. | <p>Verify that:</p> <ol style="list-style-type: none"> 1. The option is designed for your computer. 2. You followed the installation instructions supplied with the option and in <i>Installing Options in Your IntelliStation E Pro</i>. 3. All option files (if required) are installed correctly. See “Installing Files from Option Diskettes” on page 129 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. Refer to 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 instructions, refer to Chapter 5, “Using the Configuration/Setup Utility Program” on page 41. <p>If the problem persists, run the diagnostic programs. (See “IBM Enhanced Diagnostics” on page 126 for information about diagnostic programs provided with your computer.)</p> <p>If the problem cannot be isolated and corrected, have the computer and the option serviced.</p> |
| An IBM option that previously worked does not work now. | <p>Verify that all of the option hardware and cable connections are secure.</p> <p>If the option comes with its own test instructions, use those instructions to test the option.</p> <p>If the failing option is a SCSI option, verify that:</p> <ol style="list-style-type: none"> 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. <p>For more information, see your SCSI documentation.</p> <p>If the problem cannot be isolated and corrected, have the computer and option serviced.</p> |

| Parallel Port Problems | Action |
|-----------------------------------|--|
| Parallel port cannot be accessed. | <p>Verify that:</p> <ol style="list-style-type: none"> <li data-bbox="444 296 1125 413">1. Each port is assigned a unique address (not set to Disabled). Use the Configuration/Setup Utility program to check the setting. For instructions, refer to Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="444 430 1110 546">2. The parallel-port adapter, if you added one, is properly installed and firmly seated. Refer to Chapter 7, "Installing Options Overview" on page 81 for instructions on adding adapters. <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| Serial Port Problems | Action |
|---------------------------------|--|
| Serial port cannot be accessed. | <p>Verify that:</p> <ol style="list-style-type: none"> <li data-bbox="444 777 1125 894">1. Each port is assigned a unique address (not set to Disabled). Use the Configuration/Setup Utility program to check the setting. For instructions, refer to Chapter 5, "Using the Configuration/Setup Utility Program" on page 41. <li data-bbox="444 911 1149 998">2. The serial-port adapter, if you added one, is properly installed and firmly seated. Refer to Chapter 7, "Installing Options Overview" on page 81 for instructions on adding adapters. <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |

| Printer Problems | Action |
|----------------------------|---|
| The printer does not work. | <p>Verify that:</p> <ol style="list-style-type: none"> 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. (Refer to Chapter 2, "Setting Up Your Computer" on page 5 for the location of the printer, serial, and USB ports.) <p>Note: Non-IBM printer signal cables might cause unpredictable problems.</p> <ol style="list-style-type: none"> 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 instructions on using the Configuration/Setup Utility program, refer to Chapter 5, "Using the Configuration/Setup Utility Program" on page 41.) 5. If the problem persists, run the tests described in the documentation supplied with your printer. <p>If the problem cannot be isolated and corrected, have the computer and printer serviced.</p> |

| Software Problem | Action |
|------------------------------|---|
| Is your software program OK? | <p>To determine if problems are caused by installed software, verify that:</p> <ol style="list-style-type: none"> 1. Your computer has the minimum memory requirements needed to use the software. Refer to the information supplied with the software to verify memory requirements. <p>Note: If you have just installed an adapter or memory, you might have a memory address conflict.</p> <ol style="list-style-type: none"> 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. <p>If you received any error messages while using the software program, refer to the information supplied with the software for a description of the messages and solutions to the problem.</p> <p>If the problem cannot be isolated and corrected, have the computer serviced.</p> |

IBM Enhanced Diagnostics

IBM provides programs that you can run to diagnose hardware and some software problems. Several utility programs that provide helpful information about your computer are also included. The user interface for running these diagnostics and utilities is provided by WaterGate Software's 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*. 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.

An IBM Enhanced Diagnostics CD-ROM comes with your computer. You can also download the latest image of the diagnostics from the World Wide Web.

To download the latest image of the IBM Enhanced Diagnostics from the World Wide Web and create a bootable Enhanced Diagnostics Diskette:

1. Go to the following World Wide Web page:

<http://www3.pc.ibm.com/support?page=IBM+IntelliStation>

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-density diskette in diskette drive A.
5. Key in the following:

<filename> a:

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

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

To start the IBM Enhanced Diagnostics using the CD, do the following:

1. Shut down the operating system.
2. Turn off your computer and any attached devices.
3. Turn on all attached devices; then turn your computer on.
4. When you see *Press F1 For Configuration/Setup*, press the **F1** key.
5. When the Configuration/Setup Utility menu appears, select **Start Options**.

6. Select **Startup Sequence** from the Start Options menu.
7. Note the device selected as the First Startup Device. Later, you must restore this setting.
8. Select *CD ROM* as the First Startup Device.
9. Press **Esc** two times to return to the Configuration/Setup Utility menu.
10. Select **Save Settings** and follow the prompts.
11. Place the IBM Enhanced Diagnostics CD in the CD-ROM drive.
12. Select **Exit Setup** and follow the prompts. The diagnostics will load. Follow the instructions on the screen to run the diagnostics.

Important Information

When you finish running diagnostics and utilities, remove the CD from the CD-ROM drive and turn the computer off. You must restore the First Startup Device back to the original setting. Use steps 3 on page 126 through 10 of the above procedure to do this.

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

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

Other Programs on the IBM Enhanced Diagnostics CD and Diskette: The IBM Enhanced Diagnostics CD and diskette also contain utility programs designed to provide information about your computer hardware and the way it is configured. This information might be useful in helping to isolate problems related to the operating system and device drivers.

Other Diagnostic Programs on the *Ready-to-Configure Utility Program CD*: The *Ready-to-Configure Utility Program CD* supplied with your computer also contains diagnostic programs designed specifically for certain operating environments (Windows 95 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.

CoSession Remote

CoSession Remote is a remote-control diagnostic program that can be used by another individual, such as an IBM technical support representative or your in-house administrator, to help diagnose from a remote location, problems with your computer. CoSession is provided on the *Ready-to-Configure CD* for your computer. To use CoSession, it must be installed in your computer.

Important

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

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. Refer to the documentation supplied with the option to see if you need to install files.

Managing TSR Programs (DOS or Microsoft Windows 3.1x)

Terminate-and-stay-resident programs (TSRs) are loaded into memory and stay there so you can access them whenever you want. If you are loading or using an application program and receive a message that you do not have enough memory, TSR programs might be taking up valuable space.

Check the documentation supplied with each TSR program to find out how to solve this problem. You might be able to remove the program from memory for the rest of your current work session. Sometimes you can change the order in which the TSRs are loaded so that memory is used more efficiently. Or perhaps you can remove from the AUTOEXEC.BAT file the TSR programs that you do not use frequently.

See your operating-system documentation for assistance on editing or disabling statements in the AUTOEXEC.BAT file.

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 136 for HelpCenter telephone numbers in other countries.

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 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 14 400 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 that contain information about IBM products include:

- CompuServe
Use the following GO words: APTIVA, IBMPS2, ThinkPad, PowerPC, ValuePoint, IBMSVR, or IBMObI.
- PRODIGY
Use the Jump command; type **IBM** and select **PC Product Support**.
- America Online
Use the “Go to” keyword **IBM Connect**.

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.

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 |

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

| Country | | Telephone number |
|------------------------|------------------------|-------------------------|
| 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 |
| 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 139.

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 through 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

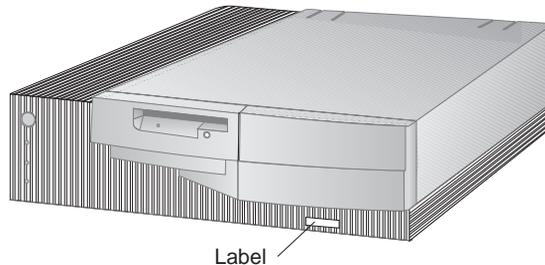
This appendix contains forms for recording information about your computer, which can be helpful if you decide to install additional hardware, or if you ever need to have your computer serviced.

Serial Numbers and Keys

Record and retain the following information.

| | |
|---------------------|----------------------|
| Product Name | IntelliStation E Pro |
| Model/Type (M/T) | Type 6893 |
| Serial Number (S/N) | _____ |
| Key Serial Number | _____ |
| Key Address | _____ |

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



Your computer comes with a cover lock. Be careful not to lose your keys, since they cannot be duplicated by locksmiths. If you do lose them, order replacement keys from the key manufacturer. The key serial number and the address of the manufacturer are on a tag attached to the keys. Anyone who has the key serial number and manufacturer's address can order duplicate keys, so store the tag in a safe place. If you record the key serial number in this book, either remove the page and store it in a secure place, or store this book in a secure place when you are not using it.

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.

| Location | Option Description |
|----------------------|---|
| System Memory | |
| (DIMM 0) | <input type="checkbox"/> 16 MB <input type="checkbox"/> 32 MB <input type="checkbox"/> 64 MB <input type="checkbox"/> 128 MB |
| (DIMM 1) | <input type="checkbox"/> 16 MB <input type="checkbox"/> 32 MB <input type="checkbox"/> 64 MB <input type="checkbox"/> 128 MB |
| (DIMM 2) | <input type="checkbox"/> 16 MB <input type="checkbox"/> 32 MB <input type="checkbox"/> 64 MB <input type="checkbox"/> 128 MB |
| Expansion Slot 1 | _____ |
| Expansion Slot 2 | _____ |
| Expansion Slot 3 | _____ |
| Expansion Slot 4 | _____ |
| AGP Slot | <input type="checkbox"/> Matrox Millennium II AGP graphics adapter <input type="checkbox"/> Matrox Millennium G200 AGP graphics adapter <input type="checkbox"/> STB GLydeR MAX-2+ AGP graphics adapter |
| Microprocessor Speed | _____ |
| AGP Connector | _____ |
| Mouse Connector | <input type="checkbox"/> 3-button mouse <input type="checkbox"/> Other: _____ |
| Keyboard Connector | 104-key keyboard <input type="checkbox"/> Other: _____ |
| Parallel Connector | _____ |
| Serial Connector 1 | _____ |
| Serial Connector 2 | _____ |
| USB Connector 1 | _____ |
| USB Connector 2 | _____ |

| Location | Option Description |
|------------------|--------------------|
| Audio connectors | _____ |
| Bay 1 | _____ |
| Bay 2 | _____ |
| Bay 3 | _____ |
| Bay 4 | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

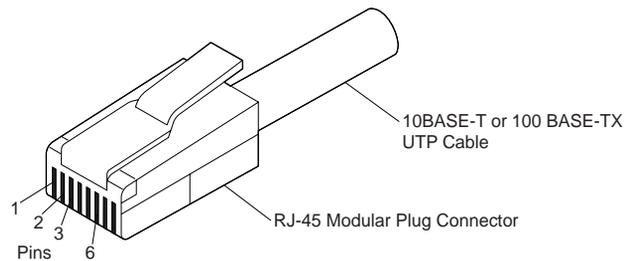
Appendix B. Ethernet Connector, Cable Specifications

The system board contains an Ethernet *controller*. The controller has an external RJ-45 connector on the rear of the computer that is used with a Category 3 or Category 5 twisted-pair cable. Through this connector, you can attach an Ethernet network cable to the internal transceiver in your computer.

Attention

The 10BASE-T Ethernet and the 100BASE-TX Fast Ethernet cabling in the network must be Category 5 or higher to meet various standards, including electromagnetic compatibility.

Ethernet Connector

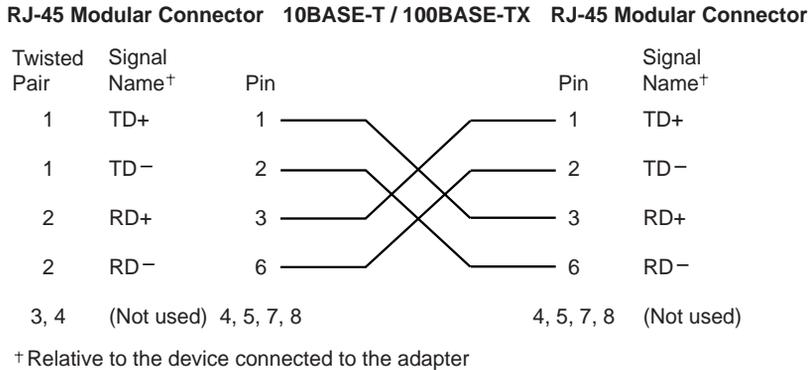


The following figure illustrates the wiring in straight-through cables.

| RJ-45 Modular Connector | | 10BASE-T / 100 BASE-TX | RJ-45 Modular Connector | |
|-------------------------|--------------------------|------------------------|-------------------------|--------------------------|
| Twisted Pair | Signal Name [†] | Pin | Pin | Signal Name [†] |
| 1 | TD+ | 1 | 1 | TD+ |
| 1 | TD- | 2 | 2 | TD- |
| 2 | RD+ | 3 | 3 | RD+ |
| 2 | RD- | 6 | 6 | RD- |
| 3, 4 | (Not used) | 4, 5, 7, 8 | 4, 5, 7, 8 | (Not used) |

[†] Relative to the device connected to the adapter

The following figure illustrates the wiring in crossover cables.



Note: For additional information about Ethernet protocols, refer to your Ethernet documentation.

Diagnostic LEDs

Green: Indicates the adapter is connected to a hub or switch and is receiving link pulses. If the green LED is not on, check all connections at the adapter and the hub. Make sure the hub is transmitting at the correct speed and the drivers are loaded.

Also, make sure you have the correct wiring configuration for the adapter to the hub connection. Some hubs require a crossover cable rather than a straight-through cable.

Note that this LED will be on when running the diagnostics loopback test without a cable attached to the adapter.

Yellow: Indicates 100 Mbps when on, and 10 Mbps when off.

Note that the yellow LED may stay on if link is broken during activity.

Ethernet Controller Messages

Note: The error messages shown in this section are available only with the integrated Ethernet controller. These error messages are not available when remote program load (RPL) or dynamic host configuration protocol (DHCP) is used through optional network adapters.

If a failure condition occurs after the Ethernet controller is initialized, an error message appears on the screen. The error messages that can occur are shown in the following sections. If you experience any error related to the integrated Ethernet controller, record the error message, and tell your network administrator about the problem.

The two most common error messages are:

RPL-ROM-ERR: 105 The integrated Ethernet failed the loopback test.

RPL-ROM-ERR: 107 Media test failed; check the cable.

Error 105 indicates that a power-on diagnostic test performed by the Ethernet module did not execute correctly. If this error message appears, you must have the server serviced. Error 107 indicates that the cable from the LAN is not securely connected to the Ethernet port on your server. Check the cable to ensure that it is properly connected.

Other error messages that might occur are shown below.

Note: An x value that follows an error code represents any alphanumeric character.

| Error Code | Description |
|-------------------|--|
| RPL-ROM-ERR: 100 | The integrated Ethernet controller cannot be found. Action: Make sure that the Ethernet controller is enabled in the BIOS. If the problem persists, have the system serviced. |
| RPL-ROM-ERR: 101 | The integrated Ethernet controller was unable to initialize. Action: Make sure that the Ethernet controller is enabled in the BIOS. If the problem persists, have the system serviced. |
| RPL-ROM-ERR: 102 | The integrated Ethernet controller could not be reset. Action: Make sure that the Ethernet controller is enabled in the BIOS. If the problem persists, have the system serviced. |
| RPL-ROM-ERR: 103 | There are multiple Ethernet controllers or adapters in the system. Action: Specify the correct serial number in the NET.CFG file. |
| RPL-ROM-ERR: 104 | The integrated Ethernet controller EEPROM is faulty or not present. |
| RPL-ROM-ERR: 105 | The integrated Ethernet failed the loopback test. A power-on diagnostic test performed by the Ethernet module did not execute correctly. Action: Have the system serviced. |
| RPL-ROM-ERR: 106 | The integrated Ethernet controller is configured for Plug and Play in a non-Plug and Play system. |

| Error Code | Description |
|-------------------|--|
| RPL-ROM-ERR: 107 | Media test failed; check the cable. Action: The cable from the LAN is not securely connected to the Ethernet port on your server. Check the cable to ensure that it is properly connected. |
| RPL-ROM-ERR: 110 | The integrated Ethernet controller RAM failed the memory test. Action: Have the system serviced. |
| E61 | Service boot (startup) canceled; that is, the boot diskette image was not downloaded from the network. Action: No action is required. |
| E62 | Cannot initialize controller. |
| E63 | Cannot initialize controller. |
| E67 | Cannot initialize controller. |
| E6d | Cannot find boot protocol (BOOTP) server. |
| E6e | Cannot start from downloaded image. |
| E71 | Too many multicast trivial file transfer protocol (MTFTP) packages. |
| M10 | Address resolution protocol (ARP) canceled by keystroke. Action: No action is required. |
| M11 | ARP timeout. |
| M20 | Cannot copy memory. |
| M21 | Cannot write to memory. |
| M22 | Cannot write to memory. |
| M30 | Cannot ARP trivial file transfer protocol (TFTP) address. |

| Error Code | Description |
|-------------------|---|
| M31 | TFTP canceled by keystroke. |
| M32 | TFTP open timeout. |
| M33 | Unknown TFTP parameter (operation code). |
| M34 | TFTP read canceled by keystroke. |
| M35 | TFTP timeout. |
| M38 | Cannot open TFTP connection. |
| M39 | Cannot read from TFTP connection. |
| M40 | BOOTP canceled by keystroke. |
| M40 | DHCP canceled by keystroke. |
| M41 | BOOTP timeout. |
| M41 | DHCP timeout. |
| M42 | No client or server Internet protocol (IP) address. |
| M43 | No boot (startup) file name. |
| M44 | Cannot ARP redirected BOOTP server. |
| M6f | System is locked. Press Ctrl+Alt+Del to restart. |
| M90 | Cannot initialize controller for multicast address. |
| M91 | MTFTP canceled by keystroke. |
| M92 | MTFTP open timeout. |
| M93 | Unknown MTFTP parameter (operation code). |
| M94 | MTFTP read canceled by keystroke. |
| M95 | MTFTP timeout. |
| M96 | Cannot ARP MTFTP address. |
| M98 | Cannot open MTFTP connection. |
| M99 | Cannot read from MTFTP connection. |
| Txx | If you are running a TFTP session to another computer, an error message generated by the TFTP session will contain a message prefix of Txx. |

Appendix C. Product Warranties 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 152)
- **Worldwide except Canada, Puerto Rico, Turkey, and United States (Z125-5697-01 11/97)**
(Part 1 - General Terms on page 155)
- **Worldwide Country-Unique Terms**
(Part 2 - Country-Unique Terms on page 158)

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 - IBM IntelliStation E Pro

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

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

The IBM Warranty for Machines

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

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

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

Extent of Warranty

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

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

Items Not Covered by Warranty

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

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

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

Warranty Service

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

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

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

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

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

You also agree to

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

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

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

Production Status

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

Limitation of Liability

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

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

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

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

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

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

Machine - IBM IntelliStation E Pro

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**.

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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

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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.

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.

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.

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

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Power Cord Notice

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

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

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

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

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

IBM power cords for a specific country 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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