EPSON EISA

Seri

FCC COMPLIANCE STATEMENT
FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

❑ Reorient or relocate the receiving antenna

❑ Increase the separation between the equipment and receiver

❑ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

❑ Consult the dealer or an experienced radio/TV technician for help

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

FOR CANADIAN USERS

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le present appareil numérique n'émet pas de bruits radioelectriques dépassant les limites applicables aux appareils numeriques de Classe B prescrites dans le règlement sur le brouillage radioelectrique édicté par le Ministère des Communications du Canada.

EPSON® EISA *Series*™

User's Guide

Important Safety Instructions

1. Read all of these instructions and save them for later reference.

2. Follow all warnings and instructions marked on the computer.

3. Unplug the computer from the wall outlet before cleaning. Use a damp cloth for cleaning; do not use liquid or aerosol cleaners.

4. Do not spill liquid of any kind on the computer.

5. Do not place the computer on an unstable cart, stand, or table.

6. Slots and openings in the cabinet and the back or bottom are provided for ventilation; do not block or cover these openings. Do not place the computer near or over a radiator or heat register.

7. Operate the computer using the type of power source indicated on its label. If you are not sure of the type of power available, consult your dealer or local power company.

8. If you plan to operate the computer in Germany, observe the following safety precaution:

   To provide adequate short-circuit protection and over-current protection for this computer, the building installation must be protected by a 16 Amp circuit breaker.

   Beim **Anschulß** des Computers an die Netzversorgung **muß** sichergestellt werden **daß** die Gebaudeinstallation mit einem 16 A ijberstromschutzschalter abgesichert ist.

9. Connect all equipment to properly grounded (earthed) power outlets. If you are unable to insert the plug into an outlet, **contact** your electrician to replace your outlet. Avoid using outlets on the same circuit as photocopiers or air control systems that regularly switch on and off.

10. Do not allow the computer's cord to become damaged or frayed.

11. If you use an extension cord with the computer, make sure the total of the ampere ratings of the devices plugged into the extension cord does not exceed the ampere rating for the extension cord. Also, make sure the total of all products plugged into the wall outlet does not exceed 15 amperes.

12. You must extend the stabilizing feet on both sides of the computer's base whenever it is in an upright position to prevent it from falling over.

13. Do not insert objects of any kind into this product through the cabinet slots.

14. Except as specifically explained in this User's Guide, do not attempt to service the computer yourself. Refer all servicing to qualified service personnel.

15. Unplug the computer from the wall outlet and refer servicing to qualified service personnel under the following conditions:

    A. When the power cord or plug is damaged.

    B. If liquid has entered the computer.

    C. If the computer does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and often requires extensive work by a qualified technician to restore the computer to normal operation.

    D. If the computer has been dropped or the cabinet has been damaged.

    E. If the computer exhibits a distinct change in performance.

Instructions Importantes de **Sécurité**

1. Lire completement les instructions qui suivant et les conserver pour references futures.

2. Bien suivre **tous** les avertissements et les instructions **indiqués** sur l'ordinateur.

3. Debrancher l'ordinateur de toute sortie murale avant le nettoyage. Utiliser un chiffon humide; ne jamais utiliser un nettoyeur liquide ou une bonbonne aerosol.

4. Ne jamais renverser un liquide d'aucune sorte sur l'ordinateur.

5. Ne pas placer l'ordinateur sur un chariot, un support, ou une table instable.

6. Les events dans le meubles, **à l'arrière** et en dessous sont **conçus** pour l'aeration; on ne **doit** jamais les bloquer. Ne pas placer l'ordinateur **près** d'une source de chaleur **directe.**

7. Le fonctionnement de l'ordinateur **doit** s'effectuer conformement au type de source d'alimentation indiquee sur l'etiquette. Dans le cas d'un doute de la source disponible, on **doit communiquer avec** le concessionaire ou la compagnie **d'électricité.**

8. Lorsqu'on desire utiliser l'ordinateur en Allemagne, on **doit** observer les normes securitaires qui suivent:

    Afin d'assurer une protection adequate a l'ordinateur **contre** les court-circuits et le survoltage, l'installation de **l'édifice doit** comprendre un disjoncteur de 16 amp.

9. On **doit brancher** tout l'equipement dans une sortie **reliée à** la masse. Lorsqu'il est impossible d'inserer la fiche dans la prise, on **doit** retenir les services d'un **électricien** ou remplacer la prise. Ne jamais utiliser une prise sur le **même** circuit qu'un appareil **à photocopie** ou un **système** de **contrôle d'aération avec** commutation **marche-arrêt.**

10. S'assurer que le cordon d'alimentation de l'ordinateur n'est pas **effrité.**

11. Dans le cas **où** on utilise un cordon de rallonge **avec** l'ordinateur, on **doit s'assurer** que la valeur **totale d'ampères** branches dans le cordon **n'excède** en aucun temps les amperes du cordon de rallonge. La **quantité totale** des appareils branches dans la prise murale ne **doit** jamais **excéder** 15 amperes.

12. Sur chaque **côté,** l'ordinateur est muni de supports qu'il est necessaire d'allonger lorsque l'appariel est mis en position **verticale,** pour l'empecher de tomber.

13. Ne jamais **insérer** un objet de quelque sorte que ce **soit** dans les **cavités** de cet appareil.

14. Sauf tel que **spécifié** dans la notice d'utilisation, on ne **doit** jamais tenter d'effectuer une reparation de l'ordinateur. On **doit référer** le service de cet appareil **à** un technicien qualifie.

15. Debrancher l'ordinateur de la prise murale et **confier** le service au personnel de service qualifie selon les conditions qui suivent:

   A. Lorsque le cordon d'alimentation ou la prise sont endommages.
   B. Lorsqu'un liquide s'est **infiltré** dans l'ordinateur.
   C. Lorsque l'ordinateur refuse de fonctionner normalement **même** en suivant les instructions. N'ajuster que les **commandes** qui sont **énumérées** dans les instructions de fonctionnement. Tout ajustement **inadéquat** de tout autre **contrôle** peut provoquer un dommage et souvent necessiter des reparations **élaborées** par un technicien qualifie **afin** de remettre l'appareil en service.
   D. Lorsqu'on a **échappé** l'ordinateur ou que l'on a endommage le boitier.
   E. Lorsque l'ordinateur demontre un changement note au niveau de sa performance.

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Introduction

The Epson® EISA Series computer is a powerful, versatile system ideally suited for use as either a network server or a high-performance personal workstation. It incorporates the latest EISA (Extended Industry Standard Architecture) technology into a convenient tower design. Its exceptional features and flexibility enable you to use the most advanced peripheral devices and software while maintaining full compatibility with ISA technology. Your system includes the following features:

❏ 4MB of RAM on single inline memory modules (SIMMs)

❏ SIMM sockets for installing up to 64MB of memory using 1MB, 2MB, 4MB, or 8MB SIMMs

❏ 8KB of extended CMOS RAM for EISA configuration information

❏ Upgradable processor board providing high speed cache memory and math coprocessor support

❏ One built-in parallel and two built-in serial interfaces

❏ IBM® PS/2® compatible mouse port and keyboard port

❏ Eight EISA expansion slots (compatible with 32-bit EISA cards and 8- or 16-bit ISA cards)

❏ IDE hard disk drive interface (for two hard disk drives)

❏ Diskette drive controller (for two diskette drives and one tape drive)

❏ Six half-height mass storage bays: two internal bays and four externally-accessible bays.

The built-in interfaces let you connect basic peripheral devices (such as a printer and mouse) directly to the computer, leaving the expansion slots for optional devices such as a SCSI adapter or a networking card.

Your computer's EISA technology allows the 32-bit processor to access certain I/O expansion boards 32 bits at a time when running appropriate software. In addition, the EISA burst mode capability enables data transfers of up to 33MB of data per second through the EISA bus.

The powerful EISA configuration program automatically configures any EISA boards you install and provides all the necessary information for configuring ISA boards. The result is a configuration that manages your system resources in the most efficient manner possible.

The EISA Series computer offers several other features to enhance system performance:

❏ Automatic shadow RAM support. This speeds up access to the system and video BIOS.

❏ Processor speed simulation support. You can set the processor to emulate a variety of system speeds from 8 MHz up to your processor's highest speed to provide compatibility with a wide variety of software.

❏ Password security. You can set a password in either regular or network server mode.

Optional Equipment

By adding SIMMs to the main system board, you can expand the computer's memory up to 64MB.

On the upgradeable processor board, you can install a math coprocessor or another coprocessor, depending on the board you have.

You can also install a variety of other options, such as diskette drives, hard disk drives, a tape drive, or a SCSI subsystem.

Check with your authorized Epson dealer to see which options are available.

Software

Your system comes with three diskettes (Reference 1, 2, and 3) containing the following software:

❏ EISA System Configuration program

❏ ISA configuration files for popular ISA boards

❏ System diagnostics program

❏ Hard disk drive low-level formatting utility

❏ HDDPARK program to park the hard disk drive read/write heads

❏ ESPEED program to change the processor simulation speed

❏ CHGCTR program to set country-dependent keyboard and configuration information.

How to Use This Manual

This manual explains how to set up, configure, and operate your computer, as well as how to install options and run diagnostic tests. It does not cover your operating system; see your operating system manual for instructions on installing and using it.

Although you should be sure to follow the steps in Chapter 1 and Chapter 2 to set up and configure your system, you do not need to read everything in this book. See the following chapter summaries to find the sections you need.

Chapter 1 provides instructions for setting up your system.

Chapter 2 describes how to run the System Configuration program to configure your computer.

Chapter 3 provides instructions for certain operating procedures, such as locking the computer's cover, using a password, and changing the operating speed.

Chapter 4 describes how to remove and replace the cover and front panel to access the internal components.

Chapter 5 describes how to install and remove options.

Chapter 6 describes how to install and remove disk drives.

Appendix A outlines the system diagnostic tests.

Appendix B gives instructions for performing a hardware-level format on a hard disk.

Appendix C contains troubleshooting tips.

Appendix D gives the technical specifications for the computer.

At the end of the manual, you'll find a glossary and an index.

Where to Get Help

If you purchased your computer outside of the United States, please contact your dealer or the marketing location nearest you for customer support and service. International marketing locations are listed on the inside of this manual's back cover.

If you purchased your Epson product in the United States, Epson America provides local customer support and service through a nationwide network of authorized Epson dealers and Service Centers.

Epson also provides the following support services through the Epson Customer Resource Center at (800) 922-8911:

❏ Technical assistance with the installation, configuration, and operation of Epson products

❏ Assistance in locating your nearest Authorized Epson Reseller or Service Center

❏ Sales of ribbons, supplies, parts, documentation, and accessories for your Epson product

❏ Customer Relations

❏ Epson technical information library fax service

❏ Product literature with technical specifications on our current and new products.

Chapter 1
Setting Up Your System

This chapter describes the basic steps you perform to set up your system for the first time. It defines the system requirements and gives a general outline of the steps you need to follow to start using your computer. It also describes how to set the appropriate country code for the system's keyboard and configuration information.

Preparing to Set Up the System

Before you set up your system, be sure to read "Important Safety Instructions" at the beginning of this manual (before the table of contents). These instructions provide information about properly caring for your computer and operating it correctly.

It is important to choose a safe, convenient location for your system that provides the following:

❏ A flat, hard surface. Surfaces like carpeted floors attract static electricity, which can erase data on your disks, damage the computer's circuitry, and prevent proper ventilation. Place the computer on an anti-static mat if the surface is carpeted.

❏ Good air circulation. Leave several inches of space around the computer so air can move freely.

❏ Moderate environmental conditions. Select a cool, dry area and protect your computer from extremes in temperature, humidity, dust, and smoke. Avoid direct sunlight or any other source of heat.

❏ No electromagnetic interference. Do not place your system too close to any electrical device, such as a telephone, that generates an electromagnetic field.

❏ Appropriate power sources. Connect all your equipment to the appropriate power source. See "Power Source Requirements" in Appendix D for more information.

❏ Extend the stabilizing feet. You must extend the feet on both sides of the computer's base whenever it is in an upright position to prevent it from falling over.

❏ Remove the protector card. If you have a 5¼-inch diskette drive, be sure to remove the protector card from the diskette slot. This card is inserted at the factory to protect the read/ write heads in the drive.

You should place your computer next to or under your desk, as shown below. This leaves more room on top of your desk for other devices, such as the monitor, keyboard, and printer.
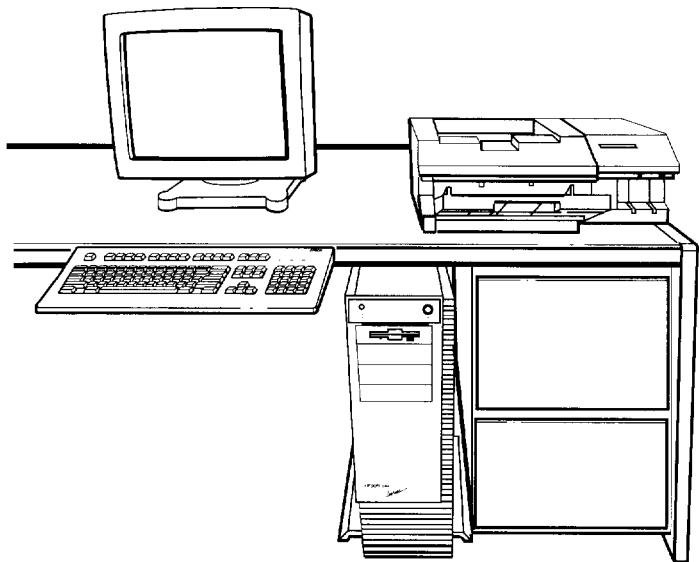
Installation Overview

Listed below are the general steps you follow to install options, connect peripheral devices, and configure your system. For detailed instructions on performing these steps, see the appropriate sections specified in the overview.

1. Install any optional equipment you want to add to your computer, such as disk drives, a math coprocessor, memory modules, or EISA option cards. Do not install any ISA option cards yet (unless you will be using an ISA card to control your monitor). See "Installing Optional Equipment" below.

2. Connect a monitor, a printer, the keyboard, and a mouse, if you are going to use one. See "Connecting Peripheral Devices" below.

3. Then see "Turning On Your Computer," below, before you turn on the system.

4. Run the Change Country Code utility (CHGCTR) to install the correct keyboard driver and configuration information for your system. See "Running the Change Country Code Utility," below, for instructions.

5. Read "The Configuration Process" in Chapter 2 to familiarize yourself with the use of the System Configuration program.

6. Run the System Configuration program, as described in Chapter 2, to configure your system.

7. Turn off the system, unplug all the power cords, and disconnect any peripheral devices from the computer.

8. Set any switches or jumpers on your ISA cards, if necessary, and install them in the computer. See Chapter 5 for instructions on installing option cards.

9. Connect all of your peripheral devices.

10. Install your operating system and any other application programs.

Installing Optional Equipment

The first time you set up your computer, you should install any disk drives, math coprocessor, memory modules, or EISA option cards you plan to use. Do not install any ISA option cards yet, unless you will be installing a video adapter on an ISA option card to control your monitor.

You can install the rest of your ISA cards after you run the System Configuration program. This program provides information about the jumper and switch settings for the ISA option cards you will install.

Follow the instructions in Chapters 5 and 6 to install optional equipment in your computer. Be sure to check your computer's option slot power limits on page 5-4 before you install any option cards.

You may need to unlock the computer's cover to access the internal components. See Chapter 3 for instructions.

When you are finished installing optional equipment, return to this chapter for guidelines on connecting the peripheral devices necessary to run the System Configuration program.

Connecting Peripheral Devices

You may not want to connect all your peripheral devices before you run the System Configuration program for the first time. If you'll be installing ISA cards after running the program, you may want to connect only those devices necessary to perform the program's functions. If you connect other devices, you will need to disconnect them later to install the ISA cards.

You must connect a monitor and a keyboard to run the System Configuration program. You may also want to connect a printer and a mouse.

As you set up your computer, leave this manual's back cover foldout open so you can refer to the illustrations identifying the different parts of the computer.

The following icons mark the built-in interfaces on the back of the computer:
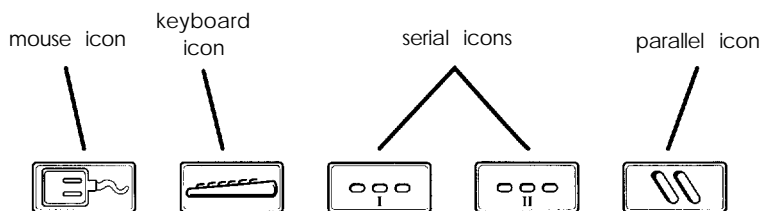
Caution
Although the keyboard and mouse ports are physically identical, you cannot use them interchangeably. Be sure to plug the keyboard and the mouse into the correct ports.

Before connecting your peripheral devices, make sure the power buttons or switches on the computer and all the peripheral devices are turned off. Then connect the devices in the following order:

1. Connect your peripheral device cables to the computer.

2. Connect the power cords to the computer and other devices, if necessary.

3. Plug the power cords into their electrical outlets.

Be sure to read the next section before you turn on your computer.

Turning On the Computer

After you set up your system, you're ready to turn on the power. But first, read the following safety rules to avoid accidentally damaging your computer or injuring yourself:

❏ Do not connect or disconnect any power or peripheral device cables when the computer's power is on.

❏ Never turn on the computer with a protector card in the diskette drive.

❏ Never turn on the computer when its cover is off.

❏ Never turn off or reset your computer while a disk drive light is on. This can destroy data stored on disk.

❏ Always wait at least five seconds after you turn off the power before you turn it on again. This allows the computer to clear and reset its memory.

❏ Do not leave a beverage near your system or any of its components. Spilled liquid can damage the circuitry of your equipment.

❏ Always turn off the power, disconnect the computer's power cord, and wait 30 seconds before you remove the cover. Only remove the cover to access internal devices.

Now you can run the Change Country Code utility, as described below.

Running the Change Country Code Utility

Before you configure your computer or perform any other operations, you need to create new AUTOEXEC.BAT and CONFIG.SYS files for your country on the Reference 1 diskette. You do this by running the Change Country Code utility.

This utility creates files that contain the appropriate keyboard driver and configuration information for the country you select. The program runs automatically the first time you boot your computer from the Reference 1 diskette.

Country codes are available for the following countries:

❏ United States

❏ United Kingdom

❏ France

❏ Germany

❏ Italy

❏ Spain.

The default country code is United States. See the instructions in the next section to set the appropriate country code. Later, if you need to change the country code, follow the instructions under "Changing the Country Code" on page l-10.

Setting the Country Code for the First Time

To run the Change Country Code utility the first time you boot your computer from the Reference 1 diskette, follow these steps:

1. Insert the Reference 1 diskette in drive A.

2. Turn on your computer or press the **RESET** button.

3. After a moment, you see a screen describing the Change Country Code utility. The screen displays the following message and prompt:

   Current country **code is United States.**

   Change country code? (Y/N)

If you **want** to select the default country code, United States, press **N**. You see a message telling you that the program still must update your files. Then the program copies the files. Go to step 4.

If you want to select another country code, press **Y**. You see the following:

```
Press F1 - US Version (United States)
Press F2 - UK Version (United Kingdom)
Press F3 - FR Version (French)
Press F4 - GR Version (German)
Press F5 - IT Version (Italian)
Press F6 - SP Version (Spanish)
Press any other key to accept the
current country code.
```

Press the appropriate function key for your country. The program copies the files and displays a message confirming the change.

4. When you see the following message, press any key to reboot the system and run the System Configuration program:

    Now **you should reboot the** system to **run the** appropriate **AUTOEXEC.BAT and CONFIG.SYS files and start the System Configuration program.**

    Press any key to reboot . . .

    After a moment, you see the System Configuration program title screen. If you want to run that program now, see the information in Chapter 2 before you begin.

    If you do not want to configure your computer now, remove the diskette from drive A and turn off your computer.

The AUTOEXEC.BAT and CONFIG.SYS files on your Reference 1 diskette are now customized for your country's keyboard and configuration information. Whenever you boot your system from the Reference 1 diskette, the computer runs the appropriate files for your country.

Also, when you run the System Configuration program, the format of the date and time in your computer's real-time clock will be set to the appropriate format for your country.

Changing the Country Code

If you need to change the country code for your system's keyboard driver and configuration information, you can run the CHGCTR utility. Follow these steps:

1. Insert the Reference 1 diskette in drive A and log onto drive A.

2. At the **A>** prompt, type CHGCTR and press **Enter**. You see the information screen for the Change Country Code utility followed by this prompt:

   Change country code? (Y/N)

3. If you want to keep the current country code, press **N**. You see a message telling you that the program still must update your files. Then the program copies the files. Go to step 4.

   If you want to select another country code, press **Y**. You see the following:

   ```
   Press F1 - US Version (United States)
   Press F2 - UK Version (United Kingdom)
   Press F3 - FR Version (French)
   Press F4 - GR Version (German)
   Press F5 - IT Version (Italian)
   Press F6 - SP Version (Spanish)
   Press any other key to accept the
   current country code.
   ```

   Press the appropriate function key for the country code you **want.** The program copies the files and displays a message confirming the change.

4. When you see the following message, press any key to reboot
    the system and run the System Configuration program:

    > **Now you should reboot the** system to **run**
    > **the** appropriate **AUTOEXEC.BAT and**
    > **CONFIG.SYS files and start the** System
    > **Configuration program.**
    >
    > **Press any key to reboot . . .**

    After a moment, you see the System Configuration title screen.
    If you want to run that program now, see Chapter 2 for
    instructions.

    If you do not want to run System Configuration, remove the
    Reference 1 diskette from drive A and turn off your
    computer.

The AUTOEXEC.BAT and CONFIG.SYS files on your
Reference 1 diskette are now customized for the country you
selected.

Also, when you run the System Configuration program, the
format of the date and time in your computer's real-time clock
will be set to the appropriate format for the country you
selected.

Chapter 2
Running System Configuration

The System Configuration program, provided with your system on the Reference 1 diskette, allows you to configure your computer. Use the program to do the following:

❏ Learn about the configuration process

❏ Set the date and time

❏ Copy the configuration (CFG) files for any option cards you install

❏ Configure the system board and any option cards

❏ Create one or more System Configuration Information (SCI) files

❏ Access other system utilities, such as System diagnostics and hard disk utilities.

You must run the System Configuration program to configure your system before you can use your computer for any other purpose. You may need to run it again later if you add or remove options, such as memory, disk drives, or option cards.

After running the program, you save your current configuration in the computer's CMOS and in a file called SYSTEM.SCI. Your computer checks this information each time you turn it on and assigns your system resources based on the configuration options you selected.

If you want to create an alternate configuration file for your computer or another computer, you can create an alternate SC1 file. See page 2-19 for more information.

> **Note**
> The first time you configure your computer, you must run
> the program from the Reference 1 diskette and it is best to
> always run it from there.

How to Use This Chapter

This chapter is divided into the following four sections:

❏ **The Configuration Process** describes the various aspects of
configuring your computer using the System Configuration
program. It also tells you how to use the keyboard or a
mouse with the program and how to use on-line help.

❏ **Configuring Your System** provides step-by-step
instructions for running the System Configuration program
and is organized in the order in which you should perform
the operations.

❏ **Using Alternate Configuration Files** tells you how to
create and use alternate configuration files, should you find
it necessary to do so.

❏ **Using Special Modes** tells you how to configure your
computer by running it in special operating modes, such as
non-target modeling mode.

Read "The Configuration Process" first to familiarize yourself
with all aspects of the configuration process. Then perform the
configuration operations in the order they are described under
"Configuring Your System."

If you need to create alternate configuration files or run the
program in special modes, see pages 2-19 or 2-21, respectively.

The Configuration Process

This section describes the following configuration operations:

❑ Using the configuration files

❑ Using the keyboard or a mouse with the program

3 Using on-line help.

Using Configuration Files

Configuration (or CFG) files provide information to the system about a card's functions and resource requirements so your computer can allocate its resources efficiently. They also provide instructions for setting any switches and jumpers on ISA cards.

You copy to your Reference 1 diskette a configuration file for each card you install using the System Configuration program. EISA cards come with the necessary CFG file to allow the program to configure the card automatically. See your EISA card documentation for more information.

ISA option cards may come with the necessary CFG file for this program. If not, Epson provides many ISA configuration files on the Reference 3 diskette. You can also write to the manufacturer of your option card and request a CFG file for it. Use the file provided by your ISA card manufacturer, if possible, and do not copy more than one file for a card.

If you do not have a configuration file for your ISA card, you can still install the card in your system. However, you should configure the rest of your system and then follow the instructions that came with the card to set any of its switches or jumpers.

Using the Keyboard

If you use a keyboard when you run the System Configuration program, refer to the table below for a description of the keys you can use to move the cursor and select items. If you'll be using a mouse with the program, see "Using a Mouse" below. Most of the screens show which keys you can press to perform various operations. Follow the instructions on each screen.

Whenever the <OK> icon is highlighted, press **Enter** to select **<OK>.** To select the <Cancel> icon, you can either press the **Esc** key or highlight **<Cancel>** and press **Enter**.

Key commands

Key	Function
Tab or **↑**	Moves the cursor to the next field
Shift **Tab** or **↑**	Moves the cursor to the previous field
↑ or **↓**	Highlights items within a list or scrolls the screen
Enter	Selects the highlighted option
Esc	Cancels the current action or menu
Pg Up or **Pg Dn**	Moves the cursor up or down one screen
Ctrl **Home**	Moves the cursor to the first line of information
Ctrl **End**	Moves the cursor to the last line of information

Using a Mouse

The first time you run System Configuration, you must use the keyboard. After configuring your system, load your operating system and then install your mouse driver. Then you can run System Configuration using your mouse.

To select most options, place the cursor on the option and click the left button once to highlight it and again to select it.

When you see [↑] or [↓] on the screen, you can scroll the text. Place the cursor on the arrow indicating the scroll direction and hold down the left button. Release it to stop.

Keep in mind that this chapter gives keyboard instructions when describing how to use the System Configuration program. You should substitute the appropriate mouse equivalents when performing the same operations.

Using On-line Help

The System Configuration program provides extensive on-line help information. You can obtain help in the following ways:

❏ Highlight a menu option to see a description of its function.

❏ Select **Step 1:** Important **EPSON EISA** configuration information for detailed information about each step in the configuration process.

❏ Press the [**F1**] key whenever you see **Help=Fl.** The following menu appears:

> **EPSON EISA Configuration Help**
>
> **Current screen**
> **Selected item or board**
> **All boards**
> **Keys**
> **Using help**
> **EPSON EISA configuration**

Press [↓] to select the help information you need; then press [Enter].

Configuring Your System

Follow the instructions in this section and on your screen to configure your computer using the System Configuration program. You configure your system in the following order:

❏ Set the date and time

❏ Add or remove boards; when you add an option card, the program copies the necessary configuration files

❏ View or edit the details of your configuration; use this selection to define your configuration options

3 View your jumper and switch settings

❏ Save the configuration as you exit the program.

Starting the Program

Follow these steps to start the System Configuration program from the Reference 1 diskette:

1. Insert the Reference 1 diskette in drive A and turn on or reset the computer.

> **Note**
> If you installed any EISA option cards in your system, you see a message telling you to run the configuration program. Press ⎡ **F1** ⎤ to continue.

2. After a moment, you see the title screen for the System Configuration program. Press any key to continue. You see the Welcome screen.

3. Press **⎡Enter⎤**. You see the Main Menu:

Main Menu

Learn about configuring your computer
Configure computer
Set date
Set time
Access to other utilities
Maintain system **configuration diskette**
Exit from this utility

Note
If you installed any EISA option cards in your system, the program **firstasks you to insert a diskette containing a** CFG **file** for the EISA card. Remove the Reference 1 diskette, insert the appropriate configuration diskette, and press [Enter. Follow the instructions on the screen to complete the installation process and then go to step 4.

---

4. For an overview of the configuration process, highlight Learn about configuring your computerand press [Enter]. When you have finished reading the three Help screens, press **⎡Enter⎤** to return to the Main Menu. (You can press **⎡ F10 ⎤** to return to the Main Menu at any time.)

Now set the date and time of your computer's real-time clock, as described below.

Setting the Date and Time

The real-time clock in your computer continuously tracks the date and time-even when the computer is turned off. The first time you run the configuration program, set the date and time for your computer. You can set them again later to adjust your clock for seasonal time adjustments, such as daylight savings time. The computer automatically changes the date for leap years.

Follow these steps to set the date and time:

1. At the Main Menu, select Set date. You see a prompt such as the following:

    ```
    Set Date

    Date 06-08-1992 (mm-dd-yyyy)
    ```

    Note
    The format for the date and time may look different from the prompts shown here, depending on the country code you chose when you ran the Change Country Code utility. (See Chapter 1 for more information.)

    ---

2. The current setting for Date is highlighted. Correct it as necessary. You can use the arrow keys to move the cursor and overtype the date. Then press [Enter.

3. At the Main Menu, select Set time. You see a prompt similar to the Set Date prompt.

4. Type the current time and press **Enter**. You see the Main Menu.

Now you can configure your computer, as described below.

Performing the Configuration Steps

Follow these steps to configure your computer:

1. At the Main Menu, select Configure **computer.** You **see**
    this menu:

    > Steps in configuring your computer
    >
    > Step 1:   Important EPSON EISA
    >   **configuration   information**
    > Step 2:   **Add or remove boards**
    > **Step 3:   View or edit details**
    > **Step 4:** Examine required switches
    > **Step 5:** Save **and   exit**

2. Select Step 1 and read the information displayed on your
    screen about configuring your system. If you want to print
    any of the screens, press the [Print Screen] key.

3. Select Step 2 and follow the instructions on the screen to
    add, remove, or move option cards in your configuration
    and copy any necessary CFG files to your Reference 1
    diskette. See the next section for more information.

4. Select Step 3 and follow the instructions on the screen to
    view or edit the details of your option cards and your
    system board. See "Defining the Configuration Settings"
    below for more information.

5. Select **step** 4 if you want to view the switch or jumper
    settings you may need to change on any ISA cards you will
    install. Follow the instructions on the screen.

6. When you are finished configuring your system, select
    step 5 to save the configuration in your computer's
    CMOS and reboot the system. You can also exit the
    program without saving the configuration, if necessary.
    Follow the instructions on the screen.

Adding or Removing a Board

Select **Step 2: Add or** remove **boards when you need to** add or remove an option card. The program displays a list of the computer's slots with a description of any boards or cards that it detects. The computer automatically detects EISA cards, but you must add the necessary ISA card information. Follow the instructions on the screen to add, move, or remove an option card.

When you add an option card, you need the configuration diskette that came with the card. Follow the instructions on the screen to copy the appropriate CFG files to your Reference 1 diskette.

Defining the Configuration Settings

Select **Step 3: View or edit details from the** configuration menu to view your system configuration options.

Follow the instructions on the screen to edit the functions of these options or to change their resource assignments. You can also perform various advanced configuration operations by accessing the Advanced menu. See "Using the Advanced Configuration Options," later in the chapter, for more information.

You cannot change the settings for certain options because they are detected and set automatically by the program. Some options or settings may not be available, depending on the processor board you have installed.

If you add any EISA option cards to your system, various configuration options for the card(s) appear on the screen beneath the system board options. See your EISA option card documentation for information about configuring your card(s).

The table below describes the settings available for each of the system board options.

System board *options*

Option	Settings	Description
Memory remap control (384KB)	Enabled Disabled	Sets the status of the unused memory between the 640KB and 1 MB addresses. (The amount of unused memory is dependent on shadow RAM.) Set to Enabled to remap this memory to the top of the extended memory area; set to Disabled (default) to leave it at its original address.
Base memory	640KB	Setting is always 640KB
Internal extended memory	(memory size)	Automatically set to the amount of internal extended memory (on SIMMs) detected in your system
External extended memory	*(memory size)*	Automatically set to the amount of external extended memory (on card) detected in your system
Total extended memory	*(memory size)*	Automatically set to the total amount of extended memory detected in your system
User-defined non-cache area	Disabled Enabled *(addresses1*	See "Non-cache areas" below
User-defined external BIOS shadow area	Disabled Enabled *(addresses)*	Sets up to three, 16KB shadow RAM address blocks in the external BIOS range C800h to EC00h to contain a copy of the external BIOS information

System board options *(continued)*

Option	Settings	Description
Video BIOS shadow	Enabled Disabled	Set to desired status of video BIOS shadow RAM: for video controllers with a BIOS (VGA or EGA), you can enable shadow RAM; for controllers without a BIOS (CGA, etc.), shadow RAM is automatically disabled
Display adapter type	CGA 40 column CGA 80 column Monochrome 80 column EGA VGA MCGA Other	Automatically set to the type of display adapter card installed
BIOS version	*[version number)*	Automatically set to the version number detected in your system
Processor type	*(processor type)*	Automatically set to the processor board type detected in your system
Numeric coprocessor type	*(coprocessor type)*	Automatically set to the numeric coprocessor type detected in your system
Power-on simulation speed	High speed (native) Auto speed during FDD access 16 MHz 386SX simulation 20 MHz 386SX simulation 25 MHz 386DX simulation 33 MHz 386DX simulation 25 MHz 486DX simulation Low speed (simulated 8 MHz speed)	Set to the appropriate speed for your system and applications; available simulation speeds vary, depending on the type of processor board installed
System BIOS update	Disabled Enabled	Set to Enabled to allow updating of CPU-dependent BIOS information from diskette; default setting is Disabled
System cache scheme	Write-thru	Automatically set to the cache type detected in your system; available settings may vary

System board options (continued)

Option	Settings	Description
Power-on password	Not installed Installed	If desired, set a password to prevent unauthorized access to the system
Network server mode	**Off** On	Turn on to provide special password security when the system operates as a network server; password must be installed to turn on this mode
Num lock mode	Enabled at power-on Disabled at power-on	Set to desired initial num lock status when system is turned on or reset
Keyboard repeat rate	Fast Normal Slow	Set to desired speed of keyboard repeat rate when a key is pressed
Speaker volume control	High Medium Low Off	Set to the desired speaker volume or turn the speaker off
Built-in mouse port	Enabled Disabled	Set to Enabled to use the built-in mouse port; set to Disabled to use a mouse with a port on an option card
Built-in serial port A	Disabled COM 1 (3F8h) COM2 (2F8h)	Set to desired setting for the first built-in port; BIOS disables port if it detects conflicting port(s) on option card(s)
Built-in serial port B	Disabled COM2 (2F8h)	Set to desired setting for the second built-in port; BIOS disables port if first serial port is set to COM2 or if it detects conflicting port(s) on option card(s)
Built-in parallel port	Disabled LPT1 (3Bch) LPT2 (378h) LPT3 (278h)	Set to desired setting for built-in port; BIOS disables port if it detects conflicting port(s) on option card(s)

System board options (continued)

Option	Settings	Description
Diskette drives A and B	Not installed 360KB (5.25 inch) 1.2MB (5.25 inch) 720KB (3.5 inch) 1.44MB (3.5 inch)	Set to type of diskette drive(s) assigned as drives A and B; BIOS disables the built-in diskette drive controller if it detects a conflicting controller on an option card
Embedded hard disk controller	Enabled Disabled	Set to the desired setting for the built-in IDE controller; BIOS disables the built-in controller if it detects a conflicting controller on an option card
Hard disk drives C and D	Not installed User defined Type (1 to 64)	Set to the type of hard disk drives installed as drives C and D or select User defined (see "Hard disk drive types" below)

Non-cache areas

Your computer automatically caches all of your memory except for the six non-cache memory blocks listed in the table below. You can define up to three additional, 16KB, non-cache memory blocks by selecting the User defined non-cache area(s) option and entering the block addresses. For example, if you install a network or bus-mastering option card, such as a SCSI controller, you should set the address blocks used by these boards as non-cache blocks to avoid any memory conflicts.

Default non-cache address blocks

Address range (hex)	Function
A0000 through AFFFF	EGA or VGA video memory
BOO00 through BFFFF	MDA or CGA video memory
COO00 through C7FFF	VGA BIOS (RAM shadow area)
C8000 through DFFFF	Adapter ROM area
E0000 through EFFFF	Adapter ROM area
F0000 through FFFFF	System BIOS ROM

Hard disk drive types

The following table lists the types of hard disk drives you can use in your computer. Check this table and the manual that came with your hard disk to find the correct type for the hard disk drive(s) installed in your computer. Then select that type at the hard disk drive **Type** prompt. If you do not find your drive type in the table, select User defined and enter your drive's parameters.

Hard disk *drive types*

Type no.	Type	Cylinders	Heads	Sectors	Precomp	Landing zone	MB	Drive name
00								No hard disk
01	ST-506	306	4	17	128	305	10.2	(1)
02	ST-506	615	4	17	300	615	20.4	
03	ST-506	615	6	17	300	615	30.6	
04	ST-506	940	8	17	512	940	62.4	
05	ST-506	940	6	17	512	940	46.8	
06	ST-506	615	4	17	—	615	20.4	
07	ST-506	462	8	17	256	511	30.7	
08	ST-506	733	5	17		733	30.4	
09	ST-506	900	15	17		901	112.1	
10	ST-506	820	3	17		820	20.4	
11	ST-506	855	5	17		855	35.5	
12	ST-506	855	7	17	—	855	49.7	
13	ST-506	306	8	17	128	319	20.3	
14	ST-506	733	7	17		733	42.6	
15								reserved
16	ST-506	612	4	17	0	663	20.3	
17	ST-506	977	5	17	300	977	40.5	Seagate 94205-51
18	ST-506	977	7	17	—	977	56.8	
19	ST-506	1024	7	17	512	1023	59.5	
20	ST-506	733	5	17	300	732	30.4	Toshiba MK-133FA
21	ST-506	733	7	17	300	732	42.6	Toshiba MK-134FA

Type no.	Type	Cylinders	Heads	Sectors	Precomp	Landing zone	MB	Drive name
22	ST-506	733	5	17	300	733	30.4	
23	ST-506	306	4	17	0	336	10.2	
24	ST-506	612	4	17	305	663	20.4	
25	ST-506	306	4	17	—	340	10.2	
26	ST-506	612	4	17	—	670	20.4	
27	ST-506	698	7	17	300	732	40.6	
28	ST-506	976	5	17	488	977	40.5	
29	ST-506	306	4	17	0	340	10.2	
30	ST-506	611	4	17	306	663	20.4	
31	ST-506	732	7	17	300	732	42.6	
32	ST-506	1023	5	17	—	1023	42.5	
33-36								none
37		683	16	38	0FFFF	683	202.8	
38-40								none
41	ESDI	1022	5	34	—	1022	84.8	Seagate 94216-106 (2)
42	ESDI	1022	5	36	—	1022	89.8	Seagate 94216-106 (2)
43	ST-506	1024	8	17	512	1023	68	(3)
44	ESDI	828	10	34	—	828	137.5	Toshiba MK-156F
45	ST-506	1024	5	17	512	1023	42.5	(4)
46	ST-506	615	8	17	128	618	40.8	NEC D5147H
47								none
48	ST-506	820	6	17		820	40.8	Seagate ST251
49	ST-506	830	10	17		830	68.9	Toshiba MK56FB
50	ST-506	1024	9	17	—	1023	76.5	Seagate ST4096
51	ESDI	828	7	34	—	820	96.2	Toshiba MK-154F
52	ESDI	967	5	36	I-	967	a5	Seagate 94166-101
53	ESDI	967	7	36	—	967	119	Seagate 94166-141
54	ESDI	967	9	36		967	153	CDC 94166-182
55	ESDI	1022	7	34		1022	118.8	Micropolis 1354A
56	ESDI	967	5	34	—	967	80.3	Seagate 94166-101 (2)

Hard disk drive types (continued)

Type no.	Type	Cylinders	Heads	Sectors	Precomp	Landing zone	MB	Drive name
57	ESDI	967	7	34	—	967	112.4	Seagate 94166-141 (2)
58	ESDI	967	9	34	—	967	144.5	Seagate 94166-1 82 (2)
59	AT	980	5	17	—	979	40.7	Conner CP-344 (5)
60	AT	776	8	33	—	775	100	Conner CP-3 104 (5)
61	AT	745	4	28	—	744	40.7	Mini 8051A native mode
62	AT	965	5	17	—	964	40.1	Quantum 40AT
63	AT	965	10	17	—	964	80.1	Quantum 80AT
64	AT	683	16	38	—	683	200	Conner CP-3204F (5) (6)

(1) Miniscribe 8425F, Seagate ST1 25
(2) For Seagate (formerly CDC Imprimis) default setting (34 sectors per track)
(3) Micropolis 1325, Atasi 3085, Lanstor Lan64, Maxtor XT1085, Newbury NDR1085
(4) Micropolis 1323A, Miniscribe 3035, Microscience HH 1050, Seagate ST4053
(5) Epson IDE drives: 40MB (type 59). 100MB (type 60), 200MB (type 64)
(6) The BIOS translates the actual parameters for Cylinders, Heads, and Landing zone to these values. The parameters listed in your drive's documentation may be the following: Cylinders (1366), Heads (8), and Landing zone (1365).

Using Advanced Configuration Options

To perform advanced configuration operations, press [F7] at the **View or edit details** screen. You see the Advanced menu:

```
Lock/unlock boards
View additional system information menu
Set verification mode menu
Maintain SCI files menu
```

The table below describes the operations you can select from the Advanced menu and its submenus.

Advanced configuration options

Advanced menu option	Submenu option	Description
Lock/unlock boards	No submenu	Displays the locked/unlocked status of each board. Locking a board prevents you from changing any of the board's configuration settings.
View additional system information menu	Board specifications	Displays information about the identification and physical characteristics of your board(s).
	System specifications	Displays information about the option slots in your computer.
	Used resources	Displays information about the currently used system resources such as IRQ levels, interface ports, and memory addresses and defines which components are using the resources.
	Available resources	Displays information about unassigned system resources such as IRQ levels, interface ports, and memory addresses.
Set verification mode menu	Automatic	Sets the program to automatically check for resource conflicts and report them, if they occur (default setting).
	Manual	Sets the program so it does not check for resource conflicts unless you select the Verify option that appears on the View or edit details screen. (The Verify option only appears if you have selected Manual verify.)
Maintain SCI files menu	Open	Loads a previously created SCI file and displays the contents. Any current configuration information you entered is lost.
	Save as	Saves the current SCI file information to a backup file. Do not name the backup file SYSTEM.SCI.

Using Alternate Configuration Files

When you save your configuration in your computer's CMOS, the computer also creates or updates the System Configuration file called SYSTEMSCI. You can also create an alternate SCI file with a different name for your own computer or for another Epson EISA computer.

You may want to create an alternate configuration for your own computer that includes a different set of option cards. Then, whenever you need to use that configuration, you can load the alternate SCI file and save it in your computer's CMOS.

If you run System Configuration on a non-target computer (an IBM AT compatible computer or another Epson EISA computer), you can create an file for the target computer. Then you can transport the alternate SCI file to the target computer, load it, and save it in that computer's CMOS.

To create an alternate SCI file, follow the guidelines in the next section. To load an alternate SCI file when you need to use one, see "Loading an Alternate SCI File" below.

Creating an Alternate SCI File

You can create an alternate SCI file using the following methods:

❑ Select Create **backup SCI file from the Maintain system configuration diskettemenu.**

❑ **Select the Save as option from the Maintain SCI files** menu when you are using the advanced configuration options.

❑ Run the System Configuration program in non-target modeling mode and save the configuration you create to a backup SCI file when you exit.

The program asks you to name the alternate SCI file you create. Do not name the file SYSTEM.SCI; this is the name of your current configuration file.

Use the third method only when you are running the configuration program on a non-target computer. This method protects you from accidentally saving the configuration you create in that computer's CMOS. See "Using Special Modes" for instructions on using non-target modeling mode.

Loading an Alternate SCI File

To load an alternate SCI file and store it in the target computer's CMOS, follow these steps:

1. Run the System Configuration program and select Maintain system configuration diskettefrom the Main Menu.

2. Select Load a backup SCI file.

3. Select the alternate SCI file you want to load from the list of SCI files displayed on the screen.

4. Exit and save the SCI file in the computer's CMOS.

> **Note**
> You can also load an alternate SCI file by selecting Open from the Maintain SCI files menu when you are using the advanced configuration options. (See page 2-18.) This method allows you to load the file while you are looking at the View or edit details screen for another configuration. However, the Open option erases the currently loaded configuration before loading the new file.

Now the computer is configured according to the information in the alternate SCI file.

Using Special Modes

You can run the System Configuration program in various special modes, including non-target modeling mode, by starting the program with one of the two commands described in this section. You can also use these commands to run the program from a hard disk that runs MS-DOS if you copy the necessary files to the disk first.

The SD command starts the System Configuration program and allows you to run that program or any of the other utilities available on the Access to other utilities menu. The CF command also starts the System Configuration program, but you cannot run any other utilities.

You can run the program(s) in different modes by including one or more parameters on the SD or CF command line, as described in the next sections.

Using the SD Command

If you want to run the program from your hard disk, first follow the instructions under "Copying the Configuration Files to a Hard Disk" below. Then follow these steps to use the SD command:

1. To run the program from a diskette, insert the Reference 1 diskette in drive A and log onto drive A.

    To run the program from a hard disk, log onto the drive and directory where you copied the configuration files.

2. Type the following and press $\boxed{\textsf{Enter}}$ to start the program:

    SD [parameters]

The table below describes the parameters you can use to modify the way the program runs on your computer.

Note

To run the System Configuration program in non-target modeling mode, add the /N parameter to the command line. Modeling mode only affects the way the configuration program operates; it does not affect any of the other utilities you can run using the SD command.

SD command parameters

Parameter	Mode	Function
/B	BIOS video mode	Causes the program to be displayed using BIOS Int 10h calls for systems using non-standard displays. In default mode, the program writes directly to the video memory
/H	High resolution display mode	Displays 43 lines per screen on an EGA monitor and 50 lines per screen on a VGA monitor. In default mode, the screen displays 25 lines.
/K	Keyboard only mode	Sets the program so a mouse cannot be used, even if you have installed one. In default mode, you can use a mouse as long as a mouse driver is loaded.
/M	Monochrome display mode	Causes the program to be displayed in black and white only. In default mode, color monitors will display in color.
/N	Non-target modeling mode	Allows you to run the System Configuration program in non-target modeling mode.

Using the CF Command

If you want to run the System Configuration program from your hard disk, first follow the instructions under "Copying the Configuration Files to a Hard Disk" below.

Then follow these steps to use the CF command:

1. To run the program from a diskette, insert the Reference 1 diskette in drive A and log onto drive A. To run the program from a hard disk, log onto the drive and directory where you copied the configuration files.

2. Then type the following and press [Enter] to start the program:

    CF [parameters]

The table below describes the parameters you can use to modify the way the program runs on your computer.

CF command parameters

Parameter	Mode	Function
/B	BIOS video mode	Causes the program to be displayed using BIOS Int 10h calls for systems using non-standard displays. In default mode, the it writes directly to video memory.
/D	Dispatcher spawning mode	Causes the program to be spawned by the dispatcher.
/F	Fast configuration operation	Causes the program to determine the boards and options installed and configure your system automatically.
/H	High resolution display mode	Displays 43 lines on an EGA monitor and 50 lines on a VGA monitor. In default mode, the screen displays 25 lines.
/K	Keyboard only mode	Sets the program so a mouse cannot be used, even if you have installed one. In default mode, you can use a mouse as long as a mouse driver is loaded.
/M	Monochrome display mode	Causes the program to be displayed in black and white only. In default mode, color monitors display in color.
/N	Non-target modeling mode	Runs the program in non-target modeling mode.
/}	Suppress reboot mode	Causes the program to exit without rebooting the computer.

Copying the Configuration Files to a Hard Disk

To run the System Configuration program from your hard disk, you must be running the MS-DOS operating system from that disk.

To copy all the configuration files from the Reference 1 diskette to the hard disk, insert the diskette in drive A, type the following command, and press $\boxed{\text{Enter}}$:

COPY A: *.* [d:] *[path]*

where d: and ***path*** are the drive and directory to which you want to copy the files.

Chapter 3
Using Your Computer

This chapter briefly describes the following operations:

❑   Extending the stabilizing feet

❑   Locking the computer's cover

❑   Using a power-on password

❑   Changing the processor speed

❑   Parking the hard disk drive heads.

Extending the Stabilizing Feet

Whenever you place the computer in an upright position, you must extend the stabilizing feet on the sides of the computer's base to prevent it from falling over.

To extend the feet, tip the computer slightly to one side; then press in and release the foot, as shown in the following illustration. Then do the same for the foot on the other side.
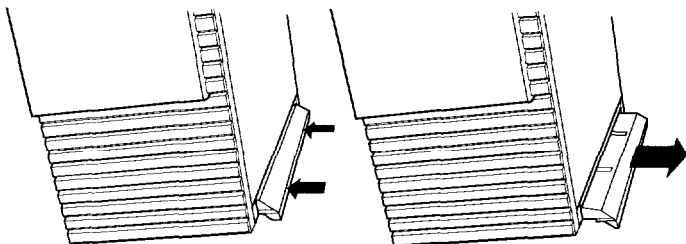
To retract the feet, press in each one until it clicks into place.

Locking the Computer's Cover

You can lock the cover onto the computer to prevent
unauthorized users from accessing its internal components.
(You can lock the cover when the computer is upright or on its
side.)

To unlock the cover, align the key with the notch in the lock
and insert the key, as shown below. Then press in the key and
turn it counterclockwise.
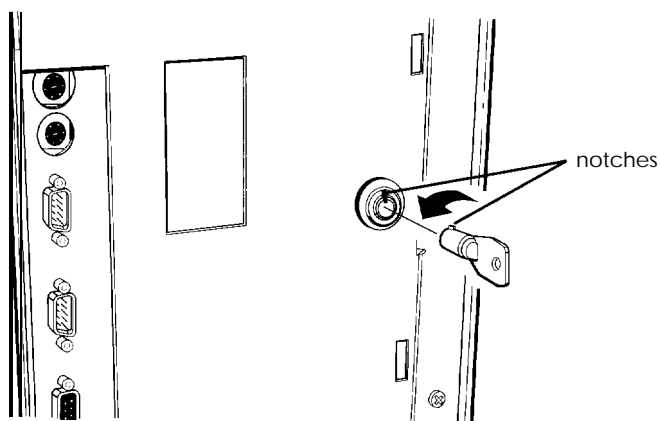
To lock the cover, align the notches and insert the key; then
push it in and turn it clockwise.

Using a Power-on *Password*

If you set a power-on password when you ran the System Configuration program, you must enter it every time you turn on the computer. Follow these steps to enter your password:

1. When you turn on the computer, you see the following prompt:

    Enter password:

2. Type your password. The screen does not display the characters you type. Then press [Enter.

After you enter the correct password, you see Password **OK.** Then the computer loads your operating system.

Note

If you turned on network server mode and booted your computer from a hard disk, you use a different procedure to enter your password. See "Using a Password in Network Server Mode" below.

If you do not enter the correct password, you see the message **Password is incorrect** and another prompt to enter the password. You have two more chances to enter the correct password; try typing it again.

If you do not enter the correct password at the third prompt, the screen displays the following message:

    System **halted! Reset your system.**

The system locks the keyboard and you cannot use your computer. Press **RESET** and try to enter the correct password again.

Changing or Deleting a Password

Follow these steps to change or delete a password:

1. Turn on the computer. You see the Enter password prompt.

2. To change the password, type the current password followed by a forward slash (/). After the slash, enter the new password you want to use. For example, if your current password is 123 and you want to change it to ABC, type:

       123 /ABC

   To delete the password, type the current password followed only by a forward slash (/), for example:

       123/

   (The screen does not display what you type.)

3. Press ⎡ **Enter** ⎤. You see a message confirming the change or deletion and then the computer loads your operating system.

Using a *Password in Network Server Mode*

If you are using your system as a network server, you may want to prevent unauthorized users from entering commands at the keyboard. To provide this security, you can enable a power-on password in network server mode using the System Configuration program.

If you set a password but do not turn on network server mode, you must enter the password before the computer loads the operating system or the network software. Once you load it, anyone can access your system by typing commands on the keyboard. However, if you set a password and turn on network server mode, you can load the operating system and network software *before* you enter the password. This allows other computers in the network to access the system, but prevents unauthorized users from entering commands at your keyboard and using any network server access privileges.

When you boot the computer from the hard disk in network server mode, you do not see the **Enter password** prompt (as you would if network server mode was turned off). The password prompt is hidden to prevent unauthorized users from knowing that a password is required. If you boot the computer from a diskette, you still see the prompt.

See Chapter 2 for instructions on using System Configuration to set a password and turn on network server mode. Then follow these steps to enter your password:

1. Turn on your computer. If you boot from the hard disk, you do not see the password prompt.

2. Type your password and press [**Enter**]. The screen does not display what you type.

Now you should be able to use your computer. Press a key such as [**Enter**] to see if the keyboard accepts your command. If you entered an incorrect password, the computer does not respond. Type the correct password, press [**Enter**], and try using the computer again. You can try as many times as you want.

> **Note**
> If you boot from a diskette, you see the Enter `password`
> prompt. Enter your password as described under "Using a
> Power-on Password" above.

You cannot change or delete a password when you boot from
the hard disk in network server mode. First insert a bootable
diskette in drive A and turn on the computer. Then change or
delete the password, as described in the previous section. If you
delete the password, the computer automatically turns off
network server mode.

Changing the Processor Speed

Your computer's processor can operate at high speed, low
speed, and automatic speed, as well as other processor
simulation speeds. When it is at high speed, the **TURBO** speed
light is on.

You set the default (or power-on simulation) speed in the
System Configuration program, described in Chapter 2. If
necessary, you can temporarily change the processor speed
using keyboard commands or the ESPEED program.

High speed is the highest speed available on your processor
board and low speed simulates an 8 MHz processor speed.
Automatic speed switches from high to low speed whenever
the computer accesses a diskette. You can set simulation speeds
for various other processors using the System Configuration
program. See Chapter 2 for more information.

Certain application programs have specific timing
requirements for diskette access and can run only at low speed.
See the manual for your program to determine if this is the case.

If you often use a copy-protected program diskette, you may want to set your processor speed to change automatically to low speed when accessing the diskette and return to high speed when it is finished.

There are three ways to change the processor speed:

❏ Run the System Configuration program (power-on simulation speed setting)

❏ Enter a keyboard command (temporary speed setting)

❏ Run the ESPEED program (temporary speed setting).

If you use programs that require the processor to operate at low or automatic speed only occasionally, you should use the keyboard commands or the ESPEED program, described below, to change the processor speed.

Entering Keyboard Commands

To change the processor speed, enter one of the keyboard commands in the table below.

Keyboard speed setting commands

Keyboard command	Function
Ctrl Alt +	Changes the speed to high
Ctrl Alt −	Changes the speed to low (simulated 8 MHz)
Ctrl Alt *	Changes the speed to low when the computer accesses a diskette

You must use the +, −, or * key located on the numeric keypad.

The speed setting remains in effect until you press **RESET** or turn off the computer, or until you change it again.

> **Note**
> You can use the commands listed above while you are
> running a program. However, if that program uses one of
> these commands for another function, you cannot use it to
> change the processor speed. For example, if the program
> uses the ⎡ **Ctrl** ⎤⎡ **Alt** ⎤⎡ **−** ⎤ command to move the cursor, you
> cannot enter ⎡t **Ctrl** ⎤⎡h **Alt** ⎤⎡g e⎤ t h e   p r o c e s s o r   s p e e d
> to low. Another alternative is to use the ESPEED program,
> described below.

Using the ESPEED Program

ESPEED allows you to change the processor speed to high or
low, or set the speed to change automatically. This method is
convenient if your application program does not recognize the
⎡ **Ctrl** ⎤ key commands or if you want to include the command
in a batch file.

The ESPEED program is provided with your system on the
Reference 1 diskette. If you do not have a hard disk, insert your
Reference 1 diskette in drive A and log onto drive A before you
enter the command to start the program.

If you have a hard disk from which you are running MS-DOS,
copy the file ESPEED.EXE from your Reference 1 diskette onto
your hard disk and run the program from there.

To run the ESPEED program, type the following at the
command prompt and press [Enter:

        ESPEED [parameter]

You can use one of these parameters:

ESPEED program parameters

Switch	Speed setting
/H	High speed
/L	Low speed (simulated 8 MHz)
/A	Automatic speed (simulated 8 MHz when accessing a diskette)

If you do not include the parameter when you type the ESPEED command, the program displays the command syntax and parameter options.

The processor speed you set remains in effect until you press **RESET** or turn off the computer, or until you change it to a different setting.

Parking the Hard Disk Drive Heads

If you need to move your computer to a new location, you may **want** to park the hard disk drive heads to protect the disk during the move. You do this by running the HDDPARK program. HDDPARK moves the drive's read/write heads to a region on the disk surface that does not contain data, and locks them securely in place so you cannot damage the disk.

Many hard disk drives, including all Epson drives, automatically park their heads when you turn off the computer. If your drive does not do this, or if you are not sure that it does, be sure to run the HDDPARK program.

Follow these steps to run HDDPARK:

1. Insert the Reference 2 diskette in drive A and log onto that drive.

2. Type **HDDPARK** and press (Enter. The computer locks the heads and disables the keyboard.

3. Remove any diskettes and turn off the computer.

Note
You can also run HDDPARK by selecting Access t o other utilities from the System Configuration program Main Menu. Then select Park hard disk. You can also copy the files HDDPARK.COM and HDDPARK.VER to your hard disk and run the program from there.

Chapter 4

Accessing Internal Components

To access your computer's internal components, you need to remove the cover. If you are installing or removing a drive in one of the upper bays, you also need to remove the front panel. Follow the instructions in this chapter when you need to do these tasks:

❏ Remove or replace the computer's cover

❏ Remove or replace the front panel

❏ Perform post-installation setup procedures.

Be sure to read the following important safety precautions before you begin.

Special Precautions

As you perform the procedures described in this chapter and in Chapters 5 and 6, observe the following precautions to avoid damaging your equipment or injuring yourself:

❏ While this manual provides detailed instructions for installing a variety of optional equipment, do not attempt a procedure if you have any reservations about performing it; ask your dealer for assistance.

❏ Always turn off the computer, disconnect all cables to the computer and any peripheral devices, and then wait at least 30 seconds before you remove the cover. First disconnect the power cord from the electrical outlet and then from the computer's back panel. Then disconnect all peripheral devices from the computer, including the monitor and keyboard.

❏ The computer is heavy, so use caution when you move it or lay it on its side.

❏ Every time you remove the cover, be sure to ground yourself by touching the inside of the computer's back panel before you touch any components inside. If you are not properly grounded, you could conduct static electricity and damage your equipment. Also, do not touch any components except those that this manual instructs you to touch.

❏ When disconnecting cables from sockets on the computer's main system board or any devices (such as disk drives), avoid pulling on the cable; grasp the plastic connector to remove it from a socket.

3 When plugging a connector or a component into a socket, be sure to position it correctly. Carefully align any connector pins with the corresponding holes in the socket before you push in the connector. Otherwise, you can severely damage the equipment.

❏ If you install optional equipment in the computer, keep the option's original packing materials in case you need to remove or transport the option later.

❏ Always replace the computer's cover before you turn on the power or the computer may overheat.

❏ Always extend the stabilizing feet on both sides of the computer's base when it is in an upright position.

Removing the Cover

You must remove the computer's cover if you need to do any of the following:

❏ Install or remove option cards

❏ Install or remove single inline memory modules (SIMMs)

❏ Remove the processor board to access its components

❏ Install or remove disk drives or other storage devices.

It is best to remove the cover and perform these procedures while the computer is lying on its side. Follow these steps:

1. Retract the stabilizing foot on the right side of the computer. (See Chapter 3 for instructions.)

2. Lay the computer down on its right side so that the left side is facing up and the back panel is facing you.

3. If necessary, unlock the computer's cover. (See Chapter 3 for instructions.)

4. Remove the four screws securing the cover to the computer.
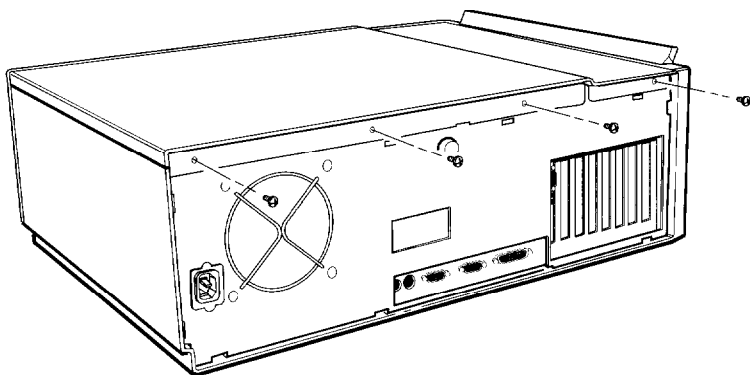
5. Grasp the edge of the cover and pull it toward you, as shown below. Then lift it up and off the computer.
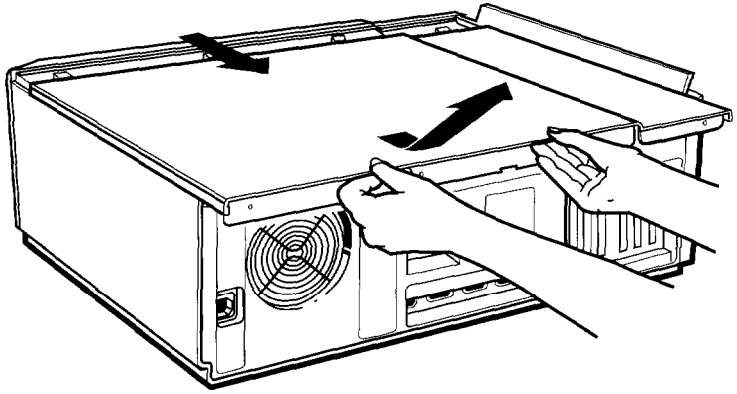
Removing the Front Panel

You must remove the computer's front panel to install or remove a drive in an upper drive bay. Follow these steps:

1. Carefully lift up and release the four clips securing the front panel to the computer on the inside of the computer case.
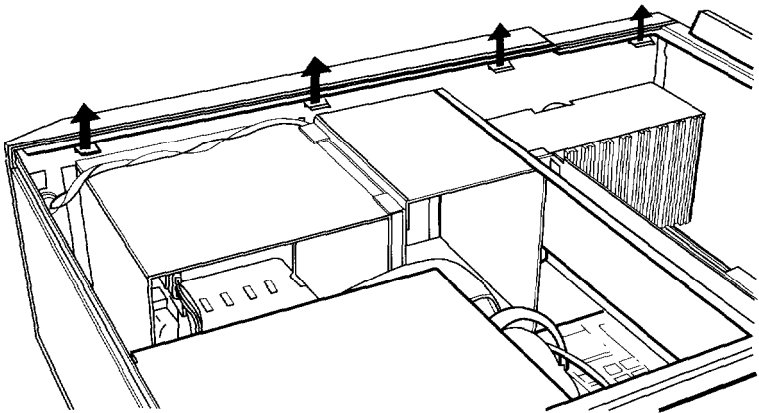
2. Pull the panel away from the front of the computer and set it aside. You may need to lift up the front of the computer slightly to release the panel.

Replacing the Front Panel

Follow these steps to replace the computer's front panel:

1. Insert the four tabs on the back of the front panel into the four notches in the computer case. You may need to lift up the front of the computer to insert the tabs.
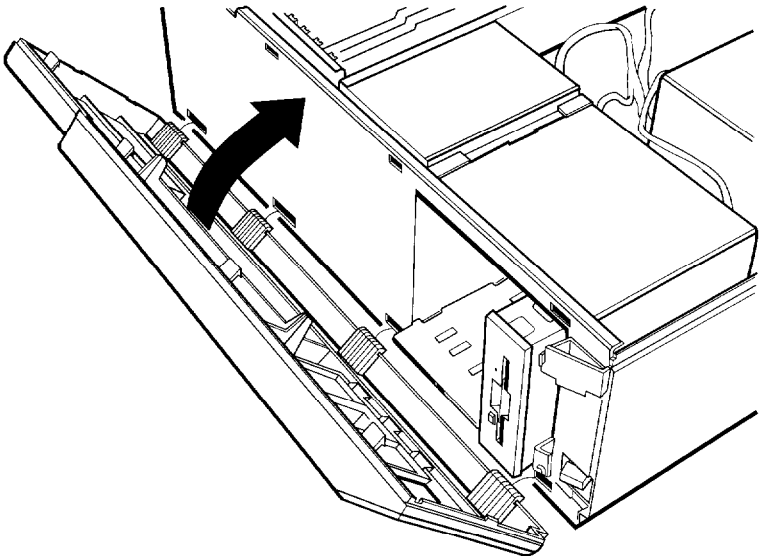
2. Tilt up the front panel and insert the clips into the notches in the top edge of the computer case. Then press along the length of the panel until the clips click into place. If all four clips are not fully seated in the notches, carefully lift them up, remove the front panel, and try again.

Replacing the Cover

Follow these steps to replace the computer's cover:

1. Facing the back panel, hold the cover at an angle and align the guiderail on each side of the cover with the guiderails on the computer case, as shown below. Then lower the cover onto the computer.

guiderails
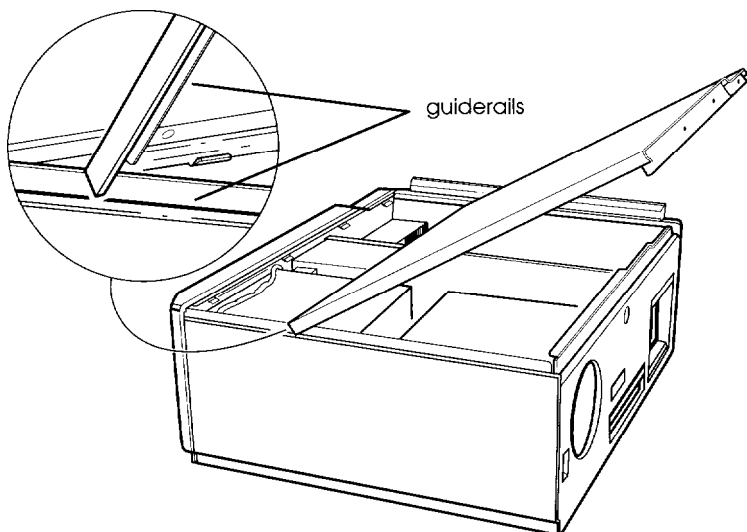
2. Slide the cover toward the front of the computer, moving any cables out of the way, until it is near the metal ledge behind the front panel.
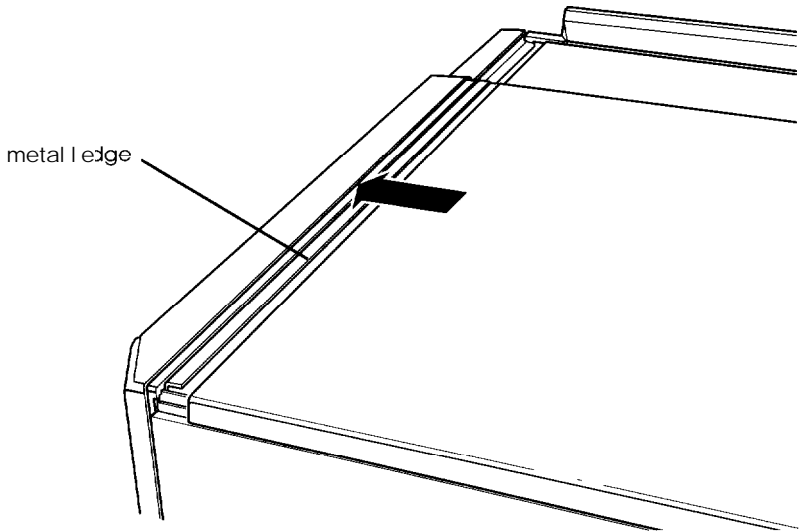
metal ledge

3. Lift up the edge of the cover so you can slide it over the metal ledge. Then push the cover forward as far as it goes.

4. Secure the cover to the computer's back panel with the four retaining screws.

5. Lock the cover on the computer, if desired. (See Chapter 3.)

6. Set the computer upright and extend the stabilizing feet. (See Chapter 3.)

7. Reconnect the monitor, printer, keyboard, and any other peripheral devices you have. Then reconnect the power cord to the back of the computer and to an electrical outlet.

Post-installation Setup Procedures

After you install or remove options, you need to run the System Configuration program on your Reference 1 diskette so you can update your system's configuration information. The program will automatically update the information about some optional equipment, such as additional memory or a math coprocessor. See Chapter 2 for instructions.

If you installed a hard disk drive that has never received a low-level format, you need to format the disk. Check the manual that came with your drive, and then, if necessary, follow the instructions in Appendix B to format your new hard disk.

You may also want to test a newly-installed option. Some options come with their own diagnostic test programs, and you can test the following options with the System diagnostics program on your Reference 2 diskette:

❏ Memory

❏ Math coprocessor

❏ Serial and parallel ports

❏ Disk drives

❏ Dot matrix printers.

See Appendix A for instructions.

Chapter 5

Installing and Removing Options

This chapter provides instructions for installing and removing the following optional equipment:

❏ Option cards

❏ Math coprocessor

❏ Memory modules (SIMMs).

It also includes instructions for removing and installing the processor board in order to install a math coprocessor or replace the board.

At the beginning of this chapter, you'll find maps of your main system board and the available processor boards so you can locate important components.

Before you perform any of the procedures described in this chapter, read the "Special Precautions" on page 4-1 and then remove the computer's cover, as described in Chapter 4.

When you have finished installing or removing options, replace the computer's cover as described in Chapter 4; then follow the "Post-installation Setup Procedures" on page 4-8 to update your configuration.

Main System Board Map

To locate components on your main system board, use the following illustration.
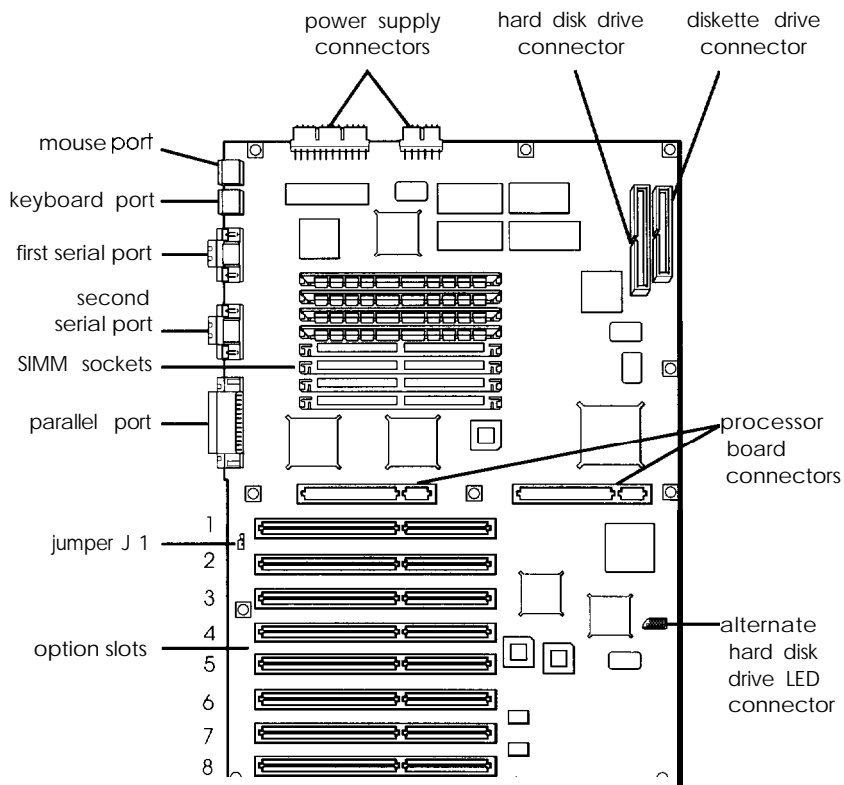
Processor Board Maps

To locate components on your processor board, use the following illustrations.

486SX/25 *processor board*

Weitek WTL4167 math coprocessor socket

Intel 80487SX coprocessor socket

Intel 80486SX 25 MHz microprocessor

processor board interface connectors
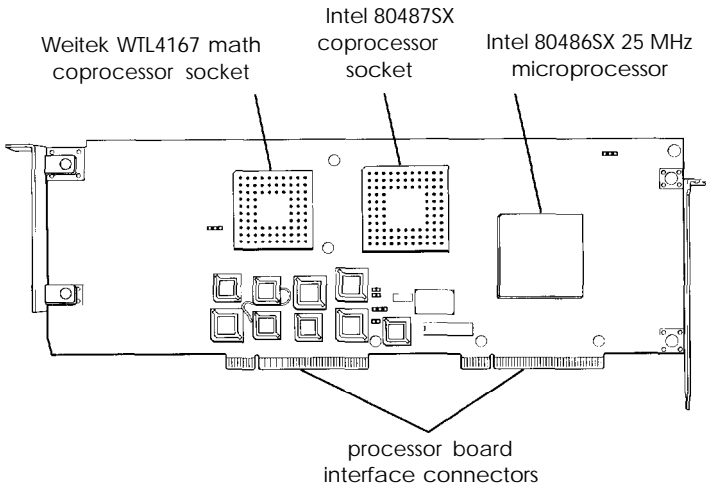
4860X/33 *processor board*

Weitek WTL4167 math coprocessor socket

Intel 80486DX 33 MHz microprosessor (with *heat sink)*

cache module

processor board interface connectors
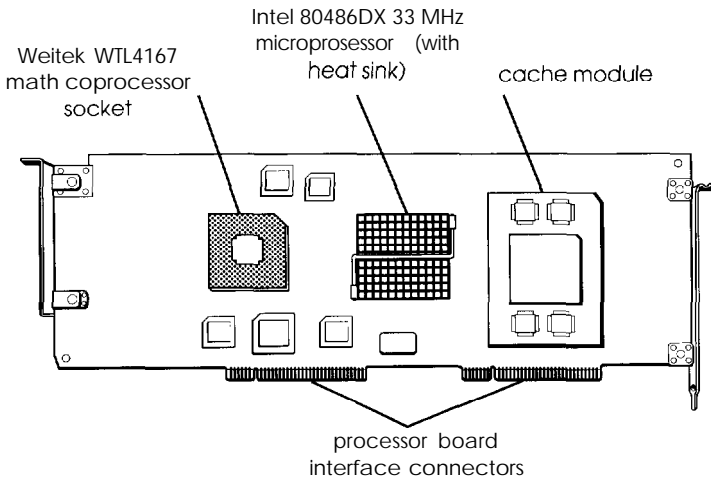
Option Cards

Your computer has eight option slots. Each slot can accommodate one card of the following types:

❏   32-bit EISA option card

❏   16-bit ISA compatible option card

❏   8-bit ISA compatible option card.

You can install up to six EISA bus-mastering cards in slots 1 through 5 and in slot 8. (You cannot install bus-mastering cards in slots 6 and 7.)

> If you have trouble with any bus-mastering option cards you install, be sure to verify that you have installed the card m
> "   I   "   .   ,   .   ,   .   .

Before you install an option card, check the power requirements given in the documentation that came with the card. Make sure that the power required by the card does not exceed the power limit for its slot, and that the total power for all the cards does not exceed the power limit for all eight slots. The table below lists the power limits.

Option slotpower limits

Maximum current	+5 Volts	+12 Volts	-5 Volts	−12 Volts
For each slot	7 Amps	1.5 Amps	0.75 Amps	0.75 Amps
For all eight slots	20 Amps	2 Amps	0.75 Amps	0.75 Amps

> **Caution**
> Although your power supply is protected against excessive power loads, you could still damage the main system board if you install an option card that draws more power than the limits shown in this table.

Installing an Option Card

Follow these steps to install an option card:

1. Unpack the option card and adjust any switches or jumpers on it, if necessary. Check the option card instructions and any of the jumper and switch settings you viewed when you ran the System Configuration program. (See Chapter 2 for more information.)

2. Remove the retaining screw from the top of the metal option slot cover and lift out the slot cover, as shown below.
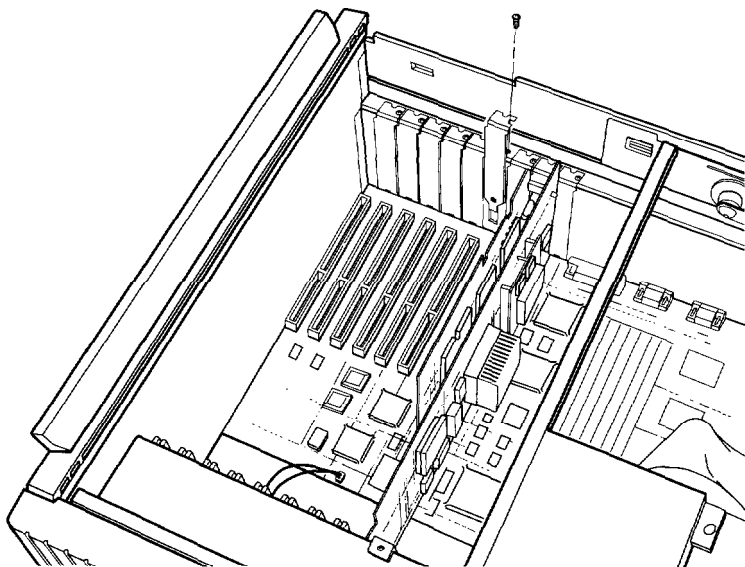
Keep the screw to secure the option card to the computer. Store the slot cover in case you remove the card later.

3. Insert the card into the slot with the connector pins pointing down, as shown below. If you are installing a full-length card, insert the other end of the card into the appropriate card guide near the front of the computer.
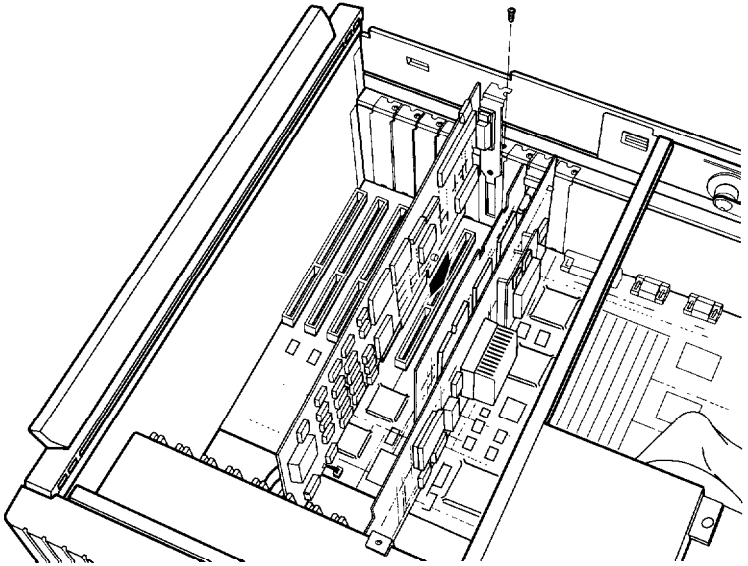
Firmly push down the card to insert it as far as it will go.

4. Secure the end of the card to the back of the computer with the retaining screw.

Removing Option Cards

If you need to remove an option card, reverse the steps outlined above. Be sure to replace the option slot cover over the empty slot to ensure proper airflow inside the computer.

Processor Board

Your computer comes with an upgradeable processor board.
To upgrade the board, you can:

❑   Install a math coprocessor

7   Install a new coprocessor (486SX/25 board only)

❑   Replace the processor board with a different board.

*Removing the Processor **Board***

Follow these steps to remove the processor board:

1. Disconnect any cables connected to the processor board and
    any cables connected to other devices that lay over the
    processor board.

2. Remove the retaining screws securing the processor board to
    the inside of the computer case, as shown below.
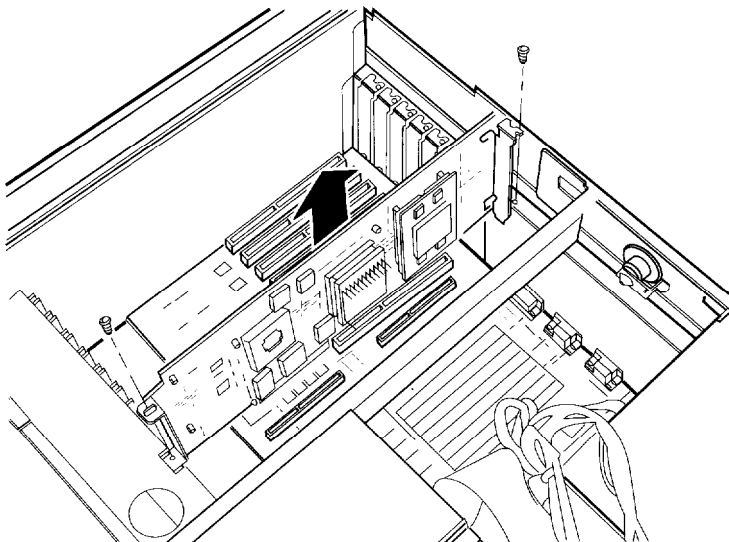
3. Pull the board straight up and out of the system board interface sockets; do not rock it back and forth.

4. If you are installing a math coprocessor, place the board on a static-free surface with the component side facing up. Then see "Math Coprocessor," below, for further instructions.

   If you are replacing the processor board, store it in an anti-static bag in a safe location. Then see the next section for instructions on installing your new processor board.

Installing the Processor Board

Follow these steps to install the processor board:

1. Insert the connectors on the bottom of the processor board into the processor board connectors on the main system board. (If necessary, see page 5-2 to locate the connectors.) Be sure to insert the board straight into the connectors; do not insert it at an angle or rock it back and forth.
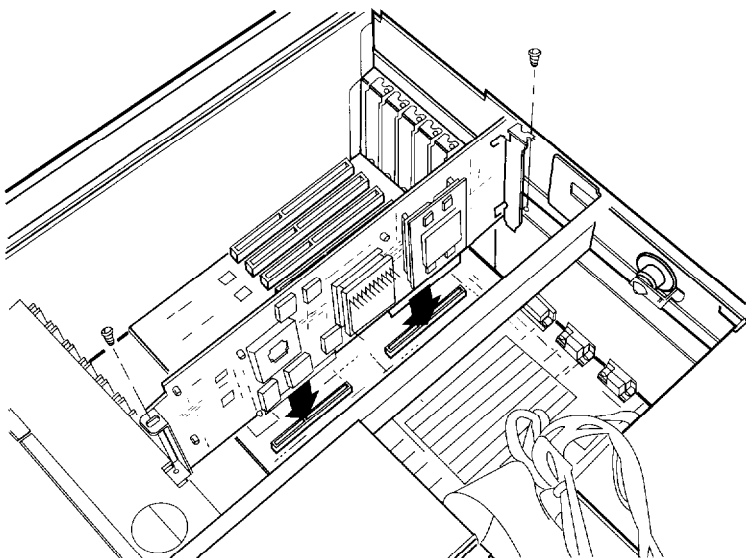
2. Secure each end of the board with the retaining screws.

3. If you disconnected any cables to remove the processor board, reconnect the cable(s) to the board or device.

Math Coprocessor

A math coprocessor speeds up the numeric calculations your computer performs when using some applications. It also increases the speed at which graphic images are displayed on your monitor when you use graphics-oriented software. You can install the following coprocessors:

Processor board	Coprocessor
486SX/25	Weitek WTL4167.25 MHz math coprocessor Intel 80487SX, 25 MHz coprocessor (with an internal math coprocessor)
486/33 board	Weitek WTL4167.33 MHz math coprocessor

Installing a Math Coprocessor

Before you can install a math coprocessor on your processor board, you must remove the board from your computer. See page 5-7 for instructions. Then carefully follow the steps below to install a math coprocessor.

Caution
To avoid generating static electricity and damaging your math coprocessor, avoid any unnecessary movement as you install it.

---

1. Position the processor board on your work surface so that the board's connectors are closest to you and the top edge of the board is away from you.

---

2. Locate the orientation dot in one corner of your coprocessor and turn the coprocessor so that the dot is in the position shown below.

Caution
If you insert the math coprocessor in the wrong position, you could permanently damage it.

Intel 80487SX
25 MHz coprocessor
Weitek WTL4167 25 MHz
math coprocessor

Weitek WTL4167
33 MHz math
coprocessor
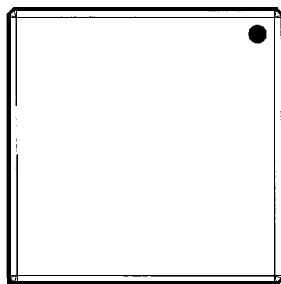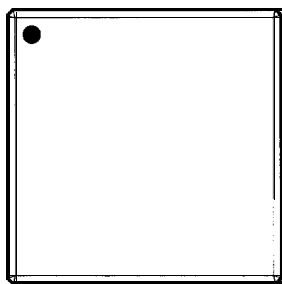
3. Line up the coprocessor pins with the holes in the socket. Then gently push the coprocessor into the socket, pressing evenly on all sides. Examine the coprocessor to be sure it is inserted all the way into the socket.

4. Reinstall the processor board as described on page 5-8.

Removing a Math Coprocessor

If you need to remove the math coprocessor from your processor board, contact your dealer for assistance. The procedure requires a special extracting tool, and if you try to remove it without this tool you can easily damage it.

Memory Modules

Your computer comes with 4MB of memory provided by SIMMs (single inline memory modules) which are installed on the main system board. You can install additional SIMMs to increase your computer's memory to 64MB.

There are eight SIMM sockets on the main system board. Each socket can contain either a single-sided or double-sided SIMM. The SIMMs must all be 70ns (nanosecond), 36-bit, 72-pin, gold-leaded, fast-page mode SIMMs.

The SIMM sockets are organized in two banks, as shown below. Facing the computer's back panel, the four left sockets (U12, U13, U14, and U15) are in Bank 0 and the four right sockets (U16, U17, U18, and U19) are in Bank 1.
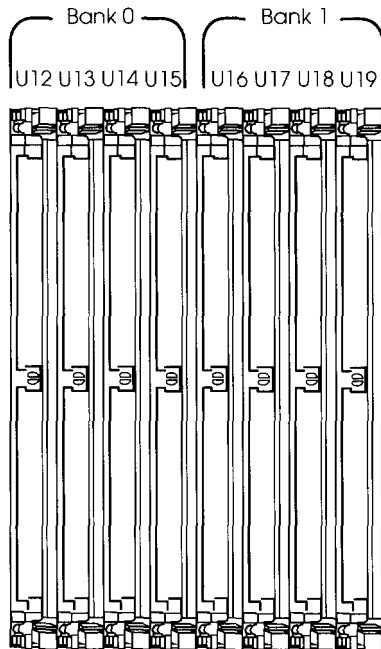
The table below describes the type of SIMMs you can install.

SIMM description

SIMM size	Description
1MB	Single-sided (256KbX36)
2MB	Double-sided (256KbX36)
4MB	Single-sided (1 MbX36)
8MB	Double-sided (1 MbX36)

Check with your dealer to be sure you install the correct type of SIMMs.

You can install these SIMMs in many different ways. For best performance, however, follow these guidelines:

❏ Fill each bank with four SIMMs of the same size

❏ Install SIMMs in Bank 0 first and then use Bank 1

❏ Install the highest capacity SIMMs in Bank 0 and the same or lower capacity SIMMs in Bank 1.

The table below gives examples of valid SIMM configurations you can use in your computer.

Example SIMM configurations

Total memory	Bank 0 u12 u13 u14 U15				Bank 1 U16 U17 U18 U19			
4MB*	1	1	1	1				
8MB	1	1	1	1	1	1	1	1
8MB	2	2	2	2				
24MB	4	4	4	4	2	2	2	2
64MB	8	8	8	8	8	8	8	8

* Factory configuration

Once you have determined where to add SIMMs, follow the
instructions below to install them. If you need to remove the
four 1MB SIMMs that came with your system, see "Removing
Memory Modules" on page 5-14.

Installing Memory Modules

Follow these steps to install SIMMs:

1. If necessary, see the main system board map on page 5-2 to
   locate the SIMM sockets.

2. It is easiest to install the SIMMs in the sockets farthest from
   the processor board first.

   Position each SIMM so its notched edge is toward the back of
   the computer. To insert the SIMM, place it in the socket at
   an angle, as shown below.
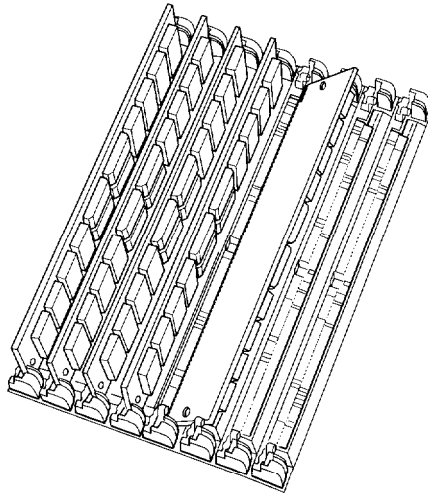
3. Gently press down on the SIMM and, at the same time, press the top to the left until it is vertical and clicks into place between the metal tabs and the retaining posts.
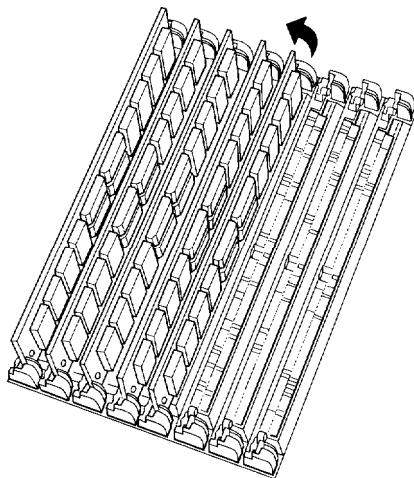
Make sure the SIMM is fully inserted into the socket and that the pins on the retaining posts fit into the holes in both ends of the SIMM.

4. Repeat steps 2 and 3 for each SIMM you want to install.

Removing Memory Modules

If you need to remove memory modules from your computer, follow the steps below. Check the information on page 5-11 to be sure you remove SIMMs from the correct sockets.

1. If necessary, see the main system board map on page 5-2 to locate the SIMM sockets.

2. It is easiest to remove the SIMMs from the sockets closest to the processor board first.

Use your fingers or two small screwdrivers to pull away the
metal tabs securing the SIMM at each end. Be careful not to
pull the tabs too far, or they may break.
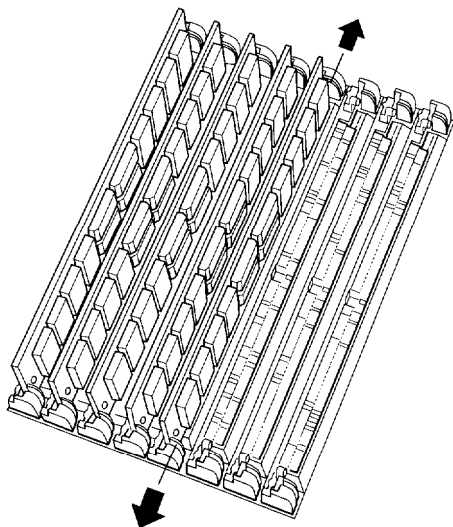
As you pull away the tabs, the SIMM falls to the right at an
angle. Carefully remove the SIMM.

3.   Repeat step 2 for each SIMM you need to remove.

Chapter 6
Installing and Removing Disk Drives

The instructions in this chapter describe how to install and remove optional Epson drives in your EISA computer. You can use these instructions to install a variety of devices, including diskette drives, hard disk drives, and tape drives. Even if your drive looks a bit different from the one illustrated here, you install it the same way.

If you are installing or removing a non-Epson drive, some of the steps in this chapter may not apply. See the manual that came with your drive for more information.

This chapter describes how to do the following:

❑ Use the correct drive bay

❑ Set the IDE (Integrated Drive Electronics) hard disk drive jumpers

❑ Install or remove a drive in an upper drive bay

❑ Install or remove an internal drive.

Before you perform any of the procedures described below, follow the steps in Chapter 4 to remove the computer's cover and the front panel (if necessary).

Using the Correct Drive Bay

Your system can hold up to six half-height drives or a combination of half- and full-height drives.

There are two sets of drive bays: the upper drive bays and the internal drive housing, as shown below.

upper drive bavs

internal drive housing
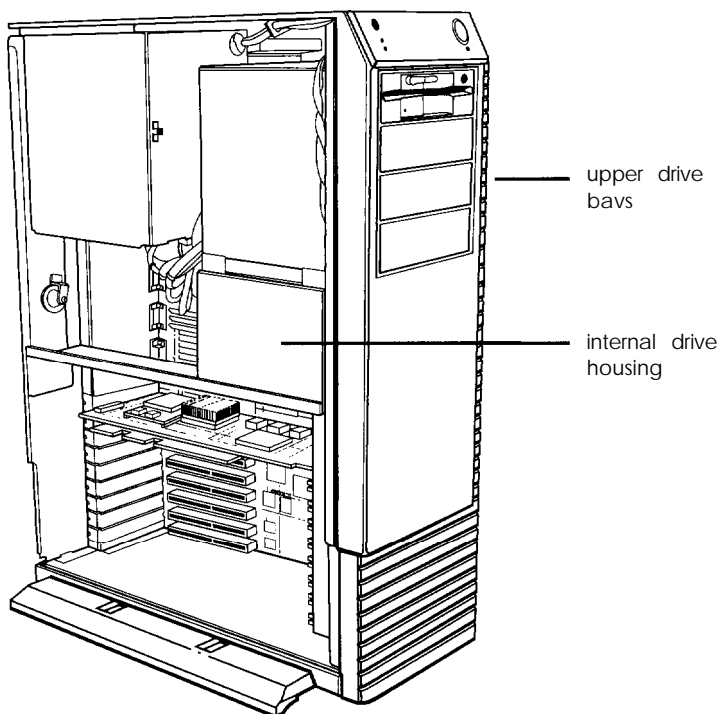
The upper drive bays can accommodate up to four drives in the following configurations:

❑   Four half-height drives

❑   One full-height and two half-height drives.

You can install up to two internal drives in the following configurations:

❏ One full-height internal drive

❏ Two half-height internal drives.

If you are installing a hard disk, it is best to install it in the internal drive housing. This reserves the upper drive bays for any externally-accessible drives you may want to add later. If you prefer, however, you can install a hard disk in an upper drive bay; just leave the drive slot cover installed in the front panel.

You can install 5¼-inch drives or 3½-inch drives with 5¼-inch mounting frames attached. See the manual that came with your drive(s) for instructions on attaching the mounting frames, if they are not already attached.

Before you install any device in an upper drive bay, you must attach a plastic guiderail and a metal grounding plate to its right side, as described in this chapter. Three guiderails, three grounding plates, and six retaining screws came with your computer.

Setting the IDE Hard Disk Drive Jumpers

You may need to change the hard disk drive jumper settings if you install or remove an IDE hard disk drive. The jumpers tell the computer whether you are using one hard disk drive or two.

> **Note**
> You do not need to set any jumpers if you are removing your only hard disk drive.

If you are installing just one hard disk drive, see "Changing the Jumper Settings" below to check your drive's jumpers.

If you are removing one hard disk drive and leaving another in your computer, you need to change the jumper settings on the remaining drive to indicate that it will be the only hard disk drive installed.

If you install two hard disk drives, you must change the jumper settings on each drive to indicate which is the master (primary) and which is the slave (secondary). The primary drive is the one from which you boot your computer.

Changing the Jumper Settings

The following illustration shows the location of the jumpers on the optional Epson 200MB IDE hard disk drive.
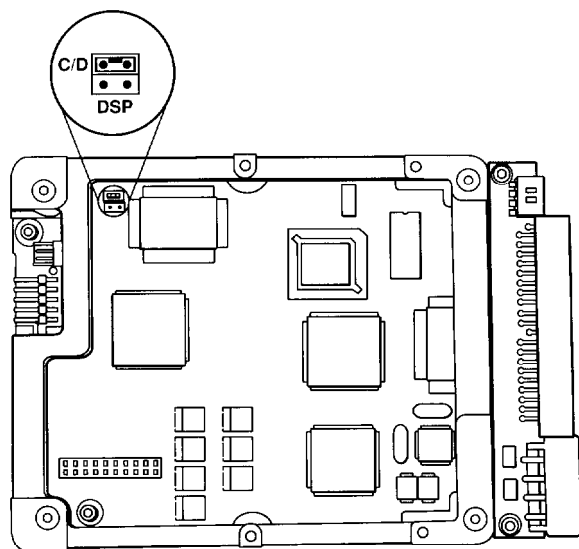
If you are installing another type of Epson hard disk drive, the jumpers may be in a different location, and there may be four jumper positions instead of two.

Set the jumpers as necessary according to the the table below.

Hard *disk* drive *jumper settings*

/Jumper positions	One hard disk drive	Two hard disk drives	
		Master (Primary)	Slave (secondary)
HSP		—	
C/D	X	X	—
DSP	—	X	—
ACT	X	X	X

X = jumper installed

— = no jumper installed

Note

If you install two 200MB hard disk drives, install one jumper from each drive in the two positions on the master drive. You do not install any jumpers on the slave drive.

To install or remove an IDE drive in the internal drive housing, see page 6-13 for instructions.

To install or remove an IDE drive in an upper drive bay, see the next section for instructions.

Installing or Removing a Drive in an *Upper Bay*

This section describes installing or removing a diskette, hard disk, or tape drive in an upper drive bay; however, you can use these same instructions for another type of storage device. Be sure to see the manual that came with it for any additional installation instructions you may need. Follow these steps:

1. Remove the front panel as described on page 4-4.

2. If you are installing a drive that is accessible from the front of the computer, you must remove the front panel slot cover for the drive bay you will use.

   Press outward on the tabs securing the slot cover to the inside of the front panel. Then pull the slot cover toward you to remove it, as shown below.
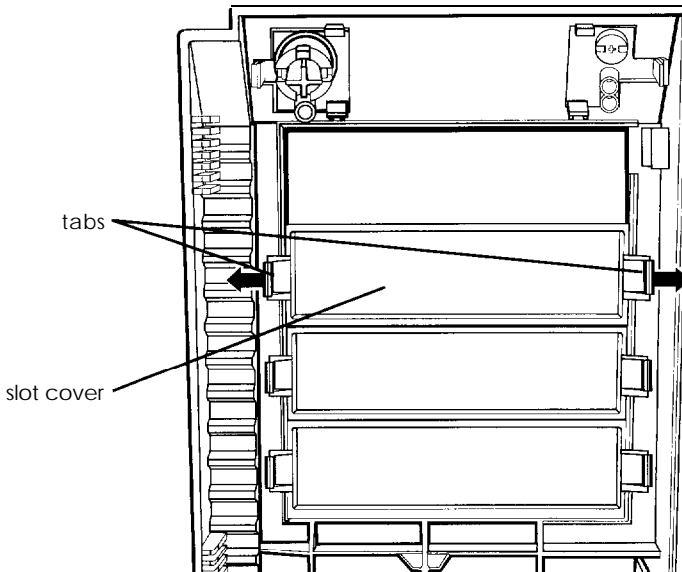
If you need to remove any drives, follow the steps below. To install a drive, see page 6-9.

Removing a Drive

Follow these steps to remove a drive from an upper bay:

1. Disconnect the power supply cable and drive cable from the back of the drive.
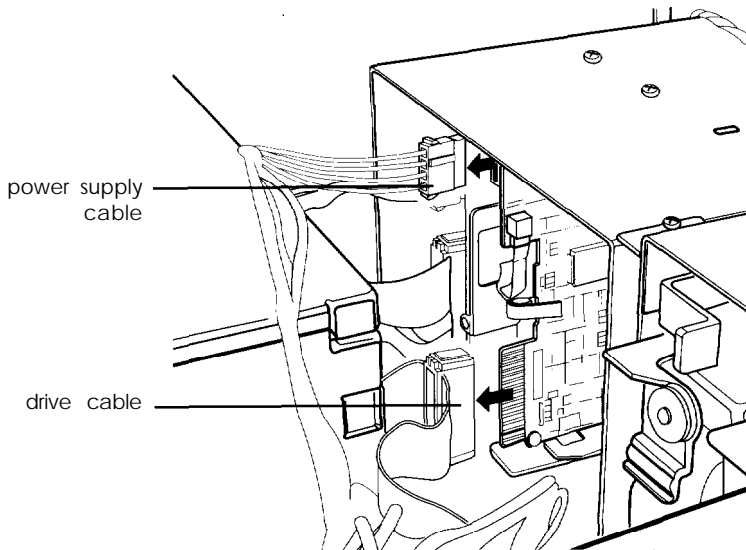
2. Remove the two screws securing the drive to the drive bay, as shown below. Then pull the drive out from the front of the bay and set it aside.
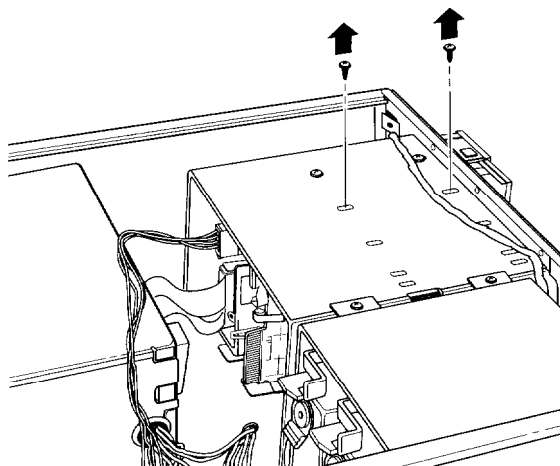
3. If you removed your only IDE hard disk drive from the computer, you must remove the internal drive housing so you can disconnect the hard disk drive cable from the main system board. See "Removing the Internal Drive Housing" on page 6-14 for instructions.

4. If you removed one IDE drive and left another one in the computer, you must also remove the remaining drive and set its jumpers to indicate that you now have only one IDE drive installed. Perform steps 1 and 2, above, to remove the drive from an upper bay or see page 6-13 to remove it from the internal drive housing. Then see page 6-3 for instructions on changing the jumper settings.

5. If necessary, replace the slot cover in the front panel for the drive you removed.

6. Replace the computer's front panel and cover as described in Chapter 4; then follow the "Post-installation Setup Procedures" on page 4-8 to update your configuration.

Installing a Drive

Follow these steps to install a drive in an upper bay:

1. Locate one plastic guiderail, one metal grounding plate, and two of the retaining screws that came with your computer.

   Attach the guiderail and grounding plate to the right side of the drive, as shown below, and secure them with the retaining screws.

grounding plate
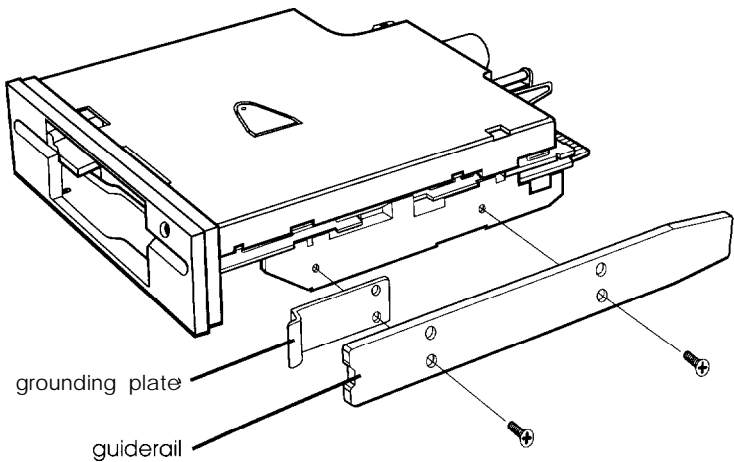
guiderail

2. Align the guiderail between the two guides on the right side of the drive bay and slide the drive into the bay.

3. Align the two holes on the drive with the two oval holes on the drive bay and secure the drive with two of the retaining screws that came with it.
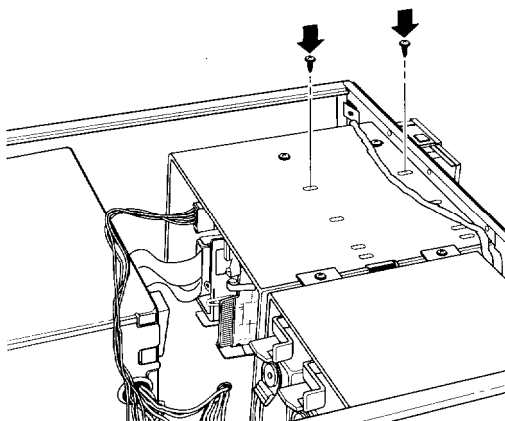
4. If the drive is externally-accessible, replace the computer's front panel (see page 4-5) and, if necessary, adjust the position of the drive so that it is flush with the front panel. Be sure to tighten the retaining screws.

5. Locate one of the power supply cables labelled P1 through P6. Align the notched corners on the cable connector with the socket on the back of the drive, as shown below. Then push in the connector.
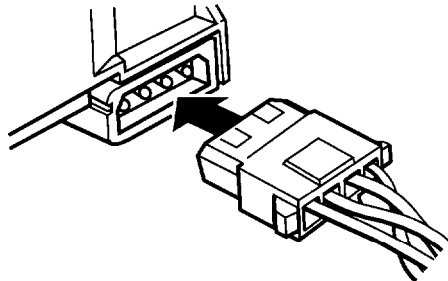
6. Locate the drive cable for the drive you just installed. If you installed an IDE hard disk drive, go to step 7. If you installed a diskette drive or tape drive, go to step 8.

7. Align the hard disk drive cable connector with the drive
    socket so the row in the connector with the blocked hole
    lines up with the row in the socket with the missing pin, as
    shown below. Then push in the connector.
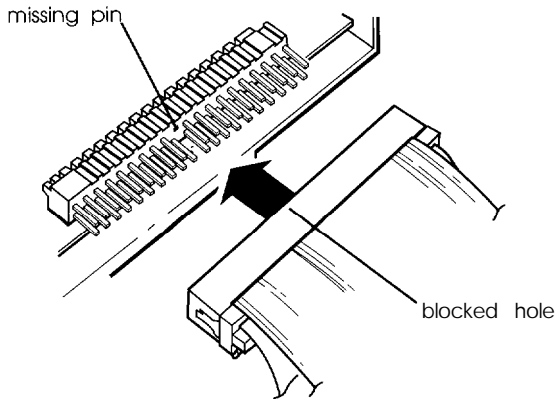
Now go to step 9.

8. If you are connecting diskette drive A, use the drive
    connector labelled **FDD1** on the end of the diskette drive
    cable. If you are connecting drive B, use the connector
    labelled **FDD2.** If you installed a tape drive, use the
    connector labelled **TAPE DRIVE ONLY.**

    Align the connector with the drive interface **so that** the
    divider in the connector lines up with the gap in the
    interface, as shown in the following illustration. Then push
    in the connector.

divider   gap
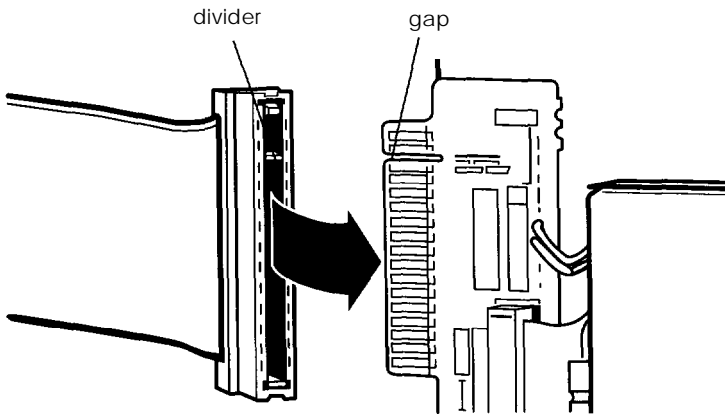
9. Replace the computer's front panel and cover as described
    in Chapter 4; then follow the "Post-installation Setup
    Procedures" at the end of that chapter to update your
    configuration.

Installing or Removing an Internal Drive

Before you install or remove an internal drive, you must
remove the internal drive housing from the computer. Follow
the steps in this section to do the following:

❏ Remove the internal drive housing

❏ Install or remove an internal drive

❏ Reinstall the internal drive housing.

These instructions describe installing or removing an IDE hard
disk drive; however, you can use them to install or remove
other types of internal drives as well.

Removing the Internal Drive Housing

Follow these steps to remove the internal drive housing from your computer:

1. If there are any drives in the internal housing, disconnect the power supply cable and drive cable from the back of each drive.

drive cable

power supply cable
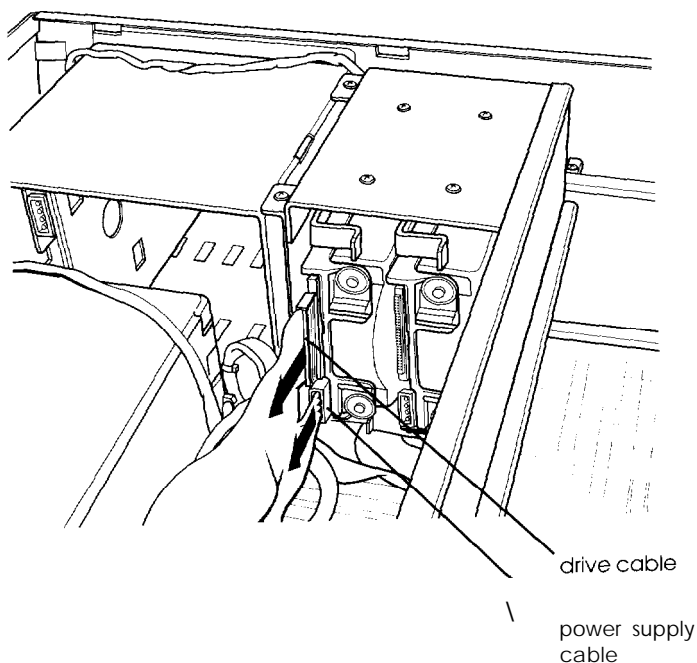
2. Remove the four screws securing the internal drive housing to the computer case, as shown below. Hold onto the screws so they do not fall on the main system board.
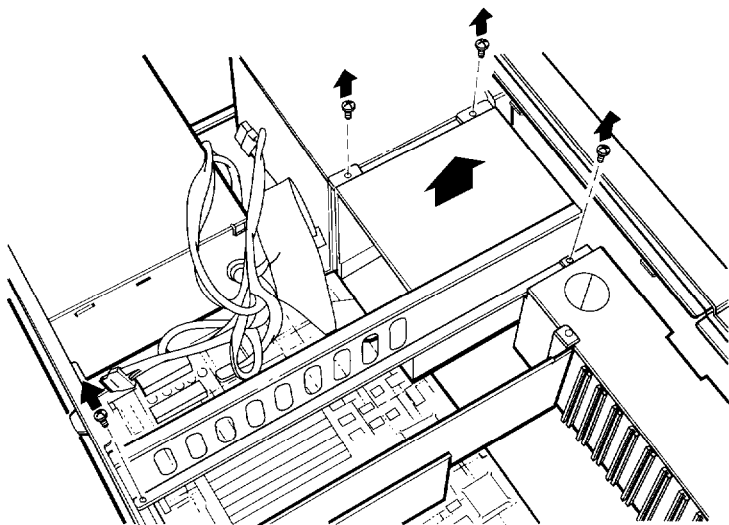
3. Grasp the underside of the housing and lift it up and out of the computer. Be careful not to bump the housing into the processor board or the main system board. Then set the housing on your work surface.

4. If you are removing your only IDE hard disk drive, disconnect the cable connected to the hard disk drive socket on the main system board. See page 5-2 to locate the socket.

5. Now follow the instructions below to install or remove a drive in the internal drive housing.

Installing or Removing a Drive

Before you perform the following steps, be sure to set the jumpers on any IDE hard disk drive(s) you may be installing. See page 6-3 for instructions.

Follow these steps to install or remove an internal drive:

1. If you need to remove a drive, remove the screws securing it to the housing; there are two screws on each side. Then grasp the drive from the front and pull it out of the housing.
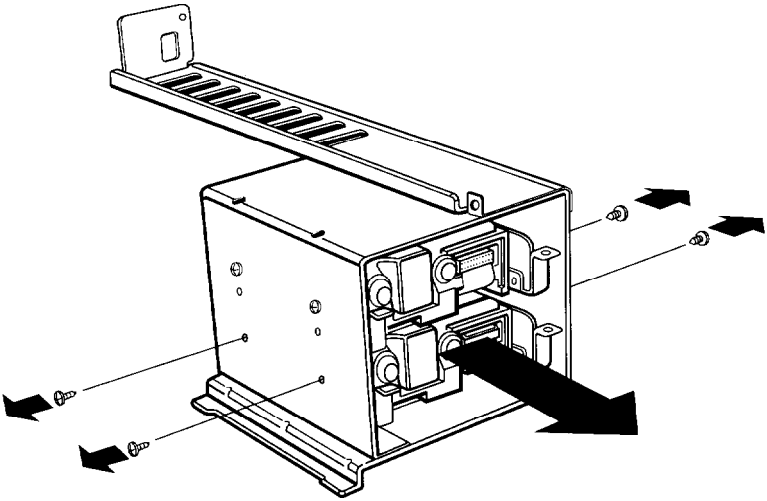
If you do not need to install a drive, go to step 4.

2. To install a new drive (or reinstall a drive you removed), position the housing as shown in the next illustration and slide in the drive.

3. Align the holes on each side of the drive with the two holes on each side of the housing and secure the drive with the four retaining screws that came with the drive.
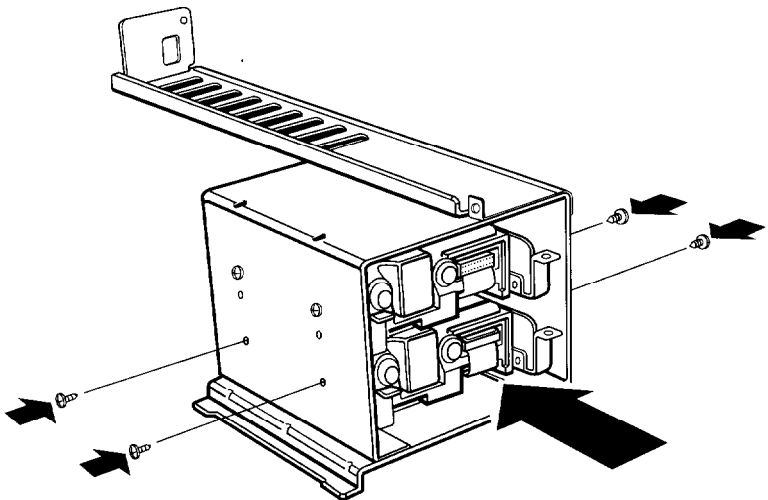
Note

If you are installing a half-height drive, insert the drive at the top or bottom of the housing to leave room for a second half-height drive, in case you want to install one later.

4. If you removed one IDE hard disk drive and left another one in the computer, you must also remove the remaining drive and set its jumpers to indicate that you now have only one IDE drive installed. Perform step 1, above, to remove the drive from the internal housing or see page 6-7 to remove the drive from an upper drive bay. Then see page 6-3 for instructions on changing the jumper settings.

5. Now reinstall the internal drive housing as described below.

Reinstalling the Internal Drive Housing

After you install or remove an internal drive, follow these steps to reinstall the internal drive housing:

1. Position the internal drive housing over the brackets inside the computer and carefully lower it into place. Be sure to keep one hand beneath the housing so it does not drop onto the main system board or bump the processor board.
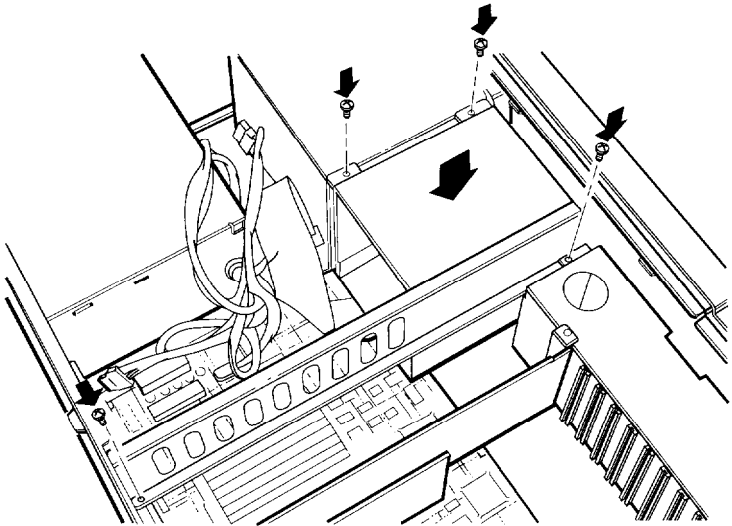
2. Secure the housing to its brackets with the four retaining screws.

3. Locate one power supply cable for each drive installed in the internal drive housing. You can use any of the cables labelled P1 through P6.

    Align the notched corners on the cable connector with the notched corners of the drive socket, as shown below. Then push in the connector.
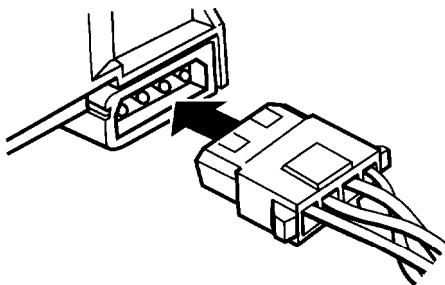
Be sure to connect a power supply cable to each drive in the
internal housing.

4. Locate the drive cable for each drive in the internal housing.
    To connect an IDE hard disk drive cable, align the cable
    connector with the drive socket so the row in the connector
    with the blocked hole lines up with the row in the socket
    with the missing pin, as shown below. Then push in the
    connector.

missing pin

blocked hole
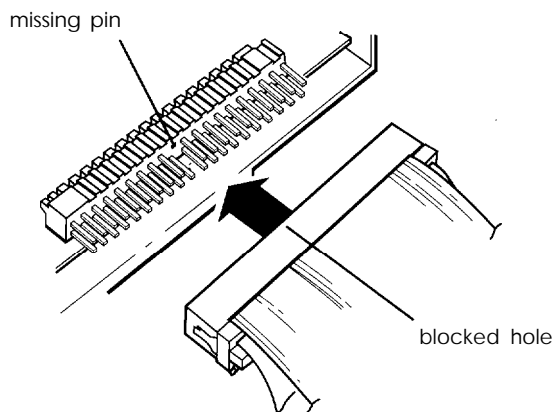
Be sure to connect a drive cable to each drive in the internal
drive housing.

> **Note**
> If the connector is different on your drive, see the
> manual that came with it for instructions on connecting
> the drive cable.

5. Replace the computer's front panel and cover as described in
    Chapter 4; then follow the "Post-installation Setup
    Procedures" at the end of that chapter to update your
    configuration.

Appendix A
Running System Diagnostics

You can test the following devices using the System diagnostics program:

❏ System board

❏ Numeric coprocessor

❏ System memory

❏ Diskette drive(s)

❏ Hard disk drive(s)

❏ Serial port(s)

❏ Parallel port(s)

❏ Dot matrix printer(s).

For some devices, you can run more than one type of test. See the table on page A-7 for a list of the tests available for each device.

Note

The Write, read checks for the hard disk drive(s) and diskette drive(s) destroy data on the disk. Be sure to back up any data on your hard disk or insert a blank, formatted diskette before you run this test. Also be sure to do this if **you select Run all above checks.**

Starting the Program

Follow these steps to start the System diagnostics program:

1. Insert the Reference 1 diskette in drive A and turn on or reset the computer.

    > **Note**
    > **Always** boot the computer from the Reference 1 diskette to start System diagnostics. This clears from memory **any** protected mode terminate-and-stay-resident (TSR) **programs** or other utilities and frees it for use by the **diagnostics program.**

2. After a moment, you see the title screen for the System Configuration program. Press any key to continue.

3. When you see the Welcome screen, press [Enter.

4. From the Main Menu, select Access to other utilities. Then select System diagnostics.

5. When prompted, remove the Reference 1 diskette, insert the Reference 2 diskette, and then press **Enter**.

6. You see a menu bar at the top of the screen with Items Detected highlighted. Press **Enter**.

7. You see a list of all the testable devices the computer detects in your system. Check to be sure the list is correct.

8. If the list is not correct, press I-] to select Quit and press **Enter**. Run the System Configuration program to make sure any missing devices are configured properly. Then run System diagnostics again.

When the list is correct, you can run diagnostic tests on each device. If you do not want to test a device, you can remove it from the list. You can also add a device to the list.

Deleting Tests

To remove devices from the Items Detected list so the System diagnostics program cannot test them, follow these steps:

1. **Press** ⟨ → ⟩ **to select Delete Tests.** You see the Delete menu, such as the following:

   System **Board**
   Numeric Coprocessor
   System Memory
   Diskette Drive A
   Hard Disk Drive #1
   Serial Port COM1
   Serial Port COM2
   Parallel Port LPTl
   LPTl Printer Test

2. Press ⟨ ↓ ⟩ or ⟨ ↑ ⟩ to highlight the device you want to delete and press ⟨ **Enter** ⟩. The device is removed from the Delete menu. You can delete as many devices as you want.

3. When you are finished deleting devices, press ⟨ ← ⟩ to select Execute and see the "Running Tests" section.

Adding Tests

If you want to add devices to the Items Detected list, follow
these steps:

1. Press $\boxed{\leftarrow}$ or $\boxed{\rightarrow}$ to select **Add** Tests. You see the Add
    menu, such as the following:

    ```
    Diskette Drive B
    Hard Disk Drive #2
    Parallel Port LPT2
    Parallel Port LPT3
    LPT2 Printer Test
    ```

    The Add menu lists the testable devices that the computer has
    not detected in your system. You also see any devices that
    you deleted from the Delete menu in case you want to be
    able to test them.

2. Press $\boxed{\downarrow}$ or $\boxed{\uparrow}$ to highlight the device you want to add
    and press [Enter. The device is removed from the Add
    menu and added **to** the **Items Detected list.** You can add as
    many devices as you want.

3. When you are finished adding devices, press $\boxed{\leftarrow}$ to select
    Execute and see the next section.

Running Tests

Follow these steps to run a test from the Execute menu:

1. **Press** [←] or [→] to select Execute. You see the Execute **menu,** such as the following:

   ```
   System Board
   Numeric  Coprocessor
   System Memory
   Diskette Drive A
   Hard Disk Drive #l
   Serial Port COMl
   Serial Port COM2
   Parallel Port LPTl
   LPTl Printer Test
   ```

2. Press [↑] or [↓] to highlight the device you want to test and press [Enter]. You see the Repeat prompt:

   ```
   How often to repeat test?     1
   ```

3. If you want to run the test once, press [Enter]. To run the test more than once, type the number of times you want to run it and press [Enter].

4. If there is only one test for a device, the program begins testing immediately. If there is more than one test for the device, you see a submenu of test selections, such as the following:

   ```
   HARD DISK DRIVE(S) AND CONTROLLER
   CHECK MENU

   1 - Seek check
   2 - Write, read check
   3 - Read, verify check
   4 - Run all above checks
   0 - Exit
   ```

Use ⎡ ↑ ⎤ or ⎡ ↓ ⎤ or type the number of the desired option to highlight a test and then press ⎡ **Enter** ⎤ to run it.

Note

If you selected to run the tests more than once, you do not see a submenu. The program immediately begins executing all the tests that do not destroy data.

---

5. When the test is completed, you see the Execute menu or the test submenu again. You can select another test or exit the menu.

    To exit System diagnostics, press ⎡ → ⎤ to select **Quit** and press [Enter. You return to the System Configuration program Main Menu.

Resuming From an Error

If an error prevents a test from running, you see a Runtime Error information box. Follow the instructions on the screen to solve the problem.

If an error occurs during a test, the test stops and an error message appears. If you want to record the problem, you can print the message on your printer. You see this prompt:

    Do you want a printout **of the** error
    message(s) ? **(Y / N)**

To continue without printing, press ⎡ **N** ⎤ and [Enter.

To print the message, press ⎡ **Y** ⎤ and ⎡ **Enter** ⎤. The program prints the message. Then press ⎡ **Enter** ⎤ again.

For a complete list of the error messages the program may display, see the table at the end of this appendix.

System Diagnostic Tests

The table below lists all the System diagnostic tests you can run on your system.

System diagnostic tests

Device	Tests available	Description
System Board		Checks the system board components
Numeric Coprocessor		Tests the operation of any built-in or optional math coprocessor
System Memory		Checks all memory and displays a memory count
Diskette Drive(s) A or B	Sequential seek check Random seek check Write, read check • Disk change check Run all above checks	Tests the operation of the selected diskette drive; requires a formatted diskette for some tests
Hard Disk Drive(s) #1 or #2	Seek check Write. read check • Read, verify check Run all above checks	Tests the operation of the selected hard disk drive
Serial Port(s) COM1 or COM2		Tests the selected serial port; requires a loop-back connector (contact your dealer)
Parallel Port(s) LPT1, LPT2. or LPT3		Tests the selected parallel port: requires a loop-back connector (contact your dealer)
LPT1 or LPT2 Printer Test(s)		Tests the operation of the selected dot matrix printer and prints a test pattern

* The Write, read check destroys data on the disk. Be sure to back up data on a hard disk or insert a blank, formatted diskette before running this test.

Error Messages

The following table lists all the error messages that may appear during System diagnostic testing.

System diagnostic error messages

Error code	Message
System board	
0101	CPU error
0102	ROM checksum error
0103	Timer counter register error
0104	Timer counter error
0105	Refresh error
0105	DMA controller register error
0106	DMA page register error
0107	Refresh error
0108	Keyboard controller timeout error
0108	Keyboard controller self diagnostic error
0108	Keyboard controller write command error
0109	CMOS checksum error
0110	CMOS shutdown byte error
0111	CPU instruction error
0112	CMOS battery error
0113	Interrupt controller error
0114	Protect mode error 1
0115	Protect mode error 2
Memory	
0201	Memory error
0201	Parity error
Diskette drive(s)	
0601	Diskette drive controller error
0602	Sequential seek error
0603	Random seek error
0604	Write error
0605	Read error
0606	Remove error
0607	Insert error

System diagnostic error messaaes (continued)

Error code	Message
Coprocessor	
0701	Coprocessor not installed
0702	Coprocessor initialize error
0703	Coprocessor invalid operation mask error
0704	Coprocessor st field error
0705	Coprocessor comparison error
0706	Coprocessor zero divide mask error
0707	Coprocessor addition error
0708	Coprocessor subtraction error
0709	Coprocessor multiplication error
0710	Coprocessor precision error
Parallel port(s)	
0901	Error pin p
Serial port(s)	
1101	control signal always low
1101	control signal always high
1102	Timeout error
1103	Verify error
Hard disk drive(s)	
1701	Seek error
1702	Write error
1703	Read error

Appendix B
Formatting a Hard Disk

This appendix describes how to low-level (or physically) format a hard disk. This procedure should not be confused with the logical format performed by your operating system. The physical formatting of a hard disk is a separate step that is usually done at the factory by the disk manufacturer.

If your computer came with a factory-installed hard disk, or if you installed an optional Epson IDE hard disk, it has already been physically formatted. You need only follow the instructions in your operating system manual to prepare your hard disk for use.

If you installed a hard disk that came with its own format utility, use that program to physically format the disk.

You may need to use the procedure in this chapter to physically format a hard disk if you installed a non-Epson hard disk in your computer that has never received the low-level format and did not come with its own format utility.

Caution
If you are unsure whether formatting is necessary, contact your Epson dealer for assistance.

Physically formatting a hard disk erases any data it contains. Be sure to back up any data on your hard disk before you format it.

In addition to destroying all the data on the hard disk, formatting removes any partitions and logical formatting defined on the disk by your operating system. After you physically format a new or used hard disk, you need to logically format the disk again using your operating system.

> **Note**
> Sometimes, after a hard disk has been used for a long time,
> its data becomes fragmented, causing the disk to perform
> less efficiently or produce errors. If this happens, check your
> operating system manual for procedures you can perform to
> reorganize your data on the hard disk. If those procedures
> (or a commercial defragmenting utility) do not solve the
> problem, you may want to reformat the disk by following
> the instructions in this chapter.

Starting the Program

Follow these steps to start the hard disk formatting program:

1. Insert the Reference 1 diskette in drive A.

2. Turn on or reset the computer. After a moment you see the
    title screen for the System Configuration program.

3. Press any key to continue. You see the Welcome screen.

4. Press [**Enter**]. You see the Main Menu.

5. Press [↓] to highlight Access to other utilities
    and press [**Enter**].

6. At the next menu, highlight LOW- level format   hard
    disk and press [**Enter**].

7. You see a prompt to insert the Reference 2 diskette. Remove
    the Reference 1 diskette, insert the Reference 2 diskette, and
    press [Enter.

You see the Hard Disk Format Menu:

```
1 - Format
2 - Destructive Surface analysis
3 - Non-destructive surface analysis

0 - Exit
```

The option you choose depends on whether you are
formatting a new disk or reformatting a used disk.
The options work as follows:

❏ Format first scans the disk for defective (bad) tracks (if
   it has no defective track table) and lets you decide
   which tracks to mark as bad. Then it formats the disk
   and marks the bad tracks so they are never used to
   store data.

❏ Destructive surface analysis tests the entire
   disk for read/write errors or unflagged bad tracks and
   updates the defective track table. Because this option
   writes and reads data on the disk, it destroys all data on
   any track that produces an error. YOU cannot run *this test
   on a disk that has never been formatted.*

❏ Non-destructive surface analysis checks the
   disk for unflagged bad tracks without destroying data.
   *You cannot run this test on a disk that has never been
   formatted.*

Formatting a New Disk

To format a new hard disk that has never been formatted, select
the Format option. You may need to modify the defective track
table to add bad tracks when you format the disk. Many hard
disk drives come with a printed list of bad tracks, but the bad
tracks are not flagged on the disk. Other hard disks (such as
Epson disks) come with the bad tracks already flagged.

Reformatting a Used Disk

To reformat a disk you have been using, follow these steps:

1. Use the Non-destructive surface analysis option to check for unflagged bad tracks.

2. If errors occur during the Non-destructive surface analysis, back up your hard disk to diskettes.

3. Run the Destructive surface analysis option to update the defective track table.

4. Run the Format option to format the disk.

Selecting an Option

When you use this program, you often need to select an option from a menu. There are two ways to do this:

❑   Use the arrow keys ([↑],[↓],[←],[→]) to highlight the option and press [Enter]

❑   Type the number of the option and press [Enter].

You can select almost any option that appears on the screen using either method.

Starting the Formatting Process

If you have more than one hard disk drive, you see this prompt:

```
Enter drive number ? (1/2)
```

Select 1 for the first hard disk or 2 for the second hard disk. Then see the instructions below for the Hard Disk Format Menu option you want to use.

Option 1, Format

If you select **Format** from the Hard **Disk Format Menu, you** see the following (for a disk **with no defective track table):**

Format Hard Disk < Drive *n*:>

Scan hard disk to get defective track information? (Y/N)

(If the disk already has a defective track table, you do not see this because you do not need to scan for bad tracks.)

1. Select **Y** to scan the disk or **N** to skip the scanning process.

   If you select **Y,** the program scans the disk and displays these messages during the process:

   Scanning for flagged bad tracks...

   Head : nnn   Cylinder : nnnnn

   You see the head and cylinder numbers decrease as the program progresses. After scanning the disk, the program displays the results, such as the following:

   Scanning finished.

   Count of tracks flagged bad   =   1
   Count of tracks with other errors =   0
   Count of good tracks   = *4884*

2. Next you see the following prompt:

   Accept recommended skewed sectors in format : 1 ? (Y/N)

For an Epson hard disk drive, it is best to accept the recommended skewed sector (also called the interleave factor) of 1, since this setting allows your drive to perform more efficiently. For other hard disk drives, you may need to change this value if the documentation that came with the disk recommends a different number.

To accept the default, select **Y.** Then go to step 3.

To enter a new value, select **N.** You see the following prompt:

> **Enter new skewed sectors** in
> format (l-16) :

Enter the recommended number, which equals the maximum sector number for the drive minus 1. Then press **Enter**.

3. Next you see this prompt:

> **Accept recommended skewed sectors per**
> **head in format : 0 ? (Y/N)**

For an Epson hard disk drive, accept the recommended value of 0. For another type of drive, use the value recommended in the documentation for the drive.

To accept the default, select **Y.** Then go to step 4.

To enter a new value, select **N.** You see the following prompt:

> **Enter new skewed sectors per head**
> **in format (O-16):**

Enter the recommended number, which equals the maximum sector number for the drive minus 1. The maximum sector number varies, depending on the drive type. Then press [Enter.

4. The program now allows you to edit the defective track table. At the bottom of the table is this prompt:

    Modify defective track table ? (Y/N)

    Select N if you want to leave the table as it is. Then skip the next **section** and go to "Formatting the Disk" on page B-9.

    To add bad tracks to the defective track table, see the next section.

Modifying the Defective Track Table

If you select Y to modify the table, you see the following options at the bottom of the table:

Defective Track Table : Move box cursor to
desired track with cursor key
A = Add track, C = Change track,
D = Delete track, F = Finish editing
Enter command :

To add a bad track, follow these steps:

1. Press $\boxed{\textbf{A}}$. You see this prompt:

    Enter   cylinder   number   (1-*nnnn*):

2. Type the number of the cylinder containing the bad track and press $\boxed{\textbf{Enter}}$. You see this prompt:

    Enter   head   number $(0$ **-*nn*):**

3. Type the head number for the bad track and press [Enter]. (To cancel the operation, press $\boxed{\textbf{Enter}}$ without typing a value.)

When you complete a valid entry, it appears in the table and you can add the next bad track, if necessary.

If you make a mistake, move the cursor block to the incorrect track and press [cl to change the track data or m to delete the track from the table. Change the track data in the same way as you add a track.

The maximum valid cylinder number and head number *(nnnn* and *nn)* vary according to the capacity of the hard disk. If you enter an invalid cylinder or head number, a reminder of the range of values appears and the program asks you to enter the value again.

When you finish adding all the bad tracks, press m without typing a value. Then check the entries in the defective track table. When you are sure the table is correct, press $\boxed{\textbf{F}}$. The program displays a warning about the consequences of proceeding with formatting, as described in the next section.

Formatting the Disk

When you are ready to start formatting the disk, you see the following warning:

```
WARNING!  ALL DATA WILL BE DESTROYED IN ALL
PARTITIONS OF HARD DISK, NOT JUST IN MS-DOS
PARTITION!
Do you want to start formatting  ? (Y/N)
```

If you are not sure you want to format the hard disk, select **N.** If you are sure, select **Y;** the program gives you one more chance to cancel:

```
DOUBLE CHECK THAT YOU HAVE BACKUP DISKETTE
COPIES OF ALL YOUR FILES.
Do you want to exit and check your file
copies ? (Y/N)
```

Select **Y** to cancel formatting or **N** to continue.

If you continue with formatting, you see:

Format started.

Head : *n n n*   **Cylinder** *: nnnnn*

You see the head and cylinder numbers decrease as the program progresses.

When formatting is complete, the program flags any bad tracks and you see a series of messages like these:

Format finished.
Flagging bad tracks...
Cylinder is *nnnn***, head is** *nn*
Format completed.
Press ENTER to return to the menu.

Press [**Enter**] to return to the Hard Disk Format Menu.

Option 2, Destructive Surface Analysis

You can perform a Destructive surface analysis of your hard disk to accurately locate any bad tracks and flag them, if they are not flagged. The test writes, reads, and verifies information on every track of the hard disk, except for tracks that are already flagged as bad tracks.

Caution
If any **errors occur** during this check, all data on the track that caused the error is destroyed. If you think that an unflagged bad track is causing trouble, first run the Non-destructive surface analysis to check the disk surface.

To start this test, select Destructive surface analysis from the Hard Disk Format Menu. You see these messages:

Analyze Hard Disk <Drive **n:>**

Read/Save/Write/Read/Restore/Read
check for all tracks...

current cylinder is **nnnn**

As the program checks each track, it decreases the cylinder numbers to zero.

When the test is complete, the program displays a report on the status of the disk, including a table of unflagged tracks that produced write, read errors-such as the following:

```
Analysis  finished.

Count of tracks flagged bad           =    n
Count of tracks with write, read errors  =    n
Count of good tracks                  = nnnn

No write, read error was detected.

No data was destroyed.

Press ENTER to return to the menu.
```

If the program **finds** an unflagged bad track, the report is
followed by a table like this:

```
Write, Read Error Tracks

Cylinder Head  Cylinder Head  Cylinder Head  Cylinder Head

237      2

Confirm to register the tracks in the Write, Read Error
Track Table as bad tracks.

Do you want to register the error tracks as bad tracks?
(Y/N)
```

To flag these tracks as bad, select Y. You see a list of the tracks
as they are flagged. When the process is complete, press (Enter
to return to the Hard Disk Format Menu.

Option 3, Non-destructive Surface Analysis

The Non-destructive surface analysis does not destroy any
data, and you can use it to safely check the condition of your
hard disk drive. However, this test does not flag any bad tracks
it detects.

To start the test, select Non-destructive surface
analysis from the Hard Disk Format Menu. You see these
messages:

```
Analyze Hard Disk  <Drive n:>

Read/Verify check for all tracks...

Current cylinder is n n n n
```

As the program checks each track, it decreases the cylinder numbers to zero. When the test is complete, the program displays a report on the status of the disk, such as the following:

```
Analysis  finished.

Count  of  tracks  flagged  bad                    =      n
Count  of  tracks  with  read,  verify  errors =      n
Count  of  good  tracks                            =  nnnn

No read,  verify  error  was  detected.
```

If the program finds errors, the screen displays a table of the tracks that produced the errors. Then you see this message:

```
Press ENTER to return to the menu.
```

Check the information displayed. Then press ⎡ **Enter** ⎤ to return to the Hard Disk Format Menu.

Exiting the Program

To leave the Hard Disk Format Menu, select **Exit.** You **see a** prompt to insert the Reference 1 diskette. Remove the Reference 2 diskette, insert the Reference 1 diskette, and press ⎡ **Enter** ⎤. Now you can use any of the other utilities or return to the Main Menu.

If you formatted the hard disk or ran the Destructive surface analysis option, you must now prepare your hard disk for use with your operating system. See your operating system manual for instructions.

Appendix C
Troubleshooting

You should not encounter any difficulties as you set up and use your computer, but if anything out of the ordinary happens, refer to this appendix. You can also run System diagnostic tests on various system components. See Appendix A for instructions.

If the suggestions here or in Appendix A do not help solve the problem, see "Where to Get Help" in the Introduction for instructions on contacting your dealer or Epson customer service.

Identifying Your System

When you contact your dealer, be ready to provide the serial number of your computer and its current configuration. You should also provide the version number of the computer's ROM BIOS, as well as the names and version numbers of your operating system and any application programs you are using.

You can find the serial number on the computer's back panel. If you are able to use your computer, run the System Configuration program to view your current configuration information.

Follow these steps to obtain the other information:

1. Turn on your computer or press the **RESET** button. When the computer performs its memory test, the version number of your system's ROM BIOS appears at the top of the screen. Write down the number. (This number is also included in your System Configuration program information.)

2. At the operating system command prompt, enter the appropriate command to display the version number of your operating system. Write it down, and then obtain the version numbers of any application programs you are using.

Error Messages

Your computer's built-in memory (ROM) contains a series of diagnostic programs, called power-on diagnostics. These programs check internal devices such as ROM, RAM, the timer, the keyboard controller, and the hard disk drive every time you turn on the computer. The RAM test program displays a count of the memory currently installed in your system.

If the computer finds an error, it may display an error message on the screen or it may sound an error tone code. The tone code is a distinct pattern of beeps that identifies the error, such as one beep-two beeps-one beep. If the error is serious, the computer cancels further checking and halts system initialization. The computer locks up and, if there is an error message, it remains on the screen. Write down the error message or the tone code pattern and give it to your dealer when reporting a problem.

The tables below list the possible error messages and tone codes.

Power-on diagnostic error messages

Message	Description
No timer tick interrupt	Timer tick failure
Shutdown failure	Shutdown failure
Gate A20 failure	Gate A20 failure
Unexpected interrupt in protected mode	Unexpected interrupt in protected mode
Decreasing available memory	RAM failure above address 0FFFFh
Timer chip counter 2 failed	Interval timer channel 2 failure
Time-of-day clock stopped	Time-of-day clock could not be read

Power-on diagnostic error tone codes

Error tone code	Description
1-1-3	8KB and real-time clock CMOS write/read failure
1-1-4	BIOS ROM checksum failure
1-2-1	Programmable interval timer failure
1-2-2	DMA initialization failure
1-2-3	DMA page register write/read failure
I-2-4	Invalid SIMM combination installed
1-3-o	VGA RAMDAC failure
1-3-1	RAM refresh verification failure
1-3-2	Wrong memory installation
1-3-3	First 64KB RAM chip or data line failure (multi-bit)
1-3-4	First 64KB RAM odd/even logic failure
1-4-1	First 64KB RAM address line failure
I-4-2	First 64KB RAM parity test failure
I-4-3	Fail-safe timer test failure
I-4-4	Software NMI port test failure

Error tone code	Description
2-1-1	First 64KB RAM or data line failure-bit 0
2-1-2	First 64KB RAM or data line failure-bit 1
2-1-3	First 64KB RAM or data line failure-bit 2
2-1-4	First 64KB RAM or data line failure-bit 3
2-2-I	First 64KB RAM or data line failure-bit 4
2-2-2	First 64KB RAM or data line failure-bit 5
2-2-3	First 64KB RAM or data line failure-bit 6
2-2-4	First 64KB RAM or data line failure bit 7
2-3-I	First 64KB RAM or data line failure-bit 8
2-3-2	First 64KB RAM or data line failure-bit 9
2-3-3	First 64KB RAM or data line failure-bit A
2-3-4	First 64KB RAM or data line failure-bit B
2-4-I	First 64KB RAM or data line failure-bit C
2-4-2	First 64KB RAM or data line failure-bit D
2-4-3	First 64KB RAM or data line failure-bit E
2-4-4	First 64KB RAM or data line failure-bit F
3-I-I	Slave DMA register test failure
3-1-2	Master DMA register test failure
3-1-3	Master interrupt mask register test failure
3-I-4	Slave interrupt mask register test failure
3-2-4	Keyboard controller test failure
3-3-4	Video memory test failure
3-4-1	Display initialization test failure
3-4-2	Display retrace test failure
4-2-1	Timer tick nterrupt test failure
4-2-2	Shutdown test failure
4-2-3	Gate A20 failure
4-2-4	Unexpected interrupt in protected mode

Power-on diagnostic error tone codes (continued)

Error tone code	Description
4-3-I	RAM test failure above address 0FFFFh
4-3-3	Interval timer channel 2 test failure
4-3-4	Time-of-day clock test failure
4-4-1	Serial port test failure
4-4-2	Parallel port test failure --
4-4-3	Coprocessor test failure

Power or Lock-up Problems

If you are having trouble with the computer's power or the
system locks up, see the suggestions below.

The computer does not start when you turn it on.

Turn off the power and check the following:

❏ Be sure all cables are securely connected to the computer.

❏ Check that the computer and monitor power cords are
plugged completely into their electrical outlets.

❏ Test the outlet to see if it supplies power.

The computer starts but the screen is blank.

See "Monitor Problems" below.

The computer starts but does not boot.

If the computer starts but does not load your operating system, the problem could be caused by many different factors. Try the following:

❏ First make sure you have correctly formatted your hard disk and have properly installed your operating system on it. (See "Hard Disk Problems" on page C-14.)

❏ If you do not have a hard disk, insert a system diskette in drive A and press **RESET.**

❏ If you think the problem may be caused by a loose physical connection inside the computer, follow these steps:

1. Remove any diskettes and turn off your peripheral devices and your computer.

2. Disconnect the power cord and peripheral device cables and remove the computer's cover, as described in Chapter 4.

3. Ground yourself by touching the inside back panel of the computer case before you perform the next step.

4. Make sure all of the internal cable connections are secure and that the processor board and any option cards are completely seated in their connectors. Then press down firmly but gently on each socketed chip on the main system board to ensure that they are also seated.

5. Replace the computer's cover and connect the peripheral device and power cables, as described in Chapter 4.

6. Turn on your system and try booting it again.

If the computer still does not load your operating system, contact your dealer.

The computer does not respond when you type.

If you have just turned on the computer, check the following:

❏ Make sure your keyboard is securely connected to the computer.

❏ If you entered the wrong password and cannot access your system, see "Password Problems" below.

If you are running a software program, try these procedures:

❏ If your computer is processing a complicated command or performing a complex task, it may take a long time to complete its work. If the computer does not respond after a reasonable length of time, proceed to the next step.

❏ Press [Ctrl][Alt][Delete] or press the **RESET** button to exit the software program and reboot the computer.

❏ If resetting the computer does not work, turn it off and wait at least five seconds. If you do not have a hard disk drive, insert a bootable diskette in drive A. Then turn on the computer and try running the program again.

❏ If none of these procedures work, check your software documentation or contact your software manufacturer for technical support.

The computer suddenly stops operating.

Your computer may have stopped operating because its power supply contains detection circuits that automatically shut down **the** power if they detect excessive operating temperatures. This protects your system from damage due to overheating.

When these circuits detect a high temperature, they shut off all the DC outputs in the power supply and your computer stops operating. This does not damage the power supply, but you must remove the cause of the high temperature before you can use your system again.

To restore normal power supply operation, follow these steps:

1. Turn off the computer and leave it off for at least 30 seconds to reset the power supply logic.

2. To determine the cause of the high temperature and correct the condition, check for the following:

    ❏ A blocked power supply fan. Make sure that nothing blocks the power supply fan vents in the back of the computer case. Check both inside and outside the computer for blockage. Make sure there is ample room around your system for air circulation.

    ❏ Room temperatures of 95" F (35° C) or above. If this is the case, move the computer to a cooler area.

    ❏ An overload of the power supply limitations. Check the table on page D-4 to see if you have exceeded the option slot power limits. See your option card manual for the power requirements of your card(s).

3. After you eliminate the problem causing the overheating, allow the computer to cool down for at least five minutes at a room temperature of about 78" F (25" C). This resets the thermal detection circuits.

4. If you removed the computer's cover, replace it now. Then turn on the computer.

If the power supply shuts off again after you follow the steps above to correct the problem, contact your dealer.

Password Problems

If you set a password using the System Configuration program and you have trouble using your password, check the section below that describes the problem you are having.

You enter the password, but nothing happens.

Type the password again and press Enter. You have three chances to enter it correctly before the system locks up. If this happens, press **RESET** to reboot the computer and try again.

If you turned on network server mode when you set your password, type your password and press Enter twice to see if your system responds. If not, enter the password again or press **RESET** and start over.

You want to change of delete the password.

See Chapter 3 for instructions on changing or deleting your password.

You have *forgotten the current password.*

If you have forgotten the current password and cannot use your computer, follow these steps:

1. Turn off the computer, remove the cover, and disable the password function by setting jumper J1 on the main system board to position A. See Chapter 4 for instructions on accessing the main system board and page 5-2 for the location of the jumper.

   If any option cards are blocking access to the jumper, follow the instructions in Chapter 5 to remove them.

2. Replace the computer's cover. (See Chapter 4 for instructions.)

3. If you do not have a hard disk, insert a bootable diskette in drive A. Turn on the computer and allow it to load the operating system.

4. Then turn off the computer, remove the cover, and enable the password function by setting jumper J1 on the main system board to position B. If necessary, follow the instructions in Chapter 5 to replace any option cards you removed.

5. Replace the computer's cover.

   If you do not want to set a new password, you do not need to do anything else. (When you turn on your computer, you will not see the Enter password prompt.)

   If you want to set a new password, go to step 6.

6. Insert the Reference 1 diskette in drive A and turn on the computer. You do not see the Enter password prompt.

7. Run the System Configuration program as described in Chapter 2.

   Select View or edit details for the system board. Then highlight Power-on password and press [Enter.

8. Type a new password at the next prompt and press **Enter**. If you want to use network server mode, turn it on now.

9. Save your configuration as you exit the System Configuration program.

   When the computer reboots, you see the Enter password prompt. Enter the password to access your system.

> **Note**
> If you turned on network server mode when you set a new
> password and then booted your system from the hard disk,
> you do **not see** the **Enter password** prompt. Follow the
> instructions in Chapter 3 to enter your password in network
> server mode.

Keyboard Problems

❏ Make sure the keyboard is securely connected to its port.

❏ If you are still having problems, see "Power or Lock-up
Problems" above.

Monitor Problems

See the suggestions below if you have trouble with your
monitor display.

There is no *display* on the screen.

❏ Make sure the monitor cables are securely connected to the
monitor, the computer, and the electrical outlet.

❏ Check that the monitor's power switch is on and that the
power light on the monitor is lit. If the power light is on but
you still do not see anything on the screen, check the
monitor's brightness and contrast controls.

❏ Check to see if the electrical outlet supplies power.

The monitor does not display images correct/y.

❏ Make sure your monitor and display adapter card match. Also, be sure any switches or jumpers on the card are set properly. See the documentation that came with your monitor and display adapter for instructions.

❏ Be sure you chose the correct display adapter type in the System Configuration program. Also check the recommended switch and jumper settings. See Chapter 2.

❏ If you are running an application program, see if you need to configure the program for the type of monitor and display adapter you have. Also, make sure you are using the appropriate monitor and display adapter for your software.

Diskette Problems

❏ Be sure you turned down the diskette drive latch or pressed the drive button to secure the diskette in the drive.

❏ Check to see if you inserted the diskette upside down or did not insert it all the way.

❏ Check to see if you inserted the right type of diskette.

❏ If the diskette is blank, make sure it is formatted.

❏ Place the diskette in another drive and repeat the operation. If this works, the trouble may be in your diskette drive. See "Diskette Drive Problems" below.

❏ Check to see if you entered an incorrect diskette drive type when you ran the System Configuration program. See Chapter 2 for instructions.

Diskette Drive Problems

If you think there is something wrong with your diskette drive, check this section.

You see an error message or have difficulty with a diskette drive.

❏ If you are having problems with a new diskette drive that your dealer installed for you, consult the dealer about the problem.

❏ If you installed the drive yourself, review all the instructions in Chapter 6. Check all the cable connections and make sure you installed the drive correctly.

❏ Be sure that you ran the System Configuration program to define the correct type of diskette drive as part of the computer's configuration. See Chapter 2.

❏ If you are still having trouble, test the drive by running the System diagnostic tests described in Appendix A. If the diagnostics program indicates an error, contact your Epson dealer.

The diskette drive is making loud or unusual noises.

Contact your Epson dealer.

Hard Disk Problems

If you think there is something wrong with your hard disk, see the suggestions below.

You have problems with a newly-installed drive.

3 If your dealer installed the drive, consult your dealer about the problem.

❏ If you installed the hard disk yourself, make sure you carefully followed all the instructions in Chapter 6. Review the instructions and check all the cable connections to make sure you installed it correctly. Also check the jumper settings on your drive to be sure they are set correctly.

❏ If you installed a non-Epson hard disk drive, verify that it was physically formatted. This type of format is usually done by the manufacturer; if yours was not, you must do it yourself. If the drive came with its own format utility, use that program; if not, follow the instructions in Appendix B.

❏ Verify that you ran the System Configuration program to define your hard disk drive type correctly. See Chapter 2.

❏ If you are sure the hard disk has been installed and prepared properly but you cannot access the drive, review the instructions in your operating system manual. Make sure you performed the necessary steps in the installation process for your configuration.

❏ If you still have trouble, test the drive by running the System diagnostic tests described in Appendix A.

❏ If you still cannot identify the problem, consult the dealer from whom you purchased the drive.

You notice a reduction in hard disk performance.

❏ The data on the disk may have become fragmented. You may want to back up all your data and then use a disk compaction utility to reorganize the files on your disk. Contact your dealer for information.

❏ If you cannot access data on your hard disk or you are receiving read/write errors, the disk may have a physical problem. Try running the Hard disk drive System diagnostic tests on the drive, as described in Appendix A.

❏ If the problem persists, contact the dealer from whom you purchased the drive.

Software Problems

❏ Make sure you are using the correct procedure for starting the program and that it is installed correctly.

❏ Be sure you are logged onto or specifying the correct drive and directory.

❏ Some programs must run at a slower operating speed. Check your software manual to see if this is the case, and change the operating speed of the processor if necessary. See "Changing the Processor Speed" in Chapter 3 for instructions and information on accommodating copy-protected programs.

❏ If you are still having problems with your software, consult your software documentation or contact the manufacturer for technical support.

Printer Problems

❏ Make sure the printer has power and is properly connected to the computer. (Also, be sure your printer has paper in it.)

❏ Check the printer manual for the printer's correct DIP switch or control panel settings.

❏ If you are using more than one parallel port or more than one serial port, check the primary and secondary port settings in the System Configuration program to make sure they are correct. See Chapter 2 for instructions.

❏ Try running the System diagnostic tests, described in Appendix A. If either the Parallel or Serial port test indicates an error, contact your printer dealer.

If you are having trouble with a dot matrix printer, also try running the printer diagnostic test. (See Appendix A.)

Option Card Problems

❏ Make sure the option card is properly inserted in its slot. Check the installation procedure described in Chapter 5 and also see the instructions that came with the card.

❏ If you installed a bus-mastering option card, be sure you added it to an appropriate option slot. You can install bus-master cards in slots 1 through 5 and in slot 8; not in slots 6 or 7.

❏ Be sure that you ran the System Configuration program to update your configuration after installing the card. See Chapter 2.

❑ Check to see if you set the necessary DIP switches or jumpers on the option card. Also be sure you performed the correct setup procedures for the software you are using with the option card. See your option card manual and check your System Configuration information for the card.

❑ If necessary, make sure that you used the proper cable to connect the device to the option card connector.

Memory Module Problems

❑ If the memory count displayed by power-on diagnostics or the System Configuration program is incorrect, you or your dealer may not have installed the SIMMs correctly. The SIMMs may be installed in the wrong sockets, they may be the wrong type of SIMM, or they may not be inserted way into their sockets.

   If your dealer installed the SIMMs for you, contact your dealer; do not attempt to correct the problem yourself. If you installed them, see "Memory Modules" in Chapter 5 and make sure you followed all the instructions correctly.

❑ Check the speed of your SIMMs. Install only 70ns, 36-bit, 72-pin, gold-leaded, fast-page mode SIMMs.

❑ Be sure to run the System Configuration program after you install or remove memory modules to automatically update your configuration. See Chapter 2 for instructions.

❑ If you are still having trouble with your SIMMs, write down any error messages you see and contact your dealer.

Mouse Problems

❏ Make sure that your mouse is securely connected to its port.

❏ Check to see if you installed your mouse driver program and loaded it into your computer's memory correctly.

❏ Be sure that you set the built-in mouse port option in the System Configuration program correctly for your mouse port. See Chapter 2 for more information.

❏ If you are still having trouble with your mouse, check the documentation that came with it for troubleshooting information or contact your mouse dealer.

Math Coprocessor Problems

❏ Run the System Configuration program and make sure that the math coprocessor is listed as **Installed on** the View or edit details screen for the system board. If it is not, you or your dealer may have installed the coprocessor incorrectly. See Chapters 2 and 5 for more information.

Caution
Do not attempt to remove the math coprocessor yourself. Contact your dealer for information about a special extraction tool that is needed to remove it.

❏ Check the manual that came with the coprocessor for troubleshooting information and for any diagnostic procedures you can perform.

❏ Test the coprocessor by running the System diagnostics program. See Appendix A for instructions.

Appendix D
Specifications

Main System Board

System memory	4MB RAM standard on SIMMs; expandable using 1MB, 2MB, 4MB, or 8MB SIMMs up to 64MB (maximum); SIMMs must be 70ns, 36-bit, 72-pin, gold-leaded, fast-page mode type
BIOS	Two-part system BIOS; one 64KB permanent BIOS on an EPROM; one 64KB CPU-dependent BIOS in a FLASH ROM device
Shadow RAM	Automatically copies the system BIOS from ROM into RAM; shadow RAM for video BIOS and external BIOS is software selectable
EISA configuration RAM	8KB SRAM; battery-backup
Clock/calendar	Real-time clock, calendar, and CMOS RAM for configuration; battery backup

Interfaces

Serial	Two RS-232-C, ISA compatible, asynchronous; 9-pin D-shell connectors
Parallel	ISA compatible, 25-pin, D-shell connector
Mouse	Mini DIN, 6-pin connector for PS/2 compatible mouse or other device

Keyboard	Mini DIN, 6-pin connector for PS/2 compatible keyboard
Option slots	Eight 32-bit EISA expansion slots (16-bit and 8-bit ISA compatible); bus-mastering option cards allowable in slots 1 through 5 and slot 8.
Speaker	Internal; operation and volume controllable by software

Controllers

Diskette and tape drive	Controller on the main system board supports up to two diskette drives in any of these formats:
	5¼-inch, high-density, 1.2MB
	5¼-inch, double-density, 360KB
	3½-inch, high-density, 1.44MB
	3½-inch, double-density, 720KB
	Also supports one optional tape drive
Hard disk	Interface on the main system board supports up to two IDE drives with embedded controllers

Processor Board

CPU   4865X/25 board: Intel 80486SX, 25 MHz microprocessor

486/33 board: Intel 80486DX, 33 MHz microprocessor

Both boards: simulated 8 MHz processor speed and other processor simulation speeds selectable through software or keyboard command

Cache memory   486SX/25 board: 8KB internal cache in the 80486SX microprocessor

486/33 board: 8KB internal cache in the 80486DX microprocessor; 64KB Intel 82485MA-33 Turbocache module with write-through, two-way set associative cache memory and controller

Math coprocessor   486SX/25 board: two sockets available for optional Weitek WTL4167 and Intel 80487SX math coprocessors

486/33 board: internal coprocessor in the 80486DX chip and one socket for an optional Weitek WTL4167 coprocessor

Mass *Storage* Bays

Up to six half-height devices maximum; two half-height or one full-height internal bays; four half-height or one full-height and two half-height externally-accessible bays

Power Supply

Type	300W, fan-cooled, automatic input voltage sensing, thermally protected
Input ranges	98 to 132 VAC and 195 to 264 VAC, 47 to 63 Hz
Maximum current	At 110 Volts, 6 Amps; at 240 Volts, 3.3 Amps

Maximum outputs

Output voltage (VDC)	Maximum current (Amps)
+5	31 (+5%, -4%); 5 Amp minimum current
+12	7 (+5%, -4%): peak 9 .
-5	0.75 (±10%)
-12	0.75 (±10%); no AC outlet

• The +12 V peak current is limited to 30 seconds maximum.

Output cables	Four main system board cables; six mass storage cables

Option slot power limits

Maximum current	+5 Volts	+12 Volts	-5 Volts	-12 Volts
For each slot	7 Amps	1.5 Amps	0.75 Amps	0.75 Amps
For all eight slots	20 Amps	2 Amps	0.75 Amps	0.75 Amps

Keyboard

Detachable, two position, 101 or 102 sculpted keys

Layout
Country-dependent main typewriter keyboard; numeric/cursor control keypad; four-key cursor control keypad; 12 function keys groups

Environmental Requirements
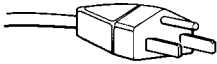
Condition	Operating range	Non-operating range	Storage range
Temperature	41° to 95° F	−4° to 140° F	−4° to 140° F
	5° to 35° c	-20' to 60° C	-20" to 60" C
Humidity (non-condensing)	20% to 80%	10% to 90%	10% to 90%
Altitude	-330 to 9900 ft	−330 to 11880 ft	-330 to 39600 ft
	-100 to 3000 m	−100 to 3600 m	−100 to 12000m
Maximum wet bulb	68' F	104° F	134° F
	20° C	40° c	I 57' c

Physical Characteristics
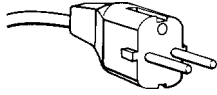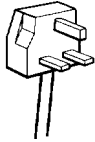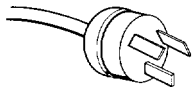
Width
8.5 inches (213 mm)

Depth
19.75 inches (494 mm)

Height
25.5 inches (638 mm)

Weight
Single diskette drive model (without keyboard): 61 lb (27.5 kg)

Power Source Requirements

120-Volt power source requirements

AC plug	Plug type	Reference standards	Power cord
	North America 125V, 10A	ANSI C73.1 1, NEMA 5-15-P. IEC 83	UL/CSA Listed, Type SJT, no 18/3AWG, or no. 16/3AWG, or <HAR> 300V, 1 0A or 13A

240-Volt power source requirements

AC plug	Plug type	Reference standards	Power cord
	Europe 240V, 1 0A to 16A	CEE 7/7 IEC 83 IEC 127 HD21	<HAR> 1 .00 mm^2 300V. 1 0A
	UK 240V. 1 0A	BS 1362 BS 1363A IEC a3 IEC 127 HD21 EN 60 320-l ASTA mark	<HAR> 1 .00 mm^2 300V, 1 0A
	Australia 240V. 1 0A	AS C112 IEC 127 HD21	<HAR> 1 .00 mm^2 300V, 10A
	North America 240V, 15A	ANSI C73.20, NEMA 6-15-P IEC 83 UL 198.6	UL/CSA Listed Type SJT no. 18/3AWG, 300V. 1 0A

System Memory Map

```
FFFFFFFFh ┌──────────────────────────────┐ 4GB
          │   Permanent BIOS ROM: 64KB   │
FFFF0000h ├──────────────────────────────┤
          │        Not accessible        │
04000000h ├──────────────────────────────┤ 64MB
          │                              │ (Maximum
          │                              │  system
          │                              │  memory)
          │       Extended  memory       │
          │                              │
          │                              │
00010000h ├──────────────────────────────┤ 1MB
          │  CPU-dependent  BIOS: 64KB   │
000F0000h ├──────────────────────────────┤
          │       Adaptor ROM BIOS       │
000E0000h ├──────────────────────────────┤
          │          Available           │
000C8000h ├──────────────────────────────┤
          │ * VGA BIOS (shadow RAM): 32KB│
000C0000h ├──────────────────────────────┤
          │ * Video memory: 64KB (MDA or CGA│
000B0000h ├──────────────────────────────┤
          │ * Video memory: 64KB (EGA or VGA)│
000A0000h ├──────────────────────────────┤ 640KB
          │ Conventional system memory: 640KB│
00000000h └──────────────────────────────┘
```

- Use of the memory areas for video memory and the video BIOS depends upon the type of video adapter card installed.

Glossary

Address

A number or name that identifies the location where information is stored in a computer's memory.

Application program

A software program designed to perform a specific task, such as a word processing or spreadsheet program.

ASCII

American Standard Code for Information Interchange. A standardized coding system for representing characters, such as numbers, letters, and graphic symbols. An ASCII character occupies one byte of storage. Many different computers, printers, and programs can use files transmitted in ASCII code.

Asynchronous

A method of data transmission in which one machine sends data one character at a time to another machine at irregular intervals that do not need to be synchronized to a timing device.

AUTOEXEC. BAT file

The batch file that is executed automatically when you load MS-DOS. See also Batch *file.*

Automatic speed

The feature that enables the computer to switch automatically from high speed to low speed when accessing a diskette drive.

Base memory

The memory in the computer below 1MB that is available to MS-DOS and application programs-usually 640KB. Also called conventional memory or main memory.

Batch file

A type of file that lets you execute a series of commands by typing one command. Batch files are text files with the filename extension .BAT. When you type the filename, the operating system executes all the commands in that file sequentially.

BIOS

Basic Input/Output System. Routines in ROM (Read Only Memory) that handle basic input/output functions of the operating system and the video controller.

Bit

A binary digit (0 or 1). The smallest unit of computer storage. The value of a bit represents the presence (1) or absence (0) of an electric charge.

Boot

To load the operating system into the computer's memory.

Byte

A sequence or group of eight bits that represents one character.

Cache memory

A high-speed type of memory buffer that stores information from base or extended memory where your system can access it faster.

CFG (configuration) tile

A file that provides the System Configuration program with all the information it needs about your system board or an option card. Most EISA and ISA cards come with CFG files. Some CFG files for ISA cards are included on the Reference 3 diskette.

CGA

Color Graphics Adapter. A type of display adapter card that can generate up to 25 lines of text with 80 characters on each line, monochrome graphics at 640 x 200 resolution, or four-color graphics at 320 x 200 resolution.

CMOS

Complementary Metal-Oxide Semiconductor. A type of low-power silicon chip.

Code

A system of symbols for representing data or instructions. Also any software program or part of a program.

Command prompt

The symbol or message that tells you your operating system is loaded and ready to receive instructions. The default command prompt displays the current drive and directory. If you are logged onto drive C, the command prompt may look like this: `c:>`.

Configuration

The particular setup of a group of components. A typical system configuration consists of a computer with one diskette drive and one hard disk drive connected to a monitor and a printer.

Control code

A command (generated when you hold down $\boxed{\text{Ctrl}}$ and press another key on the keyboard) that instructs the computer to perform a specific function.

Coprocessor

An optional device that enables the computer to process certain mathematical calculations faster.

Copy-protected program

A type of program that cannot be copied. Some copy-protected programs require you to leave the program diskette in the drive while you are using it. Some also require the computer to be running at low speed instead of high speed. See also *Automatic speed.*

CPU

Central Processing Unit. The primary unit of the computer that interprets instructions, performs the tasks you indicate, keeps track of stored data, and controls all input and output operations.

Cylinders

The vertical alignment of tracks in a hard disk that can be lined up under one read/write head. The number of tracks on a disk is equal to the number of cylinders times the number of heads.

Data

Information such as text or graphics stored or processed by a computer.

Default

Any value or setting that takes effect when the computer is turned on or reset. A default value stays in effect unless you override it temporarily by changing a setting or you reset the default value itself.

Device driver

A file containing instructions that allow your computer to recognize and control a device.

Diagnostics

The tests and procedures the computer performs to check its internal circuitry and set up its configuration.

DIP switch

Dual Inline Package switch. A small switch on a computer, option card, or printer that controls a particular function.

Directory

A list of files stored in a particular area on a disk; part of a structure for organizing files into groups. A directory listing shows the name, location, and size of the files in the directory. A directory can contain both files and subdirectories.

Display adapter card

A circuit board installed in one of the computer's option slots to provide the monitor interface. A display adapter card controls the way the monitor displays text and graphics. Also known as *Video card.*

DMA channel

Direct Memory Access channel. The pathway through which data is transferred between main storage and I/O devices. This transfer method requires no processor intervention.

DOS

Disk Operating System. A commonly used operating system that controls the computer's input and output functions. See also *Operating system.*

Double-density

A type of diskette format that allows you to store twice as much data as the standard-density format. A 5¼-inch double-density diskette can store 360KB of data. A 3½-inch double-density diskette can store 720KB of data.

Drive designator

The letter name of a disk drive, followed by a colon-for example, C : .

EGA

Enhanced Graphics Adapter. A type of display adapter card that allows you to display high-resolution graphics on a compatible monitor. It can display up to 43 lines of text with 80 characters on each line, or it can display monochrome or 16-color graphics at resolutions up to 640 x 350.

EISA

Extended Industry Standard Architecture. A bus standard for IBM compatible computers that extends the ISA bus architecture to 32 bits and allows more than one computer to share the bus easily.

Expanded memory

Memory that specially written MS-DOS application programs can use with an Expanded Memory Specification (EMS) device driver.

Extended Memory

Memory above 1MB that is accessed by the protected mode of the microprocessor and is available to some application programs and operating systems.

Fast-page mode

A dynamic memory mode that allows successive addresses to access the same DRAM page by changing the column addresses.

FLASH memory

Non-volatile, rewritable, random access memory. Your computer's CPU-dependent BIOS information is stored in a FLASH memory device.

Format

To prepare a new disk (or an old one you want to reuse) so that it can store information. Formatting divides a disk into tracks and sectors and creates addressable locations on it.

Graphics

Lines, angles, curves, and other nonalphanumeric data.

Hexadecimal

A numbering system with a base of 16, frequently used by programmers. Any decimal number between 0 and 255 can be expressed by a two-digit hexadecimal number.

High-density

A type of format that allows you to store more data than on single- or double-density diskettes. A **5¼-inch** high-density diskette can store 1.2MB of data. A **3½-inch** high-density diskette can store 1.44MB of data.

Input/output (I/O) port

See Port.

Interface

A physical or software connection used to transmit data between equipment or programs.

ISA

Industry Standard Architecture. The 8- or 16-bit bus standard developed for IBM compatible computers.

Jumper

A small device that connects two pins on an option card, a disk drive, or the main system board to close an electrical circuit and activate a particular function.

Key disk

A diskette containing a copy-protected program that must remain in the diskette drive while you are using the program.

Kilobyte (KB)

A unit used to measure storage space in a computer's memory or on a disk. One kilobyte equals 1024 bytes.

LIM 4.0 EMS

Version 4.0 of the Lotus/Intel/Microsoft Expanded Memory Specification-a protocol **that** allows certain application programs to use memory that MS-DOS cannot use.

Main system board

The board built into your computer containing the circuitry the computer requires to operate.

Mapping

The method used to mark to the geographic location of a resource within the memory address space.

Math coprocessor

An optional device that enables the computer to process certain mathematical calculations and display certain graphic images faster.

MCGA

Monochrome/Color Graphics Adapter. A type of display adapter that runs either a monochrome or color graphics monitor.

MDA

Monochrome Display Adapter. A type of display adapter that displays text in only one color, such as green or amber.

Megabyte (MB)

A unit used to measure storage space in a computer's memory or on a disk. One megabyte equals 1024KB.

Megahertz (MHz)

A unit used to measure oscillation frequency (of a computer's internal timing clock). A megahertz is one million cycles per second.

Memory

The area where your computer stores data. Memory contents are stored permanently (in ROM) or temporarily (in RAM).

Memory module

A small circuit board that contains memory chips. You can add memory modules to the main system board inside the computer to expand the computer's memory. A memory module is commonly called a SIMM (single inline memory module).

Memory on card

The additional memory on an option card installed in the computer.

MGA

Multi-mode Graphics Adapter. A type of display adapter card that can display monochrome text and color graphics on the screen.

Microprocessor

A small version of a CPU contained on one semiconductor chip.

Modem

A device that allows a computer to transmit signals over telephone lines so it can send and receive data. Modem stands for MOdulator/DEModulator.

Monitor

The piece of hardware that contains the screen and displays information.

Monochrome monitor

A monitor that displays in only one color, such as green or amber, as opposed to a color monitor which can display in several colors.

Mouse

A hand-held pointing device with one or more buttons. When you slide the mouse over a flat surface in a certain direction, the cursor moves in the same direction on the screen.

MS-DOS

Microsoft Disk Operating System. The operating system most commonly used with personal computers. See also *Operating system.*

Network

A group of connected computers configured so they can share resources.

Network server

The master computer in a network which provides storage space for the other computers connected to it. The network server can write files to and read files from the other computers in the network.

Network server mode

An optional password mode that provides extra security for a computer that is operating as a network server.

Non-target modeling mode

A method you can use to run the System Configuration program to create an SCI file for another computer. This mode prevents you from saving the information in the CMOS of the computer on which you are running the program.

Numeric keypad

The number and cursor control keys grouped on the right side of the keyboard.

Operating speed

The speed at which the central processing unit can execute commands.

Operating system

A collection of programs (such as MS-DOS, OS/2, or UNIX) that manages a computer's operations. The operating system determines how programs run on the computer and supervises all input and output.

Option card

A circuit board you install inside the computer to provide additional capabilities, such as a modem.

OS/2

Operating System/2. The enhanced operating system by Microsoft that provides dual mode processing and multi-tasking capabilities. See also **Operating system.**

Parallel

The type of interface that transmits all the bits in a byte of data simultaneously over separate lines. See also Interface and **Serial.**

Parameter

A qualifier added to a command that tells MS-DOS what particular conditions to look for and specifies information such as what data to process and where to locate or store a file.

Parity

A method used to verify the accuracy of data transmissions by adding a bit that makes the total of the byte odd for odd parity or even for even parity.

Password

The sequence of characters you type after you turn on the computer in order to access and use your system.

Pathname

The directory name(s) you specify to locate a file. For example, the pathname for the file SALES, stored in the subdirectory BUSINESS, is \BUSINESS\SALES.

Peripheral device

An external device (such as a printer or a modem) connected to a computer that depends on the computer for its operation.

Port

A physical input/output socket on a computer to which you can connect a peripheral device.

Power-on diagnostics

Tests that the computer runs to check its internal circuitry and configuration each time you turn it on.

Processor board

A special, upgradable circuit board connected to the main system board containing the microprocessor, cache memory, and a socket for a math coprocessor.

Processor speed

See Operating speed.

RAM

Random Access Memory. The portion of the computer's memory used to run programs and store data while you work. All data stored in RAM is erased when you turn off or reset the computer; so you must store all your data on disk.

Read/write head

The physical device inside a disk drive that reads data from and records data on the magnetic surface of a disk.

Real- time clock

A battery-powered clock inside the computer that keeps track of the time and date, even when the computer is turned off.

Reset

To reload a computer's operating system so you can retry a task or begin using a different operating system. Resetting erases all information in RAM.

RGB

Red Green Blue. A type of color monitor.

ROM

Read Only Memory. A portion of memory that can only be read and cannot be used for temporary storage. ROM retains its contents even when you turn off the power.

Root directory

The top-level directory in MS-DOS, designated by a \ (backslash). All other directories are subdirectories of the root directory.

RS-232-C

A widely used, standard type of serial interface. You can connect up to two RS-232-C compatible devices to the built-in ports on your computer.

SCI files

System Configuration Information files. The file(s) created by the System Configuration program that contain all the information about the option cards you have installed and how all of your system resources are allocated. The most current SCI file is called SYSTEM.SCI.

SCSI adapter card

Small Computer System Interface adapter card. An input/output bus card that can be installed in one of your computer's option slots to provide a standard interface between your computer and SCSI peripheral devices.

Sector

A contiguous section of a disk track that provides an address at which the computer can access data.

Serial

The type of interface that transmits data one bit at a time. See also Interface and **Parallel.**

Shadow RAM

The feature provided by your computer that enables it to copy ROM BIOS information into the RAM area of memory to speed up processing.

SIMM

See Memory module.

Subdirectory

A directory or group of files that branches down from another subdirectory or from the root directory.

Switch

An option added to a command that modifies the way the command works. Switches are usually preceded by a **/** (forward slash). See also **Parameter.**

System diagnostics

A series of checks you can perform on your system components to make sure they are functioning correctly.

System diskette

A diskette that contains the operating system.

Tracks

Addressable, concentric circles on a disk, resembling the grooves on a record, which help to divide the disk into separate accessible areas.

UNIX

An operating system that supports multitasking and is suited to multi-user environments. UNIX is compatible with a range of computers, from personal computers to mainframes. See also *Operating system.*

VGA

Video Graphics Array. A type of high-resolution display adapter.

Video card

See Display adapter card.

Write-protect

To protect the data on a diskette from being changed by placing a write-protect tab over the notch on a **5¼-inch** diskette or by setting the write-protect switch on a **3½-inch** diskette. When a diskette is write-protected, you cannot erase, change, or record over its contents.

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RESET button

hard disk
access light

TURBO
speed light

power button

power light

upper drive bays

internal drive housing

stabilizing feet

EPSON

power inlet

fan ve3nt

mouse port

keyboard port

first serial port

second serial port

parallel port

option card slots

cover lock