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Using this Guide

The *NEC Image® P90E/P100E Series User's Guide* is a comprehensive source of information about your Image system. Before using this guide, set-up your system in accordance with the instructions in the *NEC Image P90E/P100E Quick Setup* sheet.

To get the most out of your system, read Chapters 1, 2, 3, and 4 in this guide. See:

- Chapter 1, *Features of Your System*, for an overview of your system's configuration and capabilities.
- Chapter 2, *Using Your System*, to familiarize yourself with system components and system operation.
- Chapter 3, *Setting System Parameters*, to check or change system setup parameters.
- Chapter 4, *Using ECU and SCSI Utilities*, to use configuration utilities for configuring expansion options.

See Chapter 5 for information on mouse parameters, video drivers, and BIOS update procedures.

For information on maintaining your computer, see Chapter 6.

Chapter 7 includes information about adding expansion options to your system.

See Chapter 8 to identify the system configuration switches and how to change the switch settings.

Chapter 9 provides a checklist of conditions to determine and solve a problem that might occur with your system.

See Appendix A, Setting Up a Healthy Work Environment, for guidelines to help you use your computer productively and safely. This appendix provides tips to prevent personal injuries commonly associated with using computers.

System specifications are included in Appendix B. Appendix C provides information on the CD-ROM reader installed in your system. Appendix D lists the optional memory upgrade path for your system.

Use this guide with the software documentation that comes with your system.

TEXT CONVENTIONS

This guide uses the following text conventions.

- Warnings, cautions, and notes have the following format:

WARNING: Warnings alert you to situations that could result in personal injury.

CAUTION: Cautions indicate situations that can damage the hardware or software.

NOTE: Notes give particularly important information about the material being described.

-
- Names of keyboard keys are printed as they appear on the keyboard, for example, **Ctrl**, **Alt**, or **Enter**.
 - Text or keystrokes that you enter appear in boldface type. For example, type **return** and press **Enter**.
 - File names are printed in uppercase letters.

RELATED DOCUMENTS

In addition to this guide, the following printed documentation ships with your Image system.

NOTE: Depending on your system configuration, it may ship with additional software and related documentation. See the label on the carton for your system configuration and a list of shipped software and documentation.

- *NEC Image P90E/P100E Quick Setup*
Contains information for quickly getting your system up and running. Use this information to set up your system for the first time.
- *Microsoft Windows for Workgroups and MS-DOS User's Guide*
Provides a comprehensive source of information for using Windows™ for Workgroups and MS-DOS®.

NOTE: MS-DOS and Windows for Workgroups are factory installed on hard disk systems.

- *EZ-SCSI User's Guide*
Provides information for using the SCSI utility provided with your system.

In addition to the documentation that ships with your system, the following documentation is available from NEC:

- *Image P90E/P100E Service and Reference Manual* (part number 819-181048-000) provides information for maintaining, troubleshooting, and repairing the system. This manual also includes hardware and interface information for programmers, engineers, and others who need to know how the system is designed.

To purchase the service and reference manual, call NEC at 1-800-632-4525 and follow the prompts. When prompted, provide the document name and part number.

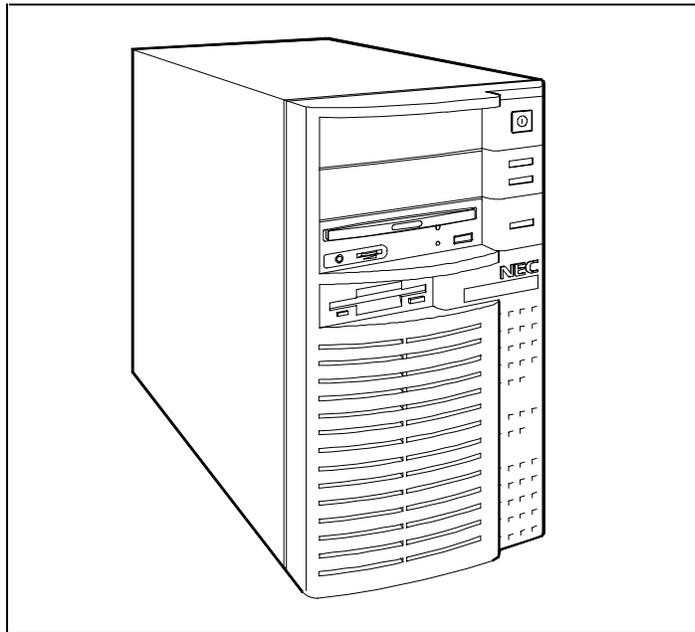
NEC also offers FastFacts™, an automated service that sends the latest information about NEC and its products directly to a fax machine. The service is available 24 hours a day, 7 days a week.

With FastFacts, you can obtain product literature and technical information bulletins. By using FastFacts, you can be kept up-to-date on the latest technical information for your Image system.

See “Product Information” in Chapter 1 for information about using FastFacts.

1 Features of Your System

The NEC Image P90E and Image P100E series of mini-tower systems consist of powerful computers featuring Intel's 90 megahertz (MHz) and 100 MHz Pentium™ microprocessors, exceptional balanced system performance, expandability, and upgradeability.



NEC Image P90E/P100E system

Each system is designed with a powerful architecture that optimizes performance, connectivity, graphics display, and expansion capabilities.

All systems feature a Peripheral Component Interconnect (PCI) bus, Extended Industry Standard Architecture (EISA) bus, enhanced Integrated Device Electronics (IDE) technology, fast small computer system interface-2 (SCSI-2) technology, and PCI/EISA bridge technology.

A key feature of the Image P90E and Image P100E systems is the PCI/EISA Bridge Component. The Bridge provides a link between the system's SCSI or IDE devices and the PCI bus, and between any optional SCSI, PCI, EISA, ISA, or IDE devices that you may install.

SYSTEM CONFIGURATIONS

The Image P90E and Image P100E systems come in several configurations.

■ Image P90E

- single-processor diskless systems (no hard disk or CD-ROM reader)
- single-processor systems with an IDE hard drive and an IDE quad-speed CD-ROM reader

■ Image P100E

- single-processor systems with an IDE hard drive and an IDE quad-speed CD-ROM reader
- single-processor systems with a SCSI-2 hard drive and an IDE quad-speed CD-ROM reader

All hard disk systems are shipped with the MS-DOS and Windows for Workgroups operating systems installed on the hard disk. The diskless systems ship with diskettes containing the operating systems.

The label on the carton that the system is shipped in identifies your configuration. Your system's configuration is also displayed during system startup (see Chapter 2, "Using Your System," for startup information.)

KEY FEATURES

NEC designed your Image system with technologies that help you get the most out of your computer. Key features include:

- Intel 90-MHz Pentium™ microprocessor (Image P90E) or Intel 100-MHz Pentium microprocessor (Image P100E) for powerful processing
- 16 kilobyte (KB) internal dual write-back cache, integrated on the microprocessor
- 256-KB standard write-back secondary cache memory
- 16-megabyte (MB) standard RAM memory, upgradeable to 256 MB
- Optional upgrade for adding a second processor to provide dual-processor capabilities
- 32-bit EISA/PCI local bus for fast data transfer
- EISA/PCI Bridge Component that links the EISA bus to the PCI bus
- System BIOS containing the ROM-based System Setup utility
- EISA Configuration utility (ECU) for setting EISA, PCI, or ISA expansion device parameters

-
- EZ-SCSI Setup utility for setting SCSI parameters
 - System input/output (I/O) controller integrating serial ports, parallel port, SCSI-2 port, enhanced IDE hard disk controller, SCSI-2 controller, and diskette drive controller
 - Extended super video graphics accelerator (VGA) controller with 2-MB interleaved video dynamic random access memory (DRAM) standard
 - Flash ROM for fast economical BIOS upgrades
 - Quad-speed IDE CD-ROM reader (hard disk configurations only)
 - Plug and Play operating system (O/S) support for Plug and Play ISA expansion boards
 - Display Data Channel (DDC) support for automatic configuration of resolutions and refresh rates for DDC-compliant monitors
 - System security for ensuring system use by authorized users only.

See the following sections for descriptions of the key features of the Image P90E and Image P100E systems. (Refer to Appendix B for system specifications.)

Processor Subsystem

The Image P90E system uses a 64-bit, 90 MHz Pentium microprocessor. The P100E system uses a 64-bit, 100 MHz Pentium microprocessor.

The 90-MHz and 100-MHz processors each have 16 KB of primary write-back internal cache, 8 KB for instructions and 8 KB for data. Integrated into the processor is a math coprocessor.

To use the Pentium processor's power, each system features an optimized high-speed 64-bit data bus and a complementary 256-KB burst-mode write-back secondary cache.

The synchronous cache design uses 9-nanosecond (ns) static random access memory (SRAM) that allows data to be sent or received from cache at the fastest possible burst rate supported by the Pentium processor.

The Pentium processor is compatible with 8-, 16-, and 32-bit software written for the Intel386™, Intel486™, and Pentium microprocessors.

A 320-pin zero insertion force (ZIF) socket comes integrated on the system board. The socket supports an optional second processor for dual-processor capability.

System Memory

Each system comes standard with 16-MB of memory and supports base and extended memory.

System memory can be expanded up to 256 MB, using optional single in-line memory modules (SIMMs) installed in SIMM sockets.

PCI Local Bus

The industry-standard PCI local bus is a highly-integrated 32-bit I/O interface that offers the highest performance local bus available for the Pentium processor. The PCI bus supports burst modes that send large chunks of data across the bus, allowing fast displays of high-resolution images.

The high bandwidth PCI local bus eliminates the data bottleneck found in traditional systems, maintains maximum performance at high clock speeds, and provides a clear upgrade path to future technologies.

The system's integrated bit-block transfers (BitBLT) graphics accelerator, IDE controller, and Fast SCSI-2 host adapter use the 32-bit PCI local bus, which increases system performance and frees the Pentium processor for other system activities.

The PCI bus is linked to the EISA bus through the PCI/EISA Bridge Component link and the EISA System Component link. The links allow concurrent operation.

EISA Bus

The system incorporates a high-performance 32-bit EISA bus with full bus-mastering capability. Advantages of EISA are:

- EISA's 33-MB per second burst mode data transfer rate increases the speed of I/O operations which is very important for configurations with multiple storage devices.
- EISA's bus-mastering capability allows maximum system throughput by distributing the workload to intelligent subsystems. This creates balanced system performance where no one subsystem impedes the activity of another.
- EISA boards are software configurable, unlike ISA boards which require jumper settings, switch settings, and configuration files.
- EISA fully supports downward compatibility with installed ISA hardware.

The EISA bus is linked to the PCI bus through the PCI/EISA Bridge Component link and EISA System Component link. The links allow concurrent operation.

Integrated Fast SCSI-2

Integrated Fast SCSI-2 provides connection of up to five internal SCSI-2 devices, up to seven external SCSI-2 devices, or a combination of internal and external devices (not to exceed seven devices total). Devices supported include hard disk drives, tape back-up drives, and CD-ROM readers.

The system uses a PCI local bus Fast SCSI-2 host adapter integrated on the system board. The Fast SCSI-2 features:

- a synchronous data transfer rate of 10 MB per second: twice as fast as the regular SCSI
- asynchronous data transfer rates up to 5 MB per second
- support for the common command set (CCS) for compatibility
- a command queuing feature that enhances multi-tasking performance and helps reduce bottlenecks in I/O operations.

IDE Interface Controller

The IDE controller provides an enhanced IDE interface to the PCI bus. The controller supports up to 11 MB per second 32-bit wide data transfers on the high-performance PCI local bus.

The controller supports IDE devices connected to the primary and secondary PCI/IDE connectors on the system board. The two PCI/IDE connectors provide support for up to four enhanced IDE devices.

The controller also has an automatic sensing feature for detecting EISA hard disk controllers.

System I/O Controller

The system I/O controller integrates, on one chip, the controller functions for the system's two serial ports, enhanced bi-directional parallel port, and diskette drive. The controller supports up to two drives (diskette or tape).

The controller is disabled through the system's BIOS if an alternate diskette drive controller is installed.

Video Features

An integrated 32-bit BitBLT graphics accelerator on the 32-bit PCI local bus provides high-performance graphics capabilities. The PCI local bus graphics subsystem features:

- 2 MB of video DRAM
- 24-bit High Color and True Color graphics.

The graphics accelerator speeds the movement of large blocks of image data in video memory. As display resolutions increase, image creation and movement into video memory are critical factors in graphics performance.

The graphics accelerator is specifically designed for graphics-intensive bit-block transfers, pattern-fill operations, text and color pixel amplification, and scrolling. The accelerator minimizes bus traffic by offloading the tasks normally performed by the processor.

The High Color graphics feature provides up to 1024 by 768-pixel high-resolution color with up to 64K colors. The True Color graphics feature provides up to 800 by 600-pixel high-resolution color with up to 16.8 million colors.

In addition to the standard VGA connector, a VESA-compliant feature connector is provided.

Flash ROM

NEC's Flash ROM allows fast, economical BIOS upgrades. NEC Flash ROMs are re-programmable system and video EPROMs.

With NEC's Flash ROM, a ROM BIOS change:

- is fast and easily done using a BIOS Update utility obtainable from NEC
- eliminates the expensive replacement of ROM BIOS chips, and reduces system maintenance costs
- reduces inadvertent system board damage that can take place when replacing ROMs
- facilitates adopting new technology while maintaining corporate standards
- gives network administrators company-wide control of BIOS revisions.

IDE Quad-Speed CD-ROM Reader

The IDE quad-speed CD-ROM reader comes standard with all hard disk systems. The reader features quad-speed technology, allowing it to operate at different speeds depending on whether the CD-ROM disc you are using contains data or music.

Quad-speed technology allows the CD-ROM reader to transfer computer data up to 700 KB per second, four times faster than ordinary CD-ROM readers. This allows you to get your data faster.

Asset Management and System Security

The Image P90E and Image P100E systems come with the following asset management and system security features:

- Asset Management Information — displays the system board serial number created during manufacturing at NEC.
- System Security — password protection ensures that only authorized persons are allowed access to system files.

PRODUCT INFORMATION

NEC offers several ways for you to obtain product information and support. If you have access to a fax machine, you can use NEC's FastFacts™ for product information. If you have access to a modem, you can use NEC's Bulletin Board Service (BBS), the Internet, or America Online® to obtain NEC product support.

NEC's FastFacts service is described in the following section. For information on using the BBS, Internet, or America Online, refer to Chapter 9 in this guide.

NEC FastFacts

NEC's FastFacts is a self-help, automated electronic information service that you can use to obtain up-to-date product application notes, installation procedures, troubleshooting tips, data sheets, technical information bulletins, illustrated parts lists, and other information about your system.

Using a fax machine, you can obtain information from the FastFacts service 24 hours a day, 7 days a week. You simply call the FastFacts number on your touch-tone telephone, order the information you want by following the voice prompts, and FastFacts will automatically fax you the information.

If you are new to FastFacts, you should first order a catalog that lists the available documents and the document numbers. Current catalogs include:

- Catalog 1, Monitors, Graphics Boards, and Data Projector Products
- Catalog 2, CD-ROM Hardware and Software, Printers, and Disk Drive Products
- Catalog 3, Laptop, Desktop, and Server Computer Products
- Catalog 4, NEC Products for the Macintosh
- Product and Configuration Index.

A catalog of all current technical information bulletins can be ordered by requesting document number 72842228.

A catalog of current illustrated parts breakdowns can be ordered by requesting document number 42228.

A set of instructions for using FastFacts can be ordered by requesting document number 63233469.

Due to the dynamic nature of FastFacts, documents are added and removed constantly, therefore all catalog and document subjects and order numbers are subject to change at any time and without notice.

Order information from FastFacts as follows.

1. Be sure your fax machine is on. Have handy the document number for the document you want.
2. At your touch-tone telephone, call 1-800-366-0476 (U.S. and Canada only).

For international use, enter the international long distance access number, the U.S. country code, and the U.S. telephone number (1-708-238-7800).

-
3. Listen to the instructions provided by the voice prompts.

Press **1** if you do not want an introduction to FastFacts. Follow the automated instructions to order your document or catalog.

Press **2** if you want an introduction to FastFacts. Follow the automated instructions to order your document or catalog.

4. When asked by the voice prompts, enter your fax number and telephone number.

For international use, first enter the international long distance access number (011), your country code, your area code or city code, then your fax number.

The information requested will be automatically sent to your fax machine. Please wait for the ordered document to arrive at your fax machine before calling to order more documents. If FastFacts attempts to send the second order before the first order is completed, the order may be canceled. After three tries, FastFacts assumes that your line is busy and terminates any further processing of the order.

2 Using Your System

If you haven't already set up your system, do so now, using the steps on the *NEC Image P90E/P100E Quick Setup* sheet that comes with your system (hard disk systems only).

NOTE: NEC recommends that after your system is set-up, you read Appendix A, "Setting Up a Healthy Work Environment." The appendix contains guidelines that help you use your system productively and safely.

Once you have done the above, familiarize yourself with the system's hardware features, including the system unit, CD-ROM reader, mouse, and keyboard. These features are described next, under "System Hardware Features."

See "System Operation" in this chapter for procedures that you will use regularly to operate your computer. Information includes system start-up, diskette loading, CD loading, reset, backup procedures, and system shutdown.

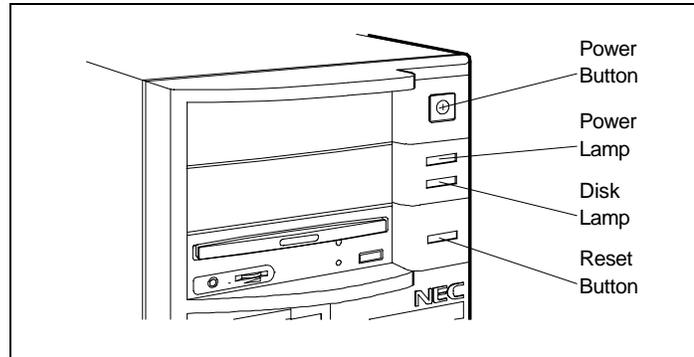
NOTE: Once familiar with system operation, you should run the ROM-based System Setup utility to check your computer's current time and date (see Chapter 3). Be sure that the system's clock is set for your time zone.

SYSTEM HARDWARE FEATURES

The following sections introduce basic hardware features of the system unit, CD-ROM reader, keyboard, and mouse.

Front Panel Controls

Controls, lamps, and other frequently used features are located on the front panel of the system unit. The following figure shows front panel features on the system unit. Brief descriptions of these features follow the figure.



Front panel controls and lamps

Power Button

The power button controls power to the system unit. Pressing the button turns power on and off. The power button is almost flush with the front panel when power is off and indented when power is on.

Lamps

The front panel contains a power lamp and a disk lamp. A lit power lamp (green) indicates that the system unit is powered on. A lit disk lamp (green) indicates when a hard disk is performing a read or write operation.

CAUTION: Do not turn off the system while the disk lamp is lit or you may damage your hard disk or data.

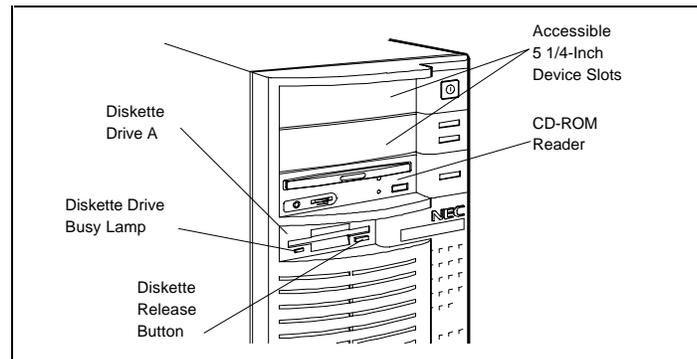
Reset Button

The reset button lets you restart your system after it has been powered on.

CAUTION: Position your system to prevent hitting the reset button by accident, thus avoiding accidental resets which can damage your hard disk or data.

Front Panel Storage Devices

The diskette drive (standard on all systems) and CD-ROM reader (hard disk systems only) are on the front panel of the system unit, as shown in the following figure. Brief descriptions of the devices follow the figure.



Front panel storage devices

Diskette Drive

Your system comes with a 3 1/2-inch 1.44-MB diskette drive (standard on all systems). The drive is assigned as drive A. Use this drive if you need to load and start programs from a diskette.

Diskette drive controls include a release button and a drive busy lamp. The diskette release button releases an inserted diskette from the drive. The diskette drive busy lamp lights when the drive is reading from or writing to a diskette.

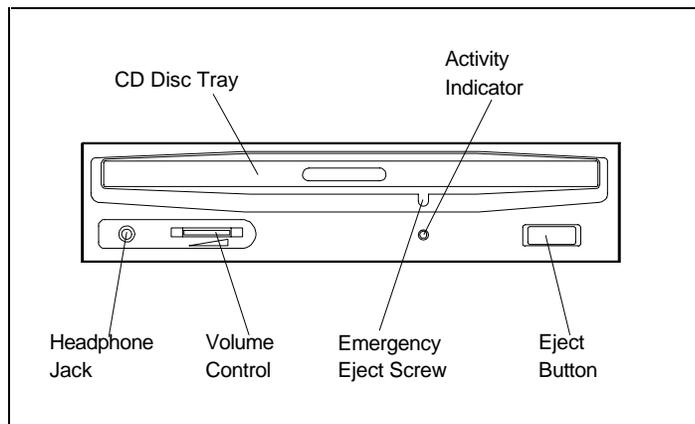
CAUTION: To prevent damage to your diskette drive and data, do not turn off the system or remove the diskette while the diskette drive busy lamp is lit.

IDE Quad-Speed CD-ROM Reader

All hard disk systems come with an IDE quad-speed CD-ROM reader. The reader is assigned as drive E.

Use your CD-ROM reader to load and start programs from a compact disc (CD). You can also use the reader to play your audio CDs. The reader is fully compatible with Kodak Multisession Photo CDs™ and standard audio CDs.

The CD-ROM reader operates at different speeds depending on whether the CD you are using contains data or music. This allows you to get your data faster.



Quad-Speed IDE CD-ROM reader

The quad-speed IDE CD-ROM reader has the following features:

- Headphone jack — for connecting optional headphones with a stereo mini-jack plug.
- Volume control — for adjusting the headphone volume when using optional headphones.
- Activity indicator — for monitoring operation of the reader.
- CD disc tray — for loading a CD disc.
- Emergency eject — allows manual opening of the CD tray if the eject function is disabled by software or if a power failure occurs.
- Eject button — opens and closes the CD tray.

Accessible Device Slots

Hard disk systems ship with two empty device bays (three for diskless systems), ready for installation of optional storage devices with a 5 1/4-inch form factor. Use these bays for installing optional devices such as a diskette drive, tape drive, or CD-ROM reader.

Internal Storage Device

An internally mounted 3 1/2-inch hard disk (IDE or Fast SCSI-2, depending on your system configuration) comes standard in hard disk configurations. The hard disk is designated as drive C. NEC formatted your hard disk and installed your software on the hard disk at the factory.

CAUTION: Do not format the hard disk. Formatting the hard disk destroys all of the data on the disk.

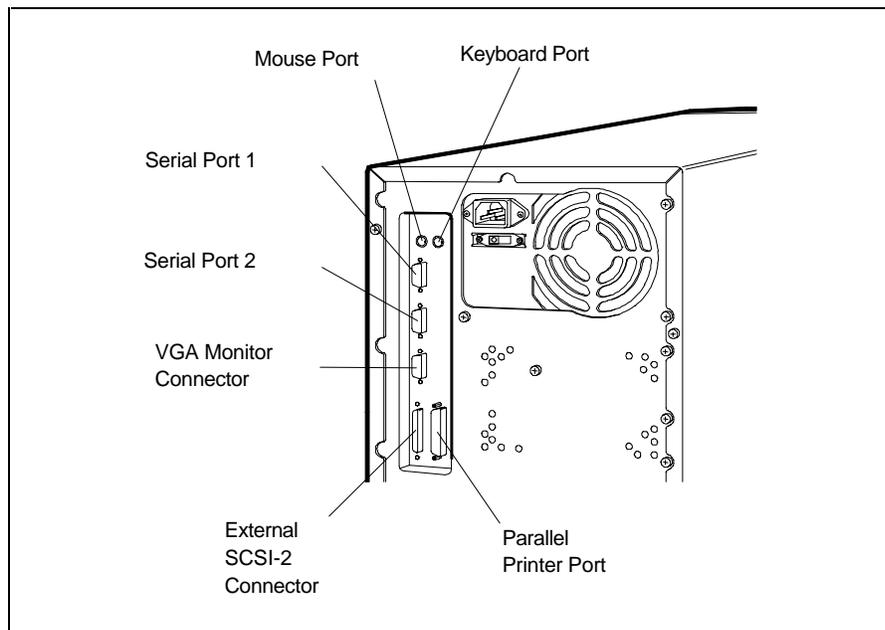
Rear Panel

The rear panel provides connectors for setting up the system, as shown in the following figure. Each connector is briefly described in the following paragraphs.

Mouse Port

The mouse port supports a personal system (PS)/2[®]-compatible mouse. Your mouse attaches to this port.

CAUTION: Always turn off system power before connecting or disconnecting the mouse. Failure to do so can damage the mouse or the system.



Rear panel connectors

Keyboard Port

The keyboard port supports a PS/2-compatible, 101-key keyboard (U.S. and Canada only) or a 102-key keyboard (United Kingdom and Germany only) with a 6-pin mini DIN connector. Your keyboard attaches to this port.

CAUTION: Always turn off system power before connecting or disconnecting the keyboard. Failure to do so can damage the keyboard or the system.

Serial Ports

The dual serial ports feature baud rates up to 19.2 KB/sec with a word length of 5 to 8 bits. You can connect up to two RS-232C serial devices with 9-pin connectors, such as a pointing device or a serial printer, to the system.

VGA Monitor Connector

The monitor connector supports a video graphics array (VGA)-compatible monitor with a 15-pin connector. Support includes NEC Plug and Play monitors.

SCSI-2 Port

The SCSI-2 port allows the connection of an external SCSI cable and up to seven external SCSI-2 devices such as a CD-ROM, hard disk, or tape drive.

Printer Port

The printer port is the system's parallel interface connector. This enhanced bidirectional parallel port supports Enhanced Parallel Port (EPP) and Extended Capabilities Port (ECP) standards for increased data transfer rates to your printer. Use this port to connect a parallel printer with a 25-pin connector to the system.

Expansion Slot Covers

The expansion slot covers are removable, allowing the installation of up to five expansion boards to the system. One slot is for a 32-bit PCI-compatible board. A second shared slot is for either an EISA board (8-bit, 16-bit or 32-bit) or a PCI board. The three remaining slots are for EISA or ISA boards.

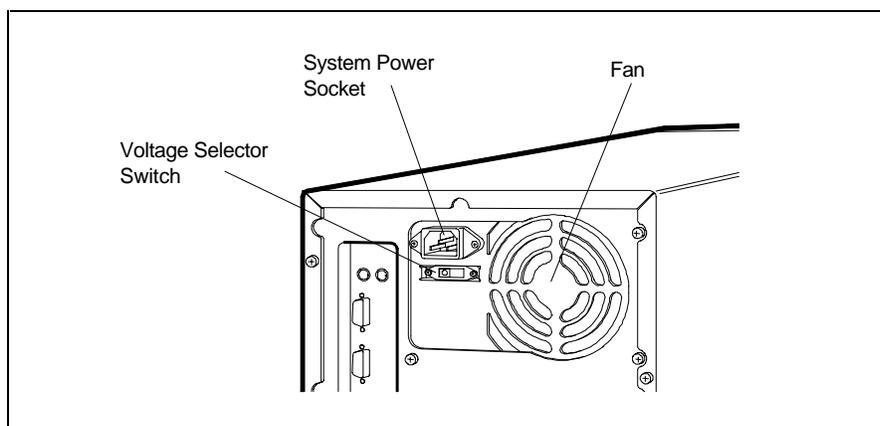
Cooling Fans

Two cooling fans in your system provide proper ventilation to cool system components and prevent overheating. One fan is an integral part of the power supply. The second fan is mounted on the processor. For proper ventilation, keep the areas around the system clear of obstructions.

Voltage Selector Switch

The voltage selector switch is on the rear of the system, as shown in the following figure. The switch sets the voltage for your system to 115 volts (V) or 230 V. Most outlets in the United States, Canada, and Taiwan are 115 V. Most outlets in Europe, Australia, and Asia are 230 V.

CAUTION: Be sure that the voltage selector switch is set correctly for the voltage in your area (115 V or 230 V).



Rear panel power supply features

System Power Socket

The system power socket is on the rear of the system, as shown in the preceding figure. Use this socket for connecting the system unit power cord to the system unit and to your wall outlet.

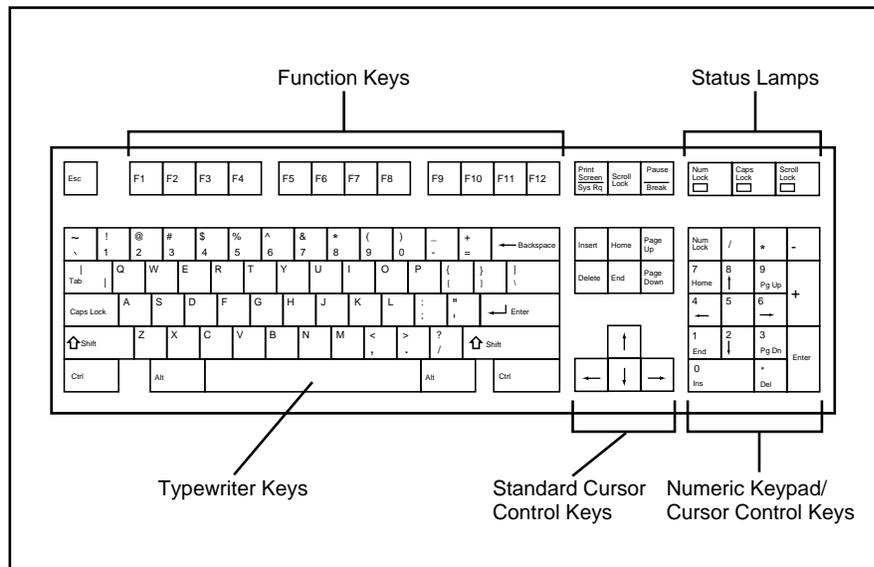
Keyboard

An industry-standard, membrane keyboard comes with your system (see the following figure). The keyboard is detachable and has adjustable supports. A general description of the keyboard follows.

Keyboard key functions depend on the operating system or software application program you use. Check the documentation that comes with your operating system or software for function information.

NOTE: Most of the keys have a repeat function. When you hold down a key, the character or function repeats until you release the key. You can set keyboard auto-repeat and delay rates in the Setup utility (see Chapter 3).

The keyboard's status lamps indicate the status of the Num (Numeric) Lock, Caps (Capital) Lock, and Scroll Lock keys.



Keyboard features (U.S. model)

The numeric keypad/cursor control keys work like a numeric keypad. In Numeric Keypad mode, the Num Lock lamp is on. To use the keys to control the direction of the cursor, press the Num Lock key (Num Lock lamp goes off). To return to the Numeric Keypad mode, press the Num Lock key. To use a keypad cursor key while in Numeric Keypad mode, press the Shift key and the keypad cursor key.

NOTE: The system enables Numeric Keypad mode at power-on. You can set the Numeric Keypad mode off at power-on with the Setup utility (see Chapter 3).

The standard cursor control keys control the direction of the cursor. The Num Lock state (Num Lock lamp is lit) does not affect the operation of these keys.

The typewriter keys function as standard typewriter keys.

Mouse

A PS/2-compatible mouse comes standard with your system. The mouse is fast, accurate, and simple to use. Your mouse lets you take full advantage of applications with a Graphical User Interface (GUI).

CAUTION: To prevent damage to your mouse and to the system, turn off the system power before you connect or disconnect your mouse.

Also, the system fails to recognize that a mouse is attached if you connect the mouse after system power is on.

SYSTEM OPERATION

The following sections describe procedures you use when you operate your computer. These procedures include:

- powering on
- diskette loading
- CD loading
- system reset
- backup
- powering off.

Powering On

Powering on your computer (called cold boot) initiates an automatic routine that prepares your computer for use. A cold boot performs diagnostic tests, sets system parameters last saved by the Setup utility, reinitializes all devices, and loads the operating system.

Power on (boot) your computer as follows.

1. Check that the power cables from the monitor and system unit are connected to a surge protector (optional) and a wall outlet.

CAUTION: Be sure that the voltage selector switch is set correctly for the voltage in your area (115 V or 230 V).

2. If you are booting from the hard disk make sure that the diskette drive is empty.

If you are booting from the diskette drive, be sure that you have a diskette in drive A containing operating system files.

NOTE: The system looks for the drive containing operating system files. If you have a diskette with MS-DOS or another operating system's files in drive A, the system boots from the diskette drive. If you do not have a diskette in drive A, the system boots from the hard disk.

A diskette without operating system files in drive A prevents a system boot and displays the error message, "non system disk installed in drive A."

-
3. Turn on power to the monitor.
 4. Turn on power to the computer by pressing the power button.

The computer's power lamp lights and the start-up screen appears on the monitor. If necessary, adjust the contrast and brightness controls on the monitor.

The start up screen displays system information including BIOS version, BIOS extensions, SCSI ID settings, system configuration information, system board serial number, host adapter settings, and other related information.

NOTE: You can pause the start-up screen at any time by pressing the **Pause** key. Restart by pressing the **F1** key.

The start-up screen also briefly displays an "F2 to run SETUP" message at the bottom left of the initial screen and a "Press Ctrl A for SCSI Select Utility" message at the last screen. The appropriate utility can be accessed by pressing **F2** (for setup) or **Ctrl A** (for SCSI) immediately on message display.

NOTE: Access the Setup utility by pressing **F2** twice when the "F2 to run SETUP" message appears. Press **F2** as soon as the message is displayed, as it appears only briefly.

Access the SCSI utility by pressing **Ctrl A** as soon as the "Press Ctrl A for SCSI Select Utility" message appears.

During the boot-up process, the system performs Power-On Self-Test (POST) diagnostic tests that check major hardware components, such as memory and interface circuits. It compares the hardware it finds with parameters last saved by the Setup utility.

Several configuration messages appear on the screen during POST. If POST finds any discrepancies between the parameters it finds and the parameters last saved, it displays an error message. The system then prompts you to run the Setup utility to correct the configuration.

If POST does not find any discrepancies in its configuration test, the computer loads system files into memory.

Once the system files are loaded, the system automatically loads Microsoft Windows for Workgroups.

Your system is ready for use.

Diskette Loading

Use the following procedure to insert and remove a 3 1/2-inch diskette in the standard diskette drive.

1. Hold the diskette label side up and insert it into the diskette drive until you hear a click.
2. To remove a diskette from the diskette drive, press the release button on the drive.

CAUTION: Do not turn off system power or remove a diskette from the diskette drive when the diskette drive lamp is lit. To do so can damage both the data on the diskette and the drive.

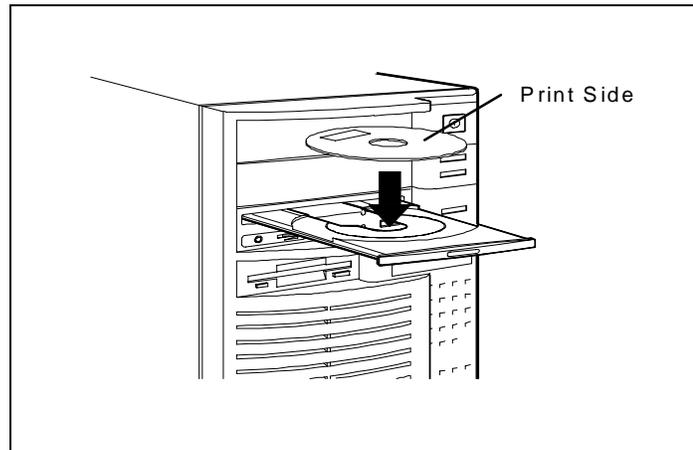
Do not reset the system (except as a last resort) when the diskette drive is in use.

CD Disc Loading

Use the following procedure to load a CD into the quad-speed CD-ROM reader.

NOTE: System power must be on before you can load a disc into the CD-ROM reader.

1. Press the Eject button to open the disc tray.
2. With the printed side facing up, hold the CD by its edges and place it in the tray (see the following figure).



Loading a CD disc into the tray

3. Press the Eject button to close the tray.

The activity lamp flashes on and off when the reader is doing data access or data transfer.

The lamp is constantly on when you are playing an audio disc. At all other times, the lamp is off.

-
4. Remove the disc by pressing the Eject button to open the tray. Remove the disc, and press the Eject button to close the tray.

If the eject function is disabled by software or a power failure, use the emergency eject function (see Chapter 9).

System Reset

A system reset is a system restart after your computer is powered on. You can reset your computer manually when a software or hardware problem prevents you from using the system. You can initiate a reset automatically under certain conditions.

The following sections describe conditions for manual and automatic resets.

<p>CAUTION: Resetting the system removes information from RAM disks, volatile system memory, and application programs. Information saved in files on disk, like program and data files, are not usually affected by a system reset.</p>
--

Manual Reset

Reset your computer manually if a software or hardware problem prevents you from using the system. Situations that require a reset include the following:

- The system does not respond to keyboard input (requires a cold boot).

-
- You cannot exit from an application program. In this case, first try a software reset in Windows for Workgroups (see the following instructions for a software reset).
 - You change the system configuration after editing the CONFIG.SYS file.
 - You change your system configuration settings or operating system and you want to start the system with the new settings.
 - The monitor screen is black. If your screen is black, it may only need a simple adjustment. Before you reset the system, check the following:
 - Adjust the contrast and brightness controls on the monitor.
 - Check that your monitor is properly connected and the monitor power is on.

You can reset the system in two ways:

CAUTION: Unless absolutely necessary, do not reset the system when the hard disk lamp or diskette drive busy lamp is on. Information on the hard disk or diskette might be lost or damaged.

- With a software reset.
Press and hold **Ctrl**, **Alt**, and **Del**. When all three keys are pressed, the system resets.

A software reset performs a warm boot. It clears volatile system memory and reloads the operating system.
- With a hardware reset.
Press the reset button on the front of the system unit.

Or turn the system power off, wait at least five seconds, and then turn the power on.

A hardware reset performs a cold boot. It checks the hardware and reloads the operating system.

Automatic Reset

An automatic reset performs a cold boot. The system automatically resets itself when you exit from the Setup utility.

Backup

Backup procedures are important for the efficient and effective use of your computer. Protect your program and data files with regular backup procedures.

See your MS-DOS and Windows for Workgroups documentation for information about backup procedures. Make backup copies of your program and data files that are on diskette and on the hard disk.

The standard practice for diskette backup is to copy each diskette, store the original in a safe place, and use the copy as your working diskette. You can use the MS-DOS DISKCOPY command for making copies of your diskettes. See your MS-DOS documentation for information about using the command.

Powering Off

Use the following steps to shut down (power off) your computer.

1. Save your work. See the documentation that comes with your application program.
2. Exit the application program.

If you are in Windows for Workgroups, exit the Program Manager by double clicking on the upper left block. Select “OK” at the prompt to exit Windows.

3. Make sure that the hard disk and diskette drive are not in use. A lit hard disk lamp or diskette drive busy lamp indicates that a drive is in use.
4. Power off the system by pressing the power button. Turn off power to your monitor.

CAUTION: Unless absolutely necessary, never power off the system when the hard disk lamp or diskette drive busy lamp is lit. Information on the hard disk or diskette might be lost or damaged.

3 Setting System Parameters

This chapter describes the ROM-based Setup utility that allows you to view and enter system configuration information. The Setup utility is pre-installed on your system and ready to run.

Your system ships with the correct system parameters for your configuration. Unless you add optional hardware devices, you do not need to run the Setup utility to operate your system. However, you might wish to run Setup to set the time, date, and security features.

NOTE: If you are adding, moving, or removing an optional EISA, PCI, Plug and Play ISA, non-Plug and Play ISA, or SCSI expansion device, use the ECU and SCSI utilities. See Chapter 4, "Using the ECU and SCSI Utilities," for information.

Use the Setup utility to:

- check or change the time and date.
- check or change the diskette drive type.
- check or change IDE hard disk parameters.
- check or change system parameters when you add or remove PCI devices.
- check or change your video device.

-
- enable or disable the system's VGA feature connector.
 - check or change memory cache or shadow settings.
 - check or change the system's boot sequence.
 - check or change keyboard settings.
 - enable or disable the Plug and Play O/S feature.
 - check the installation of optional memory by comparing the amount memory installed with the amount of memory displayed by Setup.
 - customize your system with security features such as supervisor and user login IDs and passwords.
 - correct a hardware discrepancy when the Power-On-Self-Test (POST) displays an error message and prompts you to run Setup.
 - reset system parameters in the event that you need to replace the RTC/battery module.

System configuration information is stored in nonvolatile memory. Nonvolatile memory is a complementary metal-oxide semiconductor (CMOS) chip backed up by a battery. The battery is part of the real-time clock (RTC)/battery module on the system board. The battery supplies continuous power to the CMOS memory and maintains configuration information when system power is off.

NOTE: NEC recommends that you print out or write down your current Setup parameters and store the information in a safe place. This lets you restore your system to the current parameters if the RTC/battery module ever needs replacement.

HOW TO START SETUP

To start the Setup utility, follow these steps:

1. Turn on or reboot your system. Setup briefly displays the following message at the bottom left of the screen:

F2 to run SETUP

2. Press **F2** twice as soon as the message is displayed, as it appears only briefly. Setup's Main menu appears similar to the following screen.

NOTE: The screen shown is typical of your system. The actual items on the Main menu depend upon the hardware installed in your system.

PhoenixBIOS Setup — Copyright 1985-94 Phoenix Technologies Ltd.

Main Advanced Security Exit

System Time:	[10]:19:20]	Item Specific Help
System Date:	[1/27/1995]	<Tab>, <Shift-Tab>, or <Enter> selects field.
Diskette A:	[1.44 MB, 3 ½"]	
Diskette B:	[Not Installed]	
> IDE Adapter 0 Master:	C: 540 Mb	
> IDE Adapter 0 Slave:	None	
> IDE Adapter 1 Master:	None	
> IDE Adapter 1 Slave:	None	
Video System:	[EGA/VGA]	
> Memory Cache:		
> Memory Shadow:	[Enabled]	
> Boot sequence:	[A: then C:]	
> Numlock:	[Auto]	
System Memory:	640 KB	
Extended Memory:	7 MB	

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit ←→ Select Menu Enter Select > Sub-Menu F10 Previous Values

Main menu

HOW TO USE SETUP

The Setup utility opens with the Main menu. The Main menu displays the following:

- Setup title line — displays the Setup utility name and copyright message.
- Menu bar — lists the four top-level menus (Main, Advanced, Security, Exit) that you can choose to set system parameters.
- Menu summary — lists menu setup parameters for the selected top level menu. You can set some parameters directly from this window or you can set them using the keys listed at the bottom of the screen.
- Item Specific Help — provides help information for the Setup option currently selected.
- Legend bar — provides a summary of command keys for using Setup.
- General Help window — appears any time during Setup when you press **F1** or **Alt H**. The help window provides two pages of general information about using Setup.

The following sections describe how to use the Setup menu to set system parameters.

The Menu Bar

The menu bar at the top of the Main menu lists these menus:

- Main — Use this menu for basic system configuration. For example, select “Main” to set the system time, system date, diskette drives, and video parameters. Use this menu to check memory parameters.

-
- **Advanced** — Use this menu to set integrated peripherals: serial and parallel port addresses/interrupts, enable or disable the diskette drive controller, select monitor type, and enable or disable the VGA feature connector.

The menu provides menu items for setting advanced chipset control, enabling or disabling Plug and Play, and setting PCI device parameters.

The menu also lets you set parameters for large disks (for example, to use large disks with Windows NT).

Some of the Advanced features may be accessible only with a Supervisor password.

- **Security** — Use this menu to edit and set Supervisor and user IDs and passwords, set Backup and Virus-check reminders, set network and diskette access, and enable write-protection for the hard disk.
- **Exit** — Exits the current menu.

To select an option from the menu bar, use the left and right arrow keys.

See “Exiting Setup” in this chapter for a description on exiting the Setup menu.

The Legend Bar

Use the keys listed in the legend bar on the bottom of the Setup menu to make your selections or exit the current menu.

The following table describes the legend keys and their alternates.

Startup Functions

KEY	FUNCTION
F1 or Alt-H	Displays General Help window (described later in this chapter).
Esc	Exits the menu.
← or → arrow keys	Selects a different menu.
↑ or ↓ arrow keys	Moves cursor up and down.
Tab or Shift-Tab	Moves cursor left and right.
Home or End	Moves cursor to top or bottom of window.
Page Up or Page Down	Moves cursor to top or bottom of window.
F5 or -	Selects the Previous Value for the field.
F6 or + or Space	Selects the Next Value for the field.
F9	Loads the Default Configuration values for this menu.
F10	Loads the Previous Configuration values for this menu.
Enter	Executes Command or Selects submenu.
Alt-R	Refreshes screen

Selecting a Menu Item

To select a menu item, use the arrow keys to move the cursor to the field you want. Then use the value keys (F5, -, F6, +, or space bar) to cycle through the value for that field. The Save Changes command in the Exit menu saves the values currently displayed in all the menus.

Displaying a Submenu

A pointer (a right-pointing triangle) at the left of the menu item indicates that the item contains selectable sub-menus. To display a submenu, use the arrow keys to move the cursor to the menu item containing a submenu, then press **Enter**.

The Item Specific Help Window

The Item Specific Help window on the right side of each menu displays the help text for the currently selected Setup option. It updates as you move the cursor to each new field.

The General Help Window

Pressing **F1** or **Alt H** on any menu brings up the General Help window that describes the legend keys and their alternates.

The scroll bar on the right of any window indicates that there is more than one page of information in the window. Use **Page Up** and **Page Down** to display all the pages. Pressing **Home** and **End** displays the first and last page.

Press **Esc** to exit the current window.

THE MAIN MENU

The following table lists and describes the available parameters when you select the Main menu in the legend bar.

Parameters that can be modified directly from the Main menu do not have a right-pointing triangle to the left of the parameter name. These parameters can be modified by pressing the F5, F6, - or + keys.

Parameters with submenus that are available from the Main menu have a right-pointing triangle to the left of the parameter. Use the arrow keys to move the cursor to the parameter, then press **Enter** to open the submenu.

See the sections following the table for a description of Main menu parameters and their submenus.

Main Menu Parameters

PARAMETER	OPTIONS	DESCRIPTION
System Time	HH:MM:SS	Sets the system time.
System Date	MM/DD/YYYY	Sets the system date.
Diskette A: Diskette B:	360KB, 5 1/4" 1.2MB, 5 1/4" 720KB, 3 1/2" 1.44MB, 3 1/2" (default) 2.88MB, 3 1/2" Not Installed	Selects the type of diskette drive in your system.
IDE Adapter 0 Master*	Autotype fixed disk Type Multi-sector transfers	Configures the IDE adapter.
IDE Adapter 0 Slave*	Autotype fixed disk Type Multi-sector transfers	Configures the IDE adapter.
IDE Adapter 1 Master*	Autotype fixed disk Type Multi-sector transfers	Configures the IDE adapter.
IDE Adapter 1 Slave*	Autotype fixed disk Type Multi-sector transfers	Configures the IDE adapter.
Video System	Monochrome EGA/VGA (default) CGA 80x25	Selects the default video device.

Main Menu Parameters

PARAMETER	OPTIONS	DESCRIPTION
Memory Cache*	External cache Cache system BIOS area Cache video BIOS area Cache memory regions	Enables/disables external cache.
Memory Shadow*	System shadow Video shadow Shadow memory regions	Enables/disables video shadow.
Boot Sequence*	A: then C: C: then A: C: only	Selects system boot sequence.
Numlock*	Auto On Off	Selects power-on state of Numlock and keyboard
System Memory	Automatically detected by the system	Displays the amount of conventional memory detected at power-on.
Extended Memory	Automatically detected by the system	Displays the amount of extended memory detected at power-on.

* Parameter contains submenus.

IDE Adapters

IDE adapters control the IDE devices, such as IDE hard disk drives and IDE CD-ROM readers. Your system has two IDE controllers integrated on the system board.

Setup supports up to four IDE devices, with an IDE adapter for each of the following configurations:

- 1 Master
- 1 Master, 1 Slave
- 2 Masters
- 2 Masters, 1 Slave
- 2 Masters, 2 Slaves

The master/slave combination with an IDE hard disk is “1 Master.” If you add a hard disk to the fast PCI/IDE primary port, the combination becomes “1 Master, 1 Slave.” Jumper settings on the IDE device set the device to master or slave (see the documentation that comes with the device).

Select the IDE Adapter option configuration directly from the Main menu. Available options include:

- IDE Adapter 0 Master
- IDE Adapter 0 Slave
- IDE Adapter 1 Master
- IDE Adapter 1 Slave

IDE Adapter 0 configures the PCI/IDE primary port, IDE Adapter 1 configures the PCI/IDE secondary port.

Each IDE Adapter parameter has a right-pointing arrow to the left of it. Selecting the option displays IDE hard disk parameters. Select an IDE Adapter option and set parameters for each hard disk separately.

Use the following table to configure the IDE hard disk. If your IDE hard disk features auto IDE type detection, select the Autotype Fixed Disk parameter. The system automatically detects the hard disk type and sets the remaining parameters.

<p>CAUTION: Incorrect settings can cause your system to malfunction and not be able to read your drive.</p>
--

IDE Hard Disk Adapter Parameters

PARAMETER	OPTIONS	DESCRIPTION
Autotype Fixed Disk	Automatically detected by the system	Pressing Enter causes the system to determine the hard disk type. If successful, Setup fills in the remaining fields on this menu and you do not need to select the disk parameters.
Type	1 to 39 User None Auto	Selecting 1 to 39 fills in all the remaining fields with values for a predefined disk type. The User setting prompts you to fill in the remaining fields. The Auto setting causes the system to determine disk geometry at power on.
Cylinders	1 to 2099	Specifies number of cylinders.
Heads	1 to 16	Specifies number of read/write heads.
Sectors/Track	1 to 63	Specifies number of sectors per track.
Write Precomp*	0 to 512 None	Specifies number of the cylinder at which to change the write timing.
Multi-Sector Transfers	2, 4, 8, 16 Sectors	Specifies number of sectors in multisector transfers.
LBA Mode Control	Enabled (default) Disabled	Sets LBA mode Control on or off.
32 Bit I/O	Enabled (default) Disabled	Sets 32 bit I/O to on or off.
Transfer Mode	Standard Fast PIO1 Fast PIO2 Fast PIO3	Specifies the transfer mode for moving data to and from the hard drive. Standard is the slowest mode but the most compatible. Fast PIO1 (programmed input/output 1) is the slowest of the three enhanced modes. Fast PIO3 is the fastest of the enhanced modes.

Memory Cache

For memory cache parameters, select the “Memory Cache” submenu from the Main Menu. See the following table for a description of memory cache parameters.

Memory Cache Parameters

PARAMETER	OPTIONS	DESCRIPTION
External Cache	Enabled (default) Disabled	Sets the state of the external memory cache.
Cache System BIOS Area	Enabled (default) Disabled	Controls caching of system BIOS area.
Cache Video BIOS Area	Enabled (default) Disabled	Controls caching of video BIOS area.
Cache Memory Regions	Enabled Disabled (default)	Determines configuration of specified block of upper memory. Disabled (default) – shadow memory not cached for this region. Enabled – shadow memory is cached for this region.

Memory Shadow

For memory shadowing parameters, select the “Memory Shadow” submenu from the Main menu. See the following table for a description of Memory Shadow parameters.

CAUTION: Incorrect settings can cause your system to malfunction.

Memory Shadow Parameters

PARAMETER	OPTIONS	DESCRIPTION
System shadow	Not user-selectable	Always enabled.
Video shadow	Enabled Disabled	Always enabled. Shadows video BIOS and improves performance.
Shadow Memory Regions	Shadow Disabled	Default is disabled. Shadows optional ROM located in specified segments of memory and can improve performance. CAUTION: Some add-in cards, particularly with on-board firmware, do not work properly when shadowed. Selecting shadow copies ROMs in this region to shadow memory.

Boot Sequence

Your system may require a Supervisor password to set Boot Sequence parameters. Select the Boot Sequence menu from the Main menu to display boot parameter submenus. Use the legend keys to make selections and exit to the Main menu. Use the following table to select boot parameters.

Boot Parameters

PARAMETERS	OPTIONS	DESCRIPTION
Boot sequence	A: then C: (default) C: then A: C: only	The BIOS attempts to load the operating system from the disk drives in the sequence selected here. "C: only" (under Supervisor password control) provides virus protection.
Setup prompt	Enabled (default) Disabled	Displays "F2 to run SETUP" during bootup.
POST errors	Enabled (default) Disabled	At boot error, pauses and displays "F1 to resume, F2 to run SETUP".

Boot Parameters

PARAMETERS	OPTIONS	DESCRIPTION
Floppy check	Enabled (default) Disabled	Seeks diskette drives during bootup. Disabling speeds boot time.
Summary screen	Enabled (default) Disabled	Describes system configuration at the end of bootup.

Numlock

Select Numlock from the Main menu to display the Numlock and keyboard submenus.

Use the legend keys to make your selections and exit to the Main menu. Use the following table to configure the Numlock and keyboard parameters.

Numlock and Keyboard Parameters

PARAMETERS	OPTIONS	DESCRIPTION
Numlock	Auto (default) On Off	On or Off turns NumLock on or off at bootup. Auto turns NumLock on if it finds a numeric key pad.
Key Click	Enabled Disabled (default)	Turns audible key click on or off.
Keyboard auto-repeat rate	30/sec (default) 26.7/sec 21.8/sec 18.5/sec 13.3/sec 10/sec 6/sec 2/sec	Selects the key repeat rate.
Keyboard auto-repeat delay	1/4 sec 1/2 sec (default) 3/4 sec 1 sec	Sets the delay time after the key is held down and before it begins to repeat the keystroke.

THE ADVANCED MENU

The following table lists and describes the available parameters when you select the Advanced menu in the legend bar.

NOTE: Accessing the Advanced menu might require a Supervisor password.

Parameters that can be modified directly from the Advanced menu do not have the right-pointing triangle to the left of the parameter name. These parameters can be modified by pressing the F5, F6, - or + keys.

Parameters with submenus that are available from the Advanced menu have a right-pointing triangle to the left of the parameter. Use the arrow keys to move the cursor to the parameter, then press **Enter** to open the submenu.

See the sections following the table for a description of Advanced menu parameters and their submenus

CAUTION: Setting items in this menu to incorrect values can cause your system to malfunction.

Advanced Menu Parameters

PARAMETER	OPTIONS	DESCRIPTION
Integrated Peripherals*	See the following Integrated Peripherals parameter table.	Sets parameters for I/O ports, diskette controller, monitor type, and video feature connector.
Advanced Chipset Control*	See the following Advanced Chipset Control parameter table.	Sets 1 MB memory gap and PCI parameters.
Plug & Play O/S	Yes No (default)	Enables or disables the Plug and Play feature for future Plug and Play operating system.
PCI Devices*	Enabled Disabled (default)	Enables or disables the Combed I/O resource allocation. If enabled, PCI devices requesting I/O resources are checked for requests.
Large Disk Access Mode	DOS Other	Select "DOS" if using the DOS, Windows, or Windows NT operating system. Select "Other" if you have Novell Netware™ or other operating system.

* Parameter contains submenus.

Integrated Peripherals Submenu

Select the "Integrated Peripherals" submenu on the Advanced menu to configure the connections between the system processor and the I/O ports (serial port 1, serial port 2, and the printer port), diskette drives, monitor, and VGA feature connector.

NOTE: A Supervisor password might be required to select parameters from the Integrated Peripherals submenu.

Use the legend keys to make your selections and exit to the Main menu. Use the following table to configure your peripherals.

CAUTION: Setting items in this menu to incorrect values can cause your system to malfunction.

Integrated Peripherals Parameters

FEATURE	OPTIONS	DESCRIPTION
Serial Port 1 Serial Port 2	Disabled User-selectable settings Auto	Selects a unique address and interrupt request for the listed COM ports. Auto selects the next available combination. COM1 default: 3F8, IRQ4 COM2 default: 2F8, IRQ3
Parallel Port	Disabled 378, IRQ7 (default) User-selectable settings Auto	Selects a unique address and interrupt request for the parallel port. Auto selects the next available combination.
Parallel Port Mode	Output only Bi-directional EPP ECP (enabled) – DMA	Sets parallel port mode. ECP is the default setting.
Diskette Controller	Enabled (default) Disabled	Enables the on-board diskette drive controller.

Integrated Peripherals Parameters

FEATURE	OPTIONS	DESCRIPTION
Monitor Type	DDC Select Type 1 (default) Type 2 Type 3 Type 4 Disabled	Selects the monitor type. Display Data Channel (DDC) Select senses capabilities of compatible monitors. Non-DDC compatible monitors, types 1 through 4, may also be selected (see the following paragraph for monitor type information). After selecting DDC or monitor type, you should use the TLIMODE utility to set the required resolution. (See Chapter 5, "Using NEC Utilities and Drivers" for video driver information.)
VGA DAC Broadcast	Disabled Enabled	Select Enabled only when using an option board that has its own DAC and requires use of the VGA connector. When Enabled, VGA DAC writes Go to the option board's DAC, and not to the onboard VGA's DAC. Be sure to connect the monitor to the option board's video connector.

Monitor Types

The following table lists the monitor types, and the resolution and vertical synchronization rate for each.

NOTE: When setting the monitor resolution in Windows, the Auxiliary Windows Drivers force default refresh rates equivalent to a Type 1 monitor. To obtain the appropriate refresh rate, use the TLIMODE utility to set the refresh rate. (See Chapter 5, "Using NEC Utilities and Drivers" for information on using the utility.)

Monitor Types

TYPE 1	TYPE 2	TYPE 3	TYPE 4	RESOLUTION
60 Hz	72 Hz	72 Hz	72 Hz	640 by 480 by 16 colors
60 Hz	72 Hz	72 Hz	72 Hz	640 by 480 by 256 colors
56 Hz	60 Hz	72 Hz	72 Hz	800 by 600 by 16 colors
56 Hz	60 Hz	72 Hz	72 Hz	800 by 600 by 256 colors
87 Hz*	87 Hz	60 Hz	70 Hz	1024 by 768 by 16 colors
87 Hz*	87 Hz	60 Hz	70 Hz	1024 by 768 by 256 colors
--	--	--	87 Hz*	1280 by 1024 by 16 colors

* Interlaced

Advanced Chipset Control

Select the “Advanced Chipset Control” submenu on the Advanced menu to set the 1 MB gap parameter and PCI parameters.

NOTE: A Supervisor password might be required to select parameters from the Advanced Chipset Control submenu.

Use the legend keys to make your selections and exit to the Main menu. Use the following table to configure your peripherals.

CAUTION: Setting items in this menu to incorrect values can cause your system to malfunction.

Advanced Chipset Control Parameters

PARAMETER	OPTIONS	DESCRIPTION
1 MB Memory Gap at 15 MB	Enabled Disabled	If Enabled, turns system RAM off to free address space for use with option board. Memory from 15 MB to 16 MB is disabled, creating 1 MB gap in system RAM. CAUTION: you must run the ECU utility after changing this parameter (see Chapter 4, "Using the ECU and SCSI Utilities.")
CPU to PCI Write Buffers	Enabled Disabled	Enables CPU to PCI Write Buffers, allowing data to be temporarily stored in the buffers before writing data.
PCI to DRAM Write Buffers	Enabled Disabled	Enables PCI to DRAM Write Buffers, allowing data to be temporarily stored in the buffers before writing data.
CPU to DRAM Write Buffers	Enabled Disabled	Enables CPU to DRAM Write Buffers, allowing data to be temporarily stored in the buffers before writing data.
PCI Memory Burst Cycles	Enabled Disabled	Enables PCI memory burst write cycles.
Latency Timer Value	A0 through F0 20 through 90	Sets maximum number of PCI bus clocks that PCMC may burst as a master.
CAS# Before RAS# Refresh	Enabled Disabled	If Enabled, the PCMC uses CAS# before RAS# timing to refresh DRAM array. If Disabled, RAS# only refresh is used.
Burst of 4 Refresh	Enabled Disabled	If Enabled, refreshes are performed in sets of four at a frequency of 1/4 of normal refresh rate. If Disabled, single refreshes occur at 15.6 ms refresh rate.
0 - Active RAS# Mode	Enabled Disabled	If Enabled, DRAM interface is in 0-Active RAS# mode. If Disabled, DRAM interface is in 1-Active RAS# mode.

Advanced Chipset Control Parameters

PARAMETER	OPTIONS	DESCRIPTION
Parity Error Mask	Enabled Disabled	If Enabled, parity errors generated during DRAM read cycles are masked. If Disabled, parity errors are not masked.
DRAM Burst Timing	50 ns DRAMs 60 ns DRAMs 70 ns DRAMs	Selects DRAM burst timing.
RAS# Wait State	Enabled Disabled	If Enabled, one additional wait state is inserted before RAS# is asserted.
CAS# Wait State	Enabled Disabled	If Enabled, one additional wait state is inserted before RAS# is asserted. There is no additional delay between CAS# assertions.

Plug and Play O/S Parameters

Your system comes with Plug and Play system support installed, and ready for installation of a Plug and Play operating system (O/S). Once the Plug and Play O/S is installed, your system will automatically configure newly added Plug and Play ISA boards. You need only to install the board and boot the system. The system automatically allocates resources to the board.

You can enable Plug and Play directly from the Advance menu using the command keys. Selecting “Yes” from the menu enables the Plug and Play option. “No” is the default setting, as most current ISA boards do not have Plug and Play capability. However, you can include them in your system, with or without Plug and Play capabilities.

Plug and Play boards are dynamic in nature, meaning that the system allocates resources to the boards on system boot. Some device drivers support this dynamic board configuration, but some do not. Those that do not are known as static device drivers.

If using a static device driver, you need to permanently associate resources with a Plug and Play board, instead of depending on Plug and Play behavior. Otherwise, the device driver might not be able to find the board the next time the system boots.

PCI Devices Parameters

The Combed I/O Resource Allocation parameter default setting is disabled. The parameter should be enabled only when a non-Plug and Play board is not working due to I/O space resource conflicts. This is particularly true for older boards using 10-bit I/O space decoders rather than the full 16-bit I/O space.

Select the PCI Devices parameter and enable the Combed I/O Resource Allocation parameter if you need to allocate I/O resources (see the following table).

Use the legend keys to make your selections and exit to the Main menu.

PCI Device Parameters

PARAMETER	OPTIONS	DESCRIPTION
Combed I/O Resource Allocation	Enabled Disabled (default)	If Enabled, PCI devices requesting I/O resources are checked for requests less than or equal to 256 bytes, that actual I/O resources are allocated in the first 256 bytes of a 1 KB block of I/O addresses, and that all PCI-to-PCI bridges (PPB) have their ISA Enable bits set.

NOTE: The BIOS enables Combed I/O Resource Allocation if it finds a configurable PCI VGA downstream of a PPB.

Large Disk Access Parameters

Select the Large Disk Access parameter if you need to configure a large disk (see the following table).

Use the legend keys to make your selections and exit to the Main menu.

Large Disk Parameters

PARAMETER	OPTIONS	DESCRIPTION
Large Disk Mode	DOS Other	Select "DOS" if you have DOS. Select "Other" if you have another operating system such as UNIX, Novell Netware, or other operating systems. If you install new software and the drive fails, change the selection (DOS or Other) and try again. A large disk is one that has more than 1024 cylinders, more than 16 heads, or more than 63 tracks per sector.

THE SECURITY MENU

The following table lists and describes the available security parameters when you select the Security menu in the legend bar.

Parameters that can be modified directly from the Security menu do not have the right-pointing triangle to the left of the parameter name. These parameters can be modified by pressing the F5, F6, - or + keys.

Parameters with submenus that are available from the Security menu have a right-pointing triangle to the left of the parameter. Use the arrow keys to move the cursor to the parameter, then press **Enter** to open the submenu.

NOTE: You can enter the Setup program with either a User or Supervisor password. However, more Setup choices are available with the Supervisor password.

CAUTION: The features that you set in the Security menu affect the features that appear on the Security menu as well as on other Setup menus.

See the following table for a description of the security features you can directly select. Use the legend keys to make your selections and exit to the Main menu.

See the sections following the table for a description of the Security submenus and their parameters.

Security Menu

FEATURE	OPTIONS	DESCRIPTION
Edit Supervisor Information*	See the following Edit Supervisor Information parameter table.	Selects security options associated with Supervisor login.
Allow User Login	Yes No	Selecting "Yes" allows a user to login, in addition to the supervisor.
Edit User Information*	See the following Edit User Information parameter table.	Selects security options associated with User login.

Security Menu

FEATURE	OPTIONS	DESCRIPTION
Unattended Boot	Disabled Enabled	Selecting Enabled allows the system to enter the network mode if no login ID is typed within 15 seconds.
Diskette Access	User Supervisor User Write Protected	Controls access to diskette drives.
Fixed Disk Boot Sector	Normal (default) Write Protect	Write protect helps prevent viruses. When write protected, operating systems (and viruses and application programs) which attempt to modify the boot sector will not be able to do so.
System Backup Reminder	Disabled (default) Daily Weekly Monthly	Sets how often you are prompted to do a system backup.
Virus check reminder	Disabled (default) Daily Weekly Monthly	Sets how often you are prompted to do a virus check.

* Parameter contains submenus.

Edit Supervisor Information Parameters

Select the Edit Supervisor Information submenu from the Security menu to review and set Supervisor parameters. See the following table for a description of the Edit Supervisor Information parameters.

Edit Supervisor Information Parameters

PARAMETER	OPTIONS	DESCRIPTION
Edit Supervisor Login ID	(Press Enter)	Pressing Enter allows the Supervisor to add or change a login ID.
Edit Supervisor Password	(Press Enter)	Pressing Enter allows the Supervisor to add, change, or delete a new password.
Minimum Password Length	1 to 14 characters	Selects the number of characters allowed in the password.
Numbers Required in Password	Yes No	Defines if numbers are required in password.
Password Lifetime	1 to 511 days	Sets maximum permitted lifetime of password.
Minimum Password Change	0 to 255 days	Sets minimum period between password changes.
Expired Password Life	0 to 127 days	Sets maximum period that an expired password may be used.

Pressing **Enter** at the Edit Supervisor Login parameter on the menu displays a Edit Login dialog box with the following prompt:

Enter login ID: []

Enter your ID number and press **Enter** to accept the ID.

CAUTION: Passwords and security information can only be changed on a cold boot.

Pressing **Enter** at the Edit Supervisor Password parameter on the menu displays an Edit Password dialog box with the following prompts:

Enter new password: []
Re-enter new password: []
Changes have been saved: [continue]

Enter your password, press **Enter**, reenter your password, and press **Enter** to save the password.

Edit User Information Parameters

Select the Edit User Information submenu from the Security menu to review and set user parameters. See the following table for a description of the Edit User Information parameters

Edit User Information Parameters

PARAMETER	OPTIONS	DESCRIPTION
Edit User Login ID	(Press Enter)	Pressing Enter allows the user to change a login ID.
Edit User Password	(Press Enter)	Pressing Enter allows the user to add or change a password. Note: The Supervisor may add, change, or delete a password. A user may only add or change a password.
Minimum Password Length	1 to 14 characters	Selects the number of characters allowed in the password.
Numbers Required in Password	Yes No	Defines if numbers are required in password.
Password Lifetime	1 to 511 days	Sets maximum permitted lifetime of password.

Edit User Information Parameters

PARAMETER	OPTIONS	DESCRIPTION
Minimum Password Change	0 to 255 days	Sets minimum period between password changes.
Expired Password Life	0 to 127 days	Sets maximum period that an expired password may be used.

Pressing **Enter** at the Edit User Login ID parameter on the menu displays a Edit Login dialog box with the following prompt:

Enter login ID: []

Enter your ID number and press **Enter** to accept the ID.

CAUTION: Passwords and security information can only be changed on a cold boot.

Pressing **Enter** at the Edit User Password parameter displays an Edit Password dialog box with the following prompts:

Enter new password: []
Re-enter new password: []
Changes have been saved: [continue]

Enter your password, press **Enter**, reenter your password, and press **Enter** to save the password.

THE EXIT MENU

Selecting the Exit menu from the menu bar displays the following exit options:

- Save Changes & Exit
- Discard Changes & Exit
- Get Default Values
- Load Previous Values
- Save Changes.

The following sections describe each of the options on the Exit menu. Note that **Esc** does not exit this menu. You must select one of the items from the menu or menu bar to exit.

Save Changes & Exit

After making your selections on the Setup menus, always select Save Changes & Exit to make them operative.

Unlike standard RAM memory, CMOS is sustained by an onboard battery and stays on after you turn your system off.

After you save your selections, the program displays this message:

```
Changes have been saved  
[continue]
```

Pressing **Enter** at “Continue” exits Setup and reboots your system.

If you attempt to exit without saving, the program asks if you want to save before exiting.

During bootup, Setup attempts to load the values you saved in CMOS. If the values saved in CMOS cause the system boot to fail, reboot and press **F2** to enter Setup. In Setup, you can load the ROM default values (as described below) or try to change the values that caused the boot to fail.

Discard Changes & Exit

Use this option to exit Setup without recording any changes you may have made.

Get Default Values

To load all the default Setup values in the Setup menus, select Get Default Values from the Main menu. The program displays this message:

```
Default values have been loaded.  
[continue]
```

Pressing **Enter** at “Continue” exits Setup and reboots your system.

If, during bootup, the BIOS program detects a problem in the integrity of values stored in CMOS, it displays these messages:

```
System CMOS checksum bad - run SETUP  
Press <F1> to resume, <F2> to Setup
```

The CMOS values have been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS.

Press **F1** to resume the boot or **F2** to run Setup with the default values already loaded into the menus. You can make other changes before saving the values to CMOS.

Load Previous Values

If, during a Setup session, you change your mind about your selections and have not yet saved the values to CMOS, you can restore the values you previously saved to CMOS.

Selecting Load Previous Values on the Exit menu updates all the selections and displays this message:

```
Previous values have been loaded!  
[continue]
```

Save Changes

Save Changes saves all the selections without exiting Setup. You can return to the other menus if you want to review and change your selections.

Selecting Save Changes on the Exit menu saves your changes and displays the following message:

```
Changes have been saved  
[Continue]
```

Pressing **Enter** at Continue exits your Setup and reboots your system.

4 Using the ECU and SCSI Utilities

This chapter provides information for the following utilities that you use when installing, changing, or checking expansion devices in your system:

- EISA Configuration Utility (ECU)
- SCSI Utility.

The ECU utility is used to configure your system whenever you add, move, or remove an optional EISA, PCI, Plug and Play ISA, or non-Plug and Play ISA expansion device. The ECU utility comes on a diskette shipped with your system.

NOTE: Do *not* copy the EISA Configuration Utility to your hard disk. The utility program must start with a *cold boot* from the EISA Configuration Utility diskette.

The SCSI utility is used to check or change the settings of your installed SCSI-2 devices or to configure your system for any optional SCSI devices that you may install. The SCSI utility is pre-installed on your system and ready to run.

Refer to the following table for a quick reference to configuring optional expansion devices. For details, see this chapter and the referenced chapters and sections in the table.

NOTE: It is recommended that you read this chapter before starting the configuration process.

CAUTION: You must install an EISA, PCI, or Plug and Play board or device *before* running the Setup and ECU utilities. If installing a non-Plug and Play ISA board, it must be installed *after* running the Setup and ECU utilities.

Quick Reference to Configuring Expansion Devices

IF YOU ARE CONFIGURING	THEN
EISA Expansion Board	<ol style="list-style-type: none">1. Install, move, or remove the EISA board in your system (see Chapter 7 for procedures).2. Load the ECU utility (see "How to Load the ECU" in this chapter).3. Read the overview of selecting and configuring EISA or ISA expansion boards (see "Configure Computer or Peripheral Devices - Step 1: Important EISA Configuration Information" in this chapter).4. Configure your system and EISA/ISA board (see "Configure Computer or Peripheral Devices - Step 2: Add or Remove Boards" in this chapter).5. Check or change your configuration (see "Configure Computer or Peripheral Devices - Step 3: View or Edit Details" in this chapter).6. Save your changes and exit the ECU utility (see "Configure Computer or Peripheral Devices - Step 5: Save and Exit" in this chapter).

Quick Reference to Configuring Expansion Devices

IF YOU ARE CONFIGURING	THEN
PCI Expansion Device	<ol style="list-style-type: none"><li data-bbox="618 283 1281 336">1. Install, move, or remove the device in your system (see Chapter 7 for procedures).<li data-bbox="618 359 1281 468">2. If you need to allocate I/O resources, open the Setup utility (see Chapter 3). Select "Advanced" from the Setup utility main menu, and enable the "PCI Devices - Combed I/O Resource Allocation" parameter from the Advanced menu.<li data-bbox="618 491 1281 546">3. Load the ECU utility (see "How to Load the ECU" in this chapter).<li data-bbox="618 569 1281 644">4. Select "Configure Computer or Peripheral Devices" from the ECU main menu. Your system automatically loads PCI configuration information.<li data-bbox="618 667 1281 743">5. Check or change your configuration (see "Configure Computer or Peripheral Devices - Step 3: View or Edit Details" in this chapter).<li data-bbox="618 766 1281 850">6. Save your changes and exit the ECU utility (see "Configure Computer or Peripheral Devices - Step 5: Save and Exit" in this chapter).
Plug and Play ISA Board	<ol style="list-style-type: none"><li data-bbox="618 873 1281 1014">1. If your system has a Plug and Play O/S system installed, enable "Plug and Play O/S" in the Setup utility. (See Chapter 3, "Setting System Parameters." Select the "Advanced" menu from the Setup main menu and enable the "Plug and Play O/S" parameter.)<li data-bbox="618 1037 1281 1092">2. Install the Plug and Play board in your system (see Chapter 7 for procedures).<li data-bbox="618 1115 1281 1215">3. Load the ECU utility (see "How to Load the ECU" in this chapter). Note: do <i>not</i> use the ICU utility or any other utility shipped with the Plug and Play board. Doing so may cause resource conflicts.<li data-bbox="618 1239 1281 1318">4. Select "Configure Computer or Peripheral Devices" from the ECU main menu. Your system automatically loads Plug and Play configuration information.

Quick Reference to Configuring Expansion Devices

IF YOU ARE CONFIGURING	THEN
Plug and Play ISA Board (cont'd)	<ol style="list-style-type: none">5. Check or change your configuration (see "Configure Computer or Peripheral Devices - Step 3: View or Edit Details" in this chapter).6. Save your changes and exit the ECU utility (see "Configure Computer or Peripheral Devices - Step 5: Save and Exit" in this chapter).
Non-Plug and Play ISA Board	<ol style="list-style-type: none">1. Load the ECU utility (see "How to Load the ECU" in this chapter). Note: do <i>not</i> install, move, or remove the non-Plug and Play board in your system until <i>after</i> the configuration procedure is completed.2. Configure your system and non-Plug and Play ISA board (see "Configure Computer or Peripheral Devices - Step 2: Add or Remove Boards" in this chapter). Also check the documentation that comes with the board for resource allocations.3. Check or change your configuration (see "Configure Computer or Peripheral Devices - Step 3: View or Edit Details" in this chapter).4. Save your changes and exit the ECU utility (see "Configure Computer or Peripheral Devices - Step 5: Save and Exit," in this chapter).5. Install the non-Plug and Play board in your system (see Chapter 7 for procedures) and power up the system.

Quick Reference to Configuring Expansion Devices

IF YOU ARE CONFIGURING	THEN
SCSI-2 Expansion Device	<ol style="list-style-type: none"><li data-bbox="618 283 1276 394">1. Set switches on the SCSI-2 device to the required settings. (See the documentation that comes with your device and Chapter 7 in this guide for information on setting switches.)<li data-bbox="618 415 1276 466">2. Install the SCSI-2 expansion device in your system (see Chapter 7 for procedures).<li data-bbox="618 487 1276 537">3. Open the SCSI utility (see the “SCSI Select Utility” section at the end of this chapter).<li data-bbox="618 558 1276 642">4. Select “SCSI Disk Utilities” to review what SCSI devices are currently installed and to set the SCSI ID on any optional device you installed.<li data-bbox="618 663 1276 747">5. Select “Configure/View Host Adapter Settings” from the SCSI Select utility menu (see “SCSI Select Utility” at the end of this chapter).<li data-bbox="618 768 1276 819">6. Review the settings of your installed device and reconfigure settings as necessary.<li data-bbox="618 840 1276 867">7. Save your changes and exit the SCSI Select utility.

THE EISA CONFIGURATION UTILITY (ECU)

The ECU utility is required for EISA configuration and provides a detailed view of your system's configuration. The ECU utility allows you to make system configuration changes when you add, move, or remove an EISA, PCI, Plug and Play ISA, or non-Plug and Play ISA board. This ensures that the information in CMOS is consistent with the information stored in the BIOS.

When you add a board to your configuration and run the ECU utility, it reads the board's corresponding configuration (CFG) file. The ECU uses the CFG file, which describes the characteristics and the required system resources of the board, to create a conflict-free configuration.

Once you complete the configuration process, configuration information is saved to the system's nonvolatile memory for use any time you power-on the system.

The ECU utility:

- supports EISA and ISA boards, PCI devices, and Plug and Play ISA boards.
- automatically detects EISA boards, PCI devices, and Plug and Play ISA boards installed in your computer.
- creates and maintains the System Configuration Information (SCI) file as a backup for the computer's nonvolatile memory.
- supports configuration (CFG) file extensions.
- lets you set the computer's date and time.
- allows you to create ISA CFG files.

When to Use the ECU

Run the ECU any time you add, move, or remove an EISA board, ISA board, or PCI device. You must physically install the boards in the computer and add the configuration information stored in the computer by the ECU.

CAUTION: You must install an EISA, PCI, or Plug and Play board or device *before* running the ECU utility. If installing a non-Plug and Play ISA board, it must be installed *after* running the ECU utility.

Use the ECU to

- change or check system parameters when you add, move, or remove an expansion board.
- print out the required settings of a particular board or option.
- correct a hardware discrepancy when the Power-On Self-Test (POST) displays an “Invalid EISA Configuration Storage - RUN ECU” error message and prompts you to run the ECU program.
- boot the system and check parameters when you have a problem with the system.
- change functions and resources of boards installed in the system.
- resolve a resource conflict when adding a board or changing a board function or resource.
- lock and unlock boards in the configuration.
- maintain the ECU Utility diskette.
- set system parameters if the RTC/battery module is replaced.

How to Load the ECU

Use the following steps to load the ECU.

NOTE: Do *not* copy the EISA Configuration Utility to your hard disk. The utility program must start with a *cold boot* from the EISA Configuration Utility diskette.

1. With the system powered off, insert the NEC EISA Configuration Utility (ECU) diskette into drive A.

The ECU requires a *cold boot* *each* time you load it.

2. Power on the system. After performing POST, the system loads and starts the ECU. An ECU preparation screen and NEC logo screen briefly appears, then the Main Menu screen appears similar to the following:

```

                                     Main Menu

                                     Help
                                     Configure Computer or Peripheral Devices
                                     Set Date or Time
                                     Maintain System Configuration Diskette
                                     Exit

```

How to Use the ECU

You can use the keyboard to select menu items in the ECU. To use the ECU, follow the instructions on the screen. Select the “Help” option on the Main Menu for information about the utility. Information is also available in other menu options by pressing **F1** for help.

Be sure to save your changes to set system configuration parameters (see “Exit” in this section).

Read the information in the following sections for a description of Main Menu options and how to use them. Options are described in the sequence that they appear on the Main Menu.

NOTE: For your system configuration, you might not need to use all of the selections listed under each Main Menu option. Read the information in the following sections to select the options you need.

NOTE: It is strongly recommended that you make a backup copy of the ECU diskette and any other diskettes shipped with your system. If you do not have a hard disk configuration, make a backup copy of all other diskettes that ship with the system. Use the copies and store the original diskettes.

Configure Computer or Peripheral Devices

Select the “Configure Computer or Peripheral Devices” option under the following circumstances:

- you are setting up the system for the *first* time
- the “Invalid Configuration Information” message appears at POST

If this message appears, run the Setup utility to correct any configuration errors.

If you receive an “EISA Configuration NVRAM Bad - Run Configuration Utility - F2 to Run Setup” message, run the ECU utility, not the Setup utility.

- you add, move, or remove an expansion board
- you installed a PCI device
- you want to change board functions or resources
- you want to view switch and jumper settings for a specific board
- the RTC/battery module was replaced in the system and you need to set the system parameters.

If you installed an EISA or ISA board and you select “Configure Computer or Peripheral Devices,” the ECU might display an “Automatic Add” screen with a request for a configuration (CFG) file.

The ECU displays this screen if it needs a configuration (CFG) file for the installed board. If the screen appears, remove the ECU diskette and insert the diskette containing the CFG file. Press **Enter** and follow the screen prompts to automatically add the required CFG file.

NOTE: EISA and ISA boards require CFG files for system configuration. The board manufacturer supplies the CFG file for an EISA board. Some ISA boards also come with a CFG file. If you have an ISA board that does not have a CFG file, see “ISA Boards without CFG Files” in this chapter.

If the ECU does not need any configuration files, it displays a menu with five steps for configuring your computer:

Step 1: Important EISA configuration information — provides EISA configuration information.

Step 2: Add or remove boards — configures the system for the addition or removal of an expansion board to or from the system.

Step 3: View or edit details — lets you view and change system board settings. (If you do not have a hard disk configuration, you must select this step when you are setting up the system for the first time.)

NOTE: If you are setting up the system for the *first* time, *you must select Step 3*, even if you did not install an expansion board. This step configures the system board in your system.

Step 4: Examine switches or print report — allows you to view the required switch and jumper settings of a particular board. You can also select a print option to print the required settings of a particular board.

Step 5: Save and exit — lets you save the system configuration and exit the utility.

The following describes each of the configuration steps in sequence.

Step 1: Important EISA Configuration Information

Select Step 1 for information about using the ECU to configure your EISA or ISA boards.

NOTE: It is recommended that you select Step 1 before continuing with the ECU utility. Step 1 contains an overview of the process for selecting and configuring EISA or ISA expansion boards.

Step 2: Add or Remove Boards

Select Step 2 whenever you install or remove any EISA boards or ISA boards with CFG files from the system.

NOTE: If you are adding an EISA board to your system, first install the board. Then run the ECU and select Step 3: Configure Computer and Peripheral Devices. This step automatically loads configuration information and adds the EISA board to your system configuration. If you are adding a non-Plug and Play ISA board, install the board after running the ECU and performing Steps 2 through 5.

When you select Step 2, a screen displays the system board and any EISA boards currently installed in your system. The display includes board names and expansion slot numbers.

NOTE: Integrated on-board PCI SCSI, IDE, and VGA controllers are listed as “Embedded” controllers at the bottom of the list of expansion slots. You cannot move or remove an embedded feature but you can enable or disable the feature (see “Step 3: View or Edit Details”).

To complete the Step 2 configuration process, use the following steps.

1. Select “Step 2: Add or remove boards” from the Configure Computer or Peripheral Devices menu. Press **Enter**.

A screen displays the boards installed in your system and the available expansion board slots. Scroll through the list of boards displayed and proceed as follows.

- If the list shows all your boards installed, press **F10**.

NOTE: If a CFG file comes with your board and a CFG file already exists on the ECU diskette, you still need to copy the CFG file from the option configuration diskette (see “Maintain System Configuration Diskette” in this section). This ensures that the system uses the latest version of the file.

In the rare event that the CFG file on the ECU diskette is newer, the system displays an OverWrite Current File message. In this case, press **Esc** to cancel.

- If a board is not displayed and you did not load a configuration file for it, go to the next step.

NOTE: You cannot use the next step to add ISA boards without configuration files. To add an ISA board without configuration files, see "ISA Boards without CFG Files."

2. Highlight the slot location of the installed board and press **Insert** to add the board. The Add screen appears.
3. Remove the ECU diskette from the diskette drive and insert the diskette with the board's CFG file.
4. Press **Enter**. The Add configuration (CFG) file screen appears.
5. Press **F7** and press **Enter** to change to the drive containing the CFG file.

NOTE: If a CFG file comes with your board and a CFG file already exists on the ECU diskette, you still need to copy the CFG file from the option configuration diskette (see "Maintain System Configuration Diskette" in this section). This ensures that the system uses the latest version of the file.

In the rare event that the CFG file on the ECU diskette is newer, the system displays an OverWrite Current File message. In this case, press **Esc** to cancel.

6. Select the file you want to add and press **Enter**. A screen with information about the board appears.
7. Press **Enter** to confirm the addition of the board.
8. Insert the ECU diskette. Highlight the board and press **Enter** to confirm the slot location of the board.

-
9. When you are done, press **F10** to exit “Step 2: Add or remove boards” configuration procedure.

Before you exit, note information you might need to change settings or install boards. To print out any configuration information about the board, select “Step 4: Examine Required Switches.”

Repeat steps 1 through 9 in the above procedure to add another board.

Step 3: View or Edit Details

Select Step 3 to modify system board settings or to configure your system when you are setting up for the first time.

System board settings include the following configuration categories:

- System and video BIOS caching, and system and video BIOS shadowing
- Port configurations — parallel port, serial port 1, and serial port 2 addresses and interrupts.
- Peripheral controllers — diskette drive controller, PCI SCSI controller, PCI IDE controller, PCI VGA controller.

Refer to the following table for a quick-reference list of ECU utility parameters and their factory (default) settings.

See the procedure and additional information following the table to configure your system board.

EISA Configuration Utility Parameters

MENU/PARAMETER	DEFAULT SETTING
EISA NMI Control	
Software NMI	Enabled
32-bit Bus Timeout NMI	Enabled
Parallel Port	Port 378 IRQ 7
Parallel Port Mode	Output Only
Serial Port 1	Port 3F8 IRQ 4
Serial Port 2	Port 2F8 IRQ 3
Diskette Controller	Enabled
Cache Video BIOS Area	Enabled
Cache Memory Region (C800)	Enabled
Cache Memory Region (CC00)	Enabled
Cache Memory Region (D000)	Enabled
Cache Memory Region (D400)	Enabled
Cache Memory Region (D800)	Enabled
Cache Memory Region (DC00)	Enabled
Shadow Video BIOS Area	Enabled
Shadow Memory Region (C800)	Disabled
Shadow Memory Region (CC00)	Disabled
Shadow Memory Region (D000)	Disabled
Shadow Memory Region (D400)	Disabled
Shadow Memory Region (D800)	Disabled
Shadow Memory Region (DC00)	Disabled
Embedded — PCI SCSI Controller	
Adaptec 7850 PCI SCSI Controller	Enabled
Embedded — PCI IDE Controller	
CMD 640B PCI IDE Controller	Disabled
Standard IDE Resources	Disabled
Embedded — PCI VGA Controller	
Tseng ET4000 W32P (D) PCI VGA Controller	Enabled
Standard VGA Resources	Enabled

Use the following procedure to configure your system board.

NOTE: See the guidelines that follow the procedure for additional information about setting system parameters.

1. Select “Step 3: View or edit details” from the Configure Computer or Peripheral Devices menu and press **Enter**.

A screen appears with the configuration categories and their parameters.

2. Scroll through the list using your arrow keys or Page Up and Page Down keys to view the parameters.

To view parameter choices, highlight the parameter and press **Enter**.

3. Make any parameter changes. To view, and in some cases, to edit parameter resources (for example, interrupts, I/O addresses, or I/O ports), press **F6**.
4. When you are through viewing and changing parameter settings, press **F10** to exit the “Step 3: View or edit details” procedure.

NOTE: Print options for printing the required settings of a particular board or option are available through Step 4 on the Configure Computer or Peripheral Devices menu (see “Step 4: Examine Required Switches” later in this section).

Advanced menu

Press **F7** to use Advanced menu functions for setting system parameters. Advanced menu functions are briefly described as follows.

- **Lock/unlock boards** — provides options for locking or unlocking the settings of a board or the entire system. Locking the settings prevents changes to the current settings.

NOTE: You must lock an ISA board configured as a Generic ISA Adapter board (ISA board without CFG files) to reserve the selected system resources. Locking the board prevents the ECU from using the selected resources to resolve resource conflicts.

Locking system resources for a Generic ISA Adapter board can cause changes to the switch and jumper settings of other boards in the system.

- **View additional system information menu** — provides options to display detailed information about system specifications and resources.
- **Set verification mode menu** — allows you to specify whether the computer's configuration must be checked each time you make a change or only when you choose.

CAUTION: Selecting the “Manual Mode” may cause conflicts which will prevent the system from booting.

- **Maintain SCI files menu** — provides options regarding System Configuration Information (SCI) files.

PCI IDE controller

If you installed an IDE hard disk in the system, locate the “Embedded PCI IDE controller” on the system board list of details and enable “Standard IDE Resources.”

NOTE: Enabling the IDE controller automatically changes any installed SCSI controller to a secondary controller and might change the IRQ.

If you have an IDE hard disk, you must also run the Setup utility at power-on to set the drive parameters.

PCI SCSI controller and SCSI termination

If you have a SCSI device installed in the system, check that the Embedded PCI SCSI Controller parameter is enabled.

If you have *both* internal and external SCSI devices installed and connected to the on-board SCSI-2 host adapter, use the SCSI Select Utility to set “External” SCSI device termination. Run the SCSI Select Utility when you complete the system configuration with the ECU (See “SCSI Select Utility” later in this chapter).

Shadowing and caching features

The shadowing and caching features should be left enabled.

Step 4: Examine Required Switches

Select Step 4 to view any required switch and jumper settings on installed boards. To view the required settings, highlight the board you wish to view, and press **Enter**.

NOTE: To check the current settings of a board, you must physically verify the settings. For example, you must power off the system and remove the system cover to verify the current system board System Configuration Switch settings.

If you have a printer set up, you can print the settings of a particular board or option. You can also save the settings to a file that you can use to print on another computer that is connected to a printer. Press **F7** for a list of print options.

Step 5: Save and Exit

Select Step 5 to save your configuration and reboot your system.

Set Date or Time

Set the date and time if you are setting up the system for the first time or you need to correct the settings. The settings remain in memory even after the system is powered off.

To set the date and time, choose “Select Date or Time” from the Main Menu and select the date and time menu options.

NOTE: When setting the date or time, enter any preceding zeroes. For example, to enter 8:20 a.m. and March 7, 1995, type **08:20:00** and **03-07-1995**.

To cancel the selection without saving the date and time, press **Esc**.

Maintain System Configuration Diskette

Select this option to create, load, copy, or delete any necessary system configuration information (SCI) files. You can also use this option to copy and delete CFG files.

Depending on the system configuration, you might want to modify the system board SCI file. Before configuring the system, you must copy configuration files for the EISA boards, and in some cases, ISA boards. This section provides copying procedures for both.

CFG files are required to correctly configure EISA boards. Every EISA board contains settings that determine how the board works within the system. These settings are in a configuration file and are copied to and stored in the system.

All EISA boards should come with CFG files. If not, check the configuration files that come on the ECU diskette or contact the EISA board manufacturer to obtain the appropriate files. If your ISA boards did not come with a CFG file, see “ISA Boards without CFG Files” in this chapter.

Use the following steps to copy or update configuration files.

1. Select “Maintain System Configuration Diskette” from the Main Menu.
2. Remove the ECU diskette from the diskette drive and replace it with the configuration diskette that came with the option board.
3. Select “Copy/update CFG files” from the menu.
4. Press **Enter**. A screen appears showing the available configuration files.

-
5. Select the configuration file you need to copy. You can only copy one file at a time. Press **Enter**.

You are prompted to remove the configuration diskette.

6. Remove the diskette and replace it with the ECU diskette.

After replacing the diskette, the CFG file is copied onto the ECU diskette.

7. Repeat Steps 5 and 6 to copy all the configuration files you need onto the ECU diskette.

Exit

Select this option to exit the ECU utility.

If you are setting up the system for the first time and you have a SCSI device (such as a SCSI hard disk and CD-ROM reader), see “SCSI Select Utility” later in this chapter.

PCI Devices and Plug and Play ISA Boards

Whenever you install a PCI device or Plug and Play ISA board in the system, run the ECU and select “Configure Computer or Peripheral Devices.”

This configuration procedure automatically loads configuration information and adds the PCI device or Plug and Play board to the configuration. Select “Step 3: View or Edit Details” to check system parameters and “Step 4: Examine Required Switches” to print out system configuration information.

Be sure to select Step 5 in the Configure Computer or Peripheral Devices menu and save your configuration.

ISA Boards without CFG Files

If a CFG file did not ship with your ISA board, check to see if one exists for the board on the ECU diskette or on a CFG File Library diskette. If you still cannot locate a CFG file for the board, use one of the following procedures:

- configure your system for the ISA board with the Generic ISA CFG File provided by the ECU (see the next section, “Using the Generic ISA CFG File”).
- create a CFG file for the ISA board (see “Using the Create CFG File Facility” later in this section). Use this procedure when the Generic ISA CFG File is not available.

Using the Generic ISA CFG File

The ECU provides one Generic ISA CFG file that you can use with an ISA board that does not have a corresponding file. However, if you have a multifunction ISA board, you may have to manually create a configuration file (see “Using the Create CFG File Facility,” next).

NOTE: The ECU provides only one Generic ISA CFG file. If you already used the Generic ISA CFG file, see “Using the Create CFG File Facility.”

Before you use the Generic ISA CFG file, determine if a CFG file exists for the ISA board. If you cannot locate a CFG file, use the following procedure to configure your system for the ISA board.

NOTE: Do not install the ISA board in your system until you have completed the following procedure.

-
1. Locate the manufacturer's documentation that comes with the ISA board. This document provides information about any required resources for the ISA board.
 2. Run the ECU utility and select "Configure Computer or Peripheral Devices" from the Main Menu.
 3. Select "Step 2: Add or remove boards."
 4. Press **Insert** to select the Add function. A message appears telling you to locate the CFG file for the board you want to install.
 5. Press **Enter**. The "Select a Configuration (CFG) file to add" screen appears.
 6. Select "Generic ISA Adapter" and press **Enter**. The "Add confirmation" screen appears with the manufacturer's comments and instructions to configure the board resources manually.
 7. Read the manufacturer's comments and press **Enter** when you are finished. The "Add" screen appears.
 8. Select the slot in which you want to install the ISA board and press **Enter**. The "Step 2: Add or remove boards" screen appears and shows the addition of the Generic ISA Adapter.

NOTE: You can select any available slot. Available slots are listed in the order of preference.

9. Press **F10**. The "Steps in configuring your computer" menu appears.
10. Select "Step 3: View or edit details." Scroll through the menu items until you find the Generic ISA Adapter board.

-
11. Using the information provided by the board manufacturer, select the appropriate Generic ISA Adapter board function.

For example, if the board requires an IRQ setting, select “ISA IRQ Resource Allocation.” Press **F6** to edit the resource.

When you are done editing the resource, press **F10**.

12. Repeat step 11 for each function on the Generic ISA Adapter board. When you are through editing the functions, press **F7** to select the Advanced menu.
13. Select “Lock/unlock boards.” Then select the Generic ISA Adapter board from the list. An exclamation point next to the board indicates that it is locked.

NOTE: Locking the Generic ISA Adapter board reserves the selected system resources and prevents the ECU from using them to resolve resource conflicts.

CAUTION: Do not remove a locked board after it is locked and saved, and you exited from the ECU utility. You must unlock any added boards before removing the board from the system. Otherwise, system resources may change, causing ECU problems. If this occurs, you must clear CMOS (see Chapter 8, “Setting System Board Switches” for procedures to clear CMOS).

14. Complete the Step 3 configuration as follows.

- Press **F10** to select Done. The Advanced menu appears.
- Press **Esc**. The “Step 3: View or edit details” screen appears.
- Press **F10** to select Done. The “Steps in configuring your computer” screen appears.

15. Select “Step 4: Examine switches or print report.” Identify any boards on the screen marked with an arrow.

An arrow indicates that the boards might have jumpers and switches that you must physically verify or that a software statement with additional information about the board is provided.

NOTE: Locking system resources for the Generic ISA Adapter board can cause changes to the switch and jumper settings of other boards in the system.

16. Press **F7** to select a print option to print the configurations of the boards marked with an arrow. If you do not choose a print option, be sure to write down switch and jumper information provided for the boards marked with an arrow.

17. Press **F10**. The “Steps in configuring your computer” screen appears. Select “Step 5: Save and Exit.”

18. Select “Save the configuration and restart the computer.” At the “Reboot” screen, press **Enter**.

-
19. Remove the ECU diskette and turn off the system. If you printed any configuration settings to a file, install the diskette in a computer attached to a printer so you can print a hard copy.
 20. Compare the settings of the boards installed to the printout. Make any changes necessary. The settings on the board(s) must match the settings on your printout for the system to operate correctly. You might need to remove a board to access its switches and/or jumpers.
 21. If you removed any boards to change settings, reinstall the boards in the computer.
 22. Install the ISA board (see Chapter 7 in this guide).

Using the Create CFG File Facility

Use the “Create CFG File Facility” when you cannot locate the CFG file for a particular board and the Generic ISA configuration (CFG) file is not available. Use the following procedure.

1. Run the ECU and select “Configure Computer or Peripheral Devices” from the Main Menu.
2. Select “Step 2: Add or remove boards.”
3. Press **Insert** to select the Add function. A message appears telling you to locate the CFG file for the board you want to install.
4. Press **Enter**. The “Select a Configuration (CFG) file to add” screen appears.
5. Press **F5** to select “Not Listed.” The “Add a board without a CFG file” screen appears.
6. Select “Look for CFG file.” The “Look for CFG file” screen appears. Read through the information and press **Enter** when done. The “Add a board without a CFG file” screen reappears.

-
7. Select “Create CFG file.” The “Create a Board CFG File” screen appears.
 8. Enter the board description and manufacturer. Press **Enter**. The “New Board Setup” screen appears.
 9. Review the manufacturer’s documentation and select the resources used by the board’s current configuration as follows:
 - If your board requires interrupts, choose “Select Interrupts.” Select the interrupts used by the board’s current configuration. You must limit your selections to seven interrupts.

Press **F10** when done. The “New Board Setup” screen reappears.

NOTE: Press **F7** if you need to check the current allocation of your system’s resources.

- If the board requires DMA channels, choose “Select DMA Channels.” Select the DMA channels used by the board’s current configuration. You must limit your selections to four DMA channels.

Press **F10** when done. The “New Board Setup” screen reappears.

- If the board requires a port address, choose “Select Port Addresses.” The “Select Port Addresses” screen appears. Press **Insert** to enter a port address or **Delete** to remove a port address. When you press **Insert**, the “Add New Port” screen appears.

Enter the starting and ending addresses in hexadecimal format. Press **Enter** when you are done. The “New Board Setup” screen appears.

-
- If the board requires a memory address, choose “Select Memory Addresses.” The “Select Memory Addresses” screen appears. Press **Insert** to enter a memory address or **Delete** to remove a memory address. When you press **Insert**, the “Add New Memory” screen appears.

Enter the starting address in hexadecimal format and the length of the address in kilobytes. Press **Enter** when you are done. The “Select Memory Addresses” screen appears.

You can add or delete another memory address. You must limit your selection to nine memory addresses. Press **F10** when you are done. The “New Board Setup” screen reappears.

10. Press **F10** when you finish selecting the resources used by the board. The “View Current Settings” screen appears. Press **Enter** to save the current settings. The “Add confirmation” screen appears.
11. Read the manufacturer’s comments and press **Enter** when you are done. The “Add” screen appears.
12. Select the slot in which you want to install the board. Press **Enter**. If you add a board with a tag such as “video,” it must be installed in a slot with an identical tag. Otherwise, select any available slot.

NOTE: If the board causes a conflict in the configuration, a Caution message appears with instructions to remove the conflict or the system may hang-up.

13. Press **F10** when the “Step 2: Add or remove boards” screen appears. The “Steps in configuring your computer” screen appears.

14. Complete the configuration as follows:

- Select “Step 4: Examine switches or print report.” Note any boards marked with an arrow on the screen.

The arrows indicate that the board might have jumpers and switches that you must physically verify or that a software statement provides additional information about the board.

- Press **F7** to select a print option to print the configurations of the boards marked with an arrow. If you do not choose a print option, be sure to write down switch and jumper information provided for the boards marked with an arrow.
- Press **F10**. The “Steps in configuring your computer” screen appears. Select “Step 5: Save and Exit.”
- Select “Save the configuration and restart the computer.” At the “Reboot” screen, press **Enter**.

15. Turn off the system and remove the ECU diskette. If you printed any configuration settings to a file, install the diskette in a computer attached to the printer so you can print a hard copy.
16. Compare the settings of the boards installed to the printout. Make any changes necessary. The settings on the board(s) must match the settings on your printout for the system to operate correctly. You might need to remove a board to access its switches and/or jumpers.
17. If you removed any boards to change settings, reinstall the boards in the computer.
18. Install the ISA board (see “Installing a Board” in Chapter 7).

THE SCSI SELECT UTILITY

The SCSI Select utility allows you to check your installed SCSI devices and to configure the SCSI host adapter if you install optional SCSI devices.

To enter the SCSI Select utility, reboot your system and press **Ctrl A** at the system's opening screen.

NOTE: You must press **Ctrl A** as soon as the following message appears on your screen.

<<< Press <Ctrl> <A> for SCSI Select (tm) Utility>>>

A screen similar to the following displays.

```
Adaptec AIC7850 <SCSISelect (tm) > Utility V1.11
AIC-7850 at Bus:Device 00:03h

Would you like to configure the host adapter, or run the
SCSI disk utilities? Select the option and press <Enter>
Press <F5> to switch between color and monochrome modes.

Options

Configure/View Host Adapter Settings
SCSI Disk Utilities

Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*= default)
```

See the following sections for a description of the Configure/View Host Adapter Settings option and the SCSI Disk Utilities option.

Configure/View Host Adapter Settings

The Configure/View Host Adapter option allows you to review the settings of your installed SCSI devices and to reconfigure the settings if you install optional SCSI devices.

At the SCSI Select utility menu, position the cursor to Configure/View Host Adapter Settings and press **Enter** to display the Configure/View Host Adapter menu. A screen similar to the following displays.

NOTE: The screen shown is typical of your system. The actual items on the menu depend upon the hardware installed in your system.

```
AIC-7850 at Bus Device 00:03h
Configure/View Host Adapter Settings

SCSI Bus Interface Definitions
  Host Adapter SCSI ID ..... 7
  SCSI Parity Checking ..... Enabled
  Host Adapter SCSI Termination ..... Enabled

Additional Options
  SCSI Device Configuration ..... Press <Enter>
  Advanced Configuration Options ..... Press <Enter>

<F6> - Reset to Host Adapter Defaults

Arrow Keys to Move Cursor, <Enter> to Select Option, <ESC> to Exit (*=default)
```

For the SCSI Bus Interface Definitions settings, use the arrow keys to move the cursor to the parameter, press **Enter** to change the setting, and press **Esc** to exit. Press **F6** to reset to the Host Adapter defaults.

Pressing **Esc** displays the following:

Save Changes Made?
Yes
No

Selecting **No** takes you back to the Options screen.
Selecting **Yes** saves your changes and reboots your system after you press any key when the following message is displayed:

Please Press any Key to Reboot

For the Additional Options settings, use the arrow keys to move the cursor to the parameter, press **Enter** to display the option's submenu, make your changes, and press **Esc** to exit. Press **F6** to reset to the Host Adapter defaults.

The following tables summarize the SCSI Device Configuration Option and the Advanced Configuration Option submenu parameters.

SCSI Device Configuration Options

PARAMETERS	OPTIONS	DESCRIPTION
Initiate Sync Negotiation	Yes (default) No	Enables or disables the sync negotiation for each SCSI device.
Maximum Sync Transfer Rate	10.0 (default) 8.0 6.7 5.0	Sets maximum sync transfer rate for each SCSI device.
Enable Disconnection	Yes (default) No	Enables or disables the SCSI device.
Note: The following options have no effect if the BIOS is disabled.		
Send Start Unit Command	Yes (default) No	Enables or disables the motor start command for each SCSI device.
Include in BIOS Scan	Yes (default) No	Enables or disables the BIOS scan function.

Advanced Configuration Options

PARAMETERS	OPTIONS	DESCRIPTION
Reset SCSI Bus at IC Initialization	Enabled (default) Disabled	Enables or disables the Reset SCSI Bus at Initialization.
Note: The following options have no effect if the BIOS is disabled.		
Host Adapter BIOS	Enabled (default) Disabled	Enables or disables the host adapter BIOS
Support Removable Disks under BIOS as Fixed Disks	Boot Only (default) All Disks Disabled	Allows use of removable hard disks as fixed hard disks under BIOS control
Extended BIOS Translations for Drives Greater than 1 GByte	Enabled (default) Disabled	Enables or disables extended BIOS for 1 GByte or larger drives.
BIOS Support For More Than 2 Drives (MS-DOS 5.0 and above)	Enabled Disabled	Enables or disables BIOS support for more than two drives.

SCSI Disk Utilities

Use the SCSI Disk Utilities option to check what SCSI devices are currently installed in your system and to set the SCSI ID number on any optional SCSI devices that you may install.

At the SCSI Select utility opening screen, position the cursor to SCSI Disk Utilities and press **Enter** to display the SCSI Disk Utilities menu.

Before opening the menu, the utility scans your system for installed SCSI devices as indicated by a Scanning message on your screen.

On completion of the scan, a screen similar to the following displays.

NOTE: The screen shown is typical of your system. The actual items on the menu depend upon the hardware installed in your system.

```
AIC-7850 at Bus Device 00:03h
Select SCSI Disk and Press <Enter>

SCSI ID #0 SEAGATE ST3255ON
SCSI ID #1 No device
SCSI ID #2 No device
SCSI ID #3 No device
SCSI ID #4 CD-ROM Drive
SCSI ID #5 No device
SCSI ID #6 No device
SCSI ID #7 AIC-7850

Arrow Keys to Move Cursor, <Enter> to Select Option, <ESC> to Exit (*=default)
```

Use the arrow keys to move the cursor to the parameter, press **Enter** to display the parameter's submenu, make your changes, and press **Esc** to exit.

5 Using NEC Utilities and Drivers

This chapter provides information for the following NEC utilities and drivers that you can use with your system:

- mouse driver
- video drivers
- BIOS Update Utility.

MOUSE DRIVER

Mouse driver software contains the basic operating instructions between the computer and your mouse. It tracks mouse position, gets data from the mouse buttons, and displays a text cursor or graphics pointer on the screen, based on information from your mouse and application. See the following sections to run mouse drivers for your operating system.

NOTE: Use the following information to run mouse drivers for MS-DOS. The information is not appropriate for using your mouse in Windows.

The MS-DOS mouse driver is LMOUSE.COM and works with all applications that use the Microsoft mouse driver.

To run LMOUSE.COM, you must be in the Windows directory where it is located, or you must include the mouse software directory in your PATH statement. Then, at the MS-DOS prompt, type **LMOUSE** and press **Enter**.

NOTE: You can include the LMOUSE command in an AUTOEXEC.BAT file.

Changing Mouse Parameters

Use the mouse parameters to change the function of the mouse and the way that your screen cursor responds to mouse movement. You can combine any number of parameters when loading the mouse drivers.

The parameters described in the following section are common to all types of Logitech mice. If you have another type of mouse, parameters may vary.

Command Line Options

The syntax for setting mouse parameters using a DOS command line is as follows:

LMOUSE parameter parameter...

The following list describes the parameters that you can use.

- **Ballistic Effect (BHIGH, BLOW, BON, BOFF)** — The ballistic effect gives you speed and precision as you require them. Moving your mouse quickly lets you sweep the cursor across your screen quickly. Moving it slowly lets you zero in on an exact position.

The ballistic effect lets you select a single pixel easily at any sensitivity level. This feature is ideal for graphics programs. When you use a paint or draw program, the ballistic effect slows your mouse cursor when you create fine details in your drawing and then speeds up when you need to go between your drawing and the toolbox or a menu.

Ballistic arguments include the following:

BHIGH — sets the ballistic effect to its highest setting.

BLOW — sets the ballistic effect to its lowest setting.

BON — enables the ballistic effect.

BOFF — disables the ballistic effect.

- Driver orientation (NORTH, SOUTH, EAST, WEST) — You can use this parameter to change the direction in which the screen cursor moves when you move the mouse. For most situations, keep the default parameter (NORTH).

With the driver orientation set to the default, NORTH, the mouse buttons point away from your wrist so that your fingers rest on top of the buttons. The mouse's compass direction south points towards your wrist; east points towards your right; west towards the left. The screen cursor moves in the same direction that your mouse moves.

With the driver orientation set to the default, NORTH, the cursor moves in the following directions in response to the mouse movement:

NORTH — moves the cursor to the top of the screen.

SOUTH — moves the cursor to the bottom of the screen.

EAST — moves the cursor to the right.

WEST — moves the cursor to the left.

- Sensitivity level (S_n) — defines how fast and responsive the mouse movement is for the application. This parameter sets the relationship between how fast you move the mouse to how fast the cursor moves.

The syntax for the sensitivity level is as follows:

Sn

where n is a two-digit number from 00-10. The default is S04.

- **Button orientation (SWAP)** — This parameter lets you swap the functions of the left and right mouse buttons. The swap argument toggles the functions between the two.
- **Number of mouse buttons (*n*K)** — You can specify whether you have a two- or three-button mouse using the K command.
- **?** — This parameter displays the current mouse settings. Type the following command and press enter to view a listing of mouse settings:

Imouse ?

The following example sets the ballistic effect to high, the mouse orientation to NORTH, sets the sensitivity level to 5, and specifies a 3-button mouse.

Imouse bhigh north s05 3k

VIDEO DRIVERS

Video drivers let you take advantage of your computer's integrated video hardware and extended graphics modes.

NOTE: A multi-frequency monitor, such as the NEC SVGA™ monitor, is required to access the extended graphics mode.

Your system ships with the following Windows video drivers pre-installed on the hard disk (hard disk models only). Drivers are also provided on the Auxiliary Diskette shipped with the system.

- 640 by 480 with 16 colors
- 640 by 480 with 256 colors
- 640 by 480 with 64,000 colors
- 640 by 480 with 16.8 million colors
- 800 by 600 with 16 colors
- 800 by 600 with 256 colors
- 800 by 600 with 64,000 colors
- 800 by 600 with 16.8 million colors
- 1024 by 768 with 16 colors
- 1024 by 768 with 256 colors
- 1024 by 768 with 64,000 colors
- 1280 by 1024 with 16 colors
- 1280 by 1024 with 256 colors.

The default Windows video resolution is 640 by 480 with 256 colors. For an optimum screen display, you can set video modes and refresh rates through the TLIMODE utility, also preinstalled on your system.

To change the video drivers in Windows, use Windows Setup and click on the Windows Setup Extension VIDEO button. Select the driver and resolution you want and the driver will load from the hard disk drive or instruct you to install the Auxiliary Diskette.

If you have access to a modem, you can obtain additional VGA drivers for a variety of software applications through the NEC Bulletin Board Service (see “NEC Bulletin Board Service” in Chapter 9).

BIOS UPDATE UTILITY

The system BIOS resides on a flash ROM in your system. You can update the ROM BIOS, *should it ever become necessary*. This feature allows the ROM BIOS chip to be “flashed” with a new BIOS code through software, rather than requiring you to replace the chip.

To perform a BIOS update, you need a BIOS flash diskette. The diskette, which contains the latest version of the BIOS code, can be obtained through NEC Technologies, Inc. (See Chapter 9 for the NEC telephone number to call to obtain the diskette.)

If you have access to a modem, check the NEC Bulletin Board Service for available updates to your system BIOS. See “NEC Bulletin Board Service” in Chapter 9 for information about using the bulletin board (U.S. and Canada only).

Using the Update Utility

Use the following steps to update the BIOS from the BIOS flash diskette.

1. Write down the Setup parameters currently set on your system (see Setup in Chapter 3).
2. Insert the flash diskette in drive A.
3. Cold boot the system.
4. At the flash upgrade Main Menu, use the arrow keys to select “Install new BIOS” and press **Enter**.

-
5. A prompt will ask you to confirm that you want to upgrade the BIOS. Press **Enter** to continue with the flash upgrade and **Cancel** to quit.
 6. On completion of the upgrade, remove the flash diskette from drive A.
 7. Reboot the system and run the Setup utility (see Chapter 3). Check and reset your parameters, using the copy of the Setup parameters that you made earlier.

6 Maintaining Your Computer

Your system is a durable, dependable computer built for lots of use. With protective measures and proper care, you can prevent problems and promote the successful operation and long life span of your computer.

This chapter provides information for taking care of your computer and preparing it for moving or shipping.

SYSTEM CARE

Use the guidelines in the following sections to protect your system from possible damage and to maintain its condition and performance.

Protective Measures

There are several ways that you can protect your system from possible damage. NEC strongly recommends the following protective measures:

- Connect a surge suppressor between your computer and a grounded wall outlet. A surge suppressor protects your system from sudden, transient increases and decreases in electrical power.

Be sure to connect all peripherals, such as your monitor and printer, to the surge protector. The surge protector should be the only device that you plug into the wall outlet.

- Avoid repeated power-on cycles as this subjects the system components to temperature variations and stress.

-
- Disconnect your system from power lines when an electrical storm threatens. Lightning can travel in on power lines and damage your monitor and the system unit.
 - Be sure that system power is off before you connect or disconnect a cable. Never make cable changes when the system power is on. To do so could damage your system and its peripherals.
 - Use appropriate virus detection software regularly to protect your system from computer viruses.

If you plan to use software programs other than NEC supplied software, NEC strongly recommends that you take the necessary steps, such as virus checks, to protect your system.

- Place your computer away from direct sunlight and extreme hot and cold temperatures.

The recommended operating environment is from 50°F to 95°F (10°C to 35°C).

The recommended non-operating environment (shipping or storage) is from 14°F to 158°F (-10°C to 70°C).

- Back up all hard disk information on a regular basis.
- After turning off power, wait about five seconds for the hard disk to spin down before you power on again.
- Be sure that nothing is placed on top of your system power cables.
- Never use a hard disk parking program with your computer. The system hard disk parks its heads automatically whenever you turn off system power.
- Prevent dust from entering your system by covering it when it is not in use.

Routine Care

Maintain the condition of your system by periodically following the general procedures listed below.

NOTE: For safety, power off and unplug your system, monitor, and any external options before cleaning them.

- Clean the outside of the computer with a soft clean cloth.

You can remove stubborn stains with a cloth slightly dampened with a mild detergent. Never use a strong cleaner or solvent on any part of the system.

- Check the system regularly for any loose material (such as paper, books, magazines) that blocks air circulation around your unit.

- Keep food and liquids away from your computer.

- Periodically clean the keyboard with a vacuum cleaner brush attachment. Do not use any liquid cleaners on the keyboard as they can damage the keyboard.

If an object, such as a paper clip, falls into the keyboard, turn the keyboard over and gently shake it.

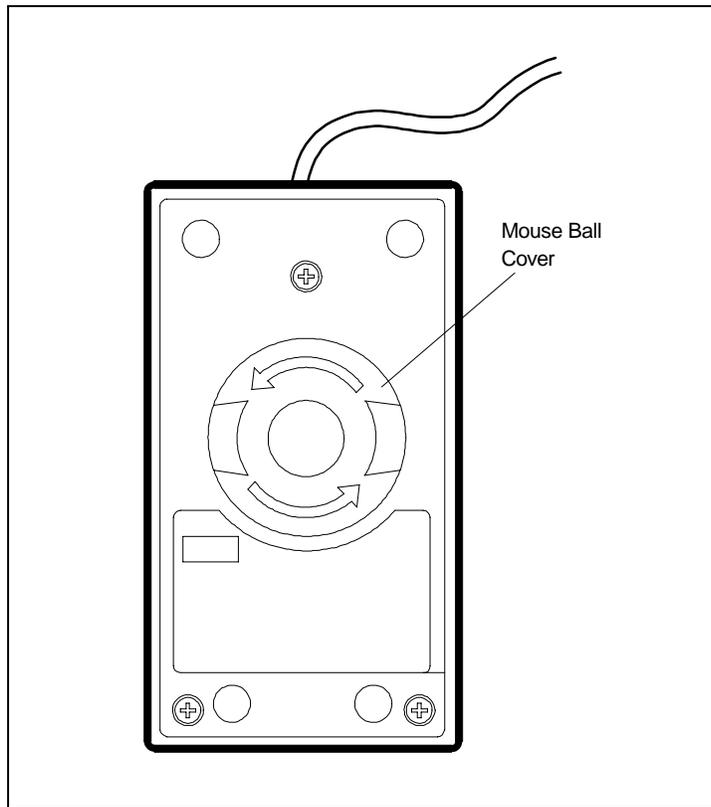
- Clean the monitor screen with a glass cleaner and wipe it with a clean, lint-free cloth. Or use wet/dry cleaning pads manufactured for monitor screens.

MOUSE CARE

For best results with your mouse, use it on a mouse pad.

Under normal conditions, your mouse has a self-cleaning mechanism that prevents a buildup of dust or lint around the mouse ball and tracking mechanism. Periodically, however, you might need to wipe the mouse ball clean. Use the following procedure to clean the mouse.

1. Turn off your computer and any peripherals attached to it.
2. Turn your mouse upside down. Locate the mouse ball cover (see the following figure).
3. Turn the ball cover counterclockwise and remove the cover.
4. Gently turn the mouse over and let the ball fall into your palm.
5. Clean the mouse as follows.
 - Use tap water, or tap water and a mild detergent to clean the mouse ball.
 - Use a clean, lint-free cloth to dry the ball.
 - Blow into the mouse socket to remove remaining dust or lint.



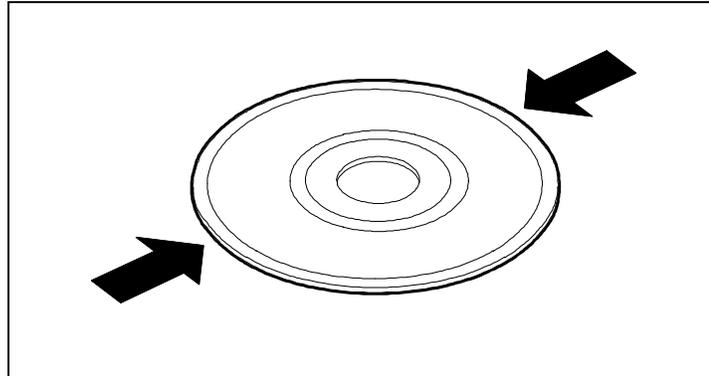
Locating the mouse ball cover

6. Gently put the ball back into its socket.
7. Fit the ball cover over the ball and turn the cover clockwise until it locks in place.

CD CARE

When handling CDs, keep the following guidelines in mind.

- Always pick up the disc by its edges.

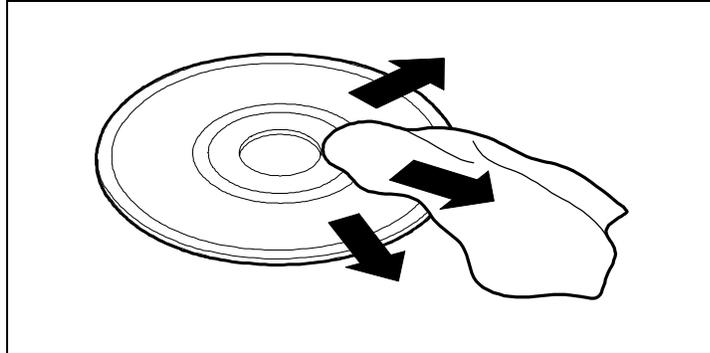


Handle a disc by its edges

- Avoid touching the side of the disc that has no printing or writing on it. This is the data side of the disc.
- Do not write on or apply labels to either side of the disc.
- Keep the disc away from direct sunlight or high temperatures.

-
- Clean fingerprints or dust from the disc by wiping it with a soft cloth. Gently brush the cloth from the center of the disc toward the edge.

CAUTION: Avoid using benzene, paint thinner, record cleaner, static repellent, or any other chemical on the disc. Chemicals and cleaners can damage the disc.



Wipe a disc from the center and toward the edge

MOVING GUIDELINES

Use the following steps to prepare your system for moving or shipping.

1. Back up your hard disk files onto diskettes or tape cartridges.

Be sure to take precautions for storing and transporting diskettes or cartridges so that they are not exposed to magnetic fields or electrical impulses.

-
2. Remove any diskette from the diskette drive.
 3. Turn off the system unit and any external options connected to it.

CAUTION: Do not use a hard disk parking program when you move your computer. The system hard disk parks its heads automatically whenever you turn off the system power.

4. Unplug the system unit power cable from the wall outlet or surge suppressor, then from the unit.
5. Unplug any external options from the wall outlets or surge suppressor, then disconnect them from the system unit.
6. Pack the system components in the original shipping materials and cartons. If these are not available, be sure to use adequate packing materials to protect the components.

To set up your system, follow the instructions on the *NEC Image P90E/P100E Quick Setup* sheet.

7 Adding Options

Your Image system supports a variety of NEC and industry-standard expansion options. This chapter provides:

- general information about the options you can use with the system.
- procedures for removing and replacing the cover.
- procedures for adding:
 - PCI, EISA, or ISA expansion boards
 - SIMM upgrade kits
 - dual-processor upgrade kit
 - SCSI-2 and IDE storage devices, such as hard disks and diskette drives
 - external peripherals, such as a printer device, a serial device, or SCSI-2 devices.

OPTIONAL HARDWARE

Many optional components are available for customizing your computer to fit your needs. See your authorized NEC dealer for assistance in determining which options are best for you.

The following describes the hardware that your system can accommodate. See the following sections for specific information and guidelines on installing options in your system.

- **Monitors**

Your system supports a VGA-compatible monitor (such as the NEC SVGA™, NEC MultiSync® FG series, and NEC Plug and Play monitors). The system supports High Color with resolutions (dependent on the monitor) of up to 1024 by 768 pixels with 64,000 colors. The system also supports True Color with resolutions (dependent on the monitor) of up to 800 by 600-pixels high-resolution color with up to 16.8 million colors.

You can disable the system's built-in video controller and install a video board in a PCI or EISA expansion slot.

- **Memory expansion**

Single in-line memory module (SIMM) sockets on the system memory board support up to 256 MB of high-speed memory. See "SIMM Upgrade Kits" later in this chapter for information on installing SIMMs.

- **Dual-processor upgrade**

A 320-pin ZIF upgrade socket on the system board supports an optional Intel 90-MHz or 100-MHz processor for dual-processor capabilities. See "Dual-Processor Upgrade Kit" in this chapter for installation procedures.

- **Drives**

The system accommodates a total of six data storage devices, including the standard 3 1/2-inch diskette drive (all configurations), a CD-ROM reader (hard disk configurations only), and a 3 1/2-inch hard disk (hard disk configurations only). See "Storage Device Installation" later in this chapter.

- **External options**

External peripherals, such as state-of-the-art printers and SCSI-2 devices, are compatible with your system. See "External Peripherals" later in this chapter for connection information.

SAFETY PRECAUTIONS

Take care when you work inside the system and when you handle computer components. Avoid electric shock or personal injury by observing the following warning.

WARNING: Before you remove the system unit cover and work inside the unit, *turn off* all system power and *disconnect* the system and its peripherals from their power sources.

Static electricity and improper installation procedures can damage computer components. Protect your computer components by following these safety instructions.

- Leave an option, such as a board or chip, in its anti-static packaging until you are ready to install it.
- Dissipate static electricity before handling any system components (boards, chips, and so on) by touching a grounded metal object, such as the system's unpainted metal chassis.

If possible, use anti-static devices, such as wrist straps and floor mats.

- Always hold a chip or board by its edges. Avoid touching the components on the chip or board.
- When you install a cable, be sure to route the cable so it is not pinched by other components and it is out of the path of the system unit cover. Prevent damage to the connectors by aligning connector pins before you connect the cable.

When you disconnect a cable, always pull on the cable connector or strain-relief loop, not on the cable.

REMOVING AND REPLACING THE SYSTEM UNIT COVER

Use the following procedures to remove and replace the system unit cover.

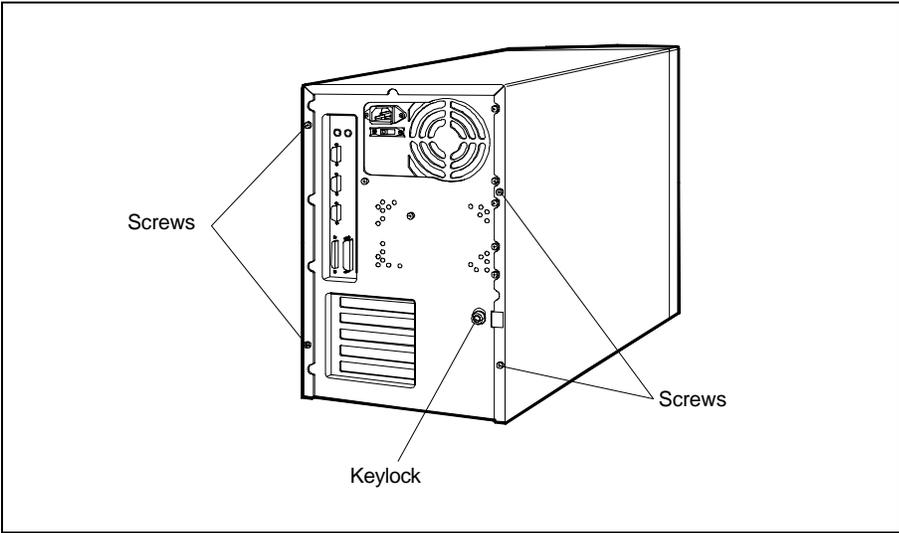
CAUTION: Electrostatic discharge can damage computer components. Discharge static electricity before you remove the system unit cover.

Remove the system unit cover as follows.

WARNING: Before you remove the system unit cover, *turn off* all system power and *disconnect* the system and its peripherals from their power sources.

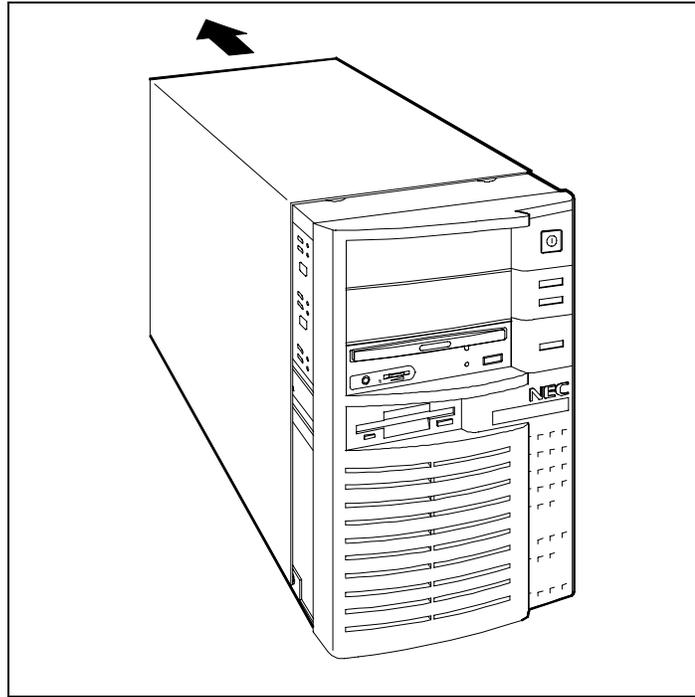
1. Turn off and unplug the system unit and monitor.
2. Disconnect the keyboard and mouse from the rear of the system.
3. Unplug any external options (such as a printer) connected to the rear of the system unit.
4. If necessary, unlock the cover with the key shipped with your system.

5. Remove the four screws that secure the cover to the system unit.



Removing the cover screws

-
6. Pull the cover back about one inch from the front of the unit.



Releasing the cover

7. Lift the cover off of the system unit.

Use the following steps to replace the cover.

CAUTION: To prevent damage to system cables, carefully tuck the cables out of the path of the cover.

1. Align the cover over the unit, about one inch in back of the front panel, then set the cover down on the unit.
2. Align the bottom edges of the cover inside the base of the system.

Press in on both sides of the cover then slide it in to meet the front panel.

Check that the key lock flange on the back of the cover is inserted into the back of the chassis.

3. Secure the cover with the four screws previously removed.
4. Connect the monitor, keyboard, mouse, and any other external options to the rear of the system unit.
5. Plug in your power cables.
6. If desired, lock the cover to the chassis.

EXPANSION BOARDS

You can add PCI, Plug and Play ISA, EISA, and non-Plug and Play ISA expansion boards to your system.

The PCI and Plug and Play ISA boards are configured through the ECU utility. Once the system is turned on after installing a PCI board, the utility automatically configures interrupts, DMA channels, I/O space, and other parameters. Plug and Play ISA boards are also automatically configured if a Plug and Play operating system (O/S) is installed.

Your system also accepts EISA boards, non-Plug and Play ISA expansion boards, and SCSI boards. These boards are configured through the ECU and SCSI utilities.

CAUTION: Before adding, moving, or removing any expansion board, you should first familiarize yourself with the Setup, ECU, and SCSI utilities. Setting system parameters incorrectly or installing a board incorrectly can disable your system.

See Chapter 3, "Setting System Parameters," for information on the Setup utility. See Chapter 4, "Using ECU and SCSI Utilities," for information on the ECU and SCSI utilities.

Use the following procedures for installing an expansion board in the system.

Precautions

Always remove an expansion board from the shipping material very carefully. Static discharge can damage board components. Take the following precautions when handling a board:

- Avoid carpets in cool, dry areas.
- Before handling a board, discharge any static electricity by touching a grounded metal object, such as the metal frame inside the system unit.
- Always hold a board by its edges. Avoid touching the components on the board.

Slot Locations

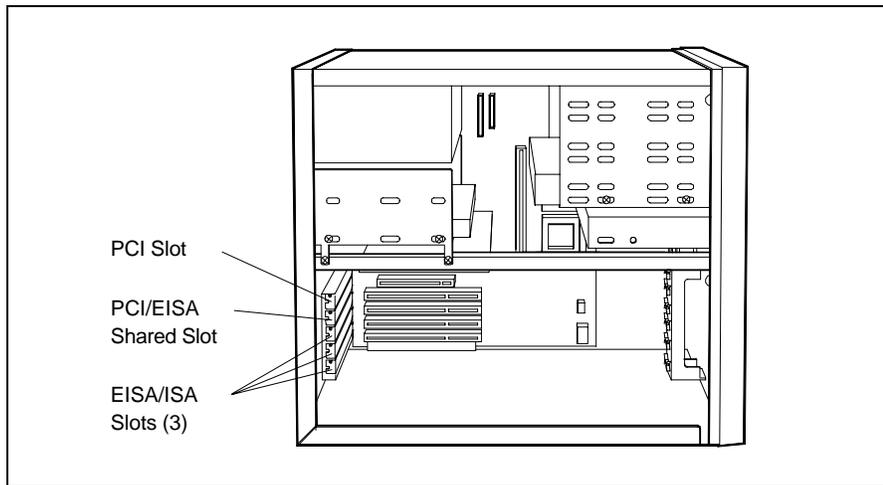
The system has five expansion slots on the rear of the system:

- one dedicated PCI slot
- one shared PCI/EISA slot
- three EISA/ISA slots.

The dedicated PCI slot supports 32-bit PCI expansion boards, such as LAN cards, graphics adapters, and disk controllers. The EISA/ISA expansion slots support industry-standard 8-/16-/32-bit expansion boards. All slots accommodate full length boards or smaller.

The PCI/EISA shared slot accommodates either a PCI board or an EISA board. If you are installing a PCI board in the shared slot, it must be connected to the PCI 2 connector on the system board. If you are installing an EISA board in the shared slot, it must be connected to the EISA 1 connector directly under the PCI 2 connector.

Expansion board slot locations for the system are shown in the following figure.



Locating system expansion slots

Board Installation

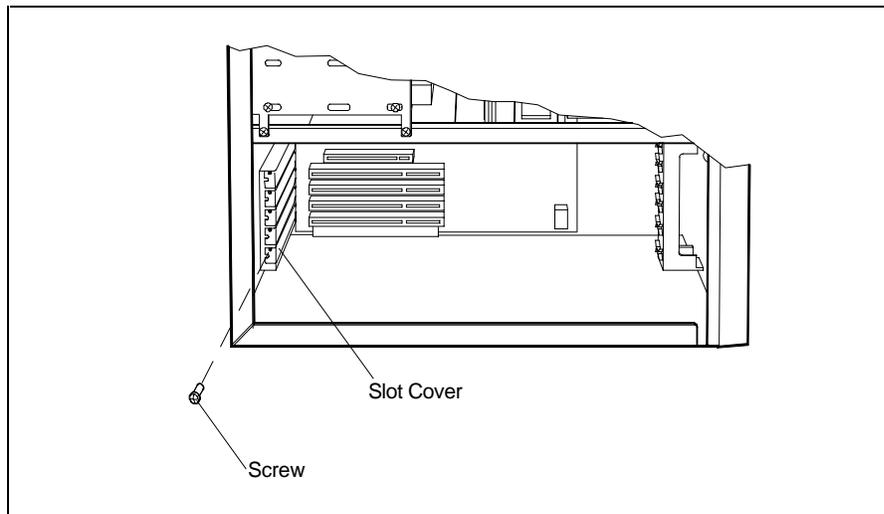
Use the following steps to install an industry-standard PCI, EISA, or ISA expansion board in your system.

CAUTION: If you are installing an EISA board, PCI board, or Plug and Play ISA board, first install the board, then run the ECU utility to configure your system. If you are installing a non-Plug and Play ISA board, first use the ECU to configure your system, then install the board. If you are installing a mix of boards, install the non-Plug and Play board last, after configuring the system. See Chapters 3 and 4 for information on using the utilities.

-
1. Follow any pre-installation instructions in your option documentation (such as setting switches or jumpers on the board).

CAUTION: Be sure that the system unit power is turned off and the system is unplugged before you begin the installation procedure.

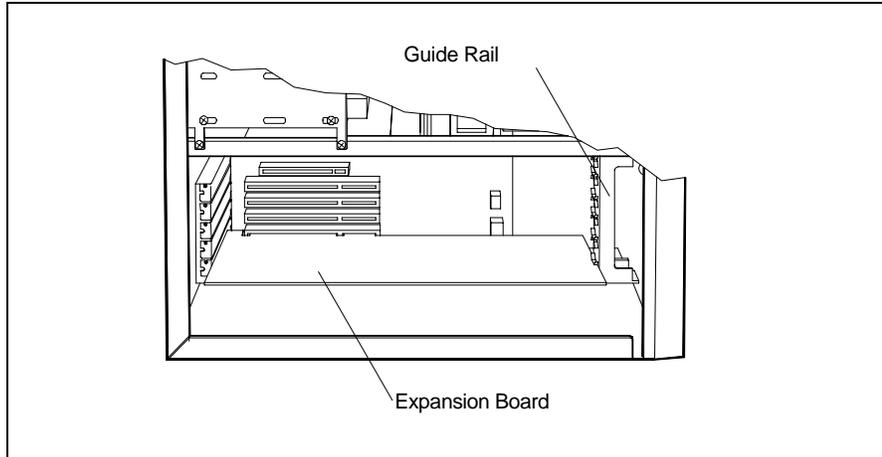
2. Remove the system unit cover. (See “Removing and Replacing the System Unit Cover” at the beginning of this chapter.)
3. Remove the screw securing an expansion slot cover and remove the cover. Save the screw and expansion cover for possible future use.



Removing a slot cover

-
4. Hold the board by its edges and insert it into the expansion slot and guide rail (full length board only).

Press the board firmly into the expansion slot connector on the system board. You might have to gently rock the board from side-to-side to seat it into the connector.



Inserting the board

5. Secure the board to the support bracket with the previously removed slot cover screw.
6. Replace the system unit cover. (See “Removing and Replacing the System Unit Cover.”)
7. Turn the system power on.

-
8. If you installed an EISA or Plug and Play ISA board, run the ECU utility to configure your system. (See Chapter 4, “Using the ECU and SCSI Utilities” for information on the utility.)

If you installed a PCI board, the system automatically configures itself on power up. (See Chapter 3, “Using the Setup Utility” for information on adding a PCI board.)

Board Removal

The installation of some options might require the removal of a board that is already installed. Use the following steps to remove a board from the system.

CAUTION: Be sure that the system unit power is turned off and the system is unplugged before you begin the removal procedure.

1. If you have any cables connected to the board, label the connector(s) then unplug the cable(s).
2. Remove the screw that secures the board to the support bracket.
3. Pull the board out of the system board connector. You might have to gently rock the board from side-to-side to release it from its connector.

SIMM UPGRADE KITS

Systems in the U.S. and Canada support the following 36-bit SIMM stick configurations:

- 4-MB stick (1-MB by 36-bit)
- 8-MB stick (2-MB by 36-bit)
- 16-MB stick (4-MB by 36-bit)
- 32-MB stick (8-MB by 36-bit).

CAUTION: To avoid corrosion between different metals, only use tin-plated SIMM sticks.

The SIMM sticks must have a speed of 60 or 70 nanoseconds (ns).

SIMM sticks installed in the sockets on the SIMM memory board increase the total system high-speed memory. The system supports up to 256 MB of high-speed memory.

Use the following procedures to install a SIMM stick.

CAUTION: Static discharge can damage SIMMs. Heed all cautions in the following sections.

Cautions

Always remove a SIMM from its shipping material carefully. Static discharge can damage SIMM components. Take the following precautions when handling SIMMs:

- Avoid carpets in cool, dry areas.
- Do not remove the SIMM from its anti-static packaging until you are ready to install it.

-
- Before handling a SIMM, discharge any static electricity by touching a grounded metal object, such as the metal frame inside the system unit.
 - Always hold a SIMM by its edges. Avoid touching the components on the SIMM.

SIMM Installation

Use the following procedures to remove the SIMM memory board, check SIMM memory, and install SIMMs on the board.

Removing the SIMM Memory Board

Use the following steps to remove the SIMM memory board from the system board.

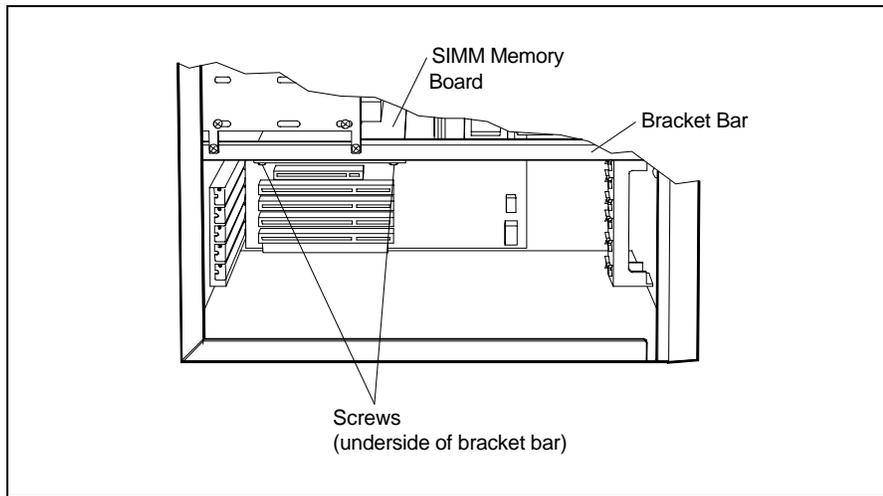
1. Remove the system cover (see “Removing and Replacing the System Unit Cover” earlier in this chapter).

CAUTION: Be sure that the system unit power is turned off and the system is unplugged before you begin the installation procedure.

2. Remove the two screws holding the SIMM memory board to the underside of the bracket bar (see the following figure).

If you have an expansion board in the way, remove the board (see “Board Removal” earlier in this chapter).

3. Carefully pull the SIMM memory board out of its connector on the system board.
4. Set the SIMM memory board on a non-conductive surface.



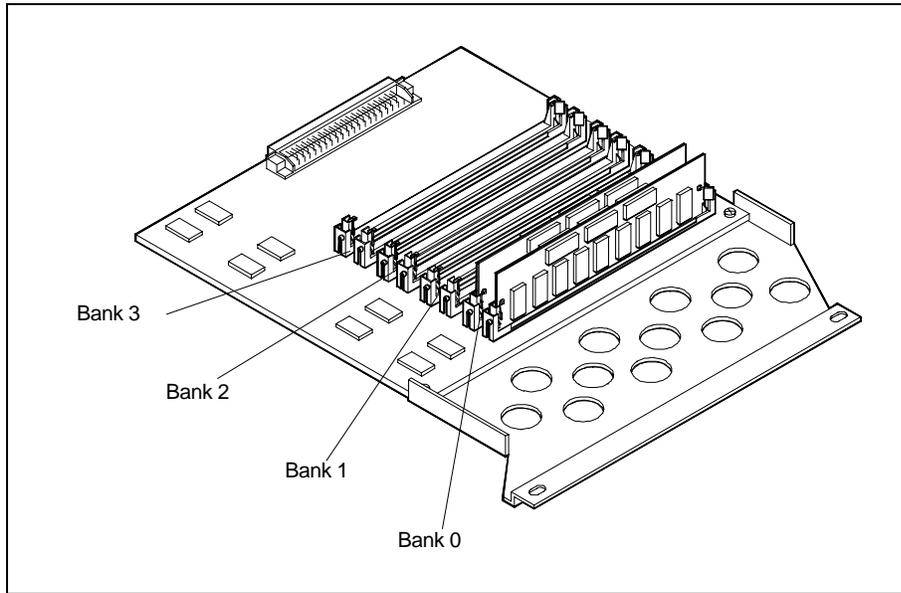
Removing the SIMM memory board

Checking the Memory

Use the following steps to locate SIMM sockets and to check the memory configuration in your system.

1. Locate the SIMM sockets on the memory board (see the following figure). The SIMM sockets are assigned as banks as follows.

- bank 0
- bank 1
- bank 2
- bank 3



Locating the SIMM banks on the memory board

2. Check the memory in your system.

Your system ships with 16 MB (2, 8-MB SIMM sticks) of memory installed in bank 0 on the memory board.

-
3. Choose your memory configuration per the following and Appendix D, “Memory Upgrade Path,” then install the SIMMs as described in the next section.
 - Always fill both sockets in a bank with SIMMs having the same capacity (for example, two 8-MB SIMM sticks in bank 0).
 - Install the same capacity SIMM stick in two banks for interleaving.
 - The following SIMMs are supported:
 - 4-MB SIMM stick (1 MB by 36 bit)
 - 8-MB SIMM stick (2 MB by 36 bit)
 - 16-MB SIMM stick (4 MB by 36 bit)
 - 32-MB SIMM stick (8 MB by 36 bit)
 - Fill SIMM banks in any order, as long as each bank gets two of the same capacity SIMM stick.
 - Refer to Appendix D for the memory upgrade path.

Installing SIMMs

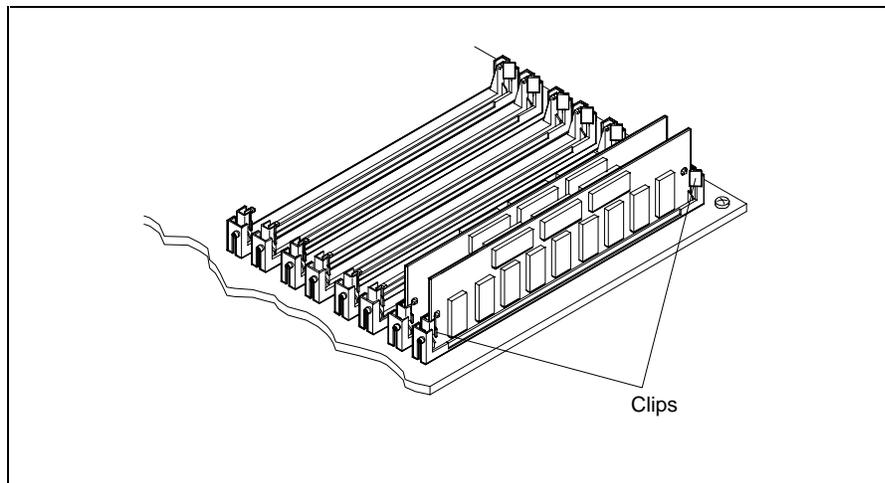
Use the following steps to install SIMM sticks.

CAUTION: Be sure to install the SIMMs in the correct sockets. Refer to the previous figure and Appendix D when you install a SIMM.

-
1. If you need to replace a SIMM that is presently installed with a different SIMM configuration, remove the SIMM as follows.

- Release the SIMM by pressing outward on the metal clips at the outer edges of the socket (see the following figure).
- The SIMM tilts forward, allowing you to remove it from the socket.

NOTE: Depending on which SIMM you are removing, you may have to release one or more SIMMs in front of the SIMM being removed.

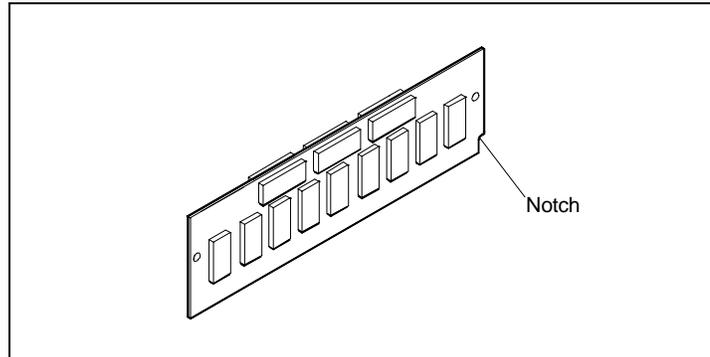


Removing a SIMM

2. Install a SIMM as follows.

CAUTION: Before you install a SIMM, reduce static discharge by touching the system's metal chassis.

- Locate the notched end of the SIMM.

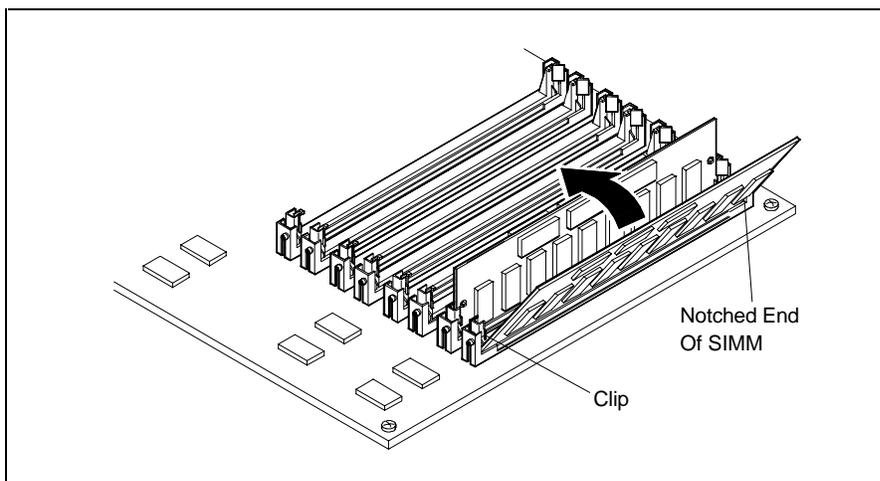


Locating the notched end of the SIMM

- Locate the appropriate SIMM socket (see the previous figures and Appendix D, "Memory Upgrade Path").

-
- Align the notched end of the SIMM with the correct end of the SIMM socket and insert it at an angle into the socket (see the following figure).

CAUTION: Be sure to install the SIMMs in the correct sockets.



Inserting the SIMM

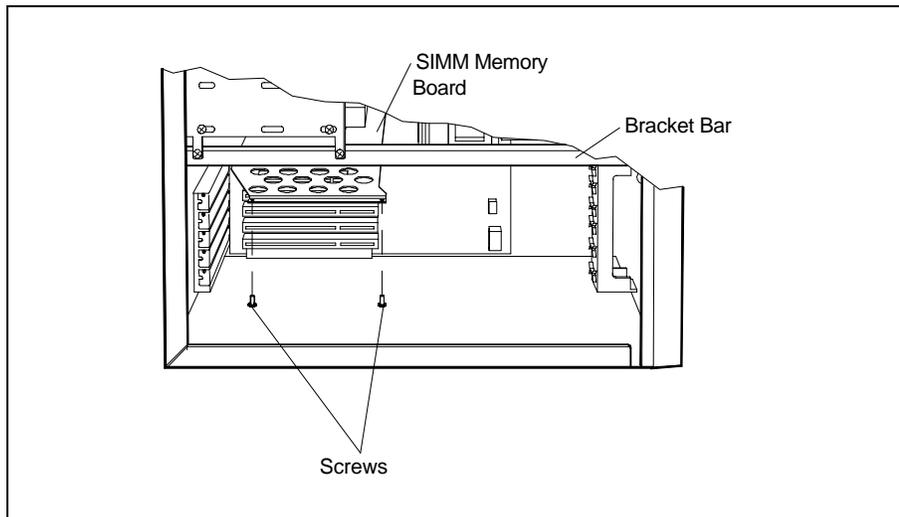
- Carefully push the SIMM towards the metal clips. Using equal pressure at the ends of the SIMM, push it until it locks under the metal clips at the ends of the socket.

CAUTION: Be careful when handling the SIMM. The SIMM and socket tabs are fragile.

Replacing the Memory Board

Replace the memory board in the system as follows.

1. Turn the memory board over, with the SIMMs facing down.
2. Position the memory board under the bracket bar (see the following figure).
3. Align the memory board edge connector with the memory board connector on the system board.
4. Carefully insert the memory board into the connector. You might have to gently rock the board from side-to-side to seat it into the connector.



Installing the SIMM memory board

5. Fasten the memory board to the bracket bar with the two previously removed screws.

-
6. Replace any expansion boards that you may have removed (see “Board Installation” earlier in this chapter).
 7. Check that all cables are out of the way of the system cover, then replace the cover.
 8. Connect external peripherals and power cables.

NOTE: If you find a discrepancy in the amount of memory that the Power-On Self-Test finds with the amount of memory that you installed, check that you installed the SIMM sticks correctly.

DUAL-PROCESSOR UPGRADE

A 320-pin ZIF socket on the system board makes it easy for you to add a second processor to your system for dual-processor capability.

Use the following procedures and the instructions included with the upgrade option kit to install the upgrade in your system.

CAUTION: Incorrect installation of the processor kit can damage the processor, system board, or both. Follow the instructions carefully.

1. Remove the system unit cover (see “Removing and Replacing the System Unit Cover” earlier in this chapter).

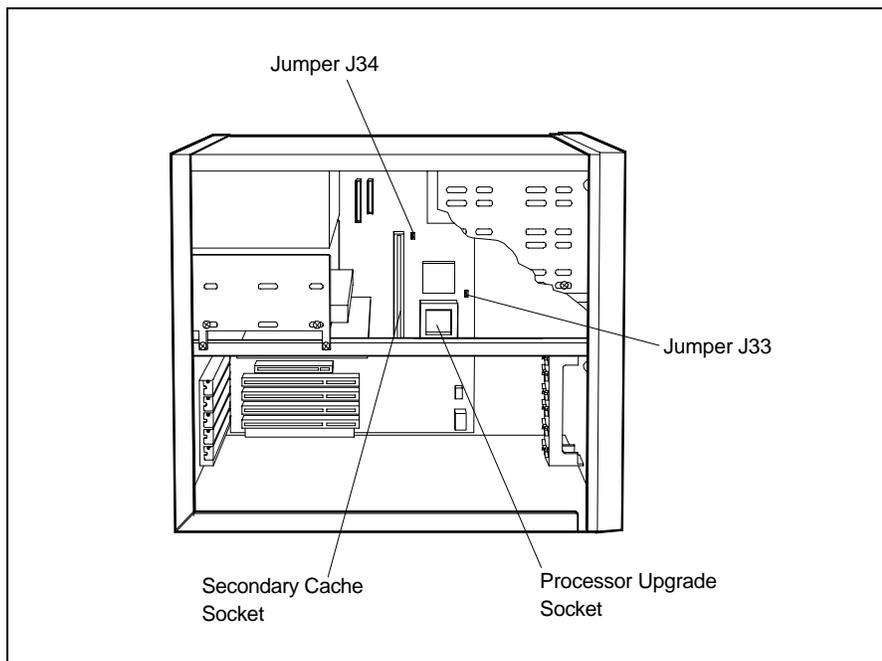
Turn the system unit on its side for easier access to the interior of the system.

CAUTION: Be sure that the system unit power is turned off and the system is unplugged before you begin the installation procedure.

2. Reset configuration jumpers J33 and J34 on the system board as follows.

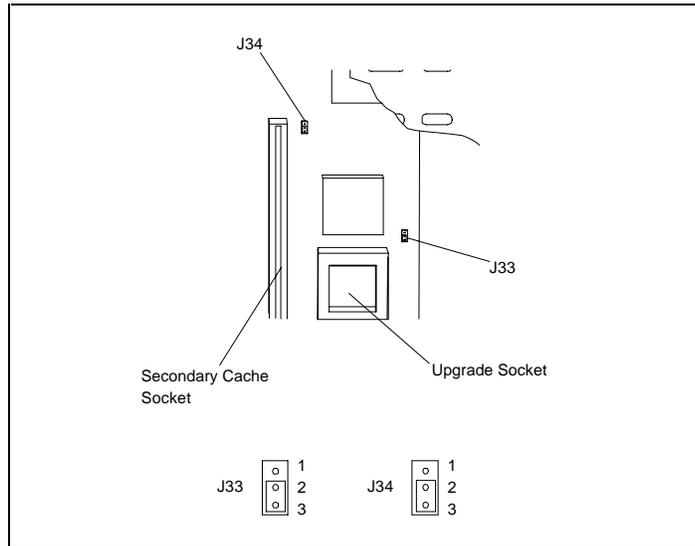
- Locate jumpers J33 and J34 on the system board (see the following figure).

You may have to tag and disconnect any cables blocking access to the jumpers.



Locating the jumpers and upgrade processor socket

-
3. Set the jumper blocks over pins 2 and 3 on J33 and J34 as shown in the following figure.



Setting the upgrade jumpers

4. Install the upgrade processor in the upgrade socket as follows.

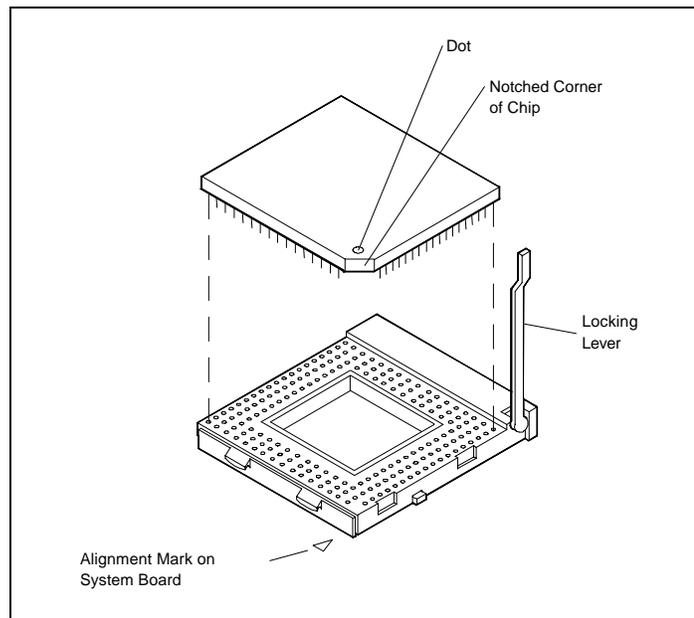
NOTE: The speed of the upgrade processor (90 MHz or 100 MHz) must match the speed of the factory installed processor (90 MHz or 100 MHz).

- Locate the upgrade socket on the system board (see the previous figures).

-
- Carefully release the socket's locking lever by pulling it slightly away from the socket and up (see the following figure).

CAUTION: Before picking up the upgrade processor, reduce static discharge by touching the metal frame of the system unit.

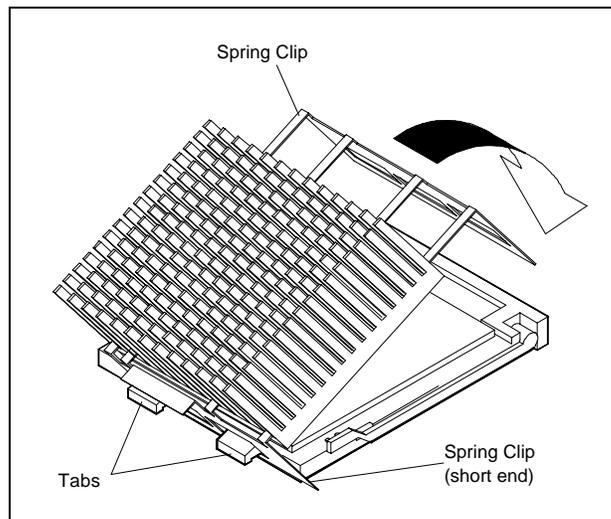
- Align the upgrade processor with the socket as shown in the following figure.



Aligning the upgrade processor

CAUTION: Incorrect installation of the processor can damage the system board, the processor, or both.

- Insert the processor into the socket.
 - Lock the processor in place by swinging the socket lever down towards the socket until it locks in place.
5. Install the upgrade processor heat sink as follows.
- Align the heat sink over the processor as shown in the following figure.
 - Position the short end of the spring clip on the heat sink under the two tabs on the socket.



Installing the heat sink

-
- Press down on the heat sink until the spring clip on the opposite end of the heat sink is aligned with the two tabs on the socket.
 - Firmly press down on the heat sink until the spring clip snaps over the two tabs on the socket.
6. Reconnect any cables that you may have disconnected.
 7. Turn the system upright and replace the system unit cover (see “Removing and Replacing the System Unit Cover” earlier in this chapter).

DATA STORAGE DEVICES

The following sections describe:

- the storage devices supported by your system
- the device slots in your computer
- device preparation, such as switch and jumper settings
- device cables and cable connector locations
- procedures for installing storage devices.

Storage Device Support

The system board in your computer supports SCSI-2 and IDE storage devices, including:

- up to two diskette drives, including the standard 3 1/2-inch, 1.44-MB diskette drive.
- up to five internal storage devices, such as SCSI or IDE hard disks and tape drives, including the standard IDE CD-ROM reader and SCSI or IDE hard disk (depending on your system’s configuration).
- up to seven optional external SCSI-2 devices connected to the SCSI connector at the rear of the unit.

Other storage devices might require the installation of a compatible controller board. See your NEC authorized dealer for the storage devices available for your system.

Device Slots

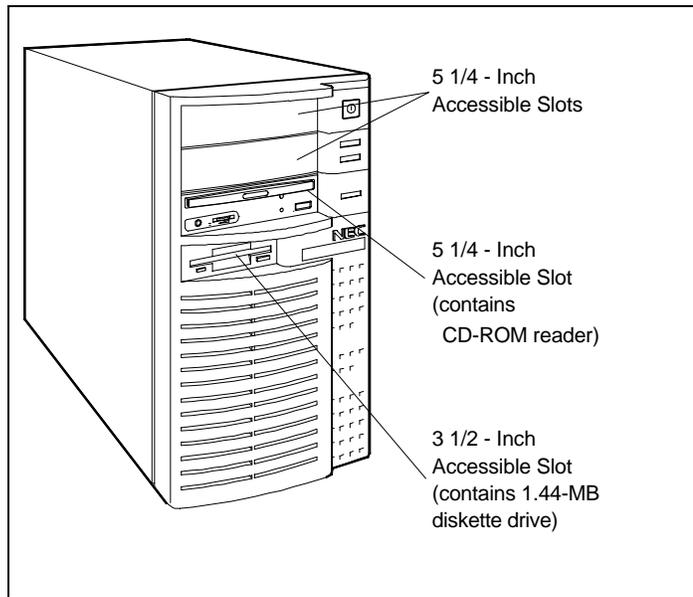
The system has six device slots:

- one 3 1/2-inch accessible device slot which contains the standard 1.0-inch high 1.44-MB diskette drive
- three 5 1/4-inch accessible device slots for 1.6-inch high devices (one slot contains the standard CD-ROM reader in hard disk configurations)
- two internal 3 1/2-inch device slots for 1.6-inch or 1.0-inch high devices (one slot contains the standard IDE or SCSI-2 hard disk in hard disk configurations).

You can install accessible devices such as a diskette drive or tape drive with a 5 1/4-inch form factor (frame) in the 5 1/4-inch slots.

You can also install a hard disk with a 5 1/4-inch form factor in the 5 1/4-inch slots.

The following figure shows the device slot locations.



Locating device slots

Device Preparation

Before you install a storage device in the system, follow any pre-installation instructions that come with the device. You should also check Chapter 3 and Chapter 4 in this document for information about setting system parameters for the device being installed.

For example, check the following items for these devices:

- Diskette drive — remove any termination on the optional diskette drive. See the drive documentation.
- SCSI-2 device — check the documentation that comes with the device and the following sections for information on setting interface termination, termination power, motor start at power-on, SCSI identification (ID) number, and any other device functions.

See the following sections for information about setting SCSI device functions.

- PCI and IDE devices — check any jumper settings on the device before you install it. See the device documentation for jumper setting information.

SCSI Device Termination

The SCSI bus requires interface termination on both ends of the SCSI cable for proper operation.

The integrated SCSI controller on the system board sets the termination on the system board end of the SCSI cable. The device attached to the last connector on the SCSI cable terminates the other end of the cable.

NOTE: The SCSI-2 hard disk configurations come with the hard disk properly connected to the internal SCSI cable. The hard disk termination is properly set and the disk drive is connected to a connector on the SCSI cable.

Use the following guidelines for proper SCSI termination.

- Terminate the device attached to the last connector on the SCSI cable.
- Remove the termination from other devices on the cable.
- Set the termination for the system board SCSI controller through the SCSI Select utility (see Section 4).

Use internal termination (factory setting) when only internal or external SCSI devices are installed but not both.

Use external termination when both internal and external SCSI devices are installed.

NOTE: In all SCSI configurations (internal and external), a terminated device must be attached to the end connector on the SCSI cable.

Termination Power

The SCSI controller is factory set to supply termination power to the SCSI bus. If your SCSI device provides a setting for termination power, disable the drive power. Set the termination power supplied by the device to “auto power sense” or “off.”

Motor Start at Power-On

In multiple SCSI drive configurations, disable the SCSI drive’s motor start at power-on feature. Set the motor to start with a Start Unit command from the SCSI controller. Disabling the motor start at power-on allows the SCSI devices to start up one at a time and prevents a power surge.

SCSI IDs

SCSI identification (ID) numbers configure all SCSI devices on internal and external SCSI cables with a device address for the SCSI bus. You can attach up to five internal devices to the internal SCSI cable.

You can attach up to seven external devices to the SCSI bus through the SCSI connector on the rear of the system. If installing both internal and external SCSI devices, you can attach a total of seven devices.

Each SCSI device must have a unique ID. ID 7 is always reserved for the integrated SCSI controller. Switches or jumpers on the SCSI device select a SCSI ID ranging from 0 to 6.

Cables

The standard internal cables shipped with your system for installing optional storage devices include:

- a diskette drive signal cable
- a primary PCI/IDE interface cable
- a secondary PCI/IDE interface cable
- a SCSI-2 interface cable
- system power cables.

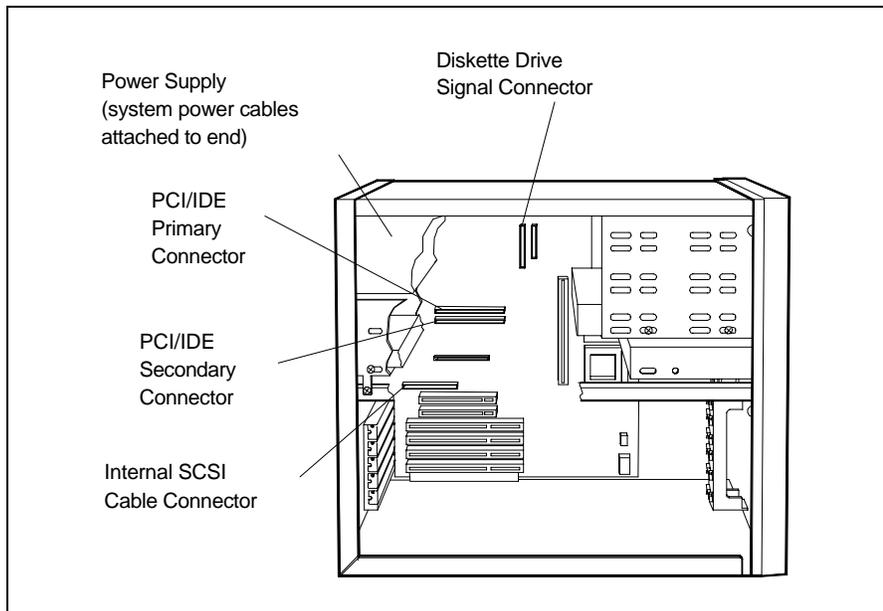
Your system ships with the diskette drive signal cable connected to the system board and to the standard 3 1/2-inch diskette drive. The cable has an additional connector for an optional diskette drive.

For systems shipped with an IDE hard disk, the primary PCI/IDE interface cable comes connected to the primary PCI/IDE connector on the system board and to the standard IDE hard disk and IDE CD-ROM. The internal SCSI interface cable comes connected to the SCSI connector on the system board. The SCSI cable has connectors for up to five optional SCSI devices.

For systems shipped with an internal SCSI-2 hard disk, the internal SCSI-2 interface cable comes connected to the SCSI connector on the system board and to the standard SCSI-2 hard disk. The cable has additional connectors for up to four optional SCSI-2 devices. The primary PCI/IDE interface cable comes connected to the PCI/IDE primary connector on the system board and to the standard IDE CD-ROM reader. The PCI/IDE cable has a connector for an additional optional IDE device.

The secondary PCI/IDE cable comes connected to the system board and allows connection of up to two additional optional IDE storage devices.

The following figure shows cable connector locations on the system board and power supply. Cable and connection information follows the figure.

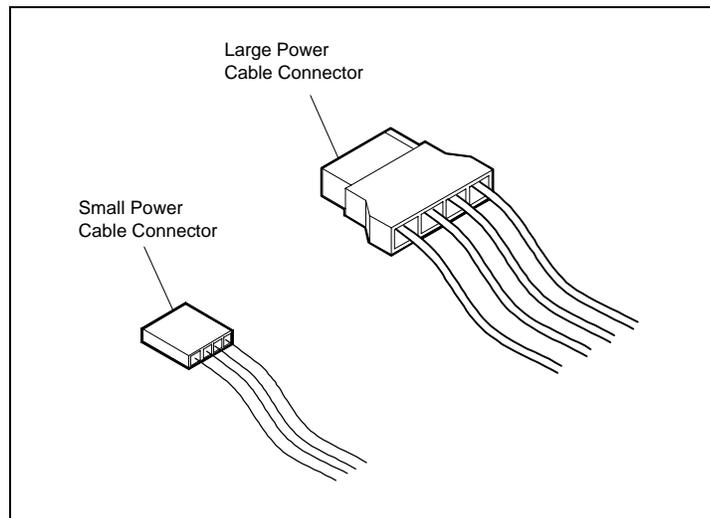


System board cable connectors

System Power Cables

System power cables vary in length and provide small and large connector sizes to accommodate a variety of supported storage configurations. Power cable connectors are keyed to fit only in the correct position.

There are a total of 12 power connectors, including those connected to the standard 3 1/2-inch diskette drive, hard disk drive, and CD-ROM reader.

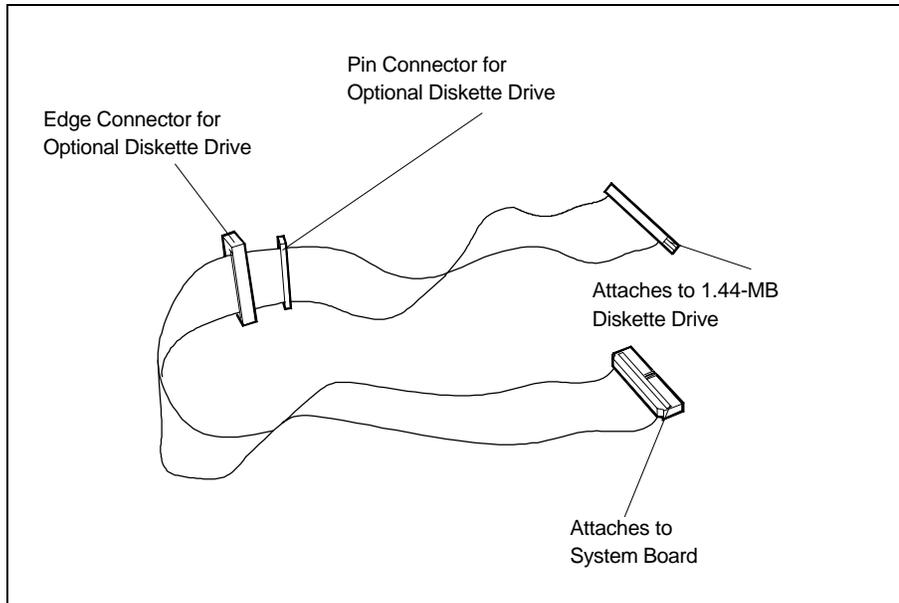


Power cable connectors

Diskette Drive Signal Cable

The diskette drive signal cable comes attached to the system board and to the standard 1.44-MB diskette drive. The cable has an additional connector for an optional diskette drive.

The cable connector for the diskette drive is keyed to fit only in the correct position. The red edge of the cable goes to pin 1 on the cable connector. Align the red edge of the cable with pin 1 (the notched end) on the drive connector.



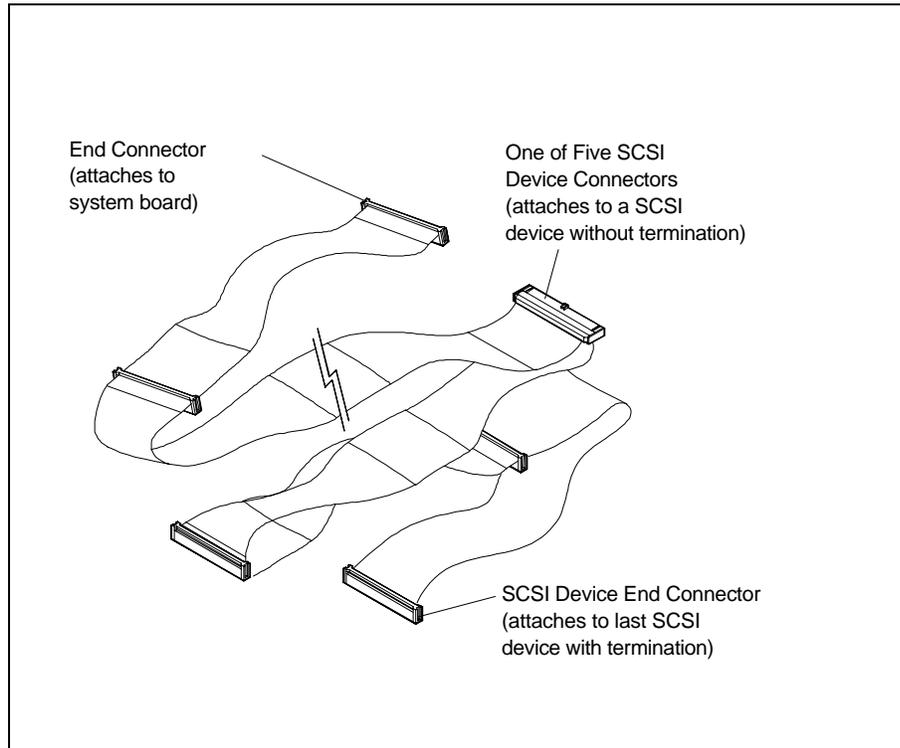
Diskette drive cable connectors

7 Adding Options

Internal SCSI Cable

All hard disk systems ship with a SCSI-2 interface cable connected to the SCSI connector on the system board. The cable supports the connection of up to five internal SCSI devices.

The SCSI hard disk configurations ship with the internal SCSI hard disk connected to the SCSI cable.



Internal SCSI-2 Interface Cable

Any additional SCSI-2 devices connected to the cable must have their termination's removed (see "SCSI Device Termination" earlier in this chapter).

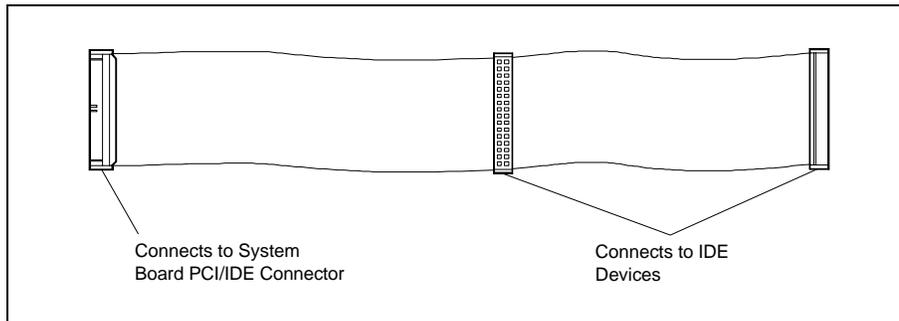
PCI/IDE Cables

All hard disk systems ship with PCI/IDE cables connected to the primary and secondary PCI/IDE connectors on the system board.

The IDE hard disk configurations ship with the IDE hard disk and standard IDE CD-ROM connected to the primary PCI/IDE cable.

The SCSI hard disk configurations ship with the primary PCI/IDE cable connected to the standard IDE CD-ROM reader.

The secondary PCI/IDE cable is ready for connection of up to two optional IDE storage devices.



PCI/IDE cable

Storage Device Installation

Use the appropriate procedures to install storage devices in your system:

- To install an accessible storage device, see “Installing an Accessible Storage Device.”
- To install an internal storage device, see “Installing an Internal Storage Device.”

CAUTION: Before adding, moving, or removing any storage device, you should first familiarize yourself with the Setup, ECU, and SCSI utilities. Setting system and device parameters incorrectly or installing a device incorrectly can disable your system.

See Chapter 3, “Setting System Parameters,” for information on the Setup utility. See Chapter 4, “Using ECU and SCSI Utilities,” for information on the ECU and SCSI utilities.

Installing an Accessible Storage Device

Use the following procedure to install an accessible storage device in the system.

NOTE: When installing an accessible storage device, install the device in the lowest empty bay. If you do not, you cannot reinstall the blank slot cover plates over any remaining empty bays.

1. Follow the pre-installation instructions that come with your device, such as setting jumpers and switches.

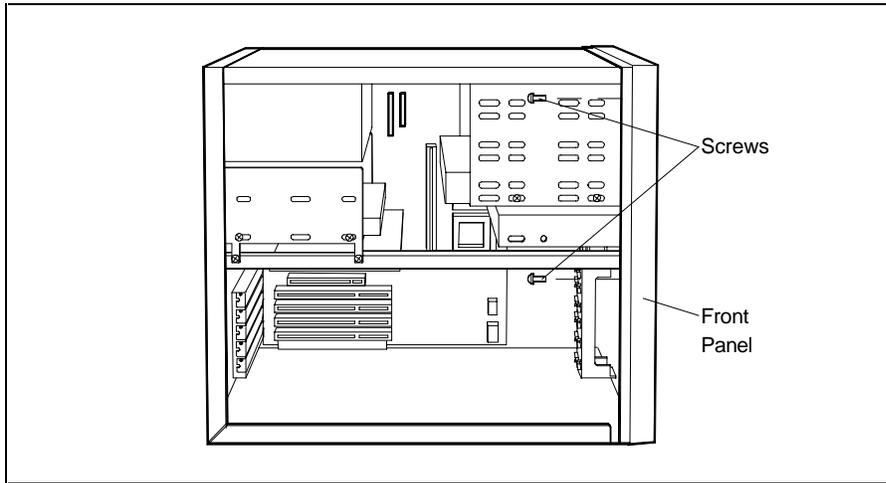
-
2. Follow any pre-installation instructions for setting device parameters. See Chapter 3, “Setting System Parameters,” and Chapter 4, “Using the ECU and SCSI Utilities.”

NOTE: If your 5 1/4-inch device comes with drive rails, do not attach them. Remove any rails already attached. See the documentation that comes with the device.

3. Remove the system unit cover (see “Removing and Replacing the System Unit Cover” earlier in this chapter).

WARNING: Be sure that system power is *off* and the system and its peripherals are *unplugged* before you begin the installation procedure.

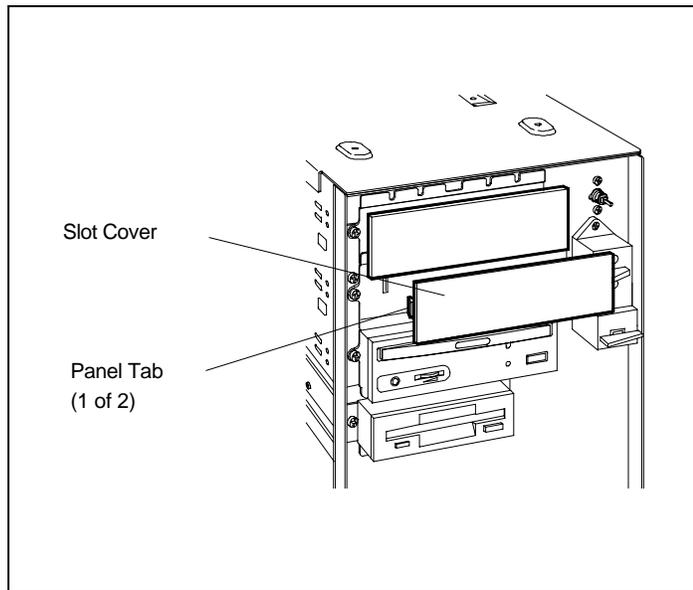
4. Remove the device bracket from the system as follows:
 - Remove the four screws (two to a side) holding the front panel to the system, and remove the panel.



Removing the front panel screws

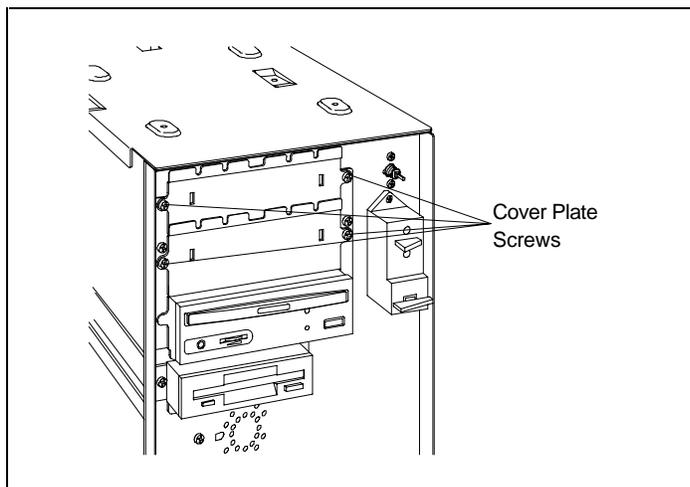
-
- Remove all slot covers from the metal cover plates by pressing in on their panel tabs.

Save the slot covers for reuse.



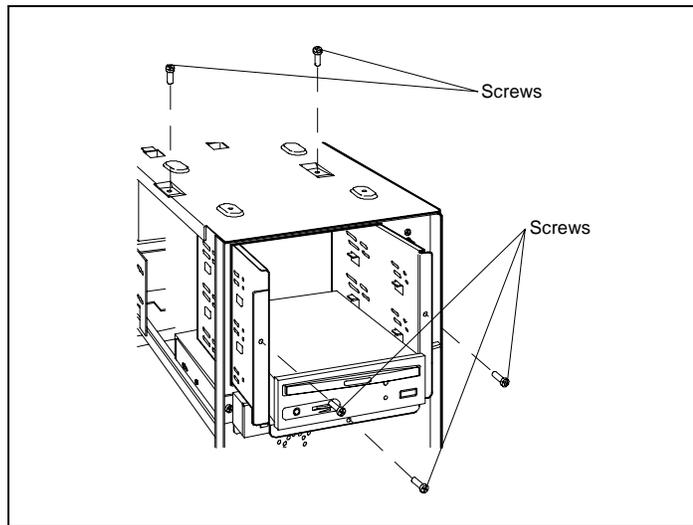
Removing the slot covers

-
- Remove the two screws holding each metal cover plate to the device bracket.
 - Remove and save the plates for reuse.



Removing the cover plate screws

- Remove the five screws holding the device bracket to the chassis.



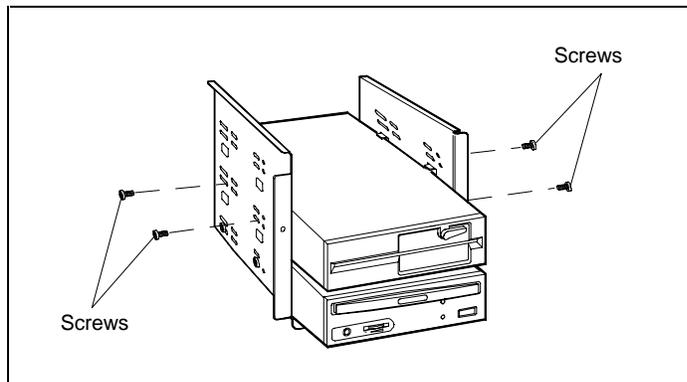
Removing the device bracket screws

- Tag and unplug the power and signal cables from the CD-ROM reader.
- Carefully pull the device bracket out of the chassis.

-
5. Insert the connector end of the device into the device bracket.

NOTE: When installing an accessible storage device, install the device in the lowest empty bay. If you do not, you cannot reinstall the blank slot cover plates over any remaining empty bays.

6. Align the device mounting holes with the bracket mounting holes.
 - Secure the device to the bracket with the four screws (two to a side) provided with the device.
7. Insert the device bracket into the chassis.

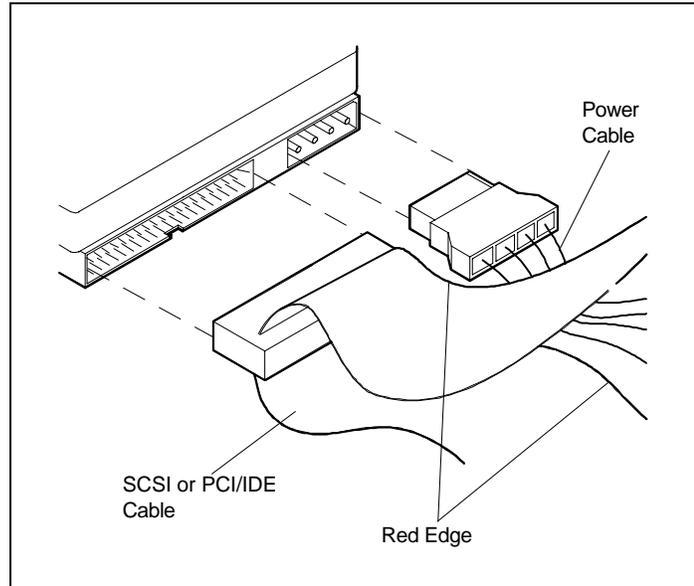


Securing the device

8. Connect the device cables as follows:

- Connect an unused connector on the SCSI cable or PCI/IDE cable and on the power cable into the device.

Use care to prevent bending drive connector pins.
Align the SCSI or IDE cable connector as shown in the figure.

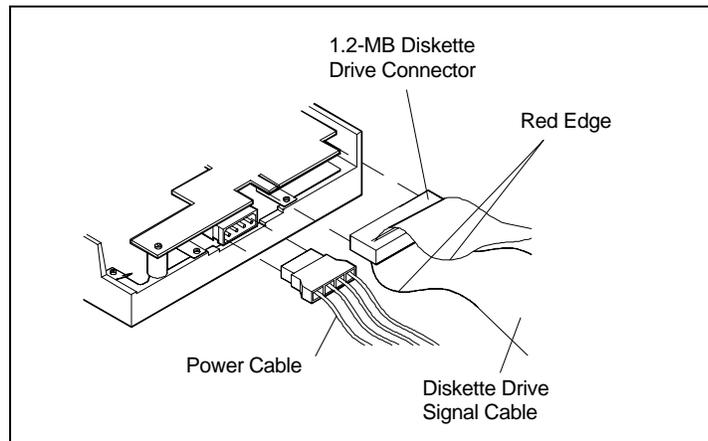


Connecting the SCSI or PCI/IDE device cable

-
- If you are installing a 1.2-MB diskette drive, connect the diskette drive signal cable and power cable.

Align the signal cable connector as shown in the following figure.

- Reconnect the power and signal cables to the CD-ROM reader.



Connecting 1.2-MB diskette drive cables

9. Push the device bracket up against the chassis and secure in place with the five previously removed screws.
10. Install the metal cover plates over any empty slots and secure with the previously removed screws.

If you installed a hard disk in the 5 1/4-inch slot, install a metal cover plate over the slot.

11. Install the slot covers over the empty slots by snapping them into the slots in the metal cover plates.

If you installed a hard disk in the 5 1/4-inch slot, install a slot cover over the metal cover plate.

-
12. Install the front panel to the chassis with the four previously removed screws (two to a side).
 13. If you installed a 1.2-MB diskette drive, remove the protective cardboard insert from the drive.
 14. Replace the system unit cover.
Be sure that you do not pinch any cables or wires when you replace the cover.
 15. Connect external peripherals and power cables.
 16. Run the Setup, ECU, or SCSI utility to set your new configuration (see Chapter 3 and Chapter 4).

Installing an Internal Storage Device

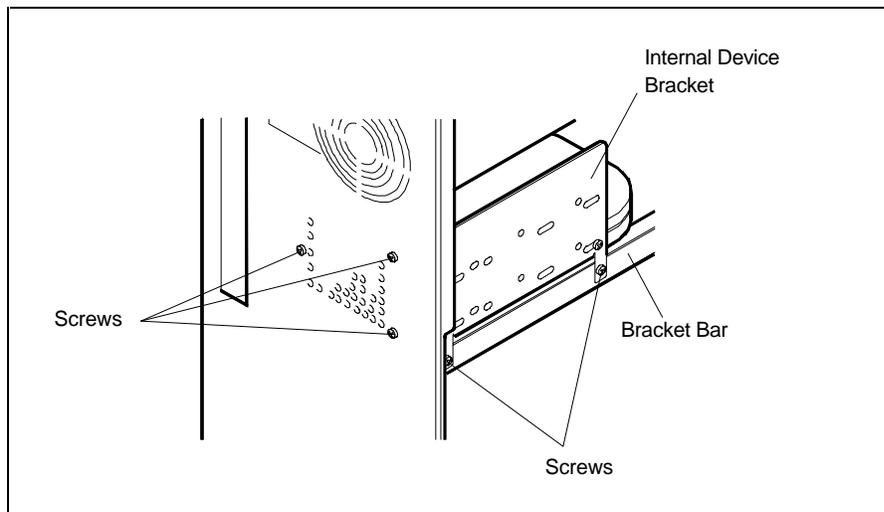
Use the following procedure to install a device in the 3 1/2-inch internal device bracket.

<p>NOTE: The internal device bracket holds up to two 1.0-inch high devices or one 1.0-inch high and one 1.6-inch high device.</p>
--

1. Follow the pre-installation instructions that come with your device, such as setting jumpers and switches.
2. Follow any pre-installation instructions for setting device parameters. See Chapter 3, "Setting System Parameters," and Chapter 4, "Using the ECU and SCSI Utilities."
3. Remove the system unit cover.

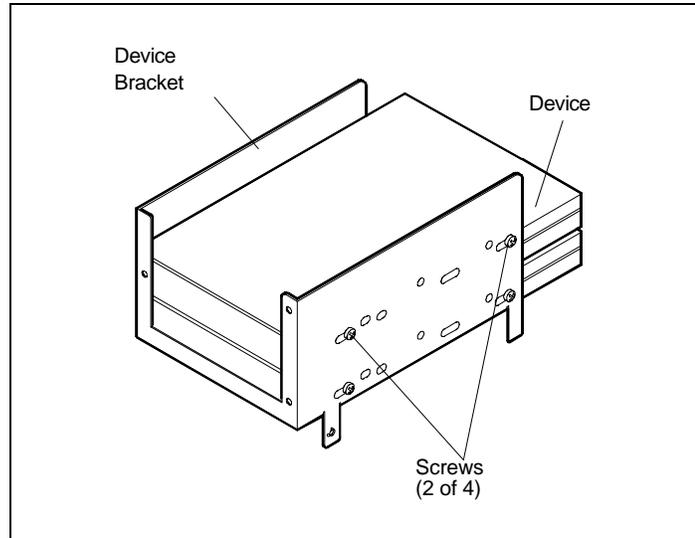
WARNING: Be sure that system power is *off* and the system and its peripherals are *unplugged* before you begin the installation procedure.

4. Tag and unplug the power and signal cables attached to any installed device in the internal device bracket.
5. Remove the internal device bracket as follows:
 - Remove the three screws holding the device bracket to the back of the chassis.
 - Remove the two screws holding the device bracket to the bracket bar.
 - Remove the device bracket from the chassis.



Removing the device bracket screws

-
6. Install the device in the device bracket as follows:
- Install the device in the open bay in the device bracket. Be sure that the device connectors are facing the inside of the chassis when reinstalled.
 - Align the device mounting holes with the mounting holes in the device bracket (see the following figure).
 - Secure the device in the device bracket with the four screws (two to a side) provided with the device.

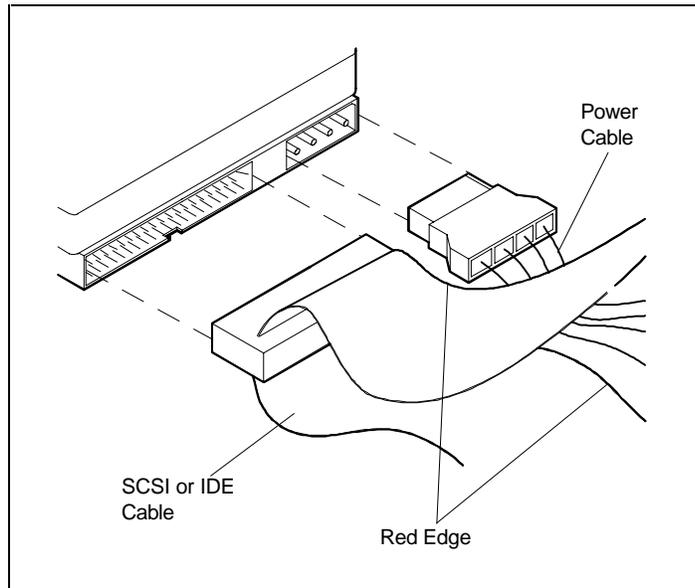


Securing the device in the bracket

7. Connect the device cables as follows:

- Connect an unused connector on the power cable and on the SCSI or IDE signal cable into the device (see the following figure).

Use care to prevent bending drive connector pins. Align the SCSI or IDE connectors as shown in the figure.



Connecting the internal device cables

-
8. Reinstall the device bracket in the chassis as follows:
 - Align the device bracket mounting holes with the bracket bar and secure with the two previously removed screws.
 - Secure the back of the device bracket to the back of the chassis with the three previously removed screws.
 9. Replace the system unit cover.

Be sure that you do not pinch any cables or wires when you replace the cover.
 10. Connect external peripherals and power cables.
 11. Run the Setup, ECU, or SCSI utility to set your new configuration (see Chapters 3 and 4).

EXTERNAL PERIPHERALS

This section contains instructions for connecting the following external peripherals to the system unit ports:

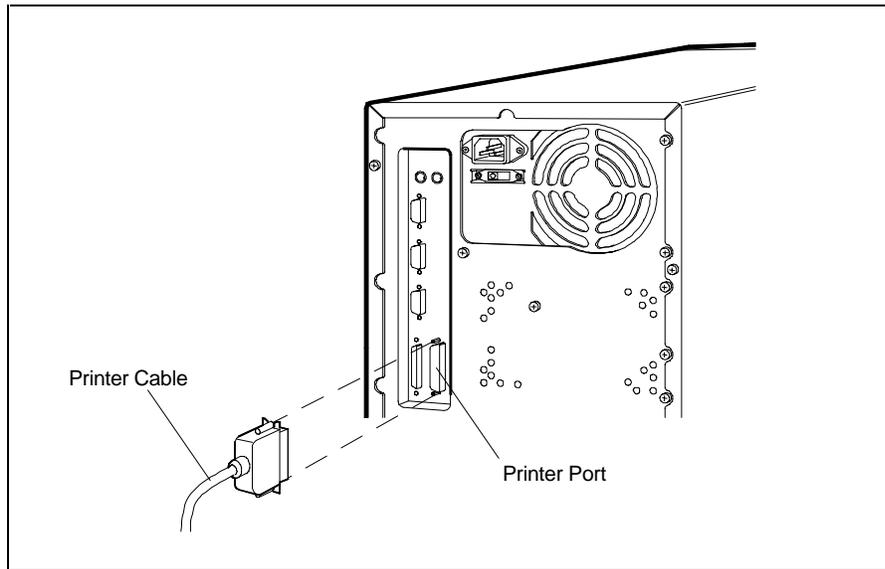
- a parallel printer to the parallel printer port
- two RS-232C devices, such as a serial printer and a pointing device, to the serial 1 and serial 2 ports
- up to seven external SCSI devices to the external SCSI port.

Parallel Printer

Use the following steps to connect a parallel printer to your system unit.

NOTE: Be sure that you have set up the printer correctly before connecting it to your system.

-
1. Turn off and unplug the system unit and any external option connected to the system unit.
 2. Make sure that your printer power is off and the power cable is unplugged.
 3. Connect the printer cable to the printer port on the rear of the system unit. Secure the cable as follows.
 - Secure the system unit connection with the screws provided.
 - Lock the connector to the printer with the connector clips.



Connecting a printer cable to the system unit

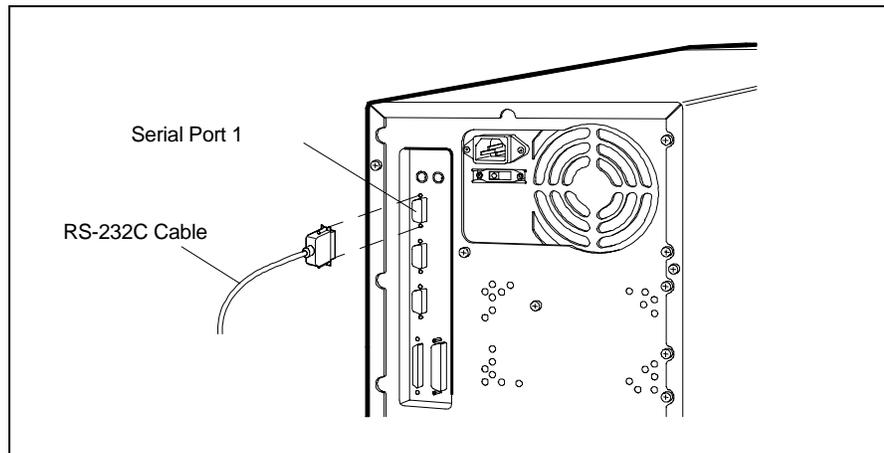
4. Plug in the system and printer power cords, and turn power on.

RS-232C Device

Use the following procedure to connect an RS-232C device, such as a serial printer or mouse, to your computer.

NOTE: Be sure that you have set up the RS-232C device correctly before connecting it to your system. Follow the instructions that come with the option.

1. Turn off and unplug the system unit and any external option connected to the system unit.
2. Make sure that any power to your RS-232C device is off and the power cable is unplugged.
3. Connect your RS-232C cable to one of the system's serial ports and to the device. Secure the cable with the screws provided.



Connecting an RS-232C cable to the system unit

-
4. Plug in the system and serial device power cords, and turn power on.

Connecting External SCSI Devices

You can connect up to five optional external SCSI-2 devices to the external SCSI-2 port on the rear of the system unit. The connection of the external SCSI devices is through an optional external SCSI-2 cable.

NOTE: The number of SCSI devices that can be connected to the external SCSI cable is dependent on the number of devices connected internally. Your system supports up to seven SCSI devices, including both internal and external devices.

Also, the maximum length of the external SCSI-2 cable cannot exceed 19.68 feet (6 meters). If you are connecting SCSI devices to both the standard internal SCSI cable and to the external SCSI-2 port, use the shortest external SCSI cable possible.

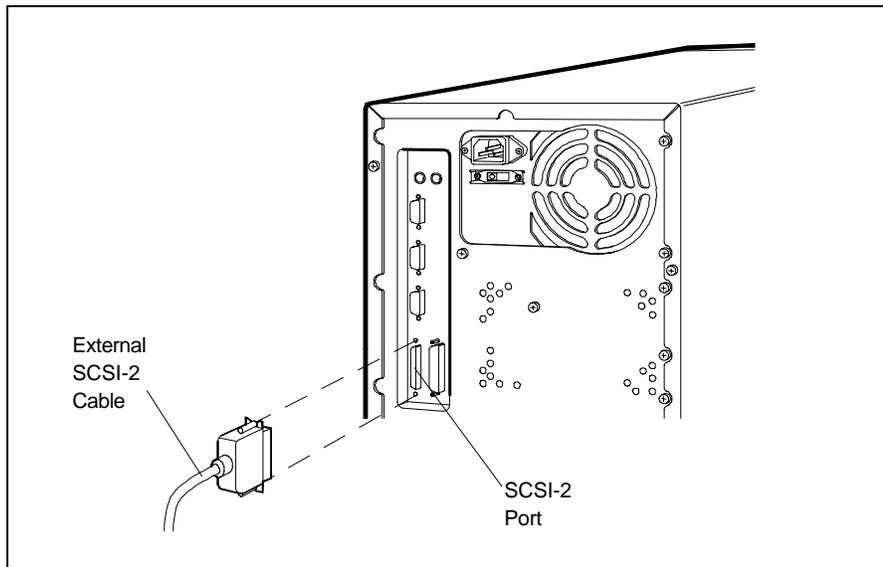
Connect an external SCSI device after you install all your internal hardware options.

NOTE: If you have internal SCSI devices, remove the termination from the last device on the internal SCSI cable.

Use the following procedure to connect an external SCSI device to the system.

1. Follow the “Device Preparation” guidelines in this chapter and the pre-installation instructions that come with your SCSI device.

2. Check that the system power is off.
3. Connect the external SCSI cable to the SCSI-2 port at the rear of the system and to the external SCSI device.



Connecting an external SCSI cable

4. Connect your external SCSI devices to the external SCSI cable.

NOTE: The last device connected to the external SCSI cable must be terminated. See the documentation that comes with the SCSI device for termination information.

5. Turn system power on.
6. Run the SCSI Select utility to change your configuration (see Chapter 4).

8

Setting System Board Switches

This chapter provides switch setting information for configuring your system for a particular system requirement.

The switches that configure your system are the System Configuration switches (SW4), a block of four switches on the system board.

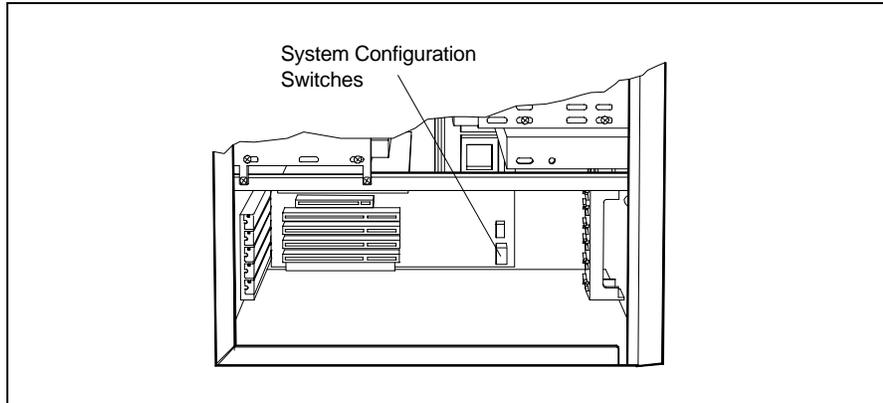
Situations that require changing switch settings include the following:

- You want to clear the CMOS.
- You want to disable the password security feature.

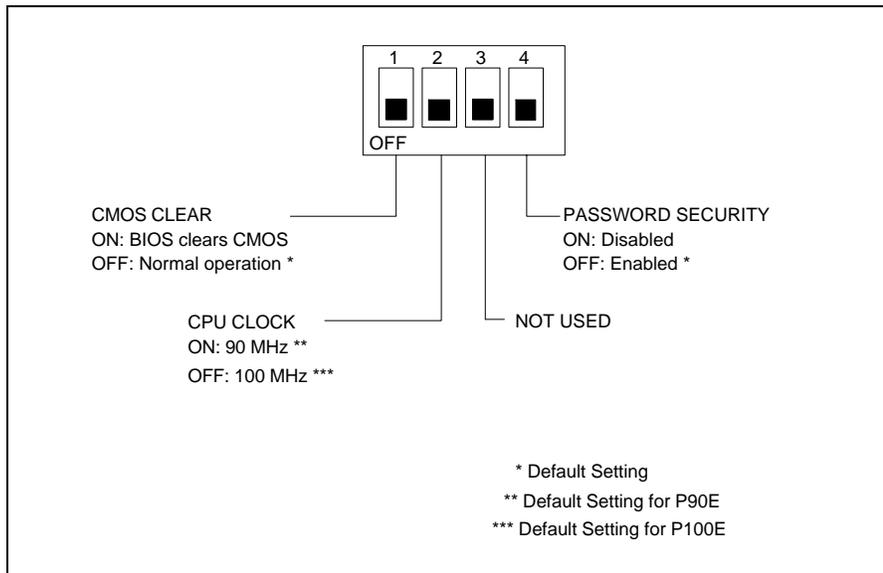
CAUTION: The switches are set correctly at the factory for your system configuration.

If your system requires a switch change, change only the switch setting for that condition. Otherwise, keep the switches at their factory settings.

The following figures show the location of the switches on the system board and the factory settings and functions of the switches. If you need to change the switches, use the procedures that follow the figures.



Locating the system configuration switches



System Configuration switch settings

CHANGING SWITCH SETTINGS

To change system board switch settings, use the following procedure. A label showing SW4 information is inside the system unit. The label provides a quick reference for switch settings.

CAUTION: If system conditions require clearing CMOS, see the following section, “Clearing CMOS.”

1. Turn off and unplug the system and any external options.

WARNING: The system power must be off before changing a switch setting.

2. Remove the system unit cover (see Chapter 7).
3. Locate SW4 on the system board (see the figure earlier in this chapter).

You may have to remove any installed expansion boards to access SW4 (see “Board Removal” in Chapter 7).

Change the appropriate switch setting using a ball-point pen. Check that the setting is correct.

4. If you removed any expansion boards, replace them (see “Board Installation” in Chapter 7).
5. Replace the system unit cover (see Chapter 7).
6. Plug in system and peripheral cables and turn on the system.
7. Run the Setup and ECU utility (see Chapters 3 and 4).

CLEARING CMOS

Clear CMOS to the default factory settings as follows.

CAUTION: Clearing CMOS changes your setup configuration, including hard disk settings.

Call the NEC Technical Support Center before clearing CMOS (see "Getting Help from NEC" in Chapter 9).

1. Turn off and unplug the system and any external options.
2. Remove the system unit cover (see Chapter 7).
3. Locate switch SW4 on the system board (see the figure earlier in this chapter).
4. Locate configuration switch 1 on SW4.
5. Position switch 1 to ON (BIOS clears CMOS), using a ball point pen.
6. Replace the system unit cover (see Chapter 7).
7. Connect system power cables and external options.
8. Power on the system. The system displays a system configuration error message.
9. Power off the system, unplug the system and any external options, and remove the system unit cover.
10. Position switch 1 to OFF (Normal).
11. Replace the system unit cover (see Chapter 7).
12. Run the Setup, ECU, and SCSI utilities to reconfigure your system (see Chapters 3 and 4).

9

Solving Problems

Your system has a built-in checking program that automatically tests its components when you turn the system unit power on. If there is a problem, the system displays an error message. If this happens, follow any instructions on the screen.

If screen messages do not help or an error message does not appear, use the information in this chapter to determine and solve the problem. The problem is often one that you can solve yourself.

PROBLEM CHECKLIST

First check the items in the following list. If these do not help, see the table that follows the list. If you still cannot determine the problem, see “If You Need Assistance” in this chapter.

Check that the following conditions are true for your computer:

- The power switch for each component is on.
- All cables and power cords are tightly connected.
- The electrical outlet to which your components are connected is working. Test the outlet by plugging in a lamp or other electrical device.
- The monitor’s brightness and contrast controls are adjusted properly.
- All option boards in the expansion slots are seated securely in their connectors.

- Additional memory is installed correctly (see “SIMM Upgrade Kits” in Chapter 7).
- Any option you have installed is designed for your system and is set up correctly.

Troubleshooting

PROBLEM	CORRECTIVE ACTION
System Errors	
No power. Power lamp is not lit.	Check that the power cable is plugged into the system power socket. Check that the other end of the cable is plugged into a live, properly grounded AC power outlet.
System does not boot and an error message is displayed on the screen.	Run Setup (see Chapter 3). Check that the parameters are set correctly. If you installed an option, run the ECU (see Chapter 4).
The system makes a continuous sound pattern.	Turn system power off, wait 5 seconds, and turn the power on again. If the sound continues, call the NEC Technical Support Center. See “If You Need Assistance” later in this chapter for the telephone number.
The system no longer maintains the date, time, or your system configuration.	The RTC/battery module needs to be replaced. Contact your dealer or the NEC Technical Support Center.
The system does not boot from the hard disk.	The system always tries to start from the diskette drive before it starts from the hard disk. Remove any diskette in the drives. Run Setup and check boot parameter settings.

Troubleshooting

PROBLEM	CORRECTIVE ACTION
Diskette Drive Errors	
A diskette won't load.	<p>Check that the diskette is inserted correctly.</p> <p>Verify that the system unit and monitor power lamps are on and that the power-on screen appears on the screen.</p> <p>If the diskette is not formatted, format it. See your MS-DOS documentation.</p> <p>If the diskette drive busy lamp does not light when you load the diskette, try a different diskette. If this loads, the problem is in the software. Call your software dealer.</p>
A Non-System Disk or Disk Error message is displayed.	<p>If you are starting from the diskette drive, insert a diskette with system files into drive A. If a bootable diskette does not boot, use Setup to verify that the initial boot parameter is set to diskette drive A and not a hard disk.</p>
Monitor Problems	
The monitor screen remains dark.	<p>Check that the monitor power cable is connected to the monitor and a power outlet.</p> <p>Be sure that the monitor signal cable is connected to the system unit.</p> <p>Check that the system unit and monitor power lamps are on, all monitor connections are tight, and the brightness and contrast controls are adjusted.</p>
A distorted image appears on your monitor screen.	<p>Adjust the video controls on your monitor. If this doesn't help, turn the monitor off for a few seconds, then turn it back on.</p>

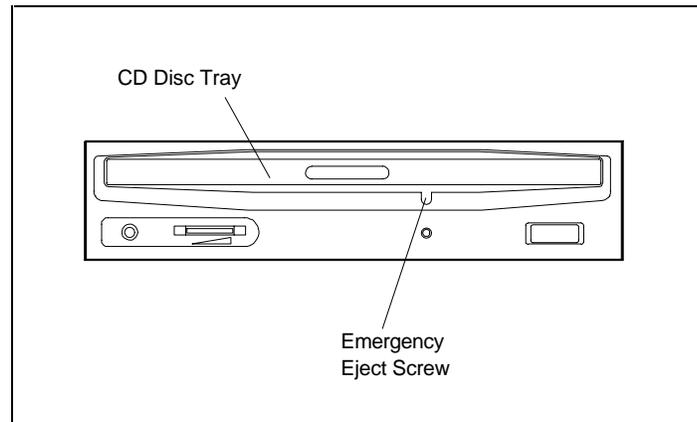
Troubleshooting

PROBLEM	CORRECTIVE ACTION
There is constant movement on the screen.	A magnetic field is affecting your monitor. If you have another monitor nearby, or other device with a motor that generates a magnetic field (for example, a fan), move the monitor or device away from the affected monitor.
Your screen display is fuzzy or graphics characters or "garbage" appear on the screen.	Check that your monitor is set up correctly. Check the monitor connections. Make sure that the monitor signal connector pins are not damaged. Be sure that the correct video driver is installed.
Keyboard Problems	
An image appears on the screen but nothing happens when you use the keyboard.	Check and tighten the keyboard cable connection. If this doesn't help, power off the system. Wait 5 seconds or more and power on the system.
Quad-Speed CD-ROM Problems	
CD-ROM disc tray does not eject due to a power failure or software error.	Power off the system. See "Emergency Eject" in this chapter.
System Performance Problems	
System performance appears sluggish.	<p>Check that you have your system set for optimal operation. See your Microsoft Windows for Workgroups and MS-DOS documentation.</p> <p>Check the memory requirements of your software applications. If required, install additional memory (see "SIMM Upgrade Kits" in Chapter 7).</p> <p>If you added optional memory, check that you installed the SIMM sticks correctly (see "SIMM Upgrade Kits" in Chapter 7).</p>

EMERGENCY EJECT

Use the following procedure to manually remove a disc from the CD-ROM reader if the eject function is disabled by software or power failure.

1. Turn off system power.
2. Locate the emergency eject hole below the tray (see the following figure).



Emergency eject

3. Insert a thin shaft, flat-bladed screwdriver into the eject hole.
4. Turn the screwdriver in a counterclockwise direction until the tray moves out far enough for you to remove the disc.

Turn the screwdriver in a clockwise direction if you want to close the tray before powering up the system.

5. Restore power to the system.
6. Press the Eject button to close the tray.

IF YOU NEED ASSISTANCE

If you have a problem with your computer, first review the checklist and troubleshooting table in the previous section. If you still have a problem, continue with the suggestions that follow.

Getting Help from Your Company

If your company is large, the best source of help may be within your own company. Your company may have designated central support personnel to whom you can go when you have problems.

Your central support personnel can then contact the appropriate dealer or NEC support staff, if needed.

Getting Help from Your Dealer

The dealer from whom you purchased your system is backed by complete support resources and programs within NEC. Your dealer can provide you with details on all available support options.

Getting Help from NEC

If you have a problem that you cannot resolve yourself, within your company, or through your NEC dealer, help is available from the NEC Technical Support Center (TSC). Call the NEC Technical Support Center, toll free, at 1-800-632-4525. Direct technical assistance is available Monday through Friday, between 8:30 a.m. and 8:00 p.m. Eastern Standard Time.

In addition to direct technical assistance, NEC provides the following services for obtaining information and help on NEC products:

NOTE: You need a fax machine or modem to use the following services.

- NEC FastFacts (see Chapter 1 for information on using FastFacts)
- NEC's Bulletin Board Service (BBS)
- NEC Technical Support by electronic mail (E-mail) or fax
- NEC Technical Support through America Online.

NEC's Bulletin Board Service

If you have a modem, the NEC Bulletin Board Service (BBS) can be used to provide you with the latest information on hardware and software. The BBS allows you to download files for system enhancements and upgrades.

Use the following steps to log onto the NEC BBS:

NOTE: The first time you use the BBS, you will be requested to provide information for a new user questionnaire.

1. From the Windows for Workgroups Program Manager, select Accessories and double click on Terminal.

-
2. From the Settings menu, select Communications and check that the settings match the following BBS parameters:
 - Baud rate: up to 14.4 bps (you can select any speed that the modem allows)
 - Parity: none
 - Data bits: 8
 - Stop bits: 1
 3. Log onto the BBS:
 - Click on the Phone menu item.
 - Enter the BBS phone number 508 635-4706. Your business phone system and/or location might require a 91 or 1 prefix.
 - Click OK.
 4. Press **Enter** twice.
 5. Enter your first name, last name, and password. Press **Enter** after each.
 6. Follow the screen prompts until the NECTECH Main Menu is displayed.
 7. At the Main Menu, press **F** and **Enter** for the file menu.

To hang up and log off, follow these steps at the NEC Technologies Bulletin Board.

1. Press **Enter** (to continue).
2. Press **G** (command for Goodbye/Hangup).
3. Press **Enter**.

E-mail/Fax Technical Support Service

The NEC Technical Support Center offers technical support by E-mail over the Internet network if you have a modem. The Internet address is:

tech-support@nected.com

You can also fax technical questions to the NEC Technical Support Center. The fax number is:

(508) 635-4666

When using the E-mail or fax support service, you should include the following words in the subject field for prompt response from the appropriate technical person:

- Monitor
- Printer
- CD-ROM
- Desktop (for minitower or desktop systems)
- Notebook.

You should also provide as much specific information about your question as possible. Also, if you are sending a fax, please include your fax number with the question.

You will receive a response to your questions sent by Internet or fax within one business day.

America Online Service

If you subscribe to America Online, you can use the service to obtain information about NEC and its products. You can also send questions to NEC Technical Support, and access the NEC bulletin board.

Use the following steps to access NEC's America Online service.

1. Log onto America Online.
2. At the opening screen, click on Go To in the Main menu.
3. Click on Keyword in the Go To menu.
4. At the prompt, type either NECTECH or NEC, then either press **Enter** or click on Go.
5. At the NEC menu, double click on one of the following topics to open it, then follow the prompts:
 - About NEC
 - NEWS
 - Product Information
 - Questions and Answers.
6. Exit at anytime by double-clicking on the rectangle in the upper left corner of the screen.

A Setting Up a Healthy Work Environment

Computers are everywhere. More and more people sit at computers for longer periods of time. This appendix describes how to set up your computer equipment to fit your physical needs. Information in this appendix is based on ergonomics — the science of making the workplace fit the needs of the worker.

MAKING YOUR COMPUTER WORK FOR YOU

Some nerve, tendon, and muscle disorders are associated with repetitive activities, improper work environments, and incorrect work habits.

Some people are more susceptible to developing these disorders due to pre-existing physical or psychosocial conditions (see “Physical and Psychosocial Factors” at the end of this appendix).

It is still unclear whether a casual relationship exists between working at a computer and developing musculoskeletal or nervous system disorders, although some studies have shown an association between increasing hours of keyboard use and the development of such disorders.

To minimize your risk of developing such disorders, adhere to the ergonomic information and follow the simple instructions given in this appendix.

The instructions in this appendix can help you control or prevent undue strain to your muscles, tendons, and nerves. The instructions can also promote maximum comfort throughout your day, minimize fatigue, increase your productivity and job satisfaction, and improve the quality of your work.

If you experience any discomfort while working at your computer or afterwards, review the instructions here to determine if you followed them correctly. Make any necessary adjustments to your computer equipment or work area. If symptoms persist overnight and continue to the next morning or throughout a weekend of rest, reduce your keyboard use to a minimum and see a physician as soon as possible.

Arranging Equipment

Arrange your office equipment so that you can work in a natural and relaxed position. Make sure the table or stand supporting your computer, monitor, keyboard, and mouse is at the proper height as described here. Be sure the table or stand is large enough to hold the equipment and necessary work items.

Adjust your computer setup by physically lowering or raising the computer table and/or your chair.

Plan to keep work items used regularly in easy reach.

When sitting at your computer:

- point your head straight forward relative to your shoulders and body.
- adjust the keyboard, mouse, and chair so that your wrists are as straight as possible and your forearms are parallel to the floor.
- sit so your knees are slightly lower than your hips.

Adjusting Your Chair

Your chair should be adjustable and should keep your body supported in an upright position. Adjust the backrest to fit the lower part of your back. Maintain a comfortable, stable, and upright position while seated. Check the following:

- Position the backrest to support the inward curve of your lower back. While sitting, tilt the backrest at a 100 to 110 degree angle to transfer the weight of your upper body away from your spine to the backrest.
- Make sure the depth of your seat allows your lower back to make contact with the backrest. Check that it does not allow pressure to your calves.
- Keep the angle between your thigh and lower leg slightly more than 90 degrees.
- Place your feet flat and firmly on the floor to provide stability and reduce pressure to the underside of the thighs. Only use a footrest when all other attempts at adjusting your chair and monitor fail.
- Ensure that you have adequate clearance between the top of your thighs and the bottom of your work table.
- Take a break and vary your position throughout the day.

POSITIONING YOUR MONITOR

Correct monitor placement and adjustment can reduce eye fatigue, as well as neck and shoulder fatigue. Check the following when you set up your monitor.

- Use an adjustable monitor stand, computer stand, or table. If available, use the tilt and swivel feature to adjust the monitor.

-
- Adjust the monitor so that the top of the screen is at or slightly below eye level when you sit at the keyboard. This allows your neck to be in a neutral position. Your eyes should look slightly downward (at a 15 degree angle) at the screen.
 - Position your monitor so your eyes are 18 to 28 inches from the screen.
 - Relax and rest your eyes periodically by looking away from the screen and focusing on an object at least 20 feet away. Blink often. Make ophthalmological care part of your regular health care program.
 - Use the monitor's brightness and contrast controls for good character and image quality.
 - Keep the monitor at a 90 degree angle to windows or light sources to minimize glare and reflections on the screen. Adjust the monitor so that overhead lights do not reflect on your screen.
 - If necessary, use an anti-glare filter on your screen. Clean the anti-glare filter regularly.
 - Maintain proper lighting at all times.
 - Clean your screen regularly to minimize dust.
 - Use a document holder placed close to your screen.
 - Position whatever you are looking at predominantly (the screen or reference material) in front of you so you do not need to turn your head to either side while typing.

Adjusting the Keyboard and Mouse

When setting up the keyboard and mouse, use the following guidelines.

-
- Place the keyboard directly in front of you. Keep the keyboard at a height that lets your arms and hands stay relaxed and comfortable. Avoid reaching to use your keyboard.
 - Angle your keyboard so that your wrists are straight while you are typing. Adjust the keyboard until you find the most comfortable slope. Keep your wrists in a neutral or straight position as much as possible.
 - While typing, avoid resting your wrists on surfaces, especially sharp edges. Avoid bending your wrists. If you have a wrist pad, use it to rest your wrists between typing.
 - Keep your elbows near your body and your forearms parallel to the floor and at keyboard height. Your upper arms should hang freely at your sides, nearly vertical and at approximately a 90-degree angle to the forearms.
 - Move your entire hand to press hard-to-reach keys. Keep your hands and fingers relaxed, straight, and parallel to the floor. Keep your hands and fingers free to move forward, backward, and sideways over the entire keyboard. Keep from bending your wrists, hands, or fingers sideways and thereby creating radial or ulnar deviation.
 - Press keys with the lightest amount of pressure required. Avoid banging on the keys. Keep your arms, hands, and fingers relaxed.
 - If you use a mouse, position it at the same height as the keyboard. Use your entire arm when moving the mouse. Avoid resting your wrist on the mouse pad surface and simply bending your wrist to move the mouse. Do not grasp the mouse too hard.

Modifying Your Workday

In addition to proper typing techniques and an ergonomically sound work area layout, adhere to the following if you use your computer for a prolonged period.

- Vary your duties and tasks throughout your day.
- Take frequent short breaks that involve walking, standing, and stretching. During these breaks, stretch muscles and joints that were locked in one position for an extended period of time. Relax muscles and joints that were active.
- Use a timer or reminder software to help you remember to take regular breaks.
- Alter your sitting position and posture periodically to increase your circulation.

For more information, see the Visual Display Terminal standards ANSI/HFS 100-1988 developed by the Human Factors Society and issued by the American National Standard Institute (ANSI). Also see literature by experts in the field of ergonomics and human factors.

PHYSICAL AND PSYCHO-SOCIAL FACTORS

Examples of musculoskeletal and nervous systems disorders that have been associated with certain forms of repetitive activities include: carpal tunnel syndrome, tendinitis, tenosynovitis, De Quervains' Disease, trigger finger, as well as other nerve, tendon, and muscle disorders.

Preexisting physical conditions that may cause or make some people susceptible to these disorders include the following: hereditary factors, vascular disorders, obesity, metabolic disorders, endocrine disorders (e.g., diabetes), connective tissue disorders (e.g., arthritis), prior trauma (to hand, wrist, or arm), prior musculoskeletal disorders, aging, and fluid retention due to pregnancy or other causes.

-
- Psychosocial factors associated with these disorders include: workplace stress, poor job satisfaction, lack of support by management, and/or lack of control over one's work.

Review the instructions in this appendix and see a physician if you experience extended periods of discomfort after working at your computer, including pain, tenderness, swelling, burning, cramping, throbbing, weakness, soreness, tingling and/or numbness in the back, neck, shoulders, arms, wrists, hands, and/or legs.

B Specifications

The following Image P90E and Image P100E specifications are standard except as noted.

System Processor

Image P90E, 64-bit, 3.3 volt Intel Pentium processor running at 90 MHz internally and 60 MHz externally

Image P100E, 64-bit, 3.3 volt Intel Pentium processor running at 100 MHz internally and 66 MHz externally

Integrated math coprocessor

16-KB dual write-back internal cache: 8 KB for data, 8 KB for instructions

Integrated Processor Sockets

Two integrated sockets on the system board in all system configurations:

- 296-pin light insertion force (LIF) socket supports the standard installed processor in all configurations
- 320-pin zero insertion force (ZIF) socket supports an optional second processor for dual-processor capabilities

Secondary Cache

Standard 256-KB write-back cache using 10-ns burst mode SRAMs

Random Access Memory (RAM)

16-MB standard (70-ns tin-based SIMMs), expandable to 256 MB on the system's memory board

Support for industry-standard 36-bit single-sided or double-sided SIMMs (4 MB, 8 MB, 16 MB, and 32 MB) with tin connector plating

Read-Only Memory (ROM)

NEC ROM flash BIOS. Upgradeable with BIOS Update Utility diskette.

Graphics

Integrated 32-bit super VGA with graphics accelerator on 32-bit PCI local bus

2 MB of 45-ns video DRAM integrated on the system board

Supports NEC's Display Data Channel (DDC) Plug and Play monitors

8-bit by 24-bit RAMDAC for High Color and True Color modes

High Color mode: 1024 by 768 pixels with 256 colors, 800 by 600 pixels with 64K colors, 640 by 480 pixels with 16.8 million colors

True Color mode: up to 800 by 600 pixels with 16.8 million colors.

Calendar Clock

Year/Month/Day/Hour/Minute/Second; maintained by 3.6 Volt High Energy Battery in RTC/battery module

Input/Output (I/O) Facilities

Integrated Industry-Standard Interfaces

- Bi-directional Parallel — supports Enhanced Parallel Port (EPP) and Extended Capabilities Port (ECP), 25-pin connector
- Serial — two RS-232C ports; support asynchronous communication, up to 9600 bps, 9-pin connectors
- VGA Video Monitor — supports NEC Plug and Play monitors and standard, super, and high-resolution VGA modes, 15-pin connector (D-shell)
- VESA Feature — VESA compliant 8514/A standard connector
- Keyboard — PS/2-compatible-style, 6-pin connector (mini DIN)
- Mouse — PS/2 compatible, 6-pin connector (mini DIN)
- Diskette Drive — supports two diskette drives, 34-pin connector
- SCSI-2 External Port — supports up to seven external Fast SCSI-2 devices (dependent on installed internal SCSI devices)

Expansion Slots

Five I/O expansion slots:

- One 32-bit dedicated PCI slot that supports a PCI expansion board
- One shared PCI/EISA slot that supports either an EISA or a PCI board
- Three 32-bit EISA bus-master slots that support industry-standard 8-/16-/32-bit expansion boards

Disk Interfaces

Integrated PCI local bus Fast SCSI-2 host adapter provides support for up to seven SCSI devices, including up to five internal devices and up to two external devices (or any combination of internal/external devices, not to exceed seven).

Active SCSI termination on the system board

Integrated PCI/IDE controller supports up to four IDE devices (two primary and two secondary)

Keyboard

PS/2-compatible; 101-key membrane keyboard (U.S., Canada, Australia, and Asia), 102 key membrane keyboard (UK and Germany)

12 function keys, separate numeric and cursor pads

Mouse

PS/2 compatible — 6-pin connector

Storage Devices

3 1/2-inch, 1.44-MB diskette drive (standard in all configurations)

3 1/2-inch IDE or SCSI-2 hard disk (standard in hard disk configurations)

Quad-Speed IDE CD-ROM reader (standard in hard disk configurations)

Quad-Speed IDE CD-ROM Reader

- Physical format
 - data disc: yellow book (mode 1 and mode 2), orange book (read only)
 - audio disc: red book
- Data disc logical format —ISO 9660 file format
- Data and buffer capacity
 - 12 cm disc
 - mode 1: 540 MB/disc
 - mode 2: 630 MB/disc
 - 8 cm disc
 - mode 1: 180 MB/disc
 - mode 2: 210 MB/disc
 - 128 KB built in buffer
- Data transfer rate (quadruple speed)
 - mode 1: 600 KB/sec
 - mode 2: 700 KB/sec
- Burst transfer rate — 3.34 MB/sec (IDE 16 bits PIO mode)
- Access time (1/3 stroke)
 - normal speed: 0.28 second
 - quadruple speed: 0.25 second

-
- Access time (full stroke)
 - normal speed: 0.45 second
 - quadruple speed: 0.42 second
 - Photo CD Compatibility — Multisession Photo CD, Single Session Photo CD
 - XA Compatibility — Mode 2, Form 1 and Form 2

Device Slots

Four externally accessible slots. One slot contains the 3 1/2-inch diskette drive (standard all configurations) and one slot contains the standard quad-speed IDE CD-ROM reader (hard disk configurations only).

Two 3 1/2-inch internal slots. One slot contains the standard IDE or SCSI-2 hard disk (hard disk configurations only).

Hardware Setup

ISA setup through Setup utility

EISA setup through EISA Configuration utility

SCSI-2 setup through SCSI Configuration utility

PCI Plug and Play support

Security Features

Asset management (system board number displayed on power-up)

Supervisor and User password

Unattended boot

Diskette access

Fixed disk boot sector

System Software

Hard disk configurations: MS-DOS and Windows for Workgroups factory installed on system hard disk

Diskless configurations: operating system software provided on diskettes, ready for installing

Dimensions

System Unit

- Height — 14.5 in. (36.8 cm)
- Width — 8.5 in. (21.6 cm)
- Depth — 16.44 in. (41.8 cm)

Keyboard

- Height — 1.6 in. (4.1 cm)
- Width — 19.0 in. (48.3 cm)
- Depth — 8.4 in. (21.3 cm)

Weight

The following weights are averages. Weights depend upon the system configuration.

- System Unit — 27.1 lb (12.3 kg)
- Keyboard — 3.5 to 4 lb (1.6 to 1.8 kg)

Power

260-Watt Power Supply — 115/230 V, switch selectable

Recommended Operating Environment

Temperature — 50°F to 95°F (10°C to 35°C)

Relative Humidity — 20% to 80%

Regulatory Compliance

Domestic:

- FCC Part 15 Class B/Part 68 compliant
- UL
- CSA

International

- Germany — BZT (VDE), TUV
- Great Britain — BSI

Service (U.S. and Canada only)

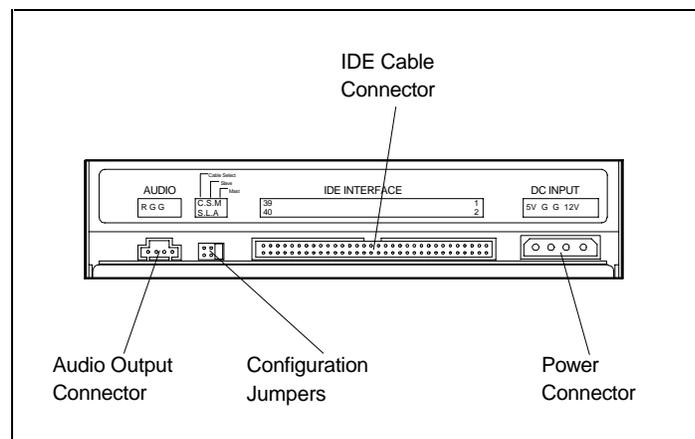
Three year limited warranty. First year free on-site service within a 50-mile radius of a NECTECH Total Service Preferred Dealer location or a NECTECH authorized third-party maintenance organization. The second and third year of service requires the unit to be returned to an authorized NECTECH Service Center or directly to the NECTECH factory for repair.

Qualified technical support available toll-free Monday through Friday from 8:30 a.m. to 8:00 p.m. Eastern Standard Time

C Quad-Speed CD-ROM Reader Configuration

This appendix provides connector and jumper setting information for the IDE quad-speed CD-ROM reader. Use this information if you need to remove, reconfigure, or reinstall the CD-ROM reader.

The rear panel of the CD-ROM reader provides features for cabling and configuring the reader. These features are shown in the following figure and then described.



Rear view of the IDE quad-speed CD-ROM reader

- Audio output connector

This output provides a connection for an external amplifier or audio board. This output can be connected to the CD auxiliary inputs on the amplifier or the input port on an audio board.

NOTE: Volume from the audio output connector is controlled by an external amplifier or audio board. The volume control on the front of the CD-ROM reader has no effect on the volume from this connector.

- Configuration jumpers

These jumpers enable or disable the cable select feature, the slave device configuration, and the master device configuration (see the following jumper descriptions).

- IDE connector

The IDE connector allows the connection of the reader to the PCI/IDE connector on the system board via the PCI/IDE cable.

- Power connector

The power connector allows the connection of the reader to the computer's power supply via the power supply cable.

Use the following jumper setting information to set your CD-ROM reader configuration.

NOTE: The CD-ROM reader jumpers are set correctly at the factory for your configuration.

-
- Cable select (C.S.) jumper is factory set at disabled (not jumpered).
 - Slave (S.L.) jumper is factory set at enabled (jumpered).
 - Master (MA) jumper is factory set at disabled (not jumpered).

D Memory Upgrade Path

The following table shows the SIMM memory upgrade path for the Image P90E and Image P100E systems. Use this table when installing SIMMs (see Chapter 7 for SIMM installation procedures).

Image P90E and Image P100E Memory Upgrade Path

TOTAL MEMORY	4-MB STICKS	8-MB STICKS	16-MB STICKS	32-MB STICKS
16 MB	4, 4-MB sticks			
16 MB*		2, 8-MB sticks		
24 MB	6, 4-MB sticks			
24 MB	2, 4-MB sticks	2, 8-MB sticks		
32 MB	8, 4-MB sticks			
32 MB	4, 4-MB sticks	2, 8-MB sticks		
32 MB		4, 8-MB sticks		
32 MB			2, 16-MB sticks	
40 MB	2, 4-MB sticks	4, 8-MB sticks		
40 MB	2, 4-MB sticks		2, 16-MB sticks	
40 MB	6, 4-MB sticks	2, 8-MB sticks		
48 MB		2, 8-MB sticks	2, 16-MB sticks	
48 MB		6, 8-MB sticks		
48 MB	4, 4-MB sticks		2, 16-MB sticks	

Image P90E and Image P100E Memory Upgrade Path

TOTAL MEMORY	4-MB STICKS	8-MB STICKS	16-MB STICKS	32-MB STICKS
56 MB	2, 4-MB sticks	2, 8-MB sticks	2, 16-MB sticks	
56 MB	6, 4-MB sticks		2, 16-MB sticks	
64 MB				2, 32-MB sticks
64 MB			4, 16-MB sticks	
64 MB		4, 8-MB sticks	2, 16-MB sticks	
64 MB		8, 8-MB sticks		
72 MB	2, 4-MB sticks			2, 32-MB sticks
72 MB	2, 4-MB sticks		4, 16-MB sticks	
72 MB	4, 4-MB sticks	2, 8-MB sticks	2, 16-MB sticks	
80 MB		2, 8-MB sticks		2, 32-MB sticks
80 MB	4, 4-MB sticks			2, 32-MB sticks
80 MB		2, 8-MB sticks	4, 16-MB sticks	
80 MB	4, 4-MB sticks			4, 32-MB sticks
80 MB		6, 8-MB sticks	2, 16-MB sticks	
88 MB	2, 4-MB sticks	2, 8-MB sticks		2, 32-MB sticks
88 MB	6, 4-MB sticks			2, 32-MB sticks
88 MB	2, 4-MB sticks	2, 8-MB sticks	4, 16-MB sticks	
96 MB			2, 16-MB sticks	2, 32-MB sticks
96 MB			6, 16-MB sticks	
96 MB		4, 8-MB sticks		2, 32-MB sticks
96 MB	4, 4-MB sticks	2, 8-MB sticks		2, 32-MB sticks
96 MB		4, 8-MB sticks	4, 16-MB sticks	

Image P90E and Image P100E Memory Upgrade Path

TOTAL MEMORY	4-MB STICKS	8-MB STICKS	16-MB STICKS	32-MB STICKS
104 MB	2, 4-MB sticks		2, 16-MB sticks	2, 32-MB sticks
104 MB	2, 4-MB sticks	4, 8-MB sticks		2, 32-MB sticks
104 MB	2, 4-MB sticks		6, 16-MB sticks	
112 MB		2, 8-MB sticks	2, 16-MB sticks	2, 32-MB sticks
112 MB	4, 4-MB sticks		2, 16-MB sticks	2, 32-MB sticks
112 MB		6, 8-MB sticks		2, 32-MB sticks
112 MB		2, 8-MB sticks	6, 16-MB sticks	
120 MB	2, 4-MB sticks	2, 8-MB sticks	2, 16-MB sticks	2, 32-MB sticks
128 MB				4, 32-MB sticks
128 MB			4, 16-MB sticks	2, 32-MB sticks
128 MB		4, 8-MB sticks	2, 16-MB sticks	2, 32-MB sticks
128 MB			8, 16-MB sticks	
136 MB	2, 4-MB sticks			4, 32-MB sticks
136 MB	2, 4-MB sticks		4, 16-MB sticks	2, 32-MB sticks
144 MB		2, 8-MB sticks		4, 32-MB sticks
144 MB	4, 4-MB sticks			4, 32-MB sticks
144 MB		2, 8-MB sticks	4, 16-MB sticks	2, 32-MB sticks
152 MB	2, 4-MB sticks	2, 8-MB sticks		4, 32-MB sticks
160 MB			2, 16-MB sticks	4, 32-MB sticks
160 MB			6, 16-MB sticks	2, 32-MB sticks
160 MB		4, 8-MB sticks		4, 32-MB sticks
168 MB	2, 4-MB sticks		2, 16-MB sticks	4, 32-MB sticks

Image P90E and Image P100E Memory Upgrade Path

TOTAL MEMORY	4-MB STICKS	8-MB STICKS	16-MB STICKS	32-MB STICKS
176 MB		2, 8-MB sticks	2, 16-MB sticks	4, 32-MB sticks
192 MB				6, 32-MB sticks
192 MB			4, 16-MB sticks	4, 32-MB sticks
200 MB	2, 4-MB sticks			6, 32-MB sticks
208 MB		2, 8-MB sticks		6, 32-MB sticks
224 MB			2, 16-MB sticks	6, 32-MB sticks
256 MB				8, 32-MB sticks

* Two 8-MB sticks ship standard.

Glossary

A applications programs

Software designed to perform specific functions, like solving business or mathematical problems.

asynchronous communications

Method of data transmission where characters are preceded by a start bit and followed by a stop bit, permitting the time between characters to vary.

AUTOEXEC.BAT

A batch program file that the operating system runs to define hardware device characteristics.

B base RAM

Area of system memory between 0 and 640 kilobytes available to the user for operating system and application programs.

BIOS

Basic Input Output System. A collection of primitive computer routines, usually burnt into ROM, that controls the real-time clock, keyboard, disk drives, video display, and other peripheral devices.

bit

Binary digit. The smallest unit of computer data.

bits per second

(bps) A unit of transmission. Also called baud rate.

board

Printed circuit board. Board onto which computer components are soldered and thin wires are printed to connect the components.

boot

To start up a computer. See cold boot and warm boot.

bus

An electronic circuit within a computer used for transmitting data or electrical power from one device to another.

busy lamp

Indicator on the front of the diskette drive that lights when the drive is writing to or reading from a diskette.

byte

Group of eight contiguous bits.

C chip

A small piece of semiconductor material, usually silicon, that contains miniaturized electronic circuits.

CD

Compact Disc. A non-erasable storage disc that is read optically by means of a laser. Holds more than 500 megabytes of data.

CD-ROM reader

Compact Disc, Read-Only Memory. A device that uses laser technology to read data or play audio stored on a CD.

clock

Electronic timer used to synchronize computer operations.

CMOS

Complementary Metal Oxide Semiconductor. A chip that contains nonvolatile memory. CMOS is backed up by an internal lithium battery that preserves clock/calendar data and system configuration parameters stored in CMOS.

cold boot

Process of starting up the computer by turning on the power. If power is already on, the process means to turn off the computer and turn it on again. A cold boot reinitializes all devices.

CONFIG.SYS

A text file that tells the computer where in memory to load the operating system, what device drivers to install, and what memory management features to activate.

conventional RAM

The first megabyte of RAM in the system which contains 640 KB of base memory and 384 KB of reserved memory.

cursor

A movable image on the display screen that indicates where the next entered data appears.

D diskette

A thin flexible platter coated with a magnetic material for storing information.

diskette drive

A magnetic drive that writes on and retrieves data from a diskette.

E EISA

Extended Industry Standard Architecture. An extension of the 16-bit ISA bus standard. EISA allows 32-bit data transmission over the EISA bus from expansion devices like network boards, video adapters, and modems.

expansion option

Add-on hardware that expands system performance and versatility.

expansion slot

Location inside the system unit for connecting an optional printed circuit board.

extended RAM

The area of RAM above the first megabyte of memory in the system available for enhancing system performance.

F formatting

The process of preparing a disk or diskette to accept data.

function key

The set of keys on the keyboard (usually F1 through F12) that let you get help and error message information or quickly select frequently used commands.

H hard disk

A rigid magnetic storage device that provides fast access to stored data.

hardware

The electrical and mechanical parts from which a computer is made.

hertz

(Hz) A unit of frequency equal to one cycle per second.

I **input/output**

(I/O) The process of transferring data between the computer and external devices.

IDE

Intelligent Drive Electronics. A hard disk drive type that has controller electronics built into the drive and delivers high throughput.

interface

A connection that enables two devices to communicate.

interrupt

A special control signal from an I/O device that diverts the attention of the microprocessor from the program to a special address.

ISA

Industry Standard Architecture expansion bus. A 16-bit expansion bus used in computers. ISA enables expansion devices (network boards, video adapters, modems) to send data to and receive data from the CPU and memory 16-bits at a time.

K **kilobyte**

(KB) 1024 bytes.

L **load**

The process of copying a program into the computer's memory from a storage device.

M megabyte

(MB) 1,048,576 bytes.

memory

Electronic storage area in a computer that retains information and programs. A computer has two types of memory — read-only memory (ROM) and random access memory (RAM).

menu

A video display of programs or options.

microprocessor

A semiconductor central processing unit that is the principal component of a microcomputer. Usually contained on a single chip that includes an arithmetic logic unit, control logic, and control-memory unit.

millisecond

(ms) One-thousandth of one second; 0.001 second.

mode

A method of operation; for example, the system operates in either normal or power-saving modes.

N nonvolatile memory

Storage media that retains its data when system power is turned off. Nonvolatile memory in your system is a complementary metal oxide semiconductor (CMOS) chip which is backed up by an internal battery. The backup battery preserves the clock/calendar data and system configuration parameters stored in CMOS. See volatile memory.

O operating system

Set of programs that manage the overall operation of the computer.

overwrite

Storing information at a location where information is already stored, thus destroying the original information.

P parallel interface

Interface that communicates eight bits at a time.

parallel printer

A printer with a parallel interface.

parameter

A characteristic of a device or system.

password

A string of characters that the user must enter before the system allows access or system privileges.

PCI Bus

Peripheral Component Interconnect. A local bus technology that allows hard disk drives and other peripherals to send data directly to and receive data from the CPU. Transfers data faster than ISA or EISA bus.

peripheral

Input or output device not under direct computer control. A printer is a peripheral device.

pixels

Picture elements. Tiny dots that make up a screen image.

port

Provides the means for an interface between the microprocessor and external devices. A cable connector is usually plugged into the port to attach the device to the computer.

processor

In a computer, a functional unit that interprets and executes instructions.

prompt

A special symbol indicating the beginning of an input line. Also a message that appears on the screen indicating that the user must take a certain action.

R RAM

Random Access Memory. A storage device into which data is entered and from which data is retrieved in a nonsequential manner.

read

To extract data from a storage device such as a diskette.

ROM

Read-Only Memory. Memory in which stored data cannot be modified by the user except under special conditions.

reset

The process of returning a device to zero or to an initial or arbitrarily selected condition.

resolution

The degree of screen image clarity. Video display resolution is determined by the number of pixels on the screen. Resolution is usually specified in pixels by scan lines, for example, 640 by 480. See pixels.

RS-232C

Standard interface for serial devices.

S scsi

Small Computer Systems Interface. A computer bus interface standard that defines standard electrical and physical connections for devices. SCSI provides a standard interface that allow different devices (disk drives, CD-ROM drives, tape drives) to interface with the CPU.

SCSI ID

An identifier assigned to SCSI devices that allows them to communicate with the CPU when the device(s) are connected to a SCSI host adapter through the SCSI bus. Each adapter has eight available SCSI IDs.

serial interface

An interface that communicates information one bit at a time.

serial printer

A printer with a serial interface.

shadowing

To copy the system and video BIOS from chip to RAM for enhanced system performance.

software

Programs that run on a computer, such as operating systems, word processors, and spreadsheets.

system board

The main printed circuit board inside the system unit into which other boards and major chip components, such as the system microprocessor, are connected.

system unit

The system component that contains the computer parts, drives, power supply, and option boards.

V VGA

Video Graphics Array. Graphics technology that supports many colors and resolutions (for example, 256 colors and a graphics resolution of 800 by 600 pixels).

volatile memory

Storage media that loses its data when system power is turned off. Standard memory and memory that you add to your computer are volatile memory. See nonvolatile memory.

W wait state

The additional cycle beyond the minimum cycles required by the microprocessor to complete a memory transaction. When additional cycles are required, the microprocessor must wait for the additional cycle before the transaction is completed. A “zero wait state” means that the operation required no additional cycles to complete the memory transaction.

warm boot

Process of resetting the computer without turning off the power through keyboard input (pressing **Ctrl**, **Alt**, and **Del** keys simultaneously) or the reset button. The system returns to an initial or arbitrarily selected condition.

write

To record or store information to a storage device.

write protection

Allows reading from a diskette but prevents writing to a diskette.

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(For United States Use Only)

**FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT**

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from the one to which the receiver is connected.

Use a shielded and properly grounded I/O cable to ensure compliance of this unit to the specified limits of the rules.

(For Canadian Use Only)

This equipment is a Class B digital apparatus which complies with the Radio Interference Regulations, C.R.C., c.1374.

Cet appareil numérique de la classe B est conforme au Règlement sur le brouillage radioélectrique, C.R.C., ch.1374.