PROPRIETARY NOTICE AND LIABILITY DISCLAIMER

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4 System BIOS and Utilities

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C System Specifications

D   System Board, Connectors, and Error Messages

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Using This Guide

The *NEC Direction L-Series User Manual* provides a quick reference to information about your computer.

This manual contains the following information:

■ Chapter 1, Introducing Your Computer, provides a look at system components. See this chapter to familiarize yourself with your system.

■ Chapter 2, Using Your Computer, explains how to start up and shut down your system, use your system components, and care for your system.

■ Chapter 3, Understanding System Features, provides a quick overview of the various features of your system.

■ Chapter 4, System BIOS and Utilities, describes the system BIOS Setup utility program and other utilities you can use to configure your system. This chapter provides detailed information about BIOS settings, including security and power management parameters.

■ Chapter 5, Installing Options, provides installation instructions and in some cases, removal procedures for the options.

■ Chapter 6, Setting System Board Jumpers, provides information on changing jumper settings when reconfiguring your system.

■ Chapter 7, 24-Hour Information Services, lists the services available to you for information and help, and describes how to access the services.

■ Chapter 8, If You Have a Problem, contains troubleshooting tips for solving simple problems and provides information on where you can find help when you cannot solve a problem yourself.

■ 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.

⚠ **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.

■ Appendix B, Limited Warranty, provides warranty information, policies, and restrictions.

■ Appendix C, System Specifications, provides a technical description of your computer and its components.

■ Appendix D, System Board, Connectors, and Error Messages provides a technical description of the system board, connectors, and describes system error messages.

TEXT CONVENTIONS

This manual 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, press **Enter**.

■ Filenames are printed in uppercase letters.

RELATED DOCUMENTS

In addition to this guide, the following printed documentation ships with your NEC Direction L-Series system:

■ *NEC Direction L-Series Quick Setup*
Quick Setup contains information for quickly getting your system up and running. Read this information to set up the system for the first time.

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

■ *NEC Direction L-Series Release Notes*
This document provides you with additional information about your computer that was not available at the time your user's guide was printed.

Your system ships with additional documentation depending on your configuration and any options you selected. See the documentation specific to devices such as your monitor, speakers, and video graphics board for detailed information about them.

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

■ *NEC Direction L-Series Service and Reference Manual*
This manual provides information for maintaining, troubleshooting, and repairing NEC Direction L-Series systems. This guide also includes hardware and interface information for programmers, engineers, and others who need to know how the systems are designed.

■ NECCSD FaxFlash™ Service
NECCSD FaxFlash is an automated service that sends the latest information about NECCSD and its products directly to a fax machine. The service is available 24 hours a day, 7 days a week.

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

See Chapter 7 for information about using FaxFlash.

1 Introducing Your Computer

> ## ⚠ 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.

Your NEC Direction L-Series multimedia computer comes with state-of-the-art, high-performance components for delivering years of service. Based on an Intel$^{®}$ Pentium II$^{®}$ processor with MMX™ technology, your system has the power and speed to tackle all today's computing needs and most of tomorrow's.

After setting up your system, take the time to familiarize yourself with your computer. This chapter provides a brief look at the features of your system.

> NOTE This guide covers both desktop and minitower models of the NEC Direction L-Series system. Features are identical for desktop and minitower systems; only their orientation differs.

FRONT FEATURES

Daily contact with your system is through the controls on the front panel. The following figures show the control features on the front of the system.

Front features — desktop models

CD-ROM Reader

Diskette Drive A
Power Lamp
Power Button
Disk Lamp
Reset Button
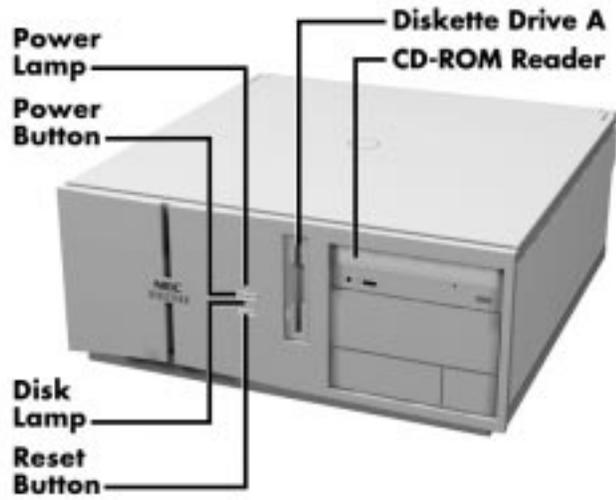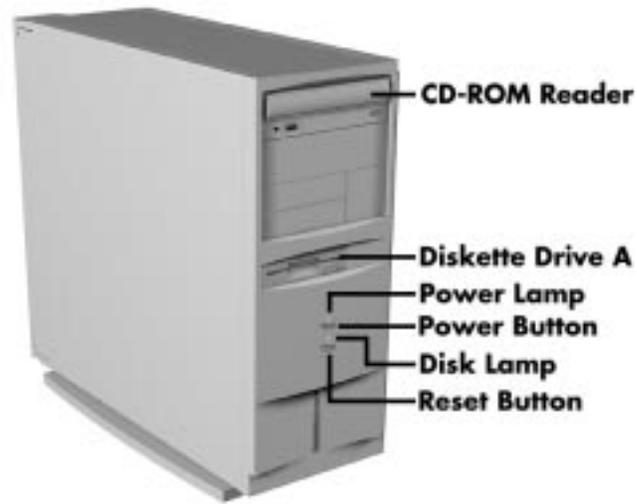
Front panel features — minitower models

System Controls and Lamps

System controls let you select specific system operations; the lamps let you know the status of system operation. Your computer has the following controls and lamps:

■ Power button
  Turns the system on and off.

■ Reset button
  Lets you restart your system manually when it does not respond to keyboard commands.

> ⚠ **CAUTION**
>
> Resetting your system can result in the loss of data. Press the reset button only when all other methods of restarting your computer fail.

- System power lamp
  Lights when the system is turned on.

- Disk lamp
  Lights when the hard disk drive is active, reading or writing data.

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

Diskette Drive A

Your diskette drive has the following features:

- Diskette drive busy lamp
  Lights when the diskette drive is active, reading or writing data on 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.

■ Diskette drive eject button
   Lets you remove a diskette from the diskette drive.

Diskette Drive Busy Lamp

Diskette Release Button
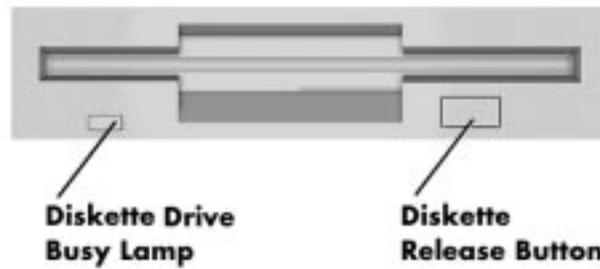
Diskette drive features

CD-ROM Reader

Your computer comes with a high-speed ATAPI CD-ROM reader. The CD-ROM reader operates at different speeds depending on whether the CD you are using contains data or music. High-speed operation lets you get your data faster and see smoother animation and video.

> **NOTE** The CD-ROM reader in your system might look different from the one shown in the following figure. The features depend upon the model you purchased.

CD-ROM reader features
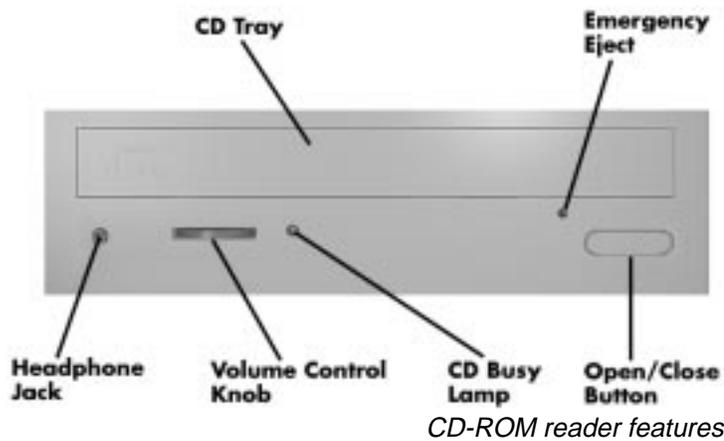
■ Headphone jack
Allows the connection of an optional set of stereo
headphones through a mini-jack plug.

■ Volume control knob
Controls the volume of the optional headphones.

■ Open/close button
Opens and closes the CD tray. Press this button when
the computer power is on to insert or remove a CD.

■ CD tray
Provides a surface for loading a CD into the reader.
Press the open/close button to open or close the CD tray.

■ CD busy lamp
Lights when reader is retrieving data, music, or
graphics/audio from a CD. Do not eject the CD or turn
off the system when the lamp is on.

■ Emergency eject hole
Allows you to remove a CD manually if normal methods
fail with the open/close button or through sound
software.

BACK FEATURES

Setting up your system is mainly done through external connectors on the back of the computer. The following figures show these connectors.

Note that the minitower and desktop models differ only in orientation.
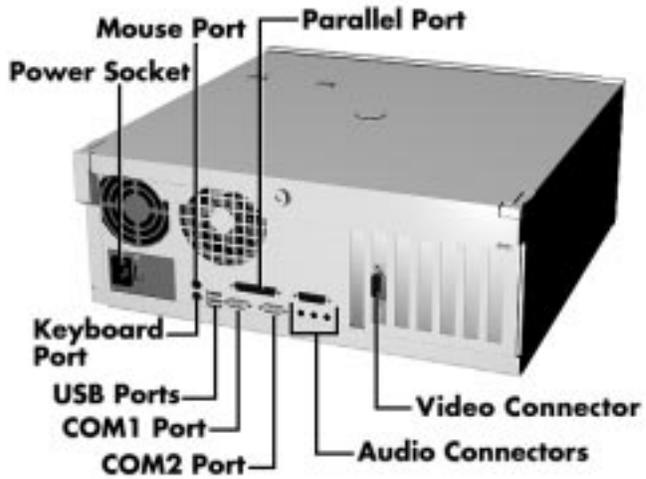
Rear features — desktop models
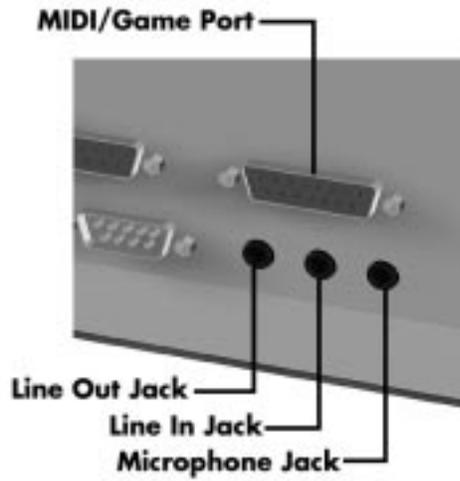
Audio connectors — desktop models
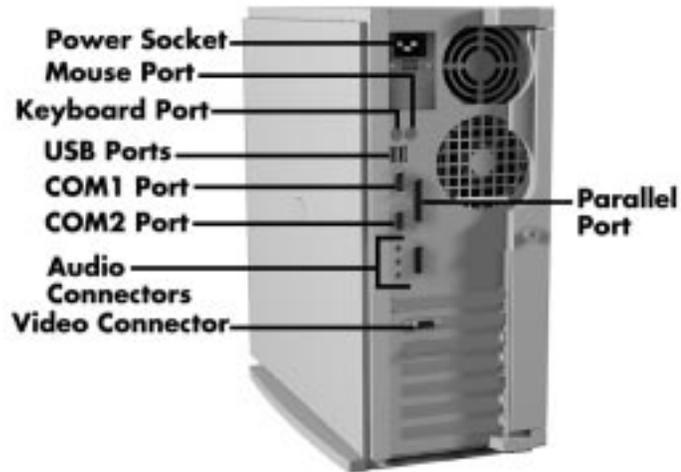
Rear features — minitower models
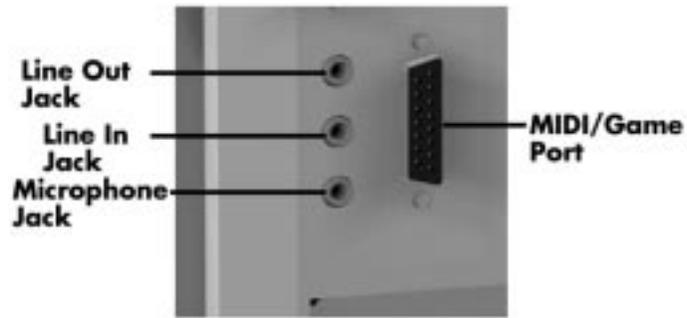
Audio connectors — minitower models

External Connectors

Your peripheral components attach to connectors on the back of your computer. This is where you connect the monitor, keyboard, mouse, speakers, and printer.

> **NOTE** Your system might have additional boards not shown in the previous figures. Boards and board locations vary depending on the model and options you purchased.

■ Keyboard port
Connect the keyboard that comes with your computer to this port. The keyboard port supports a personal system (PS)/2®-compatible, 104-key keyboard with a 6-pin mini DIN connector.

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

■ Parallel port
Use this port to connect a parallel printer with a 25-pin connector to the system.

■ Serial ports (COM1 and COM2)
Attach a serial device with a 9-pin connector to each serial port. Serial devices include a pointing device, serial printer, or modem.

■ Universal serial bus (USB) ports
Use these ports to connect a wide range of new USB devices, such as printers, mice, joysticks, keyboards, and telecommunication devices. The speed varies between 12 megabits per second (Mbps) for printers and 1.5 Mbps for mice and keyboards. You can daisy chain up to 127 devices using USB ports.

■ Audio connectors
Depending on the model, these connectors are either integrated on the system board or on a sound board. The audio connectors include line out, line in, and microphone in jacks, and a MIDI/game port.

— The line out jack connects powered speakers and other powered output devices.

— The line in jack connects stereo audio devices, such as an amplifier or a cassette or minidisc player for playback or recording.

— The microphone in jack connects a microphone or telephone headset. Connect the microphone that comes with your system to this jack.

— The MIDI/game port lets you attach a digital musical instrument for creating your own musical instrument digital interface (MIDI) files or a joystick or gamepad for playing games.

■ Video connector
Attach the signal cable from your monitor to this connector. This connection supports an NEC MultiSync® monitor or other video graphics array (VGA)-compatible monitor with a 15-pin connector.

The video board in your system depends on your system configuration. See the documentation that comes with your computer for detailed information about the board.

NOTE Your system comes with an Accelerated Graphics Port (A.G.P.) video board. A.G.P. is a new high-performance interface for graphics-intensive applications, such as 3D applications.

■ SCSI port (SCSI models only)
This port is on the SCSI adapter board that comes installed in an expansion slot on SCSI models. The Wide SCSI interface allows connection of up to 15 SCSI devices. See the documentation that comes with your computer for information about your SCSI adapter board.

- Fax/modem ports (some models)
  Some models come with a fax/data/voice modem board. The fax/modem allows the connection of a phone line to the computer for fax, data communications, and speakerphone functions. This is your connection to information services worldwide.

  See the fax/modem documentation that comes with your system to connect and use your fax/modem.

Power Supply Features

The system power supply has the following features.

- Power supply fan
  Keep this area clear for proper ventilation. The power supply fan cools system components and prevents them from overheating.

- Voltage selector 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.

Zip Drive

Some models come with an Iomega® Zip™ drive. The Zip drive lets you expand the storage capacity of your hard disk quickly and easily, 100 megabytes (MB) at a time.

Use the Zip drive to back up work, archive old files and email, organize your work, transport your work, and more. With 100-MB Zip disks, you get an unlimited storage capacity. The Zip drive features include a release button/data lamp. Press this button to release a Zip disk from the drive. The data lamp lights to indicate drive activity or status.

⚠ CAUTION

To prevent damage to your Zip drive and data, do not turn off the system or remove a Zip disk while the data lamp is lit.

Zip drive features (on Zip models only)

Microphone

All systems come with a microphone. Use it to record voice and sound into your audio files.

Microphone

Speakers

All systems come with a pair of high-quality, stereo speakers that you can arrange to suit your work environment. See the documentation that comes with your speakers to set up your speakers and to adjust sound.

Mouse

In addition to the right and left mouse buttons, your mouse features a cursor movement wheel. The cursor movement wheel lets you scroll vertically and horizontally and zoom in to view data on the screen..
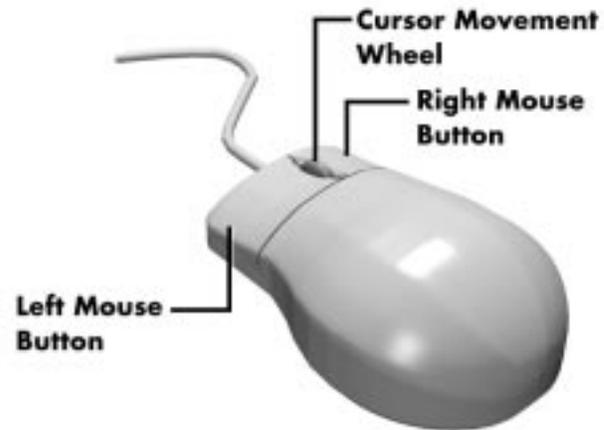
Mouse features

2 Using Your Computer

This chapter provides the information you need to start using your computer. Information includes:

- System operation

- Productivity

- Video display properties

- System care

- Moving or shipping your system

- Battery replacement

- Online documentation.

> **NOTE** Check the additional documentation that comes with your computer for information about using your monitor, speakers, graphics board, and any other devices that you purchased (such as a fax/data/voice modem).
>
> Read Windows Help files for information about using your mouse and customizing the settings.

SYSTEM OPERATION

In this section, you can find the following information:

- starting up and shutting down your system

- setting the date and time

- using system features such as the CD-ROM reader

- using power management and security features.

Starting Up

Press the power button to start up your system. The power lamp lights green to indicate that the system is on.

Several configuration messages appear on the screen at startup. These messages are part of your system's Power-On Self-Test (POST). Your computer is checking your hardware for any changes since the last startup. One beep indicates that the system has successfully completed the power-on test.

> **NOTE** You can bypass the POST memory test by pressing the space bar.

If a problem occurs, a series of beeps may sound. If this happens repeatedly after powering on, power off the system and turn to Chapter 8. This chapter provides some helpful hints on obvious system problems.

> **NOTE** If the system displays a message indicating that system settings have changed, run Setup (see Chapter 4).

On models loaded with the Windows NT® operating system, press **Ctrl-Alt-Del** when prompted on-screen to do so. The log-on box appears for entering a password.

Shutting Down

Follow these steps to shut down (power off) your computer.

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

2. Exit the application program.

3. Close any open applications. If you have programs in the taskbar, click on them and close them.

4. Make sure that the hard drive and diskette drives are off. If the hard drive light or diskette drive light is lit, it indicates that the drive is in use.

⚠ **CAUTION**

To protect the integrity of your data, shut down all applications before turning off the power. Unless absolutely necessary, never power off the system:

- without exiting properly

- when the hard drive light or diskette drive light is lit.

---

5. Press the Start button on the Windows® taskbar, then highlight and click "Shut Down." Selecting Shut Down gives you several choices in the pop-up submenu. Click "Shut down the computer," then click the **Yes** button or press **Enter** to shut down the computer.

6. Windows displays the message "It's now safe to turn off your computer."

7. Turn off power to your monitor.

> **NOTE** If you are unable to exit using the Windows
> Start button, you can use the power button on the
> front of the system to power off. Press and hold in
> the power button for about ten seconds to shut down
> the system manually.

Setting the Date and Time

Use the following steps to set the system date and time
within Windows 95 or Windows NT.

1. Double click the system clock on the taskbar.

2. Set the time by entering the current hour, minutes, and
   seconds in the appropriate fields, *hh:mm:ss*. Move from
   field to field with the Tab key or Shift-tab to move from
   right to left.

3. Set the date by entering the month and year in
   appropriate fields. To select the day, click on the
   numeric day of the calendar.

Using Diskettes

Follow these steps to insert a 3.5-inch diskette in the
standard diskette drive.

1. Holding the diskette at its top edge, insert it into the
   diskette drive:

   ■ label side facing right in desktop systems.

   ■ label side up in minitower systems.

2. Insert the diskette all the way into the drive until you
   hear a click.

> **NOTE**
> If your diskette did not come formatted, you must format it before storing information on it. See your operating system documentation for information about formatting a diskette.

> ⚠ **CAUTION**
> Do not format your hard drive. Formatting the hard drive erases all preinstalled applications.

To remove a diskette from the diskette drive, press the release button on the 3.5-inch diskette drive.

- Do not remove a diskette from the drive when the diskette drive lamp is lit. To do so can damage both the data on the diskette and the drive.

- Do not turn off the system power while the diskette is being accessed.

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

Using CDs

See the following sections for information about handling, loading, and removing CDs.

Handling Compact Discs

To protect your CDs from damage, use the following guidelines when you handle them.

■ Always pick up the disc by its edges.

■ Do not touch the surfaces of the disc. Handle it by the edges and, if necessary, by putting your finger through the hole.

Handling a CD

■ Do not write on or apply labels to either side of the disc.

■ Keep the disc away from direct sunlight or high temperatures. Clean fingerprints or dust from the disc by wiping it with a soft dry cloth.

■ Gently, brush the cloth from the center of the disc toward the edge.
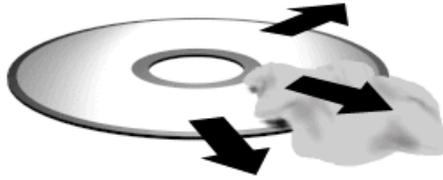
Cleaning a CD

⚠ **CAUTION**

Do NOT use benzene, paint thinner, record cleaner, static repellent, or any other chemical on the disc. Chemicals and cleaners can damage the disc.

Loading a CD

To insert a CD into the CD-ROM reader, follow these steps:

1. Press the open/close button. A CD tray slides out from the reader.

2. Remove the CD from its protective case. Hold the CD by its center hole and outer edges to avoid touching its surface.

3. Place the CD, printed side up, into the circular area of the tray.

4. Press the open/close button again. The reader automatically slides into the tray.

Removing a CD

To remove a CD, simply press the open/close button and remove the CD when the tray slides out. Press the open/close button again to close the reader tray.

Using Your System's Audio Functions

Multimedia systems come with all the audio functions and components you need to produce fine stereo output. See the separate documentation included with these devices.

The integrated audio components in multimedia systems provide support for industry sound standards including Sound Blaster™ , Windows Sound System™, and MPU-401 to provide all the functionality required for your multimedia applications.

Power Management

Your system provides an energy-saving Advanced Power Management feature, which reduces power consumption when your computer is idle. You can set the length of this idle time in your system's Setup utility.

1. Enter the Setup utility by pressing **F2** when the following bootup message appears.

    Press <F2> to enter SETUP

2. The Main menu appears. Use your right arrow key to select the Power menu. The Power Management option is factory set to "Disabled."

3. Press **Enter** to select Power Management. A sub-menu box appears.

4. Use your arrow keys to select "Enabled."

5. Follow the on-screen prompts to change the options. You can set the Inactivity Timer for up to a 16-minute delay.

6. Use the up and right arrow keys to select Exit.

7. Select "Exit Saving Changes." Press **Enter**.

8. At the prompt, to confirm exiting setup, press **Enter**.
   Exit the Setup utility.

> (NOTE) When you want to resume work after your computer has entered power-saving mode, just move your mouse or press a key, and your computer is active again.

Protecting Your System

Your system's security features provide protection against unauthorized access to your system and data. This protection includes a user and supervisor password.

Dual password security provides two levels of password security. A "Supervisor password" allows access to the system's Setup utility for system configuration. A "User password" allows system bootup only after the entry of a password.

When you start up your system for the first time, you are asked to enter a system password. The following section explains the password procedure.

Setting a Password

Use the following procedure to set a password.

1. Turn on or reboot your system. Setup displays the following message:

   Press <F2> to enter SETUP

2. Press **F2**. Setup's Main menu appears.

3. Using your arrow keys, select Security from the menu bar. The Security menu appears.

4. Select "Set Supervisor Password" or "Set User Password" with the arrow keys and press **Enter**.

> NOTE Enabling the Supervisor Password feature requires that a password be entered before entering the Setup Utility.

Setup displays a dialog box with the following prompts:

Enter new password: [   ]
Confirm new password: [   ]

5. Type your password and press **Enter**. Passwords are not case-sensitive. Reenter your password and press **Enter** again.

6. Use the arrow keys to select Exit.

7. Select "Exit Saving Changes." Press **Enter**.

8. At the prompt, to confirm exiting setup, press **Enter**. Your password takes effect the next time you power on the system. You must enter a password the next time you power on.

Using a Password

After you set your password in Setup and reboot the system, a password prompt appears each time you power on the system.

To use your password, type the password at the password prompt and press **Enter**.

> **NOTE** For security, characters you enter do not appear on your screen. Enter your password carefully.

If you enter the password incorrectly, your system does not boot. You have three chances to enter the correct password. After the third unsuccessful attempt, you must reboot your system and try again.

PRODUCTIVITY

The following sections explain how to use your system to maximize your productivity.

Saving Your Work

Save your work often! The time you take to periodically save your data file as you work can save you time in the end! By doing so, you can avoid losing a whole day's work or more when the unexpected happens, such as losing power due to a power outage.

Some applications provide automatic save options for specified intervals of time as you work. For example, you might want to save your work every 10 minutes. This reduces the amount of lost information should you lose power or experience some other problem.

In Windows programs, you can select a Save option from the File menu. If you are creating a new file, you'll need to specify a name for your file and a location to store it (drive and directory).

Always save your work before you exit an application. See the application's documentation for available save options.

Backing Up Your Work

Back up your work on a regular basis! Backup procedures are important for the efficient and effective use of your computer. Protect your program and data files with regular backup procedures.

Make backup copies of your program and data files that are on diskette and on the hard drive.

The standard practice for diskette backup is to copy each diskette, store the original in a safe place, and use the copy as your working diskette. See your operating system documentation for information about copying diskettes. Use your Zip drive or Ditto tape backup unit (if installed) to backup your files.

Printing a Document

Before you can print out a document, you must

■ connect a printer to your computer

■ set up the printer.

If you have not connected a printer, see "Connecting a Parallel Printer" in Chapter 5.

If you did not choose a printer when you initially set up your computer, you'll need to do that before you can print (see your Windows documentation). If you are using a non-Windows program, you'll need to set up a printer driver for that program. See your printer documentation for printer setup information.

Once your program is set up to work with your printer, printing a file within a Windows application is easy:

1. Turn on your printer power.

2. Be sure you have paper in your printer. See your printer documentation to load paper.

3. Check that the printer is "online" or "selected." See your printer documentation for information about choosing the online mode.

4. Select "Print" from the File menu of your Windows application. A Print dialog box appears.

5. Select how many print copies you want and the range of pages. To print one copy of all the pages, simply click "OK."

DISPLAY PROPERTIES

The following procedure describes how to load video drivers to change the properties of your display. The display properties that you can set include the screen resolution, the number of colors displayed, and the video refresh rate.

For information about the resolutions, colors, and refresh rates supported by your video drivers, see the separate documentation that describes your video adapter.

> **NOTE** If your monitor is flickering or you change your monitor, check that the Monitor type parameter is set correctly for your monitor.

1. From the Windows desktop, press the right mouse button and click on Properties.

2. The Display Properties window appears. Select the Settings tab.
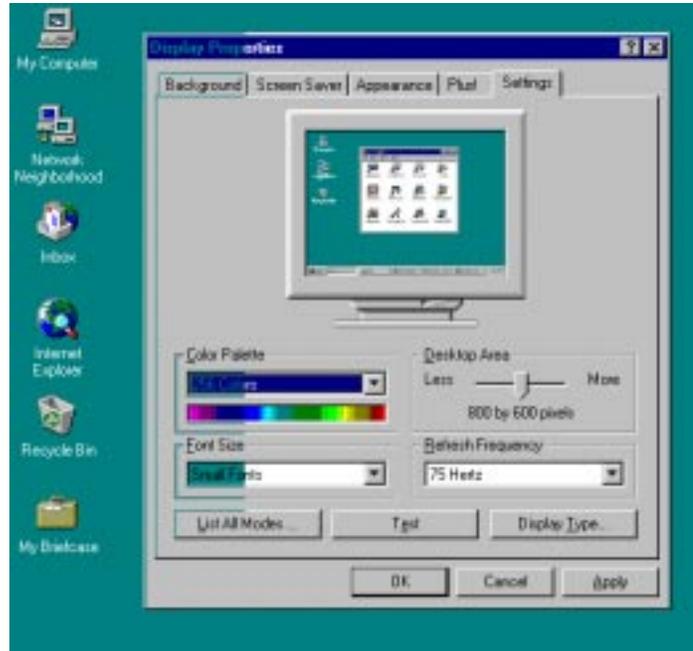
Display Properties Window

3. Use the slide bar in the Display Area section of the screen to select the screen resolution.

4. Select the number of colors you want to display from the Color Palette section of the screen.

> (NOTE) If you are using Windows NT, you can click on List All Modes. You get a list of all the modes available for your video board.

5. Click "Apply" to test the new display settings. If you are sure that the settings are correct, click "OK."

SYSTEM CARE

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

Protecting Your System from Damage

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

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

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

■ Avoid repeated power-on cycles. 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 your 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. To do so could damage your system and its peripherals.

■ Use Setup options to limit access to your computer (see "Security Menu" in Chapter 4). Use appropriate virus detection software regularly to protect your system from computer viruses.

■ Keep your computer away from direct sunlight and extreme hot and cold temperatures.

You can find the operating and non-operating (storage) temperatures in Appendix C.

■ After turning off the 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 your monitor's ventilation vents or the system's power cables.

■ Prevent dust from entering your system by covering it when it is not in use.

Keeping Your System in Good Condition

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

⚠ **WARNING**

For safety, turn off and unplug your system, monitor, and any external devices before cleaning them.

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

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

■ Keep food and liquids away from your computer.

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

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

■ Clean the monitor screen with a glass cleaner and wipe it with a clean, lint-free cloth. You may 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 your hard drive files onto diskettes, Zip disks, or tape cartridges.

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

2. Remove any diskette from the diskette drive. If you have a CD in the CD-ROM reader, remove the CD. If you have a Zip disk in a Zip drive, remove the disk.

3. Turn off the system unit and any external options connected to it.

4. Unplug the system unit power cable from the wall outlet or surge suppressor, then from the unit itself.

5. Unplug any external options from the wall outlets or surge suppressor, then disconnect them from the system unit.

6. Pack the system components in the original shipping materials and cartons. If these are not available, be sure to use adequate packing materials to protect the components.

BATTERY REPLACEMENT

All system boards use a battery to maintain system configuration information. Your system uses a coin-sized 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.

⚠ **CAUTION**

Removing the battery from the system board causes the computer to lose system configuration information. Before removing the battery, run the Setup Utility and print out or write down your system configuration settings. Then you can restore your system to its previous settings.

⚠ **WARNING**

The battery can explode if it is incorrectly replaced or improperly discarded. Use only the same 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.

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

1. Turn off and unplug the computer and any external components connected to it.

2. Remove the system access cover. See Chapter 5. Observe all safety precautions when removing the cover.

3. Locate the battery on the system board. You may have to remove any expansion boards in the way.
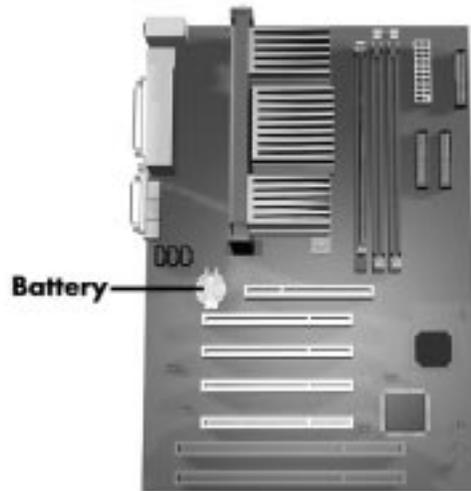
Locating the battery

4. Carefully pull the battery upward until there is sufficient space to slide the battery out of the socket. You can lift the battery with a plastic screwdriver or orange wood stick; however, be careful to avoid scratching the system board.

5. Remove the battery and discard in accordance with the manufacturer's instructions.

6. With the positive (+) side facing up, slide the new battery into the socket.

7. Replace any removed expansion boards.

8. Replace the system access cover.

9. Connect external peripherals and power cables

10. Run the Setup Utility to reconfigure your system parameters (see Chapter 4).

ONLINE DOCUMENTATION

Most of your application programs include online help at the touch of a button (usually the Help button). Many programs also incorporate separate, complete online user's guides.

Windows 95 and Windows NT provide extensive online help and "wizards" to guide you through procedures.

WHERE TO GO FROM HERE

Once you have your system up and running, we suggest that you install your applications and study the documentation that comes with them.

See the following quick reference chart to find information about some of the things you might want to do.

Quick Reference to Information About Your Computer

WHAT YOU WANT TO FIND	WHERE TO FIND IT
Basic information about my computer	"Introducing Your Computer," Chapter 1
Setting a password	"Setting a Password" in this chapter
Loading a CD	"Loading a CD" in this chapter
Adding options	Chapter 5, "Installing Options"
Understanding power management	"Power Saving Feature," Chapter 3, and "Power Menu," Chapter 4
Accessing the World Wide Web	"Microsoft Internet Explorer"
Protecting my system from viruses	"VirusScan" and "WebScan"
Changing video drivers	"Display Properties" in this chapter.
Using support services	"24-Hour Information Services," Chapter 7
Taking care of my system	"System Care" in this chapter
Troubleshooting tips	"If You Have a Problem," Chapter 8

3 Understanding System Features

Your Direction L-Series computer is a 233-, 266-, or 300-MHz Intel® Pentium® II-based system with MMX technology and 512 KB of pipeline burst cache memory.

STANDARD FEATURES

All models come with the following features:

- 3.5-inch, 1.44-MB diskette drive

- Memory — 32 to 192 MB of Synchronized Dynamic Random Access Memory (SDRAM) Dual In-line Memory Modules (DIMMs)

- A hard disk drive: 3.2-gigabyte (GB), 4.3 GB, or 7.0 GB Ultra DMA/33, or a 4- or 9-GB ultra-wide SCSI

- CD-ROM reader

- Yamaha® audio subsystem

- Altec™ Lansing® external speakers

- NEC microphone

- Accelerated Graphics Port (AGP) video port

- NEC palmrest keyboard

- Microsoft® IntelliMouse®.

Software installed on the hard disk includes:

- Microsoft® Windows NT® or Windows® 95

- MS Office 97®

- Appropriate drivers for your hardware

- McAfee® VirusScan™, McAfee WebScan™

- Adobe® Acrobat®.

SYSTEM CHASSIS

The chassis provides an enclosure for the system board, power supply, three PCI, one ISA expansion slot, one set of shared PCI/ISA slots, one specialized slot for the Accelerated Graphics Port (AGP), and seven storage device slots (two for hard drives).

SYSTEM BOARD COMPONENTS

Your computer's system board has the following components.

Processor

Processing for your system is provided by the Intel Pentium II microprocessor at speeds of 233, 266, or 300 MHz.

Drive Interfaces

- PCI EIDE

  — EIDE/ATA (Hard Disk Drives)

  — ATAPI (CD-ROM Readers, Tape Backup Units, Zip drives)

- SCSI (Adaptec)

  — Fast SCSI, Ultra Wide SCSI

Ports

Your computer's system board includes the following connectors on the rear panel:

- PS/2-style keyboard and mouse ports

- Two Universal Serial Bus (USB) ports

- Two serial ports (9-pin "D" style)

- One parallel port

- Audio — microphone in, line in, line out, MIDI/game port.

System Memory

Your system's standard memory configuration is 32 MB to 192 MB, depending upon the model you purchased. You can expand the memory to a maximum of 384 MB. See Appendix C for memory upgrade options.

Intel Xcelerator Multifunction Controller

Your computer uses an Intel PIIX4, which incorporates the PC-to ISA bridge, a USB controller, a dual-channel IDE interface, an enhanced DMA controller, an interrupt controller, power management, and a real-time clock.

See Appendix C for the interrupt level assignments (IRQ) table.

Flash ROM

With Flash ROM, a ROM BIOS change:

- is fast and easily done using a Flash utility

- eliminates the expensive replacement of ROM BIOS chips, and reduces system maintenance costs

- reduces inadvertent system board damage that can take place when replacing ROMs

- facilitates adopting new technology while maintaining corporate standards

- gives network administrators company-wide control of BIOS revisions.

Information on how to use the Flash utility is provided in Chapter 4, System BIOS and Utilities.

Plug and Play

The Intel/Phoenix BIOS is Plug and Play. It automatically configures both PCI and Plug and Play devices. This autoconfiguration feature allows you to insert or remove a PCI or Plug and Play ISA add-in card and power up your computer without complicated setting changes. The system automatically configures interrupts, I/O space, and other parameters. Any interrupts set to "Available" in the system Setup can be used by the Plug and Play board.

At the Intel Web site noted in the previous section, you can find the specifications and information on which versions of PCI and Plug and Play are supported by your system's BIOS.

Graphics and Multimedia Features

The system provides the following multimedia features.

Accelerated Graphics Port interface (AGP)

The Intel 82443LX PCI/AGP Controller(PAC) supports

- 3.3 V AGP devices

- data-transfer rates up to 500 MB/sec.

Video Support

Your system comes with a Accelerated Graphics Port video board installed. For more information about your video board see its documentation.

Audio

Your system's integrated audio chip, the Yamaha OPL$^{®}$ YMF715, and optionally the Yamaha YMF704 Wavetable Synthesizer on a module, integrates an enhanced stereo controller with an interface for MPU401 and a game port. It provides:

- all the digital and analog mixing functions you need to record and play sound

- line, microphone, and monoaural inputs

- Plug and Play compatibility

- Sound Blaster Pro and Windows Sound System™ compatibility

- Altec Lansing speakers complete the standard audio components.

The Wavetable Synthesizer, available on some models, integrates all the features of the YMF715 with a general MIDI processor and wavetable ROM, able to generate up to 24 voices simultaneously.

Super I/O Controller

As standard equipment, your system provides the National Semiconductor PC87307 Super I/O Controller, an ISA Plug and Play multifunction I/O device that incorporates:

- Two serial ports with

  — Two UARTS, software compatible with the 16450 and 16450A

  — 16-byte FIFO buffer

- Multimode bidirectional parallel port with

  — Standard mode compatibility

  — Enhanced Parallel Port (EPP) mode with BIOS and driver support

  — High-speed Extended Capabilities Port (ECP) mode

- Floppy disk controller

- Keyboard and mouse controller.

USB Ports

The two Universal Serial Bus (USB) ports allow you to add serial devices without opening up the system; simply plug them into the port.

- The ports are hot-pluggable: You can plug in a peripheral without shutting down the computer; the USB determines system resources for each peripheral and assigns them automatically.

- If you attach an external USB hub, up to 127 devices can be connected to a single PC.

Dual IDE Channels

The system board provides two independent bus-mastering PCI IDE interfaces. They support such ATAPI devices as a CD-ROM reader and Ultra DMA/33 hard drives. Up to four IDE devices may be connected at a time.

Power-Saving Feature

An Advanced Power Management (APM) feature in the BIOS can put the system into a power reduction mode of operation. This feature reduces energy consumption, but still allows the system to respond to requests from external devices, such as modems or a network.

In Setup, you can adjust how long a period of inactivity will elapse before the energy-saving Standby mode takes effect. This is a convenient way to save power when you need to be away from your computer for a short period of time.

Press a key or move the mouse and your system quickly returns to full power and to where you left off.

OPTIONS AND UPGRADES

Your system supports a variety of options.

Network Interface Card

You can select any of the following cards to add networking functions to your computer:

- 3COM 3C509B Combo card — 10Base T, ISA bus Plug & Play, with RJ45, BNC, and AUI connectors

- 3COM 3C905-TX Fast Etherlink® card — 10Base T, 100Base-TX, 100Base-T4, PCI bus, with an RJ45 connector

- Intel EtherExpress Pro/100 Ethernet LAN adapter — 10Base T, 100Base-TX, PCI bus, with an RJ45 connector.

Modem

U. S. Robotics® 56Kbps data/fax/voice modem.

Removable Storage

- Iomega® Ditto™ 1.6/3.2 GB TR3 Internal Tape Backup Unit (TBU), diskette drive-based controller

- Seagate Hornet 8 TR-4 4/8 GB TBU, ATAPI-based

- Seagate 4/8 GB SCSI DAT SCSI-based.

Keyboard

Microsoft Natural Keyboard

Audio

Altec Lansing ACS-410 Dolby® Surround Sound Stereo
speaker system with ACS-251 subwoofer

Power Backup

APC Model BF250 Uninterruptible Power Supply (UPS)
power backup system

4 System BIOS and Utilities

Your NEC Direction L-Series computer system is made up of many different components that work together to keep the system operating normally. This chapter provides information on the NECCSD utilities available for your system:

■ Setup utility

■ BIOS flash utility

■ Video drivers.

SYSTEM BIOS AND THE SETUP UTILITY

Configuration information is stored in a nonvolatile memory chip, a device that retains its data when system power is turned off. This chip is called a complementary metal-oxide semiconductor (CMOS) chip, and it is 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.

The system BIOS (Basic Input/Output System) is a set of configuration instructions burned into the CMOS chip. Your system ships from the factory with the BIOS set correctly for your configuration. Unless you add optional hardware, you do not need to run the Setup utility to operate your system. However, you might wish to run Setup to set features that customize your system, such as to add or adjust security features.

5 Installing Options

Your Direction L-Series system supports a variety of industry-standard and NEC expansion options. You can customize your computer with:

- Monitors – your system supports the connection of a VGA-compatible monitor such as the NEC MultiSync XE and XP series and NEC CS series.

- DIMM memory – your system comes with 32 MB to 192 MB of RAM upgradeable to 384 MB of memory.

- Video memory – your system comes with a 4-MB video board in the Accelerated Graphics Port slot.. Its video memory may be upgradable; see the documentation for your video board.

- Drives – your system supports a total of seven storage devices. In addition to the standard 3 1/2-inch, 1.44-MB diskette drive, internal hard disk drive, and CD-ROM reader, four other storage device slots are available.

OPTION INSTALLATION

Installation instructions for the following options are provided in this chapter:

- expansion boards

- DIMM memory upgrade

- video memory upgrade — see the documentation for your video board

- data storage devices

- external options.

Installation of all options (except external options) requires access cover removal. Procedures for removing the cover are explained in this chapter.

Safety Precautions

Before opening your computer, see the grounding instructions in Appendix D.

Take care 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 access cover, turn off the power and unplug any attached peripherals. The system power cord should remain connected, with the power off.

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

- Avoid carpets in cool, dry areas. Leave an option, such as a board or chip, in its anti-static packaging until ready to install it.

- Dissipate static electricity before handling any system components (boards, chips, and so on) by touching a grounded metal object, such as the system's unpainted metal chassis.

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

- Always hold a chip or board by its edges. Avoid touching the components on the chip or board.

- Take care when connecting or disconnecting cables. A damaged cable can cause a short in the electrical circuit. Misaligned connector pins can cause damage to system components at power-on.

- When installing a cable, route the cable so it is not pinched by other components and is out of the path of the system covers. Prevent damage to the connectors by aligning connector pins before you connect the cable.

- When disconnecting a cable, always pull on the cable connector or strain-relief loop; do not pull on the cable itself.

COVER REMOVAL AND REPLACEMENT

The following sections explain how to remove and to replace the access cover from your computer.

Note that the access cover is on the top of the desktop model and on the right side of the minitower model.

Removing the Access Cover

The following procedure describes how to remove the system access cover.

1. Turn off the computer.

2. Disconnect the keyboard, mouse, monitor, and any other external options (such as a printer) from the rear of the computer.

   Label all cables to make reinstallation easier.

3. Loosen the thumb screw at the rear of the system by turning it counterclockwise. If you installed a lock on the back of the system, unlock the lock and remove it.

Press in the release tabs located at the sides of the access cover.

Loosening the screw and pressing the tabs

4. Slide the cover toward the rear until it stops. (If it is very tight, you can also carefully insert a screwdriver into the slot adjacent to the fans at the back side of the cover, and very gently rock the cover loose, taking care not to scratch the system).

Sliding off the cover

5. Lift it away from the system.

Replacing the Access Cover

1. Gently set the access cover inside the edge of the case, taking care not to bend the metal tabs as follows.

   ■ Align the tabs on the access cover with their corresponding slots on the system.

   ■ Insert the tabs on the edge of the access cover into their slots on the system.

Aligning the tabs

2. Slide the access cover forward to meet the front panel.

3. Tighten the thumb screw.

> **NOTE** The cover fits tightly. If it does not slide all the way to the front panel, place one hand on the front of the unit while you slide the cover forward from the rear.

4. Reconnect all external peripherals.

EXPANSION BOARDS

Your computer's system board features several expansion slots that can accommodate accessory adapter boards, such as a sound board or TV board. Depending on the system you purchased, some of these devices may be installed in your system.

The Direction L-Series supports ISA Plug and Play expansion boards, which allow you to install a board in an expansion slot without changing the hardware settings. There are no system resource conflicts to resolve. Plug and Play automatically configures the board for the system.

Industry-standard 8-bit and 16-bit ISA, and 32-bit PCI expansion boards are supported in the system unit. ISA expansion boards can be Plug and Play or non-Plug and Play boards.

PCI expansion boards run at one half the system host's bus speed. The PCI bus handles 32 bits of data at a time, being wider as well as faster than the standard ISA bus. PCI boards can send and receive data much faster, thereby boosting system performance.

Your system has six expansion slots:

- one ISA slot

- three PCI slots

- one set of shared ISA and PCI slots

- one AGP slot.

The option board slot configuration accommodates the following devices:

> **NOTE** The furthest-right slot (as seen from the front) on the desktop model or highest slot on the minitower is not used.

- Slot 1 — Not used.

- Slot 2 — Accommodates a video board.

- Slot 3 — Accommodates an optional PCI board.

- Slot 4 — Accommodates an optional PCI board.

- Slots 5 — Accommodate an optional PCI board.

- Slot 6 — Accommodates a PCI or ISA board.

- Slot 7 (lowest slot on mini-tower, furthest-left slot on desktop model) — Accommodates an optional ISA board.

Locating expansion slots

Installing an Expansion Board

Although Plug and Play boards are detected by the system, and potential conflicts are resolved automatically, boards which are not Plug and Play may require you to change settings. Before installing the new board, check its documentation and the Interrupt Request (IRQ) assignments in Appendix C. This information ensures that your new board does not conflict with any installed components.

Follow these steps to install an expansion board.

1. Remove the access cover (see "Removing the Access Cover").

2. Follow any preinstallation instructions that come with the expansion board (such as setting switches or jumpers on the board).

3. Remove the screw securing an expansion slot cover and remove the cover.
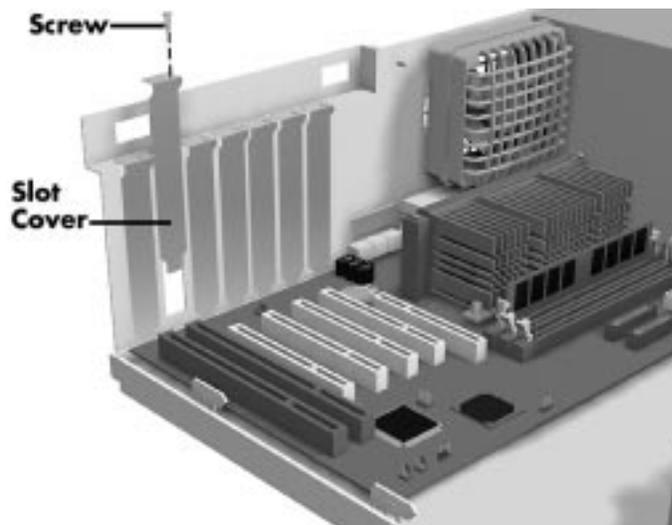
Removing the slot cover

Save the screw for installing the expansion board. Be sure to save the slot cover for future use.

⚠ **CAUTION**

A slot cover can damage the system board or any option board if it falls into the system. Take care to keep the slot cover from falling when removing the screw.

If the slot cover does fall into the unit, remove it before replacing the cover.

4. Hold the board by its edges and insert it into the expansion slot.

5. Press the board firmly into the expansion slot connector. Gently rock the board from side-to-side to seat it into the connector.

6. Insert the screw removed in step 3 to secure the expansion board to the support bracket.

7. Attach any cables required by the expansion board.

8. Replace the access cover (see "Replacing the Access Cover").

Removing an Expansion Board

Follow these steps to remove a board.

1. Remove the access cover (see "Removing the Access Cover).

2. Label and remove any cables connected to the board.

3. Remove the screw that secures the board to the support bracket.

4. Pull the board out of the connector. Gently rock the board from side-to-side to release it from its connector.

5. Replace the access cover (see "Replacing the Access Cover).

DIMM UPGRADE

Your system comes factory-installed with 32 MB to 192 MB of main system memory,as three 168-pin sockets on the system board for Dual In-line Memory Modules (DIMMs).

You may install memory in one, two, or three sockets and the size and speed of the DIMMs may vary between sockets. Single- and double-sided DIMMs are supported.

Before installing memory, read the detailed explanation of memory types and configuration options in Appendix C.

- Depending on product upgrade availability, your system memory can be upgraded to a total of 384 MB. When upgrading your system memory, note the following conditions:

- Be sure to use 168-pin 3.3V DIMMs with gold-plated contacts.

- Bus speed of 66 MHz only is supported.

- Non-Error Correcting and Checking (64-bit) and ECC (72-bit) DIMMs are both supported. When ECC memory is installed, the BIOS automatically detects its presence, and offers the Setup option to enable ECC mode.

> **NOTE** Although memory size and type may vary, the SDRAM DIMMs must meet the Intel 4-clock, 66-MHz, unbuffered SDRAM DIMM specification for either 64-bit or 72-bit SDRAM.

Use the following procedure to:

- Check the memory installed in the system

- Determine the DIMM configuration needed to increase memory

- Identify DIMM sockets.

> **NOTE** If any cables block access to the DIMM sockets, label and disconnect them. If any boards block access to the sockets, remove them.

1. Locate the three DIMM sockets, J7J1–Bank 0, J6J2-Bank-1 and J6J1–Bank 2. See Appendix D to identify the sockets.

2. Any approved size DIMM can be installed in either socket The following table shows some example configurations.

Sample Memory Configurations

BANK 0	BANK 1	BANK 2	TOTAL RAM
1 Mx64 (8)	Empty (0)	Empty (0)	8 MB (minimum)
Empty (0)	4 Mx64 (32)	8 Mx64 (64)	96 MB
16 Mx64 (128)	Empty (0)	2 Mx64 (16)	144 MB
2 Mx72 (16)	2 Mx72 (16)	4 Mx72 (16)	64 MB (ECC)
2 Mx64 (16)	Empty (0)	2 Mx64 (16)	32 MB
4 Mx64 (32)	4 Mx64 (32)	8 Mx64 (64)	128 MB
8 Mx64 (64)	1 Mx64 (8)	4 Mx64 (32)	104 MB
2 Mx64 (16)	4 Mx64 (32)	1 Mx64 (8)	56 MB
4 Mx64 (32)	8 Mx64 (64)	2 Mx64 (16)	112 MB
Empty (0)	16 Mx72 (128)	16 Mx72 (128)	256 MB (ECC)
16 Mx64 (128)	2 Mx64 (16)	8 Mx64 (64)	210 MB
16 Mx64 (128)	4 Mx64 (32)	8 Mx64 (64)	224 MB
16 Mx72 (128)	8 Mx72 (64)	1 Mx72 (8)8 MB	200 MB (ECC)
16 Mx64 (128)	16 Mx64 (128)	16 Mx64 (128)	384 MB
16 Mx72 (128)	16 Mx72 (128)	16 Mx72 (128)	384 MB (ECC)

Removing a DIMM

Use the following procedure to remove a DIMM.

⚠ **CAUTION**:

Reduce static discharge by touching the system's metal chassis.

1. Remove the access cover (see "Removing the Access Cover).

2. Locate the DIMM sockets.

3. To remove a DIMM from its socket, press the plastic clips at the outer edges of the socket away from the DIMM.

4. Carefully rock the DIMM to pull it from the socket.
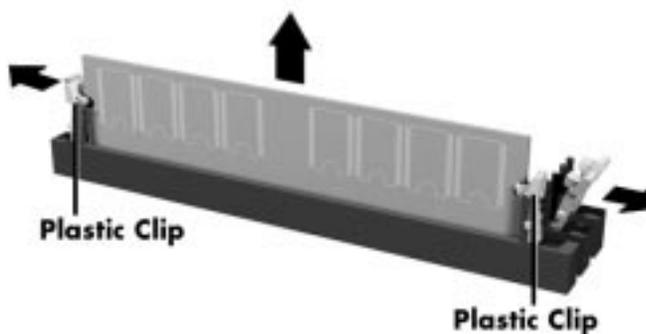
Removing a DIMM

5. Store the module in an antistatic bag (available at electronic supply stores) or a cardboard box.

6. (If necessary, repeat Steps 2 through 4 if an additional module was installed in the other DIMM socket.).

Installing a DIMM

Use the following procedure to install a DIMM.

1. Remove the access cover (see "Removing the Access Cover).

2. Locate the DIMM sockets.

3. Remove any currently-installed DIMMs that are not needed. See "Removing a DIMM" in this chapter.

> ⚠ **CAUTION**
>
> Before installing a DIMM, reduce static discharge by touching the system's metal chassis.

4. To install a DIMM, align the module with an empty socket. Make sure that the notches on the DIMM line up with the keys in the sockets.

5. Insert the DIMM into the socket. Close the plastic clips at both ends of the socket.
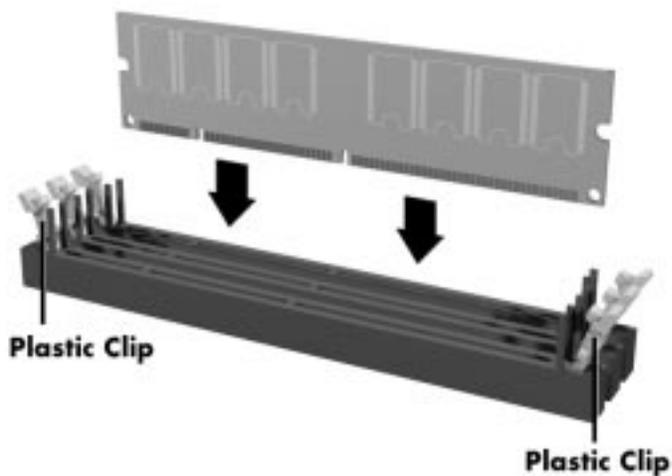
Installing a DIMM

6. Replace any cables or boards that may have been removed.

7. Replace the access cover (see "Replacing the Access Cover).

Your system automatically detects the memory at bootup.

VIDEO UPGRADE

Your computer comes with an AGP video board.

See your video board's documentation for information on upgrade capabilities.

DATA STORAGE DEVICES

The system board in your computer supports the following storage devices:

■ two diskette drives, including the standard 1.44-MB diskette drive and a tape backup unit

■ up to four IDE drives.

⚠ **CAUTION**

Reduce static discharge by touching the system's metal chassis.

Locating Device Slots

Your computer has seven storage device slots:

■ a 3.5-inch accessible device slot contains the standard 1.44-MB diskette drive

■ one internal 3.5-inch hard drive slot for the hard drive, a second 3.5-inch hard drive slot is available

■ four accessible device slots

— One accessible 5.25-inch device slot contains the standard CD-ROM reader.

— One accessible 5.25-inch device slot.

— Two accessible 3.5-inch device slots. (The lower 3.5-inch slot is not accessible on the desktop model.)

3 1/2-Inch Internal
Device Slot

Second 3 1/2-Inch
Internal Device Slot

3 1/2-Inch Diskette
Drive

3 1/2-Inch
Device Slots

5 1/4-Inch Accessible
Device Slots
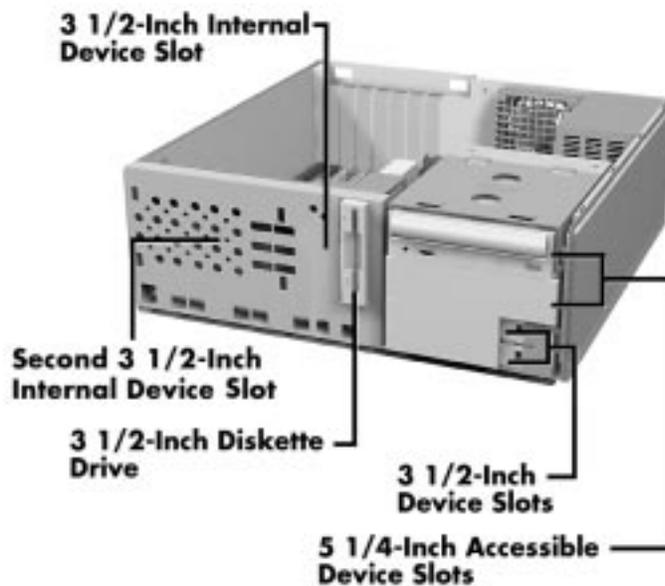
Locating accessible devices

Preparing the Device

Before installing a storage device in the system, follow any preinstallation instructions that come with the device. For example, check the following:

■ Diskette drive — remove any termination jumpers on the optional diskette drive. See the documentation included with the drive.

■ IDE device — check the jumper settings on the device before installing it. See the documentation that comes with the device for jumper setting information.

— An IDE device, such as an IDE hard disk or IDE CD-ROM reader, must be set correctly as the first (master) or second (slave) device on the IDE channel.

Installing Options   5-19

The Setup Utility

The Setup utility program allows you to enter system configuration information in the BIOS and control special features of the system.

> **NOTE** We recommend that you print out or write down your current setup parameters and store the information in a safe place. This lets you restore your system to the current parameters if you ever need to replace the battery.

When to Use Setup

The Setup utility lets you view and set system parameters. Use the Setup utility program:

- to set the time and date

- to update or check system parameters when you add or remove expansion options

- to change or set power management features

- to correct a hardware discrepancy when the Power-On Self-Test (POST) displays an error message and prompts you to run Setup

- to check the installation of optional memory by comparing the amount of memory installed with the amount of memory displayed by Setup

- to change certain system operating parameters, such as boot device sequence and keyboard parameters

- to configure system connections for peripherals such as a diskette drive, hard disks, and devices connected to the printer port and serial ports

- to customize your system with security features such as passwords

- to set system parameters in the event that you need to replace the CMOS battery.

How to Start Setup

To start the Setup utility, follow these steps:

1. Turn on or reboot the system.

2. Press **F2** after POST begins, but before the system boots up, to start the memory test. You have about five seconds to press **F2** before system boot continues.

   Setup's Main Menu appears.

How to Use Setup

The bottom of all menus show the specific keys used to navigate around the menus. Pressing the **F1** key brings up a Help screen. The right hand side of the menu is pop-up item-sensitive help.

Use the left and right arrow keys (or cursor keys) to select one of the menus (Main, Advanced, Security, etc.) and the up and down arrows to move to an option within a menu. Press **Enter** to select an option or submenu. Change the value either with the arrows or with the plus and minus (+ or –) keys.

Some entries cannot be changed; their function is to report the status of a system parameter. Other entries, when marked with an arrow (▸) symbol, lead to submenus when you press the **Enter** key.

Use the **Esc** key to return to a previous menu or to "escape" from the Setup program without changing any settings. When exiting and the menu asks if you want to discard configuration changes and exit now, be sure the menu's "Yes" field is highlighted.

If you make a mistake changing settings and you need to change them again, press the **Esc** key from anywhere within the Setup program. When the Setup Confirmation menu asks you if you want to discard configuration changes and exit now, press the Tab key or the right arrow key to highlight the menu's "No" field. With this choice, you remain in the Setup program, and you can continue to change settings, if necessary. Press the **Enter** key to confirm.

Maintenance Menu

This menu allows you to set the processor speed and clear the Setup passwords. Setup displays this menu only when the system is in configure mode. See Chapter 6 for information on putting the system in configure mode. There are two options available.

Processor Speed

This field specifies your processor's speed. Options are 233, 266, and 300.

Clear All Passwords

This field lets you clear the user and supervisor passwords.

Main Menu

The Main Menu options are described in the following sections.

```
                        BIOS Setup
    Main    Advanced    Security    Power    Boot    Exit

   Processor Type                              Item-Specific Help
                        Pentium® II
   Processor Speed      266 MHz            <Tab>, <Shift-Tab>, o
   Cache RAM            512 KB             <Enter> selects field.
   Total Memory         32 MB
   BIOS Version         xxxxxxxxxx

   Language:            [English (US)]
   System Time:         [13:48:18]
   System Date          [07/10/1997]

   >Floppy Options
   >Primary IDE Master    [XXXXXXXXX]
   >Primary IDE Slave     [XXXXXXXXX]
   >Secondary IDE Master  [None]
   >Secondary IDE Slave   [XXXXXXXXX]

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

Main Menu

Various menu options are available; others cannot be
changed. Brief explanations of each menu entry follow.

Processor Type

This field displays your computer's processor type.

Processor Speed

This field displays your processor's speed.

Cache RAM

This field displays the size of your system's L2 cache.

Total Memory

This field displays the total amount of memory installed on
your system board.

BIOS Version

This field displays your system's BIOS version number.

Language

This field displays the current default language used by the BIOS. Depending on the system you purchased, you may choose a different display language from among the options listed below.

- English (US) — (default)

- Italiano

- Français

- Deutsche

- Español

System Time and Date

These two fields specify the correct time and date. To change them, press the Tab key to highlight the field you want to change, then press the + or – keys to change the setting.

> **NOTE** Your computer has been designed to correctly report the year 2000 and beyond.

Floppy Options Submenu

This submenu can be used to configure your system's diskette drives. To enter the submenu, highlight the Floppy Options field, then press the **Enter** key. You'll see the following options:

■ Diskette A:/B:

These fields specify the capacity and physical size of
Diskette Drive A and B (if included). To change these,
highlight the field for the drive, press the **Enter** key and
select from the following options:

— Disabled

— 360KB, 5.25 inch

— 1.2MB, 5.25 inch

— 720KB, 3.5 inch

— 1.44/1.25 MB, 3.5 inch (default for Drive A)

— 2.88 MB, 3.5 inch.

If you add an optional 5.25-inch diskette drive to your
system, select Diskette B and change the parameter to
1.2 MB, 5.25 inch.

■ Floppy Write Protect

This option enables or disables write protection for the
diskette drive(s). Choose the desired setting to enable or
disable (default) this option.

To return to the Main Setup Menu, press the **Esc** key.

IDE Devices

The next four entries, Primary IDE Master and Slave and
Secondary IDE Master and Slave, refer to settings for IDE
devices. These fields report the presence of, and
identification for as many as four physical IDE devices, two
on each PCI/IDE connector.

The submenus can be used to auto-configure or manually configure the IDE devices, usually hard drives or CD-ROM drives. Depending on the system you purchased, the available options may include "User," "Auto" (default), "CD-ROM," "IDE Removable" "ATAPI Removable" or "None."

The standard hard drive (drive C) shipped with the system is configured as "Primary IDE Master." The standard CD-ROM reader is configured as "Secondary IDE Master." When the cursor is placed on one of these fields and selected by pressing the **Enter** key, the IDE Device submenu appears showing the drive parameters you can set.

> (NOTE) Jumpers on the IDE device must be set to the master or slave device (see the documentation that comes with the device).

Primary/Secondary IDE Master/Slave Submenus

These entries let you check or change the following hard disk drive parameters. They are not available if "Auto" is selected.

- Cylinders/Heads/Sectors fields.

  Cylinders — If your device configuration type is set to "Auto," this field displays the number of cylinders for your hard drive and cannot be changed. If the Type is set to "User," you must enter the correct number of cylinders for your hard drive.

  Heads — If your device configuration type is set to "Auto," this field displays the number of heads for your hard drive and cannot be changed. If the Type is set to "User," you must enter the correct number of heads for your hard drive.

Sectors — If your device configuration type is set to "Auto," this field displays the number of sectors for your hard drive and cannot be changed. If the Type is set to "User," you must enter the correct number of sectors for your hard drive.

Maximum Capacity — This field displays the maximum capacity of your hard disk drive, a value based on the number of cylinders, heads and sectors.

■ Multi Sector Transfers

This option determines the number of sectors per block for multiple sector transfers. Like the Cylinders/Heads/Sectors options discussed above, you cannot access this option if the configuration type is set to "Auto." If necessary, check the specification for your disk drive to determine the best setting for optimum drive performance. The options include:

— 2 Sectors

— 4 Sectors

— 8 Sectors

— 16 Sectors (default)

— Disabled.

■ LBA Mode Control

This option specifies the IDE translation mode. LBA causes Logical Block Addressing to be used in place of Cylinders/Heads/Sectors. You can enable (default) or disable this option. This option cannot be changed when "Auto" is selected.

⚠ WARNING

Don't change the translation mode setting from the option selected when the hard drive was formatted. Changing the option after formatting could result in corrupted data!

- **32 Bit I/O**

    This option enables (default) or disables 32 Bit IDE data transfers between the processor and the IDE device.

- **Transfer Mode**

    This option specifies the method for transferring data between the hard drive ans system memory. This option cannot be changed when "Auto" is selected. The options include:

    — Standard
    — Fast PIO 1
    — Fast PIO 2
    — Fast PIO 3
    — Fast PIO 4 (default).

- **Ultra DMA**

    This option sets the Ultra DMA Mode for the hard drive. This option cannot be changed when "Auto" is selected. The options include:

    — Mode 0
    — Mode 1
    — Mode 2
    — Disabled (default).

To return to the Main Menu, press the **Esc** key. To move to the Advanced Menu, press the right arrow key.

Advanced Menu

This menu features the following information fields or options:

```
                        BIOS Setup

   Main    Advanced   Security   Power   Boot    Exit

                                        Item-Specific Help
  Setting items on this menu to incorrect values
  may cause your system to malfunction.            <Tab>, <Shift-Tab>, or
                                                   <Enter> selects field.
  Plug & Play O/S:          [Yes]
  Reset Configuration Data:  [No]
  Memory Cache:              [Enabled]

  > Resource Configuration
  > Peripheral Configuration
  > Keyboard Configuration
  > Video Configuration
  > DMI Event Logging



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

Advanced Menu

■ Plug & Play O/S

This option lets you specify whether a Plug and Play-compatible operating system is being used in your system. Choose "Yes" (default) or "No."

■ Reset Configuration Data

This option clears the BIOS configuration data on the next boot. The options include "No" (default) or "Yes."

■ Memory Cache

This option sets the state of the memory cache. The options include "Enabled" (default) or "Disabled."

Resource Configuration Submenu

This option allows you to reserve specific resources for use by legacy ISA devices. To enter the submenu, highlight this field, then press the **Enter** key on your keyboard.

■ Memory Reservation (submenu)

This option lets you configure memory blocks for use by legacy ISA devices. When selected, the submenu displays a list of addresses from which specific addresses can be selected.

Use the arrow (cursor) keys to highlight an upper memory block, then press **Enter**. Select "Available" (default) or "Reserved" with the cursor keys, then press **Enter** to change the setting.

To return to the Resource Configuration submenu, press the **Esc** key.

■ IRQ Reservation Submenu

This option lets you reserve specific IRQs (interrupt requests) for use by legacy ISA devices. To do so, highlight this field, then press the **Enter** key. Use the arrow (cursor) keys to highlight the specified IRQ, then press **Enter**. Select "Available" (default) or "Reserved" with the arrow keys, then press **Enter** to change the setting.

⚠ **WARNING**

An asterisk symbol appearing next to an option indicates that the selected IRQ is set to conflict with another device.

To return to the Advanced Menu, press the **Esc** key twice.

Peripheral Configuration Submenu

This submenu can be used to configure your system's ports or peripheral devices. To enter the submenu, highlight this field, then press the **Enter** key on your keyboard. The following options appear:

■ Serial Port A/Serial Port B

These options let you configure your system's Serial Port A or Serial Port B. You can choose "Auto" (default), "Enabled" or "Disabled." The "Auto" setting causes the Setup program to assign the first free COM port (e.g., COM 1 3F8h, IRQ4 or COM2, 2F8h, IRQ3). Note that if you set a specific serial port address, it does not appear in the list of options for the other serial port.

⚠ **WARNING**

An asterisk symbol appearing next to an option indicates that the selected IRQ is set to conflict with another device.

> **NOTE** If you select the Enabled option, you'll see additional options that allow you to specify the Base I/O address and IRQs for the port you're configuring.

■ Mode (Serial Port B)

If installed, this option sets the mode for "Serial Port B" to "Normal."

■ Parallel Port

This option configures the system's parallel port. Choose "Auto" (default), "Enabled" or "Disabled." The "Auto" setting causes the Setup program to assign LPT 1 378h, IRQ7.

> **NOTE** If you select the Enabled option, you'll see additional options that allow you to specify the Base I/O address and IRQs for the port you're configuring.

■ Mode (Parallel Port)

This option sets the mode for the parallel port. The options include "Output Only" (AT-compatible mode), "Bidirectional" (PS/2-compatible mode), "EPP" (Extended Parallel Port – high speed bidirectional) and "ECP" (Enhanced Capabilities Port – high speed bidirectional).

⚠ **WARNING**

An asterisk symbol appearing next to an option indicates that the selected IRQ is set to conflict with another device,

To return to the Resource Configuration submenu, press the **Esc** key on your keyboard. Then press **Esc** a second time to return to the Advanced Menu.

■ Floppy Disk Controller

This option configures the system's diskette drive controller. Select "Enabled" (default) or "Disabled."

■ IDE Controller

This option configures the system's integrated IDE controller. Select from "Primary," "Secondary," "Both" (default) or "Disabled."

To return to the Advanced Menu, press the **Esc** key.

Keyboard Configuration Submenu

This submenu can be used to configure specific keyboard features. To enter the submenu, highlight this field, then press the **Enter** key. The following options appear:

■ NumLock

This option controls whether the NumLock key on the keyboard is on or off at boot-up. The choices are "Auto" (default), "On" or "Off."

- Key Click

  This feature enables or disables the key click option. Select "Enabled" or "Disabled" (default).

- Keyboard Auto-Repeat Rate

  This feature selects the key repeat rate, the rate at which a key, when pressed and held, repeats itself. The eight options range from 30 per second (default) to 2 per second.

- Keyboard Auto-Repeat Delay

  This feature selects the delay before key repeats. The four options include from ¼ second to 1 second. The default is ½ second.

To return to the Advanced Menu, press the **Esc** key.

Video Configuration Submenu

This submenu can be used to configure specific video features. To enter the submenu, highlight the field, then press the **Enter** key on your keyboard. The following option appears:

- Palette Snooping

  This option controls the ability of a primary PCI graphics controller to share a common palette with an ISA add-in video board. Select "Enabled" or "Disabled" (default).

To return to the Advanced Menu, press the **Esc** key.

DMI Event Logging Submenu

This submenu can be used to view and modify DMI Event Logs. To enter the submenu, highlight the DMI Event Logging field, then press the **Enter** key on your keyboard. The following options appear:

- Event Log Capacity/Event Log Validity

  These fields indicate whether space is available in the Event Log, and whether the contents of the log are valid.

- View DMI Event Log

  If there are no event logs stored, you cannot access this log.

- Clear All DMI Event Logs

  This option clears the DMI Event Log after rebooting the system. Choose "No" (default) or "Yes."

- Event Logging

  This option enables logging of DMI Events. Choose "Disabled" or "Enabled" (default).

- Mark DMI Events as Read

  This option is used to mark off all DMI Events as read. If necessary, press the **Enter** key to access the Confirmation dialog box and confirm your preference.

To return to the Advanced Menu, press the **Esc** key. Then press the right arrow (cursor) key to move to the Security Menu.

Security Menu

```
                          BIOS Setup
      Main    Advanced    Security    Power    Boot       Exit
                                                  Item-Specific Help
    User Password Is:          Clear
    Supervisor Password Is:    Clear           <Tab>, <Shift-Tab>, o
                                               <Enter> selects field.
    Set User Password:         [Enter]
    Set Supervisor Password:   [Enter]

    Unattended Start:          [Disabled]




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

Security Menu

The Security Menu can be used to set a user password and/or a supervisor password.

A User Password controls access to the system and Setup Utility Program at boot up. If the User Password feature has been enabled, you'll need to enter your User password correctly whenever you boot the system before you'll be able to use it.

A Supervisor Password controls access to the BIOS and Setup Utility Program. If the Supervisor Password feature has been enabled, a Supervisor password must be entered correctly before all options in the Setup Utility Program are available (for example, to disable password protection).

⚠ **WARNING**

When a Supervisor Password is enabled, access to many features in the Setup Utility Program is restricted.

How to Set a Password

Use the following steps to select the password feature you want to set.

1. Highlight the "Set User Password" or "Set Supervisor Password" field, then press the **Enter** key. The Set User Password or Set Supervisor Password dialog box appears on your monitor.

2. Type a password (up to seven alphanumeric characters) in the Enter New Password field, then press the **Enter** key. Your password should be easy for you to remember, but hard for others to guess.

⚠ **WARNING**

Be careful when typing your password, because you won't be able to see any of the characters you type.

3. Retype your password in the Confirm New Password field, then press the **Enter** key.

4. If the message "User Password Is Set" (or "Supervisor Password Is Set") appears in the Security Menu, the password has been set up successfully.

How to Disable Password Protection

1. From the Security Menu, highlight the "Set User Password" or "Set Supervisor Password" field (depending on which password you're disabling).

2. Type your password in the Enter Current Password field, then press the **Enter** key.

3. Don't type anything in the Enter New Password field — just press the **Enter** key.

4. Again, don't type anything in the Confirm New Password field — just press the **Enter** key.

If the message "User Password Is Clear" (or "Supervisor Password Is Clear") appears in the Security Menu, the User (or Supervisor) password feature is disabled.

Unattended Start

By enabling this feature and the User Password feature, the system boots up and runs, but the keyboard and mouse are locked and your keyboard LEDs flash on and off. To use the keyboard and mouse, you need to enter the User Password first. (A password is also required to boot from a floppy disk.)

Press the right arrow (cursor) key to move to the Power Menu.

Power Menu

The Power Menu can be used to enable or disable the system's power management features. When the power management option is enabled, the Power Menu displays the options shown in the following screen.

```
                        BIOS Setup
    Main    Advanced    Security    Power    Boot    Exit
  ───────────────────────────────────────────┬──────────────────────
                                             │  Item-Specific Help
  Power Management:          [Enabled]        │
                                             │  <Tab>, <Shift-Tab>, o
  Inactivity Timer:          [16 minutes]     │  <Enter> selects field.
  Hard Drive:                [Enabled]        │
  VESA Video Power Down:     [Enabled]        │
                                             │
                                             │
                                             │
                                             │
                                             │
                                             │
                                             │
  ───────────────────────────────────────────┴──────────────────────
  F1 Help    ↑↓  Select Item    −/+ Change Values    F9   Defaults for Page
  ESC Exit   ←→  Select Menu    Enter Select  > Sub-Menu  F10 Previous Values
```

Power Menu

■ Power Management

This feature lets you enable or disable BIOS power management.

■ Inactivity Timer

The Inactivity Timer lets you set the length of time that the system needs to be inactive before entering its low-power or Standby mode. The low-power mode powers down various devices in the system until you resume using it. You can select from "Off," "1," "2," "4," "6," "8," "12" or "16 minutes." A setting of 1 minute achieves maximum power savings, while a setting of 16 minutes allows maximum performance.

■ Fixed Disk

This option controls whether or not a spin down command is issued to the hard drives when the system goes into a low-power mode. Your choices are "Enabled" (the default) or "Disabled."

■ VESA Video Power Down

This option controls power to the monitor during the low-power modes. Your choices are "Disabled" or "Enabled" (default).

Press the right arrow (cursor) key to move to the Boot Menu.

Boot Menu

The Boot Menu can be used to adjust the system's boot features. The Boot Menu features the following options:

> ⚠ **CAUTION**
> Setting some items in any menu to incorrect values can cause your system to malfunction.

```
                        BIOS Setup
   Main    Advanced    Security   Power    Boot     Exit
  ┌─────────────────────────────────────────┬──────────────────────────┐
  │                                          │    Item-Specific Help    │
  │ Restore on AC/Power Loss:  [Stay Off]    │                          │
  │ On Modem Ring:             [Power On]    │  <Tab>, <Shift-Tab>, o    │
  │ On LAN:                    [Disabled]    │  <Enter> selects field.   │
  │ On PME:                    [Disabled]    │                          │
  │                                          │                          │
  │ First Boot Device:    [Floppy/Removable Devices]                    │
  │ Second Boot Device:   [Hard Drive]       │                          │
  │ Third Boot Device:    [ATAPI CD-ROM Drive]                          │
  │ Fourth Boot Device:   [Network Boot]     │                          │
  │                                          │                          │
  │ > Hard Drive                             │                          │
  │ > Floppy/Removable Devices               │                          │
  │                                          │                          │
  │                                          │                          │
  ├──────────────────────────────────────────┴─────────────────────────┤
  │ F1 Help   ↑↓ Select Item   -/+ Change Values    F9  Defaults for Page│
  │ ESC Exit  ←→ Select Menu   Enter Select  > Sub-Menu  F10 Previous Values│
  └──────────────────────────────────────────────────────────────────────┘
```

Boot Menu

■ Restore on AC/Power Loss

This option specifies whether or not to restore power to
the system if it is turned on and there is a power failure.
The options are "Stay Off" which keeps the power off,
"Power On" which restores the system's power, and
"Last State" which restores the previous power state.

■ On Modem Ring

This option specifies how the system responds when
power is off and the modem detects an incoming call.
The options are "Stay Off" (default) and "Power On."

■ On LAN

This option controls how the system responds to a LAN
wake-up call. The options are "Stay Off" (default) and
"Power On."

- On PME

    This option controls how the system responds to a PCI power management event. The options are "Stay Off" (default) and "Power On."

- First/Second/Third/Fourth Boot Device

    You can select the sequence of boot devices by type. Pressing your keyboard's + (plus) or – (minus) keys allows you to select the order. For maximum system accessibility, Removable Device should always be set as the First Boot Device.

Hard Drive Submenu

This submenu lists the system's available hard drives. Your computer will try to boot to the operating system on the first device listed on the Hard Drive submenu. If no operating system is found, the system continues trying the drives in the order they are listed until an operating system is located.

To see a list of available drives, highlight this field and press the **Enter** key. You can select the boot device by pressing your keyboard's + or – keys. To exit from the Hard Drive submenu, press the **Esc** key.

Removable Devices Submenu

This submenu lists any available removable devices (if included). One common option is Legacy Floppy Drives. The operating system assigns drive letters to these devices in the order listed. You can change the sequence (and drive lettering) by highlighting this field and pressing the **Enter** key. Then press your keyboard's + or – keys to move a device up or down the list. To exit from the Removable Devices submenu, press the **Esc** key.

Exit Menu

The Exit Menu allows you to choose how to exit the Setup program. Press the arrow (cursor) keys to select the desired option, then press the **Enter** key to make your choice (or use the arrow key to select another one).

```
                        BIOS Setup
   Main    Advanced    Security   Power    Boot     Exit
                                         ┌─────────────────────┐
                                         │   Item-Specific Help │
   Exit Saving Changes                   │                      │
   Exit Disacrding Changes               │ <Tab>, <Shift-Tab>, o│
   Load Setup Defaults                   │ <Enter> selects field.│
   Load Custom Defaults                  │                      │
   Save Custom Defaults                  │                      │
   Discard Changes                       │                      │
                                         │                      │
                                         │                      │
                                         │                      │
                                         │                      │
                                         │                      │
 ──────────────────────────────────────────────────────────────
  F1 Help    ↑↓ Select Item   -/+ Change Values    F9  Defaults for Page
  ESC Exit   ←→ Select Menu   Enter Select  > Sub-Menu  F10 Previous Values
```
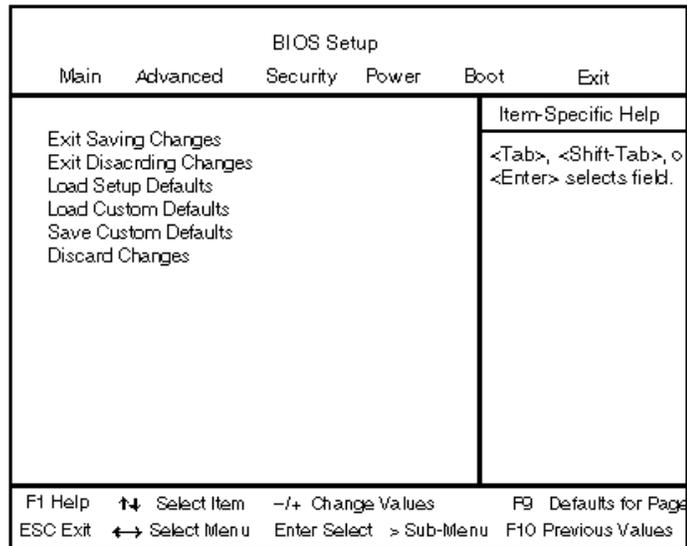
Exit Menu

■ Exit Saving Changes

This option exits the Setup program and saves your changes to the BIOS.

■ Exit Discarding Changes

This option exits the Setup program without saving your changes to the BIOS.

■ Load Setup Defaults

This option loads the Setup program's default values.

■ Load Custom Defaults

This option loads Custom default settings.

■ Save Custom Defaults

This option saves your changes to Custom default settings.

■ Discard Changes

This option loads previous values from CMOS RAM for all BIOS settings.

> **NOTE** If your system's CMOS fails, the BIOS will load custom default settings (if you've saved them) or factory default settings.

Finally, press the Enter key again to confirm and exit the Setup program.

BIOS FLASH UTILITY

From time to time, changes are made to a computer system's BIOS. While not essential, it is usually beneficial to upgrade if there is a new BIOS for your system. Check the NECCSD Bulletin Board Service (BBS) for information regarding an update to your system's BIOS. If there is one available, the BBS will have both the BIOS itself and instructions for downloading it.

Update the BIOS from the BIOS flash diskette as follows.

1. Write down the setup parameters currently set on your system.

2. Turn off the system.

3. Insert the flash upgrade diskette in drive A 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 a confirmation that you want to load the new flash upgrade into memory. Select "Continue with Programming."

7. After the upgrade completes, remove the upgrade disk.

8. Reboot the system and start the Setup program. Press **F5** to reset the BIOS defaults. Then, use the copy of the Setup selections you made at the beginning of this procedure to set the options.

(NOTE) If the flash BIOS process is corrupted, for example, by a power failure, see Chapter 6 for BIOS recovery information.

See "NECCSD Bulletin Board Service" in Chapter 7 for information about using the bulletin board (available in the U.S. and Canada).

VIDEO DRIVERS

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

Your system ships with Number Nine video drivers for Windows 95 or Windows NT loaded on your hard disk.

You can change the default video resolution in Windows Setup. You can also change the video resolution and other video features such as refresh rates in Windows. See "Changing Display Properties," in Chapter 2.

Additional VGA drivers are available for a variety of software applications through the NECCSD BBS (see "NECCSD Bulletin Board Service" in Chapter 7).

> **NOTE** A multifrequency monitor, such as an NEC MultiSync® monitor, is required to access the extended graphics mode.

— The standard IDE hard disk is set as the master device on the primary IDE connector. The standard CD-ROM reader is the master device on the secondary IDE connector.

■ SCSI device — The last SCSI device connected to the system (internally or externally) must have a termination resistor, either installed manually or set automatically if the device is self-terminating. Most SCSI devices are self-terminating. Check the manufacturer's documentation.

■ Installation hardware — check to be certain you have the screws necessary to secure the drive in an accessible drive slot.

Device Cables

The cables used for the installation of optional storage devices include:

■ diskette drive signal cable

■ IDE signal cable

■ system power cables.

Cable connector locations are shown in the system board figure in Appendix D.
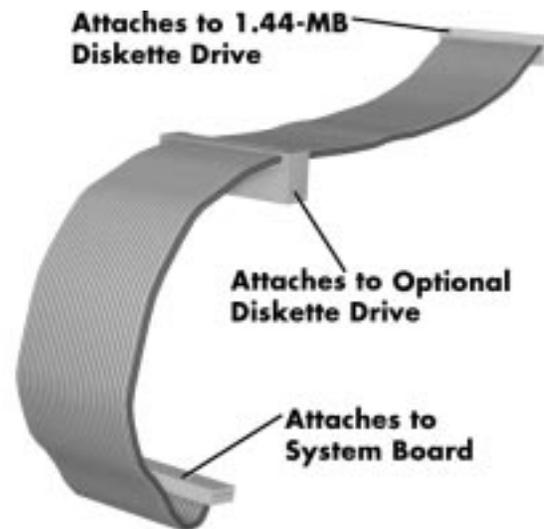
Diskette Drive Signal Cable

A two-connector diskette drive signal cable comes attached to the system board and to the standard 1.44-MB diskette drive. If your system comes standard with an Iomega Ditto tape backup unit, the signal cable has three connectors.

Depending on your system, installation of a second diskette drive may require the replacement of the existing diskette drive signal cable with a three-connector cable. Connect an optional diskette drive to the middle connector on the three-connector diskette drive signal cable.

The colored edge of the cable goes to pin 1 on the cable connector. Align the red edge of the cable with pin 1 (the notched end) on the drive connector.

The following figure shows a three-connector diskette drive signal cable.


Optional diskette drive signal cable

IDE Signal Cables

Each system comes with a three-connector IDE interface cable attached to the primary IDE connector, and another IDE cable joining the CD-ROM reader to the secondary IDE connector.

Each IDE connector on the system board supports two devices. The addition of a device to an IDE connector does not require the replacement of the existing signal cable.

The following figure shows a typical three-connector IDE cable. If the IDE cable is not keyed with a connector tab, align the colored edge of the cable with the pin 1 side of the drive connector.

Connects to System Board IDE Port

Red Edge (Pin 1)

Connects to IDE Devices
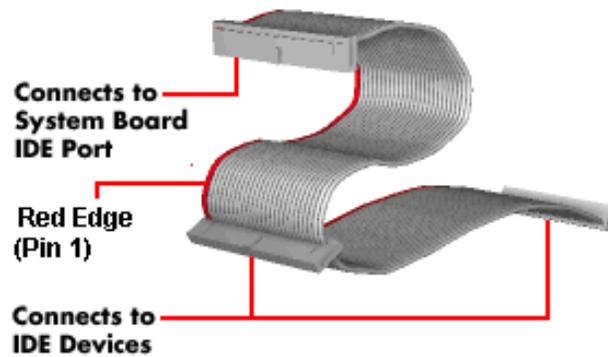
IDE cable connectors

System Power Cables

Power cables come from the power supply and are attached to the standard storage devices. System power cables vary in length and provide connector sizes to accommodate a variety of supported storage configurations. Power cable connectors are keyed to fit only in the correct position. The following figure shows the power cable connectors.
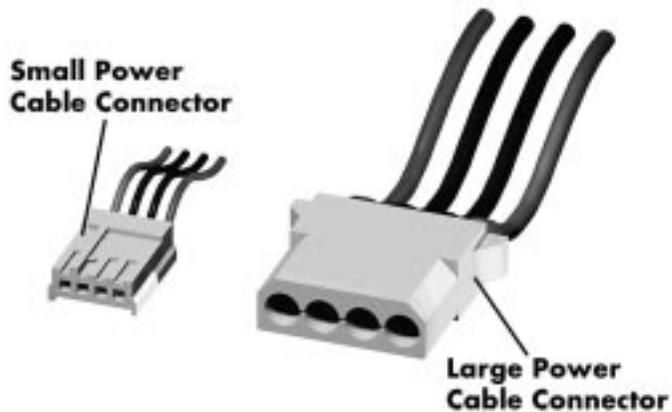
Power cable connectors

Cabling Storage Devices

All storage devices require a power and signal cable connection. Devices shipped with the system are already connected.

Procedures are provided on the following devices:

- IDE device − IDE hard disk drive, CD-ROM reader, or Zip drive

- diskette drive − 1.2-MB diskette drive.

Cabling an IDE Device

The following procedure explains IDE device cabling.

1. Connect the signal cable connector to the matching pins on the device.

   — Take care to prevent bending drive connector pins.

   — Align the cable connector to the matching pins on the drive.

2. Locate an available power connector coming from the power supply.

3. Connect the appropriate power cable to the power connector on the device.
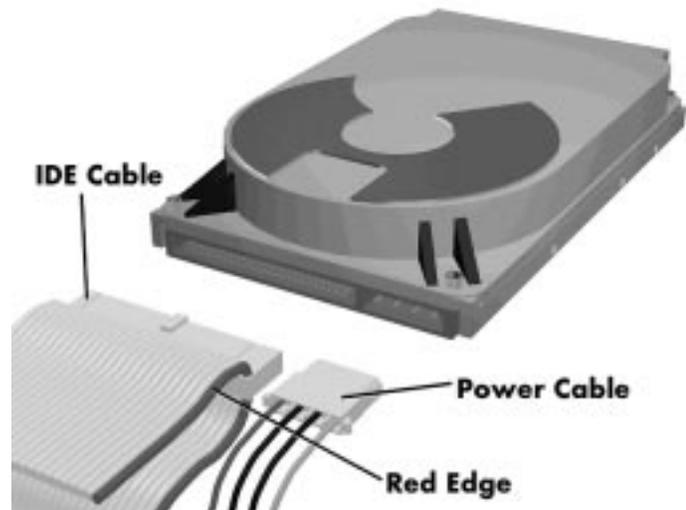
Connecting device cables

4. If you are installing an IDE CD-ROM reader, also connect the audio cable (see the instructions that came with the reader).

Cabling a Diskette Drive

1. Connect the diskette drive signal cable connector to the appropriate connector on the diskette drive as shown in the following figure.

2. Locate an available power connector.

3. Connect the power cable to the power connector on the device.
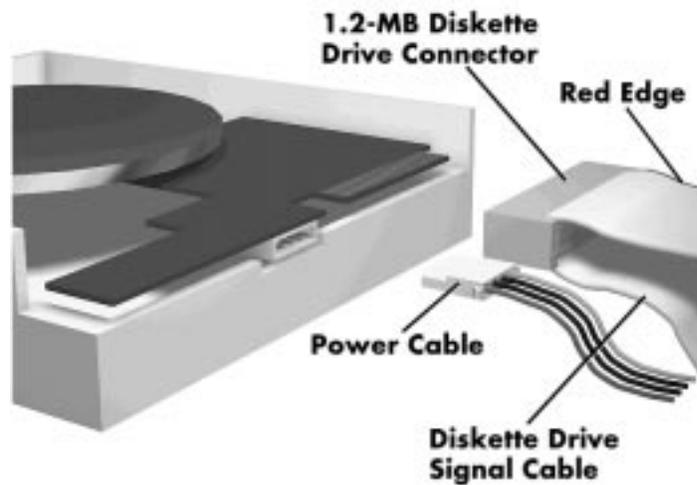
Connecting 1.2-MB diskette drive cables

Installing Storage Devices

The following subsections describe how to install 3 1/2-inch and 5 1/4-inch devices.

> **NOTE** The left side cover (as seen from the rear) on either system only needs to be removed when replacing the CD-ROM reader.

The installation procedures include:

- removing the front panel

- installing a 3 1/2-inch device

- installing a 5 1/4-inch device

- accessing the CD-ROM reader
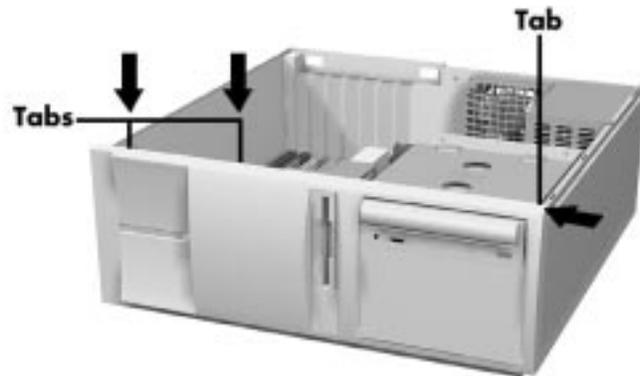
- replacing the front panel.

> **NOTE** Reboot your computer and run Setup after removing or installing a storage device.

Removing the Front Panel

1. Locate the two plastic tabs at the front of the chassis. They are indicated by two arrows engraved on the chassis.

2. Press down on the two tabs and press in a third tab at the end of the panel to release the panel.


Releasing the front panel

3. Pull the panel away from the chassis.

Installing a 3 1/2-Inch Device

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

1. Follow the preinstallation instructions that came with the device, such as setting jumpers and switches.

2. Remove the access cover (see "Removing the Access Cover).

3. Remove and label any cables that interfere with installing the device.

4. Remove the front panel (see the previous section).
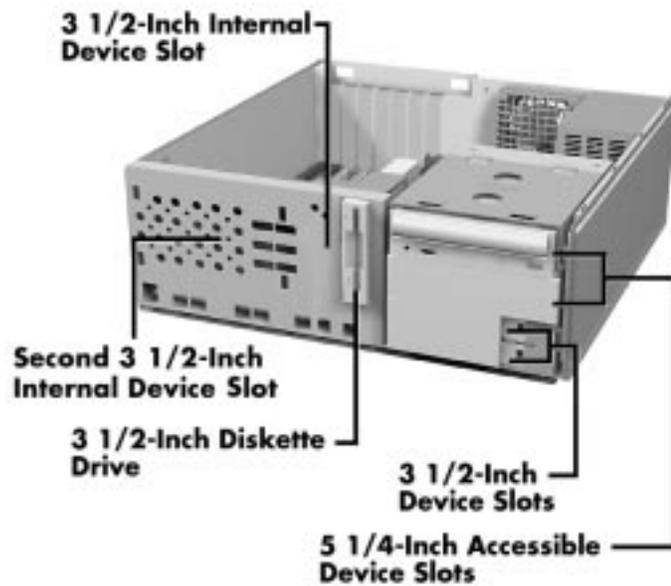
Device slots, front panel removed

5. Choose the slot for the device being installed.

If you are installing the device in an accessible slot, goto step 6. If you are installing the device in the second 3 1/2-inch internal device slot, simply insert the drive into the opening until it is secured by the clips. No screws are required to secure the device.
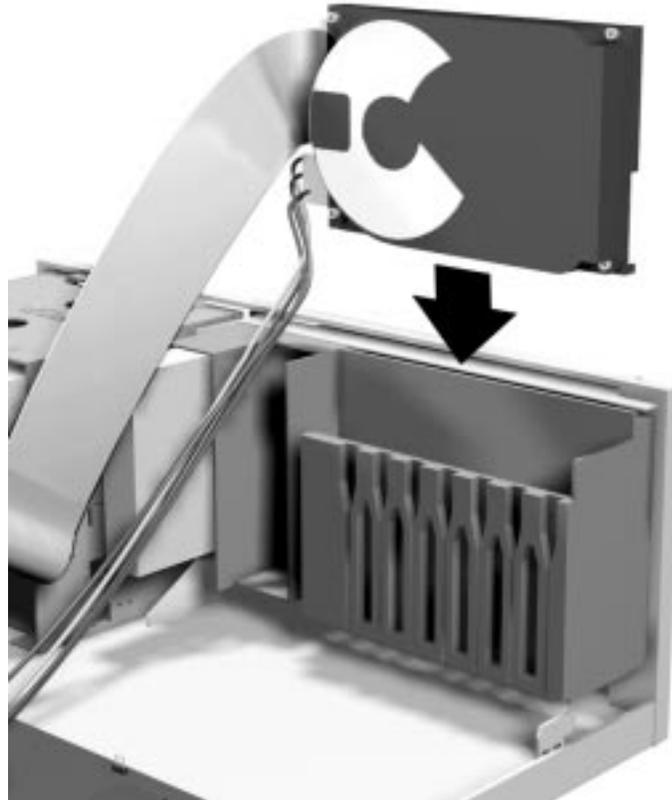
Inserting the device

6. Remove the plastic blank panel from the selected slot by pressing the panel tab and swinging the blank panel out.

Removing the blank panel

7. Remove the metal slot cover by carefully pressing it until it breaks away from the chassis. Be careful of sharp edges!

8. Slide the device into the slot and secure the device.

9. Connect the device cables (See "Cabling Storage Devices").

10. Replace the front panel (see "Replacing the Front Panel").

11. Replace the access cover (see "Replacing the Access Cover").

Installing the 5 1/4-Inch Device

Install an accessible device into the device slot as follows.

1. Follow the preinstallation instructions that came with the device, such as setting jumpers and switches.

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

2. Remove the access cover (see "Removing the Access Cover").

3. Remove and label any cables that interfere with installing the device.

4. Remove the front panel (see "Removing the Front Panel").

5. Remove the plastic blank panel. If you are installing a hard drive, keep the panel handy.

6. Remove the metal slot cover by carefully pressing it until it breaks away from the chassis. Be careful of sharp edges.

7. From the front of the system, slide the device, connector end first, into the device slot.

> NOTE To easily access device connectors for cabling, do not insert a 5 1/4-inch device all the way into the slot.

8. Connect the device cables (see "Cabling Storage Devices").

9. Align the holes in the device with the holes in the chassis.

10. Secure the device with the screws that came with the device.

Installing the device

> **NOTE** If you removed the side cover on your minitower or the accessible device cage on your desktop, replace it. Secure the device cage with the screw.

11. If you installed a hard drive in the 5 1/4-inch slot, replace the plastic panel.

12. Replace the front panel (see "Replacing the Front Panel").

13. Replace the access cover (see "Replacing the Access Cover").

Accessing the CD-ROM Reader

If you need to access the CD-ROM reader, you need to remove the side cover on the minitower or the accessible device cage on the desktop.

For the minitower, press the side cover in and slide it toward the rear of the system. If it is tight, insert a screwdriver into the slots between the cover and the front panel and carefully pry it loose.

For the desktop, use the following procedure to remove the accessible device cage.

1. Locate the screw and tab at the upper left of the device cage and the tab on the lower left.

Locate the two tabs at the lower rear and two on the right side of the system unit.

2. Remove the screw securing the cage.

3. Slide the cage toward the front of the system until it releases from the system. The tabs may need to be pressed to release the cage.

Replacing the Front Panel

To replace the front panel, follow this procedure.

1. Align the front panel's six tabs with their corresponding slots on the chassis (three of the tabs have holes, the others have prongs).

2. Press the front panel squarely into position until the tabs lock the panel in place.

3. Replace the access cover (see "Replacing the Access Cover").

4. After securing your system, reboot it and run the Setup program to set the new configuration.

ADDING EXTERNAL OPTIONS

This subsection includes installation procedures for the following external options:

■ parallel printer

■ serial devices

Connecting a Parallel Printer

> **NOTE** Before connecting a printer to the system, be sure the printer is set up correctly. Follow the setup instructions that came with the printer.

Connect a parallel printer to the system as follows.

1. Turn off power to the system and printer.

2. Connect the printer cable to the printer port on the rear of the system unit (see the following figure).

3. Secure the cable with the screws provided.

4. Connect the other end of the cable to the printer.

5. Turn on the printer and the computer.

Locating the parallel port

Connecting a Serial Device

> **NOTE** Before connecting a serial device to the system, be sure the serial device is set up correctly. Follow the setup instructions that came with the option.

Connect a serial device to the system as follows.

1. Turn off power to the system and to the serial device.

2. Connect one end of the serial cable to one of the two COM ports on the rear of the computer.

3. Secure the cable with the screws provided.

4. Connect the other end to the serial device.

5. Turn on the serial device and the computer.


Locating the COM ports

6 Setting System Board Jumpers

The system board provides a configuration jumper setting for overriding current BIOS settings or recovering the BIOS. When you override the BIOS settings, Setup's Maintenance menu appears allowing you to set the processor speed and disable the user and supervisor passwords. This chapter provides information on the jumper.

LOCATING THE JUMPER

The following figure shows the jumper location on the system board.
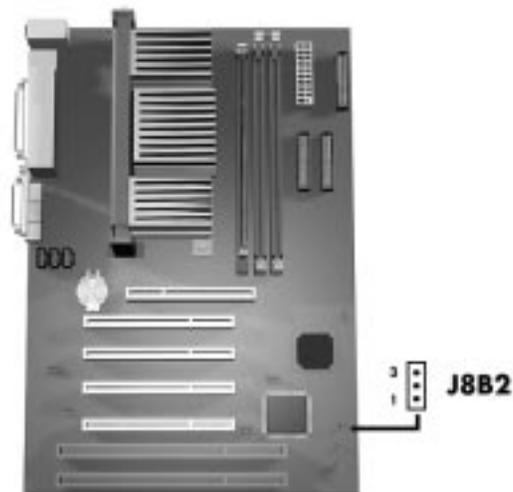
Locating the jumper

The following table summarizes the system board jumper settings.

System Board Jumper Settings

FUNCTION	JUMPER J8B2	CONFIGURATION
Normal	1-2	The BIOS uses current configuration information and passwords for booting.
Configure	2-3	After POST, Setup runs automatically. The Maintenance menu appears.
Recovery	None	BIOS attempts to recover the BIOS configuration. A recovery diskette is required.

CLEARING YOUR PASSWORD

The following sections describe how to clear your password.

1. Turn off the power and unplug the system and any peripherals.

⚠ WARNING

Turn off the system before you change any jumper settings.

---

2. Remove the access cover (see "Removing the Access Cover" in Chapter 5).

3. Locate the Configuration jumper (J8B2) on the system board (see "Locating the Jumper" in the previous subsection).

4. You may have to remove any installed expansion boards to access the jumper (see "Removing an Expansion Board" in Chapter 5).

5. Remove the jumper block from pins 1-2 and set it on pins 2-3. We recommend that you use needle nose pliers to move a jumper.

6. Replace the access cover (see "Replacing the Access Cover" in Chapter 5).

7. Connect system power cables and monitor.

8. Power on the system.

   The system enters Setup and the Maintenance menu appears. You can disable the user and supervisor passwords.

   If you removed the jumper, the system attempts to recover the BIOS. A recovery diskette is needed.

9. Power off, unplug the system and monitor, and remove the access cover.

10. Remove the jumper block from pins 2-3 and replace it on pins 1-2.

11. If you removed any expansion boards, replace them (see "Installing an Expansion Board" in Chapter 5).

12. Replace the access cover. Reconnect the system power cables and peripheral devices.

13. Power on the system.

14. Run Setup (see Chapter 4, System BIOS and Utilities).

RECOVERING THE BIOS

The following sections describe how to recover the system BIOS.

1. Turn off the power and unplug the system and any peripherals.

⚠ WARNING

Turn off the system before you change any jumper settings.

---

2. Remove the access cover (see "Removing the Access Cover" in Chapter 5).

3. Locate the Configuration jumper (J8B2) on the system board (see "Locating the Jumper" in the previous subsection).

4. You may have to remove any installed expansion boards to access the jumper (see "Removing an Expansion Board" in Chapter 5).

5. Remove the jumper block from pins 1-2. We recommend that you use needle nose pliers to move a jumper.

6. Replace the access cover (see "Replacing the Access Cover" in Chapter 5).

7. Connect system power cables and monitor.

8. Power on the system.

The system attempts to recover the BIOS. A recovery diskette is needed.

9. Power off, unplug the system and monitor, and remove the access cover.

10. Replace it on pins 1-2.

11. If you removed any expansion boards, replace them (see "Installing an Expansion Board" in Chapter 5).

12. Replace the access cover. Reconnect the system power cables and peripheral devices.

13. Power on the system.

14. Run Setup (see Chapter 4, System BIOS and Utilities).

7 24-Hour Information Services

NECCSD has made it easy for you to get information and help when you need it. We offer the following 24-hour information services:

- NECCSD FaxFlash™ Service

- NECCSD Bulletin Board Service

- America Online® Service

- CompuServe® Online Service

- E-mail to NECCSD Technical Support Services through a commercial online service or the Internet

- Fax Service to NECCSD Technical Support Services

- Internet World Wide Web and NECCSD FTP Site

- NECCSD Technical Support Services (U.S. customers only).

If you have access to a modem and/or fax machine (telephone for Technical Support), you can use these services to obtain information about your system at any time, day or night, seven days a week.

Not only do these services provide general information about your system, they can also be used to answer your questions and help solve any problems you may have with your system, should that ever be necessary.

NECCSD FAXFLASH SERVICE

The NECCSD FaxFlash service is a self-help, automated electronic information service for obtaining up-to-date product application notes, installation procedures, troubleshooting tips, data sheets, technical information bulletins, illustrated parts lists, part numbers, and other information about your system.

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

If you are new to FaxFlash, first order one of the following catalogs. Each catalog lists the available documents and their document numbers. Current catalogs include:

■ Catalog 1, NECCSD Telephone Directory and Online Service Information

■ Catalog 3, NECCSD Computer Product Specifications, Warranty Policy, Ultracare Guidelines, and Sales Information

■ Catalog 5, NEC ProServa™ and Express Server Product Information

■ Catalog 6, NEC Ready Consumer Desktop Systems

■ Catalog 7, NEC PowerMate Commercial Desktop Systems

■ Catalog 8, NEC Portable Systems (including Versa® Notebook and MobilePro™ Handheld computers).

Catalogs 5, 6, 7, and 8 contain technical support information, including Technical Information Bulletins, Illustrated Parts lists, Frequently Asked Questions (FAQs) lists, and other product support documents.

Order information from FaxFlash as follows. If you would like instructions for using FaxFlash, request document number **63233469** when prompted.

1. Be sure that your fax machine or fax/modem is turned on. Have the document number ready for the document you want.

2. At your touch-tone telephone, enter 1-888-329-0088 (U.S. and Canada only).

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

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

   Press **2** if you want an introduction to FaxFlash. Follow the automated instructions for ordering your catalog or document.

4. When prompted, enter your fax number and name.

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

NECCSD BULLETIN BOARD SERVICE

If you have access to a modem, use the NECCSD Bulletin Board Service (BBS) to get the latest information on hardware and software. The BBS allows you to download files (video drivers, printer drivers, BIOS updates, etc.) for system enhancements and upgrades.

The BBS can also be accessed through the CompuServe online service, although you cannot download any files through CompuServe.

Log onto the BBS as follows.

1. From the Windows 95 desktop, click the Start button.

2. Point to Programs. Point to Accessories and then click HyperTerminal.

3. Double click the Hypertrm.exe icon. The HyperTerminal program appears.

4. Follow the instructions on the screen to set up your modem. Click the HyperTerminal Help button for information about dialing the phone number.

   If you need to check communications settings, check that the settings match the following BBS parameters.

   ■ Baud rate: select any baud rate that matches your modem

   ■ Parity: none

   ■ Data bits: 8

   ■ Stop bits: 1

   ■ Flow control: Xon/Xoff (select Hardware if using 14.4 bps or higher)

5. Following the HyperTerminal instructions, enter the BBS phone number (508-635-4706). Your phone system and/or location might require a 9 1 or 1 prefix.

> **NOTE** The first time that you use the BBS, you will be requested to provide information for a new user questionnaire.

6. Press **Enter** twice

7. Enter your first name, last name, and password. Press **Enter** after each.

8. Follow the screen prompts until the Main Menu is displayed.

9. At the Main Menu, select **J** to join a conference. Select **Conference 1** for the desktop conference.

10. From the Main Menu, press **F** and **Enter** for the File menu.

11. At the File menu, select **F** for a list of downloadable files. Follow the prompts to select a file for downloading.

⚠ **CAUTION**

Executable files automatically format your diskette when you download files from the BBS. Formatting destroys any data on the diskette. Before you download files from the BBS, check that you do not have information on the diskette that you need.

After you complete downloading your file, log off the BBS as follows.

1. Press **Enter** (to continue)

2. Press **G** (command for Goodbye/Hangup).

3. Press **Enter**.

AMERICA ONLINE SERVICE

If you subscribe to America Online, you can use the service to obtain information about NECCSD and its products. You can use America Online to E-mail technical questions to the NECCSD Technical Support staff, post technical questions and messages on the Message Board, and access the NEC Software Library to download files.

Use the following steps to access America Online and NECCSD online information services.

1. Log onto America Online.

2. At the opening screen, click Go To in the Main Menu.

3. At the Go To menu, click Keyword.

4. At the prompt, type NEC, then press **Enter**.

5. At the NEC menu, double-click one of the following topics, then follow the prompts:

   ■ About NEC

   ■ Terms and Conditions

   ■ News

   ■ Product Information

   ■ Questions and Answers

- NEC Promotions

- Message Board

- Software Library.

6. Exit anytime by double-clicking the rectangle in the upper left corner of the screen.

COMPUSERVE ONLINE SERVICE

If you subscribe to CompuServe, use it to obtain information about NECCSD products. Use CompuServe to E-mail technical questions to the NECCSD Technical Support staff, post technical questions and messages on the Bulletin Board, and access the NECCSD BBS.

NOTE You cannot download information from the NECCSD Bulletin Board from CompuServe. You must call the NECCSD Bulletin Board directly using the procedure described earlier in this chapter.

Use the following steps to access CompuServe and NECCSD online information services.

1. Log onto CompuServe.

2. At the opening screen, click Service, type in **NEC** at the prompt, and click "OK."

3. At the NEC menu, double-click one of the following topics, then follow the prompts:

- NEC Bulletin Board

- Information About This Service

- Access NEC BBS

- Access CompuServe Information Services

- Exit.

4. Exit anytime by double-clicking the rectangle in the upper left corner of the screen.

E-MAIL/FAX TECHNICAL SUPPORT SERVICE

NECCSD Technical Support offers technical support by E-mail over the Internet network if you have a modem. The Internet address is:

tech-support@neccsd.com

You can also fax technical questions to NECCSD Technical Support if you have access to a fax machine or fax/modem. The fax number is:

(508) 635-4100

When using the E-mail or fax support service, you should include the following words in the subject field for prompt response from the appropriate technical person:

- Desktop (desktop or minitower systems)

- Monitor

- CD-ROM

- Printer

- 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 will receive a response to your questions within one business day.

INTERNET

If you have a modem, you can access the NECCSD Home Page on the Internet World Wide Web. You can do this through a commercial online service or through your Internet account. the NECCSD Home Page contains general information about NECCSD products.

You can also use the Internet to access the NECCSD ftp (file transfer protocol) site to download various files (video drivers, printer drivers, BIOS updates). The files are essentially the same files as on the NECCSD Bulletin Board Service.

To access the World-Wide-Web NECCSD Home Page, enter the following Internet Uniform Resource Locator (URL) through your service:

http://www.nec-computers.com/

To access the NECCSD ftp Site, enter the following Internet ftp address through your service:

ftp.nectech.com

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

NECCSD TECHNICAL SUPPORT SERVICES

NECCSD also offers direct technical support through its Technical Support.

Direct assistance is available 24 hours a day, seven days a week. Call NECCSD Technical Support, toll free, at 1-888-632-2678 (U.S. only).

Free technical support for hardware is limited to the length of the standard warranty. Software support for pre-loaded software is limited to 90 days from the time of the first call to NECCSD Technical Support. Get software support after the initial 90 days or hardware support after the warranty period 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 assistance outside the U.S., please contact your local NECCSD sales provider.

8 If You have a Problem

Your NEC Direction system has a built-in checking program that automatically tests its components when you turn the system unit power on. If there is a problem, the system displays an error message. If this happens, follow any instructions on the screen. See Appendix D for a description of system error messages.

If screen messages do not help or an error message does not appear, use the information in this chapter to determine and solve the problem. The problem is often one that you can solve yourself.

See the following sections in this chapter for help:

- "Problem Checklist"
  See this section first to determine the cause of your problem.

- "Solutions to Common Problems"
  Refer to this section to solve common minor problems.

- "Getting Help"
  See this section for the help available to you for information about your computer and for help when you cannot solve a problem yourself.

PROBLEM CHECKLIST

If you have a problem, go through the following checklist for possible solutions.

- **Is the power switch on for the computer and any connected peripherals (monitor, printer)?**

  Check that all power switches are on.

- **Are the computer and its peripherals connected to a working AC power outlet or surge protector?**

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

- **Are all cables and power cords connected securely?**

  Check that all cables and power cords are securely connected.

- **Is the monitor screen blank or is the display hard to read?**

  Check that the monitor is on. Adjust the brightness and contrast controls on the monitor.

- **Was a Non-System Disk error message displayed when you started the system?**

  You have a diskette in the diskette drive. Remove the diskette from drive A and restart the system.

- **Is your mouse or keyboard not responding?**

  You may 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.

- **Does your system fail to recognize the CD-ROM?**

  Your drive designation may be incorrect.

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 the power cable is plugged into the system power socket. Check that the other end of the cable is plugged into a live, properly grounded AC power outlet.

■ **System does not boot and error message displayed on screen**

Run the Setup Utility. Check that the parameters are set correctly, particularly if you just installed an option.

See Appendix D for a description of error messages.

■ **System sounds continuous beeps**

Turn the system off, wait at least five seconds, and turn the system on. If the beeps continue, call your NECCSD dealer or NECCSD Technical Support.

■ **System does not maintain date, time, system configuration information**

Replace the battery (see "Battery Replacement" in Chapter 2).

■ **System does not boot from hard disk**

The system 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 and check the Boot parameter settings to verify that the initial boot parameter is set for hard drive C and not for a diskette drive.

■ **System performance appears sluggish**

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

Check the memory requirements of your software applications. If required, install additional DIMM memory.

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

■ **System did not recognize additional DIMM memory**

Be sure that the DIMM is correctly installed and that the holding clips are locked in place.

■ **System password forgotten**

Clear the password and reset it.

Diskette Drive Problems

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

■ **Diskette won't load**

Check that the diskette is being loaded correctly.

Check that the system and monitor power lamps are on and the power-on screen appears.

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

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 booting from the diskette drive, insert a diskette with system files into drive A.

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

Monitor Problems

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

- **Monitor screen is dark**

  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 the spacebar or move the mouse to take the system out of the power management mode.

- **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 have been made.

  Check that the video refresh rate and video driver are correct for your monitor.

Keyboard/Mouse Problems

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

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

Check that the keyboard or mouse cable connection is snug.

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

CD-ROM Problems

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

■ **The system does not see the CD-ROM reader**

The drive designation is wrong and should be changed.

■ **The CD-ROM reader is not reading a disc**

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

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

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

■ **The CD-ROM disc does not eject due to a power failure or software error**

Turn off the system and use the CD-ROM emergency eject feature.

Speaker Problems

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

■ **No sound from the speakers**

Check that the speaker power is on.

■ **Speaker volume is too low**

Adjust the volume control on the speaker. If the volume is still too low, adjust the volume by clicking on the Sound Mixer in Windows.

■ **Sound is only coming from one speaker**

Balance the speaker output by adjusting the balance on the Sound Mixer in Windows.

Microphone Problems

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

■ **You get no response from the microphone**

Check that the microphone is connected to the microphone in connector on the back of your system.

Adjust the microphone (MIC) level through sound software.

GETTING HELP

If you tried correcting problems yourself and weren't successful, you may want to try one or more of our 24-hour services for answers to your questions. See Chapter 7 for information about online or faxback services.

If you still need help, continue with the suggestions that follow.

Getting Help From Your Company

If you are in a company, the best source of help may be internal. Your company may have designated central support personnel to whom you can go when you have problems.

Getting Help From Your NECCSD Dealer

The NECCSD dealer from whom you purchased your system is a good source of help and should be contacted. The dealer is backed by complete support resources and programs within NECCSD.

Getting Help From NECCSD Technical Support

Help is available to you through NECCSD Technical Support. Direct assistance is available 24 hours a day, 7 days a week. You can call for support, toll free, at 1-888-632-2678.

Free technical support for hardware is limited to the length of the standard warranty. Software support for pre-loaded software is limited to 90 days from the time of the first call to NECCSD Technical Support. Get software support after the initial 90 days or hardware support after the warranty period for a fee.

Before calling, please have ready your system name, model number, serial number, and purchase date. Also have ready as much information as possible about the problem you are having, including any error messages that occurred.

NECCSD Warranty/Non-Warranty Repair Service

The NECCSD repair service is designed to support your warranty and non-warranty service activity.

Before you call for repair service, see the previous sections in this chapter to determine if you can solve the problem yourself, within your company, through your dealer, or with the help of a technician from NECCSD Technical Support.

If your system requires repair service from NECCSD, call to request repair service in the United States and Canada, call 1-888-632-2678.

A Setting Up a Healthy Work Environment

⚠ 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 keyboard
and mouse

Adjust
your monitor
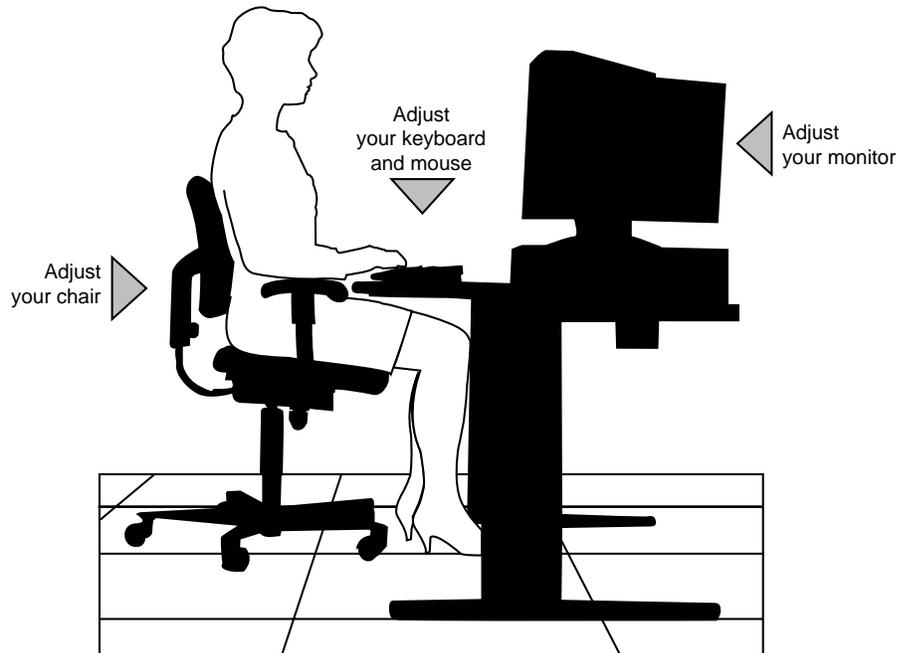
Adjust
your chair

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
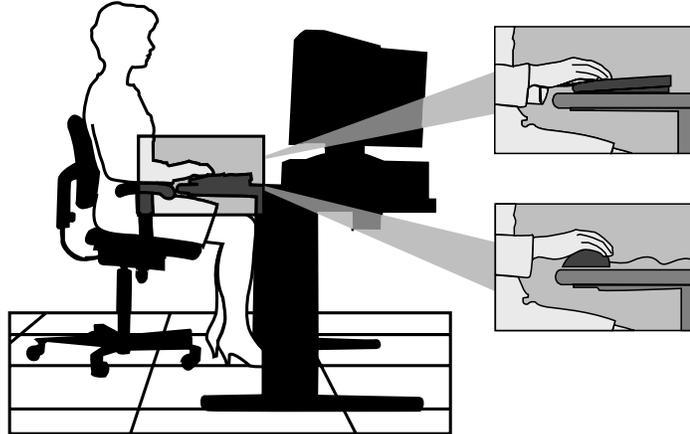
Follow these points in positioning your keyboard and mouse.

■ 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.
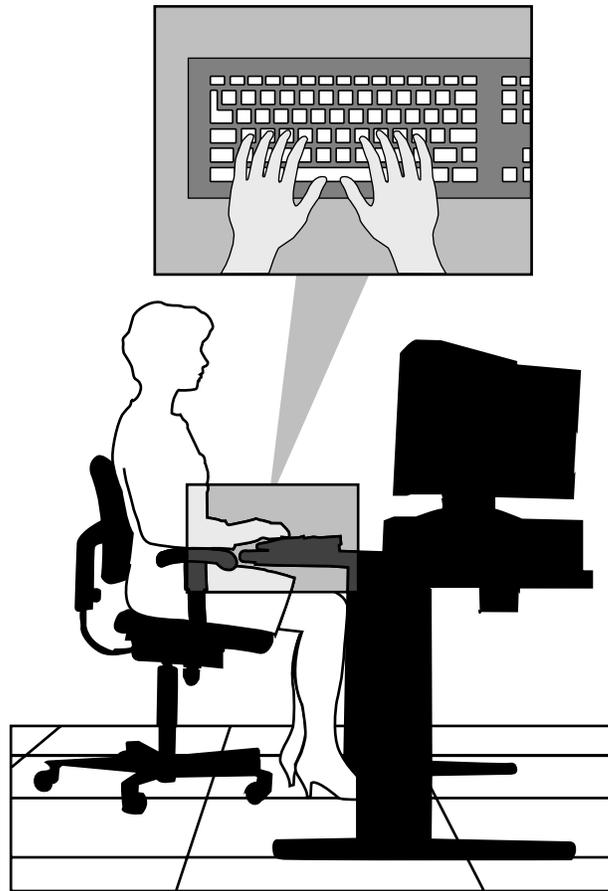
- Type with your hands and wrists floating above the keyboard. Use a wrist pad only to rest your wrists between typing. Avoid resting your wrists on sharp edges.

- 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.
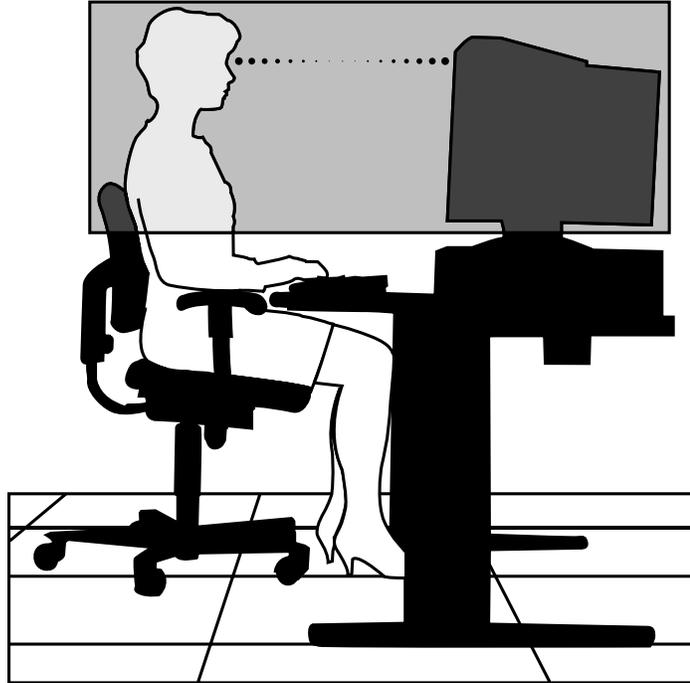
- Adjust the monitor height so that the top of the screen is at or slightly below eye level. Your eyes should look slightly downward when viewing the middle of the screen.

- Position your monitor no closer than 12 inches and no further 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.
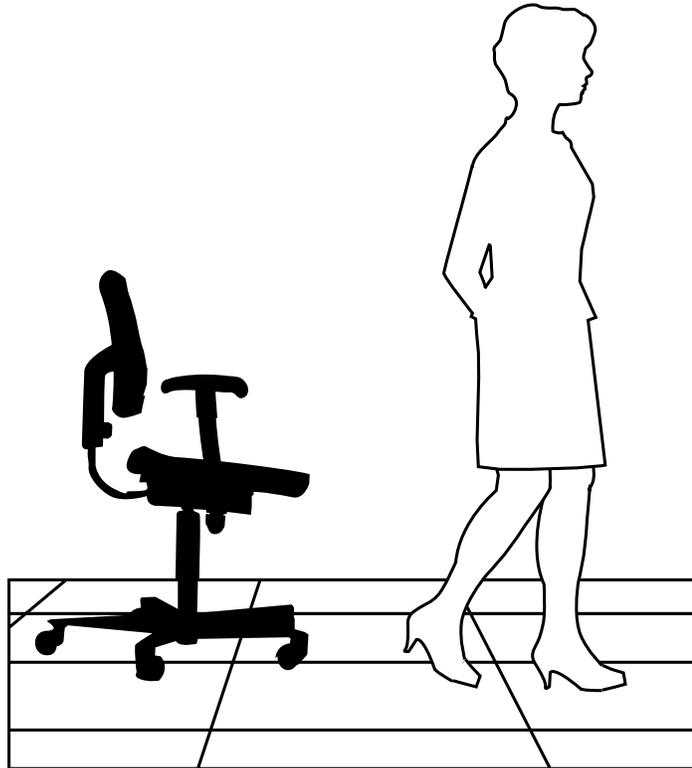
- Use a timer or reminder software to remind you to take breaks.

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

PREEXISTING CONDITIONS AND PSYCHOSOCIAL FACTORS

Preexisting 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 further 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 Limited Warranty

NEC Computer Systems Division, Packard Bell NEC, Inc. (hereinafter "NECCSD") warrants this Product to be free from defects in material and workmanship under the following terms:

HOW LONG IS THE WARRANTY?

Labor and parts are warranted for three (3) years from the date of the first consumer purchase in the U.S.A., Canada, and selected countries. Year one is on-site; years two and three are on a return-to-service-center basis. Spare parts are warranted for ninety (90) days.

WHO IS PROTECTED?

This warranty may be enforced only by the first consumer purchaser.

WHAT IS COVERED AND WHAT IS NOT COVERED?

Except as specified below, this warranty covers all defects in material and workmanship.

1. Any product which is not distributed in the U.S.A. or Canada by NECCSD.

2. Any Product on which the serial number has been defaced, modified or removed.

3. Damage, deterioration, or malfunction resulting from, but not limited to:

   a. Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature, unauthorized Product modification, or failure to follow instructions supplied with the product.

   b. Repair or attempted repair by anyone not authorized by NECCSD.

   c. Any shipment of the Product (claims must be presented to the carrier).

   d. Removal or installation of the Product.

   e. Any other cause which does not relate to a Product defect.

4. Cartons, carrying cases, pens, external cabinets, magnetic media, or any accessories used in connection with the Products.

5. This warranty covers only NECCSD-supplied components. Service required as a result of third-party Products is not covered under this warranty.

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items, but we will not pay for the following:

1. Removal or installation charges.

2. Payment of shipping and related charges incurred in returning the Product for warranty repair.

HOW YOU CAN GET WARRANTY SERVICE

Year One

For the first year, NECCSD provides an on-site limited warranty for your NECCSD computer.

Such on-site warranty service may be obtained by calling **1-888-632-2678**. You may also obtain warranty service in the same manner as the procedure for years two and three, below.

Years Two and Three

To obtain warranty service during years two and three of the warranty terms, you must return this product to NECCSD for repair. It shall be your obligation and expense to ship the product, freight prepaid, or to deliver it to a facility authorized by NECCSD to render the warranty services, in either the original package or a similar package affording an equal degree of protection. Call 1-888-632-2678 for a correct return address.

NOTE: All products returned to NECCSD for service MUST have prior approval; this may be obtained by calling the above number.

FOR CUSTOMER SERVICE AND OTHER INFORMATION, TELEPHONE 1-888-632-9128

NECCSD offers warranty upgrades, service extensions and other technical support programs for its products. For information or to order any such services, call toll-free 1-888-632-9128.

NECCSD products are warranted in accordance with the terms of the applicable NECCSD limited warranty. Product performance is affected by system configuration, software, the application, customer data, and operator control of the system, among other factors. While NECCSD products are considered to be compatible with many systems, the specific functional implementation by the customers of the product may vary. Therefore, the suitability of a product for a specific purpose or application must be determined by the customer and is not warranted by NECCSD.

LIMITATION OF DAMAGES AND IMPLIED WARRANTIES

NECCSD'S SOLE LIABILITY FOR ANY DEFECTIVE PRODUCT IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE PRODUCT AT OUR OPTION. NECCSD SHALL NOT BE LIABLE FOR:

1. DAMAGE TO OTHER PROPERTY CAUSED BY ANY DEFECTS IN THIS PRODUCT, DAMAGES BASED UPON INCONVENIENCE, LOSS OF USE OF THE PRODUCT, LOSS OF TIME OR DATA, LOSS OF SOFTWARE, COMMERCIAL LOSS; OR

2. ANY OTHER DAMAGES, WHETHER INCIDENTAL, CONSEQUENTIAL OR OTHERWISE.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SOME STATES DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES; THEREFORE, THE ABOVE EXCLUSIONS OR LIMITATIONS MAY NOT APPLY TO YOU.

HOW STATE LAW RELATES TO THE WARRANTY

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

C System Specifications

STANDARD FEATURES

The NEC Direction L-Series computer uses a high-performance ATX system board outfitted with a Pentium II processor.

System specifications are listed by component.

Processor

- 233-MHz, 266-MHz, or 300-MHz, depending on the system you purchased.

- Implements the MMX instruction set which optimizes multimedia performance

- Backward compatible with the 8086, 80286, Intel386™, Intel486™, Pentium and Pentium Pro processors

- Packaged in a Single Edge Contact (SEC) cartridge; the processor cartridge's 242-pin edge connector plugs into the system board's Slot 1. The SEC is secured by a retention mechanism attached to the system board. The SEC includes

  — processor core

  — second-level cache

  — thermal plate with fan-heatsink

  — back cover.

Second Level Cache

The second level cache (L2) consists of 512 MB of pipeline burst static RAM (PBSRAM). Also called external cache memory, it is part of the SEC cartridge and cannot be expanded.

Memory

With three dual in-line memory module (DIMM) sockets, memory is expandable to 384 MB; minimum memory size is 8 MB.

> **NOTE** You can use either ECC (error-checking and correcting) DIMMs or non-ECC DIMMs, but you should not mix them.

The BIOS automatically detects memory type, size and speed. All main memory can be cached. The system board supports

- 168-pin 3.3V DIMMs with gold-plated contacts.

- Up to 384 MB of unbuffered 66 MHz , 4-clock Synchronous DRAM (SDRAM) memory; this improves memory speed and system performance through memory access that is synchronous with the memory clock

- 3.3V memory only

- ECC (72-bit) and non-ECC (64-bit) memory

- Single- or double-sided DIMMs

Acceptable DIMM Options

DIMM SIZE	NON-ECC CONFIGURATION	ECC CONFIGURATION
8 MB	1 Mbit x 64	1 Mbit x 72
16 MB	2 Mbit x 64	2 Mbit x 72
32 MB	4 Mbit x 64	4 Mbit x 72
64 MB	8 Mbit x 64	8 Mbit x 72
128 MB	16 Mbit x 64	16 Mbit x 72

NOTE: Do *NOT* mix non-ECC and ECC DIMMs

■ Use of 8-, 16-, 32-, 48-, 64-, or 128-MB DIMMs installed in any of the three sockets regardless of speed or size; therefore, dozens of combinations are possible. See the examples of DIMM combinations in the following table.

Sample Memory Configurations

BANK 0	BANK 1	BANK 2	TOTAL RAM
1 Mx64 (8)	Empty (0)	Empty (0)	8 MB (minimum)
Empty (0)	4 Mx64 (32)	8 Mx64 (64)	96 MB
16 Mx64 (128)	Empty (0)	2 Mx64 (16)	144 MB
2 Mx72 (16)	2 Mx72 (16)	4 Mx72 (16)	64 MB (ECC)
2 Mx64 (16)	Empty (0)	2 Mx64 (16)	32 MB
4 Mx64 (32)	4 Mx64 (32)	8 Mx64 (64)	128 MB
8 Mx64 (64)	1 Mx64 (8)	4 Mx64 (32)	104 MB
2 Mx64 (16)	4 Mx64 (32)	1 Mx64 (8)	56 MB
4 Mx64 (32)	8 Mx64 (64)	2 Mx64 (16)	112 MB
Empty (0)	16 Mx72 (128)	16 Mx72 (128)	256 MB (ECC)
16 Mx64 (128)	2 Mx64 (16)	8 Mx64 (64)	210 MB
16 Mx64 (128)	4 Mx64 (32)	8 Mx64 (64)	224 MB
16 Mx72 (128)	8 Mx72 (64)	1 Mx72 (8)8 MB	200 MB (ECC)
16 Mx64 (128)	16 Mx64 (128)	16 Mx64 (128)	384 MB
16 Mx72 (128)	16 Mx72 (128)	16 Mx72 (128)	384 MB (ECC)

> **NOTE** Buffered or 2-clock SDRAM DIMMs are not supported. SDRAM DIMMs with an *nx4* DRAM base are not supported. DO NOT use a DIMM rated 16 Mbit x 4.

Chipset

The Intel 440LX chipset was designed for the Pentium II processor. It consists of the Intel 82443LX PCI/A.G.P. controller (PAC) and the Intel 82371AB PCI/ISA IDE Xccelerator (PIIX4) bridge chip.

Intel 82443LX PCI/A.G.P. Controller (PAC)

The PAC provides bus-control signals, address paths, and data paths for transfers between the processor's host bus, PCI bus, Accelerated Graphics Port (AGP) and main memory. The PAC comes in a 492-pin BGA package and features

■ Processor interface control

— Processor host bus speeds up to 66 MHz

— 32-bit addressing

— GTL+ compliant host bus

■ Integrated DRAM controller

— Supports synchronous DRAM (SDRAM)

— 64/72-bit path to memory

— Auto detection of memory type

— Supports 40, 16-, and 64-Mbit DRAM devices

— Symmetrical and asymmetrical DRAM addressing

— Supports 3.3 V DRAMs

■ Accelerated graphics port interface

— Supports AGP video adapters with data transfer rates up to 133 MHz

— Synchronous coupling to the host-bus frequency

- Fully synchronous PCI bus interface
    - — PCI-to-DRAM access greater than 100 MB/seconds
    - — Supports five PCI bus masters in addition to the host and PCI-to-ISA I/O bridge
    - — Delayed transactions
    - — PCI parity checking and generation support

- Data buffering
    - — Supports host-to-DRAM, PCI-to-DRAM, and AGP-to-DRAM write-data buffering
    - — Supports write-combining for host-to-PCI burst writes
    - — Supports concurrent host, PCI, and AGP transactions to main memory

- System Management Mode (SMM) compliant

Intel 82371AB PCI ISA IDE Xccelerator (PIIX4)

The PIIX4 is a multifunction PCI device implementing the PCI-to-ISA bridge, PCI IDE functionality, universal serial bus (USB) host/hub functions, and enhanced power management. The PIIX4 comes in a 324-pin package that features the following:

- — Multifunction PCI-to-ISA bridge
- — Supports PCI bus at 33 MHz
- — Supports full ISA or extended I/O bus

- USB controller
    - — Supports two USB ports
    - — Supports legacy keyboard and mouse
    - — Supports UHCI design guide, revision 1.1 interface

- Integrated dual-channel enhanced IDE interface

  — Supports up to four IDE devices

  — Supports PIO Mode 4 transfers at up to 14 MB/second

  — Supports Ultra DMA/33 synchronous DMA mode transfers up to 33 MB/second

  — Supports bus master mode with an 8x32-bit buffer for bus master PCI IDE burst transfers

- Enhanced DMA controller with two 8237-based DMA controllers

  — Supports PCI DMA with three PC/PCI channels and distributed DMA protocols

  — Supports fast type-F DMA for reduced PCI bus usage

- Interrupt controller based on 82C59

  — Supports 15 interrupts

  — Programmable for edge/level sensitivity

- Power management logic

  — Sleep/resume logic

  — Supports thermal alarm

  — Supports wake-on-modem through Ring Indicate input

- Real-time clock

  — 256 byte battery-backed CMOS SRAM

  — Includes date alarm

■ 16-bit counters/timers based on 82C54.

Accelerated Graphics Port (AGP)

The AGP is a high-performance interface for intensive graphics programs, such as 3D applications. Independent of the PCI bus, the AGP is intended for exclusive use with graphical display devices. The AGP features:

■ AC timing for 133 MHz data transfer rates, allowing data throughput of 500 MB/second

■ Pipeline-memory read and write operations that hide memory access latency

■ Demultiplexing of address and data on the bus for near 100 percent bus efficiency

Universal Serial Bus (USB) Support

Two external USB ports support USB-type peripheral devices. System board supports standard universal host controller interface (UHCI) with UHCI-compatible software drivers.

■ Support for isochonous and asynchronous transfer types

■ Automatic mapping of function to driver and configuration

■ Guaranteed bandwidth and low latencies appropriate for telephony, audio and other applications

■ Shielded (high speed) cable required to connect USB peripheral devices

■ Supports up to 127 physical devices

> **NOTE** Use shielded cable that meets the FCC Class B requirements to connect any USB device.

IDE Support

Two independent bus mastering PCI IDE interfaces support PIO Modes 3 and 4, ATA-33 (Ultra DMA-33) and ATAPI devices.

The BIOS supports Logical Block Addressing (LBA) and Extended Cylinder Head Sector (ECHS) translation modes.

The IDE device transfer rate and translation mode are automatically detected.

Super I/O Controller

National Semiconductor PC87307 Super I/O Controller is an ISA Plug and Play compatible, multifunction device that provides the following features:

- Two serial ports
- Multimode bidirectional parallel port
- Floppy disk controller

  — DP8473 and N82077 compatible

  — 16 byte FIFO

  — PS/2 diagnostic register support

  — CMOS disk input and output logic

  — High performance digital data separator (DDS)

  — PC-AT and PS/2 Drive Mode support.

- Keyboard and mouse controller —8042A compatible, 8-bit internal data bus.

Serial Ports

- External 9-pin D-sub serial port connectors
- Four internal 8-bit DMA options for the UART with SIR support (USI)
- Send/receive 16-byte FIFO
- Two 16450/16550A-software compatible UARTs supporting data transfers up to 921.6 Kbaud.
- Extended UART mode supports data transfers up to 1.5 Mbaud.

Parallel Port

- External 25-pin D-sub parallel port connector
- Multimode
  - Standard (compatible)
  - Enhanced parallel port (EPP)
  - High-speed extended capabilities Port (ECP) modes.

Floppy Controller

Supports 3.5- and 5.25-inch devices (360KB, 720KB, 1.2MB, 1.25/1.44MB and 2.88MB settings).

Keyboard & Mouse

- External PS/2 type keyboard and mouse ports
- PS/2-type keyboard and mouse
- Optional PS/2-compatible multimedia keyboard
- Optional PS/2-compatible 3D mouse.

Interrupt Requests (IRQs)

Interrupt Assignments

IRQ	NORMAL ASSIGNMENT
NMI	I/O channel check
0	Reserved, interval timer
1	Reserved, keyboard buffer
2	Reserved, cascade interrupt from slave PIC
3	COM2*
4	COM1*
5	LPT2 (Plug and Play option) / audio /user available
6	Floppy Drive
7	Parallel Port 1 (LPT1)*
8	Real time clock
9	User available
10*	User available / USB
11*	Windows Sound System*/user available
12	On-board mouse port if mouse is present; else is user available
13	Reserved, math coprocessor
14	Primary IDE channel
15	Secondary IDE channel or else user-available

*Default, but can be changed to another IRQ

Audio Support

Your system is equipped with the OPL3-SA3 audio system. The wavetable synthesizer is available as an upgrade. Details follow.

OPL3-SA3 Audio System

- 16-bit audio codec
- OPL3 FM synthesis
- Integrated 3D enhanced stereo controller including all required analog components
- Interface for MPU-401 and a joystick
- Stereo analog-to-digital and D/A converters
- Analog mixing, anti-aliasing, and reconstruction filters
- Supports 16-bit address decoding
- Line, microphone and monaural inputs
- ADPCM, A-law, or μlaw digital audio compression and decompression
- Full digital control of all mixer and volume control functions
- Software switching between rear panel mic in and line in connectors
- Plug and Play compatible
- Complies with Sound Blaster Pro and MS Windows Sound System standards.

OPL4-ML Wavetable Synthesizer

The optional Yamaha OPL4-ML synthesizer integrates the OPL3 audio system (described above), general MIDI processor and wavetable. This wave synthesis results in richer and more realistic sounds than that of FM synthesis. It has the following additional features:

- Compliance with general MIDI system 1
- Compliance with MPU-401 UART mode
- 24 simultaneous voices
- 100-pin SQFP package.

Audio Connectors

- Back panel audio jacks (line in, line out, mic in)
- CD-ROM audio connector (both CD and ATAPI)
- Telephony connector (ATAPI style)
  — Line-in audio input connector (style)
- Supports hardware wavetable.

CD-ROM Audio Connector

A 1x4-pin connector is available for connecting an internal CD-ROM reader

Expansion Slots

- Three PCI expansion slots
- One ISA expansion slot
- One PCI/ISA shared expansion slot
- One AGP video slot
- Supports Plug and Play compatible devices
- Optional video riser for TV out and/or video capture features.

BIOS

- Stored in 2Mbit flash memory
- Supports DMI (Desktop Management Interface)/Advanced Power Management
- Incorporates ISA Plug and Play capability

- Security features include User and Supervisor passwords.

Video Support and Monitor

Depending on the system you purchased, your computer may be equipped with one of several monitors and high-performance graphics adapters. See the separate documentation that comes with these products for relevant specifications.

Power Supply

The input voltage is selectable from a switch on the switching power supply.

Input Requirements

VOLTAGE (VAC)	RANGE (VRMS)	CURRENT (ACMS)
115	90 to 132	6.0
230	180 to 264	4.0

This equipment has a 3-wire, grounded power cord. To prevent electrical hazards, do not remove or defeat the ground prong on the power cord if it gets damaged. Contact your dealer or Authorized Service Provider for a replacement.

In the U.S.A. and Canada, the power cord must be a UL-listed detachable power cord (in Canada, CSA-certified), type SV or SVT, 18 AWG, 3-conductor, provided with a molded-on NEMA type 5-15 P plug cap at one end and a molded-on cord connector body at the other end. The cord length must not exceed 15 feet (4.5 meters).

Outside the U.S.A. and Canada, the plug must be rated for 250 VAC, 10 amp minimum, and must display an international agency approval marking. The cord must be suitable for use in the end-user country. Consult your dealer or the local electrical authorities if you are unsure of the type of power cord to use in your country.

Output DC Load Requirements

NOMINAL LOAD OUTPUT	CURRENT (Maximum)
+3.3V	14.0A
+5V	22.0A
+12V	8.0A
–5V	0.5A
–12V	0.8A
+5V$_{SB}$	0.8A

Power Consumption

Rated Output Power: 200W max.

DC Voltage

DC Voltage—Acceptable Tolerance

- +3.3V   ±4%
- +5V   ±5%
- –5V   ±5%
- +12V   ±5%
- –12V   ±5%

Environmental Specifications

Ambient Temperature

Operating: 5° to 35° C (41° to 95° F)

Non-Operating: –40° to 70° C (–4° to 158° F)

Humidity

Operating: 85% relative humidity (max.) at 35° C (95° F)

Non-Operating: 95% relative humidity (max.) at 35° C (95° F)

D System Board, Connectors, and Error Messages

This chapter contains illustrations of the Direction L-Series system board, a list of connectors, and list of error messages.

SYSTEM BOARD

Your system is equipped with a Pentium II that runs at 233 MHz, 266 MHz or 300 MHz, depending on the system you purchased. The Pentium II has the MMX instruction set built in. MMX-type components optimize a system's ability to process multimedia components.

⚠ WARNING

Should you have occasion to open your system, before touching anything, be sure to ground yourself. Electrostatic discharge poses a considerable hazard to electronic components. Service technicians ground themselves by wearing a wrist strap that is attached to an electrical ground, such as your system's serial port. A grounding strap is available at electronic supply stores.

If you do not have a grounding strap, you can ground yourself and dissipate any electrostatic buildup by doing the following:

1. Connect the computer's power cord between the computer and a three-pronged, grounded electrical outlet.

2. Be sure power to the computer is turned off.

3. Touch, and maintain continuous contact with an unpainted metal surface of the computer system while handling or touching any internal components, chips, add-on boards or disk drives.

   Proper grounding surfaces inside the computer include the disk drive mounting cage, the metal surrounding the power supply, or unpainted portions of the computer's rear panel.

CONNECTORS

System board external and internal connectors are described in the following sections.

Rear Panel Connectors

The following table lists the external connectors on the rear panel.

System Board External Connectors

NAME	FUNCTION
PS/2 keyboard	Connects to your keyboard
PS/2 mouse	Connects to your mouse
USB (Universal Serial Bus)	Reserved for future product development
Parallel port	Connects to an optional parallel printer data cable
COM port 1	Connects to an optional serial device
COM port 2	Connects to an optional serial device
Audio connectors: Line in, Line out, Mic in	Connects to powered stereo input/output devices, and a microphone or headset
MIDI/Game port	Connects to a MIDI device or joystick

Internal Connectors

The following connectors and jumper are located inside your computer.

System Board Internal Connectors

CONNECTOR	FUNCTION
J4E1	AGP video connector
J2F2	ATAPI audio line-in connector
J1F1	ATAPI CD-ROM audio connector
J2F1	ATAPI telephony connector
BT2E1	CMOS/BIOS battery socket
J8B2	Configuration
	Normal mode 1-2: Normal (default)
	Configure 2-3:
	BIOS recovery No jumper; resets BIOS
J7J1	DIMM slot (Bank 0)
J6J2	DIMM slot (Bank 1)
J6J1	DIMM slot (Bank 2)
J8M1	Fan 1 connector
J3F1	Fan 2 connector
J5L1	Fan 3 (active heatsink) connector
J8K1	Diskette drive connector
J8H2	Front panel connectors—speaker/ reset/ power LED/HDD LED/reserved/sleep/power
J7H1	IDE connector (primary)
J8H1	IDE connector (secondary)
J4A1/J4B2	ISA slots
J4B1/J4C1 J4D1/J4D2	PCI slots

System Board Internal Connectors

CONNECTOR	FUNCTION
J4J1	Pentium II CPU socket (Slot 1)
J7L1	Power supply connector
J8B1	SCSI hard drive LED
J1C1	Wake on LAN
J8A1	Wake on ring
J6B1/J6B2	Yamaha wavetable

The following figures show the system board internal connectors and jumper.
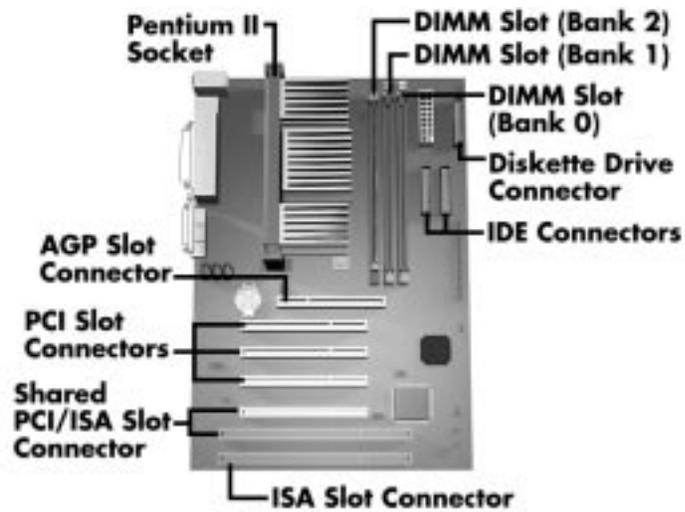
System board slots and connectors
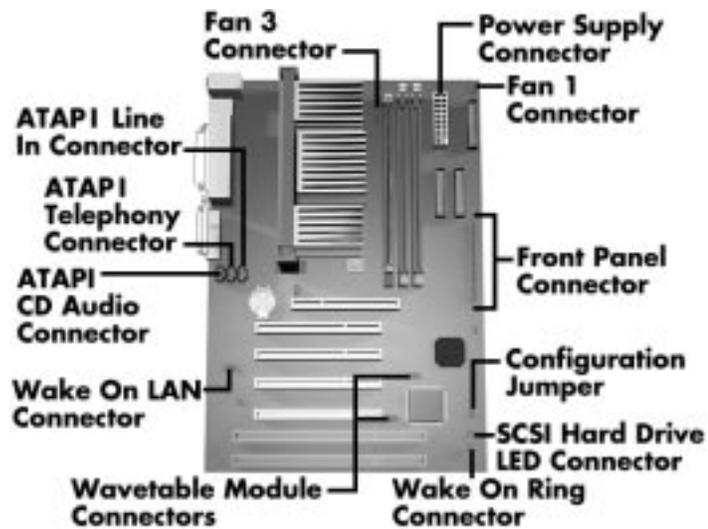
System board connectors and jumper

ERROR MESSAGES

When your computer's power is switched on, the system
automatically goes through initialization, which includes
running the Power-On Self Test (POST). Fatal errors are
those that prevent the system from continuing the boot
process. If any are detected, an error message will appear
on the screen. The following list of error messages includes
causes and possible solutions.

Message	Diskette drive A Error or Diskette drive B Error.
Cause	Drive A or B is present but fails the BIOS POST diskette tests.
Solution	Make sure the drive is defined with the correct diskette type in the Setup Utility program and is properly attached.

Message	Entering SETUP…
Cause	Starting the Setup Utility program.

Message	Extended memory not working or not configured properly at offset: *nnnn*.
Cause	Extended RAM failed at offset: *nnnn*.

Message	Fixed Disk 0 or Fixed Disk 1 Failure, or Fixed Disk Controller Failure.
Cause	Fixed (hard) disk drive is not working or not configured properly.
Solution	Make sure the drive is correctly identified in the Setup utility program and is properly attached.

Message	Failing Bits: *nnnn*.
Cause	The hex number *nnnn* is a map of the bits at the RAM address that failed the memory test. Each 1 (one) in the memory map indicates a failed bit. The failed memory could be in System, Extended or Shadowed memory.

Message	Incorrect Drive A Type or Incorrect Drive B Type – run SETUP.
Cause	Type of floppy drive A or B is not correctly identified in Setup Utility program.

Message	Invalid NVRAM media type.
Cause	Problem with NVRAM (CMOS) access.

Message	Keyboard Controller error.
Cause	The keyboard controller failed its test. The keyboard may need to be replaced.

Message	Keyboard error.
Cause	The keyboard is not working. The keyboard may need to be replaced.

Message	Keyboard error *nnnn*.
Cause	BIOS discovered a stuck key and displays the scan code *nn* for the key.

Message	Keyboard locked—Unlock key switch.
Cause	Unlock the system to proceed.

Message	System battery is dead. Replace and run SETUP.
Cause	The CMOS clock battery that supports the BIOS is dead.
Solution	Replace the battery and run the Setup Utility program to reconfigure the system.

Message	System CMOS Checksum bad – run SETUP.
Cause	System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS.
Solution	Run the Setup Utility program and reconfigure the system, either by selecting the default values and/or by making your own selections.

Message	Monitor type does not match CMOS – Run SETUP.
Cause	The monitor type is not correctly identified in the Setup program.
Solution	Run the Setup Program.

Message	Operating System not found.
Cause	The operating system cannot be found in either Drive A or Drive C.
Solution	Run the Setup program and make sure the fixed disk and drive A are properly identified.

Message	Press <F1> to resume, <F2> to enter SETUP.
Cause	Displayed after any recoverable error message.
Solution	Press the <F1> key on your keyboard to start the boot process, or <F2> to enter the Setup Utility program and change any settings.

Message	Press <F2> to enter SETUP.
Cause	Optional message displayed during POST. Can be turned off in the Setup program.
Solution	Run the Setup program and disable the feature.

Message	Parity Check 1.
Cause	Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays *????.*

Message	Parity Check 2.
Cause	Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays *????.*

Message	Real time clock error.
Cause	The real time clock failed BIOS test.
Solution	This malfunction may require board repair.

Message	Shadow RAM failed at offset: *nnnn*.
Cause	Shadow RAM failed at offset: *nnnn* of the 64K block at which the error was detected.

Message	System cache error – Cache disabled.
Cause	RAM cache failed the BIOS test. BIOS disabled the cache.

Message	System RAM failed at offset: *nnnn*.
Cause	System RAM failed at offset: *nnnn* of the 64K block at which the error was detected.

Message	System timer error.
Cause	The timer test failed.
Solution	This malfunction requires repair of system board.

BEEP CODES

Beep codes can signify a terminal error. If the BIOS detects a terminal error condition, it sounds an error beep code, halts the POST, and attempts to display a port 80h code on the POST card's LED display. A table of beep codes follows.

Beep Codes

BEEPS	80H CODE	DESCRIPTION
1	B4h	One short beep before boot
1-2	98h	Search for options ROMs
1-2-2-3	16h	BIOS ROM checksum
1-3-1-1	20h	Test DRAM refresh
1-3-1-3	22h	Test 8742 keyboard controller
1-3-4-1	3Ch	RAM failure on address line *xxxx*
1-3-4-3	2Eh	RAM failure on data bits *xxxx* of low byte of memory bus
1-4-1-1	30h	RAM failure on data bits *xxxx* of high byte of memory bus
2-1-2-3	46h	Check ROM copyright notice
2-2-3-1	58h	Test for unexpected interrupts

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BATTERY REPLACEMENT

A lithium battery in some computers maintains system configuration information. In the event that the battery fails to maintain system configuration information, NECCSD recommends that you replace the battery. See "Battery Replacement" in Chapter 2 of this guide 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.

ATTENTION: 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

Do not place used batteries in your regular trash.

The nickel-cadmium or nickel metal-hydride batteries must be collected, recycled, or disposed of in an environmentally-approved manner.

The incineration, landfilling, or mixing of batteries with the municipal solid waste stream is **prohibited by law** in most areas.

Return batteries to a federal or state approved battery recycler. This may be where your purchased the battery or a local seller of automotive batteries. In MINNESOTA, call 1-800-225-PRBA if further disposal information is required.

Contact your local waste management officials for other information regarding the environmentally sound collection, recycling, and disposal of the batteries.