*The Space-Saving Office PC*

# POWERMATE® ES SLIMLINE SERIES


## USER'S GUIDE

NEC

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# Contents

# Using This Guide

The *PowerMate® ES SlimLine Series User's Guide* provides a comprehensive reference to information about your system.

The guide contains the following information:

- Chapter 1, Reviewing System Features, provides a look at the front, back, and inside features of the system. It also gives a summary of the system's hardware, software, and security features.
- Chapter 2, Setting Up the System, briefly describes how to set up, start up, and shut down the system. The chapter also provides information on installing applications and tips on caring for the system.
- Chapter 3, Configuring the System, describes how to use the software utilities shipped with your system, including the BIOS Setup Utility, FLASH Utility, NEC INFO Center, NEC Application and Driver CD, NEC OS Restore CD, and Intel Processor Serial Number Control Utility. The chapter also includes information for setting system jumpers.
- Chapter 4, Installing System Upgrades, provides installation procedures for processor, memory, expansion board, and storage device upgrades.
- Chapter 5, Solving System Problems, contains troubleshooting tips for solving simple problems. The chapter also includes procedures for cleaning the mouse and replacing the system battery.
- Chapter 6, Getting Services and Support, describes the services available to you for information and help, and describes how to access the services.
- Appendix A, Setting Up a Healthy Work Environment, contains guidelines to help you use your computer productively and safely. This appendix also instructs you on how to set up and use your computer to reduce your risk of developing nerve, muscle, or tendon disorders.
- Appendix B, System Specifications, provides technical specifications for your system and its components.

**WARNING** Prolonged or improper use of a computer workstation may pose a risk of serious injury. To reduce your risk of injury, set up and use your computer in the manner described in Appendix A, Setting Up a Healthy Work Environment.

## *Text Conventions*

This guide uses the following text conventions.

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

**WARNING** Warnings alert you to situations that could result in serious personal injury or loss of life.

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

***Note*** Notes give 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 **abc123** and press **Enter**.
- File names are printed in uppercase letters. For example, AUTOEXEC.BAT.

# Related Documents

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

- *NEC PowerMate ES SlimLine Series Quick Setup/Quick Reference*
  The Quick Setup shows how to quickly get the system connected and powered on.

  The Quick Reference briefly describes the documentation, NEC utilities, software applications, and services available with the NEC PowerMate ES SlimLine Series system.

- *How Does Your Workplace Measure Up?*
  This brochure provides information for setting up and using the computer productively and safely. Information includes guidelines to reduce the risk of injury associated with using a computer.

- *NEC PowerMate ES SlimLine Series Release Notes*
  Release Notes provide additional information about the computer that was not available at the time the user's guide was printed. Information in the Release Notes is the result of extensive product testing.

Your system also comes with the NEC INFO Center online documentation on your hard drive. The NEC INFO Center is an online guide to your PowerMate system. It provides information about the system through the following online modules: Tour, User's Guide, Questions, Solutions, and Services.

In addition to the documentation that ships with the system, documentation is available from the NECC website.

- *NEC PowerMate ES SlimLine Series Service and Reference Manual*
  This manual 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.

  Service and reference manuals are available on the Internet at the Service and Support area of the NECC website (see Chapter 6 for access information).

- *NEC PowerMate ES SlimLine Series User's Guide*
  Check the website for the most current online version of your printed user's guide.

# 1

## Reviewing System Features

- Front Features
- Rear Features
- Interior Features
- Chassis
- Optional Speakers
- System Overview

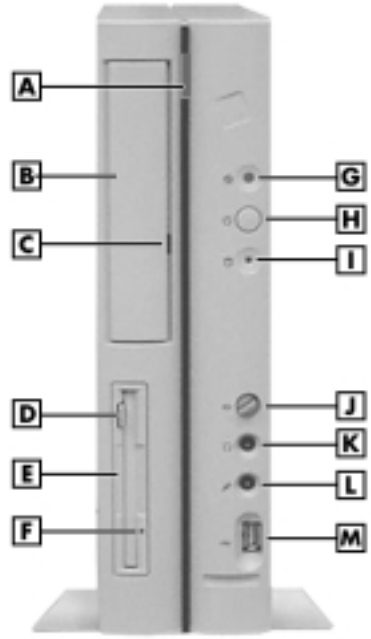
**⚠ WARNING** Prolonged or improper use of a computer workstation may pose a risk of serious injury. To reduce your risk of injury, set up and use the computer in the manner described in Appendix A, Setting Up a Healthy Work Environment.

This chapter highlights system hardware and software, and describes the security features of the system.

# *Front Features*

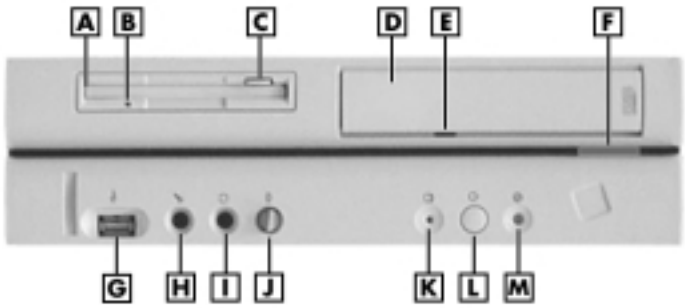
Your PowerMate ES SlimLine Series system can be used as a slimtower or as a desktop system. The following figures show the features on the front of the system for both configurations. Brief descriptions follow the figures.

*PowerMate ES SlimLine Series slimtower front features*




**A** – CD-ROM Tray Open/Close Button
**B** – CD-ROM Drive
**C** – CD-ROM Drive Activity Lamp
**D** – Diskette Drive Disk Eject Button
**E** – Diskette Drive
**F** – Diskette Drive Activity Lamp
**G** – Power/Sleep Lamp
**H** – Power/Sleep Button
**I** – Hard Drive Activity Lamp
**J** – Volume Control
**K** – Headphone Jack
**L** – Microphone Jack
**M** – USB Port

*PowerMate ES SlimLine Series desktop front features*




**A** – Diskette Drive
**B** – Diskette Drive Activity Lamp
**C** – Diskette Drive Disk Eject Button
**D** – CD-ROM Drive
**E** – CD-ROM Drive Activity Lamp
**F** – CD-ROM Tray Open/Close Button
**G** – USB Port
**H** – Microphone Jack
**I** – Headphone Jack
**J** – Volume Control
**K** – Hard Drive Activity Lamp
**L** – Power/Sleep Button
**M** – Power/Sleep Lamp

## *System Controls and Lamps*

System controls and lamps are identical for both setups. The controls and lamps include a power/sleep button, power/sleep lamp, and hard drive activity lamp.

- Power/Sleep button
  Press this button to turn on system power. To turn off power, close all applications and shut down Windows. If you have Windows 98 or Windows 2000, the system automatically powers down. If you have Windows NT, close all applications, shut down Windows NT, and press in the power button until the system powers down (approximately four seconds).

  Press and immediately release the power/sleep button to suspend system operation and go into the power saving mode. If you have a VESA-compliant monitor, your monitor also goes into a power-saving mode.

  An amber system unit power/sleep lamp indicates that the system is in a power-saving mode.

  Move the mouse or press a key on the keyboard to exit the power saving mode and resume system operation.

- Power/Sleep lamp
  The power/sleep lamp indicates whether system power is on or off. It also lets you know if the system is operating in a power-saving mode.

  A steady green lamp indicates that the power is on to all system components. An amber lamp indicates that the system is in sleep mode with full-power reduction.

- Hard drive lamp
  A lit lamp indicates that the hard drive is active. The green lamp tells you that the hard drive is reading or writing data.

**⚠ CAUTION** Do not turn off the system unless absolutely necessary while the hard drive lamp is lit. To do so can damage your hard drive or data.

## *Diskette Drive*

Use the diskette drive to copy data files to and from a diskette. You can also use it as a bootable drive for loading and starting programs from a diskette.

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

## *Universal Serial Bus Port*

The universal serial bus (USB) port on the front of the system allows you to easily and conveniently add plug-and-play USB devices without opening up the system. You simply plug the USB device into the port. You can connect up to 127 devices including a mouse, monitor, keyboard, printer, scanner, speakers, and more. A second USB port is on the rear of the system.

## CD-ROM Drive

Systems come with a 40X Max or higher variable speed CD-ROM drive. Use the CD-ROM drive to load and start programs from a compact disc (CD). You can also use the CD-ROM drive to play your audio CDs.

The CD-ROM drive operates at different speeds depending on whether the CD you are using contains data or music. This allows you to get your data faster and to see smoother animation and video.

## DVD-ROM Drive

Some systems might come with an 8X or higher digital video disc (DVD)-ROM drive. The drive offers many improvements over the standard CD-ROM technology, including superior video and audio playback, faster data access, and greater storage capacities.

The DVD-ROM drive uses DVD technology to read DVD discs as well as standard audio and video CDs.

## Audio Connectors

Your system has the following audio connectors and a volume control on the front of the system.

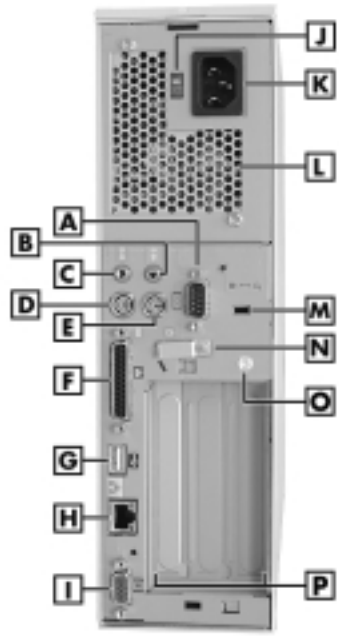
- Microphone jack
  Use this jack to connect a microphone for recording audio information in your data files.
- Headphone jack
  Use this jack to connect an optional headphone set. Plugging in the headphone set disables the speakers.
- Volume control
  Use this control to adjust the volume of the optional headphone set.

  You can also use the Windows sound software. To bring up the Windows volume control, double click the speaker icon in the taskbar (next to the system clock). Use the software to balance the sound between the left and right speakers.

# Rear Features

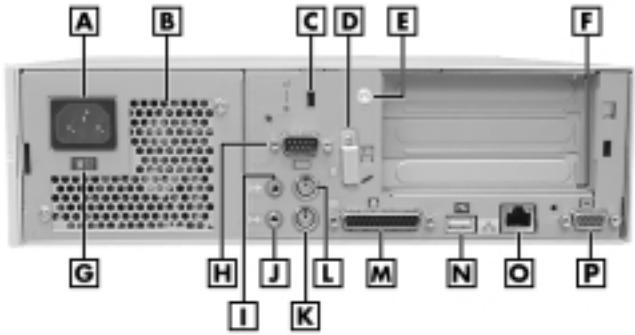
On the rear of your computer, you'll find external connectors, the power supply socket, a voltage switch, and expansion board slots. The following figures show the features.

*PowerMate ES SlimLine Series slimtower rear features*




**A** – Serial Port
**B** – Line Out Jack
**C** – Line In Jack
**D** – Keyboard Port
**E** – Mouse Port
**F** – Parallel Port
**G** – USB Port
**H** – LAN Port
**I** – VGA Port
**J** – Voltage Switch
**K** – AC Power Connector
**L** – Power Supply
**M** – Kensington Lock Slot
**N** – Keyboard/Mouse Anti-theft Bracket
**O** – Anti-Theft Ring
**P** – Expansion Slots

*PowerMate ES SlimLine Series desktop rear features*




**A** – AC Power Connector
**B** – Power Supply
**C** – Kensington Lock Slot
**D** – Keyboard/Mouse Anti-theft Bracket
**E** – Anti-Theft Ring
**F** – Expansion Slots
**G** – Voltage Switch
**H** – VGA Port
**I** – Line Out Jack
**J** – Line In Jack
**K** – Keyboard Port
**L** – Mouse Port
**M** – Parallel Port
**N** – USB Port
**O** – LAN Port
**P** – Serial Port

## *External Connectors*

External connectors let you attach peripheral devices, such as a monitor, keyboard, mouse, and printer to your system. Your system has the following external connectors.

- Mouse port
  Attach the mouse that comes with your computer to this port. The mouse port supports a PS/2-compatible mouse.

- Keyboard port
  Attach the PS/2®-compatible keyboard that comes with your computer to the keyboard port.

- VGA monitor connector
  The system comes with an accelerated graphics port (AGP) integrated on the system board and ported to the external video graphics array (VGA) connector on the board. The VGA connector supports an NEC MultiSync® monitor, NEC VistaScan™ monitor, or other VGA-compatible monitor with a 15-pin connector. Attach your monitor's signal cable to the VGA connector.

- Printer port
  Use this port to connect a parallel printer with a 25-pin connector to the system.
- Serial port (COM1)
  Attach a serial device with a 9-pin connector to this serial port. Serial devices include a pointing device, serial printer, or a modem.
- Universal Serial Bus port
  This port adds a USB capability at the rear of the system (see "Universal Serial Bus Port" earlier in this chapter).
- Audio connectors
  The system comes with sound integrated on the system board. The following connectors come integrated on the board (see the preceding figures for jack locations).
  - Line in jack
    The line in jack lets you connect a stereo audio device such as a stereo amplifier or a cassette or minidisc player for playback or recording.
  - Line out jack
    The line out jack allows you to connect optional speakers, an amplified output device such as powered speakers, a stereo tape recorder, or an external amplifier for audio output.
- LAN port
  All systems come with local area network (LAN) integrated on the system board. Use the RJ-45 compatible LAN port on the board for connecting the system to an Ethernet LAN.

## *Power Supply Features*

The system has the following power supply features:

- Power socket
  Connect your power cable to this socket.
- Voltage switch
  Sets the voltage for your system to 115 volts or 230 volts.

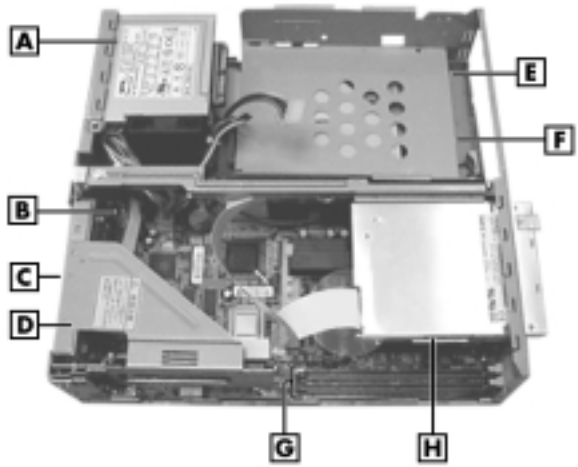
**⚠ CAUTION** Set the switch correctly for the voltage in your area. Most wall outlets in the United States and Canada are 115 volts. Outlets in Europe are 230 volts.

- Power connectors
  The power supply has four power connectors that connect to the diskette drive, system board, and two storage devices.
- Power supply fan
  The power supply fan cools the power supply and other system components to keep them from overheating. Keep the area near the fan clear for proper ventilation.

# Interior Features

See the following figure for the location of features within the system. Feature descriptions follow.

*Inside the system*




**A** – Power Supply
**B** – System Board
**C** – Expansion Slots
**D** – Riser Board Bracket
**E** – Hard Drive (under support plate)
**F** – CD-ROM Drive (not shown)
**G** – DIMM Memory Sockets
**H** – Diskette Drive

## System Board

The system processor, memory, system battery, internal connectors, and external connectors are on the system board. For information on the external connectors, see “External Connectors” earlier in this chapter.

The system board supports a diskette drive, an IDE hard drive, and an IDE CD-ROM drive (or IDE DVD-ROM drive on some systems).

Internal connectors on the system board include:

- primary and secondary IDE connectors
- diskette drive connector
- front panel connectors for system lamps and USB
- power connectors
- AGP graphics connector (VGA)
- riser board connector
- additional connectors include Wake-On LAN and fan.

## Riser Board

All systems come with a riser board attached to a removable riser board bracket. The riser board has three PCI connectors for adding up to three optional expansion boards. The riser board plugs into the riser board connector on the system board.

## Local Area Network

All systems come with a 3COM local area network (LAN) chip integrated on the system board. Connect your network cable to the LAN connector on the rear of the system.

## Storage Device Support

Three storage device bays accommodate up to two accessible devices (diskette drive and CD-ROM drive or DVD drive) and one internal hard drive.

# Chassis

The chassis is an NEC proprietary design with the following features:

- standardized chassis size and dimensions
- standardized system board size and dimensions
- standardized ATX 106-watt power supply
- convertible to slimtower or desktop orientation.

The system can be placed in the slimtower or desktop position. Choose the position that best suits your space.

# Optional Speakers

When ordered, two high-quality stereo speakers come with the system. One speaker connects to the line out jack at the rear of the system unit.

An AC adapter and connecting cables come with the speakers. Install the AC adapter and cables along with the speakers.

Adjust the speaker volume by using the volume control on the speaker. You can also use the Windows sound software. To bring up the Windows volume control, double click the speaker icon on the taskbar (next to the system clock). Use the software to balance the sound between the left and right speakers.

# System Overview

See the following sections for a quick overview of system hardware, software, and security features.

## Hardware

The system includes the following hardware features.

- PC99 Compliance
  All the hardware in the system has been certified by Microsoft® to be PC99 compliant.

- Processor
  The system comes with an Intel® Celeron™ 500-MHz or higher processor with a 66-MHz or higher front side bus (FSB) or a Pentium® III 533-MHz or higher processor with a 100-MHz or higher FSB. Processor speed and FSB depend on system model.

- Audio features
  The system comes with sound integrated on the system board. The audio chipset gives you a surround sound system for three-dimensional sound effects. It also provides wavetable synthesis. (Wavetable synthesis uses actual recordings of real sound effects and musical instruments for a dynamic audio experience.)

- Flashable ROM BIOS
  The system's ROM BIOS features system setup configuration, plug-and-play support, and flash support for easy and economical BIOS upgrades.

- System memory
  The system comes with at least 64 MB of ECC synchronous dynamic random access memory (SDRAM) and supports up to 512 MB.

- AGP graphics
  All models ship with 4X AGP graphics integrated on the system board. AGP enhances graphics performance, particularly for 3-D applications.

- Power management options
  Power management options conserve energy and reduce power costs.

## *Software*

NECC provides a variety of applications and hardware utilities with your system to let you take advantage of your hardware capabilities.

### *Preloaded Software*

Your system comes preloaded with the Microsoft® Windows® 98 operating system or the Windows 2000/Windows NT® operating system configuration.

If you have a Windows 2000/Windows NT configuration, you must choose the operating system you want to load. The operating system you choose is your only operating system and is the one that the NEC OS Restore program restores.

NECC-provided applications, drivers, and utilities come loaded on the hard drive. You can install some of your applications from icons on the Windows desktop. Software available on your system includes the following applications:

- Microsoft® Internet Explorer
  Internet Explorer provides a top-notch browser with preloaded links for easy access to the world wide web. Also use Internet Explorer to access one of the many new browser-based utilities.
- Norton AntiVirus™ 2000 Software
  Protect your system from viruses by running Norton's virus scan software.
- Adobe® Acrobat® Reader
  Use the Adobe Acrobat Reader to read and print portable document format (PDF) files found on the Internet and PDF documents included with various software applications.
- NEC INFO Center
  Get quick access to information about your system in the online NEC INFO Center. NEC INFO Center modules include Tour, User's Guide, Questions, Solutions, and Services. See "NEC INFO Center" in Chapter 3 for a description of the modules and how to use the INFO Center.
- Intel LANDesk® Client Manager
  Use LANDesk software to track system information such as serial number, BIOS version, memory capacity, disk capacity, expansion board settings, and applications. Use LANDesk software for remote starts from a server computer using Wake-On LAN and remote reboot.

## *NEC OS Restore CD*

Your system comes with an NEC OS Restore CD and bootable diskette. Should a problem occur that causes data loss or corruption, you can use the NEC OS Restore CD to restore your system to its original factory state or you can restore just the operating system and drivers. A full system restore loads the operating system and all the factory-supplied software that comes on your hard drive. See "NEC OS Restore CD" in Chapter 3 for information about using the restore options.

## *NEC Application and Driver CD*

Use the NEC Application and Driver CD to install drivers for NEC system options that are not part of the factory configuration. Also use the NEC Application and Driver CD to reinstall NECC-supplied software. See “NEC Application and Driver CD” in Chapter 3 for information about installing software from the CD.

## *Security*

The system has hardware, software, and mechanical security features that offer protection against unauthorized access to your system and data. The following security features are available with the system.

- Password security
  The BIOS Setup Utility includes a feature that lets you set up either a user or supervisor password, or both.

  The user password controls booting of the system and controls access to the Setup Utility and the keyboard. (User access to the BIOS Setup Utility is limited to a subset of all BIOS Setup parameters when a supervisor password has been set.)

  The supervisor password allows full access to the system and the BIOS.

- Windows network security features
  To learn more about the network security features available through the Windows operating system, refer to your Windows documentation or consult your system administrator.

- Keyboard/mouse anti-theft bracket
  Secure the mouse and keyboard cables within the anti-theft bracket to make it difficult to remove them from your system. Remove the screw that holds the bracket to the chassis, position the cables under the bracket, and secure the bracket to the chassis with the screw. (You need to remove the cover to access the screw. See Chapter 4 for cover removal procedures.)

- Security Lock Slot
  The security lock slot on the rear of the system accepts a Kensington Security Standard connector or other locking device. Secure the locking device to the lock slot and to an immovable object to protect your system from theft.

- Anti-Theft Ring
  The system has an anti-theft ring on the rear of the chassis. Attaching a padlock (not supplied) to the ring prohibits removal of the screw fastening the system cover to the chassis. With the padlock attached and locked, the cover cannot be removed and the system is physically protected from chassis intrusion.

# 2

# Setting Up the System

- Slimtower Setup
- Cable Connections
- Startup
- Shutdown
- Power-Saving Operation
- System Care
- More Information

This chapter provides the basic information you need to set up and use your system (refer to the Quick Setup poster for details). Included are procedures for converting the desktop to a slimtower (if required), making cable connections, system startup, system shutdown, and system care. The chapter also includes a table showing where to find additional information about the computer.

# Slimtower Setup

Your system shipped as a desktop. You can configure it as a slimtower by attaching stabilizers to the system and standing it upright.

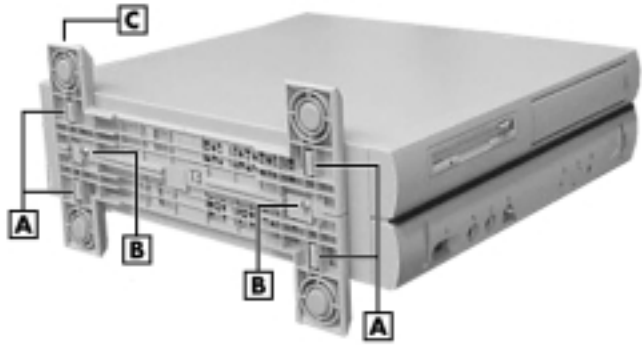
Configure the desktop as a slimtower as follows. To reconfigure the slimtower to a desktop, reverse the following procedure.

1. Set the desktop system on the edge of a table, with the left edge of the desktop protruding beyond the edge of the table.

***Note*** You can attach one or both stabilizers, depending on whether you intend to place the system against a wall or use it as a standalone.

2. If attaching only one stabilizer, determine which side of the system you want to attach the stabilizer.
3. If attaching both stabilizers, first join them by sliding them together to form one piece.
4. Position the stabilizer(s) over the feet on the side of the system and fasten in place with two screws (see the following figure).

*Attaching the slimtower stabilizer(s)*




**A** – Foot (4)
**B** – Screw (2)
**C** – Stabilizer (1 of 2)

# Cable Connections

After unpacking the system and positioning it in your work area, connect the system components using your Quick Setup poster and the following tips.

- Use the icons on the rear of the system unit to identify the keyboard, mouse, printer, USB, LAN, power, audio, and monitor connectors.
- See your network administrator for guidelines on configuring the system for LAN.

**⚠ WARNING** Set the voltage switch correctly for your area.

- Set the voltage switch correctly for your area. The correct setting for the U.S. and Canada is 115V and 230V for Europe.
- Connect system power cables to a surge protector (recommended) or a properly grounded wall outlet.

**⚠ CAUTION** NECC recommends connecting the power cable to a surge protector.

# Startup

Press the power button to start your system. The power lamp lights green to indicate that the system is on. The system performs its Power-On Self-Test (POST) and several messages appear indicating that the system is checking its subsystems.

***Note*** At the bottom of the NEC startup screen, the following message appears: **<F2 for BIOS Setup>**. If you want to enter the BIOS Setup Utility, immediately press **F2** while the startup screen displays. (See Chapter 3, "Configuring the System," for information on using the BIOS Setup.)

After a short delay, Windows starts up.

If a problem occurs, a series of beeps might sound. If this happens repeatedly after powering on, power off the system and turn to Chapter 5, "Solving System Problems." The chapter provides helpful hints for solving system problems.

***Note*** If the system displays a message indicating that system settings have changed, run the BIOS Setup Utility (see Chapter 3, "Configuring the System").

On systems with Windows 2000, enter your password at the log-on box. On systems with the Windows NT® 4.0 operating system, press **Ctrl Alt Del** when prompted on-screen to do so. The log-on box appears for entering a password.

# Shutdown

Follow these steps to power off the system.

1. If the system is in sleep mode (power lamp is amber), press a key or move the mouse to take it out of sleep mode (see "Power Saving Operation" in the next section).
2. Save and exit all your open applications.
3. Make sure that the hard drive, diskette drive, and any other drives are not in use. A lit device lamp indicates that the device is in use.

**⚠ CAUTION** Wait until all applications are saved and closed before using the Windows shut down procedure in step 4.

Unless absolutely necessary, never power off the system if the system power lamp is amber (sleep mode), if the hard drive lamp, diskette drive, or other device lamp is flashing, or if any applications are open. Information on the device might be lost or damaged.

4. Click **Start** on the taskbar, then point to and click **Shut Down**. Selecting Shut Down gives you several choices in the pop-up submenu. Select **Shut down the computer**, then click **OK** or press **Enter** for shut down.

   - If the system is configured with Windows 98 or Windows 2000, the system shuts down automatically after a short interval.
   - If the system is configured with Windows NT, and after you perform a Windows shutdown, power off the system by pressing and holding in the power button for four seconds or longer before releasing.

5. Turn off power to the monitor.

## *Power-Saving Operation*

If the system is running Windows 98 or Windows 2000, you can put it in sleep mode (a power-saving state) by pressing and immediately releasing the power/sleep button on the front of the system unit. The sleep mode is a convenient way of conserving energy when you are going to be away from the system for a short period of time.

**⚠ CAUTION** Take care to press and immediately release the power/sleep button to enter the sleep mode. Avoid pressing and holding in the power button longer than three seconds. If you do so, you might turn off power and lose data from any open applications.

The system also goes into sleep mode when it has been inactive, if the power management has been enabled in BIOS, and an inactivity timeout has been enabled. (See Chapter 3, “Configuring Your System” for information on setting power management functions.)

When the system goes into sleep mode, it saves data and system status and then shuts off power to all possible components. Sleep mode lets you save power without first saving your work.

An amber power lamp indicates that the system is in sleep mode. Press a key or move the mouse to resume system operation where you left off.

# System Care

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

## Protecting Your System From Damage

There are several ways that you can protect your system from possible damage. NECC 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 a monitor and printer, to the surge suppressor. The surge protector should be the only device that you plug into the wall outlet.

- Avoid repeated power-on cycles. These subject the system components to temperature variations and stress.

- Disconnect your system from telephone and power lines when an electrical storm threatens. If you have a fax/modem, lightning can travel in on the phone line and damage both the fax/modem and the system unit. Lightning can also travel in on power lines and damage the monitor and 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. Doing so can damage the system and its peripherals. However, note that USB devices do not require powering down the system to connect them.

- Use BIOS Setup Utility options to protect against viruses (see “Security Menu” in Chapter 3). Use appropriate virus detection software regularly to protect the system from computer viruses.

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

- Position the system 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).

- After turning off power, wait about five seconds for the hard drive to spin down before you power on again.

- Be sure that nothing is placed on top of the system power cables.

## *Keeping Your System in Good Condition*

Maintain the condition of your system by periodically using the following procedures.

**⚠ WARNING** For safety, power off and unplug your system, monitor, and any external devices before cleaning them.

- Prevent dust from entering the system by covering it when it is not in use.

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

  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.

- Keep food and liquids away from your system.

- 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. You can use wet/dry cleaning pads manufactured for monitor screens.

## Moving or Shipping Your System

Use these steps to prepare your system for moving or shipping.

1. Back up the files on the hard drive to diskettes, CD-ROM discs, server hard drives, or other backup devices.

   Take precautions for storing and transporting storage media so that the media is not exposed to magnetic fields or electrical impulses.

2. Remove any diskette from the diskette drive. If you have a disc in the CD-ROM drive or DVD-ROM drive, remove the disc.
3. Wake up a system in sleep mode, save and close any open applications, shut down Windows, and turn off the system and any external options connected to it.
4. Unplug the system power cable from the wall outlet or surge suppressor, then from the system itself.
5. Unplug any external options from the wall outlets or surge suppressor, then disconnect them from the system.
6. If installed, remove the stabilizer(s) from the system.
7. 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 the system, follow the steps on the *PowerMate ES SlimLine Series Quick Setup* poster that comes with the system.

# More Information

Once you have your system up and running, we suggest you do the following.

- Install applications provided by NECC.
- See "Setting Up a Healthy Work Environment" in Appendix A.
- Install any of your own applications. See the documentation that comes with the application.

See the following quick reference chart to find more information about using the system.

### *Quick Reference to Information About Your System*

| Information | Where to Find It |
|---|---|
| Accessing the world wide web | Chapter 6 |
| Adding system upgrades | Chapter 4 |
| Configuring your system | Chapter 3 |
| Setting up the system as a desktop | Chapter 2 |
| Setting up the system as a slimtower | Chapter 2 |
| Reinstalling the applications provided by NECC | "NEC Application and Driver CD" in Chapter 3 |
| Installing the NEC INFO Center online documentation | "NEC INFO Center" in Chapter 3 |
| Protecting the system from viruses | Chapter 1, Chapter 3 |
| Setting a password | Chapter 3 |
| Setting up your system | Chapter 2 |
| Taking care of the system | "System Care" in Chapter 2 |
| Troubleshooting tips | Chapter 5 |
| Using support services | Chapter 6 |

# 3

# Configuring the System

- Configuration Tools and Utilities
- BIOS Setup Utility
- FLASH Utility
- NEC INFO Center
- NEC Application and Driver CD
- NEC OS Restore CD
- System Board Jumper Settings
- Intel Processor Serial Number Control Utility

This chapter provides information on configuring your system. The chapter includes the following topics:

- American Megatrends Inc. (AMI) BIOS Setup Utility for configuring your system
- FLASH Utility for BIOS updates
- NEC INFO Center for quick access to information about your system
- NEC Applications and Driver CD for reinstalling the NEC-supplied applications and installing optional drivers
- NEC OS Restore CD for restoring the operating system
- jumper settings for setting various system configurations
- Intel Processor Serial Number Control Utility for controlling the reading of the processor serial number.

See the following table for a quick guide to the utilities, tools, or procedures required for configuring the system. For detailed information about these and other tools, see the sections following the table.

# Configuration Tools and Utilities

The following table lists ways you can configure the system, and the utility, tool, or procedure to use for the configuration.

***Configuration Tools and Utilities***

| Configuration | Method, Tool, or Utility |
|---|---|
| BIOS, updating | FLASH Utility |
| Boot devices, determining | BIOS Setup (Advanced Menu) |
| Boot order, changing | BIOS Setup (Advanced Menu) |
| Clearing CMOS | Jumper settings |
| Configuring jumpers on system board | Jumper settings |
| Diskette drive, enabling | BIOS Setup (Main Menu) |

## *Configuration Tools and Utilities*

| Configuration | Method, Tool, or Utility |
|---|---|
| Drivers for NECC hardware, installing | NEC Application and Driver CD |
| Hard drive, setting a pre-delay | BIOS Setup (Advanced Menu) |
| Inactivity timeout, setting | BIOS Setup (Advanced Menu) |
| Keyboard options | BIOS Setup (Advanced Menu) |
| NEC INFO Center, installing | NEC Application and Driver CD (see "NEC INFO Center") |
| NEC INFO Center, uninstalling | See "NEC INFO Center" |
| Operating system, restoring | NEC OS Restore CD |
| Parallel port, enabling, configuring | BIOS Setup (Advanced Menu) |
| Password, setting or clearing (user, supervisor, or both) | BIOS Setup (Security Menu)<br>Jumper settings |
| Plug and Play, enabling | BIOS Setup (Advanced Menu) |
| Power management, enabling, configuring | BIOS Setup (Advanced Menu) |
| Serial port, enabling | BIOS Setup (Advanced Menu) |
| Software, reinstalling (NECC-provided) | NEC Application and Driver CD |
| Sound, enabling | BIOS Setup (Advanced Menu) |
| Time and date, setting | BIOS Setup (Main Menu) |
| USB functions | BIOS Setup (Advanced Menu) |
| Windows 98, Windows NT, Windows 2000, restoring | NEC OS Restore CD |

# BIOS Setup Utility

The AMI BIOS Setup Utility program lets you configure the main components of your system.

Your system ships from the factory with the correct system parameters for your configuration. Unless you add optional hardware, you do not need to run the BIOS Setup Utility to operate the system. However, you might wish to run the Setup Utility to set features that customize the system, such as security features.

System configuration information is stored in nonvolatile memory. A nonvolatile memory device retains its data when system power is turned off. Nonvolatile memory in your system is stored in a complementary metal-oxide semiconductor (CMOS) memory chip backed up by a battery on the system board. The battery supplies continuous power to CMOS memory and maintains configuration information when system power is off (see "How to Replace the CMOS Battery" in Chapter 5).

NECC recommends that you print out or write down your current BIOS Setup parameters and store the information in a safe place. This lets you restore your system to the current parameters if you ever need to replace the battery.

## How to Start BIOS Setup

To start the BIOS Setup Utility, follow these steps.

1. Turn on or reboot the system.
2. Press **F2** as soon as you see the following message at the bottom of the NEC startup screen.

   **<F2 for BIOS Setup>**

   You have about five seconds to press **F2** before the system boot continues.

Setup's Main Menu appears.

## How to Use Setup

The Setup Utility has a Main Menu window and four top-level menus with submenus. The menu bar at the top of the Main Menu window lists the following top-level menus.

- Main — Use the Main Menu for basic system configuration. For example, select Main to set the system date, set diskette and hard disk parameters, or set the hard drive auto-detect feature.
- Advanced — Use the Advanced Menu to set up the system for advanced CMOS, advanced chipset, power management, Plug and Play, serial and parallel peripherals, and hardware monitor.
- Security — Use this menu to set User and Supervisor Passwords and keyboard wake-up password.
- Exit — Exits the Setup Utility with various save or discard options.

Use the keys listed in the legend bar on the bottom of the menu screen to make the selections or exit the current menu. Help Setup information displays on the right side of the menu screen.

The following table describes the legend keys.

### Navigation Keys

| Key | Function |
|---|---|
| Esc | Exits the menu. |
| Enter | Executes Command or brings up a submenu. |
| F5 | Loads the Default Configuration values for this menu. |
| F6 | Selects the Original Values for the field. |
| F10 | Saves changes and Exits the BIOS Setup Utility. |
| Up or down arrow keys | Moves cursor up and down in the menu. |
| Left or right arrow keys | Selects next menu. |

To select one of the four menus from the menu bar, use the left and right arrow keys. Use the up or down arrow keys to select an item under the menu.

Menu items preceded by a > contain a submenu of selectable fields for setting system parameters. Display a submenu by using the up or down arrow keys to move the cursor to the desired submenu, then press **Enter**.

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

Pressing **F1** on any menu brings up the General Help window that describes the legend keys and their functions.

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

The following subsections describe the four top level menus and their submenus.

## *Main Menu*

Choose the Main Menu by selecting Main in the legend bar on the Main Menu screen. Other Main Menu options are available by selecting submenus.

Use the arrow keys to select one of the Main Menu options and press **Enter** to select a submenu. Items with grayed-out text are not available. Explanations of each Main Menu item are in the following table.

**⚠ CAUTION** Setting items on this menu to incorrect values can cause your system to malfunction.

***Note*** The following BIOS settings are typical and can vary between system configurations. You should record your system's BIOS settings and save them in a safe place in the event you need to restore or update the BIOS.

### *Main Menu Items*

| Menu Item | Settings (default is bold) |
|---|---|
| System Date | Set system date in this field. Press **Tab** or **Enter** to move between month, date, and year fields.<br><br>Example: 04/28/2000 |
| System Time | Set system time in this field. Press **Tab** or **Enter** to move between hour, minute, and second fields.<br><br>Example: 09:30:50 |
| Floppy Drive A | Not Installed<br>360 KB 5 1/4"<br>1.2 MB 5 1/4"<br>720 KB 3 1/2"<br>**1.44 MB 3 1/2"**<br>2.88 MB 3 1/2" |
| Floppy Drive B | **Not Installed**<br>360 KB 5 1/4"<br>1.2 MB 5 1/4"<br>720 KB 3 1/2"<br>1.44 MB 3 1/2"<br>2.88 MB 3 1/2" |

## *Main Menu Items*

| Menu Item | Settings (default is bold) |
|---|---|
| Primary IDE Master<br>Primary IDE Slave<br>Secondary IDE Master<br>Secondary IDE Slave | **Auto**<br>**Auto**<br>**Auto**<br>**Auto** |
| | Each device menu item displays the hard drive or CD-ROM identifier if a device is installed.<br><br>If you install a hard drive that does not feature auto IDE type detection or your IDE hard drive was formatted on another system with parameters different from those reported by the drive, enter a parameter for each of the fields in the device submenu.<br><br>Bring up a device submenu by pressing **Enter**. The submenus include IDE Device Configuration and, depending on device selection, Fast Programmed I/O Mode, 32 Bit Transfer Mode, LBA Mode, and Block Mode. Each is briefly described in the following. |
| IDE Device Configuration | **Auto**, User, CD-ROM, Floptical, Not Installed, 1-46<br><br>When set to Auto, the BIOS sets the correct values for the device. Selecting User allows you to configure the BIOS for the device selected. The Not Installed setting indicates that there is no IDE device present in the system.<br><br>Depending on the option selected, one of the following submenus displays. |
| LBA Mode | **On**, Off<br><br>When On is selected, it causes logical block addressing to be used in place of cylinders, heads, and sectors. |

### *Main Menu Items*

| Menu Item | Settings (default is bold) |
|---|---|
| Block Mode | **On**, Off<br><br>When On is selected, it allows block mode data transfers. |
| Fast Programmed I/O Modes | **Auto**, 0 -5<br><br>Use these settings to configure the Advanced PIO Mode. |
| 32 Bit Transfer Mode | **On**, Off<br><br>When On, allows 32 bit IDE data transfers. Should only be On if supported by a chipset controller. |
| Auto Detect Hard Drives | Press **Enter**<br><br>Auto detects all hard drive parameters. |
| CPU Speed | xxx MHz<br><br>Not selectable, displays information only. |
| Front Side Bus Speed | xxx MHz<br><br>Not selectable, displays information only. |
| Memory Size | xx MHz<br><br>Not selectable, displays information only. |
| BIOS Version | A6303P2 V1.0<br><br>Not selectable, displays information only. |

## Advanced Menu

Choose the Advanced Menu by selecting Advanced in the legend bar on the Main Menu screen. Advanced Menu options include:

- Advanced CMOS Setup
- Advanced Chipset Setup
- Power Management Setup
- Plug and Play Setup
- Peripheral Setup
- Hardware Monitor Setup.

Use the arrow keys to select an Advanced Menu option. Press **Enter** to display the submenu. Items with grayed-out text are not available. Explanations of each Advanced Menu option are in the following tables.

**⚠ CAUTION** Setting items on this menu to incorrect values can cause your system to malfunction.

### Advanced Menu - Advanced CMOS Setup

| Menu Item | Settings (default is bold) |
|---|---|
| View DMI Event Log | Status only. Press **Enter** to view. |
| Clear all DMI Events Logs | **No**, Yes<br>Selecting No prevents clearing out the DMI events logs. |
| Event Logging | **Enabled**, Disabled<br>Selecting Enabled permits event logging. |
| Mark DMI Events as Read | Press **Enter** (Yes/No)<br>Press Enter to mark DMI event log as read. |

## *Advanced Menu - Advanced CMOS Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| Quick Boot | **Enabled**, Disabled<br><br>When Enabled, the BIOS does not test system memory above 1 MB or wait for ready signals, allowing a quick boot. |
| Delay for Hard Drive (seconds) | 3, **Disabled**, 1 -10<br><br>Selects the amount of time for hard drive delay. |
| 1st Boot Device | **Floppy**, Disabled, IDE-0, IDE-1, IDE-2, IDE-3, LS-120/Zip, ATAPI Zip, CDROM, SCSI, Network<br><br>Sets the diskette drive as the first boot device. |
| 2nd Boot Device | **IDE-0**<br><br>Sets the second boot device. |
| 3rd Boot Device | **CD-ROM**<br><br>Sets the third boot device. |
| Try Other Boot Devices | **Yes**, No<br><br>Select Yes to cause the system to try to boot from other boot devices if there is a boot failure. Selecting No causes the boot to be carried out from selected devices. |
| Floppy Access Control | **Read-write**, Read-only<br><br>Select Read-write to allow the diskette drive to have read-write capabilities. |
| S.M.A.R.T. for Hard Disks | **Disabled**, Enabled<br><br>Select Enabled to use the Self Monitoring Analysis and Reporting Technology (S.M.A.R.T.) for reporting a possible problem with an IDE device. After receiving the warning, the BIOS alerts you to the problem. |

### *Advanced Menu - Advanced CMOS Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| Boot-up Num-Lock | **On**, Off<br><br>Select Off to lock the numeric keypad on boot up. |
| Password Check | **Setup**, Always<br><br>Allows the user to determine at what moment a password check is needed. |
| Boot to OS/2>64 MB | **No**, Yes<br><br>Select Yes to enable a boot to OS/2 if RAM is greater than 64 MB. |
| CPU Serial Number | Disabled, **Enabled**<br><br>Controls detection of the processor serial number. |
| System BIOS Cacheable | Disabled, **Enabled**<br><br>Select Enabled to allow storing of system BIOS in RAM. |

### *Advanced Menu - Advanced Chipset Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| USB Function | Enabled, **Disabled**<br><br>Select Enabled to enable use of USB functions for USB devices. |
| USB Keyboard Legacy Support | **Enabled**, Disabled<br><br>Select Enabled to enable the legacy keyboard functions. |

## *Advanced Menu - Advanced Chipset Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| Memory Hole | Enabled, **Disabled**<br><br>Select Enabled to reserve a space in the memory, between 15 and 16 MB, for certain ISA boards. |
| ClkGen Spread Spectrum | **Enabled**, Disabled<br><br>Select Enabled to enable the Clock Generator Spectrum and limit the risk of electromagnetic emissions. |

## *Advanced Menu - Power Management Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| ACPI Standby State | **S1**, S3<br><br>Select S1 for a low wake-up latency sleeping state. In the S2 mode, the CPU, cache, and chipset contexts are lost. |
| USB Keyboard Wakeup From S3 | **Disabled**, Enabled<br><br>Select Enabled to allow the system to wake up from a keyboard input. |
| Power Management/APM | **Enabled**, Disabled<br><br>Select Enabled to enable Power Management and Advanced Power Management (APM). |
| Green PC LED Status | **Dual Color**, Single Color, Blinking<br><br>Select Dual-Color to show a green LED for normal use and an orange LED for standby use. |
| Video Power Down Mode | **Standby**, Disabled, Suspend<br><br>Select Standby or Suspend to power down the video display as a power saving feature. |

## *Advanced Menu - Power Management Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| Hard Disk Power Down Mode | **Suspend**, Standby, Disabled<br><br>Select Suspend or Standby to power down the hard disk as a power saving feature. |
| Standby Time Out (Minutes) | **Disabled**, 1, 2, 4, 8, 10, 20, 30, 40, 50, 60<br><br>Specifies the length of time of system inactivity while in full power on state before entering Standby state. |
| Suspend Time Out (Minutes) | **Disabled**, 1, 2, 4, 8, 10, 20, 30, 40, 50, 60<br><br>Specifies the length of time of system inactivity while in Standby state before entering Suspend power state. |
| Power Button Function | **Suspend**, On/Off<br><br>Suspend sets the power switch for Suspend (Sleep) mode. With power on, pressing the switch once places the system in sleep mode. Pressing and holding the switch in for 4 seconds turns power off. |
| Restore on AC/Power Loss | **Last State**, Power Off, Power On<br><br>The Power On setting automatically turns power on after a power loss. The Power Off setting requires the user to restart the system with the power button. The Last State setting restores the system to the state where it was on power loss. |
| Resume on Ring | Enabled, **Disabled**<br><br>Enabled allows the system to boot up on an incoming telephone call. Disabled causes the system to ignore any incoming call from a modem. |
| Resume on LAN | **Enabled**, Disabled<br><br>Enabled allows the system to boot up on an incoming LAN signal. Disabled causes the system to ignore any incoming signal from LAN. |

## *Advanced Menu - Power Management Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| PME Function | **Enabled**, Disabled<br><br>Select Enabled to allow the system to react to PCI Power Management Enabled wake up events. |
| Resume on RTC Alarm | **Disabled**, Enabled<br><br>When Enabled, you can choose the time the system boots up (see the following time settings). |
| RTC Alarm Date | **15**, Every Date<br><br>Sets the day that the system boots up (when Resume on RTC Alarm is Enabled). |
| RTC Alarm Hour | **12**, 1-00<br><br>Sets real time clock alarm hour (when Resume on RTC Alarm is Enabled). |
| RTC Alarm Minute | **30**, 0-59<br><br>Sets real time clock alarm minute (when Resume on RTC Alarm is Enabled). |
| RTC Alarm Second | **30**, 0-59<br><br>Sets real time clock alarm second (when Resume on RTC Alarm is Enabled). |

## *Advanced Menu - Plug and Play Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| Plug and Play Aware O/S | No, **Yes**<br><br>Select No to allow the BIOS to initialize any add-on boards (Windows NT only). Select Yes to allow the operating system to initialize any add-on boards (Windows 98 and Windows 2000). |
| Clear NVRam | **No**, Yes<br><br>Select No to prohibit clearing of NV Ram. |
| Primary Graphics Adapter | **Add-on VGA**, Onboard VGA<br><br>Select Onboard VGA if VGA is integrated on the system board. |
| PCI VGA Palette Snoop | **Disabled**, Enabled<br><br>Set to Enabled to enable PCI VGA palette snooping. |
| DMA Channel 0, 1, 3, 5, 6, 7 | **PnP**, ISA<br><br>Permits configuring the DMA channels either by Plug and Play or by ISA. |
| IRQ 3, 4, 5, ,7, 9, 10, 11, 14, 15 | **PCI/PnP**, ISA<br><br>Permits configuring the interrupt requests either by PCI/Plug and Play or by ISA. |
| Reserved Memory Size | **Disabled**, Enabled<br><br>Select Enabled to reserve a non-writeable zone in memory. |
| Reserved Memory Address | D0000<br><br>Defines the non-writeable zone in memory. |

## *Advanced Menu - Peripheral Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| Onboard AC'97 Audio | **Enabled**, Disabled,<br><br>The Enabled setting allows use of onboard sound. |
| Onboard AC'97 Modem | Enabled, **Disabled**<br><br>Onboard modem not available. |
| Onboard LAN | **Enabled**, Disabled<br><br>Select Enabled to allow use of onboard local area network. |
| Onboard Serial Port A | **3F8/COM1**, Auto, Disabled, 2F8/COM2, 3E8/COM3, 2E8/COM4<br><br>Defines serial port A base I/O address. |
| Onboard Serial Port B | 3F8/COM1, Auto, **Disabled**, 2F8/COM2, 3E8/COM3, 2E8/COM4<br><br>Defines serial port B base I/O address. |
| Serial Port B Mode | **Normal**, 1.6us, 3/16 baud, ASKIR<br><br>Select Normal to set the port for normal use. |
| IR Duplex Mode | **Half Duplex**, Full Duplex<br><br>This option allows the Infra red Duplex mode to function in one direction at a time (Half Duplex) or both directions (Full Duplex). |
| Onboard Parallel Port | **378**, Auto, Disabled, 278, 3BC<br><br>Select Auto to allow the BIOS to automatically assign the parallel port to an available parallel port IRQ. |
| Parallel Port Mode | **ECP**, Normal, Bi-Directional, EPP<br><br>Use this mode to choose the operating mode of the onboard parallel port. |

## *Advanced Menu - Peripheral Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| EPP Version | **N/A**, 1.9, 1.7<br><br>Use this setting (1.7 or 1.9) to select the EPP version. |
| Parallel Port IRQ | **7**, 5<br><br>Allows setting of the interrupt request (IRQ) for the parallel port. |
| Parallel Port DMA Channel | 0, 1, **3**<br><br>Allows you to choose a DMA channel for the onboard parallel port in ECP mode. Displays only when parallel port is enabled and in ECP mode. |
| Keyboard/Mouse Power On Function | **Disabled**, Powerkey, Specific Key, Mouse Left, Mouse Right<br><br>This option, when enabled, allows system to be turned on by pressing a specific key or moving the mouse. |

## *Advanced Menu - Hardware Monitor Setup*

| Menu Item | Settings (default is bold) |
|---|---|
| ACPI Shut Down Temperature | 80°C/176°F<br><br>ACPI gives the operating system direct control over the power management and Plug and Play functions of a computer. The system shuts down at the temperature indicated. |
| Chassis Intrusion | **Disabled**, Enabled<br><br>When Enabled, the chassis cover must be in place before the system can start up. When Disabled, the system can be started without the cover in place. |
| Temperature, Fan Speeds, Voltages | Not selectable, information only. |

## Security Menu

Choose the Security Menu by selecting Security in the legend bar on the Main Menu screen. Other Security Menu options are available by selecting submenus.

Use the arrow keys to select one of the Security Menu options and press **Enter** to select a submenu. Items with grayed-out text are not available. Explanations of each Security Menu item are in the following table.

### Security Menu Items

| Menu Item | Settings (default is bold) |
|---|---|
| Set Supervisor Password | [Enter]<br><br>Use this field to set or change the supervisor password. Press **Enter** to bring up a dialog box where the password can be entered and confirmed. |
| Set User Password | [Enter]<br><br>Use this field to set or change the user password. Press **Enter** to bring up a dialog box where the password can be entered and confirmed. |
| Set Keyboard Wake Up Password Change | [Enter]<br><br>Use this field to change the keyboard wakeup password. |

### *Exit Menu*

Choose the Exit Menu by selecting Exit in the legend bar on the Main Menu. Other Exit Menu options are available by selecting submenus.

Use the arrow keys to select one of the Exit Menu options and press **Enter** to display the submenu. Explanations of each Exit Menu item are in the following table.

***Exit Menu Items***

| Menu Item | Settings (default is bold) |
|---|---|
| Exit Saving Changes | Implements the changes just made, and exits BIOS. |
| Exit Discarding Changes | Reverts to the settings from before the BIOS session. |
| Load Optimal Settings | Reverts to the factory set optimal settings. |
| Load Fail Safe Settings | Reverts to the factory set fail safe settings. |
| Load Original Values | Reverts to the factory-shipped settings. |

## *FLASH Utility*

The system BIOS resides on a flash read only memory (ROM) chip in your system. The FLASH ROM can be updated using the following procedure. Before starting the BIOS update, we recommend that you first contact NECC for assistance (see Chapter 6 for contact information).

Update the FLASH ROM with a BIOS flash diskette. The diskette contains the latest version of the BIOS code. You can get the diskette from NECC or download the BIOS from the NECC website. See Chapter 6 for download and website information.

Update the BIOS from the BIOS flash diskette as follows.

1. Write down the BIOS Setup parameters currently set on your system.
2. Turn off the system.
3. Put the flash diskette in the diskette drive, and turn on the system.

4. When the flash upgrade menu appears, choose **Update Flash Memory Area from a file**.

5. When the menu asks you to enter a path/filename, use the arrow keys to select the ".bio" file and press **Enter**.

6. The utility asks for confirmation to load the new flash into memory. Select **Continue with Programming**.

7. After the upgrade completes, remove the diskette.

8. Reboot the system and start the Setup program. Press **F5** to reset the BIOS defaults. Use the recorded Setup selections you made at the beginning of this procedure to set the parameters.

# *NEC INFO Center*

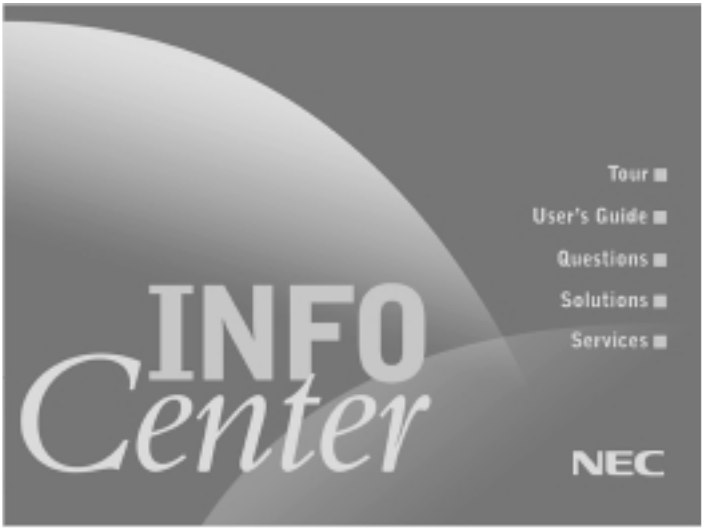
The online NEC INFO Center provides quick access to information about your system. The NEC INFO Center includes the following modules:

- Tour
  Use Tour to find information about easy-to-use NECC printed and online documentation, software installation tools, and many support services.
- User's Guide
  Use this module to get quick access to basic information about your system.
- Questions
  Look in this module to get answers to frequently asked questions about your system.
- Solutions
  Go to this module to find solutions to common system problems.
- Services
  Check this module for a quick reference to the many NECC support services available to you.

To install the NEC INFO Center, double click the NEC OnLine Docs icon on the Windows desktop. Once the NEC INFO Center is installed, an NEC INFO Center icon appears on the Windows desktop. Double click on this icon to start the NEC INFO Center. The INFO Center opening screen appears (see the following figure).

Click on an NEC INFO Center module of your choice, depending on the information you want to see. We suggest you start with the Tour module.

*NEC INFO Center opening screen*




To uninstall the NEC INFO Center, use these steps:

1. Access the C:\NEC INFO directory on your system.
2. Double click the **Unwise.exe** icon to remove all files related to the NEC INFO Center and the **C:\NEC INFO** directory.

   Alternately, you can click **Start**, point to **Settings**, and click **Control Panel**. At the Control Panel, double click **Add/Remove Programs**. Double click **NEC INFO Center** and follow the prompts.

To reinstall the NEC INFO Center, use the NEC Application and Driver CD (see the following section, “NEC Application and Driver CD”).

# NEC Application and Driver CD

Use the NEC Application and Driver CD to reinstall NECC-provided software, including

- applications
- utilities and device drivers
- the NEC INFO Center (online documentation).

You can also use the NEC Application and Driver CD at any time to restore an application, driver, or utility.

---

***Note*** If you perform a full system restore using the NEC OS Restore CD, the full restore process loads all the factory-installed software that came with your system.

---

If you add NECC hardware options specified for your system, you can use the NEC Application and Driver CD to install the drivers for the options.

Install the software from the NEC Application and Driver CD as follows.

1. Power on your system.
2. Insert the auto-start Application and Driver CD into the CD-ROM drive. The Selective Restore screen appears, prompting you to select an application or driver from the list.
3. Click on an application, driver, or utility in the "Applications/Drivers:" window.
4. Read the information given in the "Important Setup Information:" window.
5. Click **Install** to install your selection. Follow any on-screen instructions to install your selection.
6. Click **Exit** to close the Application and Driver program.
7. Remove the CD from the CD-ROM drive when the installation is complete.

# NEC OS Restore CD

Use the NEC OS Restore CD to restore your system to its original factory state if a problem occurs that causes data loss or corruption. The NEC OS Restore CD provides options for a full system restore with factory-installed software or for a restore with only the operating system and drivers. A full restore loads all the factory-installed software.

If you select to restore only the operating system and drivers, you can use the NEC Application and Driver CD to select the software you want to load on your system. See the previous section, "NEC Application and Driver CD," for information on using the Application and Driver CD.

Before starting, we recommend that you first contact NECC for assistance (see Chapter 6 for contact information).

Use the following steps to perform the OS Restore with the bootable Master Restore diskette and the OS Restore CD.

**⚠ CAUTION** The NEC OS Restore program deletes all the data on your hard drive. If possible, back up your data before performing an OS restore.

1. If possible, back up all your critical data files onto storage media (such as diskettes, Zip disks, or CD-ROM discs) or to an external storage device such as a server hard drive.
2. Remove any diskette or CD-ROM disc from your system.
3. Power down your system. Insert the bootable Master Restore diskette into the diskette drive and the NEC OS Restore CD into the CD-ROM drive. Power on the system.

   The system boots and the NEC Computers Inc. Restore screen appears.
4. At the Restore screen, click **Y** to continue (or **N** to exit the program).

   A warning screen appears, with a prompt that continuing the restore will destroy all data on your primary drive.

5. At the warning screen, click **C** to continue (or **X** to exit the program).

   A restore selection screen appears, with a prompt asking if you want a full restore or an operating system and driver restore.

6. At the restore selection screen, click **F** for full restore or **O** for an operating system and driver restore. (Or click **X** to exit the program.)

   A series of restoring screens appear, advising you that the restore process is continuing. The restore process takes a few minutes to do.

7. At the completion of the restore, a Restore Complete screen is displayed, with a prompt to either do system updates (see step 8) or reboot the system (see step 9).

8. If you are updating your system, do the following procedure at the system update prompt.

   - Remove the Master Restore bootable diskette and restore CD from their drives.
   - Insert the NEC Application and Driver CD or other CD into the drive(s).

     If you are using the NEC Application and Driver CD, go to "NEC Application and Driver CD" earlier in this chapter to complete the update.

9. If you are not updating your system, remove the Master Restore bootable diskette and restore CD from their drives. Press any key to reboot your system and open the Windows desktop.

# System Board Jumper Settings

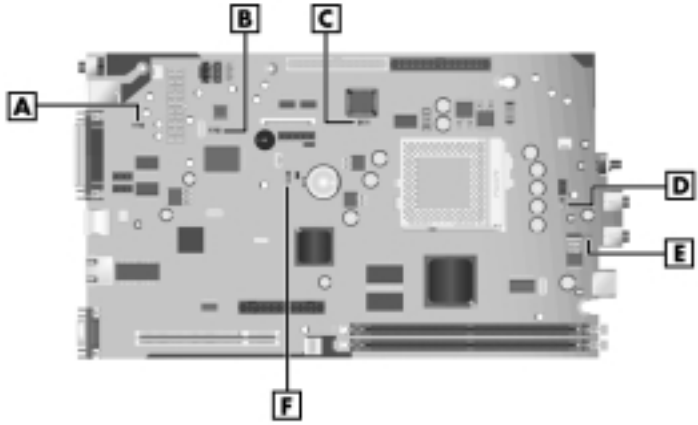
System board jumpers enable you to configure your system for a particular system requirement. Conditions that might require changing jumper settings include the following situations.

- You are adding a sound board to your system.
- You need to restore the CMOS settings to the factory state.
- Your BIOS is corrupted and you need to recover the BIOS.

Before starting, we recommend that you first contact NECC for assistance (see Chapter 6 for contact information).

Use the following figure to locate the jumpers on the system board.

*Locating the system board jumpers*




**A** – Keyboard Wakeup (JKBV1)
**B** – Onboard Audio (JP3)
**C** – BIOS Recovery (J4)
**D**– CPU Type (J23)
**E** – Save to RAM (JP4)
**F** – CMOS Clear (JBAT1)

**⚠ CAUTION** Jumpers are set correctly at the factory for your configuration. Only change the appropriate jumper setting for your application. Otherwise, keep the jumpers at their factory settings.

Set the jumpers as follows.

1. Power off and unplug the system and any external options. Remove the system cover (see “Removing the Cover”).
2. Locate the appropriate jumper block on the system board (see the previous figure “Locating the system board jumpers”).

3. Move the appropriate jumpers for your application as shown on the following figure, “Setting system board jumpers.”

***Note*** Before setting jumpers, we recommend that you first contact NECC for assistance (see Chapter 6 for contact information).

**⚠ WARNING** The system power must be off before changing a jumper setting.

4. Check your settings to be sure that they are correct for your application.
5. Replace the system cover (see “Replacing the Cover”). Connect system power cables and external options.
6. Power on the system and launch the BIOS Setup Utility before POST and recustomize your BIOS settings as necessary.

**Keyboard Wakeup**


Factory setting. Wakes up the system from Suspend to RAM mode via the keyboard. Requires Windows 98 running in Advanced Configuration Power Interface (ACPI) mode.


Normal operation. Disables Keyboard Wakeup.

---

**Onboard Audio**


Factory setting. Enables onboard audio.


Disables onboard audio. Use this setting if you install a sound card.

---

**CMOS Clear**


Factory setting. Maintains system board configuration in CMOS RAM with onboard battery.


Clears CMOS while system power is off. Return jumper to pins 1 and 2 before powering system on.

**Caution:** To prevent damage to the system board, avoid clearing CMOS while power is on.

---

**BIOS Recovery**


Factory setting. Sets the system for normal operation. The BIOS uses current configuration information and passwords at power on.

To enable BIOS recovery for a corrupted system, remove the jumper. Wait 10 seconds. Replace the jumper on pins 1 and 2.


Restores Safe BIOS settings as the default BIOS settings and loads the BIOS Setup at power on.

---

**CPU Type**


Factory setting. Uses an Intel® CPU.


Uses a Cyrix® CPU.

---

**Save to RAM**


Factory setting. Enables the Save to RAM function.


Disables the Save to RAM function.

# Intel Processor Serial Number Control Utility

The Intel Processor Serial Number Control Utility is a Windows program that enables or disables the reading of the Pentium III processor serial number by software. This function lets you control which software programs or websites have permission to read the processor serial number. When installed, the utility runs automatically each time the system powers on.

This utility places an icon in the Windows system tray. The icon provides a visual status of the processor serial number. You have the option of hiding the system tray icon. You can enable or disable the processor serial number at any time. However, enabling the serial number requires restarting the system.

The following information describes:

- system requirements
- installation procedures
- processor serial number features
- FAQs
- technical support.

## System Requirements

The Intel Processor Serial Number Control Utility requires:

- a Pentium III processor-based system
- Windows 98, Windows NT 4.0 (or later), or Windows 2000
- 2 megabytes of hard drive space.

## Installation

The Intel Processor Serial Number Control Utility (version 1.0) comes already installed on your system. The system ships with the processor serial number turned off.

## Processor Serial Number

The Intel processor serial number, a feature of the Pentium III processor, is an identifier for the processor. The processor serial number is unique, and when used in conjunction with other identification methods, can be used to identify the system or user. This number can be used in a wide variety of applications which benefit from stronger forms of system and user identification.

The processor serial number is analogous to a conventional serial number, with these important differences:

- A software application can read the processor serial number.
- You can enable or disable the reading of the serial number via utility programs such as this one, or via the BIOS, depending on the system configuration.

For additional information about the Pentium III processor and the processor serial number, visit **www.intel.com/pentiumiii**.

## Frequently Asked Questions

### What are the benefits of the processor serial number?

You can use the processor serial number in applications which benefit from stronger forms of system and user identification.

### Why would I want to turn off my processor serial number?

Intel believes the processor serial number can provide compelling benefits to users. They are developing features in conjunction with the processor serial number to allow responsible service providers to provide services which maintain your privacy. However, if you are concerned that a given application/service using your processor number might impact your privacy, you can turn off the processor serial number using the utility.

### What is the default state of the processor serial number?

The default state of the processor serial number is on, until the Processor Serial Number Control Utility is installed. Once the Processor Serial Number Control Utility is installed, it turns the processor serial number off by default. You can use the utility to turn on the processor serial number.

### Can a website read my serial number without my knowledge?

No, generally not. Websites cannot read serial numbers unless you allow them to download a program which can read the processor serial number. Almost all browsers are configured to warn users whenever they download executable software. Unless you disable the warning in the browser, you should receive a notification.

### Does Intel track serial numbers?

Generally not, other than related to the manufacturing process. Intel does not, in the absences of advance and express consent of a user, collect serial number data which is otherwise identified with a user.

### Which programs and/or websites currently use the processor serial number?

You can find a complete list of programs which can take advantage of the processor serial number and other new capabilities of the Pentium III processor at **http://www.intel.com/pentiumiii/utility.htm**.

### How can I tell if my processor serial number is turned on?

The vast majority of Pentium III processor-based systems ship with the processor serial number enabled. The control utility allows you to check the status by:

- Viewing the icon itself. The disabled icon shows a red circle with a white "x."
- Clicking the task tray icon and selecting the "Status" menu item. Or you can select the menu from the tool tip shown when you position the mouse over the task tray icon.

## *Technical Support*

For world wide 7 days a week, 24 hours a day technical support, please visit the Intel support website at **http://support.intel.com**.

Email: **support@intel.com**.

In the United States, call **800-628-8686** from 5:00 a.m. to 5:00 p.m. Pacific Standard Time.

For world wide phone contacts, please see **http://support.intel.com/support/feedback.htm**.

# 4

# Installing System Upgrades

- General Rules
- Safety Precautions
- System Cover
- System Board Upgrades
- Expansion Boards
- Data Storage Devices

This chapter provides installation instructions for a variety of industry-standard and NECC upgrades that you can add to your system.

Included in the chapter are procedures for

- memory module upgrade
- processor upgrade
- expansion board installation
- data storage device installation.

Most procedures require the removal of the system cover. Procedures for removing the cover are included in this chapter.

## General Rules

Follow these general rules when installing system upgrades.

- Turn off system power and unplug the power cable.
- Turn off and disconnect all peripherals from the front and rear of the system.
- When handling boards or chips, touch the system metal frame to discharge static.
- Do not disassemble parts other than those specified in the procedure.
- All screws are Phillips-head unless otherwise specified.
- Label any cable connectors before disconnecting. Note where the connector goes and in what position it was installed.

## Safety Precautions

Observe safety rules when working inside the system and when handling computer components. Avoid electric shock or personal injury by observing the following warning.

**⚠ WARNING** Before removing the system cover, turn off the power and unplug the system power cable. Power is removed only when the power cable is unplugged.

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

**⚠ CAUTION** Electrostatic discharge can damage system components. Discharge static electricity by touching a metal object before removing the system cover.

- Avoid carpets in cool, dry areas. Leave boards and chips in their anti-static packaging until ready to be installed.
- Dissipate static electricity before handling any system components (boards, chips, memory modules) by touching a grounded metal object, such as the system's unpainted metal chassis.

  If possible, use antistatic 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.
- Take care when connecting or disconnecting cables. A damaged cable can cause a short in the electrical circuit.
- When installing a cable, route the cable so it is not pinched by other components and is out of the path of the system cover.
- Prevent damage to the connectors by aligning connector pins before you connect the cable.

  Misaligned connector pins can cause damage to system components at power-on.
- When disconnecting a cable, always pull on the cable connector or strain-relief loop, not on the cable itself.

## *System Cover*

You need to remove the system cover to access the interior for installing system upgrades.

The following sections describe how to remove and replace the system cover.

## *Removing the Cover*

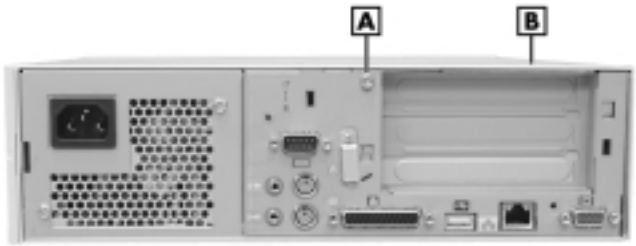
Remove the cover as follows.

**WARNING** Before removing the cover, turn off system power and unplug the system power cable. Power is removed only when the power cable is unplugged.

1. Turn off the system and any peripherals and unplug the system power cord.
2. Disconnect any external options (such as a keyboard, mouse, and monitor) from the front or rear of the system.

   If the mouse and keyboard cables are installed in the anti-theft bracket, remove the screw fastening the bracket to the chassis and release the cables. The screw is accessible from inside the chassis, after the cover is removed.
3. If the system is configured as a slimtower, remove the stabilizer(s).
   - Position the system unit on its side on a table, with the stabilizers over the edge of the table.
   - Remove the screws attaching the stabilizers to the chassis and remove the stabilizers (see Chapter 2 for screw locations).
4. If you have a padlock in the anti-theft ring on the rear of the system, remove it.
5. Remove the screw and anti-theft ring securing the cover to the rear of the system.

*Removing the cover screw*




**A** – Cover Screw **B**– Cover

6. Press in on the sides of the cover and slide the cover about one inch towards the front of the chassis.

***Note*** The cover is a one piece unit that fits tightly to the chassis. The cover unit includes the top panel, left and right side panels, and front panel. Do not attempt to separate the panels from the cover unit.

7. Lift the cover off the system and set aside.

*Removing the cover*


**A** – Cover

## *Replacing the Cover*

Replace the cover as follows.

⚠ **CAUTION** Ensure that all cables are positioned to prevent crimping, abrasion, or cutting while installing the cover. Check that the ribbon cables are folded along their fold lines and out of the direct path of the cover.

1. If removed, reinstall the mouse and keyboard anti-theft bracket, with the mouse and keyboard cables inside the bracket.
2. Position the cover over the chassis so that the front edge of the cover is about one inch beyond the front edge of the chassis (see the preceding figure).

3. Align the tabs on the sides of the cover with the corresponding slots on the bottom edges of the chassis sides.

4. Firmly press the cover against the chassis and slide the cover towards the back of the chassis until it locks in place.

***Note*** If the cover does not slide all the way to the rear of the chassis, check that the cover tabs on the sides of the cover are properly inserted into their slots in the chassis. Also check that the tab on the riser board is positioned inside the chassis (see "Installing an Expansion Board" later in this chapter for tab location).

5. Secure the cover with the previously removed cover screw and anti-theft ring.

6. If you have a padlock for the anti-theft ring on the rear of the chassis, install it.

7. If you are using the system as a slimtower, reinstall the stabilizers.

8. Reconnect all external peripherals.

9. Plug in your power cables.

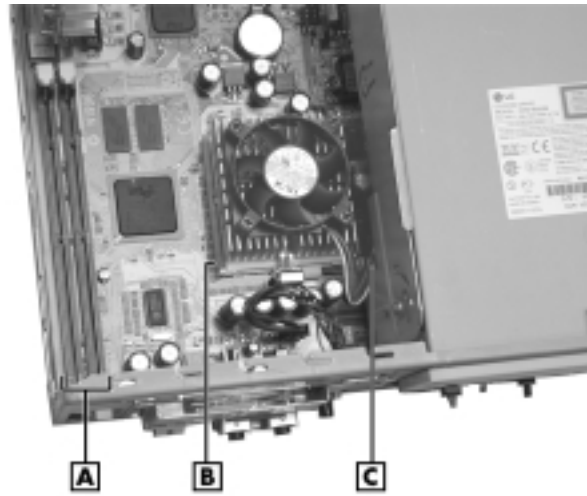
# System Board Upgrades

This section describes how to install upgrades on the system board. Procedures described in this section include:

- adding memory modules
- upgrading the processor.

The following figure shows the locations of the memory module sockets and the processor socket on the system board.

*Locating the memory module and processor sockets*




**A** – Memory Sockets 1 and 2
**B** – Processor Socket
**C** – Fan Connector (under CD-ROM drive)

## *Memory Upgrade*

Memory upgrades are installed into two memory module sockets on the system board. The sockets support up to 512 MB of high-speed memory. The system supports 168-pin, 100-MHz non-ECC SDRAM modules in 64-, 128-, and 256-MB unbuffered memory configurations.

Use the following guidelines in selecting DIMM types:

- memory can be installed in one or two sockets
- the size of the DIMMs can vary between sockets
- the speed of the DIMMs must match or exceed the processor bus speed
- single- and double-sided DIMMs are supported.

To determine what configuration of DIMMs to use, see the table "Supported DIMMs."

For sample memory configurations, see the table "Sample DIMM Upgrade Paths."

To locate memory module sockets on the system board, see the previous figure, “System board sockets and connectors.”

To determine the memory you need to purchase for a memory upgrade, see “Checking System Memory.”

***Supported DIMMs***

| DIMM Size | Configuration |
|---|---|
| 64 MB | 8 Mbit x 72 |
| 128 MB | 16 Mbit x 72 |
| 256 MB | 32 Mbit x 72 |

***Sample DIMM Upgrade Paths****

| Total Memory | DIMM 1 | DIMM 2 |
|---|---|---|
| 64 MB | 64 MB | - |
| 128 MB | 64 MB | 64 MB |
| 128 MB | 128 MB | - |
| 256 MB | 128 MB | 128 MB |
| 256 MB | 256 MB | - |
| 512 MB | 256 MB | 256 MB |

*The information in this table shows sample DIMM upgrade paths. It does not represent every combination of DIMMs supported in the system.

## *Checking System Memory*

If you do not know how much memory is installed in your system, check the amount by using the following procedure.

1. On the Windows desktop, point to **My Computer**, and click the right mouse button.

2. With the left mouse button, click **Properties**. The **General** tab shows the random access memory (RAM). This is the amount of system memory in your computer.

In Windows 98 or Windows 2000, you can also find the amount of memory by pointing to **My Computer**, clicking the right mouse button, and selecting the **Performance** tab.

***Note*** If you find a discrepancy in the amount of memory displayed at the Power-On Self-Test or in Windows with the amount of memory that you installed, check that you installed the memory modules correctly.

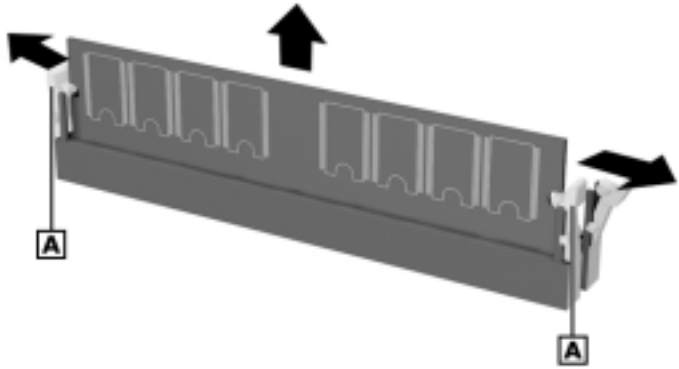
## *Removing a DIMM*

If your memory configuration requires the removal of a DIMM module, use the following steps.

⚠ **CAUTION** Before opening the system and before handling boards or memory modules, reduce static discharge by touching the chassis.

1. Remove the cover (see "Removing the Cover" earlier in this chapter).
2. Locate the memory upgrade sockets on the system board (see the figure "Locating the memory module and processor sockets" earlier in this chapter).
3. Eject a DIMM by pressing the plastic clips at the outer edges of the socket away from the memory module (see the following figure).

*Removing a DIMM*




**A** – Plastic Clips

4. If you are installing a DIMM, see "Installing a DIMM" in the next section.
5. If you are not installing a DIMM, replace the cover (see "Replacing the Cover" earlier in this chapter).

## *Installing a DIMM*

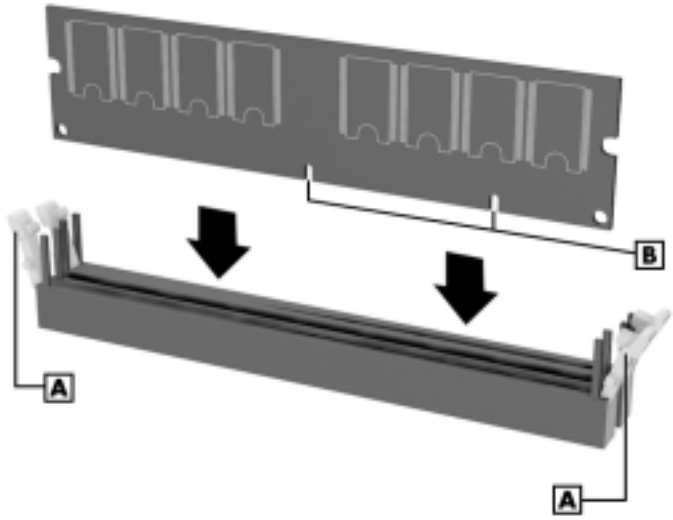
Use the following steps to install a memory module.

1. Remove the cover (see "Removing the Cover" earlier in this chapter).
2. If you need to remove a currently installed DIMM, see "Removing a DIMM" earlier in this chapter.

**⚠ CAUTION** Before you install a DIMM, reduce static discharge by touching the chassis.

3. Align the notches on the new DIMM with the keys in an empty memory socket (see the following figure).
4. Press the DIMM firmly into the socket.
5. Ensure that the locking clip at each end of the DIMM clicks closed.

*Installing a DIMM*




**A** – Plastic Clips **B** – Notches

**6.** Replace the cover (see “Replacing the Cover” earlier in this chapter).

## *Processor Upgrade*

The system board has a Socket 370 for mounting a Celeron processor or a Pentium III processor.

To remove the processor from the Socket 370, see “Removing the Processor” in the following sections. To install the upgrade processor, see “Installing an Upgrade Processor” in the following sections.

**⚠ CAUTION** NECC recommends that you contact your NEC service center for assistance in upgrading your processor.

Incorrect installation of the processor, fan, and heat sink can damage the processor, system board, or both. Carefully follow the installation instructions provided with the upgrade processor and the procedures in the following sections.

## *Removing the Processor*

Remove the processor from its socket on the system board as follows.

**⚠ CAUTION** Before handling components, reduce static discharge by touching the chassis.

1. Remove the cover (see “Removing the Cover” earlier in this chapter).
2. Remove the diskette drive and bracket (see “Removing the 3 1/2-inch Diskette Drive” later in this chapter).
3. Locate the processor assembly (fan, heat sink, processor) on the system board (see the figure “Locating the memory module and processor sockets” earlier in this chapter).
4. Remove any expansion boards that might be in the way of the processor (see “Removing an Expansion Board” later in this chapter).

**⚠ WARNING** If the system was just running, the processor and heat sink on the system board are hot. To avoid a burn, let the components cool before continuing the upgrade.

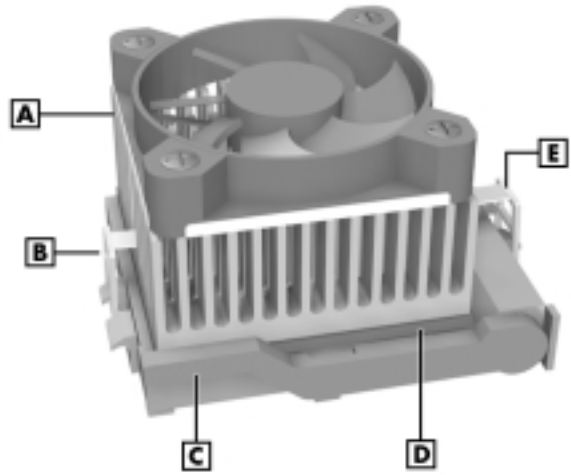
5. Carefully cut the cable tie retaining the fan cable and front panel cables.
6. Tag and unplug the cooling fan cable from its connector (CPU Fan) on the system board.
7. If in the way, tag and unplug the front panel cable from the front panel connector.
8. Remove the fan and heat sink from the processor as follows.
   - Carefully press down on the flange on the right end of the retention clip and unhook the clip from the tab on the processor socket (see the following figure for flange location).
   - Unhook the retention clip from the tab on the opposite side of the processor socket.
   - Remove the fan, heat sink, and retention clip from the processor.

**9.** Remove the processor as follows.

- Carefully pull out on the processor socket lock lever just enough to release the lever from the socket, then pivot the lever up to release the processor.
- Carefully lift up on the processor and remove it from the socket. Store the processor in a static-free bag.

**10.** Install the upgrade processor (see "Installing the Upgrade Processor" in the next section).

*Removing the fan, heat sink, and processor*




**A** – Heat Sink
**B** – Retention Clip
**C** – Lock Lever
**D** – Processor
**E** – Flange

## *Installing an Upgrade Processor*

Install the upgrade processor as follows.

1. Remove the processor currently in your system (see "Removing the Processor" in the previous section).

**⚠ CAUTION** Before picking up the processor, reduce static discharge by touching the metal chassis.

2. Determine the manufacturer (Intel or Cyrix) of the processor and set jumper J23 accordingly (see "System Board Jumper Settings" in Chapter 3).
3. Align the white triangle (or notch) on the corner of the processor with the corresponding white triangle on the socket.
4. Carefully align the processor pins with the socket pin holes and set the processor into the socket.
   - If aligned correctly and the pins are not bent, the processor seats in the socket without forcing.
   - If the processor does not seat, check for correct alignment and bent pins.
5. Pivot the lever down and press it in towards the socket until it locks in place.

**⚠ CAUTION** Using the wrong heat sink or fan or no heat sink and fan can damage the processor, system board, or both. Ensure that the upgrade processor has the correct heat sink and fan (refer to the documentation that comes with the upgrade kit).

Additional information can be obtained from NECC (see Chapter 6, "Getting Services and Support" for information on contacting NECC).

6. Install the replacement heat sink and fan as follows and in accordance with the procedures contained in the upgrade kit.
    - If the kit includes a thermal pad, center it on top of the processor.
    - Align the heat sink, fan, and retention clip assembly with the processor and set it down on the processor (see the figure "Removing the fan, heat sink, and processor" for alignment).
    - Attach the heat sink retention clip to the processor socket by hooking the non-flange end of the clip over the socket tab.
    - Press down on the flange on the opposite end of the clip and hook the clip over the socket tab.
7. Plug the cooling fan cable into its connector (CPU Fan) on the system board. If unplugged, plug in the front panel cable.
8. Replace any expansion boards you might have removed (see "Installing an Expansion Board" later in this chapter).
9. Install the diskette drive, bracket, and cover.
10. Connect any peripherals and power cords, and power up the system.

# Expansion Boards

Your system supports 32-bit PCI Plug and Play expansion boards. With Plug and Play expansion boards, you can install a board without changing the hardware settings. There are no system resource conflicts to resolve. Plug and Play automatically configures the board for the system.

The PCI connectors support bus mastering and accept PCI expansion boards that run at half the system board's bus speed. The PCI bus handles 32 bits of data at a time, boosting system performance.

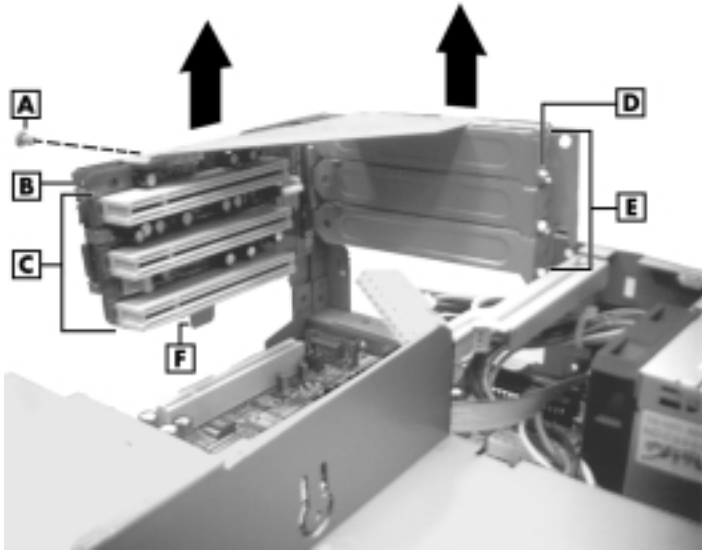
The following sections include procedures for installing and removing expansion boards.

## Installing an Expansion Board

Install an expansion board in the system as follows.

1. Remove the cover (see “Removing the Cover” earlier in this chapter).
2. Remove the riser board bracket to access the expansion board connectors on the riser board.
   - Label and remove any cable(s) connected to the expansion board.
   - Remove the upper screw securing the bracket to the side of the chassis (see the following figure).
   - Carefully pull up on the bracket to release it from the chassis and the riser board connector on the system board. As the bracket fits tightly, you might need to rock the bracket slightly to release it from the chassis.
3. If you need to remove an expansion board from the slot designated for the new board, see “Removing an Expansion Board” later in this section.
4. Follow any preinstallation instructions that come with the expansion board (such as setting jumpers on the board).
5. If the slot is empty, remove and save the screw securing the expansion board slot cover to the riser board bracket.
6. Remove and save the slot cover.
7. Hold the expansion board by its edges or its bracket and insert the board into the expansion slot on the riser board.

*Removing the riser board bracket*




**A** – Upper Side Screw
**B** – Riser Board
**C** – Expansion Board Connectors
**D** – Slot Cover Screw
**E** – Expansion Slots
**F** – Tab

**8.** Press the board firmly into the expansion slot connector on the riser board.

**9.** Secure the expansion board bracket in place with the previously removed slot screw.

**10.** Attach any cables required by the expansion board.

**11.** Align the riser board bracket with the chassis and the riser board with its connector on the system board.

**12.** Carefully push the riser board bracket down until the riser board and bracket seat. Ensure that the tab (**F** on the preceding figure) at the bottom of the bracket is inside the chassis.

**13.** Secure the riser board bracket in place with the previously removed screw.

**14.** Replace the cover (see “Replacing the Cover” earlier in this chapter).

### Removing an Expansion Board

Remove an expansion board as follows.

1. Remove the cover (see “Removing the Cover” earlier in this chapter).
2. Remove the riser board bracket (see “Installing an Expansion Board” earlier in this section).
3. Remove the screw securing the expansion board to the riser board bracket.
4. Pull the expansion board out of its connector and expansion slot. Place the board in an antistatic bag.
5. Install a new board or install the slot cover if you are not installing a board. Secure the board or slot cover with the previously removed screw (see “Installing an Expansion Board” earlier in this section).
6. Install the riser board bracket (see “Installing an Expansion Board” earlier in this section).
7. Replace the cover (see “Replacing the Cover” earlier in this chapter).

## Data Storage Devices

The system board supports the following storage devices:

- one 3 1/2-inch 1.44-MB diskette drive
- one 3 1/2-inch IDE hard drive
- one 5 1/4-inch IDE CD-ROM drive or DVD-ROM drive.

Before replacing a storage device, follow any preinstallation instructions that come with the device. For example, check the following information.

- IDE hard drive — check the jumper settings on the device before installing it. See the documentation that comes with the device for jumper setting information. Connect the drive as the master device on the primary IDE channel.
- CD-ROM drive or DVD-ROM drive — check the jumper settings on the device before installing it. See the documentation that comes with the device for jumper setting information. Connect the drive as the master device on the secondary IDE channel.

## Connecting Device Cables

The cables used for installing replacement storage devices include:

- flat ribbon cable for the diskette drive
- Ultra ATA/66 cable for the hard drive
- IDE cable for the CD-ROM drive
- system power cables.

A two-connector diskette drive signal cable comes connected to the system board and to the standard 1.44-MB diskette drive. The cable combines signal and power lines in one flat ribbon cable.

The system comes with a two-connector Ultra ATA/66 interface cable connected to the primary IDE channel connector on the system board and the hard drive. A two-connector IDE interface cable is connected to the secondary IDE channel and the CD-ROM drive or DVD-ROM. The connectors are keyed to fit only in the correct position.

Power cables come from the power supply and are connected to the hard drive and CD-ROM or DVD-ROM drive. Power cable connectors are keyed to fit only in the correct position.

***Note*** Ensure that you use the long power cable to connect to the hard drive. The short power cable must be used for the 5 1/4-inch accessible device.

## Replacing the 5 1/4-Inch Accessible Device

The following sections describe how to remove and install a 5 1/4-inch accessible device in the system.

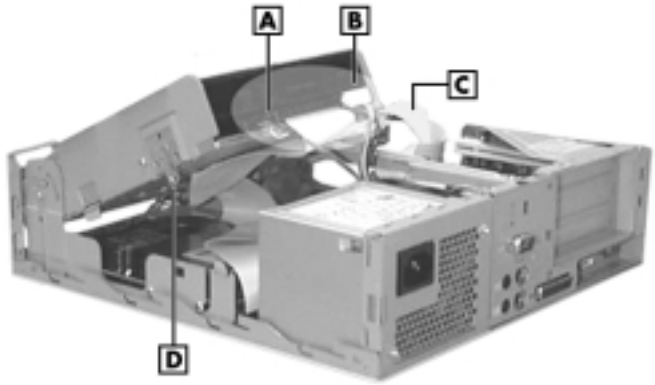
### Removing the 5 1/4-Inch Accessible Device

Remove the 5 1/4-inch accessible device as follows.

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

2. While pressing the lock on the device bracket, raise the bracket up just enough to access the cables (see the following figure).

*Unplugging the 5 1/4-inch device cables*




**A** – Audio Cable
**B** – Power Cable
**C** – Signal Cable
**D** – Device Bracket Lock

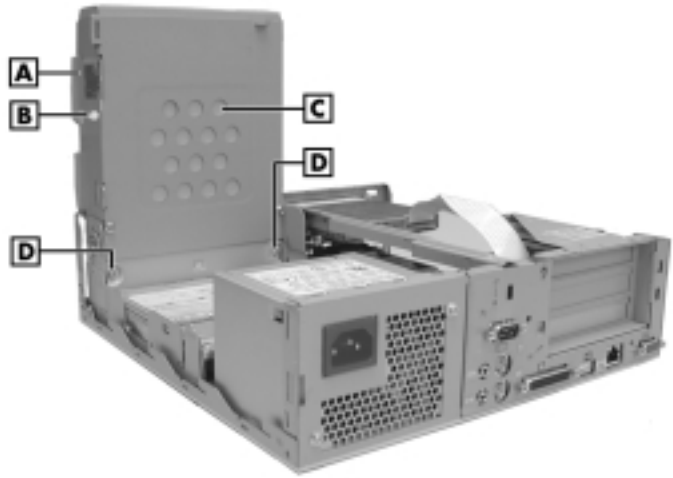
3. Tag and unplug the power and signal cables connected to the device. If the device is a CD-ROM or DVD-ROM drive, tag and unplug the audio cable.

4. Raise up the device bracket until it is vertical to the chassis.

5. Remove the top screw (**B**) securing the device to the bracket.

6. Remove the two bottom screws (**D**) securing the device to the bracket.

*Releasing the 5 1/4-inch device*




**A** – Device Bracket
**B** – Top Screw
**C** – Device
**D** – Bottom Screws

7. Lower the device bracket until it latches in place.

8. Slide the device out of the bracket.

9. Install a replacement device in the bracket (see “Installing a 5 1/4-inch Accessible Device” in the following section).

## *Installing a 5 1/4-Inch Accessible Device*

Install a 5 1/4-inch accessible device as follows.

1. With the empty device bracket latched in place (see "Removing a 5 1/4-inch Accessible Device" earlier in this section),
   - slide the connector end of the device through the front panel and into the device bracket
   - align the front of the device flush to the bracket.
2. Attach the device to the bracket with the previously removed top screw (**B** on the figure "Releasing the 5 1/4-inch device" earlier in this section).
3. Press the bracket lock on the side of the device bracket and raise the device bracket up to its perpendicular position.
4. Attach the bottom of the device to the bracket with the two previously removed bottom screws (**D** on the figure "Releasing the 5 1/4-inch device").
5. Lower the device bracket halfway. Plug the signal and power cables into their connectors on the device. As appropriate, plug the audio cable into the device.

***Note*** Ensure that you use the short power cable to connect to the device. The long power cable must be used for the hard drive.

6. Lower the device bracket all the way down until it locks in place on the chassis.

⚠ **CAUTION** As you lower the device bracket, ensure that all cables are out of the way, are not pinched, and are folded correctly.

7. Replace the system cover (see "Replacing the Cover").

## Replacing the 3 1/2-Inch Diskette Drive

The following sections describe how to remove and install the 3 1/2-inch diskette drive.

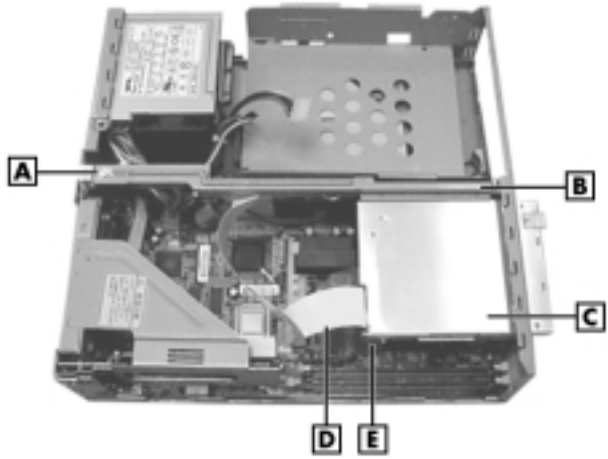
### Removing the 3 1/2-Inch Diskette Drive

The 3 1/2-inch diskette drive is secured to a bracket which is attached to the rear panel of the chassis.

Remove the diskette drive as follows.

1. Remove the system cover (see “Removing the Cover”).
2. Unplug the diskette drive cable from the drive as follows (see the following figure).
   - Release the brown cable retainer connector on the drive by gently pulling up each end of the retainer until the cable releases.
   - Remove the cable from the drive connector.
3. Remove the screw (**A** on the following figure) securing the drive bracket to the chassis.
4. Lift the bracket up slightly to clear the tabs on the front panel, then slide the bracket and drive towards the back of the chassis and out of the chassis.
5. Remove the two screws fastening the drive to the bracket and set the drive aside.

*Removing the 3 1/2-Inch diskette drive*



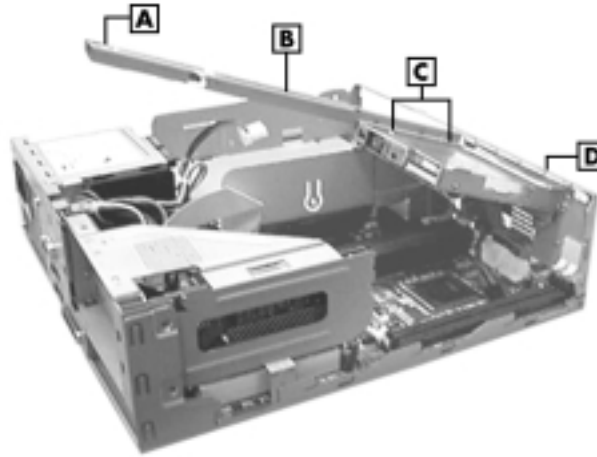

**A** – Bracket Screw
**B** – Bracket
**C** – Diskette Drive
**D** – Diskette Drive Cable
**E** – Brown Cable Retainer

## Installing the 3 1/2-Inch Diskette Drive

Attach the diskette drive to the bracket and install the bracket in the chassis as follows.

1. Attach the diskette drive to the bracket with the two previously removed screws.
2. Tilt the bracket and slide into the back of the front panel until it stops.

*Installing the 3 1/2-inch diskette drive*




**A** – Bracket Screw Hole
**B** – Bracket
**C** – Drive Fastening Screws (2)
**D** – Front Panel

3. Lift the back of the drive slightly and slide it forward to engage the two tabs on the bracket with their slots in the front panel.
4. Align the screw hole at the end of the bracket with its corresponding hole in the chassis.
5. Install the previously removed screw through the bracket and into the chassis to fasten the bracket in place.
6. Lift up the cable retainer on the drive connector and insert the drive cable into the connector. Push down on the retainer to lock the cable in place. Check that the cable is secured.
7. Replace the system unit cover (see “Replacing the Cover”).

## Replacing the 3 1/2-Inch Hard Drive

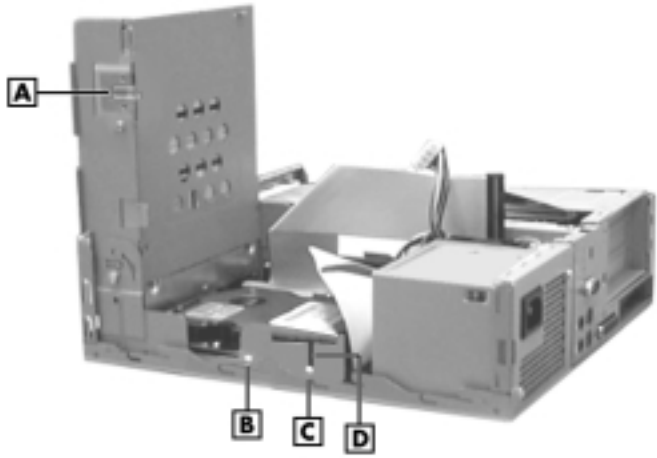
The internal hard drive is located under the CD-ROM drive. Remove and install the hard drive as follows.

### Removing the 3 1/2-Inch Hard Drive

Remove the hard drive as follows.

1. Remove the system cover (see "Removing the Cover").
2. While pressing the device bracket lock on the side of the bracket, raise the bracket up enough to access and unplug the CD-ROM drive cables. (See the figure "Unplugging the 5 1/4-inch device cables" earlier in this chapter.)
3. Raise the device bracket up to its vertical position (see the following figure).
4. Remove the hard drive screw (**B**). Loosen but do not remove the shoulder screw (**C**).

*Removing the 3 1/2-inch hard drive*




**A** – Device Bracket Lock
**B** – Hard Drive Screw
**C** – Shoulder Screw (1 of 3)
**D** – Shoulder Screw Slot

5. Remove the hard drive as follows.
    - Tilt the device bracket slightly from its vertical position, enough to allow access to the front of the drive.
    - Slide the drive towards the rear of the chassis until the shoulder screw is aligned with the vertical shoulder screw slot.
    - Lift the drive straight up, following the path of the shoulder screw slots on each side of the drive bay.
6. Unplug the power and signal cables from the hard drive.
7. Remove the hard drive from the chassis.

## *Installing the 3 1/2-Inch Hard Drive*

Install the 3 1/2-inch hard drive as follows.

1. If not already removed, remove the hard drive being replaced (see "Removing the 3 1/2-Inch Hard Drive" earlier in this section).
2. Remove the three shoulder screws from the old drive and install them in the same position on the new drive.

    Leave enough of the screws exposed so that each fits into the shoulder screw slots.
3. Hold the hard drive above the drive bay, with the drive connectors facing the rear of the chassis.
4. Plug the hard drive signal and power cables into their respective connectors on the hard drive.

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***Note*** Ensure that you use the long power cable to connect to the hard drive. The short power cable must be used for the 5 1/4-inch accessible device.

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5. Align the three shoulder screws with the shoulder screw slots and lower the drive into the bay. Check that the screws are in their slots.
6. Slide the hard drive towards the front of the chassis, following the path of the shoulder screw slots.

7. Align the fastener hole in the hard drive with its corresponding hole in the chassis. Secure the drive in place with the previously removed screw.

8. Tighten the accessible shoulder screw.

9. Lower the device bracket halfway, and plug in the CD-ROM drive signal cable, power cable, and audio cable (if installed).

10. Lower the device bracket into the chassis until it locks in place.

**⚠ CAUTION** As you lower the device bracket, ensure that all cables are folded correctly, are out of the way, and are not pinched.

11. Replace the system cover (see "Replacing the Cover").

12. Set the hard drive parameters using autotype in the BIOS (see Chapter 3).

# 5

# Solving System Problems

- Solutions to Common Problems
- How to Clean the Mouse
- How to Replace the CMOS Battery

You may occasionally encounter a problem with the system. In most cases, the problem is one that you can solve yourself.

The system has a built-in program that automatically checks its components when the system is powered 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, refer to the information in this chapter to help determine and solve the problem. If information in this chapter doesn't solve the problem, see Chapter 6 for Technical Support Center help.

# Solutions to Common Problems

See the following sections to match your problem area and view the possible causes and solutions.

When trying to solve problems, you should note what the system was doing when the problem occurred and what you attempted to do to correct the problem. This information is useful if you request assistance.

## System Problems

Check the following list to match your problem and see the possible cause and solution.

- **No power and power lamp not lit.**

  Check that system power is on.

  Check that the AC power cord is plugged into the system power socket on the system unit and into a live, properly grounded AC power outlet or surge protector.

  Check the outlet or surge protector by plugging in a lamp.

- **Non-System Disk error message displays when the system is started.**

  You have a diskette in the diskette drive, and the diskette drive is set before the hard drive in boot order. Remove the diskette from the drive and restart the system.

- **Operating system not found error message displays when the system is started.**

  If you left a CD in the CD-ROM drive, your system might not be able to boot. Try removing the CD and rebooting.

- **System does not boot and error message displayed on screen.**

  Run the BIOS Setup Utility (see Chapter 3). Check that the parameters are set correctly, particularly if you just installed an option.

- **System emits continuous beeps.**

  Turn the system off, wait at least five seconds, and turn the system on. If the beeps continue, call the NECC Technical Support Center (see Chapter 6 for Technical Support Center help).

- **System does not maintain date, time, system configuration information.**

  The CMOS battery is reaching end of life. Replace the battery (see "How to Replace the CMOS Battery" in this chapter). Or have the battery checked and replaced by an NEC authorized service center.

- **System does not boot from hard drive.**

  The system usually tries to start from the diskette drive before it starts from the hard drive. Remove the diskette from the diskette drive.

  Run the Setup Utility (see Chapter 3) and set the initial Boot parameter to a hard disk device instead of floppy disk device.

- **System performance appears sluggish.**

  Check that your system is set for optimal operation. See your operating system documentation.

  You might have too many applications open. Close any applications that you are not using.

  Check your Internet browser and Windows for excessive Internet cache files. Delete the cache files as necessary (see the browser and Windows online documentation for further information).

  Check the memory requirements of your software applications. If required, install additional DIMM memory (see Chapter 4).

  If you added optional memory, check that you correctly installed the DIMM memory.

- **System shuts off instead of going into sleep mode.**

  You pressed and held in the power/sleep button for more than four seconds. For sleep mode, press in the button and immediately release.

- **System does not shut off after pressing the power/sleep button.**

  You might not have pressed and held in the power/sleep button long enough. Press in the button and hold for four seconds or more before releasing.

- **System password forgotten.**

  Clear the password and reset it. To clear and reset the password, see "Security Menu" in Chapter 3.

## *Diskette Drive Problems*

Check the following problems to see the possible cause and solution.

- **Diskette won't load.**

  Ensure that a diskette is not in the drive.

  Check that the diskette is being loaded correctly.

  Check that the system power lamp is on and that the power-on screen appears.

  Check that the diskette is formatted. If not, format it. See your operating system documentation.

  Check that the diskette size is 1.44 MB.

  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.

- **Non-System Disk or Disk Error message displayed.**

  If you are trying to boot from the diskette drive, insert a diskette with system files into the diskette drive.

  If a bootable diskette does not boot, use the BIOS Setup Utility to verify that the initial boot parameter is set to diskette drive A and not a hard drive.

## Monitor Problems

Check the following problems to see the possible cause and solution.

- **Monitor screen is dark or the display is hard to read.**

  Check that the monitor is on.

  Check that the monitor power cable is connected to the monitor and a power outlet, the monitor signal cable is connected to the system, and the brightness and contrast controls are adjusted.

  Press a key or move the mouse to take the system out of the power management mode.

- **Screen is hard to read, it's very dark, or the contrast is low.**

  Adjust the monitor's brightness or contrast controls.

- **Distorted image appears on your monitor screen.**

  Adjust the monitor's video controls. If this does not help, turn the monitor off for several seconds, then back on.

- **There is constant movement on the screen.**

  A magnetic field is affecting your monitor. Move any devices (fan, motor, another monitor) that generate magnetic fields away from your monitor.

- **The screen display is fuzzy or flickering; graphics characters or "garbage" appears on the screen.**

  Check that your monitor is set up correctly and that all connections are made.

  Check that the video refresh rate and video driver are correct.

  Check display properties. Click the right mouse button anywhere on the Windows desktop and a menu appears. Click **Properties** and the Display Properties window appears.

## Keyboard/Mouse Problems

Check the following problem to see the possible cause and solution.

- **Mouse or keyboard does not respond.**

  You might have connected the mouse and keyboard after turning on your system. Turn the system off, make sure the mouse and keyboard are connected, and turn the system back on.

  Using the mouse results in erratic or no movement of the cursor on the monitor screen, even after cleaning. Mouse may need to be replaced.

- **Image appears on screen but nothing happens when you use the mouse or keyboard.**

  Make sure the keyboard cable and mouse cable are firmly connected to the rear of the system.

  If this does not help, turn off the system, wait five or more seconds, and turn on the system.

## CD-ROM Drive Problems

Check the following problems to see the possible cause and solution.

- **The system does not see the drive.**

  The drive designation is wrong and should be changed. The drive designation depends upon the storage device configuration in your system. To find out what drive designation letter is assigned to your drive, double click **My Computer** on the Windows 98, Windows NT, or Windows 2000 desktop. The drive designation is below the drive icon.

  You can also open Windows Explorer and scroll down the list of folders until you locate the drive icon. The drive designation is beside the icon.

- **The drive is not reading a disc.**

  Check that the disc is inserted in the disc tray with the printed label side up.

  Check that the disc is a data disc, not a music disc.

  Clean the non-label side of the disc with a soft lint-free cloth. Gently brush from the center of the disc to the outer edge of the disc. Or use a commercial CD disc cleaner.

  Try a different disc to see if the problem is limited to one disc.

- **The CD does not eject due to a power failure or software error.**

  Remove the system cover (see Section 4, "Removing the Cover") to access the emergency eject hole on the CD-ROM drive. Insert the end of a paper clip into the hole and press inward until the drive door opens. Remove the CD.

- **The drive plays music CDs but the sound is not heard.**

  If installed, check that the speaker power is on (see "Speaker Problems").

  Adjust the volume control on the speaker.

  Adjust the volume control in the system tray along the taskbar.

  Check that the cable connecting the CD-ROM drive to the system board CD audio connector is plugged in and secure.

## *Speaker Problems*

Check the following problems to see the possible cause and solution.

- **Speaker volume is too low.**

  Adjust the volume control on the speaker.

  If the volume is still too low, adjust the volume through the system software. See your Windows Multimedia online help.

- **No sound from the speakers.**

  Check that the volume control is turned up.

  Check that the optional headphone (if used) is unplugged.

  Check that the speaker power is on.

  Check that all speaker cable connections are correct and secure.

  Check that the speaker's AC adapter is plugged into a live, properly grounded AC power outlet.

- **Sound is only coming from one speaker.**

  Balance the speaker output by adjusting the balance in the sound software. See your Windows Multimedia online help.

## How to Clean the Mouse

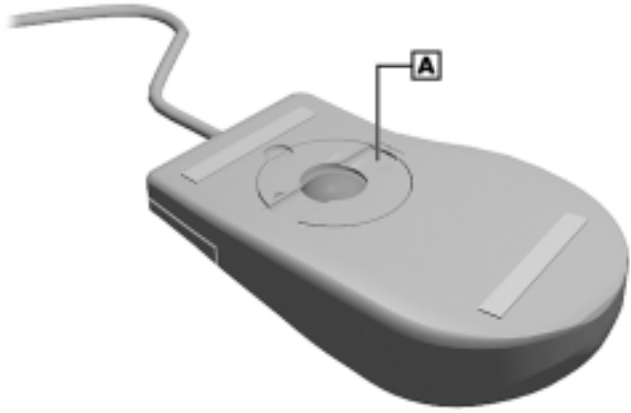
Under normal conditions, the mouse self-cleaning mechanism prevents a buildup of dust or lint around the mouse ball and tracking mechanism. Periodically, however, you might need to clean the mouse ball.

Use these steps to clean your mouse.

***Note*** The following procedure describes cleaning of a typical mouse and should be used as a guideline. The procedure and your mouse configuration might differ, depending on the type of mouse you have.

1. Wake a system in sleep mode, save and close any open applications, close Windows, and power off your system and any peripherals attached to it.
2. Turn the mouse over. Locate the mouse ball cover (see the following figure).

*Typical mouse ball cover*




**A** – Mouse Ball Cover

3. Rotate the ball cover counterclockwise and remove the cover.
4. Turn the mouse over so that the cover and 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. Use a Q-tip to remove accumulations of dirt.
6. Gently put the ball back into the mouse.
7. Fit the ball cover back into the mouse and turn the cover clockwise until it locks in place.
8. Connect the mouse to the mouse port.
9. Plug in the AC power cord and press the power/sleep button.

# How to Replace the CMOS Battery

The system board uses a CMOS battery to maintain system configuration information. The battery is a coin-cell battery mounted on the system board (see the following figure). If it fails to maintain system configuration information, replace it with an identically rated battery from the same manufacturer.

**⚠ WARNING** The battery can explode if it is incorrectly replaced or improperly discarded. Use only the same type battery or an equivalent type recommended by the manufacturer when replacing the battery.

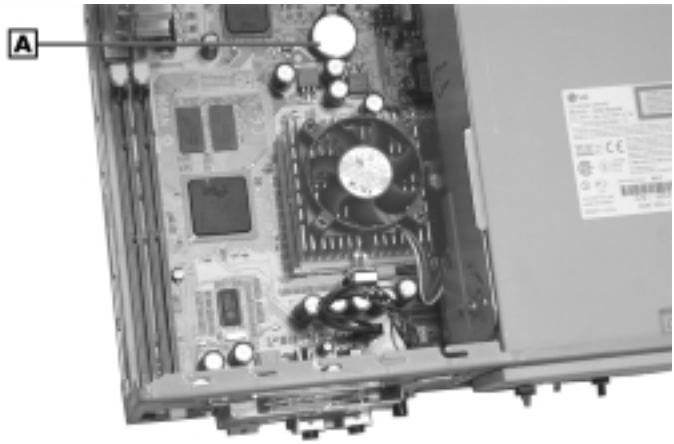
Lithium acts as a catalyst when exposed to water and causes spontaneous combustion on contact. Discard used batteries according to the manufacturer's instructions.

**⚠ CAUTION** Removing the battery from the system board causes the system to lose system configuration information. If possible, prior to removing the battery, run the BIOS Setup Utility (see Chapter 3) and print out or write down your system configuration settings. Then you can restore the system to its previous settings.

If you need to replace the battery, follow these steps.

1. Turn off and unplug the system and any external components connected to it.
2. Remove the system cover (see "Removing the Cover" in Chapter 4).
3. Locate the battery on the system board (see the following figure).
4. Remove any installed expansion boards that might be blocking access to the battery (see "Removing an Expansion Board" in Chapter 4).

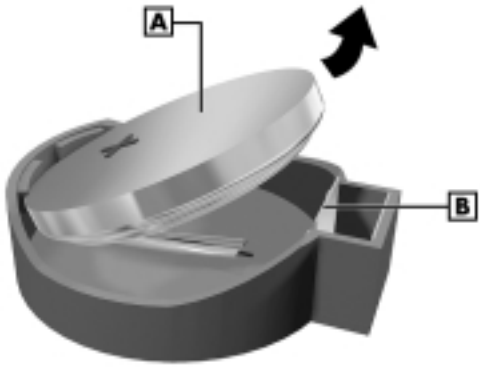
*Locating the battery on the system board*




**A** – Battery

5. Press down on the battery clip to release the battery from its socket in the system board.
6. Remove the battery and discard in accordance with the manufacturer's instructions.

*Removing the battery*




**A** – Battery **B** – Clip

7. With the positive (+) side of the new battery facing up, press the new battery into the socket. Ensure that the new battery is the same type as the removed battery or is an equivalent battery recommended by the manufacturer.

8. Replace any removed expansion boards (see “Installing an Expansion Board” in Chapter 4).

9. Replace the system cover (see “Replacing the Cover” in Chapter 4).

10. Connect external peripherals and power cables, and power up the system.

11. Run the Setup Utility to reconfigure your system parameters (see “BIOS Setup Utility” in Chapter 3).

# 6

# Getting Services and Support

- NECC Website
- NECC FTP Site
- Email/Fax Technical Support Service
- NECC Technical Support Services

If you tried correcting problems yourself or within your company and were not successful, you may want to try one or more of the following NECC 24-hour services for answers to your questions. (Some services require a connection to the Internet or a fax machine.)

- NECC website and FTP site
- Email to NECC Technical Support Services through a commercial online service or the Internet
- Fax Service to NECC Technical Support Services
- NECC Technical Support Services

This chapter describes these services and how to access them.

# NECC Website

If you have access to the Internet (via your network or an optional modem), you can access the NECC website. You can do this through a commercial online service or through your Internet account. The NECC website contains general information about NECC and its products. The website also contains press releases, reviews, and service and support information.

Look in the Service and Support area for the following information:

- technical documentation, including Frequently Asked Questions, user's guides, reference manuals, and warranty information
- BIOS updates, drivers, and setup disk files to download
- contact information, including telephone numbers for Technical Support and links to vendor websites
- automated email form for your technical support questions
- Reseller's area (password accessible).

To access the NECC Home Page, enter the following Internet Uniform Resource Locator (URL) in your browser:

**www.nec-computers.com**

# NECC FTP Site

You can use the Internet to access the NECC FTP (file transfer protocol) site to download various files (video drivers, printer drivers, BIOS updates, and Setup Disk files). The files are essentially the same files as on the NECC website.

To access the NECC FTP site, enter the following Internet ftp address through your service:

**ftp.neccsdeast.com**

Once in the file menu, follow the prompts to choose and download the file(s) you want.

# Email/Fax Technical Support Service

The NECC Technical Support Center offers technical support by Internet email if you have access. The Internet email address is:

**tech-support@nec-computers.com**

You can also fax technical questions to the NECC Technical Support Center if you have access to a fax machine (or an optional fax/modem). The fax number is:

**(801) 981-3133**

When using the email or fax support service, please include the following words in the subject field for prompt response from the appropriate technical person:

- Desktop
- Monitor
- Notebook.

You should provide as much specific information about your questions as possible. Also, if you are sending a fax, please include your voice telephone number and your fax number with the question. You should receive a response to your questions within one business day.

# NECC Technical Support Services

NECC also offers direct technical support through its Technical Support Center. (NECC technical support is for U.S. and Canadian customers only; international customers should check with their sales provider.)

Direct assistance is available 24 hours a day, 7 days a week. Call the NECC Technical Support Center, toll free, at **1-800-632-4525** (U.S. and Canada only) for the following support.

- System hardware — toll-free phone support is limited to the length of the standard warranty.

  For hardware support after the standard warranty, get system hardware support for a fee.

- Preinstalled software — toll-free phone support for 90 days from the time of your first call to the NECC Technical Support Center.

  After the initial 90 days, get preinstalled software support for a fee.

Please have available your system's name, model number, serial number, and as much information as possible about your system's problem before calling.

For outside the U.S. and Canada, please contact your local NECC sales provider.

# A

# Setting Up a Healthy Work Environment

- Making Your Computer Work for You
- Arrange Your Equipment
- Adjust Your Chair
- Adjust Your Input Devices
- Adjust Your Monitor
- Vary Your Workday
- Pre-existing Conditions and Psychosocial Factors
- Checking Your Comfort: How Do You Measure Up?

**⚠ WARNING** Prolonged or improper use of a computer workstation may pose a risk of serious injury. To reduce your risk of injury, set up and use your computer in the manner described in this appendix.

Contact a doctor if you experience pain, tenderness, swelling, burning, cramping, stiffness, throbbing, weakness, soreness, tingling and/or numbness in the hands, wrists, arms, shoulders, neck, back, and/or legs.

# *Making Your Computer Work for You*

Computers are everywhere. More and more people sit at computers for longer periods of time. This appendix explains how to set up your computer to fit your physical needs. This information is based on ergonomics — the science of making the workplace fit the needs of the worker.

Some nerve, tendon, and muscle disorders (musculoskeletal disorders) may be associated with repetitive activities, improper work environments, and incorrect work habits. Examples of musculoskeletal disorders that may be associated with certain forms of repetitive activities include: carpal tunnel syndrome, tendinitis, tenosynovitis, de Quervain's tenosynovitis, and trigger finger, as well as other nerve, tendon, and muscle disorders.

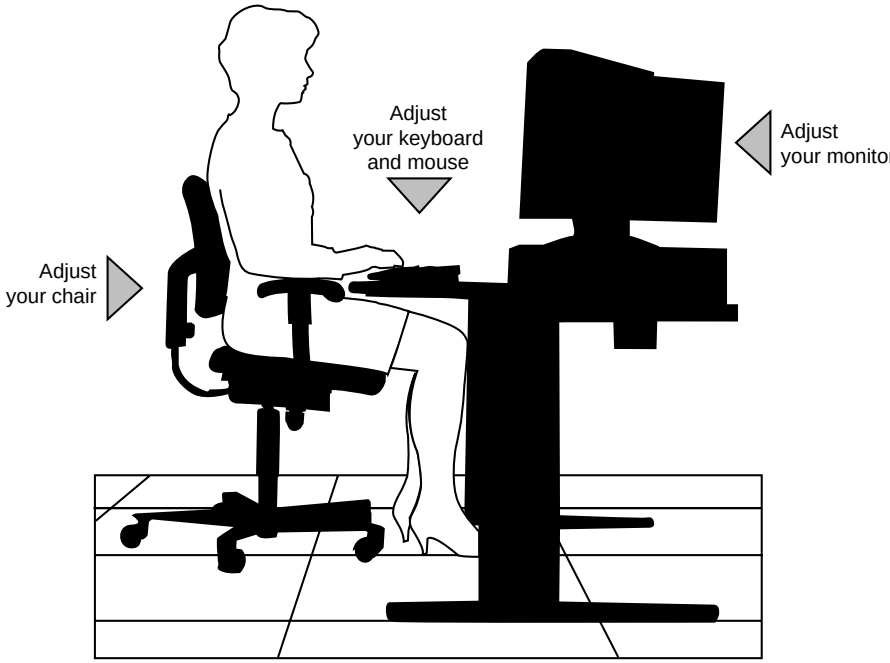
Although some studies have shown an association between increasing hours of keyboard use and the development of some musculoskeletal disorders, it is still unclear whether working at a computer causes such disorders. Some doctors believe that using the keyboard and mouse may aggravate existing musculoskeletal disorders.

Some people are more susceptible to developing these disorders due to preexisting conditions or psychosocial factors (see "Preexisting Conditions and Psychosocial Factors" later in the appendix).

To reduce your risk of developing these disorders, follow the instructions in this appendix. If you experience discomfort while working at your computer or afterwards, even at night, contact a doctor as soon as possible. Signs of discomfort might include pain, tenderness, swelling, burning, cramping, stiffness, throbbing, weakness, soreness, tingling and/or numbness in the hands, wrists, arms, shoulders, neck, back, and/or legs.

# Arrange Your Equipment

Arrange your equipment so that you can work in a natural and relaxed position. Place items that you use frequently within easy reach. Adjust your workstation setup to the proper height (as described in this appendix) by lowering the table or stand that holds your computer equipment or raising the seat height of your chair. To create more desk space, you can put your computer base on the floor.



## Adjust Your Chair

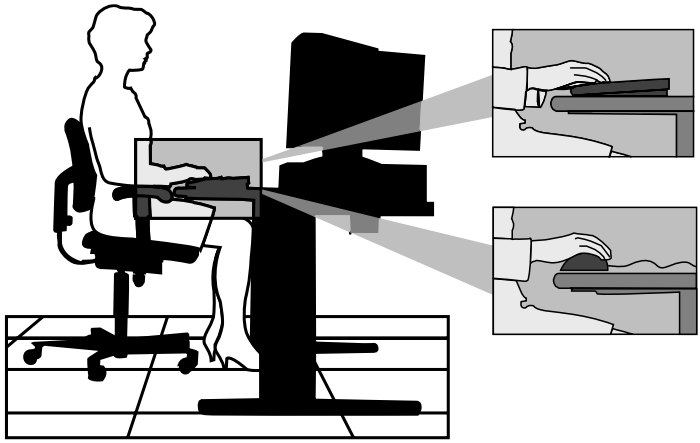
Your chair should be adjustable and stable. Vary your posture throughout the day.

Check the following:

- Keep your body in a relaxed yet upright position. The backrest of your chair should support the inward curve of your back.
- Use the entire seat and backrest to support your body. Tilt the backrest slightly backwards. The angle formed by your thighs and back should be 90° or more.
- Your seat depth should allow your lower back to comfortably contact the backrest. Make sure that the backs of your lower legs do not press against the front of the chair.

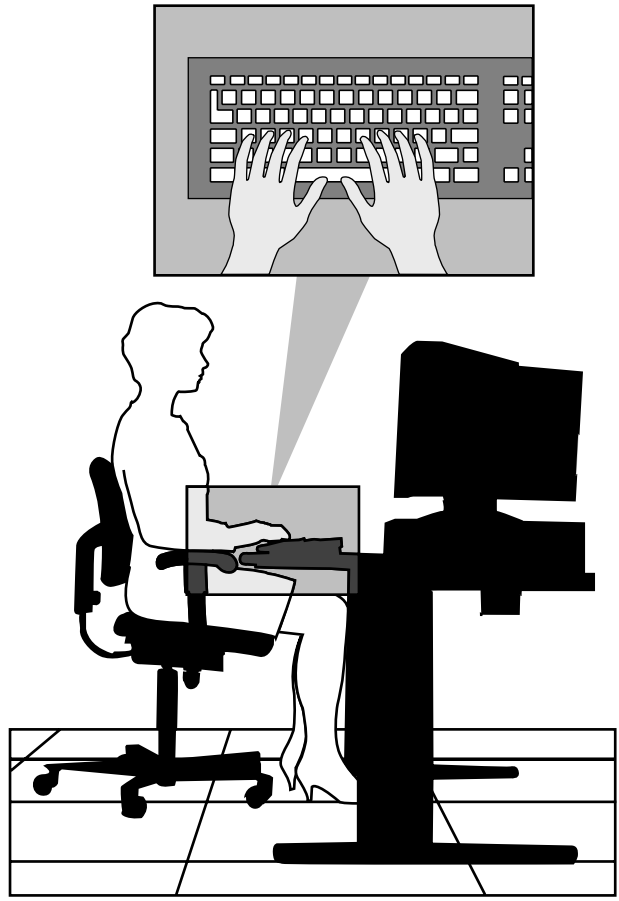
- Extend your lower legs slightly so that the angle between your thighs and lower legs is 90° or more.
- Place your feet flat on the floor. Only use a footrest when attempts to adjust your chair and workstation fail to keep your feet flat.
- Be sure that you have adequate clearance between the top of your thighs and the underside of your workstation.
- Use armrests or forearm supports to support your forearms. If adjustable, the armrests or forearm supports should initially be lowered while all the other adjustments discussed in this appendix are made. Once all these adjustments are completed, raise the armrests or adjust the forearm supports until they touch the forearms and allow the shoulder muscles to relax.

## Adjust Your Input Devices



Follow these points in positioning your keyboard and mouse.

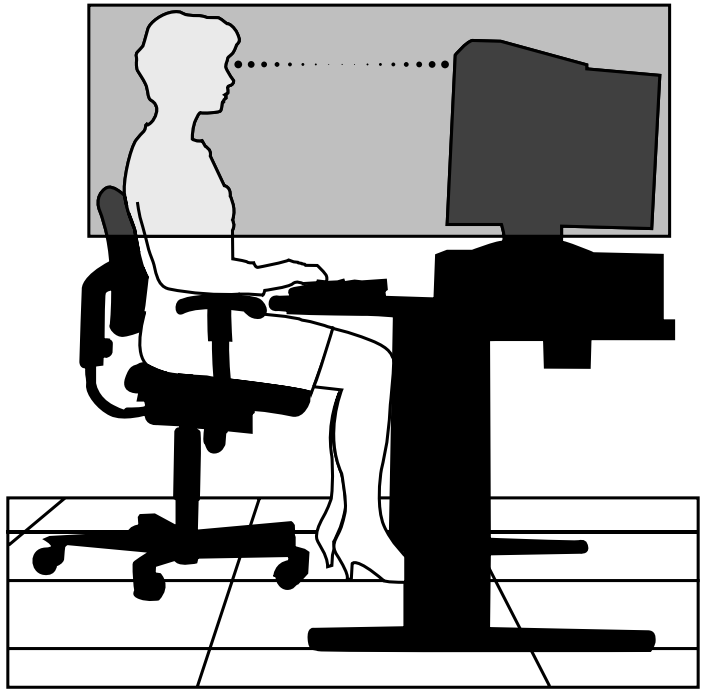
- Position your keyboard directly in front of you. Avoid reaching when using your keyboard or mouse.
- If you use a mouse, position it at the same height as the keyboard and next to the keyboard. Keep your wrists straight and use your entire arm when moving a mouse. Do not grasp the mouse tightly. Grasp the mouse lightly and loosely.
- Adjust the keyboard height so that your elbows are near your body and your forearms are parallel to the floor, with your forearms resting on either armrests or forearm supports, in the manner described previously. If you do not have armrests or forearm supports, your upper arms should hang comfortably at your sides.
- Adjust your keyboard slope so that your wrists are straight while you are typing.



- Type with your hands and wrists floating above the keyboard. Use a wrist pad only to rest your wrists between typing. Avoid resting your wrists on sharp edges.
- Type with your wrists straight. Instead of twisting your wrists sideways to press hard-to-reach keys, move your whole arm. Keep from bending your wrists, hands, or fingers sideways.
- Press the keys gently; do not bang them. Keep your shoulders, arms, hands, and fingers relaxed.

## Adjust Your Monitor

Correct placement and adjustment of the monitor can reduce eye, shoulder, and neck fatigue. Check the following when you position the monitor.



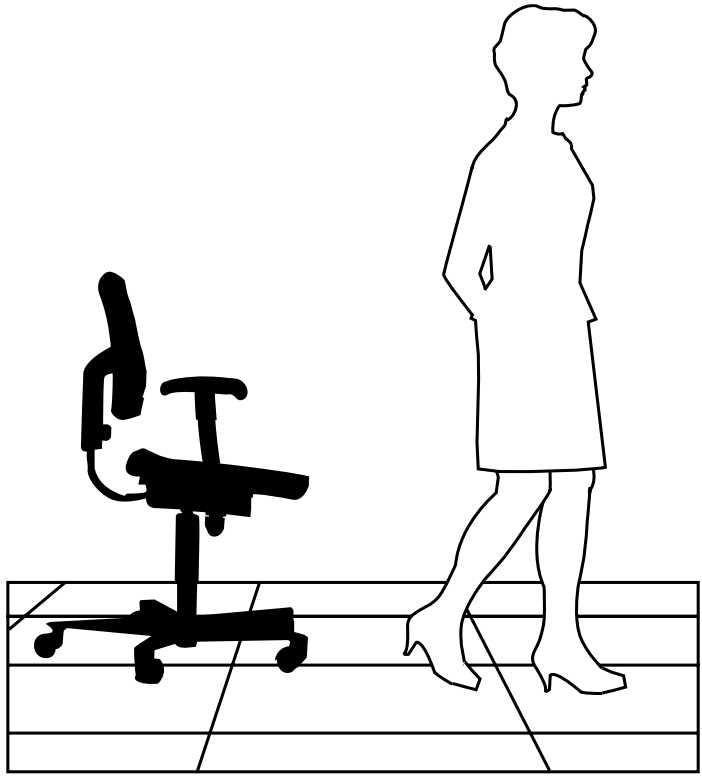
- Adjust the monitor height so that the top of the screen is at or slightly below eye level. Your eyes should look slightly downward when viewing the middle of the screen.
- Position your monitor no closer than 12 inches and no farther away than 28 inches from your eyes. The optimal distance is between 14 and 18 inches.
- Rest your eyes periodically by focusing on an object at least 20 feet away. Blink often.

- Position the monitor at a 90° angle to windows and other light sources to minimize glare and reflections. Adjust the monitor tilt so that ceiling lights do not reflect on your screen.
- If reflected light makes it hard for you to see your screen, use an anti-glare filter.
- Clean your monitor regularly. Use a lint-free, non-abrasive cloth and a non-alcohol, neutral, non-abrasive cleaning solution or glass cleaner to minimize dust.
- Adjust the monitor's brightness and contrast controls to enhance readability.
- Use a document holder placed close to the screen.
- Position whatever you are looking at most of the time (the screen or reference material) directly in front of you to minimize turning your head while you are typing.
- Get regular eye check-ups.

## Vary Your Workday

If you use your computer for prolonged periods, follow these instructions.

- Vary your tasks throughout the day.
- Take frequent short breaks that involve walking, standing, and stretching. During these breaks, stretch muscles and joints that were in one position for an extended period of time. Relax muscles and joints that were active.
- Use a timer or reminder software to remind you to take breaks.



- To enhance blood circulation, alter your sitting posture periodically and keep your hands and wrists warm.

***Note*** For more information on workstation setup, see the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations. ANSI/HFS Standard No. 100-1988. The Human Factors Society, Inc., P.O. Box 1369, Santa Monica, California 90406.

# *Pre-existing Conditions and Psychosocial Factors*

Pre-existing conditions that may cause or make some people more susceptible to musculoskeletal disorders include the following: hereditary factors, vascular disorders, obesity, nutritional deficiencies (e.g., Vitamin B deficiency), endocrine disorders (e.g., diabetes), hormonal imbalances, connective tissue disorders (e.g., arthritis), prior trauma (to the hands, wrists, arms, shoulders, neck, back, or legs), prior musculoskeletal disorders, aging, fluid retention due to pregnancy, poor physical conditioning and dietary habits, and other conditions.

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.

Contact a doctor if you experience pain, tenderness, swelling, burning, cramping, stiffness, throbbing, weakness, soreness, tingling and/or numbness in the hands, wrists, arms, shoulders, neck, back, and/or legs.

# *Checking Your Comfort: How Do You Measure Up?*

Use this checklist to see if you are setting up your work environment to fit your physical needs.

## *Checking Your Chair*

- Do you sit in an upright position with the backrest supporting your lower back?
- When sitting, are your feet flat on the floor?
- Do you periodically adjust your chair and your posture?

## Checking Your Keyboard

- Is your keyboard angled so your wrists are straight when you type?
- Is your keyboard directly in front of you?
- Do you avoid resting your wrists on sharp edges?
- Do you press the keys gently and not bang on them?

## Checking Your Mouse

- Is your mouse at the same height as the keyboard and next to the keyboard?
- Are your wrists straight and your touch light when moving the mouse?

## Checking Your Monitor

- Did you adjust your monitor so that the top of the screen is at or slightly below eye level?
- Do you periodically rest your eyes by blinking often or looking away from the screen?
- Is your monitor no closer than 12 inches and no farther away than 28 inches from your eyes?
- Do you use a document holder placed close to the screen?

## Checking You

- Is your work area set up to promote a natural and relaxing working position with frequently used work items within close reach?
- Do you take frequent short breaks?
- Do you stretch and walk during your breaks?
- Do you vary your tasks during the day?
- Do you have regular eye checkups?
- Do you contact your doctor if you feel any sustained discomfort?

*For more information on workstation setup, see the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations. ANSI/HFS Standard No. 100-1988. The Human Factors Society, Inc., P.O. Box 1369, Santa Monica, California 90406*

*This appendix was prepared in consultation with Dr. David Rempel of the University of California/San Francisco Ergonomics Program and Mr. M.F. Schneider of HUMANTECH, Inc., Ann Arbor, Michigan.*

# B

# System Specifications

- System Board
- System Peripherals
- Dimensions
- Power
- Operating Environment
- Compliance

# System Board

The following sections give the specifications for major components on the system board.

## System Processor

- Processor types (type, speed, and FSB depend on system model)
  - — Intel Celeron 500-MHz or higher processor, 66-MHz or higher FSB
  - — Intel Pentium III 533-MHz or higher processor, 100-MHz or higher FSB
- Support — 32-bit addressing, 64-bit data
- Secondary cache — 128 KB (Celeron) or 256 KB (Pentium III)
- Socket — 370-pin Socket 370

## Random Access Memory (RAM)

Total system RAM — minimum of 64 MB of SDRAM installed in one of two industry-standard DIMM sockets on system board.

- Total system memory — support for up to 512 MB of high-speed SDRAM in two memory module sockets on system board
- DIMM speed must match processor bus speed (100 MHz or higher)
- Memory module type — gold-plated, non-parity, SDRAM modules
- Expansion — supports 64-MB, 128-MB, and 256-MB non-ECC DIMM modules

## Cache Memory

- pipelined 32-bit addressing
- 64-bit data

## Read Only Memory (ROM)

Flash ROM — 4 Mbit

## Calendar Clock

Year/month/day/hour/minute/second/.01 second; maintained by lithium coin cell battery.

## Input/Output (I/O) Features

Industry-standard interfaces integrated on system board:

- Universal Serial Bus (USB) — two USB ports support two USB peripherals directly to the system. With appropriate connectors, the system supports up to 127 daisy-chained devices. Supports 12 megabits (Mbs) per second.
- Parallel — bi-directional, ECP/EPP support; one 25-pin connector
- Serial — one high-speed RS-232C port using a 16550 UART, supports transfer rates up to 115.2 KB per second; one 9-pin connector.
- Keyboard — PS/2-compatible, 6-pin connector (mini DIN)
- Mouse — PS/2-compatible, 6-pin connector (mini DIN)
- VGA Monitor Connector — supports a VGA-compatible monitor with a 15-pin connector
- Microphone In — supports a microphone or other audio input device for recording audio information in data files or broadcasting audio
- Line In — supports input from an external audio device
- Line Out — supports powered speakers or amplified output device
- Headphone — supports optional external headphone set
- IDE
  - — support for an Ultra DMA/33/66 IDE hard drive and an IDE CD-ROM drive or DVD drive
  - — support for PIO mode 4
- Diskette drive — supports 1.44-MB diskette drive; 34-pin connector
- RJ-45 LAN connector.

## Video Memory

Standard video memory — shared with system memory. Memory allocation controlled by Dynamic Video Memory Technology (DVMT).

## Sound Controller

All systems come with audio integrated on the system board. The audio is based on the Audio-Codec AC 97 controller. Features include:

- Compatible with Sound Blaster Pro™, Sound Blaster™ 2.0, MPU-401, and Microsoft® Windows Sound System™ for PC sound applications
- SigmaTel STAC9700 Codec
- SigmaTel Surround (SS3D) Stereo Enhancement
- 18-bit full duplex stereo ADC, DACs
- Low-noise differential CD-ROM input
- AC'97 2.1 compliant
- Five analog line-level inputs.

## Local Area Network

The system comes with a local area network (LAN) integrated on the system board. Features include:

- 3COM CC920 BR006 chipset
- PCI bus type
- RJ-45 LAN port
- 10Base-T/100Base-TX with Wake On LAN and AOL2 support.

## Graphics Controller

Systems come with a Direct AGP graphics controller chip integrated on the Intel i810e chipset. Features include:

- 4 MB of dedicated display cache video memory
- Integrated Hardware Motion Compensation
- 2D/3D graphics
- GMCH with DDM/DDM+.

# System Peripherals

The following sections give the specifications for system peripherals.

## Keyboard

Systems come with a Windows enhanced PS/2-compatible keyboard.

- Function keys
- Cursor control keys
- Numeric keypad
- Windows keys
- Typewriter keys

## Mouse

Systems come with a PS/2-compatible mouse.

## Diskette Drive

Systems come with a notebook type diskette drive, 3 1/2-inch, 1.44 MB

- Capacity
  - — High density mode:
    Unformatted: 2.00/1.00 MB
    Formatted: 1440 KB (512B 18 Sec)
    720 KB (256B 18 Sec)
  - — Normal density mode:
    Unformatted: 1.00/0.50 MB
    Formatted: 640 KB (256B 16 Sec)
    20 KB (128B 16 Sec)
- Data transfer rate
  - — High density mode: 500/250 Kbit/sec
  - — Normal density mode: 250/125 Kbit/sec

### Hard Drive

Systems come with a 10-GB or higher EIDE Ultra DMA33/66 hard drive with SMART® technology.

### CD-ROM Drive

Systems come with a 40X or higher CD-ROM drive.

**⚠ CAUTION** Use of CD-ROM drive controls, adjustments, or the performance of procedures other than those specified in this document may result in hazardous radiation exposure.

### DVD Drive

Some systems might come with an 8X or higher DVD drive.

### Optional Speaker Set

If ordered, systems come with a speaker set and AC power adapter. Features include:

- 16-bit stereo, 48 KHz
- Sound Blaster compatible.

## Dimensions

### System

Slimtower chassis — 3.4 inches (87 mm) wide x 12.9 inches (332 mm) deep x 12.3 inches (315 mm) high

Weight — approximately 12.8 lb. (5.8 KG)

### Keyboard

Height — 1.4 in. (35.6 mm)

Length — 18.0 in. (457.2 mm)

Width — 6.7 in. (170.2 mm)

## Power

The system has a 106-watt AC power supply with the following features.

- AC power input — 100 - 240 Volt, 50-60 Hz
- Switch selectable — 115 or 230 volts
- Power connectors — one diskette drive, one system board, two storage devices (hard drive, CD-ROM drive or DVD drive)
- Power management — full-power reduction

## Operating Environment

Temperature, operating — 32° F to 95° F (0° C to 35° C)

Relative humidity, operating — 85% at 35° C

## Compliance

| | |
|---|---|
| Domestic: | FCC CFR 47 Part 15, Subpart B<br>UL 1950 3rd edition |
| Canadian: | C-UL C22.2 No.950-95<br>ICES-003 Issue 2, Revision 1 |
| Year 2000: | YMARK 2000<br>NEC Y2KTEST.EXE<br>WHQL |
| DMI | DMI 2.0 Self Certification Test Suite |
| Energy Star | All systems are Energy Star Compliant |

# Index

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## W

# Regulatory Statements

The following regulatory statements include the Federal Communications Commission (FCC) Radio Frequency Interference Statement, compliance statements for Canada and Europe, battery disposal and replacement information, and the Declaration of Conformity.

## *FCC Statement for United States Only*

**⚠ 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.
- Consult the dealer or an experienced radio/TV technician for help.

## *Canadian Department of Communications Compliance Statement*

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations (pursuant to ICES-003 Issue 2, Revision 1).

## *Avis de conformité aux normes du ministere des communications du Canada*

Cet equipment numérique de la Classe B respecte toutes les exigences du Reglement sur le matérial brouillage du Canada (en conformité avec ICES-003 Emission 2, Révision 1).

## *European Community Directive Conformance Statement*

This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of laws of the Member States relating to electro-magnetic compatibility. This product satisfied the Class B limits of EN55022.

## *Battery Replacement*

A lithium battery maintains system configuration information. In the event that the battery fails to maintain system configuration information, NECC recommends that you replace the battery. See Chapter 5 for battery replacement information.

**⚠ WARNING** There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

**⚠ AVERTISSEMENT** Il y a danger d'explosion s'il y a replacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

## Battery Disposal

The CMOS battery is made of lithium. Contact your local waste management officials for other information regarding the environmentally sound collection, recycling, and disposal of batteries.

NEC Computers Inc.

# DECLARATION OF CONFORMITY

*We, the Responsible Party*

NEC Computers Inc.
15 Business Park Way
Sacramento, CA 95828

*declare that the product*

***NEC PowerMate ES SlimLine Series***

is in compliance with FCC CFR47 part 15 for Class B digital devices.