

EPSON®

User's Guide



Printed on recycled paper

The Energy Star emblem does not represent EPA endorsement of any product or service.

IMPORTANT NOTICE
DISCLAIMER OF WARRANTY

Epson America makes no representations or warranties, either express or implied, by or with respect to anything in this manual, and shall not be liable for any implied warranties of merchantability and fitness for a particular purpose or for any indirect, special or consequential damages. Some states do not allow the exclusion of incidental or consequential damages, so this exclusion may not apply to you.

COPYRIGHT NOTICE

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Epson America, Inc. No patent liability is assumed with respect to the use of information contained herein. Nor is any liability assumed for damages resulting from the use of the information contained herein. Further, this publication and features described herein are subject to change without notice.

TRADEMARKS

Epson is a registered trademark of Seiko Epson Corporation.

Epson Connection is a service mark of Epson America, Inc.

General notice: Other product names used herein are for identification purposes only and may be trademarks of their respective owners. Epson disclaims any and all rights in those marks.

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.
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 Anschluß des Computers an die Netzversorgung muß sichergestellt werden, daß die Gebäudeinstallation mit einem 16 A Überstromschuttschaber 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 power 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. Do not insert objects of any kind into this product through the cabinet slots.
13. Except as specifically explained in this User's Guide, do not attempt to service the computer yourself. Refer all servicing to qualified service personnel.
14. 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 complètement les instructions qui suivent et les conserver pour références futures.
2. Bien suivre tous les avertissements et les instructions indiqués sur l'ordinateur.
3. Débrancher 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 événements dans les meubles, à l'arrière et en dessous sont conçus pour l'aération; 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 conformément au type de source d'alimentation indiquée sur l'étiquette.
8. Lorsqu'on desire utiliser l'ordinateur en Allemagne, on doit observer les normes sécuritaires qui suivent:

Afin d'assurer une protection adéquate à l'ordinateur contre les court-circuits et le survolage, l'installation de l'édifice doit comprendre un disjoncteur de 16 amp.
9. On doit brancher tout l'équipement dans une sortie reliée à la masse. Lorsqu'il est impossible d'insérer 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 branchés dans le cordon n'excède en aucun temps les ampères du cordon de rallonge. La quantité totale des appareils branchés dans la prise murale ne doit jamais excéder 15 ampères.
12. Ne jamais insérer un objet de quelque sorte que ce soit dans les cavités de cet appareil.
13. Sauf tel que spécifié dans la notice d'utilisation, on ne doit jamais tenter d'effectuer une réparation de l'ordinateur. On doit référer le service de cet appareil à un technicien qualifié.
14. Débrancher l'ordinateur de la prise murale et confier le service au personnel de service qualifié selon les conditions qui suivent:
 - A. Lorsque le cordon d'alimentation ou la prise sont endommagés.
 - 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 nécessiter des réparations élaborées par un technicien qualifié afin de remettre l'appareil en service.
 - D. Lorsqu'on a échappé l'ordinateur ou que l'on a endommagé le boîtier.
 - E. Lorsque l'ordinateur démontre un changement noté au niveau de sa performance.

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 FTC 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 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 présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Contents

Introduction

Optional Equipment	3
System Memory	3
CacheMemory	3
VideoMemory	4
Microprocessor	4
Math Coprocessor	4
Drives..	4
SVGA and IDE Drivers	5
How to Use This Manual	5
Conventions Used in This Manual	6
Where to Get Help	7
CompuServe On-line Support	8

Chapter 1 Setting Up Your System

Getting Started	
Choosing a Location	1-1
Unpacking Your Computer	1-2
Connecting Peripheral Devices	1-3
Connecting a Keyboard	1-3
Connecting a Mouse.	1-4
Connecting a Monitor	14
Connecting a Printer or Other Device	1-5
Connecting the Power Cord	1-6
Turning On the Computer	1-7
Turning Off the Computer	1-9

Chapter 2 *Running SETUP and Installing Drives* *

Using SETUP	2-1
Starting the SETUP Program	2-2
Using the System Setup Option	2-4
Checking System Memory	2-4
Assigning Hard Disk Drive Types	2-5
Using the Advanced System Setup Options	2-6
Setting the Boot Options	2-8
Setting the Security and Anti-Virus Options	2-10
Using the Virus Protection Features	2-12
Using the Green PC Features	2-13
Viewing the System Summary	2-14
Exiting SETUP	2-15
Post-SETUP Procedures	2-16
Installing the IDE Driver	2-16
Installing Video Drivers	2-18

Chapter 3 *using Your Computer*

Working Comfortably	3-1
Using Energy Wisely	3-2
Using Your Green PC Features	3-3
Inserting and Removing Diskettes	3-4
Stopping a Command or Program	3-5
Resetting the Computer	3-5
Using a Password	3-7
Changing the Processor Speed	3-8

Chapter 4 *Instlding and Removing Options*

Removing the Cover	4-2
Replacing the Cover	4-4
Locating the Internal Components	4-5
Changing the Jumper Settings	4-6
Setting the Jumpers	4-8
Installing Memory Modules (SIMMs)	4-10
Inserting SIMMs	4-11
Removing SIMMs	4-13

Installing an Option Card	4-14
Removing an Option Card	4-19
Adding Video Memory	4-19
Installing the Video Chips	4-20
Installing External Cache	4-22
Installing the External Cache Chips	4-23
Upgrading the Microprocessor	4-25
Replacing the Processor Chip	4-26
Installing a Heat Sink	4-28
Post-installation Procedures	4-29

Chapter 5 Installing and Removing Drives

Installing a Hard Disk Drive in the Internal Drive Bay	5-2
Removing the Mounting Frames	5-3
Connecting the Hard Disk Drive Cables	5-4
Installing the Hard Disk Below the Mounting Bracket	5-8
Installing the Hard Disk On the Mounting Bracket	5-11
Removing a Hard Disk Drive From the Internal Drive Bay	5-14
Installing a Drive in the Upper External Drive Bay	5-14
Connecting the Drive and Power Cables	5-17
Removing a Drive from the Upper Drive Bay	5-19
Reconnecting the Drive and Power Cables to the Diskette Drive in the Lower Drive Bay	5-19
Post-installation Procedures	5-21

Chapter 6 Troubleshooting

Identifying Your System	6-1
The Computer Will Not Start	6-3
The Computer Does Not Respond	6 - 4
Keyboard Problems	6-5
Monitor Problems	6-6
Diskette Problems	6-7
Diskette Drive Problems	6-8
Hard Disk Drive Problems	6-8
Password Problems	6-10
Software Problems	6-11
Printer Problems	6-12

Option Card Problems	6-12
Memory Module Problems	6-13
Mouse Problems	6-14
Controller Problems	6-14
External Cache Problems	6-14

Appendix A Specifications

CPU and Memory	A-1
Controllers	A-3
Interfaces	A-3
Massstorage..	A-4
Keyboard	A-5
SETUP Program	A-5
Physical Characteristics	A-5
Power Supply	A-6
Option Slot Power Limits	A-6
Environmental Requirements	A-6
Video Resolutions and Colors	A-7
Hard Disk Drive Types	A-8
Drive Option Information	A-10
DMA Assignments	A-11
Hardware Interrupts	A-11
System Memory Map	A-12
System I/O Address Map	A-13
Connector Pin Assignments	A-14
Tested Operating Environments	A-20
Options Available from Epson	A-21

Glossary

Index

Epson International marketing Locations

Introduction

Your new Epson™ computer offers the following features:

- ❑ Intel® 486SX, DX, or DX2 processor upgradable to faster, more powerful processors, including the Pentium™ OverDrive™
- ❑ Energy Star compliant, low-power standby mode for the video and hard disk drive for standard configurations
- ❑ High-speed, 32-bit local bus interfaces for both SVGA video and IDE hard disk drives
- ❑ 4MB of internal memory, expandable to 64MB
- ❑ System and video BIOS shadow RAM
- ❑ 8KB of internal processor cache, with support for 64KB, 128KB, or 256KB of external cache
- ❑ 1 MB of onboard video memory, expandable to 2MB
- ❑ Math coprocessor built into the microprocessor on DX, DX2, and Pentium OverDrive systems
- ❑ Local bus video with True Color support, which lets your monitor display up to 16.8 million colors
- ❑ Built-in VGA port
- ❑ Two built-in serial ports and one built-in parallel port
- ❑ One built-in PS/2™ compatible keyboard port and one built-in PS/2 compatible mouse port

- ❑ Three 16-bit, full-length and two 8-bit, half-length ISA option slots (if your system has a DX, DX2, or Pentium OverDrive processor, access to the bottom 16-bit slot may be blocked by the heat sink/fan assembly)
- ❑ Support for up to two externally accessible and two internal storage devices (see Appendix A for power restrictions)
- ❑ Password security and anti-virus features.

Your system contains local bus interfaces for the video and IDE controllers. These buses can transfer data at the full speed of your processor rather than at the standard 8.33 MHZ ISA bus speed, so your system can access the hard disk drive and process video data far more quickly. The video local bus, combined with the standard 1MB of on-board video memory, provides fast video response in a range of resolutions and colors. (See Appendix A for a list of supported resolutions.)

In standard configurations, this computer complies with the United States Environmental Protection Agency's Energy Star Program, which promotes the manufacture of energy-efficient printers, computers, and monitors. Your computer's "Green PC" feature places the hard disk drive in a low-power standby mode when the mouse or keyboard has been inactive for a specified period of time. It also stops sending video signals to your monitor.

Note

If you have an Energy Star compliant monitor, it also goes into a low-power standby mode because it isn't receiving video signals from your computer. (Screens on noncompliant monitors go blank, but do not enter a low-power standby mode.)

Your computer's SETUP program lets you select different timeout periods for the hard disk drive and video signals so you can ensure that the standby feature fits the way you work.

Your system may have been configured for you. If so, everything you need to get started is already in place. The settings for your hardware configuration have been set to ensure optimal system performance. The hard disk drive already contains the MS-DOS® operating system and Microsoft® Windows.™ In addition, the drivers needed to take advantage of your system's local bus features and enhanced video resolutions have been installed for you. Just connect your keyboard, mouse, and monitor and you're ready to go.

Optional Equipment

You can easily upgrade your computer by installing additional memory and a wide variety of options, as described below. (**Installation** instructions are provided in Chapters 4 and 5.)

System Memory

By adding 1MB, 2MB, 4MB, 8MB, 16MB, or 32MB SIMMs (single inline memory modules) to the main system board, you can expand the computer's memory up to 64MB.

Cache Memory

You can increase the cache memory to 64KB, 128KB, or 256KB by installing additional SRAM chips on your main system board. Additional cache allows your system to access frequently used data faster, improving the overall performance of the system.

Video Memory

You can add video memory chips to your system board to increase the video memory to 2MB, which allows you to use higher video resolutions with more colors.

Microprocessor

Your system supports the following microprocessors:

- 486SX/25
- 486SX
- 486DX/33
- 486DX/50
- 486DX2/50
- 486DX2/66
- Pentium OverDrive.

Math Coprocessor

If your system contains a DX, DX2, or Pentium OverDrive microprocessor, a math coprocessor is built into the chip.

Drives

Your system can support up to four mass storage devices, including hard disk drives, diskette drives, a tape drive, a CD-ROM, or an optical drive. As your storage needs expand, you can install additional drives. (See Appendix A for power restrictions.)

SVGA and IDE Drivers

Your computer comes with special SVGA and IDE drivers for the integrated local bus SVGA and IDE hard disk drive interfaces. The IDE driver lets you use the high-speed, 32-bit local bus IDE hard disk drive interface which dramatically increases the speed of your computer as it reads from and writes to your hard disk drive.

The SVGA drivers allow you to take advantage of the local bus and extended VGA features such as high resolutions and 132column text mode when you run popular application programs.

If your system was configured for you, these drivers have already been installed. If you need to install them yourself, see Chapter 2 for instructions on installing the IDE driver. Readme files on your driver diskettes tell you how to install drivers for specific applications.

How to Use This Manual

This manual contains the information you need to get the best results from your computer. You don't have to read everything in this book; see the following chapter summaries to find the sections you need.

Chapter 1 provides simple instructions for setting up your system and connecting peripheral devices such as the monitor and printer.

Chapter 2 describes how to run the SETUP program to define your computer's configuration. You may need to do this the first time you use your computer. If you change the configuration later, you will need to run it again. This chapter also describes how to install the IDE driver that allows you to take advantage of your hard disk drive's local bus capabilities.

Chapter 3 covers general operating procedures, such as resetting the computer, using the password, and changing the processor speed.

Chapter 4 describes how to remove and replace the computer's cover, change jumper settings, and install optional equipment such as microprocessor upgrades, option cards, and memory modules.

Chapter 5 explains how to install and remove disk drives.

Chapter 6 contains troubleshooting tips.

Appendix A lists the specifications of your computer and the operating environments that have been tested on your system.

At the end of this manual you'll find a Glossary, an Index, and a list of international marketing locations.

Conventions Used in This Manual

This manual uses the following type conventions:

Example	Meaning
Enter	Keys you press on the keyboard
Ctrl C	Keys you press at the same time; hold down the key marked Ctrl and press the letter C
<i>C:\DOS</i>	Text as it appears on the screen
DISKCOPY A: B:	Text that you type exactly as shown
COM1	Names of labeled hardware elements

where to Get Help

If you purchased your computer outside the United States, please contact your dealer or the marketing location nearest you for customer support and service. international marketing locations are listed at the back of this manual.

If you purchased your computer in the United States, Epson provides the following support services through the "Epson Connection" at (800) 922-8911. (You can also contact Epson at (310) 782-0770 and ask for the Epson Connection.)

- ❑ Technical assistance with the installation, configuration, and operation of Epson products
- ❑ On-site Servicer referral
- ❑ Assistance in locating your nearest Authorized Epson Reseller or Service Center
- ❑ Sales of Epson ribbons, supplies, parts, documentation, and accessories for your Epson product
- ❑ Customer Relations
- ❑ Epson technical information library fax service-also available directly by calling the toll number (310) 782-4214
- ❑ Product literature with technical specifications on our current and new products.

If you need help with any software you are using, see the documentation that came with it or contact the manufacturer for technical support.

CompuServe On-line Support

The fastest way to access helpful tips, specifications, drivers, application notes, tables for DIP switch or jumper settings, and bulletins is through the Epson America Forum on CompuServe.®

If you are not currently a member of CompuServe, you are eligible for a free introductory membership as an owner of an Epson product. This membership entitles you to:

- ❑ An introductory \$15 credit on CompuServe
- ❑ Your own user ID and password
- ❑ A complimentary subscription to CompuServe *Magazine*, CompuServe's monthly publication.

To take advantage of this offer, call (800) 848-8199 in the United States and Canada and ask for representative #529. In other countries, call (614) 529-1611 or your local CompuServe access number.

If you are already a CompuServe member, simply type GO EPSON at the menu prompt to reach the Epson America Forum.

Chapter 1

Setting Up Your System

This chapter briefly describes how to set up your computer. It includes the following information:

- ❑ Getting started
- ❑ Connecting peripheral devices
- ❑ Turning the computer on and off.

Getting Started

Follow the instructions below for choosing a location for your new system and unpacking it.

Choosing a Location

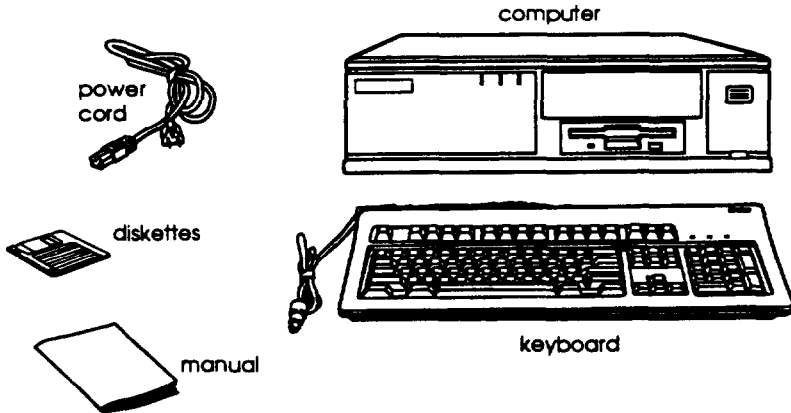
When you are ready to set up your system, choose a safe, convenient location that provides the following:

- ❑ A flat, hard surface. Surfaces like beds and carpets attract static electricity, which can erase data on your disks, damage the computer's circuitry, and prevent proper ventilation.
- ❑ Moderate environmental conditions. Select a cool, dry area and protect your computer from extremes in temperature, humidity, dust, and smoke. Avoid direct sunlight or other sources of heat.
- ❑ Good air circulation. Leave several inches of space around the computer so air can move freely.

- ❑ No electromagnetic interference. Do not place your system too close to any electrical device, such as a telephone or television, which generates an electromagnetic field.
- ❑ Appropriate power source. Connect all your equipment with the appropriate power cords for the power source in your area.

Unpacking Your Computer

When you unpack your system components, make sure you have these items:

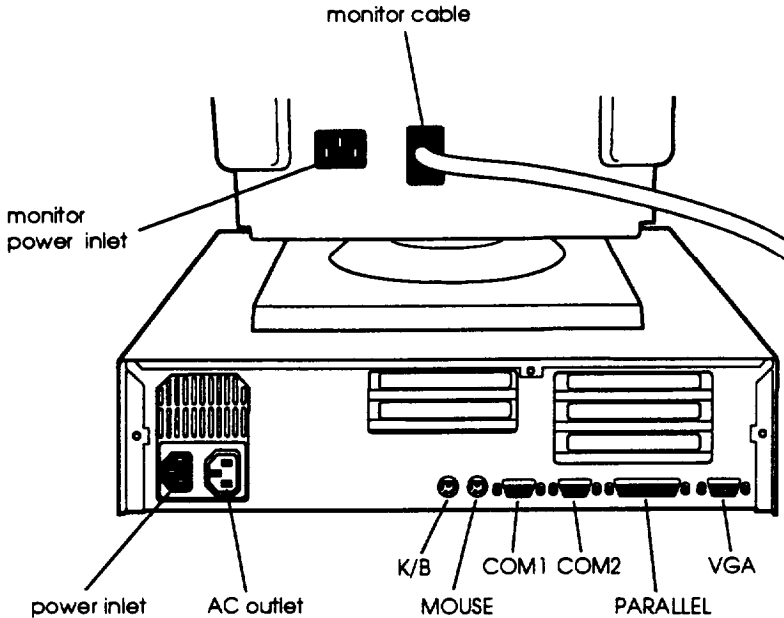


Your system may also include Epson's PS/2 compatible mouse and may come with the operating system and software already installed on a hard disk drive.

If you purchased any optional equipment that wasn't installed at the factory—such as option cards, memory modules, a hard disk, or a diskette drive—install these options before you connect your computer. See Chapters 4 and 5 for instructions.

Connecting Peripheral Devices

Use the illustration below to locate the ports on the back of your system as you connect the keyboard, monitor, printer, and other devices.



Your system also includes a removable panel above the mouse and keyboard ports if you want to install a game port connector to the game port interface on the system board.

Connecting a Keyboard

To connect a keyboard, hold the cable connector so the arrow on the connector faces up. Insert it into the port marked K/B.

Connecting a Mouse

If you have a PS/2 compatible mouse, connect it to the computer's built-in mouse port by inserting the connector into the port marked **MOUSE**.

caution

Although the **connectors** and ports for the mouse and keyboard are physically identical, they cannot be used interchangeably. Be sure to plug the mouse connector into the **MOUSE** port, or you may damage your system.

If your system has not already been configured, you may need to install a mouse driver. See your *mouse* manual for instructions. (If you are using Windows, the Windows installation program installed a mouse driver for Windows applications.)

Connecting a Monitor

YOU Can connect your VGA or SVGA monitor to the computer's built-in VGA port as described below.

1. Place your monitor on top of or near the computer. Turn the monitor and computer around so the backs are facing you.
2. There should be two cables provided with your monitor: the monitor cable (to **connect** it to the computer) and the power cable (to connect it to the power source). On most monitors, the monitor cable is permanently attached to the monitor. If your monitor does not have an attached cable, connect the cable to it now.
3. Examine the connector on the monitor cable and line it up with the **VGA port on the** computer. Then insert the connector into the port.

Caution

To avoid damaging the connector, be careful not to bend the pins when you insert it.

4. If the connector has retaining screws, tighten them.
5. Plug the monitor's power cord into the power inlet on the back of the monitor.
6. Plug the other end of the power cord into a grounded electrical outlet or into the power outlet on the back of the computer.

Caution

Before you plug the monitor's power cord into the back of your computer, make sure the monitor's power requirements do not exceed 1 Amp.

Connecting a Printer or Other Device

Your computer has one bidirectional parallel and two serial ports. To **connect** a printer or other peripheral device, follow the appropriate instructions below.

Using the parallel port

Follow these steps to connect a parallel printer to your computer:

1. Place the printer next to the computer so that the backs are facing you.
2. Align the connector end of the printer cable with the **PARALLEL** port and plug it in. If the connector has retaining screws, tighten them.

3. Connect the other end of the cable to the printer. To secure the cable, squeeze the clips at each side of the printer port and push them into place.
4. Plug the printer's power cord into a grounded electrical outlet.

Using the serial ports

If you have a printer, a modem, or other device with a serial interface, you can connect it to one of the serial (RS-232C) ports on the back of the computer. Make sure you have a cable compatible with a DB-9P connector.

To **connect** a serial device, insert the connector into one of the ports marked COM1 and COM2. If you are connecting only one serial device, use the COM1 port.

Connecting the Power Cord

Follow these steps to **connect** the computer's power cord:

1. Plug the power cord into the power inlet on the back of the computer.

Warning

To avoid an electric shock, be sure to plug the cord into the computer before plugging it into the wall outlet.

2. Plug the other end of the power cord into a grounded electrical outlet.

- ❑ Always wait at least 20 seconds after you turn off the power before you turn it on again to prevent possible damage to the computer's electrical circuitry.
- ❑ Do not leave a beverage near your system. Spilled liquid can damage the circuitry of your equipment.

Follow these steps to turn on your system:

1. Turn your computer around so the front panel faces you. Place your monitor, printer, and other devices in a convenient arrangement.
2. If there is a protective card in the diskette drive, remove it.
3. Turn on the monitor, printer, and any other devices **connected** to the computer.
4. Turn on the computer by pressing the power button on the right side of the front panel.

The power indicator lights up, then the screen displays the BIOS version number and copyright information. The computer performs **its power-on** diagnostics, which are a series of checks to make sure everything is working correctly. During diagnostics, you see a message telling you to press F2 to run the SETUP program. (Chapter 2 describes starting and using SETUP.)

when the computer completes **its testing**, it displays a screen describing the system's configuration. If necessary, press **the Pause** button on the keyboard to view the configuration screen. Then press any key to continue the startup process.

5. If necessary, use the controls on your monitor to adjust the brightness **and contrast** until you can easily see the characters on the screen. If your monitor has horizontal and vertical hold controls, you may need to use them to stabilize the display.

if your system is configured to automatically load a program (such as Windows or a word processing program), you see the first menu or screen display of that program. If not, you may see the operating system prompt, such as `C:\>` or `A:\>`.

If there is no operating system installed on your computer, you see an error message. Ignore the message for now; once you install the operating system, you will not see this message.

Now you need to run the SETUP program to make sure your computer is configured properly- First turn off the computer, as described below, then see Chapter 2 for instructions. When you finish running SETUP, be sure to see “Post-SETUP Procedures” on page 2-16 for guidelines on what you need to do next.

Turning Off the Computer

Whenever you turn off your system, follow these steps:

1. Save your data and exit any application program you are using.
2. Check the hard disk drive light and the diskette drive light(s) to make sure they are not **on**. Do not turn off the computer if a drive light is on, because you can damage the drive or lose data.
3. Remove any diskette(s) from the diskette drive(s).

4. Press the power button to turn off the computer.
5. Turn off the monitor, printer, and any other peripheral devices.

Chapter 2

Running *SETUP* and Installing Drivers

Your computer has a configuration program, *SETUP*, contained within the BIOS chip on the system board. This program allows you to change the settings for your hardware configuration.

The computer also comes with several drivers and utilities on diskette. These drivers and utilities let you take advantage of some of the advanced features of your system, like the local bus hard disk drive interface and the local bus SVGA capabilities of the built-in video interface.

This chapter describes using *SETUP* and installing the local bus IDE driver. If you want information about installing video drivers or utilities, see the Readme files included on the diskettes that came with your system.

Using *SETUP*

You may need to run the *SETUP* program the first time you use your computer. If your system came unconfigured, you need to define how it is set up. If your system was configured for you, you may want to check the settings or adjust the date and time. You also may need to run *SETUP* again later if you change your configuration.

SETUP lets you verify or change the following:

- ❑ System settings such as date, time, diskette drives, and type of video display
- ❑ Automatic or manual selection of hard disk drives
- ❑ Automatic or manual selection of advanced hardware features for optimizing system performance

- ❑ System booting options
- ❑ Security password and anti-virus features
- ❑ Green PC options, such as the time intervals before the system and the hard disk drive go into low-power standby mode.

SETUP also allows you to see summary information about your system.

The SETUP program and the factory default options for your computer are stored in the computer's ROM BIOS (read-only memory, basic input/output system). The configuration information you enter is stored in an area of memory called CMOS RAM. This memory is backed up by a battery, so it is not erased when you turn off or reset the computer.

Starting the SETUP Program

When you start your computer, it performs some power-on diagnostics. During these diagnostics, you may see the following message:

Press <F2> to enter SETUP

Press F2 to run SETUP. This message is only on the screen for a few seconds. If you missed it, restart your computer and try again. (If you want, you can disable this message in SETUP.)

If, during power-on diagnostics, the system detects an error in your system configuration, you hear two beeps and see an error message followed by this message:

Press <F1> to resume, **<F2>** to Setup

Press F2 to run SETUP.

Using the System Setup Option

When you select this option, you see the System Setup screen. From this screen, you can set the system time and date, define your video display type, check system memory, and define the diskette drives.

Move the cursor to the value you want to change. Then increase or decrease the value until you see the one you want.

Setting the time and date

The real-time clock in your computer continuously tracks the date and time—even when the computer is turned off. Once you set the system Time and system Date options, you should not need to change them, unless you adjust the time for daylight savings or a different time zone. (The computer automatically changes the date for leap years.)

Setting the video display type

The **video** System option allows you to define the type of display you are using. If you have connected a VGA or SVGA monitor to the computer's built-in VGA port, select **EGA/VGA**.

If you connected a monitor that doesn't support VGA to a video adapter card installed in your system, select either the **CGA 80 x 25** or the **Monochrome** option. If you installed a video adapter card, make sure you disable the on-board SVGA controller by setting jumpers J36 and J37 to the Off position. (See Chapter 4 for information on jumper settings.)

Checking System Memory

Your computer comes with 4MB of RAM on a SIMM. MS-DOS and application programs that run under MS-DOS use the first 640KB of memory. The memory above 1MB is extended memory.

When you boot your system, the system BIOS updates the memory size automatically. You see the memory configuration displayed in the System Memory and **Extended Memory** fields on this SETUP screen.

You **cannot** change these values; if they are not **what you** expect them to be, check your jumper settings. Also, check that the SIMM(s) are securely seated in their sockets. (See Chapter 4.)

Setting the diskette drive(s)

On your system, diskette drive A is the 3.5-inch, highdensity drive installed in the lower drive bay. You may also have another drive of a different size or capacity; this is drive B. Check the settings for both drives and correct them if necessary.

Assigning Hard Disk Drive Types

The **Fixed Disk Setup option** defines the types of hard disk drives you have installed in your system. When you select this option, you see the Fixed Disk Setup screen. From this screen, select Fixed Disk 0 **Control** or *Fixed Disk 1 Control*.

Your computer comes with a hard disk auto-sensing feature. **Press Enter when the Autotype** Fixed Disk option is highlighted. The system detects the type of hard disk drive and fills in the remaining fields on the screen.

If you are using an older drive or a preformatted drive, it may not support the auto-sensing feature. If you press **Enter when** the Autotype **Fixed** Disk option is highlighted and the drive parameters do not match your drive, check Appendix A to see if your drive's parameters are included in the hard disk drive table. If not, you need to define your own drive type or reformat the disk. See the next section for instructions on how to define your own drive type.

Defining your own drive type

If the parameters for your hard disk do not match the parameters detected by the auto-sensing feature, or if you want to use your drive with parameters other than the defaults, you can define your own drive type. (See Appendix A for a list of predefined hard disk drive types and their parameters.)

To define your own drive type, follow these steps:

1. Move the cursor to *Type* and select *User*.
2. Type the values in each field that are appropriate for your hard disk drive. Press **Tab** or **↑** and **↓** to move the cursor to the next field.
3. When you leave **SETUP**, make sure you save your changes.

Note

If you are going to install NetWare® 286, version 22, you must enable the System **shadow** option. See page 2-7.

Using the Advanced System Setup Options

When you select the Advanced System Setup option from the Main Menu, you see the Advanced System Setup screen. From this screen, you can select options that allow you to configure the computer's cache memory and shadow memory, and define the advanced chipset.

Note

Your system can automatically configure the **Advanced System Setup** options for you. To avoid configuration problems, you should let the system configure these options.

Configuring cache memory

The system can configure your Memory **Cache options** or you can manually set them. If you have installed external cache, enabling cache memory improves system performance, especially in large data retrieval and processing environments.

If you choose to configure the cache memory yourself (rather than let the system configure it for you), you can define the burst wait states and two non-cacheable areas of memory. However, it's a good idea to let the system automatically configure this feature.

Configuring memory shadow

The system can configure the Memory **Shadow** options or you can manually enable shadowing for your system and video memory as well as for **specific** blocks of ROM.

Your computer can access RAM faster than ROM. The options on this screen allow your system to copy the contents of its system and/or video ROM into RAM. **When you** use shadowing, your system can perform certain operations faster, providing a significant increase in performance.

Note

For the best system performance, always set the **System shadow** and the **Video shadow** options to **Enabled**.

If you enable shadowing for specific blocks, the ROM located in this block is copied to the shadow area.

Configuring chipset registers

The system can automatically set your Advanced **Chipset Control** options or you can manually set them to change the values in the chipset registers and optimize your system's performance. Getting these values correctly increases your system performance; however, setting these values incorrectly may cause your system to malfunction or shut down. Be sure to set the **Auto Configuration** option to **Enabled** to let the system automatically configure these options to avoid problems.

Setting the Boot Options

When you select Boot Options from the Main Menu, you see the Boot Options screen. Options on this screen allow you to define the boot sequence and determine what information you see when you start your system.

The Disk **drive boot sequence** option determines the order in which the computer checks the drives for an operating system when you turn it on or reset it. The following table describes the available options.

Disk drive boot sequence options

select	T0
A: then C:	Load operating system from drive A. If it isn't there, loads it from drive C.
C: than A:	Load operating system from drive C. If it isn't there, loads it from drive A.
c: only	↓ Load operating system from drive C.

If you set the Disk drive boot sequence option to C: only, you can disable the Floppy seek option so the system doesn't access the diskette drive during the startup procedure. Disabling this option decreases the time needed to start the system.

The other options on this screen determine what you see when your system starts.

The Display SETUP prompt **during** POST option allows you to disable the message *Press <F2> to enter SETUP* that you see during power-on diagnostics. You may want to disable this prompt to prevent unauthorized users from seeing the SETUP prompt. Even when the message is disabled, however, you can still start SETUP by pressing F2 during power-on diagnostics.

The Pause on POST errors option allows you to disable the error message, followed by the message *Press <F1> to resume, <F2> to Setup* that you see when the system identifies a configuration error. If you disable this option, the system ignores configuration errors it finds during power-on diagnostics and starts as it normally would. It's a good idea to keep this option enabled.

By disabling the system summary **screen** at boot option, you can disable the system summary screen that you see when you start the system. If you disable this option, your system starts more quickly. You can see the same screen by selecting the System Summary option from the SETUP Main Menu. (See page 2-14).

Setting the Security and Anti-Virus Options.

When you select the Security and Anti-Virus option from the Main Menu, you see the Security and Anti-Virus screen. The password options on this screen let you define both a Supervisor and a User password. You can also specify whether a password is required when you start the system.

The virus **protection** options on this screen allow you to write protect the boot sector on your hard disk drive and display prompts reminding you to periodically run a virus detection program and back up your hard disk drive. A **Diskette Access** option allows you to restrict diskette access **at either** the User or Supervisor password level.

Entering or changing a password

You can define both User and Supervisor password levels for this system. If this system will be used by more than one person, you may want to set a Supervisor password for yourself and a User password for others you don't want to have complete **access to** the system. For instance, you may want to restrict access to the diskette drives or the virus protection features on this system.

If you enable the Password on boot option, you must enter the Supervisor or User password each time you **turn on** the system. If you do not enable this option, but you've defined passwords, you must enter the password each time you start SETUP. If both a Supervisor password and a User password are enabled, SETUP displays options for setting the User password only to users who logged on with a User password.

To specify a User password, you must first specify a Supervisor password. Follow these steps to enter or change a Supervisor password:

1. Select the Set Supervisor Password option and press **Enter**.
2. You see a Set Supervisor Password window. Type the password you **want to use**, then press **Enter**. **You can** define a password of up to eight characters.
3. Type **the** same password a second time and press **Enter**. **You** see a message that your **changes have been saved**.
4. Press the spacebar. The Supervisor Password In option now displays Enabled.

To set a User password, select the Set User Password option and follow the steps above.

Deleting passwords

To delete your passwords, follow these steps:

1. Set the Password on boot option to Disabled.
2. Delete the User password by pressing **Enter** for both the password field and the confirmation field. Don't type any characters in these fields.
3. Then delete the Supervisor password the same way.

Note

You must delete the User password before SETUP will allow you to access the Supervisor password.

If you have forgotten your password, see “Password Problems” in Chapter 6.

Using the Virus Protection Features

Several options on the Security and Anti-Virus screen allow you to define system protection features.

The Diskette Access option allows you to restrict access to your diskette drives based on the password levels you have defined. This prevents unauthorized users from accessing the drives and possibly introducing a virus to your system. You can restrict diskette access only if passwords are enabled and **you have enabled the Password on boot option.**

If you select Supervisor for this option, you can access the diskette drives only if you enter the Supervisor password when you start your system. Someone who starts the system with a User password, however, will see an error message when he or she tries to access the diskette drive. If you select User for the Diskette Access option, you can access the diskette drives whether you enter the Supervisor or User password when you start the system.

Note

To use passwords for diskette drive access, you must enable the Password **on** boot option. If you select a password level for **Diskette Access**, but leave the Password on boot option disabled, you see an error message whenever you try to access your diskette drive.

You can also protect your system by selecting Write protect for the *Fixed* **disk boot** sector option. When this option is enabled, the system displays an error message when a program tries to write to the boot sector of your hard disk drive. To use a legitimate program (such as the MS-DOS FORMAT command) you must disable the write protect option.

Two additional options on this screen allow you to define time intervals for the system to display a prompt asking you whether you have performed your scheduled virus check or your scheduled backup for your hard disk drive'. You can disable these prompts or have them display **Daily, Weekly, or Monthly**. If you respond that you have not performed these functions, however, the system still starts normally.

Using the Green PC Features

The Green PC options allow you to define how the energy-saving features of this Energy Star compliant system will work for you. The options on the Green PC Features screen allow you to disable the energy-saving feature or set time-out periods to put the system and hard disk drive in a low-energy standby mode.

The **Inactivity Timer1** option sets the time-out period for video signals to your monitor. When the mouse or keyboard has been inactive for the time period you select here, your computer stops sending video signals to your monitor. If your monitor is also Energy Star compliant, it goes into a low-power standby mode because it isn't receiving video signals from **your computer**. **Screens on monitors that aren't Energy Star compliant** will go blank when your system is in standby mode.

If you select a time period for the Lockout Timer as well as the Inactivity Timer1 option, the system Won't accept your keyboard input for the specified period of time after your system has returned to an active mode. This allows time for your monitor to return to full power also.

The **Fixed Disk Timeout option** determines the time-out period for your hard disk drive. The hard disk drive goes into a low-power standby mode when the mouse and keyboard have been inactive for the period of time you've indicated.

Note

Some hard disk drives do not support a low-power standby mode. Also, the delay caused by the hard disk drive returning to active mode may cause errors in some applications. If you have problems, you may want to disable the **Fixed Disk Timeout option**.

Viewing the System Summary

When you select the System **summary** option from the Main Menu, the SETUP program displays a summary of the configuration settings for your system.

This summary screen is the same one you see when you start your system. You can choose not to have the system display this screen so that system startup is faster. See page 2-8 for information on disabling this option.

Exiting SETUP

When you leave SETUP, you can save your settings, or exit SETUP without saving your settings. You can also return all values to the factory defaults.

To leave SETUP, press Esc from any SETUP screen. From the SETUP Main Menu, you can perform the following functions:

Load ROM Default Values	Loads the factory default settings stored in ROM back into CMOS. If you change your system configuration using the SETUP program and then have problems, you can load ROM values to boot the system and start over.
Load Values from CMOS	Loads the current values stored in CMOS for all SETUP options. This ignores any changes you have made through SETUP.
Save Values to CMOS	Saves the changes you have made to your configuration to CMOS.

Press **Esc** to leave SETUP and restart your computer.

Post-SETUP Procedures

After you run SETUP for the first time, you may need to install the operating system on your computer (if it is not already installed). See your operating system manual for instructions.

Once you have installed your operating system, install any software you plan to use. See your application program manuals for instructions.

Note

If you plan to install IDE or video drivers for Windows applications, you must install Windows before you can install the drivers.

Installing the IDE Driver

If you want to take advantage of the high-speed performance available through your system's local bus interface for the hard disk drive, you must install the IDE (integrated drive electronics) driver included on the Drivers diskettes.

If your system was configured for you, this driver and the SVGA drivers have been installed for you.

Before you install the IDE driver, make sure you back up your hard disk drive. Then use the installation program on the **Drivers diskette 1** to install the driver.

Note

Make sure you use the installation program to install the IDE driver. If you simply copy the driver files, the driver won't work correctly.

Follow these steps to install the IDE driver:

1. Insert the Drivers diskette 1 in drive A.
2. Log onto the IDE subdirectory on drive A.
3. Type the following and press **Enter**:

INSTALL

4. Follow the instructions on the screen to install the IDE driver on your hard disk. This installation program changes your system's CONFIGSYS file so the system loads the IDE driver as part of its startup procedure. If you select the IDE driver for Windows, this program also modifies the SYSTEM.INI file for Windows.

Note

You should always install the IDE driver for DOS. If you are using Windows, make sure you also install the IDE driver for Windows. Windows must be installed before you install the driver for Windows.

After installing the driver, the system reboots.

Note

Not all hard disk drives can take advantage of the local bus IDE interface. To take advantage of this feature, your hard disk drive must support a 32-bit data path that utilizes double-word I/O. To find out whether your hard drive utilizes double-word I/O, see the hardware specifications for the drive or contact the vendor of the drive and request a product specification.

Installing Video Drivers

For instructions on installing video drivers, see the Readme files included on the Drivers diskettes.

Chapter 3

Using Your Computer

This chapter briefly describes the following operations:

- ❑ Working comfortably
- ❑ Using energy wisely
- ❑ Using your Green PC features
- ❑ Inserting and removing diskettes
- ❑ Stopping a command or program
- ❑ Resetting the computer
- ❑ Using the password
- ❑ Changing the processor speed.

Working Comfortably

This section provides some tips for creating a comfortable work environment.

- ❑ Use good posture. Keep your elbows, hips, and knees bent at approximately 90 degree angles and keep your wrists as close to horizontal as possible.
- ❑ Vary your posture often and take frequent breaks. Stand up, stretch, and move around.
- ❑ Use a good chair. Make sure your chair supports your lower back. A chair with padded armrests lets you rest your arms as you work.

- ❑ Keep your copy stand at the same eye level as your screen. This reduces eye and neck strain. Also, rest your eyes occasionally by closing them or focusing on a fixed spot in the distance.
- ❑ Be gentle with your keyboard. Too much force creates tension in your hands. Also, make sure your work surface has enough room for you to move the mouse or other pointing device freely.
- ❑ Use good lighting that isn't too bright. Try to keep bright light sources out of your field of vision when you are looking at the screen.
- ❑ Place your monitor directly in front of you and sit about an arm's length away from it. The top of the screen should be slightly below your eye level so you look down at the screen. Position the monitor so that no light is reflected from the screen.

Using Energy Wisely

By purchasing this low-power, Energy Star compliant computer, you join a growing number of users concerned about conserving energy. Here are a few **additional** tips you can use to be even more energy-wise:

- ❑ If your printer and monitor aren't Energy Star compliant, turn them off when you're not using them.
- ❑ Use the print preview **option** on your software before you print something. You'll be able to catch formatting errors before you commit them to paper.

- ❑ If you have an electronic mail system available to you, send E-mail rather than memos. Not only is this faster, but you'll save paper and storage space too.
- ❑ Use recycled paper whenever you can.

Using Your Green PC Features

Your computer places the system, the hard disk drive, or both into a low-power standby mode when the keyboard or mouse has been inactive for the time periods you select in SETUP. See Chapter 2 for information on setting these values.

When your system is in standby mode, the NumLock light on your keyboard flashes and your screen is blank. Press any key or move the mouse to resume activity.

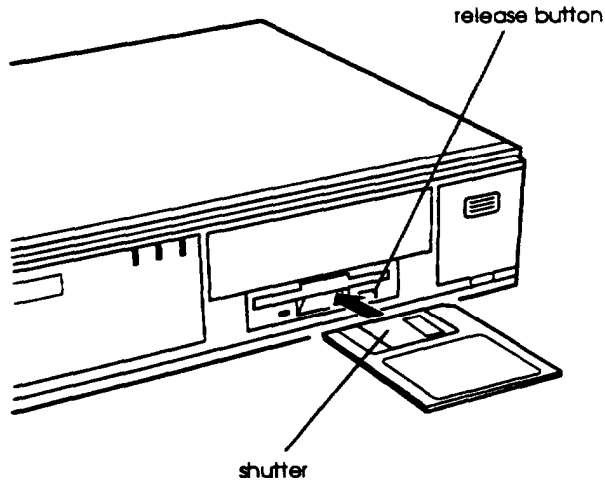
If the hard disk drive is in standby mode, it doesn't return to active mode until you access it. You'll hear it start again. It will take a second or two to reach its operating speed and read or write to the disk. The hard disk drive access light turns on when the system begins accessing the disk.

Note

Some hard disk drives do not support a low-power standby mode. Also, the delay caused by the hard disk drive returning to active mode may cause errors in some applications. If you have problems, you may want to disable the standby mode for the hard disk drive.

Inserting and Removing Diskettes

To insert a diskette into a 3.5-inch drive, hold the diskette with the label facing up and the shutter leading into the drive, as shown in the following illustration. Slide the diskette into the drive until it clicks into place.



To insert a diskette into a 5.25-inch drive, hold the diskette with the label facing up and the read/write slot leading into the drive. When the disk is completely in the drive, turn down the latch to secure the diskette in the drive.

When you want to remove the diskette, make sure the drive light is off; then press the release button or turn the latch. Remove the diskette and store it properly.

caution

Never remove a diskette, reset the computer, or turn it off while a diskette drive light is on. You could lose data. Also, remove all diskettes before you turn off the computer.

Stopping a Command or Program

You may sometimes need to stop a command or program while it is running. If you have entered a DOS or application program command **that you want** to stop, try one of the following:

- Press Pause
- Press Ctrl C
- Press Ctrl Break.

If these methods do not work, you may need to reset the computer as described below. Do not turn off the computer to exit a program or stop a command unless you have to, because the computer erases any data you did not save.

Resetting the Computer

Occasionally, you may want to clear the computer's memory without turning it off. You can do this by resetting the computer.

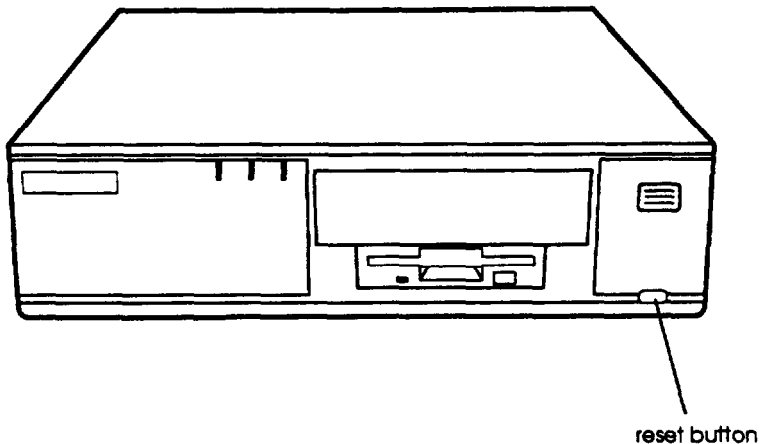
For example, if an error occurs and the computer does not respond to your keyboard *entries*, you can *reset* it to reload your operating system and try again. However, resetting erases any data in memory that you have not saved; so reset only if necessary.

Caution

Do not reset the computer to exit a program. Some programs classify and store new data when you exit them. If you reset the computer without properly exiting a program, you may lose data.

If you set the **Disk** drive boot sequence. in SETUP to C: only (see Chapter 2), the operating system must be on the hard disk when you reset the computer. If you selected the other options, the operating system must be either on the hard disk or on a diskette in drive A. If you do not have a hard disk, insert the operating system diskette in drive A. If you are using DOS, press Ctrl Alt and Del to reset the system.

You can **also** press the **RESET** button located on the front right side of your computer. (See the following illustration.) The screen displays nothing for a moment and then the computer reloads the operating system.



If resetting the computer does not correct the problem, you probably need to turn it off and on again. Remove any diskette(s) from the diskette drive(s). Turn off the computer and wait 20 seconds. If your operating system is not on the hard disk drive, insert a bootable diskette (one that contains the necessary portions of the operating system) in drive A. Then turn on the computer.

Using a Password

Using SETUP, you can define both a Supervisor level password and a User level password. You can also specify whether a password is required when you start the system. This password can also control who has access to the diskette drives.

If **you** enabled the **Password on boot option in SETUP**, you must enter the Supervisor or User password every time you turn on or reset the computer. If you enter a password but disable the Password on boot option, you must enter the password when you start SETUP.

If you set the **Diskette Access option to Supervisor**, you can access a diskette drive only if you entered the Supervisor password when you started your system. If you entered a User password when you started the system but the **Diskette Access** option is set to Supervisor, you see an error message when you access the diskette drive.

When you need to enter your password, you'll see the prompt, Enter password :. As you type your password, you see a rectangle for each character you type. When you press **Enter**, the computer loads the operating system (or starts SETUP).

If you don't enter the correct password the first time you type it, you can try two more times. If you haven't entered the correct password on the third try, the computer locks up to prevent unauthorized access. You see the message:

System Disabled1

You must either turn off the computer or press the **RESET** button to start over. In this situation, you cannot reset the computer by pressing Ctrl **Alt** and **Del**.

Note

If you want to delete your password, you must run the SETUP program and follow the Instructions for deleting a password in Chapter 2.

If you do not remember your password, see “Password Problems” in Chapter 6.

Changing the Processor Speed

Your computer’s processor can operate at two speeds: fast (the speed of your microprocessor) or slow (8 MHz). The slow speed is available to provide compatibility with older application programs.

When your computer is operating at fast speed, the **SPEED** light on the front panel is on. When the computer is operating at slow speed, the light is off.

You should use fast speed for almost everything you do because your programs will work faster. However, certain application programs have specific timing requirements and can run only at the slower speed. See your software manual to determine if this is the case.

Some copy-protected programs require the computer to run at slow speed while accessing the program on a diskette. These programs also usually require you to leave a key disk—the diskette that contains the copy protection—in the diskette drive. If you use a copy-protected program, you can change the speed to slow to access the diskette and return it to fast speed when you are finished.

You can change the processor speed temporarily by entering one of the following commands from the numeric keypad on your keyboard:

- ❑ To select slow speed, press **Ctrl Alt** and then press the **-** key on the numeric keypad. This turns off the speed light.
- ❑ To select fast speed, press **Ctrl Alt** and then press **+** on the numeric keypad. The speed light comes on.

Note

You can use the commands listed above while you are running a program. However, if the program uses one of these commands for another function, you cannot use it to change the processor speed.

The speed setting remains in effect until you do one of the following

- ❑ Reset your computer
- ❑ Turn off your computer
- ❑ Change the speed with another keyboard command
- ❑ Change the jumper setting of J22 (as described in chapter 4).

Chapter 4

Installing and Removing Options

You can enhance the performance of your computer by adding optional equipment such as system, video, or cache memory modules, option cards, or a microprocessor upgrade.

This chapter first describes how to remove your computer's cover to install options and how to replace the cover when you are finished. It then describes the following:

- ❑ Locating the internal components
- ❑ Changing the jumper settings
- ❑ Installing and removing SIMMs (single inline memory modules)
- ❑ Installing and removing option cards
- ❑ Adding video memory
- ❑ Installing external cache
- ❑ Installing microprocessor upgrades.

Caution

Never install options or change jumper settings when the computer is turned on or the power cable is **connected** to the computer.

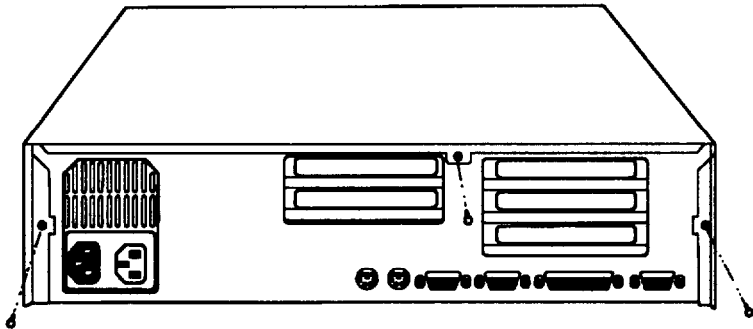
Once you have installed your options, see “Post-installation Procedures” on page 4-29.

Removing *the Cover*

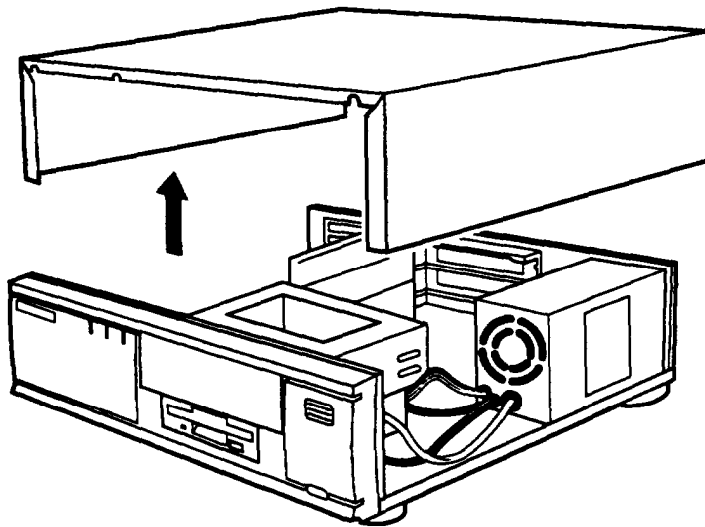
You need to remove the computer's cover to install any of the options described in this chapter or to install or remove a disk drive (as described in Chapter 5).

Follow these steps to remove the cover:

1. Turn off the computer and then any peripheral devices (including the monitor and printer).
2. Disconnect the computer's power cable from the electrical outlet and from the back panel. Also disconnect any other cables that are connected to the computer, including the keyboard cable.
3. If the monitor is on top of the computer, lift it off and set it to one side.
4. Turn the computer around so the back panel is facing you.
5. Remove the three screws securing the back panel.



6. Grasp the sides of the cover and lift it straight up, as shown below:



7. Set the cover aside.
8. Ground yourself to the computer by touching the metal surface of the back panel.

Warning

Be sure to ground yourself by touching the back panel of the computer every time you remove the cover. If you are not properly grounded, you could generate an electric shock that could damage a component when you touch it.

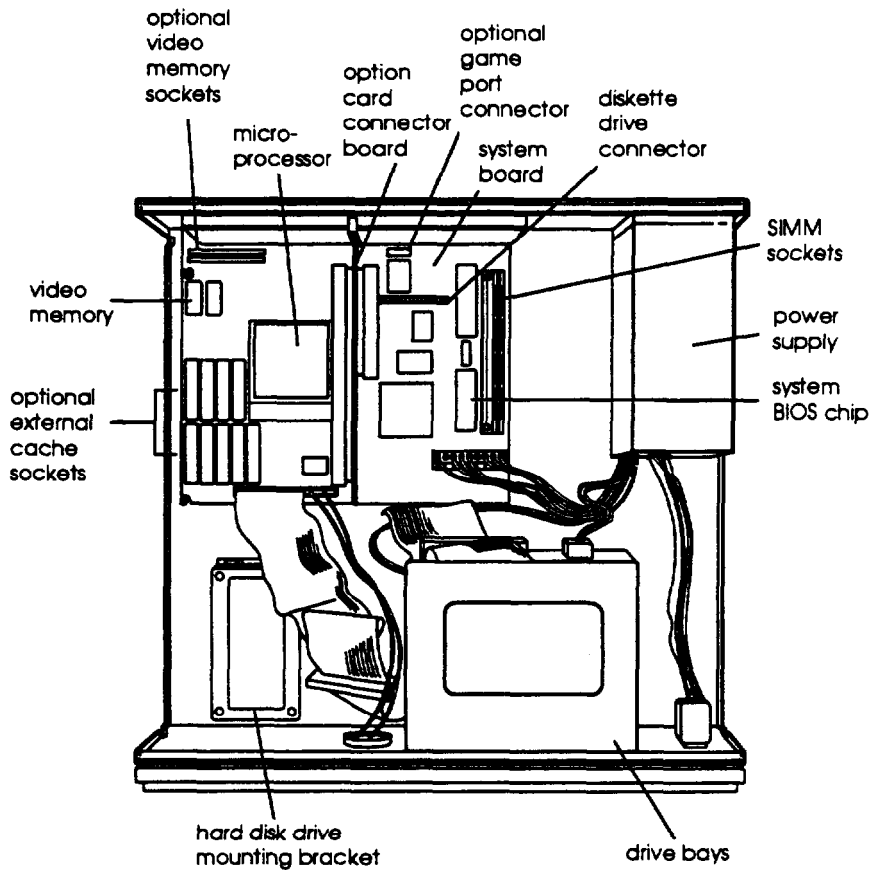
Replacing the Cover

When you are ready to replace the computer's cover, follow these steps:

1. Make sure all the internal components are installed properly.
2. Check all cable connections, especially those that might have been loosened during your work.
3. Make sure all cables are out of the way so they do not catch on the cover.
4. Insert the front of the cover between the front bezel and the chassis of the computer and guide it straight down. (See the illustration on page 4-3.)
5. Replace the three cover retaining screws.
6. Reconnect the computer to the monitor, printer, keyboard, and any other peripheral devices you have. Then reconnect the power cable to the back of the computer and to an electrical outlet.

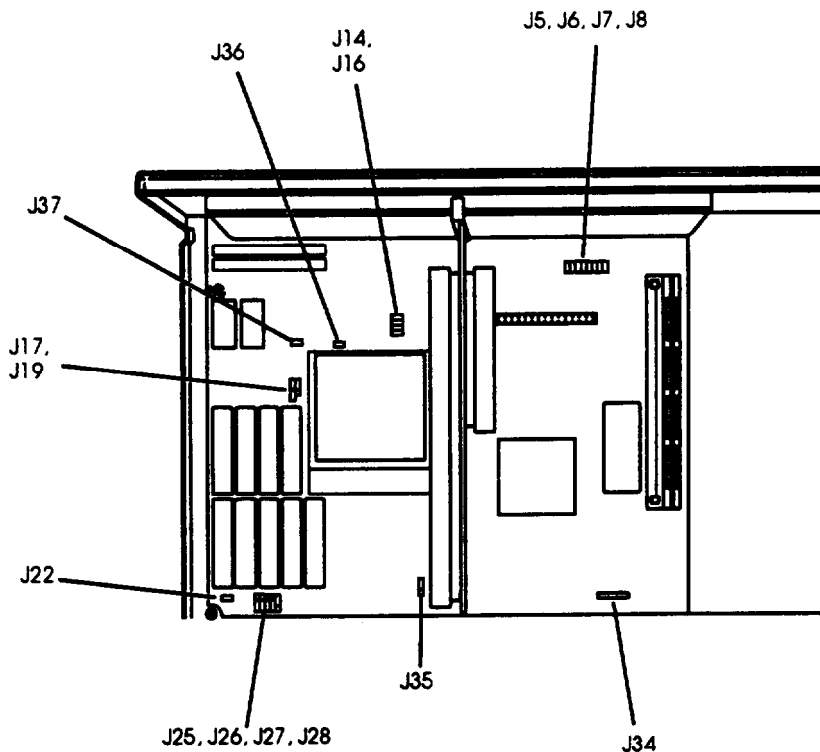
Locating the Internal Components

As you follow the instructions in this chapter, refer to the illustration below to locate the different components inside your computer.



Changing the Jumper Settings

The main system board in your computer has a number of jumpers that control certain functions. These jumpers are preset at the factory to default positions. See the illustration below to locate the jumpers on the system board.



Note

You may need to change the jumpers shown here. Other jumpers on the system board are for service purposes only.

Use the information in the following tables to change jumper settings, if necessary.

Jumper number	Jumper setting	Function
J5	1-2*	Assigns PARALLEL port as LPT1
	2-3	Assigns PARALLEL port as LPT2
J6	1-2*	Assigns COM1 serial port as COM1
	2-3	Assigns COM1 serial port as COM3 ^{tt}
J7	1-2 ^t	Assigns COM2 serial port as COM2
	2-3	Assigns COM2 serial port as COM4 ^{tt}
J8	1-2*	Enables diskette drive controller
	2-3	Disables diskette drive controller
J14 ^t	Off	VGA IRQ9 disable
	On	VGA IRQ9 enable
J16	1-2 ^{ttt}	Selects a CPU clock speed of 33 MM (486SX/33, 486DX/33,486DX2/66, and Pentium OverDrive)
	3-4	Selects a CPU clock speed of 50 MM (DX/50)
	5-6	Selects a CPU clock speed of 25 MM (486SX/25, 486DX2/50)
J22	Off	Selects fast speed
	On	Selects 8 MM speed
J34	2-3 ^t	Selects normal system board battery operation
	3-4	Discharges CMOS memory (resets SETUP to defaults)
J35^{ttt}	1-2*	Enables the IDE hard disk drive controller
	2-3	Disables the IDE hard disk drive controller

* Factory setting

☞ You can use MS-DOS to automatically reassign parallel and serial ports. Check your MS-DOS manual for more information.

☞ Setting depends on CPU

t Do not change this jumper setting.

tt If you have trouble changing the setting of jumper J35, remove the option card connector board. Remove the two screws that secure the board to the chassis, then lift the board straight up and out of the socket.

External cache jumper settings'

cache size	J25	J26	J27	J28
64KB	1-2	1-2	off	2-3
128KB	2-3	1-2	1-2	1-2
256KB	2-3	2-3	2-3	2-3

- If you have no external cache installed, the position of these jumpers does not matter.

Processor type jumper settings

Processor	J17	J19
486DX/DX2, or Pentium OverDrive	1-2, 3-4	1-2
486SX	2-3	off

SVGA jumper settings

SVCA jumper function	J36	J37
Enable on-board SVGA	On'	On'
Disable on-board SVGA	Off	off

* Factory settings

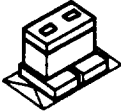
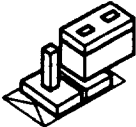
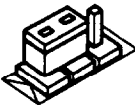
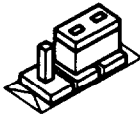
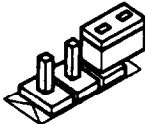
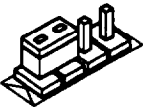
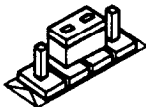
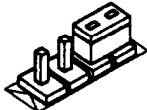
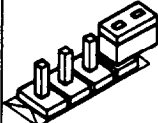
Setting the Jumper

If you need to change any jumper settings, follow these steps:

1. Refer to the illustration on page 4-6 to locate the jumpers.
2. If there are any option cards installed in your computer, you need to remove them to access the jumpers. See page 4-19.

3. A jumper's setting is determined by where the jumper is placed on the pins. Use the following table to identify the pin settings for 2-pin, 3-pin, and 4-pin jumpers. To identify pin 1, look at the system board under the jumper. A triangle is traced on the board at pin 1.

Setting jumpers

Jumper type	Position				
2-pin	On	Off			
					
3-pin	1-2	2-3			Off
					
4-pin	1-2	2-3	3-4	Off	
					

To move a jumper from one position to another, use needle-nose pliers or tweezers to pull it off its pins and gently move it to the desired position.

Caution

Be careful not to bend the jumper pins or damage any components on the main system board.

4. Replace any option cards you removed. See page 4-14 for instructions.

Installing Memory Modules (SIMMs)

Your computer comes with 4MB of memory on a SIMM. By installing additional SIMMs, you can increase the amount of memory in your computer up to 64MB.

There are two SIMM sockets on the main system board, and each can contain one memory module. You can install 1MB, 2MB, 4MB, 8MB, 16MB, and 32MB SIMMs.

The following table shows the possible SIMM configurations. (When the front of the computer is facing you, BANK 0 is on the right. An x in the table below indicates that no SIMM is installed.)

SIMM configurations

BANK 0	BANK 1	Total memory
4MB	x	4MB
4MB	1MB	5MB
4MB	2MB	6MB
4MB	4MB	8MB
8MB	x	8MB
8MB	1MB	9MB
8MB	2MB	10MB
4MB	8MB	12MB
8MB	4MB	12MB
8MB	8MB	16MB
16MB	x	16MB
16MB	1MB	17MB
16MB	2MB	18MB
16MB	4MB	20MB

SIMM configurations *(continued)*

BANK 0	BANK 1	Total memory
16MB	8MB	24MB
16MB	16MB	32MB
32MB	x	32MB
32MB	1MB	33MB
32MB	2MB	34MB
32MB	4MB	36MB
32MB	8MB	40MB
16MB	32MB	48MB
32MB	16MB	48MB
32MB	32MB	64MB

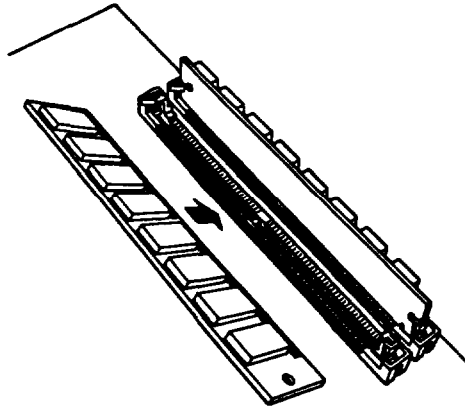
Use only tin-plated, 32-bit or 36-bit, 72-pin, fast-page mode SIMMs that operate at an access speed of 80ns (nanoseconds) or faster. Be sure all the SIMMs operate at the same speed.

Inserting SIMMs

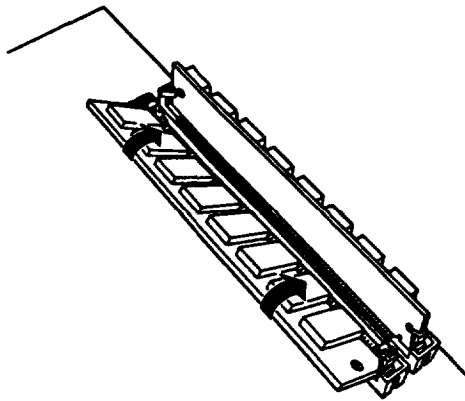
Make sure the computer is turned off and then follow these steps to install SIMMs:

1. Make sure the front of the computer is facing you.
2. Refer to the illustration on page 4-5 to locate the SIMM sockets on the right side of the system board.
3. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 4-19 for instructions.)

4. Position the SIMM at an angle over the empty SIMM socket, as shown below.



5. Push the SIMM into the socket until it is seated firmly in the slot. Then tilt it upright, as shown below, guiding the hole at each end of the SIMM over the retaining post at each end of the SIMM socket. If it does not go in smoothly, do not force it; pull it all the way out and try again.

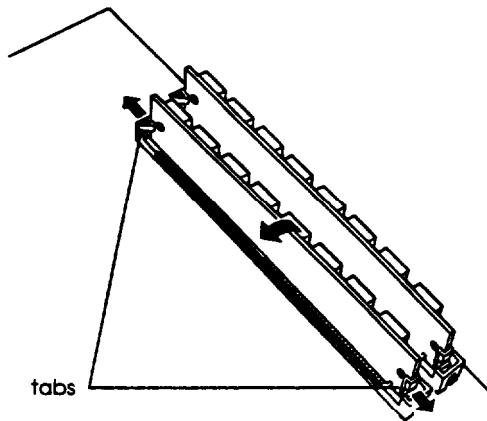


6. Replace any option cards you removed. (See page 4-14 for instructions.)

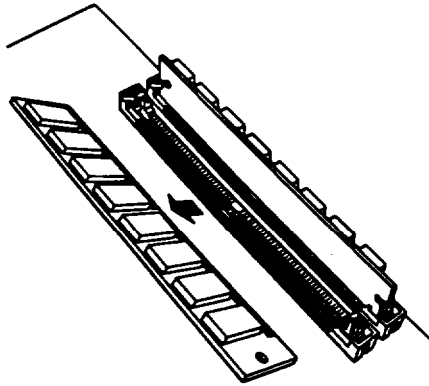
Removing SIMMs

If you need to remove SIMMs from your computer (to install different ones, for example), make sure the computer is turned off and then follow the steps below:

1. Make sure the front of the computer is facing you.
2. Use the illustration on page 4-5 to locate the SIMM sockets on the right of the system board.
3. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 4-19 for instructions.)
4. Use your fingers or a small screwdriver to carefully pull away the metal tabs that secure the SIMM at each end, as shown below.



5. As you pull away the tabs, the SIMM falls to the side. Remove it from the socket.



6. If necessary, follow the same procedure to remove the other SIMM.
7. If you are inserting different SIMMs, follow the instructions on page 4-11 to install them.
8. Replace any option cards you removed, as described below.

Installing an Option Card

This section explains how to install option cards in your computer. Your computer has three 16-bit, full-length slots and two 8-bit, half-length slots to accommodate a total of five option cards.

As you install option cards, keep these general guidelines in mind.

- ❑ Usually it does not matter which slot an option card occupies as long as the card fits in the slot. For example, you can place some 8-bit cards in a M-bit slot. When you select the slot you want to use, make sure no components are touching or obstructing other cards or cables.
- ❑ If you have a DX/50, DX2, or Pentium OverDrive processor installed, you cannot install an option card in the bottom 16-bit slot when a heat sink or heat sink/fan assembly is mounted on the processor.
- ❑ When you unpack the option card, be careful not to touch any of the components on the circuit board or the gold-edged connectors. If you need to set it down before you install it, place it gently on top of its original packing material with the component side facing up. Keep the packing materials in case you remove the card later.
- ❑ Before you install the card, adjust any switches or jumpers on the card, if necessary. (See the option card instructions.) Also, see if you need to change any jumper settings on the system board. For example, if you install a SCSI hard disk drive, you may need to change jumper J35 to disable the IDE hard disk drive controller. See page 4-6 for more information on jumpers.

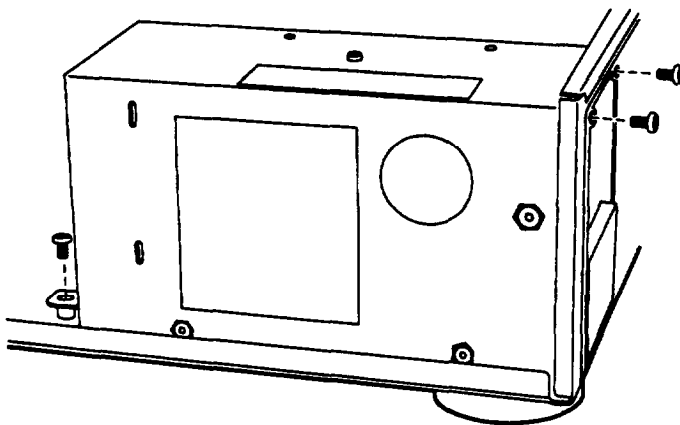
Caution

Make sure the power requirements for the option cards you install do not exceed the power supply limitations. See your option card manual(s) for the power requirements. Then check Appendix A for the option slot power limits.

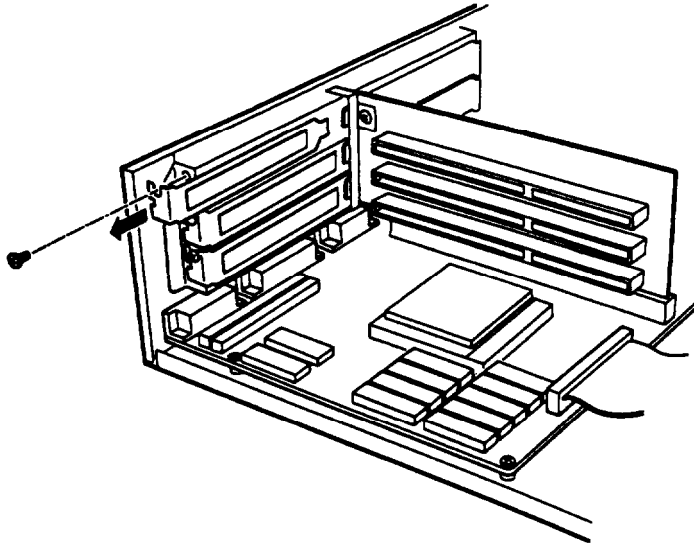
Refer to the illustrations below and follow these steps to install an option card:

1. If you are using a 16-bit option slot, go on to step 2. If you are using an 8-bit slot near the power supply, you need to move the power supply before you can remove the metal slot cover.

Remove the three screws securing the power supply to the computer, as shown below. Be careful not to disconnect any of the cables. Slide the power supply away from the slots **until you** can remove the slot covers easily.

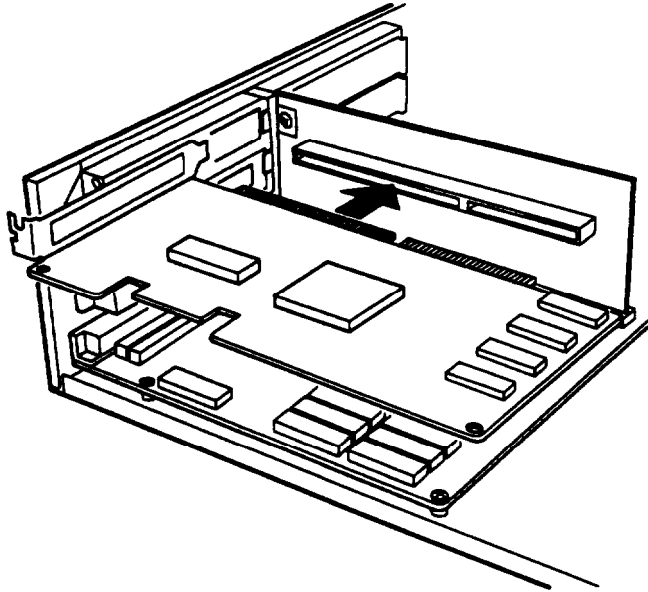


2. Remove the retaining screw securing the option slot cover to the computer, as shown below. (Keep the screw to secure the option card to the computer.)



3. Slide out the slot cover and set it aside. (Store it in a safe place in case you remove the option card later.)

4. Hold the card along the top corners and guide it into the connector, as shown below. (If you are installing a full-length card, insert the front edge of the card into the corresponding guide inside the computer's front panel.)



Once the connectors reach the slot, push the card in firmly (but carefully) to insert it fully. You should feel the card fit into place. If it does not go in smoothly, do not force it; pull the card all the way out and try again.

5. Secure the end of the card to the computer with the retaining screw.
6. If you had to move the power supply, make sure you replace it and secure it again with the three retaining screws.

Removing an Option Card

You may need to remove an option card to access components on the main system board—to change a jumper setting, for example. You may also want to remove a card if you no longer need it. Refer to the option card illustration on page 4-18 and follow these steps:

1. Remove the retaining screw securing the option card to the computer. Then pull the card straight out of the slot.
2. Set the card aside with the component side facing up.
3. If you are not replacing an option card, replace the option slot cover and retaining screw.

Adding video Memory

Your computer comes with 1MB of video memory. You can increase your video memory to 2MB by installing two video DRAM, 256KB x 16-bit, 40-pin, ZIP (Zig-zag Inline Package) chips. This is useful for running graphics-intensive applications or for supporting high resolutions with many colors.

The following table lists the video DRAM ZIP chips you can install on the main system board.

Supported video ZIP chips

Manufacturer	Part number
Fujitsu	MB8 14260A-70/80 ns
MICRON	MT4C16256Z-70/80 ns
Mitsubishi	M5M4426OAL-80 ns
NEC	UPD424260V-70/80 ns
Samsung	KM416C256JZ-70/80 ns

Installing the video Chips

You need two ZIPs to install the optional memory. For the memory to work properly, you must install one chip in each of the empty video memory sockets on the system board. Follow these steps:

1. Locate the video memory chip sockets on the main system board, shown on page 4-5. The chip sockets are labeled U2 and U3.
2. If there is an option card in your way, remove it. See page 4-19 for instructions.

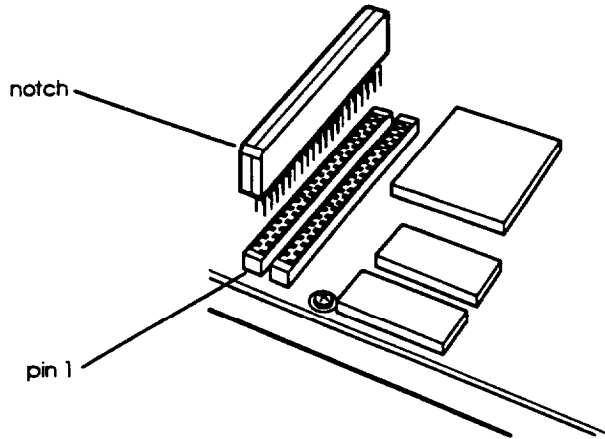
Caution

To avoid generating static electricity and damaging the memory chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

3. Remove the memory chips from their package and inspect each one. All the pins should be straight.

If any of the pins are bent or crooked, straighten them gently with your fingers or with small tweezers to align them with the other pins. Be careful when you do this; the pins are fragile and can break off easily.

4. Position one of the ZIP chips over the first empty socket (U2) as shown below, aligning pin 1 on the chip (identified by the notch on the top of the chip) with pin 1 on the system board.



5. Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip does not go in smoothly, remove it and try again.
6. When the chip is properly positioned, push down firmly on both ends of the chip to make sure it is well-seated.
7. Repeat steps 4 through 6 to install the other chip in socket U3.
8. Replace any option cards you removed. See page 4-14 for instructions.
9. Now run **SETUP** as described in Chapter 2 so that your system recognizes the increased memory.

Installing External Cache

You can install 64KB, 128KB, or 256KB of external cache on your system.

- ❑ To install 64KB of external cache, use eight SRAM, 28-pin, 8 x 8, 20ns DIP chips, and one 8 x 8, 20ns tag chip
- ❑ To install 128KB of external cache, use four SRAM, 28-pin, 32 x 8, 20ns DIP chips, and one 8 x 8, 20ns tag chip
- ❑ To install 256KB of external cache, use eight SRAM, 28-pin, 32 x 8, 20ns DIP chips, and one 32 x 8, 20ns tag chip
- ❑ To install any cache on a 486DX/50 system, make sure the tag chip is a 15ns chip.

For the cache memory to work properly, you must install chips in the following configuration (each bank contains four cache memory sockets):

Cache memory configurations

BANK0 U20,21,22,23	BANK1 U29,30,31,32	Tag SRAM U36	Total cache
8 K x 8	8 K x 8	8 K x 8	64KB
32 K x 8	x	8 K x 8	128KB
32 K x 8	32 K x 8	32 K x 8	256KB

Installing the External Cache Chips

Follow these steps to install the external cache chips:

1. Locate the external cache memory sockets on the main system board, shown on page 4-5.
2. If there is an option card in your way, remove it. See page 4-19 for instructions.

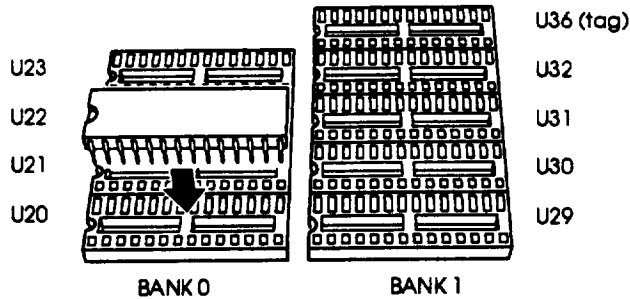
Caution

To avoid generating static electricity and damaging the cache chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

3. Remove the cache chips from their package and inspect them. The pins should point inward at slightly less than a 90° angle.

If any of the pins are bent or crooked, straighten them gently with your fingers or with small tweezers to align them with the other pins. Be careful when you do this; the pins are fragile and can break off easily.

- Position one of the cache chips over the first socket as shown below, aligning the pins on the chip with the holes in the socket. Make sure the small notch on the end of, the chip is aligned with the corresponding notch on the socket.



- Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip goes in at an angle, remove it and try again.
- When the chip is properly positioned, push down firmly on both ends of the chip to make sure it is well-seated.
- Repeat steps 4 through 6 for each of the remaining chips.
- Change jumpers J25, J26, J27, and J28, as described on page 4-8, to match to the amount of cache you installed.
- Replace any option cards you removed. See page 4-14.
- Run **SETUP** to enable the **External Cache** option and check that the **System shadow** and **Video shadow options** are enabled. You select these options from the Advanced System Setup menu. Make sure you save your settings as you leave **SETUP** (see Chapter 2).

When the computer restarts, it displays the amount of external cache you have installed on the system.

Upgrading the Microprocessor

You can upgrade your computer by replacing the microprocessor with a faster one. The following table lists the components you can use to upgrade the microprocessor in your system.

Microprocessor upgrade components

Part	Manufacturer
486SX/33 processor	Intel
486DX/33 processor	Intel
486DX/50 processor	Intel
486DX2/50 processor	Intel
486DX2/66 processor	Intel
Pentium OverDrive processor	Intel
Heat sink'	Tennmax Trading Corp.
Heat sink/fan assembly"	Tennmax Trading Corp.

- For me DX/33 processor
- For DX/50, DX2/50, DX2/66 and Pentium OverDrive processors

To upgrade your microprocessor, you will perform these steps. See the page in parentheses for instructions.

- Replace the existing processor chip (see page 426).
- Install the new microprocessor and heat sink or heat sink/fan assembly, if necessary (see page 426).
- If necessary, change the settings of jumpers J16, J17, and J19 (see page 4-6), and connect the fan to connector J12.

Replacing the Processor Chip

Follow these steps to replace the processor chip:

1. Use the illustration on page 4-5 to locate the microprocessor on the system board. The microprocessor chip may be inserted in a ZIF (Zero Insertion Force) socket.

caution

Make sure you ground yourself by touching the metal surface on the inside of the computer's back panel before you touch the processor chip. Then remain as stationary as possible while you install it. Do not touch the pins on the processor chip. Handle the microprocessor only by the edges of its case.

2. Open the ZIF socket by lifting up the ZIF handle. The handle rests under a plastic tab. Press the handle down and away from the tab; then rotate the handle to the released position. This releases the chip from the socket. The illustration on the next page shows this handle in the released position.

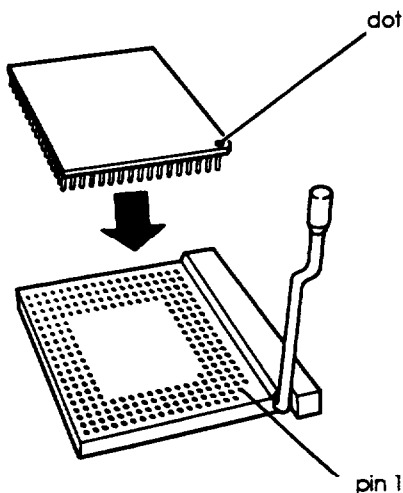
If your microprocessor isn't inserted in the ZIF socket with a handle, use a chip puller or a small, flat-head screwdriver to remove the chip. Carefully wedge the tip of the screwdriver between the processor chip and the socket. Gently turn the screwdriver until the chip begins to separate from the socket. Move the screwdriver to another side of the processor chip and again turn it until the chip separates from the socket. Keep doing this until you can lift the processor chip straight up from the socket.

3. Gently pull the processor chip straight up and set it aside.

Note

The 486SX/25 microprocessor may be soldered onto an adapter board that is seated in the socket. Remove the adapter board as described above.

4. Remove the replacement chip from its package and inspect the pins. If they are bent, do not install the processor chip. Contact your vendor for a new microprocessor.
5. Position the processor chip over the socket, aligning the notched edge of the chip (marked with a dot) with pin 1 on the socket, as shown below.



Note

If you install the processor chip in the wrong orientation, you may damage the chip and void your warranty.

6. Make sure the pins in the processor chip are directly over the holes in the socket. Then gently push the microprocessor straight into the socket, pressing evenly on all sides.

If you are installing a 486 chip rather than a Pentium OverDrive processor, you'll see an extra row of holes around the outside of the socket. The 486 chip will not fit into the outside row of holes.

7. If your system has a ZIF socket, secure the processor chip by pressing the ZIF handle back to the closed position.
8. If you are upgrading from a 486SX processor to a DX, DX2, or Pentium OverDrive processor, you need to change the jumper settings of J17 and J19. If you are upgrading to a CPU with a different clock speed, you may need to change the setting of jumper J16. See the tables on pages 4-7 and 4-8 for the correct jumper settings.
9. If you are upgrading to a DX/33, DX/50, DX2, or Pentium OverDrive processor, you must install a heat sink or a heat sink/fan assembly. Follow the instructions included with the heat sink.
10. Run SETUP as described in Chapter 2 to update your computer's configuration with the new microprocessor.

Installing a Heat Sink

If you are installing a DX/33, DX/50, DX2, or Pentium OverDrive processor, you must install a heat sink on the processor chip. Follow the instructions included with the heat sink.

If the heat sink has an embedded fan, connect the fan connector into J12 on the system board. The casing for the fan connector has a small triangle over pin 1. A triangle also identifies pin 1 on the system board. Align pin 1 on the connector with pin 1 on the system board.

Post-installation Procedures

After you install or remove options such as memory modules or a microprocessor, you must run **SETUP** to update the computer's configuration. See Chapter 2 for instructions. Additionally, you may need to add some commands to your configuration files. See your operating system manual and the manual that came with your optional equipment.

Chapter 5

Installing and Removing Drives

This chapter describes how to install and remove optional drives in your computer. You can use these instructions to install a variety of devices, including hard disk drives, a diskette drive, a tape drive, a CD-ROM, or an optical drive. Although your drive may look different from the ones illustrated here, you should be able to install it the same way.

Your computer can hold up to four mass storage devices. You can install one or two hard disk drives in the internal hard disk drive bays. In the upper externally accessible bay, you can install a second diskette drive, a tape drive, or a CD-ROM drive.

To install or remove a drive, first remove the computer's cover as described in Chapter 4. Then follow the appropriate instructions in this chapter to install and remove drives:

- ❑ Installing a hard disk drive in the internal drive bay
- ❑ Removing a hard disk drive from the internal drive bay
- ❑ Installing a drive in the upper externally accessible drive bay
- ❑ Removing a drive from the upper drive bay
- ❑ Reconnecting drive and power cables to the diskette drive in the lower drive bay
- ❑ Post-installation procedures.

Some of the steps in this chapter may not apply for the drive you are installing. See the documentation that came with your drive for more information.

Installing a Hard Disk Drive in the Internal Drive Bay

Your computer may have a hard disk drive already installed in the internal drive bay. If not, you can install a 1-inch high by 3½-inch wide drive in this bay.

This section includes steps for the following procedures:

- ❑ Removing the mounting frames from the hard disk drive (if necessary)
- ❑ Connecting the hard disk drive cables
- ❑ Installing the hard disk drive under the mounting bracket
- ❑ installing the hard disk drive above the mounting bracket.

Note

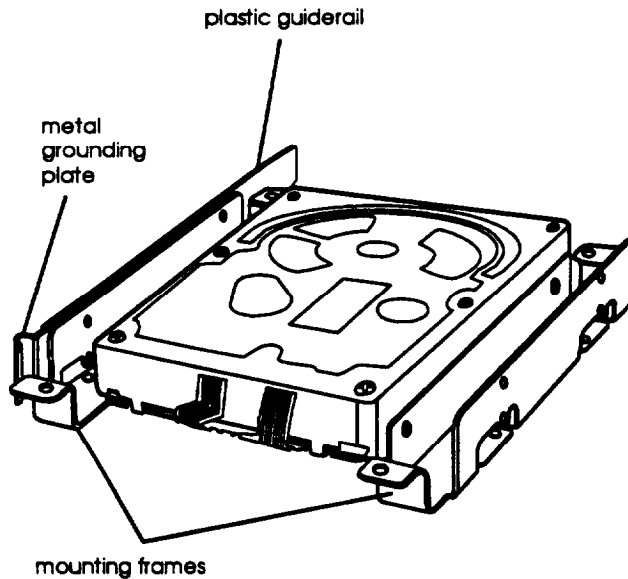
Be sure to check the jumper settings on the hard disk drive before you install it. Also, you may need to know the drive parameters if the hard disk drive autosensing feature in SETUP is unable to correctly identify your drive. See the documentation that came with your drive for this information.

Before you can install a hard disk drive, you need to remove any option cards that may be blocking your access to the hard disk drive area. Once you have installed the drive, replace any option cards you removed. See Chapter 4 for instructions.

Removing the Mounting Frames

If there are mounting frames attached to your hard disk drive, remove them before you install the drive. Follow these steps:

1. On your drive, there may be a plastic guiderail and metal grounding plate attached to one of the mounting frames. If so, remove the screws securing them to the mounting frame and remove the guiderail and grounding plate.



2. Then remove the two screws securing each mounting frame to the drive and remove the frames.

Connecting the *Hard Disk Drive Cables*

To connect the hard disk drive to the computer, you need to connect two cables: the hard disk drive ribbon cable and a power supply cable.

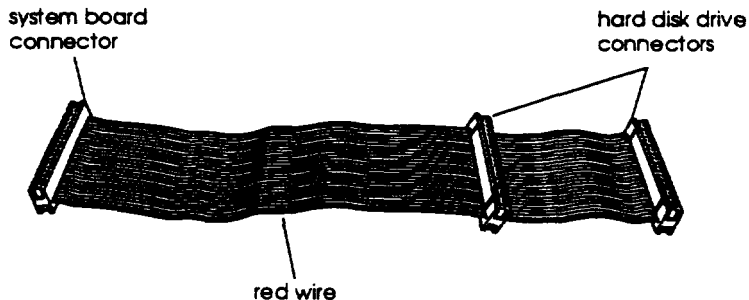
The hard disk drive ribbon cable is attached to your system board. If you **need to remove** it for any reason, see “Connecting the drive cable to the system board,” below, for instructions on reconnecting the cable to the system board. Otherwise, see page 5-6 for instructions on connecting the ribbon cable and power supply cable to the drive.

You should connect both the hard disk drive ribbon cable and the power supply cable to the drive before you secure it with the mounting bracket. You will not be able to attach them once the bracket is in place.

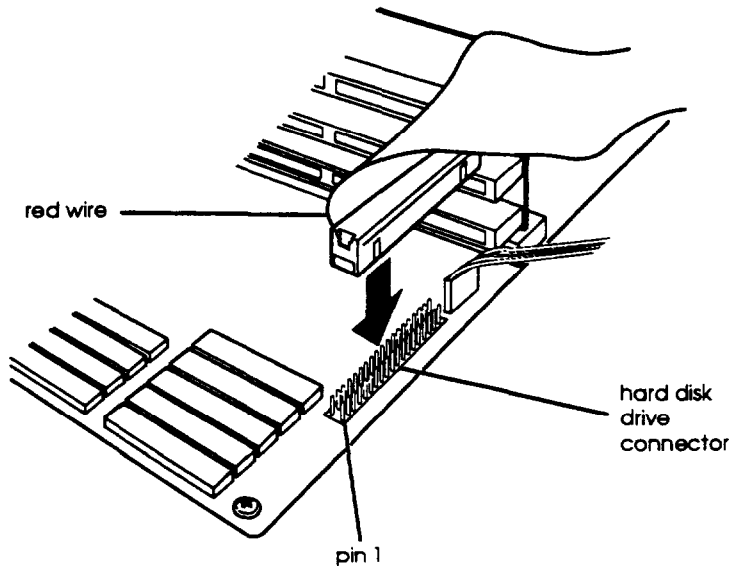
Connecting the drive cable to the system board

If you need to connect the hard disk drive ribbon cable to the system board, follow the steps below. (If the hard disk drive ribbon cable is already attached to the system board, see “connecting the drive and power cables to the drive” on page 5-6.)

1. Locate the hard disk drive ribbon cable; it is a flat cable with a connector on each end and an additional connector on the ribbon cable. All the **connectors** on this cable look the same.



2. Locate the hard disk drive connector on the system board.



3. Position the system board connector end of the cable so that the red wire aligns with pin 1 of the connector on the system board. There is a "1" printed on the system board to identify pin 1.
4. Make sure the holes in the cable connector fit over the pins in the system board connector; then push in the cable connector.

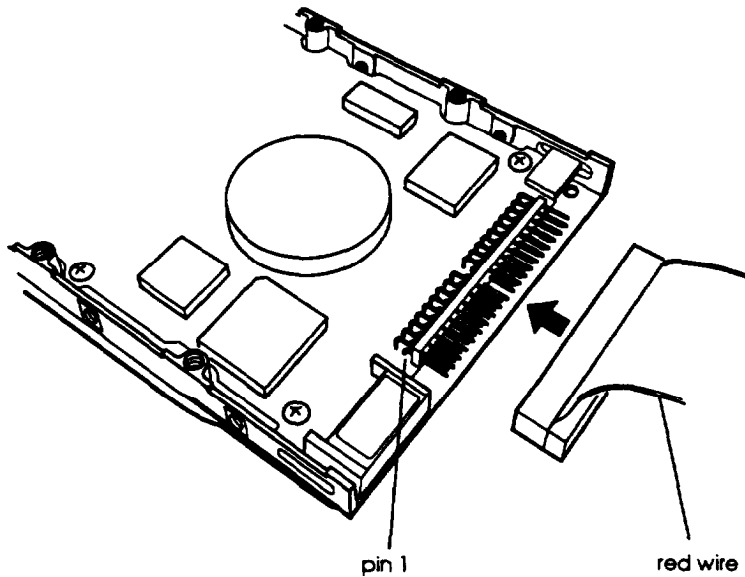
Caution

If you do not correctly align the holes with the pins, you could severely damage your system board when you push in the cable connector.

Connecting the drive and power cables to the drive

Follow the steps below to connect the hard disk drive ribbon cable and a power supply cable to the drive:

1. Locate the hard disk drive connector on the end of the hard disk drive ribbon cable.
2. Locate pin 1 on the drive connector. If you do not see it on the connector casing, turn the drive over so you can see the drive's circuit board, as shown below. There is a "1" or "2" printed on the board to identify the side of the connector containing pin 1.

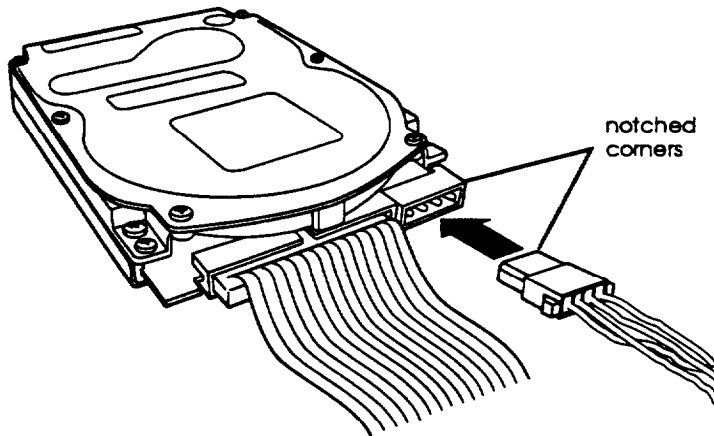


3. Position the connector on the cable so that the red wire aligns with pin 1 on the drive.
4. Make sure the holes in the cable connector fit over all the pins; then push in the connector.

Caution

If you do not correctly align the holes with the pins, you could severely damage your hard disk drive when you push in the cable connector.

5. Locate one of the power supply cables that lead from the power supply. (They have multi-colored wires and a plastic connector on the end.)
6. Position the power supply cable connector so that its notched corners line up with the notched corners of the power supply connector on the hard disk drive.



7. Make sure the holes fit over all the pins and then push in the connector.

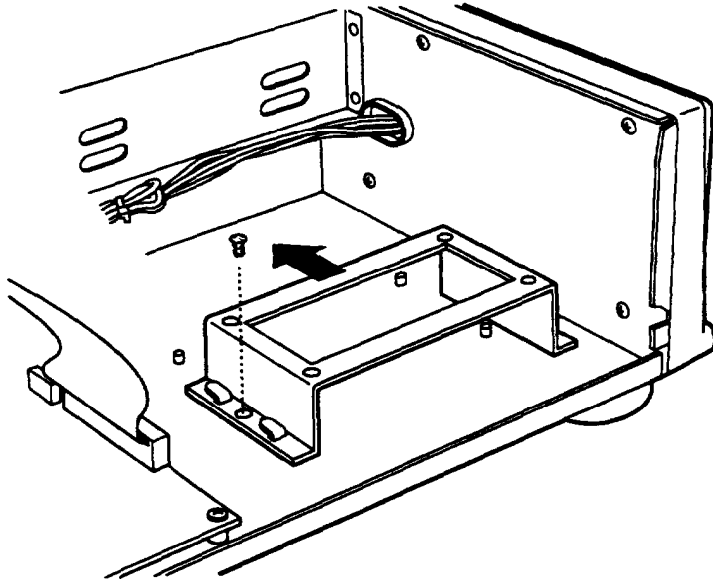
Caution

If you do not align the cable connector correctly, you could severely damage your hard disk drive when you push it in.

Installing the Hard Disk Below the Mounting Bracket

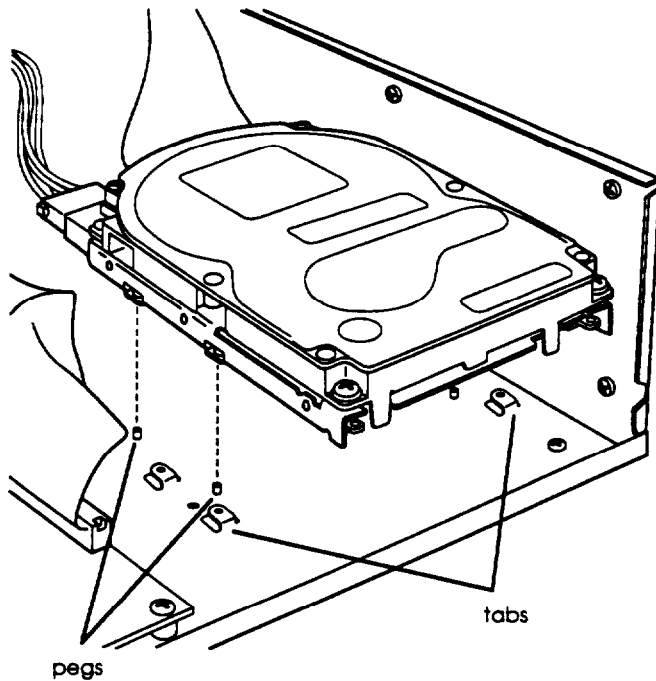
If you have a 1-inch tall hard disk drive, you can install it below the hard disk drive mounting bracket. Refer to the illustrations below and follow these steps:

1. Remove the screw securing the mounting bracket to the base of the computer, as shown below.



2. Slide the mounting bracket toward the diskette drive bays, as shown above, until the slots clear the tabs.
3. Lift the mounting bracket out of the computer and set it aside.

4. Align the hard disk drive so the cables lead toward the diskette drive bays and the four screw holes on the base of the drive are above the four pegs, as shown below.

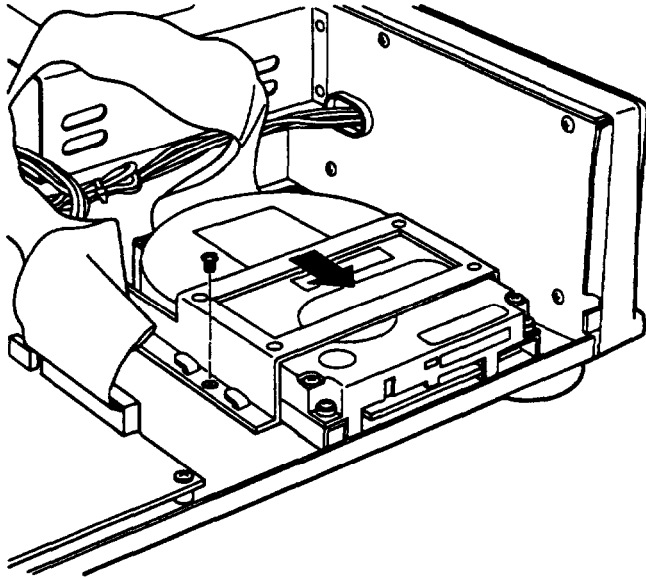


5. Gently lower the drive over the pegs. When the pegs are inserted in the mounting holes on the base of the hard disk drive, the drive will not move from side to side.

Note

If the drive isn't seated correctly on the pegs, you may not be able to close the cover all the way.

6. Lower the mounting bracket over the hard disk drive, making sure that the slots in the mounting bracket fit over the tabs on the base of the computer.
7. Slide the bracket toward the side of the computer, as shown below, until the tabs hold the bracket in place.

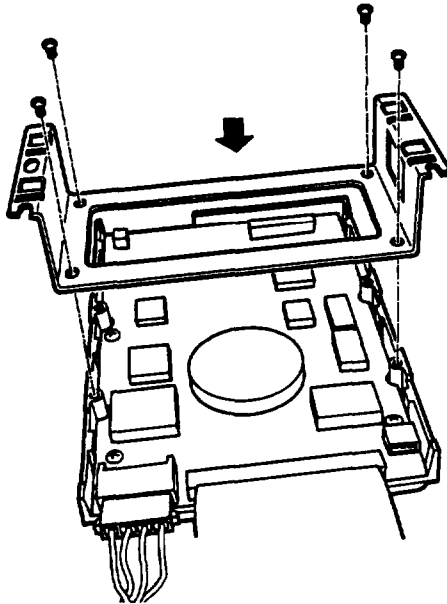


8. Secure the mounting bracket with the screw.

Installing the Hard Disk On the Mounting Bracket

You can install a hard disk drive on top of the mounting bracket rather than under it. Refer to the illustration of the mounting bracket on page 5-8 and the one below while following these steps:

1. Remove the screw securing the mounting bracket to the base of the computer and slide the mounting bracket toward the diskette drive bays until the slots clear the tabs. (See the illustration on page 5-8.)
2. Lift the mounting bracket out of the computer.
3. Turn the hard disk drive over and locate the four mounting holes on the drive.
4. Position the bracket on the hard disk drive, aligning the holes in the bracket with the holes on the drive.



5. Secure the bracket to the drive with four screws.

Note

If you plan to install two hard disk drives make sure additional option cards do not exceed the power supply limitations. See Appendix A.

Also, use flat-head screws to secure a second drive to the mounting bracket. You can purchase flat-head screws at any hardware store; request this size: #6-32UNC x 8 FH,M,+.

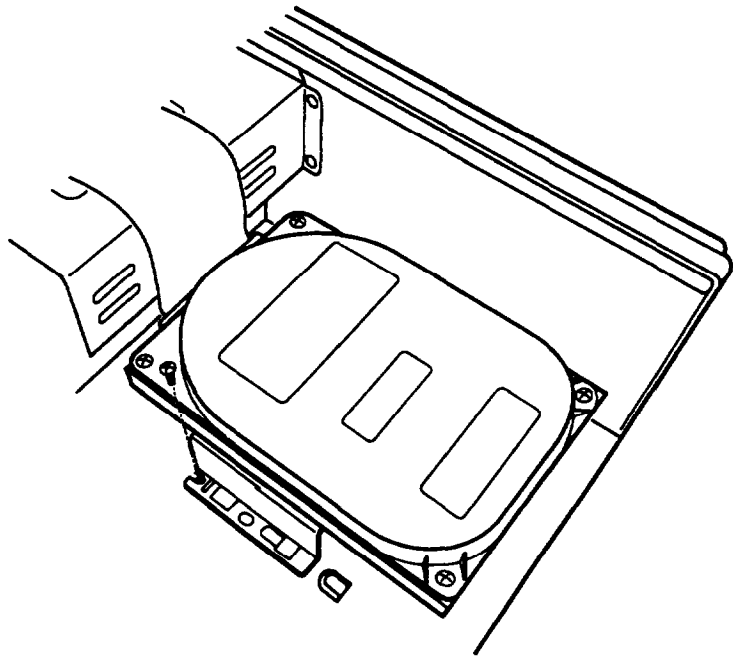
Set the jumpers on both hard disk drives to indicate which is the master and which is the slave drive. See the documentation that came with your drive for instructions.

6. Turn the drive and the mounting bracket over, then slide the slots in the mounting bracket under the tabs at the base of the computer until the tabs hold the bracket in place.

7. Secure the mounting bracket with the retaining screw.

Note

If the drive does not fit within the internal bay, you can move the mounting frame toward the diskette drive bays and align only one set of the slots on the mounting bracket with the tabs on the computer. In this case, insert the retaining screw in the front slot on the mounting bracket as shown below.



Removing a Hard Disk Drive From the Internal Drive Bay

To remove a hard disk drive, reverse the installation steps outlined above. Then disconnect the hard disk drive ribbon cable and the Power supply cable from the back of the drive. When you disconnect the cables, grasp the connectors and pull them straight out so you do not bend the pins; do not pull on the cables. Use the screws to again secure the hard disk drive mounting bracket to the base of the computer.

Installing a Drive in the Upper External Drive Bay

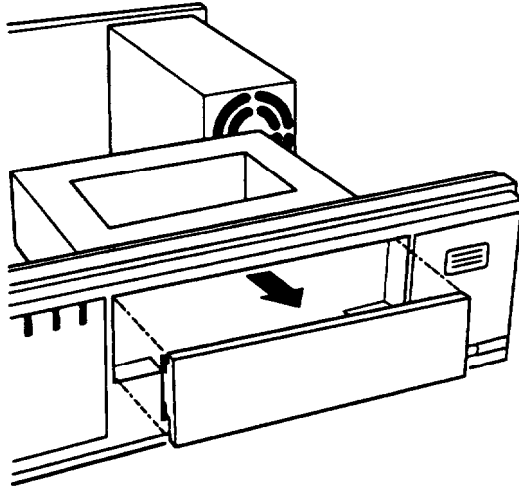
Your system comes with a 3.5-inch diskette drive installed in the lower externally accessible drive bay. You can also install a diskette drive, a CD-ROM, a tape drive, or optical drive in the upper externally accessible drive bay.

If you are installing a diskette drive or a tape drive with a standard 5.25-inch diskette drive connector, you can **connect** it using the diskette drive cable that came with your system.

Before you install a drive in the upper drive bay, remove the cover. Once you have the drive installed, replace the cover, following the instructions in Chapter 4.

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

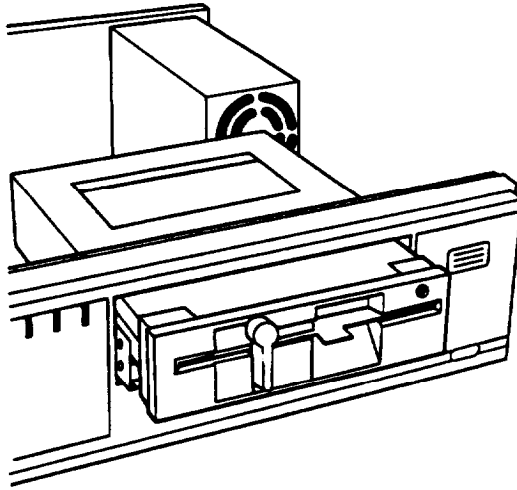
1. Remove the faceplate from the bay by pushing it forward, as shown below.



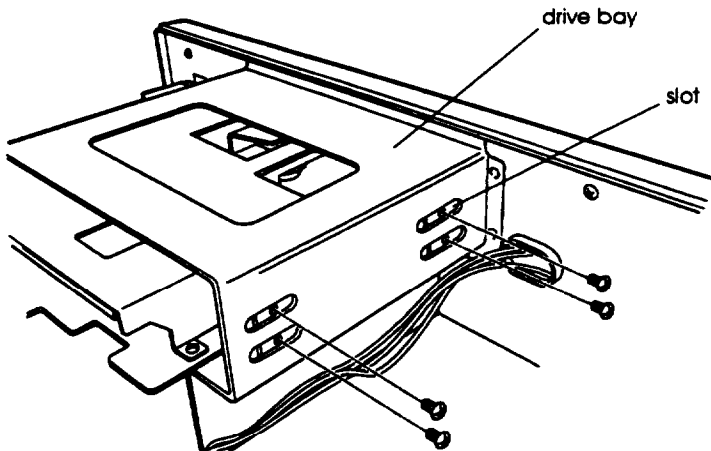
Keep the faceplate in a safe place in case you remove a drive later (or you are installing a drive that you don't need to access).

2. Remove any brackets or mounting frames from the drive. See page 5-3 for instructions.

3. Slide the drive into the bay until it is flush with the front of the computer.



4. Align the slots at the side of the drive bay with the mounting holes in the drive. Then secure both sides of the drive to the drive bay using the retaining screws.

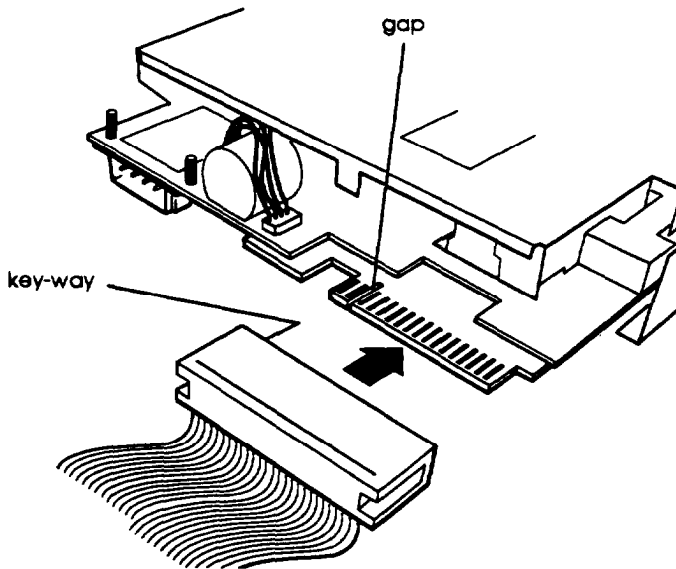


Connecting the Drive and Power Cables

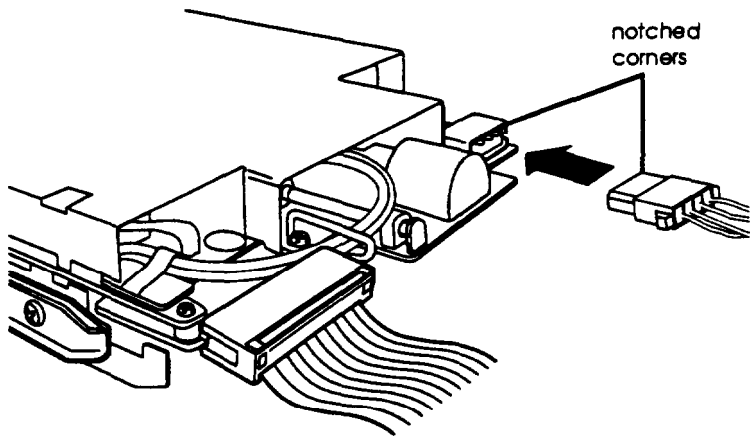
To connect the drive to the computer, you need to connect both the drive ribbon cable and a power supply cable. Follow the steps below.

1. If you are installing a diskette drive, locate the diskette drive ribbon cable. (The connector in the middle of the cable is already connected to the system board.)
2. If you are installing a drive with a card-edge connector *make* sure you align the key-way (the plastic divider) with the gap in the drive **connector**, as shown below.

If you are installing a 3.5-inch diskette drive with a header connector in the bottom slot, see page 5-19 for instructions on connecting the cable.



3. Locate one of the power supply cables that lead from the power supply. (They have multi-colored wires and a plastic connector on the end.)
4. Align the notched corners of the power supply cable connector with the notched corners of the drive's power supply connector (such as the one shown below). Make sure the holes fit over all the pins and then push in the Connector.



Caution

If you do not align the cable connectors correctly, you could severely damage your drive when you push them in.

If you installed a diskette drive in the upper bay, it is drive B; the lower drive is A. You can change the drive assignments through your operating system or you can purchase a different diskette drive ribbon cable.

Removing a Drive from the Upper Drive Bay

To remove a drive from the upper drive bay, follow these steps:

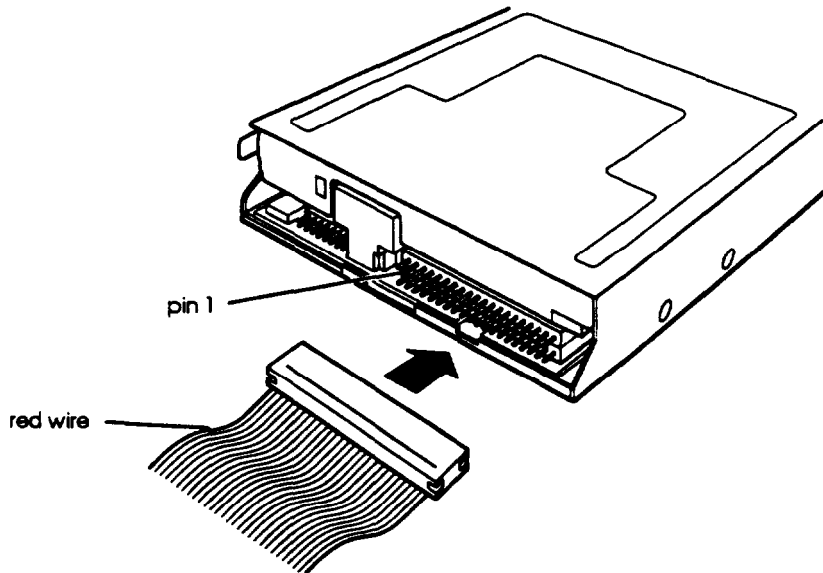
1. Remove both the ribbon cable connector and the power cable connector from the drive.
2. Remove the screws securing the drive.
3. Reach behind the drive and gently push it to the front of the bay; then pull it out of the slot.
4. Once you have removed the drive, replace the faceplate by inserting one side of the plate, then gently guiding the other side into place. You will hear it snap into place.

Reconnecting the Drive and Power Cables to the Diskette Drive in the lower Drive Bay

If for any reason you had to disconnect the drive and power cables from the diskette drive mounted in the lower drive bay, refer to the illustration below while you follow these steps to **reconnect the** cables:

1. Locate the connector on the diskette drive ribbon cable.

2. Identify pin 1 on the drive and align the connector so that the red wire is at pin 1, as shown below. Push in the connector.



3. Locate the multicolored power supply cable with the small connector. This cable is attached to the system board rather than the power supply.
4. Position the power supply cable connector so that the holes fit over all the pins. The red wire on the cable aligns with pin 1 identified at the power connector on the circuit board of the drive. Push in the connector.

Caution

If you do not align the cable connector correctly, you could severely damage your hard disk drive when you push it in.

Post-installation Procedures

After you install or remove your drive(s) and replace the cover on your computer, you need to run SETUP to define the correct configuration for your newly installed drive. See Chapter 2 for instructions.

Chapter 6

Troubleshooting

If you have any problems as you set up and use your computer, refer to this chapter. You can correct most problems by adjusting a cable connection, repeating a software procedure, or resetting the computer.

The troubleshooting suggestions in this chapter are organized in general categories, such as “The computer will not start.” Within each category, a more specific problem is described with possible solutions.

If the suggestions here do not solve the problem, contact your Authorized Epson Servicer.

Identifying Your System

When you request technical assistance, be ready to provide the serial number of your computer, its system BIOS version number, its configuration (including the type of disk drives, monitor, and option cards), and the names and version numbers of any software programs you are using.

Use these guidelines to locate information about your system:

Serial number: Look on the back panel of the computer to find the serial number.

System BIOS version: Restart your system. You'll see the system BIOS version number displayed on the screen when your system performs power-on diagnostics.

System configuration Start SETUP and select the System Summary option to see your system's configuration.

MS-DOS version: At the MS-DOS prompt, type **VER** and press **Enter** to see the MS-DOS version number.

Software versions: In Windows applications, select "About" from the Help menu. As your software application starts, it usually displays a version number on the banner screen. Also, you can check your software manual.

CONFIG.SYS: At the MS-DOS prompt, type **TYPE CONFIG.SYS** and press **Enter** to see a listing of your CONFIG.SYS file, which contains system configuration commands.

AUTOEXECBAT: At the MS-DOS prompt, type **TYPE AUTOEXBC.BAT** and press **Enter** to see a listing of your AUTOEXEC.BAT, which contains system startup commands.

The Computer Will Not Start

The power light is on, but the computer does not start.

Make sure the boot options in SETUP are set to access drive A. Then place a bootable diskette in drive A and turn on the computer again.

Caution

If you turn off the computer, always wait at least 20 seconds before turning it back on. This prevents damages to the computer's electrical circuitry.

Also, your IDE driver may not be installed correctly. Start the system from a bootable diskette in drive A; then reinstall the IDE driver. Also make sure the hard disk drive type is identified correctly in SETUP.

The computer does not start and the power light is not /it.

Make sure the power cord is securely connected to both the AC inlet on the back panel and an electrical outlet.

The power cord is securely connected, but the computer still does not start.

Check the electrical outlet for power. Turn off your computer and unplug the power cord. Plug a lamp into the outlet and turn it on.

You installed or removed system components, and now your computer does not stat.

Check to make sure you have reconnected all the internal and external cables correctly.

You may have installed option cards that exceed the system's power requirements. Check the power requirements in Appendix A.

You may have installed a SIMM incorrectly. If the system doesn't detect memory, it won't start. Check that your SIMM(s) are securely installed in their sockets.

If you replace the microprocessor, make sure the new processor chip is installed correctly. Also make sure the jumpers are set correctly and pin 1 on the chip is connected with pin 1 on the system board. If you did not align the chip correctly, the system won't start. See Chapter 4.

The Computer Does Not Respond

The computer locks up.

Wait a few moments; if your computer does not respond after a reasonable length of time, press Ctrl Alt **Del**. If that doesn't work, press the **RESET** button.

You may have installed memory using SIMMs that work at the wrong speed. Install the correct SIMMs (see Chapter 4).

Your system may have over-heated. If you are using a DX/33 processor, make sure you have an adequate heat sink installed on the chip. If you are using a DX/50, DX2/50, DX2/66, or Pentium OverDrive processor, you need a heat sink and a fan.

You reset the computer, but it still does not respond.

Try turning the computer off, wait 20 seconds, and turn it on again.

Your computer suddenly stops operating.

You may have overloaded the power supply. See your option card manual(s) for the power requirements for your option card(s). Then check Appendix A to see if you have exceeded the option slot power limits.

Keyboard Problems

The screen displays a keyboard error message when you turn on or reset the computer.

Make sure the keyboard is securely connected to the keyboard port and not the mouse port. Although these ports look alike, they cannot be used interchangeably.

Nothing happens when you type on the keyboard.

The **Lockout Timer may be set in SETUP**. This option inactivates the keyboard for a specified period of time after the system returns to an active mode from a low-power standby mode. This delay gives Energy Star compliant monitors the time they need to return to an active mode. Wait a few seconds and try again.

See “The Computer Does Not Respond,” above.

The cursor keys on the numeric keypad do not work Property.

If the Num Lock light in the upper right corner of the keyboard **is lit**, press **NumLock** to turn off the function.

Monitor Problems

There is no display on the screen.

Check that the monitor's power switch is on and that its power light is on.

Also, the computer may be in low-power standby mode. When you press a mouse button or a key on the keyboard, see if the monitor displays an image.

The power light is on, but you still do not see anything on the screen.

Press a mouse button or a key on the keyboard to see if the computer is in low-power standby mode. Also, check the brightness and contrast controls.

If you still do not see anything on the screen, make sure the monitor is securely connected to the computer.

If you are running an application program, see if you need to set up 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.

The power switch is on but the power light is not on.

If the monitor is Energy Star compliant, it may be in low-power standby mode. Press a mouse button or a key on the keyboard to activate the monitor.

Turn off the monitor's power, wait five seconds, and turn it **back** on.

If the light still does not come on, check the electrical outlet for power. Turn off your monitor and unplug it from the outlet. Then plug a lamp into the wall outlet and turn it on. If the light turns on, your monitor may be faulty.

Diskette Problems

You see a diskette error message.

Reinsert the diskette, making sure you insert it all the way. If the drive has a latch, turn it down to secure the diskette.

Also, check to see that you have inserted the right type of diskette in the drive. For example, make sure you are not inserting a high-density diskette in a double-density drive.

If reinserting the diskette does not solve the problem, insert the diskette in another diskette drive of the same type. If you can read the diskette in a different drive, your drive may be faulty.

The diskette is the right type, but you still see an error.

Check that the diskette is not writeprotected, preventing the drive from writing to the diskette.

Make sure the diskette is formatted. See your operating system documentation for instructions on formatting diskettes.

The system may have the **Diskette Access option in SETUP** enabled. If you entered a User level password when you started the system, but this option is set to a Supervisor level, you see an error when you access the drive.

You may have a defective diskette. Try copying the files from the bad diskette to a new diskette.

Something is wrong with the data in the files.

If you are using MS-DOS, run CHKDSX to repair the files. You may also be able to use special utilities or diagnostics to solve this problem.

Diskette Drive Problems

A newly-installed diskette drive is not working properly.

Make sure you have installed the drive correctly and check all the cable connections.

You see a diskette drive error when you start your computer.

Run the SETUP program and configure your system for the correct type of diskette drive.

The diskette drive is making loud or unusual noises.

Contact your Authorized Epson Servicer.

Hard Disk Drive Problems

A newly-installed hard disk drive is not working properly or its performance is not what you expect.

Make sure you have installed the drive correctly and check all cable connections. Also, check the jumper settings on your drive.

Check that you have installed the IDE driver on your hard disk (see Chapter 2). To take advantage of the local bus IDE interface, your hard disk drive must support a 32-bit data path that uses double-word I/O. Also make sure your CONFIG.SYS file is loading the IDE driver when you start your system.

Some hard disk drives do not support the Energy Star features on your system. You may need to disable these features in SETUP.

You see a hard disk drive error when you start your system.

Run SETUP and check that your system is auto-sensing the correct drive type. If auto-sensing is enabled and SETUP displays information that does not match your drive, you may need to define your own drive type. See Chapter 2.

If you've loaded the IDE driver, edit your CONFIG.SYS file so that the command line for your IDE driver is after any memory or disk management utility commands. Save your changes, then restart your system.

Make sure the jumpers on the system board are set correctly. Jumper J35 enables or disables the IDE hard disk drive controller. See Chapter 4 for jumper information.

Make sure the jumpers on the hard disk drive are set correctly. See the documentation that came with the drive for more information.

You are unable to store data on the hard disk drive.

If the hard disk drive has been in low-power standby mode, make sure the drive has had time to achieve its full operating speed before you try to write data to it.

If your drive was not configured, make sure you have partitioned and formatted it correctly for your operating system. See your operating system manual for instructions.

Also, make sure your hard disk drive has been physically formatted by the manufacturer. (All Epson-supplied drives are physically formatted at the factory.) If it has not been physically formatted, use the format utility that came with the drive to format it before you partition it or install the operating system.

Note that a physical format is different from software-based formatting commands, such as the MS-DOS FORMAT command.

You have been using your hard disk drive successfully for some time but notice a reduction in performance.

The data on the disk may have become fragmented & back up all your data and use a disk compaction utility to reorganize the **files on your disk.**

Check that your IDE driver is installed correctly (see Chapter 2). Make sure your CONFIG.SYS has not been altered and that it loads the IDE driver.

If you cannot access data on your hard disk or you are seeing read/write errors, the disk may have a physical problem. Contact your Authorized Epson Servicer.

Password Problems

You have forgotten your password.

You must discharge your CMOS memory. To do this, you need to change the setting of jumper J34 to position 3-4. See Chapter 4 for details on changing the jumper setting.

After you have changed J34, restart your system, leave it on for a few seconds, then turn it off again. This resets the SETUP values to their factory defaults. Both the Supervisor and the User passwords are disabled.

Set J34 back to position 2-3. Then turn the computer on again. Use SETUP to set a new password, if you want one.

Software Problems

Windows won't Start after you installed the IDE driver.

Reinstall the IDE driver, making sure you load the driver for DOS as well as for Windows.

The application program does not start.

Check that you are following the correct procedure for starting the program and that it is installed correctly. If you do not have a hard disk, make sure the correct diskette is in the diskette drive. If you need help, contact your software manufacturer.

The application program is having trouble reading a key disk.

You may be running an application that requires a slower processor speed. You need to change the speed switch jumper, J22. See Chapter 4 for information on changing the jumper..

The application program is having trouble reading from or writing to the hard disk drive.

If you have enabled the Fixed Disk Timeout option in SETUP, your application may be timing out during the few second delay when the hard disk drive returns to its operating speed after being in standby mode. Disable this option in SETUP.

Your application has locked the computer, making it unresponsive to keyboard commands.

Reset the computer and try again. If resetting the computer does not help, turn it off, wait 20 seconds, then turn it on again.

Some software, like OS/2,[®] UNIX,[®] or NetWare 3.11, needs a minimum of 8MB to 16MB of RAM to work correctly. Check your software documentation for the minimum memory requirements. If necessary, add additional memory using the instructions in Chapter 4.

Printer Problems

The printer does not work at all.

Check that the printer has power and is properly **connected** to the computer. Also make sure your printer has paper in it.

The printer prints garbled information.

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

Also, make sure you have the proper drivers installed for your printer and make sure you've selected the correct printer within your software application.

Option Card Problems

A newly installed option card is not working correctly.

Make sure the option card is installed correctly and is well-seated in its slot. Run the SETUP program to update your computer's configuration after you install the card. Also, perform setup procedures for any software you are using with the option card.

See the documentation that came with the option card to set any necessary DIP switches or jumpers on the card.

The computer may also have some jumpers that must be set for the option card to work properly. See Chapter 4 for system jumper information.

Your system may need to operate at the slower processor speed to access the device. Try reducing the processor speed (see chapter 3).

Make sure you install option cards that meet the system's power requirements. See Appendix A.

Make sure the option card is not touching any other card. Also make sure the card isn't touching the CPU or any fan or heat sink you have attached to the CPU.

If a fan or heat sink is attached to the CPU, don't install an option card in the lowest 16-bit option slot.

An external device connected to the option card is not working correctly.

Make sure you are using the proper cable to securely connect the device to the card.

Memory Module Problems

The memory count displayed by the power-on diagnostics program is incorrect.

You may have installed the SIMMs incorrectly. They may be the wrong type or speed, or they may not be inserted all the way. See Chapter 4 for information on installing SIMMs.

If you have installed a gold-plated SIMM in the sockets, the socket may have corroded slightly. Remove the SIMM and clean the gold-plated connection; then reinstall the SIMM.

Mouse Problems

Your mouse isn't working properly or you see auxiliary device error message.

Make sure the mouse cable is securely **connected** to the MOUSE port and not the keyboard (K/B) port. Also make sure you installed the mouse driver correctly (if necessary). See the documentation that came with your mouse for instructions. (Windows automatically installs a mouse driver when you install the program.)

Controller Problems

You see a controller error for the drive controllers or the I/O port controllers when you start your system.

The indicated controller on your system board may be faulty. If you have an option card with a controller that will work with your device, you can install it and change the jumper settings on the system board to disable the built-in controller. You can then continue to use your system until it is convenient for you to have it serviced.

External Cache Problems

The amount of cache displayed by the power-on diagnostics program is incorrect.

You may have installed the external cache chips incorrectly. They may be the wrong type, or they may not be inserted all the way. Also, make sure the tag chip you've installed is 20ns for all microprocessors except the 486DX/50. For this processor, the tag chip must be 15ns.

Also, you may not have changed the SETUP program or the jumpers to *recognize the new* cache. *Make* sure you have set the External cache option to Enabled and set both the System shadow and the Video shadow optionsto Enabled.

See Chapter 4 for instructions on changing the jumper settings or information on installing external cache; see Chapter 2 for instructions on using the SETUP program.

Appendix A

Specifications

CPU and Memory

32-bit CPU

Intel 486SX, DX, or DX2 processor upgradable to faster, more powerful processors, including the Pentium OverDrive

Green PC energy saver

Energy Star compliant, low-power standby mode (using less than 30 Watts) for the hard disk drive and the video signals the computer sends to the monitor; time periods selectable in SETUP

System speed

Fast and slow speeds available as described in the table below; speed selection through keyboard commands or jumper setting

speed setting	CPU speed	local bus speed	ISA bus speed
Fast*	25/33/50 MM	25/33/50 MM	8.33 MHz
slow	8MHz	25/33/50 MHz	8.33 MHz

* DX2/50 and DX2/66 systems run internally at 50 and 66 MHz. but run externally at 25 and 33 MM The local bus speed for these systems 25 and 33MHz. respectively.

Memory	4MB RAM standard on a SIMM; expandable to 64MB using 1MB, 2MB, 4MB, 8MB, 16MB, and 32MB SIMMs; SIMMs must be tin-plated, 72-pin, 32-bit or 36-bit, fast-page mode type with access speed of 80ns or faster
ROM	128KB Phoenix@ system BIOS, video BIOS, and SETUP code located in EPROM on main system board
<i>video RAM</i>	1MB DRAM on main system board; expandable to 2MB using two ZIP chips
<i>Shadow RAM</i>	Supports shadowing of system and video BIOS ROM into RAM
<i>Memory relocation</i>	Supports relocation of 256KB of memory from A0000h to BFFFFh and D0000h to EFFFFh to extended memory
Cache	8KB of internal cache; supports 64KB, 128KB, or 256KB of external cache using 28-pin, 8 x 8, 20ns DIP chips or 28-pin, 32 x 8, 20ns DIP chips
Math coprocessor	Math coprocessor built into the microprocessor for DX, DX2, and systems upgraded to a Pentium OverDrive processor.
<i>Clock/calendar</i>	Contained in the 82C491 system controller chip along with 64 bytes of CMOS RAM backed up by a soldered NiCad rechargeable battery

Controllers

<i>Video</i>	Cirrus Logic® GD5428 high speed super VGA local bus controller with True Color support
<i>Diskette</i>	Controller on main system board supports up to two diskette drives or one diskette drive and one tape drive
<i>Hard disk</i>	High-speed, 32-bit local bus IDE interface on main system board supports up to two IDE hard disk drives with built-in controller; BIOS provides hard disk auto-sensing function

Interfaces

<i>Monitor</i>	VGA interface for fixed or multi-frequency monitor built into system board; low-power standby mode for Energy Star compliant monitors; 15-pin, D-shell connector
<i>Parallel</i>	One standard 8-bit parallel bidirectional interface built into main system board; 25-pin, D-shell connector
<i>Serial</i>	Two RS-232C, programmable, asynchronous interfaces built into main system board; 9-pin, D-shell connectors
<i>Keyboard</i>	PS/2 compatible keyboard interface built into main system board; 6-pin, mini DIN connector

<i>Mouse</i>	PS/2 compatible mouse interface built into main system board; 6-pin mini DIN connector
Optional game port	Optional IO-pin game port interface on system board; can control joy-stick functions with the addition of a port connector
<i>Option slots</i>	Three 16-bit, full-length and two 8-bit, half-length I/O expansion slots, ISA compatible, 8.33 MHz bus speed; on DX/50, DX2, or Pentium OverDrive systems, one 16-bit slot is unavailable because of the CPU heat sink/fan assembly
<i>Speaker</i>	Internal
<i>Mass storage</i>	<p>Internal mounts: Two 3½-inch wide, one-inch drives; with three or more option cards installed, the power supply only supports one internal drive</p> <p>Externally accessible mounts: One 3½-inch wide, third-height drive and one 5¼-inch wide, half-height drive</p>
<i>Diskette drives</i>	<p>3.5-inch diskette drive, 720KB or 1.44MB storage capacity</p> <p>5.25-inch diskette drive, 360KB or 1.2MB storage capacity</p>
<i>Hard disk drives</i>	3½-inch form factor hard disk drive(s), up to half-height size

Other devices Half-height tape drive, CD-ROM, optical drive, or other storage device; 5¼-inch or 3½-inch with mounting frames

Keyboard Detachable, two-position height; 101 or 102 sculpted keys; country-dependent main typewriter keyboard; numeric/cursor control keypad; four-key cursor control keypad; 12 function keys

SETUP Program Stored in ROM; accessible by pressing F2 during boot

System security User and supervisor level passwords (8 characters) available for system boot or diskette access

Virus protection Write protection feature for the hard disk drive boot sector; periodic reminder message for running virus detection utility

Physical Characteristics

Width 15.6 inches (396 mm)

Depth 14.5 inches (368 mm)

Height 4.1 inches (104 mm)

Weight 15 lb (6.8 kg), without drives or keyboard

Power Supply

Type	65 Watt, UL listed, fan-cooled
Input ranges	100-240 VAC
Maximum outputs	+5 VDC at 7.5 Amps, -5 VDC at 0.1 Amps, +12 VDC at 2.0 Amps, -12 VDC at 0.2 Amps
Frequency	50/60 Hz
Cables	Two to main system board; four to mass storage devices

Option Slot Power Limits

Maximum current	+5 Volts	-5 volts	+12 volts	-12 volts
For all slots*	3.3 Amps	0.1 Amps	1.0 Amps	0.1 Amps

* Based on a system containing one hard disk drive and one diskette drive.

Environmental Requirements

condition	Operating	Non-operating range	storage range
Temperature	41° to 90° F (5° to 32° C)	-4° to 140° F (-20° to 60° C)	-4° to 140° F (-20° to 60° C)
Humidity (non-condensing)	20% to 90%	10% to 90%	10% to 90%
Altitude	-330 to 9,900 ft (-100 to 3,000 m)	-330 to 39,600 ft (-100 to 12,000 m)	-330 to 39,600 ft (-100 to 12,000 m)

Environmental requirements (continued)

Condition	Operating range	Non-operating range	Storage range
Maximum wet bulb	68° F (20° C)	104° F(40° C)	134° F (57° C)
Accoustical noise	46.2 dB	N/A	N/A

Video Resolutions and Colors

Resolution	Memory Requirements (MB)	Color	Vertical Frequencies (HZ)	Remarks
640x480		256	60/72	8 bits/pixel
		32K/64K	60	16 bits/pixel
		16.8M (True Color)	60	24 bits/pixel
800x600		16	56/60/72	4 bit planes
	1	256	<i>56/60/72</i>	8 bit/pixel
1024x768	1	16	43.5/60/70/72	4 bit planes*
	1	256	43.5/60/70/72	8 bit/pixel*
	2	64K	43.5	16 bits/pixel"
1280 x 1024		16	43.5	4 bit planes"
	2	256	43.5	8 bits/pixel"

* Non-interlaced and interlaced

** Interlaced

Hard Disk Drive Types

This computer comes with a hard disk auto-sensing feature. When you press **Enter** with the cursor positioned on the Autotype Placed Disk option in **SETUP**, the system detects the type of hard disk drive you have installed and fills in the drive information using values in the following table.

Hard disk drive types

Type	Size* (MB)	Cylinders	Heads	Sectors/Track	Landing Zone	Write Precomp	Epson Drive
1	85	903	4	46	903	None	CP30084E
2	121	762	8	39	762	None	CP30104H
3	106	1024	12	17	1024	None	
4	65	940	8	17	615	300	
5	49	940	6	17	940	512	
6	170	903	8	46	903	None	CP30174E
7	171	332	16	63	332	None	
8	213	1024	12	34	1024	None	
9	117	900	15	17	901	None	
10	341	768	14	62	768	None	
11	528	1024	16	63	1024	None	
12	52	855	7	17	855	None	
13	170	1010	6	55	1010	None	AC1170
14	255	1010	9	55	1010	None	AC2250
16	341	1010	12	55	1010	None	AC2340
17	212	989	12	35	989	None	
18	59	977	7	17	977	None	
19	62	1024	7	17	1023	512	
20	31	733	5	17	732	300	
21	127	919	16	17	919	None	ELS127A
22	31	733	5	17	733	300	
23	170	1011	15	22	1011	None	ELS170A
24	245	723	13	51	723	None	LPS240A
25	252	895	10	55	895	None	CP30254
26	343	665	16	63	665	None	CP30344

Hard disk drive types (continued)

Type	Size* (MB)	Cylinders	Heads	Sectors/Track	Landing Zone	Write Precomp	Epson Drive
27	528	1024	16	63	1024	None	
28	42	977	5	17	977	None	
29	131	1002	8	32	1002	None	
30	245	967	16	31	967	None	
31	345	790	15	57	790	None	
32	42	809	6	17	809	128	
33	50	830	7	17	830	None	
34	72	830	10	17	830	None	
35	44	1024	5	17	1024	None	
36	71	1024	8	17	1024	None	
37	42	615	8	17	615	128	
38	109	1024	8	26	1024	None	
39	72	925	9	17	925	None	
40	80	1024	9	17	1023	None	
41	119	918	15	17	917	None	
42	133	1024	15	17	1023	None	
43	143	823	10	34	822	None	
44	84	969	5	34	968	None	
45	118	969	7	34	968	None	

* Actual formatted size may be slightly different than size on drive label; you cannot change this value.

Drive Option Information

Hard disk drive options for 1-inch IDE drives

Model	Size (MB)	Avg seek (ms)	Buffer size (KB)	Cyl	Hds	Pre	LZ	Sec
Conner®								
CP-30084E	80	17	32	903	4	0	903	46
CP-30104H	120	<19	32	762	8	0	762	39
CP-30174E	170	17	64	903	8	0	903	46
CP-30254	250	14	32	895	10	0	895	55
CP-30344	340	13	64	655	16	0	655	63
Quantum®								
ELS170AT	170	17	32	1011	15	none*	1011	22
LPS240AT	240	16	256	723	13	none*	723	51
Western Digital®								
AC1170	170	<13	64	1010	6	1011	1011	55
AC2250	250	<13	64	1010	9	1011	1011	55
AC2340	340	<13	128	1010	12	1011	1011	55
Seagate®								
ST3243A	213	16	32	1024	12	none*	1025	34

- Select 1 or none for the precomp value. If neither of these options are available, select the maximum available precomp value.

DMA Assignments

Level	Assigned device
DMA0	Reserved (8-bit)
DMA1	Reserved (8-bit)
DMA2	FDD controller (8-bit)
DMA3	Reserved (8-bit)
DMA4	Cascade for DMA controller 1
DMA5	Reserved (16-bit)
DMA6	Reserved (16-bit)
DMA7	Reserved (16-bit)

Hardware Interrupts

IRQ no.	Function
IRQ0	Timer output
IRQ1	Keyboard
IRQ2	Cascade from IRQ controller 2
IRQ3	Serial port 2
IRQ4	Serial port 1
IRQ5	Parallel port 2
IRQ6	FDD controller
IRQ7	Parallel port 1
IRQ8	Real-time clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 mouse
IRQ13	Math coprocessor
IRQ14	HDD controller
IRQ15	Reserved

System Memory Map

000FFFFFFh	System BIOS ROM: 64KB Duplicated from 0F0000h	
000FF0000h	Reserved for system board: 64KB Duplicated from 0E0000h	64MB
000FE0000h	Extended memory	(Maximum system memory)
00100000h	System BIOS ROM: 64KB Default Shadow RAM duplicated at FF0000h	1MB
000F0000h	Unused or I/O expansion ROM: 160KB Reserved for ROM on I/O adapters	
000C8000h	VGA BIOS ROM: 32KB Default Shadow RAM	
000C0000h	VGA text (color): 32KB	
000B8000h	Unused or VGA text (monochrome): 32KB	
000B0000h	Video memory: 64KB Reserved for graphics display buffer	
000A0000h	Conventional system memory: 640KB	640KB
00000000h		

System I/O Address Map

Hex address	Assigned device
000 - 01F	DMA controller 1, 8237
020 - 03F	Interrupt controller 1, 8259
022 - 024	Chip set configuration register
040 - 05F	Timer, 8254
060 - 06F	Keyboard controller, 8042
070 - 07F (CMOS)	Real-time clock NMI (non-maskable interrupt) mask
080 - 09F	DMA page register, 74LS612
0A0 - 0BF	Interrupt controller 2, 8259A
0B4, 0B8	AD12 control register
0BC	AD12 control register
0C0 - 0DF	DMA controller 2, 8237
0F0	Clear math coprocessor busy
0F1	Reset math coprocessor
0F8 - 0FF	Math coprocessor
1F0 - 1F8	Hard disk
200 - 207	Game I/O
278 - 27F	Parallel printer port 2
280 - 2DF	Alternate enhanced graphics adapter
2E1	GPIO (adapter 0)
2E2, 2E3	Data acquisition (adapter 0)
2F8 - 2FF	Serial port 2
300 - 31F	Prototype card
360 - 363	PC network (low address)
368 - 36B	PC network (high address)
378 - 37F	Parallel printer port 1
380 - 38F	SDLC, bisynchronous 2
390 - 393	Cluster
3A0 - 3AF	SDLC, bisynchronous 1
3B0 - 3BF	Monochrome display and printer adapter
3C0 - 3CF	Enhanced graphics adapter
3D0 - 3DF	Color graphics monitor adapter
3F0 - 3F7	Diskette drive controller

System I/O address map (continued)

Hex address	Assigned device
3F8 - 3FF	Serial port 1
6E2, 6E3	Data acquisition (adapter 1)
790 - 793	Cluster (adapter 1)
AE2, AE3	Data acquisition (adapter 2)
B90, B93	Cluster (adapter 2)
EE2, EE3	Data acquisition (adapter 3)
1390 - 1393	Cluster (adapter 3)
22E1	GP1B (adapter 1)
2390 - 2393	Cluster (adapter 4)
42E1	GP1B (adapter 2)
62E1	GP1B (adapter 3)
82E1	GP1B (adapter 4)
A2E1	GP1B (adapter 5)
C2E1	GP1B (adapter 6)
E2E1	GP1B (adapter 7)

Connector Pin Assignments

Parallel port connector pin assignments (CN3)

Pin	Signal	Pin	Signal	Pin	Signal
1	Strobe	10	ACK *	19	Signal ground
2	Data 0	11	Busy	20	Signal ground
3	Data 1	12	PE	21	Signal ground
4	Data 2	13	Select	22	Signal ground
5	Data 3	14	AFD *	23	Signal ground
6	Data 4	15	Error *	24	Signal ground
7	Data 5	16	Init *	25	Signal ground
8	Data 6	17	Selectin *		
9	Data 7	18	Signal ground		

* Active low logic

Serial port connector pin assignments (CN4 and CN5)

Pin	Signal	Pin	Signal
1	Data carrier detect	6	Data set ready
2	Receive data	7	Request to send
3	Transmit data	8	Clear to send
4	Data terminal ready	9	Ring indicator
5	Ground		

Keyboard and mouse connector pin assignments (CN7, CN6)

Pin	Signal	Pin	Signal
1	Data	4	+5 VDC
2	NC	5	Clock
3	Ground	6	NC

VGA port connector pin assignments (CN2)

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	6	Red ground	11	NC
2	Green	7	Green ground	12	Monitor detect
3	Blue	8	Blue ground	13	Horizontal sync
4	NC	9	NC	14	Vertical sync
5	Ground	10	GND	15	NC

Power supply connector pin assignments (CN8)

Pin	Signal	Pin	Signal
1	Power good	7	Ground
2	+5 VDC	8	Ground
3	+12 VDC	9	-5 VDC
4	-12 VDC	10	+5 VDC
5	Ground	11	+5 VDC
6	Ground	12	+5 VDC

Diskette drive connector pin assignments (J15)**

Pin	Signal	Pin	Signal
2	REDWC*	20	STEP
4	No connect	22	Write data
6	No connect	24	Write enable
8	INDEX	26	Track 00
10	MotorA	28	Write protect
12	DriveB	30	Read data
14	DriveA	32	Select head
16	MotorB	34	Disk change
18	Direction		

* Active low logic

** All odd-numbered pins are grounds

Hard disk drive connector pin assignments (J30)

Pin	Signal	Pin	Signal	Pin	Signal
1	RESET*	15	D1	29	NC
2	Ground	16	D14	30	Ground
3	D7	17	D0	31	Interrupt
4	D8	18	D15	32	IOCS16*
5	D6	19	Ground	33	A1
6	D9	20	NC	34	NC
7	D5	21	NC	35	A0
8	D10	22	Ground	36	A2
9	D4	23	IOW*	37	CS0*
10	D11	24	Ground	38	CS1*
11	D3	25	IOR*	39	Active*
12	D12	26	Ground	40	Ground
13	D2	27	Ready*		
14	D13	28	NC		

* Active low logic

Speaker connector pin assignments (J21)

Pin	Signal
1	VCC
2	Speaker

Optional game port interface pin assignments (J2)

Pin	Signal	Pin	Signal
1	VCC	6	Position 1
2	Button 0	7	Button 1
3	Position 0	8	VCC
4	Ground	9	VCC
5	Ground	10	NC

Optional game port connector pin assignments

Pin	Signal	Pin	Signal	Pin	Signal
1	VCC	6	Position 1	11	NC
2	Button 0	7	Button 1	12	NC
3	Position 0	8	VCC	13	NC
4	Ground	9	VCC	14	NC
5	Ground	10	NC	15	NC

Option card riser board connector pin assignments (S1)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A1	+12 VDC	A31	SA3	B1	+12 VDC	B31	BALE
A2	Ground	A32	SA2	B2	+5 VDC	B32	+5 VDC
A3	Ground	A33	SA1	B3	Ground	B33	OSC
A4	IOCHCK*	A34	SA0	B4	Ground	B34	Ground
A5	SD7	A35	Ground	B5	RESETDRV	B35	Ground
A6	SD6	A36	Ground	B6	+5 VDC	B36	+5 VDC
A7	SD5	A37	+5 VDC	B7	IRQ9	B37	+5 VDC
A8	SD4	A38	SBHE*	B8	5 VDC	B38	MEMCS16*
A9	SD3	A39	LA23	B9	DRQ2	B39	IOCS16*
A10	SD2	A40	LA22	B10	-12 VDC	B40	IRQ10
A11	SD1	A41	LA21	B11	OWS*	B41	IRQ11
A12	SD0	A42	LA20	B12	+12 VDC	B42	IRQ12

Option card riser board connector pin assignments (continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A13	IOCHRDY	A43	LA19	B13	Ground	B43	IRQ13
A14	AEN	A44	LA18	B14	SMEMW*	B44	IRQ14
A15	SA19	A45	LA17	B15	SMEMR*	B45	DACK0*
A16	SA18	A46	MEMR*	B16	IOW*	B46	DRQ0
A17	SA17	A47	MEMW*	B17	IOR*	B47	DACK5*
A18	SA16	A48	SD8	B18	DACK3*	B48	DRQ5
A19	SA15	A49	SD9	B19	DRQ3	B49	DACK6*
A20	SA14	A50	SD10	B20	DACK1*	B50	DRQ6
A21	SA13	A51	SD11	B21	DRQ1	B51	DACK7*
A22	SA12	A52	SD12	B22	REFRESH*	B52	DRQ7
A23	SA11	A53	SD13	B23	SYSCLK	B53	+5 VDC
A24	SA10	A54	SD14	B24	IRQ7	B54	MASTER*
A25	SA9	A55	SD15	B25	IRQ6	B55	Ground
A26	SA8	A56	Ground	B26	IRQ5	B56	Ground
A27	SA7	A57	Ground	B27	IRQ4	B57	Ground
A28	SA6	A58	Ground	B28	IRQ3	B58	Ground
A29	SA5	A59	+5 VDC	B29	DACK2#	B59	+5 VDC
A30	SA4	A60	+5 VDC	B30	TC	B60	+5 VDC

* Active low logic

Option slot connector pin assignments

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A1	IOCHCK*	A26	SA5	B20	SYSCLK	C14	SD11
A2	SD7	A27	SA4	B21	IRQ7	C15	SD12
A3	SD6	A28	SA3	B22	IRQ6	C16	SD13
A4	SD5	A29	SA2	B23	IRQ5	C17	SD14
A5	SD4	A30	SA1	B24	IRQ4	C18	SD15
A6	SD3	A31	SA0	B25	IRQ3	D1	MEMCS16*
A7	SD2	B1	Ground	B26	DACK2*	D2	IOCS16*
A8	SD1	B2	RESET	B27	T/C	D3	IRQ10
A9	SD0	B3	+5 VDC	B28	BALE	D4	IRQ11
A10	IORDY	B4	IRQ9	B29	+5 VDC	D5	IRQ12
A11	AEN	B5	-5 VDC	B30	OSC	D6	IRQ15

Option slot connector pin assignments (continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A12	SA19	B6	DRQ2	B31	Ground	D7	IRQ14
A13	SA18	B7	-12 VDC	C1	SBHE*	D8	DACK0*
A14	SA17	B8	OWS*	C2	LA23	D9	DRQ0
A15	SA16	B9	+12 VDC	C3	LA22	D10	DACK5*
A16	SA15	B10	Ground	C4	LA21	D11	DRQ5
A17	SA14	B11	SMEMW*	C5	LA20	D12	DACK6*
A18	SA13	B12	SMEMR*	C6	LA19	D13	DRQ6
A19	SA12	B13	IOW*	C7	LA18	D14	DACK7*
A20	SA11	B14	IOR*	C8	LA17	D15	DRQ7
A21	SA10	B15	DACK3*	C9	MEMR*	D16	+5 VDC
A22	SA9	B16	DRQ3	C10	MEMR*	D17	MASTER*
A23	SA8	B17	DACK1*	C11	SD8	D18	Ground
A24	SA7	B18	DRQ1	C12	SD9		
A25	SA6	B19	REFRESH*	C13	SD10		

* Active low logic

SIMM socket pin assignments (U18, U19)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	Ground	19	D10	37	DP1	55	D11
2	Data 0	20	D4	38	DP3	56	D27
3	Data 16	21	D20	39	Ground	57	D12
4	Data 1	22	D5	40	CAS0*	58	D28
5	Data 17	23	D21	41	CAS2*	59	VCC
6	Data 2	24	D6	42	CAS3*	60	D29
7	Data 18	25	D22	43	CAS1*	61	D13
8	Data 3	26	D7	44	RAS0*	62	D30
9	Data 19	27	D23	45	RAS1*	63	D14
10	VCC	28	A7	46	NC	64	D31
11	NC	29	NC	47	WE*	65	D15
12	A0	30	VCC	48		66	NC
13	A1	31	A8	49	D8	67	PD1
14	A2	32	A9	50	D24	68	PD2
15	A3	33	RAS3*	51	D9	69	PD3
16	A4	34	RAS2*	52	D25	70	PD4

SIMM socket pin assignments (continued)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
17	A5	35	PD2	53	D10	71	NC
18	A6	36	DPO	54	D26	72	Ground

Active low logic

Tested Operating Environments

Although your system will run most software applications, the following operating environments have been tested for compatibility with your system.

Microsoft MS-DOS **3.1** to 5.0,6.0, and 6.20

Novell® DR DOS® 6.0

Novell NetWare* 2.2,3.12, and 4.01

Novell NetWare Lite 1.1

IBM® OS/221

SCO® UNIX release 3.2, version **4.2**

SCO Open Desk top 3.0

Microsoft Windows 3.0 and 3.1

Microsoft Windows for WorkGroups 3.11

Microsoft Windows NT 3.1

- Certified as Workstation; tested as File server

Your system has also received Novell's 'Yes, NetWare tested and approved' certification as a workstation. As new environments become available, these also will be tested.

Options Available from Epson

Many options for enhancing and supplementing this product are available from Epson, including the following:

Monitors

- 14" **VGA** monochrome and color monitors
- 14" Extended color VGA monitor
- 17" and 20" Professional Series monitors

Keyboards

- 101 or 102 USA
- 102 International language

Mouse

- 6-pin PS/2-type mouse

Mass **storage devices**

- 5.25 and 3.5-inch diskette drives
- Hard disk drives from 80 to 340MB
- Tape backup drives

Upgrade kits

- 4MB, 8MB, and 16MB SIMM memory expansion kits
- 486SX, DX, DX2, and Pentium OverDrive processor upgrade kits

Printers

- 9-pin and 24-pin dot matrix printers
- Laser printers
- Ink jet printers

Software

- Microsoft Windows**
- MS-DOS**
- OS/2

Glossary

Access speed

The time it takes for a device, such as memory or a disk drive, to return data. For example, your computer's SIMMs return data requested by the microprocessor at an access speed of 70ns.

Address

The location where information is stored in a computer's memory.

AUTOEXEC.BAT file

The batch file your computer runs automatically whenever you load MS-DOS. It configures the installed system devices and sets various user preferences. See also Batch file.

Base memory

see Conventional memory.

Batch file

A file that executes commands automatically. Batch files are text files with the filename extension .BAT. When you type the filename, the operating system sequentially executes the commands in that file.

BIOS

Basic Input/Output System. Routines in ROM (Read Only Memory) that handle the transfer of information among various hardware components, and between the hardware and your operating system.

Boot

The process a computer performs to check its components and then load the operating system into memory.

Bus

A wire or group of wires that sends information between components in the computer. The speed of a bus increases by the number and width of the channels the bus uses to move data.

Cache

A high-speed memory buffer that stores frequently used data where your microprocessor can access it faster. Your computer includes 8KB of internal cache expandable to 256KB with external cache chips. See also External cache and Internal cache.

CMOS

Complementary Metal&de Semiconductor. A low-power silicon chip used for RAM and switching applications that is backed up by a battery.

Conventional memory

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

Coprocessor

See Math coprocessor.

Copy-protected program

A program containing a software “lock” that prevents it from being copied. See also Key **disk**

CPU

Central Processing Unit. The primary device that interprets instructions, performs tasks, keeps track of stored data, and controls input and output operations. See also ***Microprocessor***.

Device driver

A file containing instructions that allow your computer to recognize and communicate with a device. The device may be a printer, monitor, or other type of device.

Display adapter card

A circuit board that controls the way a monitor displays text and graphics, normally installed in an option slot. Also called video card. This computer does not support optional display adapter cards. (A VGA display adapter is built into your computer's main system board.)

Expanded memory

Memory that specially written MS-DOS programs can use when an expanded memory manager program maps that memory into an accessible area.

Extended memory

Memory above 1MB that is accessed by 386 or 486 microprocessors when they are operating in protected or virtual mode. This memory is available to OS/2 programs, but is available to MS-DOS only if an extended memory manager program is installed. See also Expanded memory.

External cache

Optional cache chips you can install on the system board to increase cache memory.

IDE

Integrated Drive Electronics. A type of hard disk drive interface in which the controller is on the drive instead of on a controller card. Your computer includes an interface on the main system board for up to two IDE hard disk drives.

Internal cache

Cache memory built into your microprocessor. Your computer includes 8KB of internal cache.

Jumper

A small moveable plug that connects two pins on a device's circuit board. Jumpers alter the operation of a particular function.

Key disk

A diskette containing a copy-protected program that must remain in a diskette drive while you use the program. See also **Copy-protected program**.

Kilobyte (KB)

A unit used to measure storage space in a computer's memory or on a disk. One kilobyte equals 1024 bytes.

Local bus

An internal bus that controls the connections from the microprocessor to the VGA and IDE interfaces on this computer. Local bus provides increased performance and speed. See also **Bus**.

Main system board

The circuit board inside your computer containing the circuitry and components your computer needs to operate.

Math coprocessor

A device that enables the computer to process mathematical calculations faster by using floating point numbers instead of whole numbers.

Megabyte (MB)

A unit used to measure storage space in a computer's memory or on a disk. One megabyte equals 1024KB (kilobytes).

Megahertz (MHZ)

A unit used to measure oscillation frequency, such as that of a computer's internal clock. A megahertz is one million cycles per second.

Memory module

A small circuit board, commonly called a SIMM (single inline memory module), that contains surface-mounted memory chips. You can add memory modules to the main system board to expand your computer's memory.

Microprocessor

A small CPU on one semiconductor chip. See also CPU.

Numeric keypad

The number and cursor control keys grouped together on the right side of the keyboard. The operation of the dual-use keys on the numeric keypad is controlled by the NumLock key.

Parallel

An interface that transmits data simultaneously over separate wires in a cable. See also Serial.

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.

Pentium OverDrive

The Pentium OverDrive microprocessor incorporates the latest in Pentium technology, including a 64-bit data path, one 8KB internal cache for read-only code, and a second 8KB internal cache for read-write data, and the ability to execute instructions in parallel.

Power-on diagnostics

Tests stored in a computer's ROM that the computer runs to check its internal circuitry, peripheral device configuration, and operating status each time you turn it on or reset it.

Processor speed

The speed at which the computer's processor can execute commands, usually expressed in megahertz (MHz), such as 33 MHz. See also Megahertz.

RAM

Random Access Memory. The area of the computer's memory used to run programs and store data while you work. All data in RAM is erased when you turn off or reset the computer.

Read/write head

The physical device inside a disk or tape drive that reads data from and writes data to the magnetic surface of the disk or tape.

Real-time clock

A clock inside the computer that keeps track of the time and date, even when the computer is turned off, by using power from a backup battery.

Refresh rate

The frequency with which a monitor can redraw a screen image. The faster the refresh rate, the less the screen will flicker.

Reset

To restart a computer without turning it off. You can reset your computer by pressing **Ctrl Alt Del**. Resetting erases all data stored in RAM and reloads your operating system.

ROM

Read Only *Memory*. Memory that can only be read and cannot be modified. ROM retains its contents even when you turn off the computer by using power from a backup battery.

Root directory

The main directory in a hierarchical disk directory structure. All other directories are subdirectories of the root directory.

RS-232C

A standard type of serial communication. You can connect an RS-232C device to either of the computer's RS-232C serial ports.

Serial

The type of communication that transmits data from a serial interface to a serial device over a single wire. See also **Parallel**.

ShadowRAM

The feature in your computer that copies the contents of the system, video, and external BIOS ROMs into the RAM area of memory to speed up processing.

SIMM

See Memory module.

subdirectory

In a hierarchical disk directory structure, a group of files in a directory within another directory or the root directory.

SVGA

Super VGA (Video Graphics Array). In addition to supporting standard VGA modes, your computer's built-in SVGA controller supports resolutions up to 1280 x 1024 in 16 colors on a compatible monitor. If you upgrade the video memory to 2MB, the SVGA controller supports this resolution in 256 colors.

True color

A VGA feature that supports 24-bit-per-pixel color, which enables your VGA interface to display 16.8 million colors. The screen image looks more like a photograph than a traditional computer image.

VESA

Video Electronic Standards Association. The standards set for a common hardware and software interface to super VGA video adapters; provides simplified software application access to VGA products.

VGA

Video Graphics Array. A high-resolution display adapter that provides a variety of video modes.

Video card

See Display adapter card.

Write-protect

To protect the data on a diskette from being changed by setting the write-protect switch on a 3.5-inch diskette or by placing a write-protect tab over the notch on a 5.25-inch diskette. You cannot change data on a write-protected diskette.

ZIF socket

Zero Insertion Force. The type of socket on your system board that holds the microprocessor. With this type of socket, it is easy to remove and install processor chips.

ZIP chip

Zig-zag Inline Package. The type of optional video memory chip you can install on the system board. On this type of chip, the pins alternate in a zig-zag pattern rather than symmetrically.

Index

A

- AC outlet, 1-3
- Advanced Chipset Control option, 2-8
- Advanced System Setup options, 2-6-7
- Application programs
 - compatibility, A-20
 - copy protected, 3-8
 - installing, 2-16
 - problems, 6-11
 - requiring slow speed, 3-8
 - running under MS-DOS 2-4
 - stopping, 3-5
- Auto-sensing, 2-5, 6-9, A-3
- AUTOEXEC.BAT file, 6-2
- Autotype Fixed Disk option, 2-5

B

- Back panel, 1-3,4-2
- Banks
 - cache, 4-22,4-24
 - SIMM socket, 4-10
- Base memory, 2-4
- Battery, 2-2.4-7, A-2
- BIOS, Intro-1, 2-1-2,2-5,4-5,6-1-2, A-2, A-12
- Boot options, 2-8-9,3-6,6-3
- Bootling system, 2-2,2-5, 2-15
- Brightness, 1-9,6-6
- Buttons
 - diskette release, 3-4
 - Pause, 1-8,3-5
 - power, 1-7-8
 - RESET, 1-7,3-6,6-1

C

- Cable
 - diskette drive, S-17-20
 - hard disk drive, 5-2-7,5-14,5-18
 - monitor, 1-3-4
 - power supply, 5-4, 5-6-7,5-17-19
 - printer, 1-5
 - serial device, 1-6
- Cache memory
 - banks, 4-22,4-24
 - configuration, 4-22
 - configuring 2-7
 - external, Intro-1, Intro-3,2-7,45,48, 422-24, 6-14-15, A-2
 - installing, 4-22-24
 - internal, Intro-1, A-2
 - jumpers, 4-8,4-22-24
 - location, 4-5
 - problems with, 6-14
 - setting in SETUP, 4-24
 - sockets, 4-5,4-21-22
 - upgrades, Intro-3
- Card, see Option cards
- CD-ROM, Intro-4, 5-1,5-14, A-5
- Chipset registers, 2-8
- CHKDSK command, 6-7
- Clock speed, processor, 4-7, A-1
- Clock, real-time, 2-4, A-2
- CMOS RAM, 2-2-3,2-15,4-7, A-2
- Colors, Intro-1-2, Intro-4, 4-19, A-3, A-7
- Command prompt, 1-9
- COMn port, see Serial ports
- CompuServe on-line support, Intro-8
- CONFIG.SYS, 2-17, 6-2, 6-8-9

- Configuration
 - cache, 4-22
 - cache memory, 2-7
 - changing 2-1-2,2-15
 - drive, 2-5,5-21
 - files, 4-29,6-2,6-10
 - SIMM, 2-4,4-10
- connecting
 - drive cables, 5-4,5-6,5-17-20
 - keyboard, 1-3
 - monitor, 1-4-5
 - mouse, 1-4
 - power cord, 1-6
 - printer, 1-5-6
- Connector
 - diskette drive, 5-17-18, A-16
 - hard disk drive, 5-5-7, A-16
 - keyboard, 1-3, A-15
 - monitor, I-3-5, A-15
 - mouse, 1-4, A-15
 - option card riser board, A-17
 - option slot, A-18-19
 - optional game port, A-17
 - pin assignments, A-14-19
 - printer, 1-5-6, A-14
 - serial device, 1-6, A-15
 - speaker, A-17
 - VGA port, 1-3,1-5, A-15
- Connector board, option card, see Option card connector board
- Contrast.1-9,6-6
- Control Panel settings, 6-12
- Controller
 - diskette drive, 4-7, A-3
 - had disk drive, 4-7, A-3
 - parallel port, A-3
 - problems, 6-14
 - SVGA, Intro-2, A-3
- Conventional memory, 2-4
- conventions, manual, Intro-6

- Coprocessor, math, Intro-1, Intro-4 A-2
- Cover
 - removing 4-2-3
 - replacing, 4-4
- CPU, see Processors
- CTRL ALT +, 3-9
- CTRL ALT -, 3-9
- CTRL ALT DEL, 3-6-7,6-4
- CTRL BREAK, 3-5
- CTRL C, 3-5
- Cursor, 2-3
- Customer support, Intro-7-8

D

- Data, losing, 3-5
- Date, setting, 2-4
- DB-9P connector, 1-6
- Default settings, 2-15
- Depth, computer, A-5
- Diagnostics, power-on 1-8,6-13
- Disk compaction utility, 6-10
- Diskette drive
 - accessing, 2-9-10, 3-7
 - bays, 1-7,4-5,5-1, 5-14-16,5-19
 - boot sequence, 2-8, 3-6
 - cable, 5-17-20
 - caution, 5-18
 - configuration, 2-5,5-21,6-8
 - connector, 5-17-18, A-16
 - controller, 4-7, A-3
 - errors, 2-10, 6-8
 - faulty, 6-7
 - installing, 5-1-22
 - jumper, 4-7
 - latch, 3-4,6-7
 - light, 1-7, 3-4
 - power cable, 5-17-19,6-8
 - problems, 6-8
 - protective card, 1-8

- Diskette Drive
 - removing, 5-19
 - restricting access, 2-10,3-7,6-7, A-5
 - types, 2-5, 5-2, A-4
- Diskette(s)
 - access, controlling, 2-10, 3-7, 6-7, A-5
 - defective, 6-7
 - formatted, 6-7
 - inserting 3-4
 - key, 3-8, 6-11
 - label, 3-4
 - problems, 2-10, 6-7
 - release button 3-4
 - removing 1-9, 3-4
 - shutter, 3-4
 - type, 6-7
 - write-protected, 6-7
- Display adapters, 2-4, 6-6
- Display option SETUP, 2-4
- DMA assignments, A-11
- DOS, see MS-DOS
- Double-word I/O, 2-17, 6-8
- DRAM video chips
 - installing, 4-19
 - type, 4-19, A-2
- Drivers
 - local bus IDE, Intro-3, Intro-S, 2-1, 2-16-17, 6-3, 6-8-11
 - mouse, 1-4, 6-14
 - pm-configured, Intro-3-4, 2-16
 - printer, 6-12
 - SVGA, Intro-3, Intro-5, 2-1,2-16,2-18
 - Windows, 1-4, 2-16-17, 6-14
- Drives, see *Diskette drive or Hard disk drive*
- E
- EGA/VGA, 2-4
- Electric shock, 1-6, 4-3
- Electrical
 - circuitry, 1-8, 6-3
 - outlet, 1-5-6, 6-3
- Electromagnetic interference, 1-2
- Energy Star
 - description, Intro-3, 3-3
 - monitors, Intro-2, 2-13,3-2,6-5-6, A-1, A-3
 - problems, 6-5-6, 6-9,6-1 1
 - settings, 2-2, 2-13-14
- Energy, conserving, 3-2
- Environmental conditions, 1-1
- Epson America Forum, CompuServe, Intro8
- Epson Connection, Intro-7
- Ergonomic tips, 3-1
- Errors
 - disabling messages, 2-9
 - diskette drive, 2-10, 6-7-8
 - hard disk drive, 6-9
 - keyboard, 6-5
 - read/write, 6-10
- Extended
 - memory, 2-4-5, A-12
 - VGA, Intro-5, 2-18; see *also* SVGA
- External cache, Intro-1, Intro-3, 2-7, 4-5,4-8,4-22-24, 6-14-15, A-2
- External device problems, 6-13
- F
- Faceplate
 - removing 5-15
 - replacing, 5-19
- Factory default settings, 2-15
- Fast processor speed, 3-8-9, A-1
- Files
 - AUTOEXEC.BAT, 6-2
 - CONFIG.SYS, 2-17, 6-2, 6-8-9
 - repairing 6-7
 - SYSTEM.INI, 2-17
- Fixed Disk Setup option, 2-5
- Fixed Disk Timeout option, 2-14
- Formatting
 - diskettes, 6-7
 - hard disk drive, 6-9

Frequency, power supply, Ad
Full-length option slots, A-4
Function keys, SETUP, 2-3

G

Game port, optional, A-4, A-17
Green PC, Intro-1-3,2-2,2-13-14,
3-3, 6-5--6, 6-9, 6-11, A-1, A-3
Grounding
plate, 5-3
yourself, 4-3, 4-20, 4-26
Guiderail 5-3

H

Half-length option slots, A-4
Hard disk drive
access light, 1-7
auto-sensing, 2-5--6,& 9, A-3
bays, 4-5,5-1-2,5-13--14
boot sequence, 2-8
cable, 5-2-7, 5-14, 5-18
configuration, 2-5--6, 5-21
connecting cables, 5-4, 5-6
connector, 5-5-7, A-16
controller, 4-7, A-3
double-word I/O, 2-17, 6-8
errors, 6-9
formatting, 6-9
installing, Intro-4, 5-1-22
jumpers, 5-2,5-12, 6-8
light, 1-7
local bus, Intro-1-2,2-1,2-16-17,68,
A-1, A-3
master, 5-12
parameters, 2-5-6, A-10
physical format, 6-9
power cable, 5-6-7
power requirements, 5-12
preformatted, 2-5
problems, 6-8
removing 5-14, 5-19
SETUP options, 2-5, 2-14
slave, 5-12

Hard disk drive
standby mode, Intro-1-3,2-2,
2-13-14, 3-3 ,6-9, 6-11, A-1
time-out, Intro-3, 2-13-14
types, 2-5, 5-2
user-defined, 2-6
Hardware interrupts, A-11
Heat sink
installing, 4-28
limitations, A-4
Height, computer, A-5
Help screen SETUP, 2-3
Help, where to get, Intro-7
High-speed video memory, A-3
Humidity, A-6

I

I/O

address map, A-13-14
double word, 2-17, 6-8
expansion slots, A-4
problems, 6-14
IDE hard disk drive
controller, 4-7, A-3
driver, Intro-3, Intro-5, 2-1, 2-16-17,
6-3, 6-8--11
interface, 2-17
local bus, Intro-1-2,2-1,2-16-17,6-3,
6-8, A-1, A-3
Indicator lights
diskette drive, 3-4
power, 1-7, 6-3, 6-6
speed, 1-7, 3-8
Inlet, power, 1-5--6, 6-3
Input ranges, power supply, A-6
Interference, electromagnetic, 1-2
Internal cache, intro-1, A-2; see also
Cache memory
Internal components, 4-5
International marketing locations,
Intro-7

J

Jumpers

- cache, 4-8, 4-22-24
- changing settings, 4-6-9
- diskette drive controller, 4-7
- hard disk drive, 5-2, 5-12, 6-8
- location, 4-5-6
- parallel port, 4-7
- processor type settings, 4-8
- serial ports, 4-7

K

K/B port, Intro-1, 1-3, A-3, A-15

Key disk, 3-8, 6-11

Keyboard

- available options, A-21
 - checking connections, 6-5
 - Connecting 1-3
 - connector, 1-3, A-15
 - errors, 6-5
 - num lock, 6-5
 - pin assignments, A-15
 - port, Intro-1, 13, A-3, A-15
 - problems, 6-5
 - PS/2 compatible, Intro-1, 1-3, A-3, A-15
 - specifications, A-3
- Keypad, numeric, 3-9, 6-5
- Keys, SETUP function, 2-3

L

Local bus

- hard disk drive, Intro-1-2, 2-1, 2-16-17, 6-3, 6-8, A-1, A-3
 - IDE driver, Intro-3, Intro-5, 2-1, 2-16-17, 6-3, 6-8-11
 - IDE hard disk interface, A-3
 - speed, A-1
 - video, Intro-1-2, Intro-5, 2-1, A-1, A-3
- Location, choosing 1-1
- Lockout timer option, 2-13, 6-5

Low processor speed, 3-8-9, 6-11, 6-13, A-1

Low-level format, 6-9

Low-power standby mode,
Intro-1-3,2-2,2-13-14,3-3,6-%,
6-9, 6-11, A-1, A-3

L.PTn, see Parallel port

M

Main system board, see System board

Manual conventions, intro-6

Mass storage, Intro-2, Intro-4, 5-1, A-4-5

Master hard disk drive, 5-12

Math coprocessor, Intro-1, Intro-4, A-2

Memory

- banks, 4-10-11
- base, 2-4
- cache, see Cache memory
- clearing/ 3-5
- CMOS RAM, 2-2, A-2
- configuration 4-10-11
- conventional, 2-4
- extended, 2-4-5, A-12
- installing, Intro-3, 4-10-12
- insufficient, 6-12
- modules, see SIMMs
- problems, 6-13
- RAM, Intro-1, Intro-3, 2-4, 2-7, 6-12, A-2
- relocation, 2-8, A-2
- removing 4-13-14
- ROM, 2-2-3, 2-7 2-15, A-2
- SIMMs, see SIMMs
- size, 2-5
- standard, A-2
- system, Intro-1, Intro-3, 1-8, 2-4-5, 2-7, 4-10-12, A-2
- video, see Video memory

Memory shadow, configuring, 2-7

Messages, error, 1-9, 2-10, 6-5,
6-7-10, 6-14

Microprocessor, **see** Processors

Modem, 1-6

Monitor

available options, A-21

brightness, 1-9, 6-6

cables, 1-3-4

connecting 1-4-5

connector, 1-3-5, A-15

contrast, 1-9, 6-6

Energy Star compliant, Intro-2, 2-13,
3-2, 6-5-6, A-1, A-3

power cord, 1-4-5, 6-6

power requirements, 1-5

power switch, 6-6

problems, 6-6

SVGA, 1-4-5

turning off, 1-10, 4-2

turning On, 1-8

VGA port, Intro-1, 1-3-4, 2-4

Mouse

connecting, 1-4

connector, 1-4

driver, 1-4, 6-14

pin assignments, A-15

port, Intro-1, 1-346-14

PS/2 compatible, Intro-1-2, 1-4, A-4,
A-15

specifications, A-4

MS-DOS, Intro-3, 2-4, 4-7

N

NetWare, 2-6, A-20

Num lock, 6-5

Numeric coprocessor, Intro-1,
Intro-4, A-2

Numeric keypad, 3-9, 6-5

O

On-line support, CompuServe,
Intro-8

Operating range, A-6

Operating system

diskette, 3-6, 6-3

installing, 1-9, 2-16

MS-DOS, 2-4, 4-7

pre-configured, Intro-3

prompt, 1-9

reloading, 3-5

version number, 6-2

Optical drives, Intro-4, 5-1, 5-14, A-5

Option card connector board

installing 4-7

locating, 4-5

pin assignments, A-17

option cards

&bit, Intro-2, 4-14, 4-16

16-bit, Intro-2, 4-14, 4-16

connector board 4-5, 4-7

DIP switches, 6-12

installing, Intro-3, 4-14, 4-16, 4-18

power requirements, 4-15, 6-4-5, 6-13

problems, 6-12

removing 4-8, 4-19

Option slots

cover, 4-16

description, Intro-2

length, A-4

pin assignments, A-18

power limits, 4-15, 6-5

Optional equipment, 1-2, 4-1

Outlet, electrical, 1-5-6, 6-3

OverDrive, Pentium, **See** Pentium
OverDrive

P

Parallel port

- connecting 1-5-6
- controller, A-3
- description, Intro-1
- location 1-3
- pin assignments, A-14
- reassigning, 4-7

Password

- defining, 2-10
- deleting, 2-11, 3-8
- feature, Intro-2
- on boot option 2-10--12
- option, 2-11--12, 3-7
- problems, 6-10
- Supervisor, 2-10--12, 3-7,6-7, A-5
- User, 2-10--12, 3-7,6-7, A-5
- using, 3-7--8

Pause button, 1-8, 3-5

Pentium OverDrive

- heat sink/fan, 4-15, 4-25, 4-28, 6-4, A-4
- jumper, 47-8
- support, Intro-1-2, Intro-4 A-1-2, A-4, A-21

Physical format, hard disk, 6-9

Port

- keyboard, Intro-1, 1-3, A-3, A-15
- location, 1-3
- mouse, Intro-1, 1-3--4, 6-14, A-15
- parallel, Intro-1, 1-3, 1-5--6, 4-7, A-3, A-14
- serial, Intro-1, 1-3, 1-5--6, 4-7, A-3, A-15
- VGA, Intro-1, 1-3-4, 2-4, A-15

Post-installation procedures, 4-29

Power

- button 1-7-8
- inlet, AC, 1-5-6, 6-3
- light, 1-7, 6-3, 6-6

Power cable

- computer, 1-5-7, 4-2,4-4
- diskette drive, 5-17--19, 6-8
- hard disk drive, 5--6--7
- monitor, 1-4--5, 6-6

Power requirements

- monitor, 1-5
- option cards, 4-15, 6-4--5, 6-13
- with two hard disk drives, 5-12

Power supply

- cables, 5-4, 5-6--7, 5-17--19
- connector pin assignments, A-15
- frequency, A-6
- input ranges, A-6
- limitations, 4-15, 5-12, 6-4--5, 6-13
- location, 4-5
- maximum output, A-6
- removing, 4-16
- type, A-6

Power-on diagnostics, 1-8, 6-13

Pre-configured systems, Intro-3-4, 2-1

Precautions, iii-viii, 1-1-2, 4-1

Printer

- cable, 1-5
- checking connections, 6-12
- connecting, 1-5-6
- drivers, 6-12
- problems, 6-12
- turning off, 1-10, 4-2
- turning on, 1-8

Processor speed

- changing, 3-8-9, A-1
- fast, 3-8-9, A-1
- keyboard command, 3-9
- normal, 4-7
- problems, 6-11
- relation to local bus speed, A-1
- slow, 3-8-9, 6-11, 6-13, A-1

Processors

- clock speed, 4-7
- jumpers, 4-8
- replacing 4-26-27
- socket, 4-25
- specifications, A-1
- speed, 3-8, 4-7, A-1
- supported, Intro-4
- upgrading 4-25

PS/2 compatible, Intro-1, 1-3, A-3, A-15

R

RAM, Intro-1, Intro-3, 2-4, 2-7, 6-12, A-2

Read/write

- errors, 6-10
- slot, 3-4

Readme files, Intro-5,2-1, 2-18

Real-time clock, 2-4, A-2

RESET button, 1-7, 3-6, 6-1

Resolutions, see Video resolutions

ROM, 2-2-3, 2-7, 2-15, A-2

RS-232C port, A-3, see also Serial ports

S

safety instructions, iii-viii 1-1-2, 4-1

screen colors and resolutions,

- Intro-2, Intro-4, 4-19, A-3, A-7

Security and anti-virus options, 2-10

Serial number, 6-1-2

Serial ports

- connecting, 1-4-6
- connector, 1-6, A-15
- controller, A-3
- description, Intro-1
- jumpers, 4-7
- location, 1-3
- pin assignments, A-15
- reassigning 4-7

SETUP program

Autotype fixed disk, 2-5

boot options, 2-8

cache memory, 2-7.

changing values, 2-4

chipset registers, 2-8

date and time function, 2-4

disabling prompt, 2-9

display type, 2-4

drive configuration, 2-5-6

exiting, 2-15

factory default settings, 2-15

fixed disk, 2-5

function keys, 2-3

hard disk drive, 2-5

help screen 2-3

Main Menu, 2-3

memory shadow, 2-7

restoring default values, 2-3

running 2-1-18

saving settings, 2-15

shadow options, 2-7

starting, 2-2-3

system information, 2-4-5

system memory, 2-4

system summary, 2-14

user-defined, 2-4

Shadowing

BIOS ROM, 2-7

memory, Intro-1, A-2

video ROM, 2-7

SIMMs

adding Intro-3

banks, 4-10-11

configuration, 2-4, 4-10-11

gold-plated, 6-13

incorrect type, 6-4

installing, Intro-3, 4-10-12

location 4-5

pin assignments, A-19

positioning, 4-12

- SIMMs
 - removing 4-13-14
 - sockets, 2-5, 4-5, 4-10-14, 6-13
 - tin-plated 4-11
 - type, 4-11, A-2
- Slave hard disk drive, 5-12
- Slot cover, 4-16
- Slots, option, see Option slots
- Slow processor speed, 3-8-9, 6-11, 6-13, A-1
- Sockets
 - cache, 4-5, 4-22-23
 - microprocessor, 4-5, 4-25-26
 - optional video memory, 4-5
 - SIMM, 4-5, 4-10-14, 6-13
 - video, 4-5, 4-19, 4-21
 - ZIF, 4-26-27
 - ZIP, 4-19-21, A-2
- Software, see Application programs
- Speaker, A-4, A-17
- Speed, see Processor speed
- Speed light, 1-7, 3-8
- SRAM chips, Intro-3, 4-22
- Standby mode, Intro-1-32-2, 2-13-14, 3-3, 6-5-6, 6-9, 6-11, A-1, A-3
- Sk tic electricity, 1-1
- Stopping a command or program, 3-5
- Storage devices, Intro-2, Intro-4, 5-1, 5-14, A45
- Supervisor password, 2-10-12, 3-7, 6-7, A-5
- SVGA
 - connector, 1-3-5
 - controller, A-3
 - drivers, Intro-3, Intro-5,2-1, 2-16, 2-18
 - interface, A-3
 - jumper settings, 4-8
 - local bus, Intro-1-2,2-1, A-1, A-3
 - monitor, 1-4

- System
 - BIOS, Intro-1, 2-1-2, 2-5,4-5, 6-1-2, A-2, A-12
 - board, 4-5, 4-7, 4-10, 5-5
 - configuration, 245,2-15,6-1
 - I/O address map, A-13-14
 - identifying 6-1
 - memory, Intro-1, Intro-3, 1-8, 2-4, 2-7, A-1-2, A-12
 - memory map, A-12
 - optimizing performance, 2-8, 4-1
 - shadowing, 2-6
 - speed, 3-8, A-1
 - startup information, 2-9, 6-2
 - startup password, 2-10-12, 3-7
 - summary, 2-9, 2-14
 - virus protection A-5
- System Setup option, 2-4-5
- System Summary option, 2-14
- SYSTEM.INI, 2-17

T

- Tag SRAM, 4-22
- Tape drive, Intro-4, 5-1, 5-14, A-3, A-5
- Technical support, Intro-7
- Temperature, A-6
- Time, setting, 2-4
- Timeout periods
 - hard disk drive, Intro-3, 2-14
 - monitor, Intro-3, 2-13
- Timing requirements, 3-8
- Translation mode, hard disk drives, A-10
- Troubleshooting, 6-1-16
- True Color support, Intro-1, A-3
- Turning off computer, 1-9, 4-2
- Turning on computer, 1-7

U

User password, 2-10-12, 3-7,6-7, A-5
User-defined hard disk drive, 2-6
Utility, disk compaction, 6-10

V

VGA port, Intro-1, 1-3-4, 2-4

Video

BIOS, 6-2, A-2
card option, 2-4
chips, 4-19, A-2
colors, Intro-1-2, Intro-4, 4-19, A-3,
A-7
controller, A-3
display type, 2-4
drivers, Intro-3, Intro-5, 2-1, 2-16,
2-18
local bus, Intro-1-2, Intro-5, 2-1,
A-1, A-3
readme files, Intro-5,2-1, 2-18
resolutions, A-3
ROM, 2-7
sockets, 4-5,4-20-21
standby mode, Intro-1-3, 2-2,
2-13-14, 3-3, 6-5-6, A-1, A-3
time-out, Intro-3,2-13

Video memory

adding, Intro-4, 4-19-21
configuration, 4-19, A-12
installing, 4-20-21
location, 4-5
on system board, Intro-1
RAM, 2-7
sockets, 4-5,4-19
type, 4-19, A-2
ZIP chips, 4-20-21, A-2

Virus protection options, 2-10, 2-12,
A-5

W

Weight, computer, A-5
Width, computer, A-5
Windows

mouse driver, 1-4, 6-14
pre-configured, Intro-3
video drivers, 2-16-17

Work environment, comfortable, 3-1

Write-protection, 6-7

Z

ZIF socket, 4-26-27
ZIP chips, 419-21, A-2

Epson America (USA)

Epson America, Inc.
20770 Madrona Avenue
Torrance, CA 90509-2842
Tel: (310) 782-0770
Fax: (310) 782-5051

Epson Direct
P.O. Box 2858
20770 Madrona Avenue
Torrance, CA 90509-1111
Tel: (800) 374-7300

Epson America (International)

E Latin America
Miami, FL, USA
Tel: (305) 265-0092
Fax: (305) 265-0097

Epson Argentina, S.A.
Buenos Aires, Argentina
Tel: (541) 322-7487
Fax: (541) 322-4637

Epson Chile, S. A.
Santiago, Chile
Tel: (562) 232-8966
Fax: (562) 233-3197

Epson Costa Rica, S.A.
San Jose, Costa Rica
Tel: (506) 34-6666
Fax: (506) 25-6709

E Mexico, S.A. De C.V.
Mexico, D.F., Mexico
Tel: (525) 395-9897
Fax: (525) 395-9499

Epson Do Brasil
Sao Paulo, SP Brazil
Tel: (5511) 813-3044
Fax: (5511) 210-9290

Epson Venezuela, S. A.
Caracas, Venezuela
Tel: (582) 241-0433
Fax: (582) 241-6515

Epson Canada Limited
Willowdale, Ontario, Canada
800-GO-EPSON [(800) 463-7766]
Tel: (416) 498-9955
Fax: (416) 498-4574

Epson International Marketing locations

Epson Deutschland GmbH
Zulpicher StraÙe 6,
4000 Dusseldorf 11
Germany
Phone: 211-56030
Telex: 41-8584786

Epson Iberica, S.A.
Avda. de Roma 18-26
08290 Cerdanyola del valles
08036 Barcelona, Spain
Phone: 3-582-15-00
Fax: 3-582-15-55
Telex: 50129

Epson Hong Kong Ltd.
25/F., Harbour Centre,
25 Harbour Road
Wanchai, Hong Kong
Phone: 831-4600
Fax: 572-5792
Telex: 65542 EPSCO HX

Epson Electronics Trading Ltd.
Taiwan Branch
10F, No. 287, Nanking E. Road,
Sec. 3, Taipei, Taiwan R.O.C.
Phone: 886-2-717-7360
Free phone: 886-080-211172
Fax: 886-2-712-9164
Telex: 785-24444

Epson (U.K.) Ltd.
Business Management Dept. (PC)
Campus 100, Maylands Avenue
Hemel Hempstead, Hertfordshire,
HP2 7EZ, UK
Phone: 0442 61144
Free phone: linkline 0800 289622
Fax: 0422 227227
Telex: 51-824767

Epson France S.A.
BP. 320, 68 Bis Rue Marjolin
92305 Levallois-Perret Cedex
France
Phone: 33-1-4737-3333
Telex: 42-610657

Epson Italia s.p.a.
V.le F.lli Casiraghi, 427
20099 Sesto S. Giovanni
Milano, Italy
Phone: 2-262331
Fax: 2-2440641 or 2-2440750
Telex: 315132

Epson Australia Pty. Ltd.
17 Rodborough Road
Frenchs Forest, N.S.W. 2086
Australia
Phone: 2-452-0666
Fax: 2-451-0251
Telex: n-75052

Epson Singapore Pte. Ltd.
Oub Centre, Singapore 0104
Phone: 533-0477
Telex: 87-39536

Distributors

South America

SISCO

Sao Paulo, SP Brazil
Tel: (5511) 574-8877
Fax: (5511) 572-1306

Exhibit Computer
Bogota, Colombia
Tel: (571) 218-2700
Fax: (571) 218-5370

UPEN Computer Systems
Bogota, Colombia
Tel: (571) 257-7800

Ace Computers & Electronics
Georgetown, Guyana
Tel: (592) 25-65-48
Fax: (592) 26-39-67

Alvimer S.R.L. Trading Inc.
Ciudad Del Este, Paraguay
Tel: (595) 61-60234
Fax: (595) 61-60566

Control De Procesos Informaticos
Lima, Peru
Tel: (5114) 328-384
Fax: (5114) 355-017

Intefase S.A.
Montevideo, UN y
Tel: (598) 249-4600
Fax: (598) 249-3040

Siser Ltda .
La Paz, Bolivia
Tel: (591-2) 34-32-45
Fax: (591-2) 35-92-68

McSiiver, S. A.
Bogota, Colombia
Tel: (571) 230-1014
Fax: (571) 230-9205

C.I.L.D.S.E.
Quito, Ecuador
Tel: (593) 2-54-3418
Fax: (593) 2-55-4780

A.J. Vierci & CLA
Asuncion, Paraguay
Tel: (595) 21-449-220
Fax: (595) 21-449-234

Infocenter
Asuncion, Paraguay
Tel: (595) 214-98762
Fax: (595) 214-49514

Peru Mercantil, S.A.
Lima, Peru
Tel: (5114) 62-2566
Fax: (5114) 61-8256

Caribbean

Caribbean Computer Systems, Ltd.
Bridgetown, Barbados
Tel: (809) 429-7050
Fax: (809) 427-6089

North Atlantic Data Systems
Hamilton, Bermuda
Tel: (809) 295-7111
Fax: (809) 292-3834

Columbus Limited
Grand Cayman, West Indies, B.W.1
Tel: (809) 949-8039
Fax: (809) 949-7537

WTG / APTEC Systems Limited
Kingston Jamaica
Tel: (809) 929-9250
Fax: (809) 929-8296

Computer Gallery
Hato Rey, Puerto Rico
Tel: (809) 753-0500
Fax: (809) 753-0552

IMCON Limited
Castries, St. Lucia, west Indies
Tel: (809) 452-6130
Fax: (809) 452-3883

Da Costas Limited
Bridgetown, Barbados
Tel: (809) 427-5854
Fax: (809) 436-9870

The Computer Center
Nassau, Bahamas
Tel: (809) 328-0304
Fax: (809) 328-0307

Compusupplies, Ltd.
Kingston, Jamaica
Tel: (809) 925-8382
Fax: (809) 925-8115

Boolchand Pessomal N.V.
Curacao, Netherlands Antilles
Tel: (599) 961-7545
Fax: (599) 961-7876

Micro Internacional, S.A.
Santo Domingo, Republica Dominicana
Tel: (809) 533-7096
Fax: (809) 535-3218

Complete Computer Systems
Port-of-Spain Trinidad
Tel: (809) 625-1204
Fax: (809) 623-5426

Central America

Equipos Electronicos Valdez y Cia
San Salvador, El Salvador
Tel: (503) 23-73-43
Fax: (503) 2453-82

Servicio Integral De Computacion S.A.
Guatemala, Guatemala
Tel: (502-2) 31-11-70
Fax: (502-2) 32-52-22

Micro-Tee
Managua, Nicaragua
Tel: (505-2) 66-27-15
Fax: (505-2) 66-27-58

PS2000
Guatemala, Guatemala
Tel: (502-2) 32-57-44
Fax: (502-2) 31-24-49

CODASA
Tegucigalpa, Honduras
Tel: (504) 33-5685
Fax: (504) 58-0255

Sonitel, C.A.
Panama, Republica De Panama
Tel: (507) 63-98-00
Fax: (507) 63-98-15