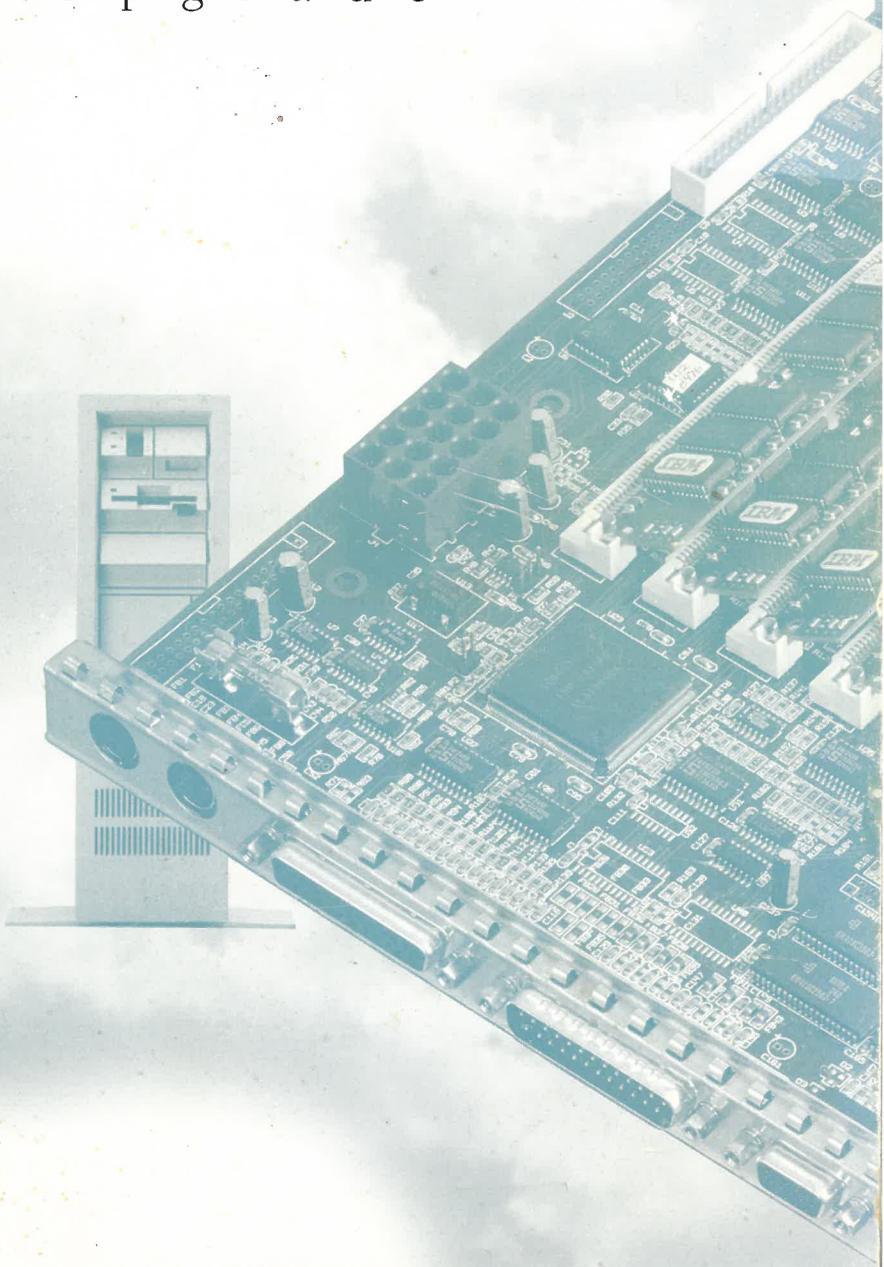


PS/2® MODEL 60/80

TurboProcessor

System Upgrade™

*Installation &
Reference Manual*



TurboProcessor System Upgrade™
Model 60/80
Installation and Reference Manual

PN 42000157, Revision A
June, 1993

Copyright

Copyright 1993 Reply Corporation. All rights reserved.

No part of this publication may be reproduced, photocopied, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means - electronic, mechanical, magnetic, optical, chemical, manual, or otherwise - without the prior written permission of Reply Corporation.

Disclaimer

REPLY CORPORATION MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Reply Corporation reserves the right to make changes in the specifications of the product described within this material at any time without notice and without obligation to notify any person of such changes or to update or revise this material.

Limitation of Liability

Reply Corporation shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Trademark Acknowledgment

Reply, TurboProcessor, and TurboProcessor System Upgrade are trademarks of Reply Corporation.

IBM, PS/2, OS/2, and Micro Channel are registered trademarks and AIX is a trademark of the International Business Machines Corporation.

Reply Corporation
4435 Fortran Drive
San Jose, CA 95134
(800)955-5295

Preface

Congratulations on your purchase of the Model 60/80 System Upgrade Kit from Reply Corporation. You will find that only a few tasks are required to install the upgrade kit into your IBM PS/2 Model 60, 65, or 80 computer, making it fully operational with increased functionality and performance. To ensure your successful completion of these tasks in the most convenient manner possible, please read the "How to Use This Manual" section below and follow the recommendations it provides.

HOW TO USE THIS MANUAL

This manual is divided into three functional areas. For the most effective use of the information provided, follow these recommendations:

- Part 1** – Use this information to become familiar with the Model 60/80 System Upgrade Kit and to perform the upgrade installation. ***Be sure to perform all procedures in the sequence defined in the Installation Checklist.***
- Part 2** – Use this information to configure CMOS memory to support your computer hardware and to make the most effective use of Reply utility programs.
- Part 3** – Use this information when you need to troubleshoot computer failures, update the system BIOS, or clear CMOS memory.

For more details regarding the contents of each chapter and appendix, please read the summaries provided in the next section.

MANUAL ORGANIZATION

This manual is organized into the following chapters and appendices:

Part 1:

- Chapter 1** *Product Introduction* – This chapter provides a product overview of the Model 60/80 Upgrade Kit. Additionally, an Installation Checklist is included to guide you through all upgrade installation procedures.
- Chapter 2** *System Upgrade Procedure* – This chapter provides all preparation details and the step-by-step procedures needed to install the Model 60/80 Upgrade Kit into your computer. Additionally, at the beginning of the chapter, Reply Technical Support information is provided, should you require assistance.
- Chapter 3** *Adding Options* – This chapter provides the step-by-step procedures you will need to install Reply-supplied memory and processor options.

Part 2

- Chapter 4** *CMOS Configuration and Utilities* – This chapter describes how to use the Reply Reference Diskette to configure CMOS memory to match new computer configurations and how to save the configuration to diskette. Additionally, Reply Utilities such as the diskette copy option, Reference Diskette backup, and system password setup are also described.

Part 3

- Chapter 5** *Troubleshooting* – This chapter provides basic troubleshooting instructions, a description of how to use the Reply Reference Diskette to isolate computer failures, and lists of error messages with corresponding repair suggestions.
- Appendix A** *Specifications* – This appendix provides the Reply system board specifications.

Appendix B *Updating the System BIOS* – This appendix describes how to update the system BIOS using the Reply Reference Diskette.

Appendix C *Clearing CMOS Memory* – This appendix provides instructions for clearing CMOS Memory.

CONVENTIONS

Throughout the text of this manual you will find the following terms used to denote Reply and IBM system boards:

Reply system board – this refers to the Reply Model 60/80 system board used to upgrade IBM PS/2 Model 60, 65, and 80 computers.

system upgrade kit – this refers to the Reply Model 60/80 system upgrade kit.

original system board – generically refers to IBM Model 60, 65, or 80 system boards, unless specified otherwise.

Notation conventions used to describe menu selections, file names, and directories are shown in 10-point bookman bold typeface such as this example:

Select the **Test The Computer** option from the **Utilities** menu.

Additionally, you may find **NOTE**, **CAUTION**, **WARNING**, and **DANGER** statements throughout the manual. The purpose of each type of statement is as follows:

NOTE: Notes provide special considerations or details which are important to the procedures or explanations presented.

WARNING: Warnings indicate actions that may result in possible damage to equipment, software, or data.

CAUTION: Cautions indicate actions that may result in possible minor personal injury.

 **DANGER:** Danger indicates action that may result in possible serious personal injury.

SAFETY

Some procedures presented in this manual require you to work on the computer with the cover removed.

 **DANGER:** Never remove the computer cover until you have turned off the computer, disconnected the power cable from the power outlet, and turned off all attached peripheral devices.

When you intend to perform any of the procedures presented in this manual, be sure to read the entire procedure before you attempt execution of the procedure. You should pay special attention to all **NOTE**, **WARNING**, **CAUTION**, and **DANGER** statements provided in the procedural text.

Finally, before you attempt to perform any of the system upgrade procedures, read the information in Chapter 2, Section 2.5 regarding electrostatic discharge damage prevention.

Contents

	Page
Chapter 1 - Product Introduction	1-1
1.1 Product Overview	1-2
1.2 Installation Checklist.....	1-3
1.2.1 Preparations.....	1-3
1.2.2 Removal and Installation.....	1-4
1.2.3 Configuration and System Test.....	1-5
Chapter 2 - System Upgrade Procedure	2-1
2.1 How to Get Reply Assistance	2-2
2.2 Reply Upgrade Kit Inventory	2-3
2.3 Required Tools.....	2-3
2.4 Input/Output Port Locations.....	2-4
2.5 ESD Damage Prevention.....	2-5
2.6 Side Cover Removal and Installation	2-7
2.7 Removing the Original System Board	2-9
2.8 Installing the Reply System Board	2-16
2.9 Label Installation	2-19
Chapter 3 - Adding Options	3-1
3.1 Introduction	3-2
3.2 Adding Memory	3-2
3.3 Installing a Processor	3-5

Chapter 4 - CMOS Configuration and Utilities.....	4-1
4.1 Configuration Programs.....	4-2
4.1.1 Using the Set Configuration Program.....	4-2
4.1.1.1 Main Setup Window.....	4-5
4.1.1.2 Slot Setup Window.....	4-8
4.1.1.3 Extra Features Window.....	4-10
4.1.1.4 Memory Layout Window.....	4-11
4.1.1.5 Set/View SCSI Devices Window.....	4-11
4.1.2 Using the Automatic Configuration Program.....	4-13
4.1.3 Saving Your Configuration to Diskette.....	4-15
4.1.4 Restoring Your Configuration from Diskette.....	4-17
4.2 Utility Programs.....	4-19
4.2.1 Copying an Option Diskette.....	4-19
4.2.2 Backing Up the Reference Diskette.....	4-21
4.2.3 Setting and Using Passwords.....	4-22
4.2.3.1 Power-on Password.....	4-23
4.2.3.2 Power-on Password Operations.....	4-25
4.2.3.3 Network Password Operations.....	4-26
4.2.3.4 Keyboard Password.....	4-27
4.2.4 Parking Hard Disk Drive Heads.....	4-29
 Chapter 5 - Troubleshooting.....	 5-1
5.1 Troubleshooting Tips.....	5-2
5.2 Troubleshooting Problems at Initial Startup.....	5-3
5.2.1 Preliminary Checks.....	5-3
5.2.2 Startup Sequence.....	5-4
5.2.2.1 Startup Checks.....	5-5
5.3 Subassembly Diagnostics.....	5-7
5.3.1 Loading Tests and Specifying Testing Parameters.....	5-7
5.3.2 Memory Tests.....	5-12
5.3.3 Keyboard Test.....	5-13
5.3.4 System Board VGA Test.....	5-14
5.3.5 Parallel Port Test.....	5-15
5.3.6 Diskette Drive Test.....	5-16
5.3.7 Serial Port Test.....	5-17
5.3.8 SCSI Hard Disk Drive Test.....	5-19
5.3.9 ATA IDE Hard Disk Drive Test.....	5-21

5.4 Error Logging	5-22
5.4.1 Retrieving Error Logs from Diskette	5-23
5.5 Error Code Definitions	5-24
Appendix A - Specifications	A-1
A.1 Specifications and Options	A-2
Appendix B - Updating the BIOS	B-1
B.1 Overview	B-2
B.2 Running the Update Program	B-2
Appendix C - Clearing CMOS Memory	C-1
Index	I-1

CHAPTER 1

Product Introduction

This chapter provides a product overview of the Reply™ Model 60/80 System Upgrade Kit. Additionally, an Installation Checklist is included to guide you through the entire upgrade procedure.

1.1 PRODUCT OVERVIEW

Your Reply system board is based on the high performance 32-bit Micro Channel™ bus. As standard features, the Reply system board offers the following:

- 486DX/33 or 486DX2/66 processors (standard options at time of order); support for 487SX processor
- Standard 4MB of RAM, expandable to 128MB
- An integrated video controller with up to 1024 x 768 pixels with 256 colors, non-interlaced; or 1280 x 1024 pixels with 16 colors, interlaced. The controller is supported by 1MB of dedicated video memory.
- One serial port and one parallel port
- Diskette drive interface that supports 1.44MB or 2.88MB diskette drives or tape backup unit
- Integrated hard disk interface that supports a maximum of two ATA hard disk drives
- PS/2™-compatible keyboard and pointing device ports
- Clock/calendar with integrated battery (10 years)
- Seven full-length 32-bit Micro Channel expansion slots, including one with extended video and one 16-bit full-length Micro Channel expansion slot
- Secondary Cache Module

For a complete list of Reply system board specifications and options, refer to Appendix A.

1.2 INSTALLATION CHECKLIST

Install the Reply system board by completing the tasks provided in this checklist. The checklist tasks are presented in three sections: Preparation; Removal and Installation; and Configuration and System Test. All tasks should be performed in the prescribed sequence. Where checklist tasks reference particular sections in this manual, read the referenced material before you attempt to carry out the instructions.

1.2.1 Preparations

- ___ 1. Unpack the system upgrade kit and verify receipt of all hardware, software, and documentation (Section 2.2).

WARNING: Do not remove the Reply system board from its anti-static package at this time.

If you also purchased any of Reply's option kits, unpack each such kit and verify receipt of all listed hardware, software, and documentation (Chapter 3).

- ___ 2. Following the instructions in your operating system documentation, perform a complete backup of your hard disk (operating system, application programs, and data files).
- ___ 3. Using the IBM™ PS/2 Reference Diskette, run the **Configuration** option and record the existing configuration information. You may need this information to customize the Reply system board configuration.
- ___ 4. Using the IBM PS/2 Reference Diskette, run the diagnostic test to verify that each peripheral device is functioning properly. In the event of a peripheral failure after the upgrade is installed, this simplifies troubleshooting. Also, park the hard disk drive heads by using the appropriate utility on the IBM Reference Diskette.
- ___ 5. Verify that you have the proper tools to perform the upgrade procedures (Section 2.3).
- ___ 6. Perform an orderly computer power down (including all peripheral devices).

- ___ 7. Disconnect all peripheral devices from the computer back panel (Section 2.4). Tag the cables as necessary for reconnection later.
- ___ 8. Familiarize yourself with the proper handling procedures to prevent ESD damage to the Reply system board or other components (Section 2.5).

1.2.2 Removal and Installation

- ___ 1. Remove the computer side cover (Section 2.6).
- ___ 2. Observing proper handling procedures, remove the Reply system board from the protective packaging. Inspect the board to verify that it contains at least one full bank of memory and has no physical defects.
- ___ 3. If you intend to install memory or processor options, install these components on the Reply system board at this time (see Chapter 3). Upon completion, set the Reply system board aside on a static-free surface.

NOTE: If you purchased a Reply hard disk drive option kit, you will be instructed to install the option at the appropriate time as part of the Reply system board installation. The hard disk installation instructions are provided in the hard disk option kit.

- ___ 4. Replace the original system board with the Reply system board (Sections 2.7 and 2.8).

WARNING: Replace the original system board by following each step in Section 2.7 and 2.8. Failure to do so can result in permanent damage to the new Reply system board.

NOTE: Since a Real-Time clock is incorporated into the Reply system board, you may want to remove the old battery. If you choose to remove the battery, be sure to dispose of it in an environmentally safe manner.

- ___ 5. Remove the grounding side cover (Section 2.6).

- ___ 6. Connect the display, keyboard, and mouse to their respective I/O ports on the back panel (Section 2.4). Do not make any other I/O connections at this time (network, printer, etc.).
- ___ 7. Verify that the computer power switch is still off (set to 0). Connect the computer power cord to the electrical outlet.

1.2.3 Configuration and System Test

- ___ 1. Insert the Reply Reference Diskette into the diskette drive (Drive A); turn on the display and the computer.
- ___ 2. Verify that the startup sequence functions properly (Chapter 5).
- ___ 3. Create a backup copy of the Reply Reference Diskette (Section 4.3.2).
- ___ 4. Using the **Copy an Option Diskette** utility, copy any needed Adapter Description Files (ADF) and diagnostic files (DGS file extension) from the IBM Reference Diskette to the backup copy of your Reply Reference Diskette (Section 4.3.1). The ADF files are required to configure, while DGS files are needed to test the peripheral devices currently installed in the computer.
- ___ 5. Run the Automatic Configuration program (Section 4.1.2). Upon successful completion of the program, leave the **Main Setup Menu** intact for the step that follows.
- ___ 6. Set the current system date and time, as well as any other configuration options needed to support the computer. Upon completion, be sure to save the configuration to CMOS memory (Section 4.1.1.1), then restart the computer.
- ___ 7. Using the **Test The Computer** option, test your computer to verify proper operation (Section 5.3.1). Upon completion, turn off the computer.

- ___ 8. If you have additional I/O connections to make (for example, printer, network, etc.), make these connections. Turn the computer on and restart using the Reply Reference Diskette.
- ___ 9. We recommend that you now back up your configuration to the Reply Reference Diskette (Section 4.1.3).
- ___ 10. Install the Reply logo label as shown in Section 2.9.
- ___ 11. The computer should now start from hard disk. However, if you added a new hard disk, read the note that follows this step. If you replaced your original hard disk drive with a new one, restore the operating system, applications, and all data files in accordance with your operating system documentation.

NOTE: The computer checks for the presence of, and then attempts initial startup from hard disk drive types in this order: ESDI, ATA, and finally ST 506. Consequently, if your original hard disk is an ST 506 and you have added an ATA hard disk drive, the computer will attempt initial startup from the ATA hard disk drive. Therefore, in this case you would be required to load the operating system on the new hard disk drive.

- ___ 12. If you have a Super VGA or 8514 type display, you may want to install Cirrus Logic Video Drivers to support Windows 3.1 or OS/2™. Install the appropriate driver by following the instructions provided in the text file residing on the Reply Video Drivers Diskette.
- ___ 13. Your computer is now ready for normal operations. ***Please fill out your warranty card and immediately send it to Reply Corporation.***

CHAPTER 2

System Upgrade Procedure

This chapter provides all preparation details and the step-by-step procedures needed to remove the original system board and replace it with the Reply system board. Topics of discussion include kit inventory, required tools, I/O port locations, ESD damage prevention, and removal and replacement procedures. Additionally, at the beginning of the chapter, Reply Technical Support information is provided, should you require assistance.

2.1 HOW TO GET REPLY ASSISTANCE

Typically, the Model 60/80 upgrade process goes quite smoothly. However, if you need assistance, Reply Technical Support is ready to help (see the telephone number below). Since we attempt to solve your problems in the most efficient manner possible, you will find that our representatives require certain basic information each time you call. By obtaining the information shown below prior to calling Reply Technical Support, you can help minimize delays and contribute to an efficient solution to your problem.

- BIOS level
- Error code (if applicable)
- Reply Reference Diskette version
- Operating system (include version)
- Specific types of peripheral devices and optional adapters installed
- Contents of **CONFIG.SYS** and **AUTOEXEC.BAT** files
- Types of resident (TSR) programs installed (if applicable)
- Detailed problem description
- Results of Reply diagnostic tests

0181832
8304

Additionally, Reply's Bulletin Board (BBS) provides you with immediate access to video drivers, Reference Diskette files, compatibility tips, release notes, etc. Communication specifications for the Reply BBS are as follows:

Phone number:	(408) 956-2784
Baud rate:	2400 to 14400
Data bits:	8
Stop bits:	1
Parity:	None
Reply modems:	US Robotics Courier HST Dual Standard modems supporting V.32 bis

REP 2 REPLY

PA number is 11600
PW is A. K. M. R.

Z. M. R. R. R. R. R.

114-80-EXE
www.reply.com
WRAP 747-1074

11024

Reply Technical Support
1-800-4REPLY2
(1-800-473-7592)

408 942 4804
4897 fax

2.2 REPLY UPGRADE KIT INVENTORY

Table 2-1 lists the contents of the system upgrade kit. Verify the contents of the kit you received with the table to ensure that you have received a complete shipment. After you have confirmed receipt of all items, return to the next step in the Installation Checklist.

If you encounter *any* problems, Reply support organizations are ready to provide the assistance you need. If an item is damaged in shipment or is missing, refer to the previous section for Reply contact information.

Table 2-1 System Upgrade Kit Inventory

Item	Qty
Reply system board	1
Reply logo label	1
Reply Reference Diskette	1
Reply Video Drivers Diskette	1
<i>Model 60/80 Installation and Reference Manual</i>	1
Disposable grounding wrist strap	1

2.3 REQUIRED TOOLS

To install the Reply system board and its associated options, you will need the following tools:

- 0.25-inch standard blade screwdriver
- 0.5-inch standard blade screwdriver
- 3/16-inch nut driver/socket

CMOS Clod.

2.4 INPUT/OUTPUT PORT LOCATIONS

After turning off the computer and all attached peripheral devices, disconnect all devices from the I/O ports on the computer back panel (see Figure 2-1). Expansion slot I/O connectors must also be disconnected in accordance with the specific option's documented instructions.

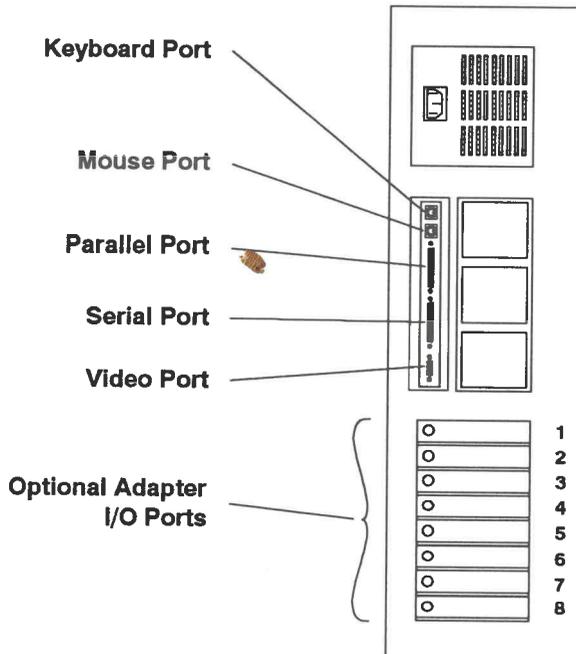


Figure 2-1 Back Panel I/O Port Locations

2.5 ESD DAMAGE PREVENTION

Integrated circuits (chips) are susceptible to damage from electrostatic discharge (ESD). ESD is the transfer of electricity from one object to another. Some examples of ESD are: lightning; the "shock" you sometimes feel in the winter when you walk across a carpet and touch a doorknob; the crackling and sparks that occur when you remove clothes from your dryer. This same electrostatic buildup can damage chips.

When you purchase a system upgrade kit from Reply, an easy-to-use, disposable wrist strap is provided with the kit to minimize possible ESD damage when you are carrying out the installation procedures. When instructed to install the upgrade, use the wrist strap as follows:

1. If you have not already done so, turn off the computer and unplug it from the power source outlet.
2. Remove the side cover as described in Section 2.6.
3. After removing the disposable wrist strap from the envelope, unwrap the first two or three folds of the strap. Notice the shiny black conductive strip is exposed on the adhesive side of the strap.
4. With the black conductive strip in contact with the skin, wrap the strap firmly around your wrist.
5. Unroll the rest of the strap and peel off the adhesive liner of the copper foil at the opposite end.
6. Secure the copper foil to the front foot detent spring in the base of the chassis (see Figure 2-2).
7. You can now install the upgrade in accordance with the Installation Checklist. Upon completion, the wrist strap can be discarded.

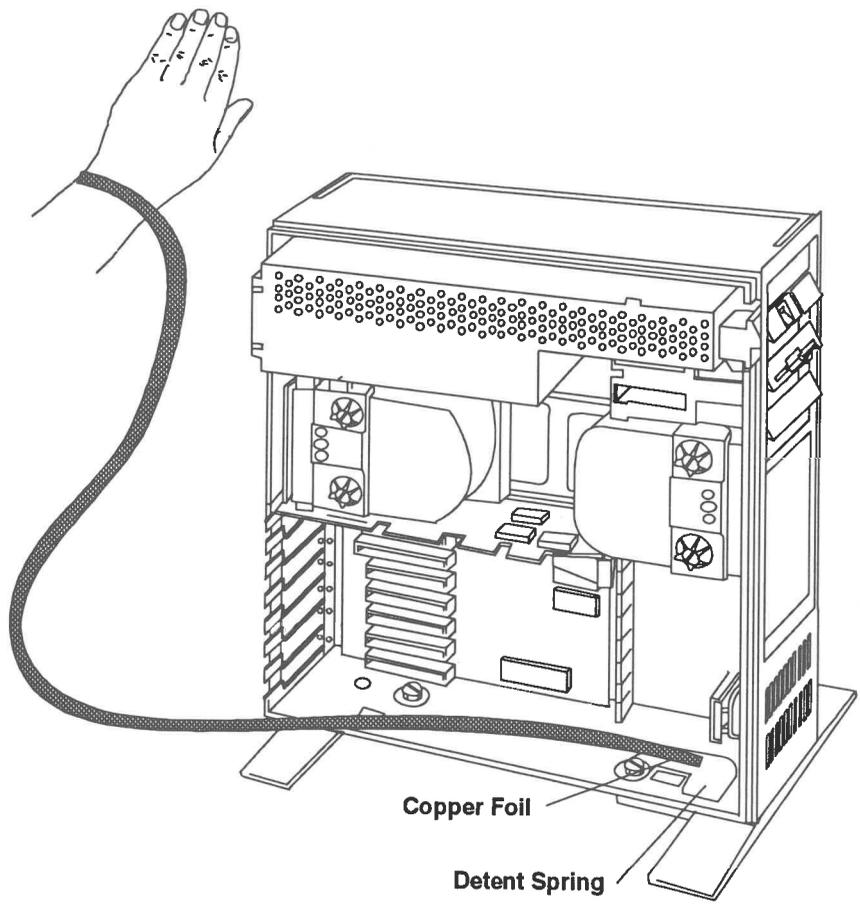


Figure 2-2 Using the Grounding Wrist Strap

2.6 SIDE COVER REMOVAL AND INSTALLATION

To gain access to the interior of the IBM PS/2, remove the side cover by following these steps:

1. Turn off the computer and all attached peripheral devices (for example, display, printers, etc.).
2. Unplug the computer power cable from its electrical outlet.
3. If your computer has a cover lock in the side panel, unlock it (otherwise you will not be able to remove the cover).
4. Loosen the two capture screws in the side panel as shown in Figure 2-3.
5. Pull the top portion of the panel away from the computer, then lift the panel up and out as indicated in Figure 2-3.

To replace the cover, reverse the procedure detailed in steps 1 through 5.

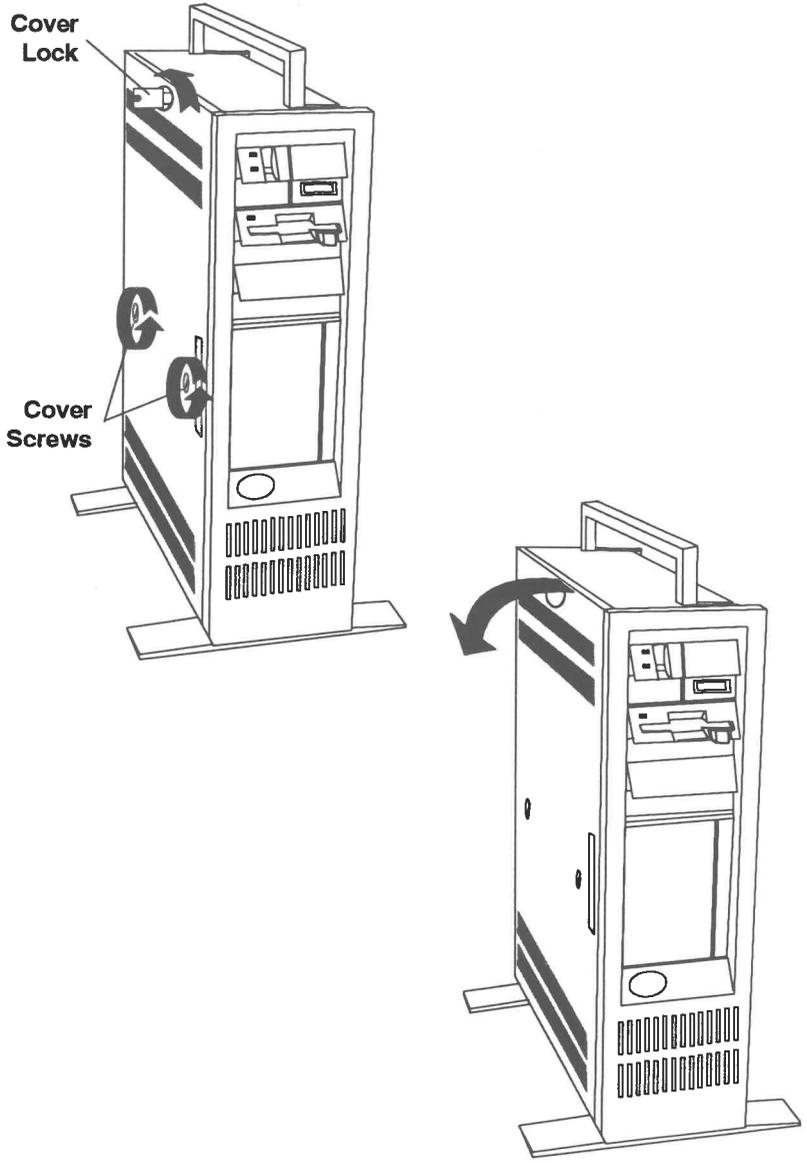


Figure 2-3 Side Cover Removal/Installation

2.7 REMOVING THE ORIGINAL SYSTEM BOARD

Remove the original system board from the IBM PS/2 Model 60, 65, or 80 by following these steps:

WARNING: Verify that you have performed "Preparation" steps 1 through 8 and "Removal and Installation" steps 1 through 3 on the Installation Checklist before beginning this procedure.

1. If you do not have a hard disk drive mounted in the front drive bay, skip to step 5. If there is a hard disk in the front drive bay, remove the front bezel by pulling it away from the chassis as shown in Figure 2-4.

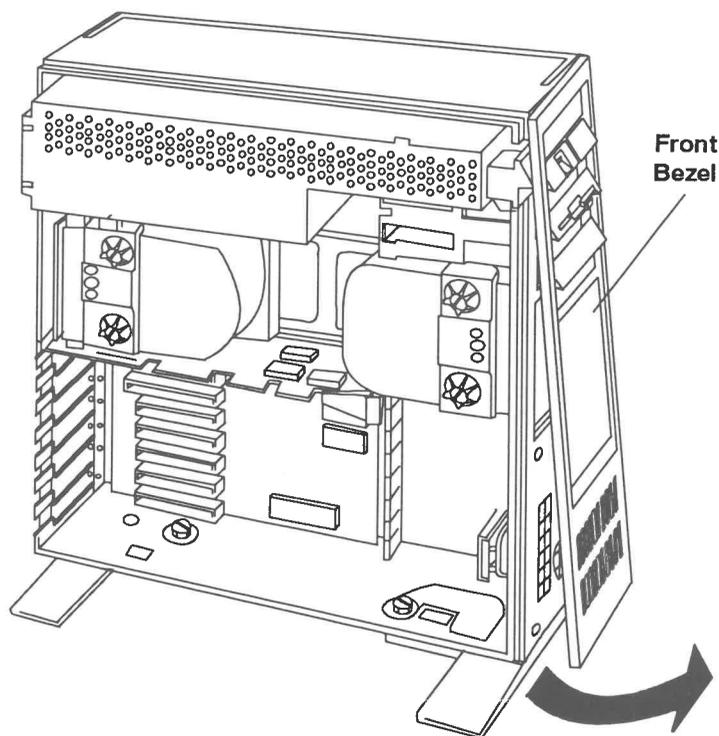


Figure 2-4 Front Bezel Removal/Installation

2. Disconnect the power and signal cables from the hard disk drive.
3. Loosen the two mounting fasteners that secure the hard disk drive to the hard disk drive support structure (see Figure 2-5).
4. Slide the hard disk drive out the front of the computer.

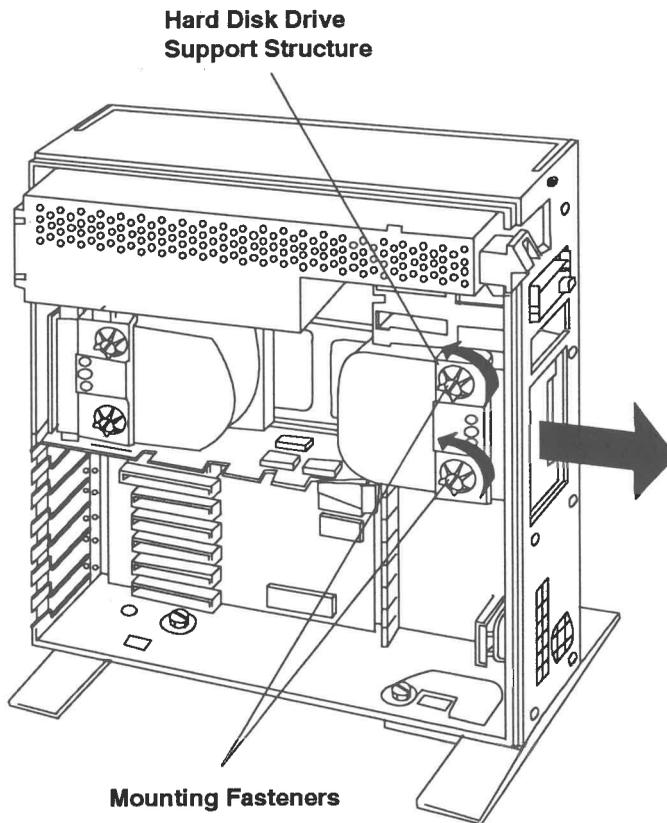


Figure 2-5 Hard Disk Drive Removal/Installation, Front Bay

5. Disconnect the power and signal cables from the hard disk located in the rear drive bay.
6. Loosen the two mounting fasteners that secure the hard disk drive to the hard disk support structure (see Figure 2-6).
7. Slide the hard disk toward the front of the unit until it has cleared the support structure enough to pull it out and away from the unit as shown in Figure 2-6.

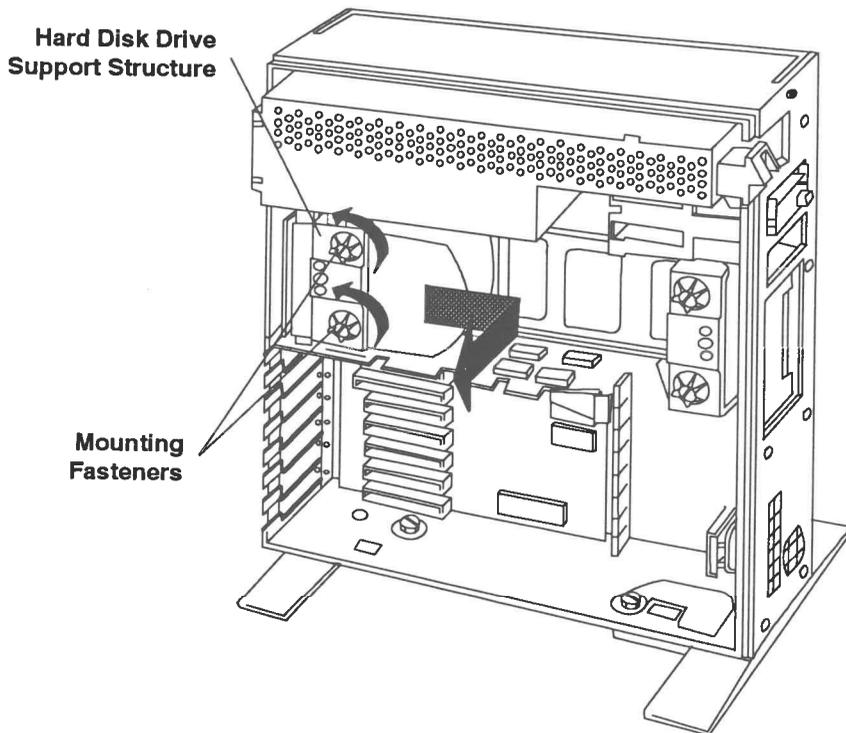


Figure 2-6 Hard Disk Drive Removal/Installation, Rear Bay

8. If adapters occupy any of the expansion Slots 1 through 8, remove them as follows (see Figure 2-7):

- a. Make a note of the adapter's slot location and disconnect all cables attached to the adapter (tag the cables if needed).
- b. Loosen the thumb nut that secures the adapter mounting bracket to the chassis.
- c. Remove the adapter by sliding it out the side of the computer.

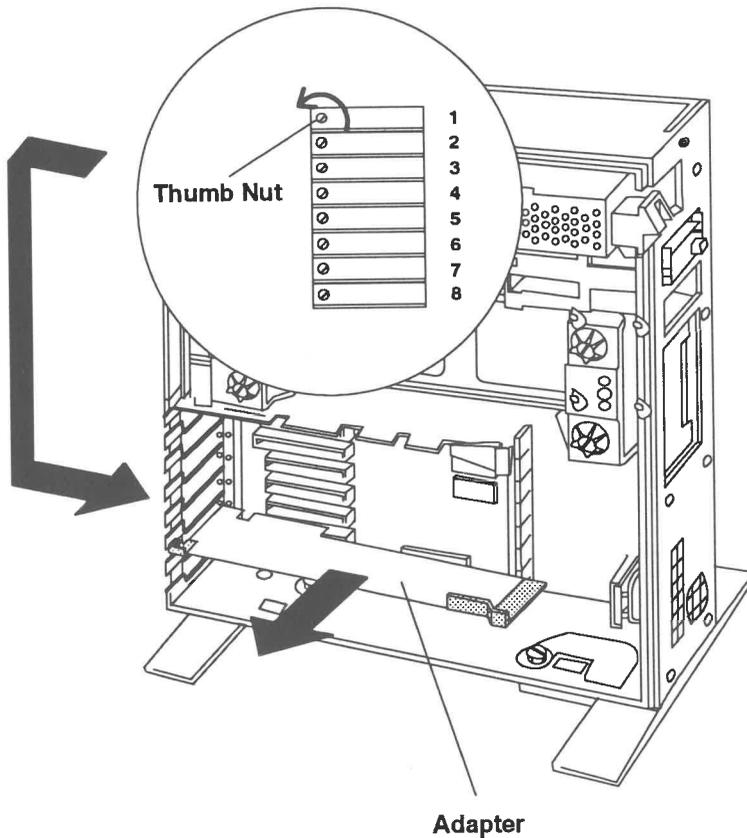


Figure 2-7 Adapter Removal/Installation

9. Remove the four screws that secure the drive support structure to the chassis (see Figure 2-8).
10. While holding the support structure with both hands, pivot the front of the support structure away from the chassis as shown in Figure 2-8. Remove the assembly from the computer.

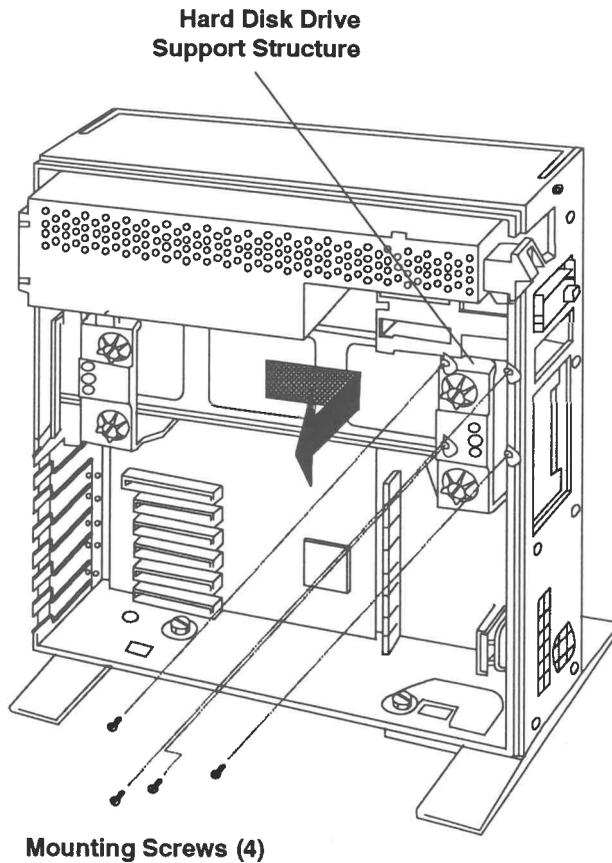


Figure 2-8 Drive Support Structure Removal

11. Disconnect the power cable and any other remaining cables from the original system board.
12. Remove the seven screws that fasten the original system board to the chassis (see Figure 2-9). Save the screws to mount the new Reply system board later.
13. Loosen the screw that fastens the original system board EMI shield to the chassis (see Figure 2-9).
14. Lift the original system board out of the chassis.
15. Using a 3/16-inch nut driver, remove the six jack screws that fasten the EMI shield to the original system board (see Figure 2-10). Save the EMI shield and jack screws to mount to the new Reply system board later.

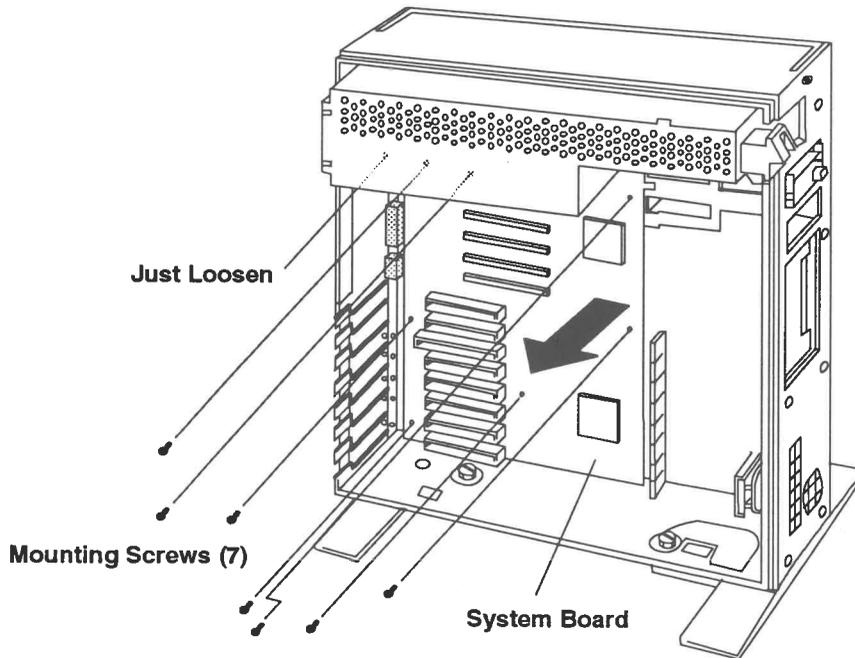


Figure 2-9 System Board Mounting Screw Locations

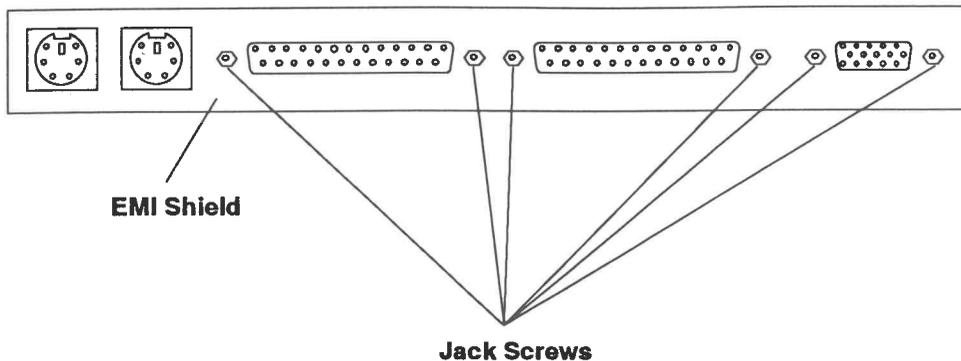


Figure 2-10 EMI Shield Jack Screw Locations

16. After you have removed the original system board, locate the grounding plate affixed to the chassis, below the power supply (see Figure 2-11).

NOTE: If you have an IBM PS/2 Model 65 computer, you may not have this grounding plate installed.

CAUTION: Be careful when handling the grounding plate; it may have sharp edges.

17. The grounding plate is held to the chassis by heat staking. The location of the stakes are shown in Figure 2-11. Using a standard blade screwdriver, pry the grounding plate away from the chassis. Slide the grounding plate down from beneath the power supply and remove it from the chassis. The grounding plate can be discarded.

WARNING: Failure to remove the grounding plate from the computer will result in permanent damage to the new Reply system board.

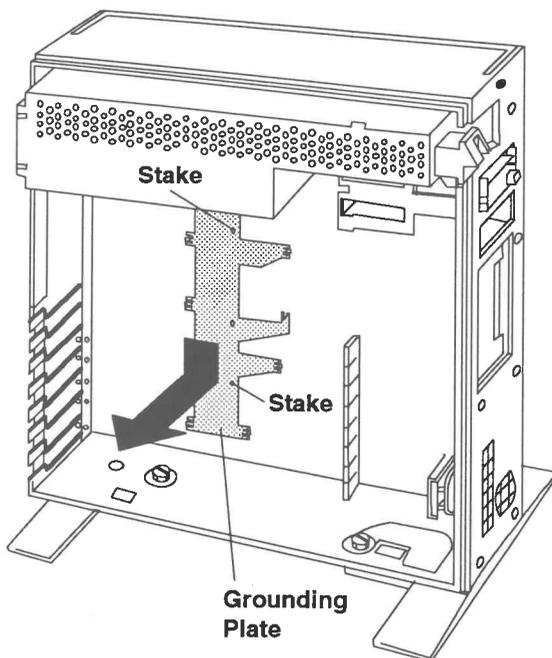


Figure 2-11 Grounding Plate Removal

2.8 INSTALLING THE REPLY SYSTEM BOARD

Install the new Reply system board into the IBM PS/2 Model 60, 65, or 80 by following these steps:

NOTE: If you are installing a processor or memory option as part of the upgrade, these components should be installed on the Reply system board before the board is installed in the computer (refer to the Installation Checklist).

1. Install the EMI shield formerly installed on the original system board on the Reply system board (see Figure 2-10).

2. Taking care not to over tighten the screws (just snug), secure the shield to the board with the six jack screws (use a 3/16-inch nut driver).
3. Slide the Reply system board into the chassis so the mounting bracket incorporated onto the EMI shield slides into position beneath the screw still mounted in the chassis (see Figure 2-9).
4. Hand-tightening only, fasten the Reply system board to the chassis using the seven mounting screws (see Figure 2-9).
5. Tighten the eight Reply system board mounting screws with a screwdriver, just to the point of being snug; then tighten an additional 1/8 revolution.
6. Plug the power supply cable into its corresponding connector on the Reply system board (see Figure 2-12).
7. Insert the hard disk drive support structure mounting tabs into their corresponding slots on the chassis. Firmly press the assembly into place so that its four mounting holes are aligned with their corresponding standoffs on the chassis (see Figure 2-8).
8. Tighten the four mounting screws to secure the hard disk drive support structure to the chassis.
9. If adapters were originally installed in any of the eight expansion slots, install them in their assigned slots by following these steps (see Figure 2-7):
 - a. Align the adapter mounting bracket with the expansion slot guide rails.
 - b. Carefully slide the adapter into the slot until its edge connector is inserted into the slot connector. Press the adapter firmly, until it is fully seated.
 - c. Tighten the thumb nut that secures the option adapter mounting bracket to the chassis.
 - d. If the option adapter has internal cable connections, connect the cable(s) to the adapter.
10. If you originally had a hard disk drive in the rear bay, install it now (if you are installing a Reply hard disk option in this bay, see the documentation included in the hard disk option kit for installation instructions, then return to the next step in this procedure).

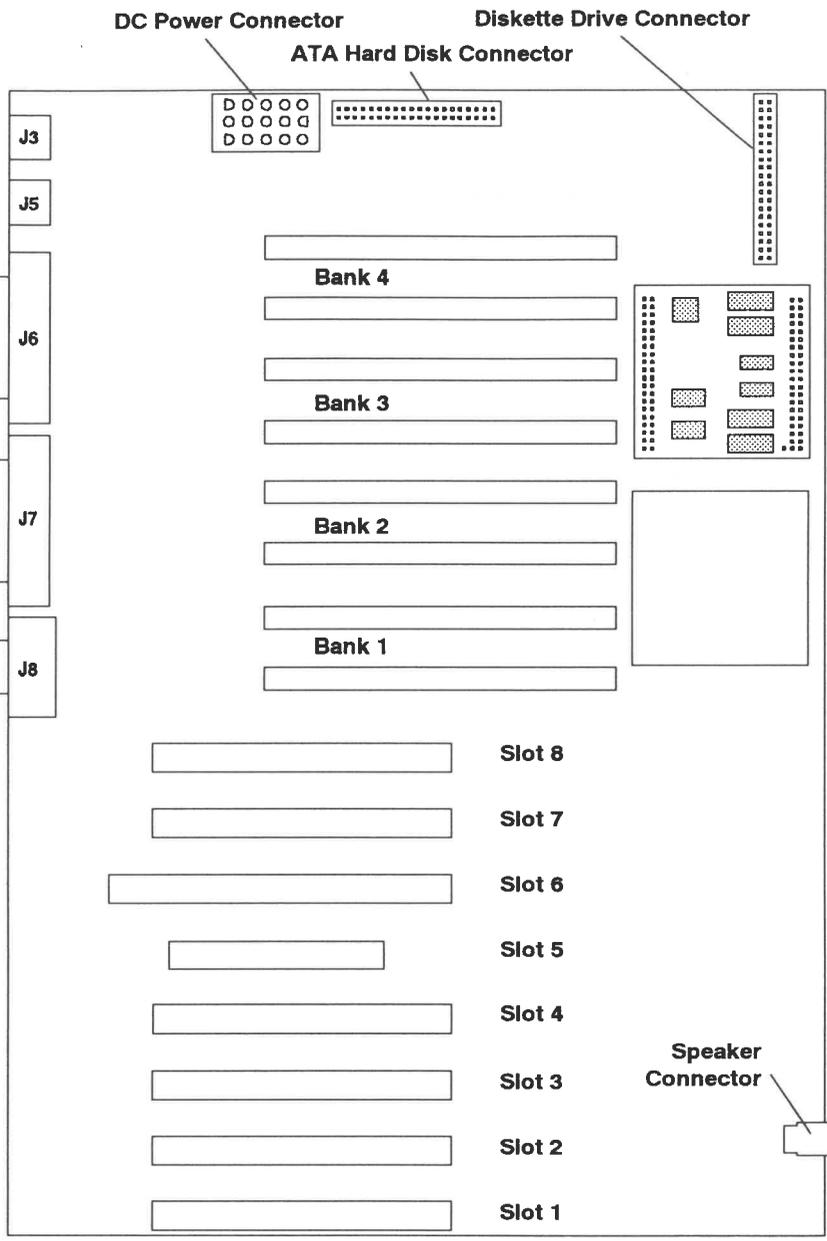


Figure 2-12 Reply System Board Connector Locations

11. Secure the rear bay hard disk drive into place by tightening the two mounting fasteners on the support structure (see Figure 2-6).
12. Connect all required signal, ground, and power cables to their respective connectors on the hard disk drive(s).
13. If you originally had a hard disk drive in the front bay, install it now (if you are installing a Reply hard disk option in this bay, see the documentation included in the hard disk option kit for installation instructions, then return to the next step in this procedure).
14. Secure the front bay hard disk drive into place by tightening the two mounting fasteners on the support structure (see Figure 2-5).
15. Connect all required signal, ground, and power cables to their respective connectors on the hard disk drive(s).
16. Connect the diskette drive cable to connector J6 on the Reply system board (see Figure 2-12).
17. If you have installed Reply optional ATA hard disk drives, connect the interface cable to connector J1 on the Reply system board (see Figure 2-12).
18. If you removed the front bezel, install it at this time (see Figure 2-4).
19. Remove the grounding wrist strap from the chassis and install the computer side cover (see Section 2.6). Return to the next step on the Installation Checklist.

2.9 LABEL INSTALLATION

There is a Reply label, which should be installed on the front of the computer, just below the power switch (see Figure 2-13).

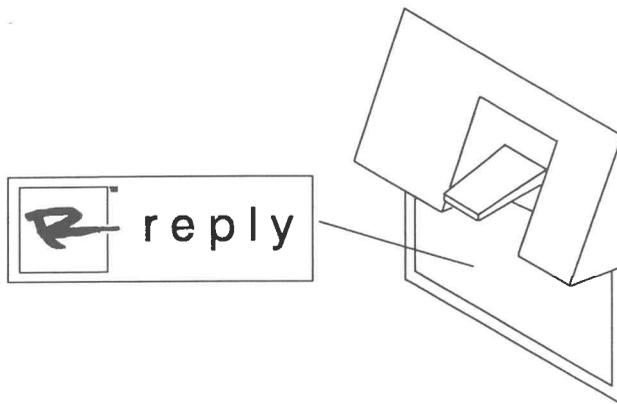


Figure 2-13 Installation Location of the Reply Label

CHAPTER 3

Adding Options

This chapter provides installation instructions for optional memory modules, processors, and secondary cache module offered by Reply.

3.1 INTRODUCTION

When you purchase a Model 60/80 Upgrade Kit from Reply, you may also purchase a number of option kits that, for convenience, should be installed during the installation of the Reply system board. This chapter provides installation instructions for optional memory modules and processors.

NOTE: Installation instructions for optional hard disk drives are provided in the hard disk drive option kits.

3.2 ADDING MEMORY

The Reply system board memory can be expanded to a maximum of 128MB. This section explains how to install memory modules.

The Reply system board has four memory banks, each consisting of two sockets for single in-line memory modules (see Appendix A for the memory modules supported by the Reply system board). Figure 3-1 shows the locations of the memory module socket pairs that make up Banks 1 through 4.

WARNING: Before handling memory modules, read the information provided in Chapter 2, Section 2.5 regarding ESD damage prevention.

Reply offers 2MB, 4MB, 8MB, and 16MB memory module option kits. You must install the modules in pairs (two modules for each bank). Modules in different banks do not need to be of the same density, however, *ECC* and *Parity* memory modules cannot be installed on the same Reply system board. Memory modules are not required to be installed in any specific bank order.

Install the memory module option by following these steps:

1. Verify that you have received a complete kit. Each kit should include one pair of memory modules (either 2MB, 4MB, 8MB, or 16MB) and a grounding wrist strap.
2. If you are installing the memory modules as part of the Reply system board upgrade procedure, go directly to step 5. Otherwise, continue with step 3.

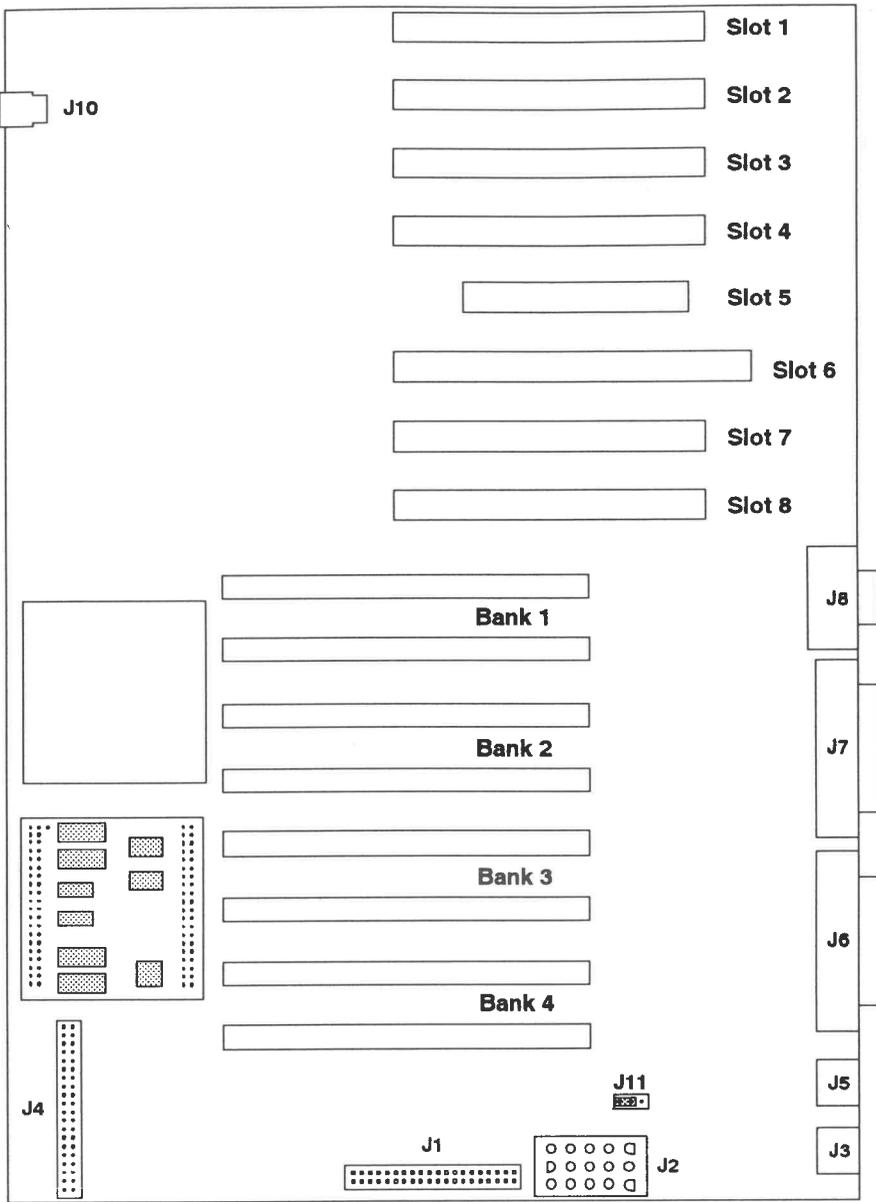


Figure 3-1 Memory Module Bank and Socket Locations

3. Remove the computer side cover as described in Chapter 2, Section 2.6.
4. Remove the hard disk drive(s) and drive support structure as described in Chapter 2, Section 2.7, steps 1 through 10 (you do not need to remove adapters).
5. Position a memory module over a socket with the notch keys of the module oriented relative to the socket as shown in Figure 3-2.
6. Carefully slide the module edge connector into the socket at a 45-degree angle. Make sure the module is seated firmly in the socket.
7. While gently applying downward pressure, tilt the memory module downward from 45 degrees to about 60 degrees, until the retaining clips lock with a *click*.
8. Repeat the process for each memory module. Be sure to seat each module firmly and confirm that each bank is filled with two memory modules. The computer may not operate properly if memory modules are installed incorrectly.
9. If you are installing memory as part of the Reply system board upgrade, return to the next step in the Installation Checklist. Otherwise, reassemble the unit as described in Chapter 2, Section 2.8, steps 7 through 19. Run **Set Configuration** to update the configuration data in CMOS (see Section 4.1.1).

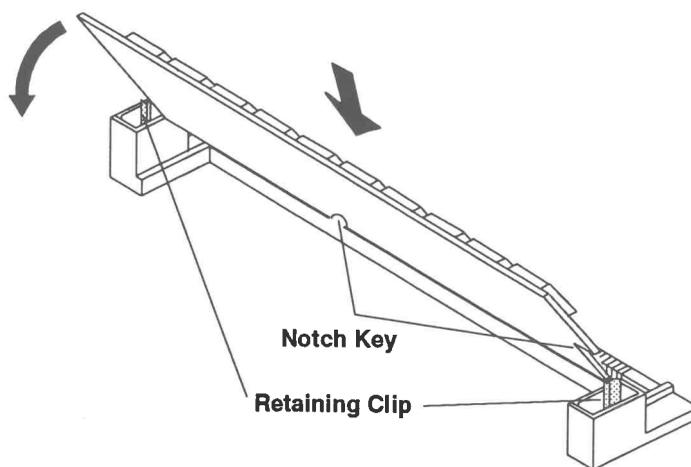


Figure 3-2 Installing Memory Modules

3.3 INSTALLING A PROCESSOR

The Reply system board has an Intel OverDrive™ socket that supports the use of the following upgrade processors offered by Reply:

- 487SX 33MHz
- 486DX 33MHz
- 486DX2 66MHz

The location of the Intel OverDrive socket is shown in Figure 3-3.

WARNING: Before handling a processor, read the information provided in Chapter 2, Section 2.5 regarding ESD damage prevention.

1. Verify that you have received a complete kit. Each kit should include one processor and a grounding wrist strap.
2. If you are installing the processor as part of the Reply system board upgrade procedure, go directly to step 5. Otherwise, continue with step 3.
3. Remove the computer side cover as described in Chapter 2, Section 2.6.
4. Remove the hard disk drive(s) and drive support structure as described in Chapter 2, Section 2.7, steps 1 through 10 (you do not need to remove adapters).
5. Pivot the Intel OverDrive socket bail to its released position (see Figure 3-4). If a processor is currently installed in the socket, remove it by lifting it straight up.
6. Referring to Figure 3-3, properly orient the processor to the Intel OverDrive socket.

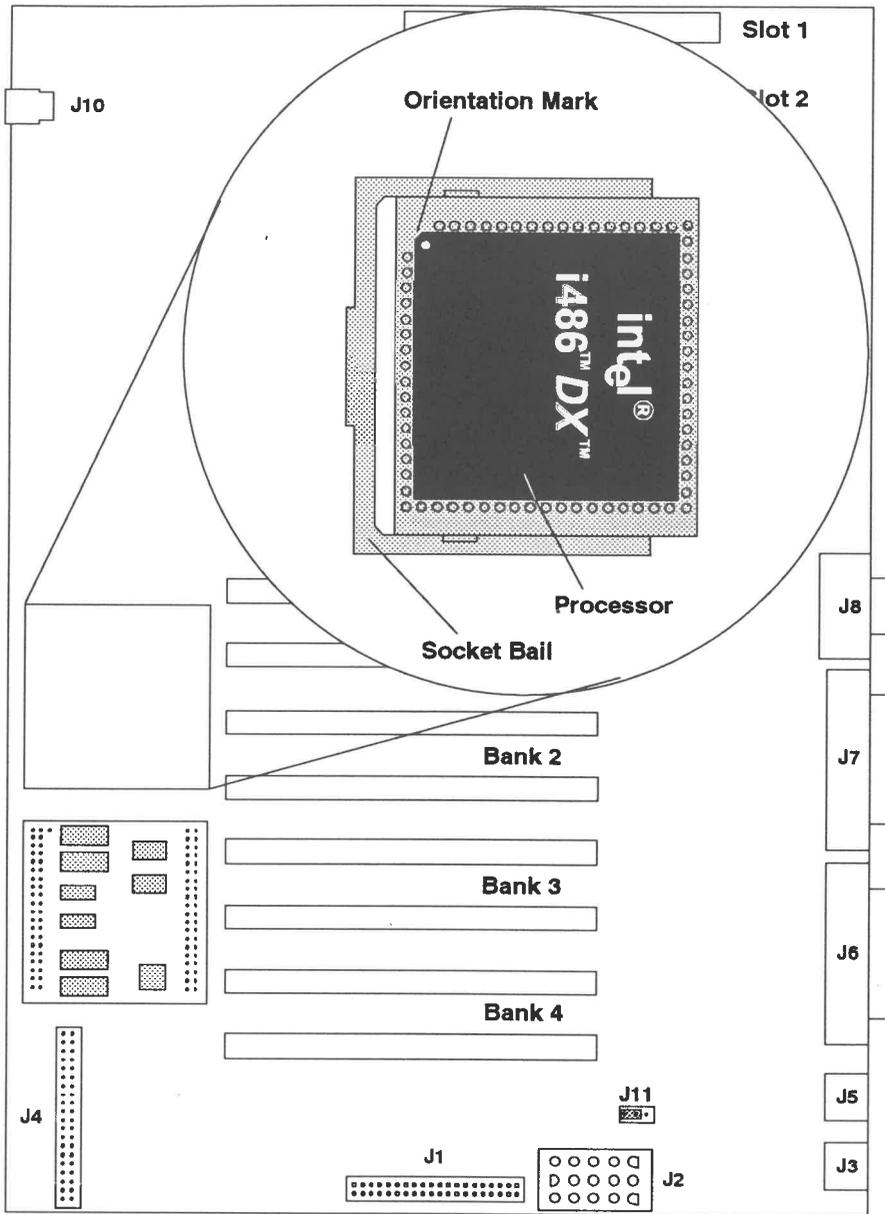


Figure 3-3 Intel OverDrive Socket Location

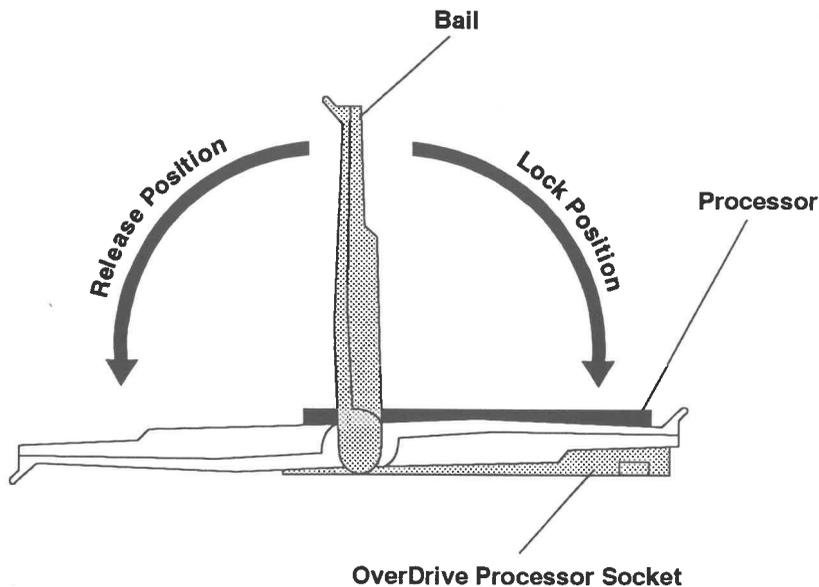


Figure 3-4 Installing a Processor

WARNING: Incorrect orientation of the processor in the socket on the Reply system board could result in permanent damage to both the processor and the board.

7. Carefully place the processor in the socket, verifying that all pins are properly inserted in the socket and that no pins are bent or improperly aligned.
8. Pivot the socket bail into its locked position (see Figure 3-4).
9. If you are installing this processor as part of the Reply system board upgrade, return to the next step in the Installation Checklist. Otherwise, reassemble the unit as described in Chapter 2, Section 2.8, steps 7 through 19. Run **Set Configuration** to update the configuration data in CMOS (see Section 4.1.1).

CHAPTER 4

CMOS Configuration and Utilities

This chapter describes how to use configuration and utility programs that reside on the Reply Reference Diskette.

4.1 CONFIGURATION PROGRAMS

Your Reply Reference Diskette provides four programs associated with CMOS memory configuration tasks. The CMOS memory contains the hardware configuration information used to start the computer. For the computer to start properly, the CMOS configuration must match the installed hardware. The system board is shipped with a default configuration that may not match the actual computer configuration. The CMOS memory contents are changed and protected using the Reference Diskette configuration programs. These programs include:

- **Set Configuration** - provides the means for viewing or setting the computer configuration
- **Automatic Configuration** - automatically senses the computer hardware and sets the appropriate default configuration
- **Save Configuration** - provides the means to save your current computer configuration to the Reference Diskette
- **Restore Configuration** - provides the means to restore the computer configuration from data previously saved to the Reference Diskette

Each of these programs is discussed in detail in the subsections that follow.

4.1.1 Using the Set Configuration Program

As discussed previously, the Set Configuration program allows you to view or set your computer configuration. Additionally, if your configuration includes SCSI devices, changes in the SCSI device configuration are sensed and automatically reconfigured as part of the Set Configuration program execution.

Select and run the Set Configuration program by following these steps:

1. With the Reply Reference Diskette inserted in Drive A, start the computer.
2. When the Reply logo appears, press any key to display the **Main Menu** (the **Main Menu** will appear after a 5-second delay, whether or not you press a key).
3. From the **Main Menu**, leave the default selection **Set Configuration** intact and press Enter (see Figure 4-1).

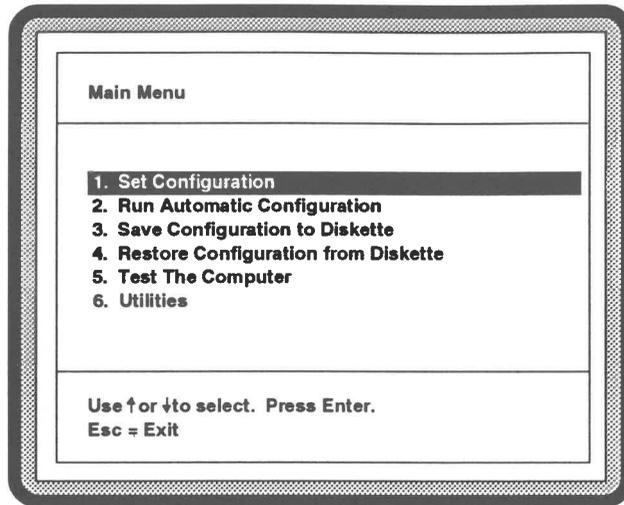


Figure 4-1 Selecting the Set Configuration Program

4. If modifications to SCSI devices have been made, the SCSI device configuration program runs as shown in Figure 4-2. The **Main Setup Window** then appears on the display (see Figure 4-3).
5. As shown in Figure 4-3, the Set Configuration program has four windows:
 - Main Setup
 - Slot Setup
 - Extra Features
 - Memory Layout

The features and functions of each window are discussed in the subsections that follow. You may exit the Set Configuration program by pressing F9.



Figure 4-2 SCSI Device Configuration Message

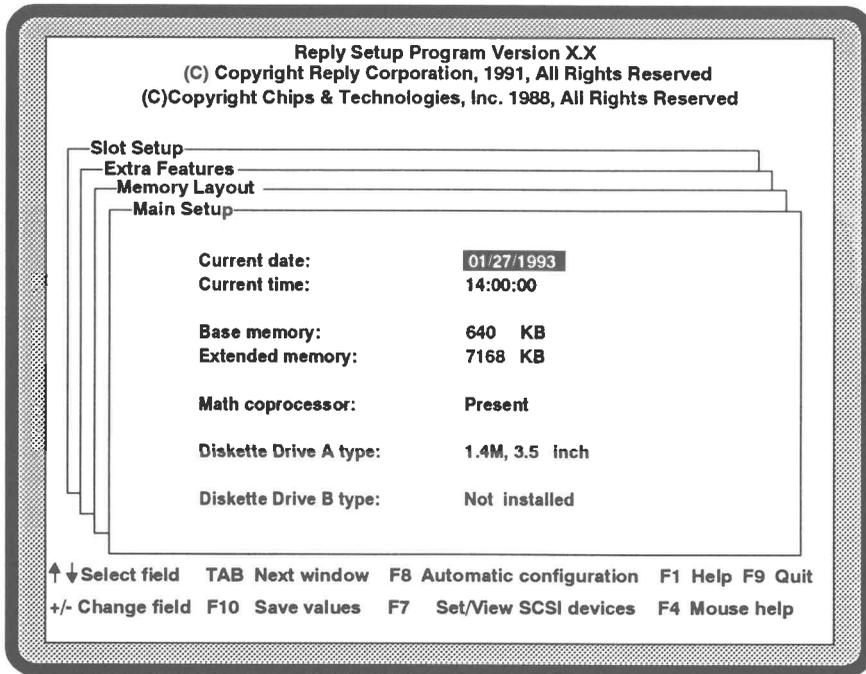


Figure 4-3 Main Setup Window

4.1.1.1 Main Setup Window

The **Main Setup Window** options allow you to view and modify the current date and time, base and extended memory values, and diskette drive type. Additionally, it also shows whether or not a math coprocessor is present.

The details regarding each of these options are provided in Table 4-1. On-screen help is available for each field simply by selecting the field and pressing the F1 key. You can exit the help display by pressing any key.

The function keys for the Set Configuration program are displayed at the bottom of the **Main Setup Window** (see Figure 4-3). These functions are defined in Table 4-2.

Table 4-1 Main Setup Window Configuration Fields

Field	Description
Current date	This field allows you to set the system date. The date consists of three fields: month, day, and year. Type the appropriate value for the month, day, and year as shown in Figure 4-3. A change to the current date is written directly to CMOS, requiring no save operation.
Current time	This field allows you to set the system time. The three fields that make up the current time are hour, minute, and second. Enter the current time using the 24-hour format (for example, 2:00 p.m. is entered as 14:00:00). A current time change is written directly to CMOS, requiring no save operation.
Base memory	This field specifies the amount of memory to use for conventional DOS memory. It will always be set to 640KB.
Continued on the next page	

Table 4-1 Main Setup Window Configuration Fields (Continued)

Field	Description
Extended memory	This field shows the amount of memory in excess of 640KB. Running the Set Configuration program or the Automatic Configuration program senses the actual memory installed and correctly sets the value of this field. Press the F1 key while the field is selected for further details.
Floppy Drive A/B type	These fields allow you to specify the diskette drive type for Drives A and B. Using the + or - key, select the appropriate drive type from the fixed set of options (press the F1 key to review the list). Be sure to select the appropriate type or diskette errors could occur. The Automatic Configuration program senses the presence of the diskette drives installed, however, the user must correctly specify the drive type.

Table 4-2 Configuration Programs Function Keys

Key	Function	Description
↓ ↑	Select field	Pressing the up or down arrow allows you to select the field you wish to modify. Selection wraps around so you can proceed through all fields and return to your original position by continuously pressing the same key.
TAB	Next window	As specified earlier, there are four windows. Pressing the Tab key allows you to page through the four windows until you see the one you want. Paging wraps around, returning you to the Main Setup Window .
F8	Automatic Configuration	Pressing F8 runs the Automatic Configuration program.
Continued on the next page		

Table 4-2 Configuration Programs Function Keys (Continued)

Key	Function	Description
F1	Help	Pressing F1 causes on-screen help information for the currently selected configuration field to be displayed. Exit the help display by pressing any key.
F9	Quit	Pressing F9 causes the configuration program to be terminated and then gives you the opportunity to save configuration modifications to CMOS. If you save the configuration, the configuration program ends and the computer restarts. If you choose not to save the configuration, the program ends and the Main Menu is once again displayed. (If you previously saved the configuration by pressing the F10 key, pressing F9 immediately restarts the computer.)
+/-	Change field	Pressing the + or - key allows you to change the field contents, selecting from a fixed list of selections. Both keys provide wrap-around selection through the entire list of valid options.
F10	Save values	Pressing the F10 key saves the configuration values for all four windows to CMOS. When you press this key, you will be asked whether or not you really wish to save these values. After selecting Y, the program saves the value to CMOS and returns to the currently selected window.
F7	Set/View SCSI Devices	Pressing the F7 key causes the SCSI Device Configuration Window to be displayed. The options available for this window are discussed later in this chapter in the Section 4.1.1.5.
F4	Mouse help	Pressing the F4 key displays on-screen help information regarding the use of a mouse for Reply configuration programs.

4.1.1.2 Slot Setup Window

The **Slot Setup Window** lists the optional adapters that occupy Expansion Slots 1 through 8, and the Reply system board built-in features (see Figure 4-4). You must scroll down to see all slots and the built-in features.

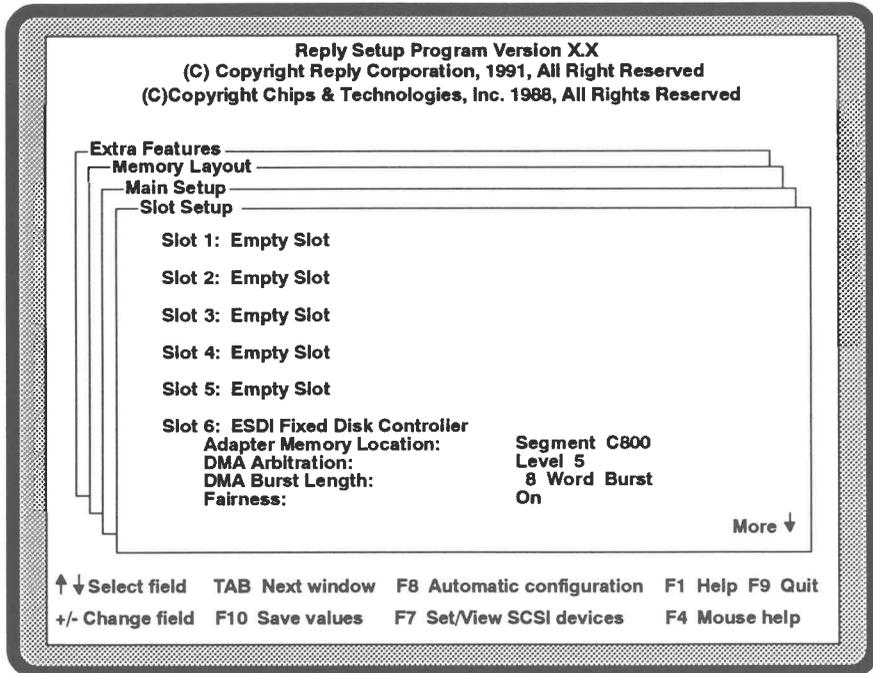


Figure 4-4 Slot Setup Window

The **Slot Setup Window** configuration fields are as follows:

Expansion Slots 1-8: The configuration parameters available for optional boards that may occupy the expansion slots are adapter-dependent. Refer to the documentation that accompanies the adapter for details.

Built In Features: This portion of the **Slot Setup Window** includes configuration fields for the on-board serial port, parallel port, parallel port arbitration, AT IDE interface, and cache status at startup. The configuration fields are as follows:

Serial Port: Using the + or - key, you can specify the on-board serial port number from a selection of 1 through 16 or disable the port entirely. The selection also specifies the interrupt request level. The Automatic Configuration program sets the port to *Serial 1, IRQ 4*.

Parallel Port: Using the + or - key, you can specify the on-board parallel port number from a selection of 1 through 4 or disable the port entirely. The Automatic Configuration program sets the port to *Parallel 1*.

Parallel Port Arbitration: Using the + or - key, you can set the parallel port arbitration level to 0 through 7 or disable port arbitration. Additionally, this field specifies the arbitration level you select as *shared* (other devices can share this arbitration level) or *dedicated* (only this port can use the assigned arbitration level). Specifying *disabled* results in a PS/2-compatible parallel port without DMA capabilities. The Automatic Configuration program sets the port arbitration level to *Shared 7*.

AT IDE Interface: The on-board AT IDE interface can be configured as *Primary* or *Secondary*, each with a different port address range. Automatic Configuration sets *Primary* as the default. It is not necessary to change the setting unless there is an address conflict with another device. You can also specify *Disabled* if no ATA hard disk drive is installed.

Cache enabled at startup: This field allows you to specify whether or not cache memory on the Reply system board is enabled or disabled as the computer startup default. Normally, the default setting of *Yes* is the correct choice. However, some older software, not designed to operate at the current faster speeds, may work better when cache is disabled. Generally, the system speed is reduced dramatically by disabling cache. Automatic Configuration sets this field to a *Yes* default.

The function keys for the **Slot Setup Window** are identical to those of the **Main Setup Window** (see Table 4-2 for details).

4.1.1.3 Extra Features Window

The **Extra Features Window** allows you to view and modify configuration fields that affect a variety of Reply system board features. As shown in Figure 4-5, the features include the following:

Extended memory: This field is identical in function to the Extended memory field on the **Main Setup Window**.

Typematic rate: This field specifies the keyboard repeat key rate as *Normal* or *Fast* using the + or – keys. The Automatic Configuration program sets this field to *Normal*. Press the F1 key while this field is selected for further details.

Numlock On at startup: This field specifies the startup default status of the Numlock key. Use the + or – key to specify *Yes* or *No*. The Automatic Configuration program sets this field to *No*.

Disable memory below 16MB: This feature allows the computer to accommodate the use of certain adapters that require address space in upper memory (between C00000 and FFFFFFFF) in order to operate properly. Depending on the memory requirements of the adapter, you can choose to disable and specify as non-cache address space a 1MB, 2MB, or 4MB block. Even if the address space is not actually occupied by memory, you must still disable the space so the processor will not treat it as cache-able memory space. The Automatic Configuration program sets this field to *None*.

The function keys for the **Extra Features Window** are identical to those of the **Main Setup Window** (see Table 4-2 for details).

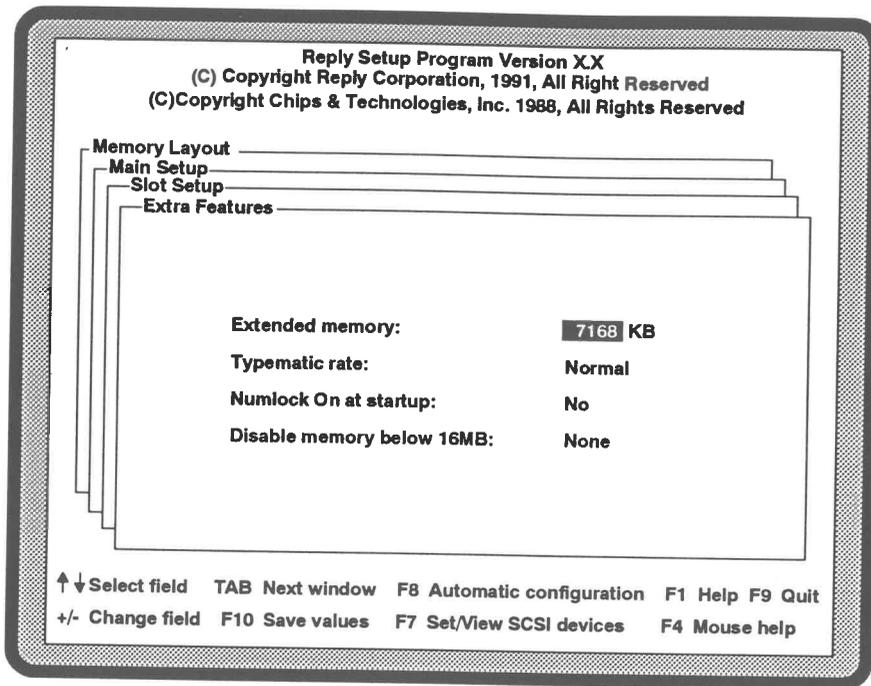


Figure 4-5 Extra Features Window

4.1.1.4 Memory Layout Window

This read-only window provides a memory map of the adapter ROM address space and address space above one MB. With the exception of the ↑ ↓ keys, all other function keys are identical to those of the **Main Setup Window** (see Table 4-2 for details). The ↑ ↓ keys function as scroll keys, rather than field select keys.

4.1.1.5 Set/View SCSI Devices Window

From any of the Set Configuration program or Automatic Configuration program windows, pressing the F7 key will bring up the **Set/View SCSI Devices Configuration Window** as shown in Figure 4-6. The **Set/View SCSI Devices Window** shows the slot location of the SCSI adapter(s) installed in the computer, as well as the devices attached to each SCSI adapter. The ID for each adapter and device is provided, as is the logical unit number for each device.

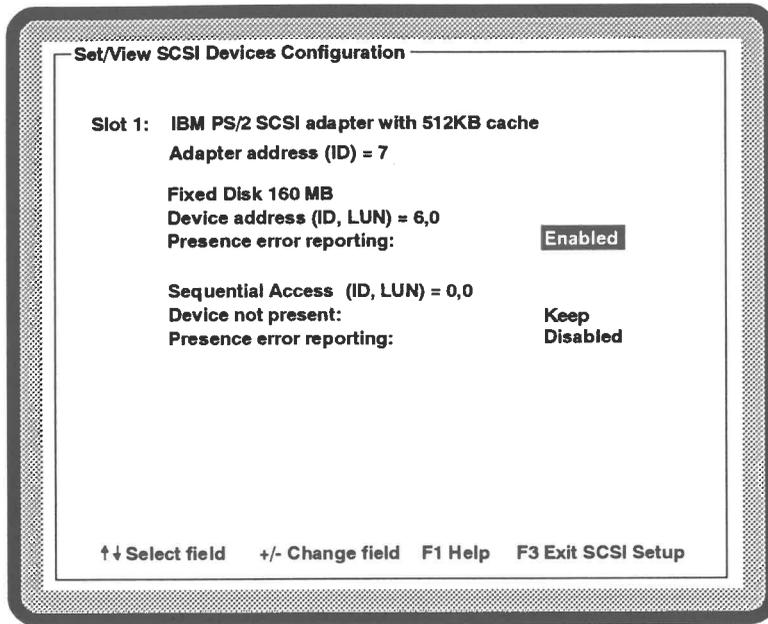


Figure 4-6 SCSI Devices Configuration

In addition to the SCSI configuration information, this window also offers two features that make it more convenient for environments in which devices may be shared (for example, a standalone SCSI tape drive is moved from one computer to another for backups). The two features are:

Presence error reporting: When *Enabled* is specified, an error is issued at computer startup if the SCSI device that was previously configured into the computer has been disconnected. Notice the fixed disk in Figure 4-6 has this parameter set to *Enabled*. This is because the device is a fixed disk and this field cannot be changed for such a device (it is unlikely that fixed disks will be commonly moved among several computers).

The tape drive (Sequential Access) shown in the figure happens to be an external, standalone device that is moved among several computers for backups. When the tape drive is first configured into the computer, this field is automatically set to the default, *Enabled*. If you know the tape drive will be disconnected from time to time, error reporting can be disabled. Consequently, when the computer is turned on, no error occurs if the tape drive is disconnected.

Device not present: this parameter only appears when a device previously configured into the computer has been disconnected. It can be set to *Keep* (default) or *Remove*. When set to *Keep*, the SCSI Configuration program allows the device configuration to remain intact, even though the device is no longer connected to the computer (as is the case of the previously discussed tape drive). If *Remove* is the specified parameter, the device is deleted from the configuration when the SCSI Configuration program is run.

4.1.2 Using the Automatic Configuration Program

This program automatically senses the computer hardware and sets up a default configuration that optimizes performance, while avoiding configuration conflicts. Run the Automatic Configuration program by following these steps:

1. With the Reply Reference Diskette inserted in Drive A, start the computer.
2. When the Reply logo appears, press any key to access the **Main Menu**.
3. From the **Main Menu**, select the **Automatic Configuration** option and press Enter (see Figure 4-7).
4. Upon successful completion of the Automatic Configuration program, the message shown below appears on the display; press Enter.

Automatic configuration complete.

5. If your computer includes SCSI devices, the SCSI Device Configuration program runs. The **Main Setup Window** then appears (see Figure 4-3). The Automatic Configuration program allows you at this point to view and modify the configuration via four windows:

- Main Setup
- Slot Setup
- Extra Features
- Memory Layout

These are identical to the four windows described earlier in this chapter in Section 4.1.1. Refer to that section now for details regarding the features and functions of each window. You may exit the Automatic Configuration program by pressing F9.

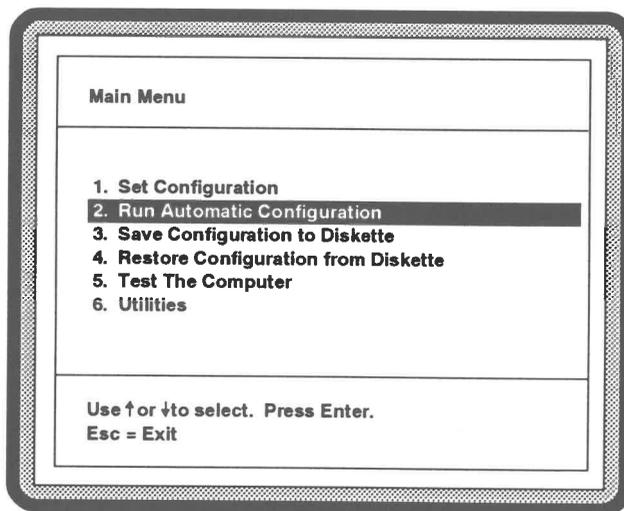


Figure 4-7 Selecting the Automatic Configuration Program

4.1.3 Saving Your Configuration to Diskette

Once your computer configuration has been set and saved to CMOS, we recommend that you save it to your backup Reference Diskette. To do so, follow these steps:

1. Set the write-protect tab on your backup Reference Diskette to the *write* position (that is, the diskette is no longer write-protected).
2. With the backup Reply Reference Diskette inserted in Drive A, start the computer.
3. When the Reply logo appears, press any key to access the **Main Menu**.
4. From the **Main Menu**, select **Save Configuration to Diskette** and press Enter (see Figure 4-8).

NOTE: Figure 4-8 is a composite of the windows you will see while carrying out this procedure. It is intended to show the program sequence.

5. The configuration in CMOS is written to the diskette in a file called **CMOSCOPY.DAT**. Upon completion you are notified and prompted to press Enter.
6. The program returns to the **Main Menu**. Remove the backup Reference Diskette from Drive A and set the write-protect tab to *protect*.
7. Restart your computer from hard disk to return to normal operations.

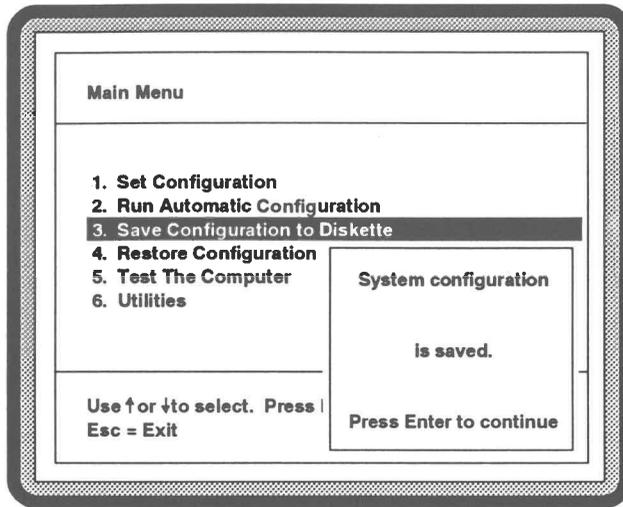


Figure 4-8 Save Configuration to Diskette Program Sequence

4.1.4 Restoring Your Configuration from Diskette

If the integrity of your computer configuration is in doubt or you have cleared CMOS, you can restore the configuration from the **CMOSCOPY.DAT** file on your backup Reference Diskette (of course, this assumes you saved the configuration earlier using the **Save Configuration to Diskette** program).

Restore your computer configuration by following these steps:

1. With the backup Reply Reference Diskette inserted in Drive A, start the computer.
2. When the Reply logo appears, press any key to access the **Main Menu**.
3. From the **Main Menu**, select **Restore Configuration from Diskette** and press Enter (see Figure 4-9).

NOTE: Figure 4-9 is a composite of the windows you will see while carrying out this procedure. It is intended to show the program sequence.

4. The configuration in the **CMOSCOPY.DAT** file is written to CMOS. Upon completion, you are notified and prompted to press Enter.
5. The program returns to the **Main Menu**. Remove the backup Reference Diskette from Drive A.
6. Restart your computer from hard disk to return to normal operations.

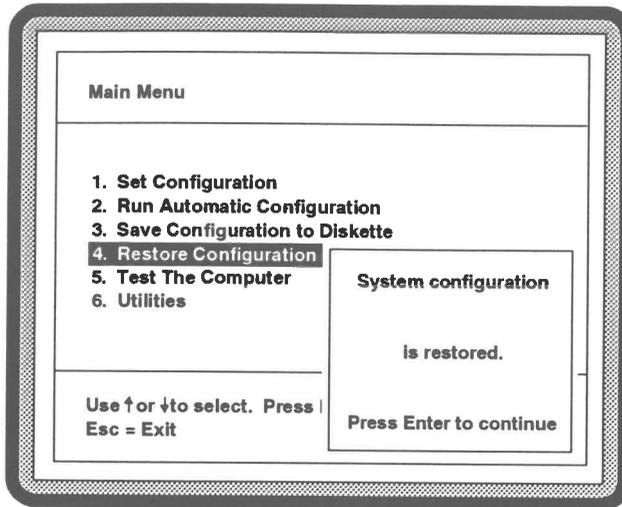


Figure 4-9 Restore Configuration from Diskette Program Sequence

4.2 UTILITY PROGRAMS

The Reply Reference Diskette includes five utility programs that allow you to perform the following functions:

- Copy option diskette files to the Reference Diskette
- Create a backup copy of the Reference Diskette
- Set system passwords
- Park the hard disk drive heads when the computer must be moved (necessary for ST 506 hard disk drives)
- Update BIOS (see Appendix B)

These utilities are discussed in detail in the subsections that follow.

4.2.1 Copying an Option Disk

When you install a new option into your computer (for example, SCSI adapter, Token Ring adapter, etc.), you may need to copy adapter description files (ADF) and diagnostic files (DGS) from an option diskette to your backup copy of the Reference Diskette. You can accomplish this by running the **Copy an Option Diskette** utility from the Reference Diskette. To copy option diskette files follow these steps:

1. With the backup Reply Reference Diskette inserted in Drive A, start the computer.
2. When the Reply logo appears, press any key to access the **Main Menu**.
3. From the **Main Menu**, select the **Utilities** option; press Enter.

4. From the **Utilities Menu**, select the **Copy an Option Diskette** option and press Enter (see Figure 4-10).

NOTE: Figure 4-10 is a composite of the windows you will see while carrying out this procedure. It is intended to show the program sequence.

5. The program prompts you to insert the option diskette. Follow the on-going prompts to complete the copying process. Upon completion, the program provides notification and prompts you to press Enter.
6. Press the Enter key. If no further utilities are needed for now, remove the backup Reference Diskette from Drive A and restart from the hard disk to resume normal operations.

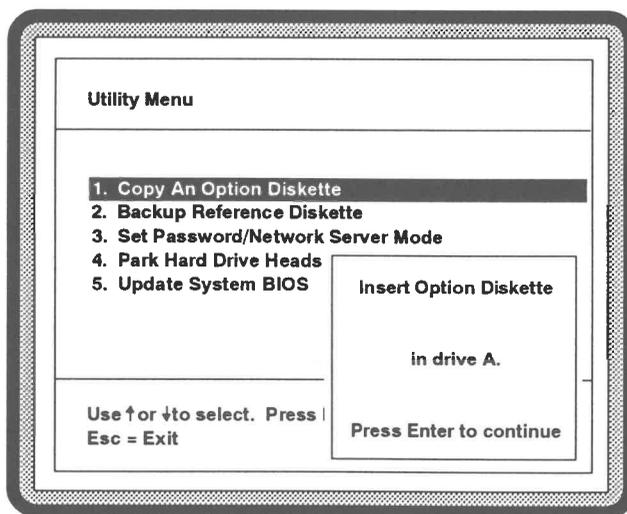


Figure 4-10 Copy an Option Diskette Program Sequence

4.2.2 Backing Up the Reference Diskette

The Reply Reference Diskette contains configuration programs, diagnostic tests, and utilities. You should create a backup copy of this diskette as soon as possible and store the original copy in the back of this manual. You can create a backup copy of the Reference Diskette using the **Backup Reference Diskette** option by following these steps:

1. Have a blank 3.5-inch, 1.44MB diskette available. It need not be formatted.
2. With the Reply Reference Diskette inserted in Drive A, start the computer.
3. When the Reply logo appears, press any key to access the **Main Menu**.
4. From the **Main Menu**, follow the instructions to select the **Utilities** option.
5. When the **Utility Menu** appears, select the **Backup Reference Diskette** option and press Enter (see Figure 4-11). The program then prompts you to alternately insert the Reference Diskette and then the backup (destination) diskette. Follow the prompts on the display to complete the backup process. Upon completion, the program provides notification and prompts you to press Enter.

NOTE: Figure 4-11 is a composite of the windows you will see while carrying out this procedure. It is intended to show the program sequence.

6. Press the Enter key. If no further utilities are needed for now, remove the backup Reference Diskette from Drive A and restart from hard disk to resume normal operations. From now on, use only this backup copy whenever you need to run a Reference Diskette program.

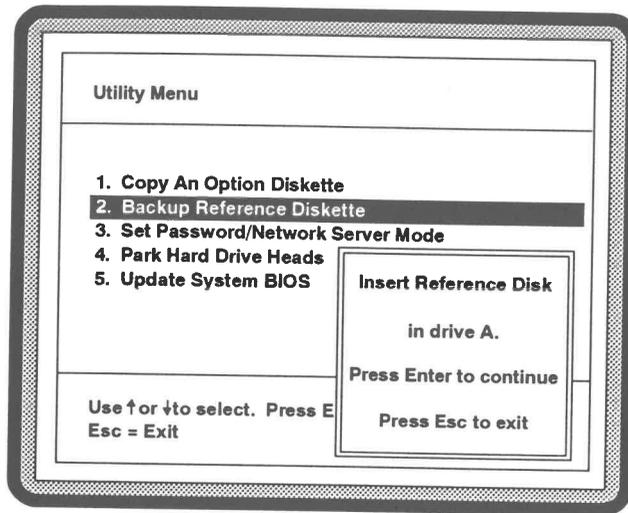


Figure 4-11 Reference Disk Backup Program Sequence

4.2.3 Setting and Using Passwords

Using a password can help prevent unauthorized persons from operating your computer and accessing files. We recommend using the mechanical cover lock in the back panel in conjunction with a power-on password to maintain security, since a password can be bypassed by clearing CMOS.

The Reply system board supports the use of three passwords:

- Power-on password
- Network password
- Keyboard password

4.2.3.1 Power-on Password

When a power-on password is enabled, the Reply system board runs all the normal startup routines prior to loading the bootstrap file. At this point you are prompted to enter your password. Failure to do so prevents initial startup and loading of the operating system. To set a power-on password follow these steps:

1. With the backup Reply Reference Diskette inserted in Drive A, start the computer.
2. When the Reply logo appears, press any key to access the **Main Menu**.
3. From the **Main Menu**, follow the instructions to select the **Utilities** option.
4. When the **Utility Menu** appears, select the **Set Password/Network Server Mode** option and press Enter (see Figure 4-12).
5. An information window appears, which explains how to set, change, and remove the power-on password. At the bottom of the window is a query as to whether or not you want to set a power-on password. Specifying *N* (No) ends the program without setting a password. Specify *Y* (Yes) to continue.
6. The **Set Power-On Password Window** appears (see Figure 4-13). Type from one to seven characters (any printable ASCII character), with the following considerations:
 - The program ignores the SHIFT, ALT, and CTRL keys. As an example, it cannot differentiate between 7 and & (that is, Shift-7).
 - Keystrokes from the numeric keypad and function keys are invalid.
7. Press Enter. The program requests that you confirm that you want the specified password enabled. Pressing *N* provides the opportunity to specify the password again. Press *Y* if you are sure you want to enable the specified password.

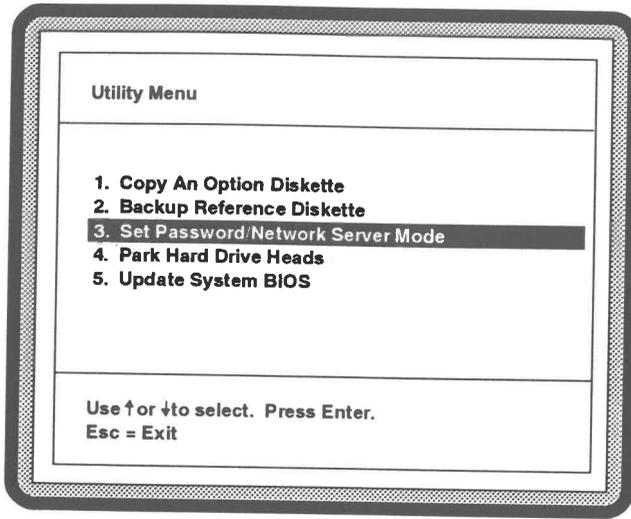


Figure 4-12 Initiating the Set System Password Program

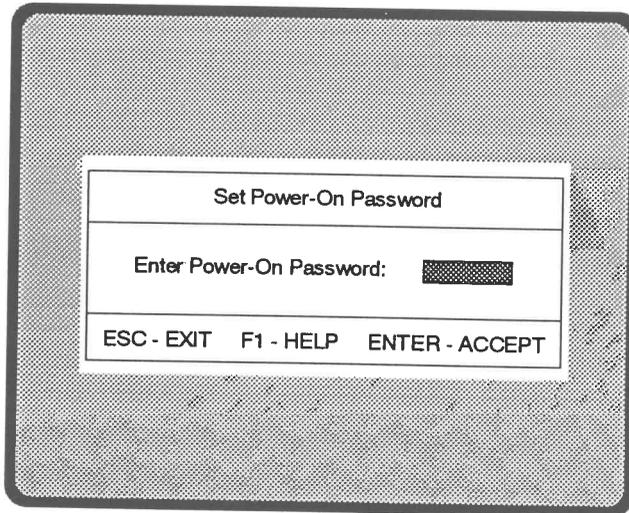


Figure 4-13 Set Power-On Password Window

8. The information window described in step 5 appears once again, except the query at the bottom of the window pertains to whether or not you want to set network mode. If you do not want network mode enabled go to step 9. If you do want network mode enabled, press *Y*. You will be queried one more time as to whether or not you want to clear network mode. Press *N* and go to step 10.
9. Press *N* to prevent network mode from being enabled.
10. The **Utility Menu** once again appears. If no further utilities are needed for now, remove the Reference Diskette from Drive A and restart hard disk to resume normal operations.
11. If you did not enable network mode, read Section 4.3.3.2 to make sure you understand how to use, change, and clear the power-on password. If you enabled the network mode, the password operates differently and you will want to read Section 4.3.3.3.

4.2.3.2 Power-on Password Operations

Once the power-on password is set, each time the computer is turned on or restarted, you will be prompted to enter your password before the bootstrap file can be accessed. Additionally, the power-on password you specified is also the keyboard password (see Section 4.3.3.4).

NOTE: The system does not prompt you for your password after a warm restart (CTRL-ALT-DEL).

Changing Your Power-on Password

When you are prompted to enter your password, type in the following continuous string (no spaces) and press Enter:

Word1-Word2

The diagram shows the text "Word1-Word2" with three lines extending from it to the right. The top line points to "New Password", the middle line points to "Minus Sign", and the bottom line points to "Old Password".

The message *PASSWORD CHANGED* appears, the initial startup continues, and the new password is activated.

Canceling Your Power-on Password

When you are prompted to enter your password, type your password followed by a minus sign (-) in a continuous string without spaces. Press the Enter key. The message *PASSWORD CLEARED* appears, the initial startup continues, and the password is cleared.

NOTE: If you forget your power-on password, you will be unable to gain access to your computer. Furthermore, you will not be able to change or cancel the password. In this circumstance, your only method of recovery is to clear CMOS memory (see Appendix C).

4.2.3.3 Network Password Operations

If you chose to enable network mode as part of the power-on password configuration, when you restart or turn on your computer, all initialization routines will be run and the operating system will be loaded. However, the keyboard will remain locked until you type in the password and press Enter. You will not be prompted to enter your password.

This feature can serve as one element of the security for a network file server or some other computer that needs to be operational, while keyboard access remains restricted.

Canceling Network Mode

You may clear network mode only by using the Reference Diskette, following the procedures described in Section 4.3.3.1. Be sure to specify that you want network mode to remain disabled.

NOTE: If you forget your password, you will be unable to gain access to your computer. Also, you will not be able to change or cancel the password. Your only method of recovery is to clear CMOS memory (see Appendix C).

4.2.3.4 Keyboard Password

A keyboard password promotes security on occasions when you must leave your computer, but do not want to restart it. Unlike the system password, the keyboard password is only in effect until you restart the computer.

Since the keyboard password utility must be run from a DOS prompt, you must first copy the program from your backup Reference Diskette to your hard disk. With the Reference Diskette inserted in Drive A, copy **KEYLOCK.EXE** from the diskette to a directory of your choice on the hard disk. Once the file is copied, you can use the keylock utility as follows:

1. Change to the directory in which **KEYLOCK.EXE** resides.
2. Type in *Keylock* and press Enter.
3. If you have not set a power-on password, the **Keylock Program Window** appears (see Figure 4-14). Enter up to seven alphanumeric characters (any printable ASCII character).

NOTE: This utility ignores the SHIFT, ALT, and CTRL keys. For example, it cannot differentiate between 7 and & (that is, Shift-7). Also, keystrokes from the numeric keypad and function keys are invalid.

Press Enter after you are satisfied with your password. The message *Use Keyboard password to unlock keyboard* appears, followed by the DOS prompt. To unlock the keyboard you must type your password and press Enter (the password is not echoed on the display).

If you had already installed a power-on password, the program functions in the same fashion, except you do not have to specify a keyboard password; the power-on password is used.

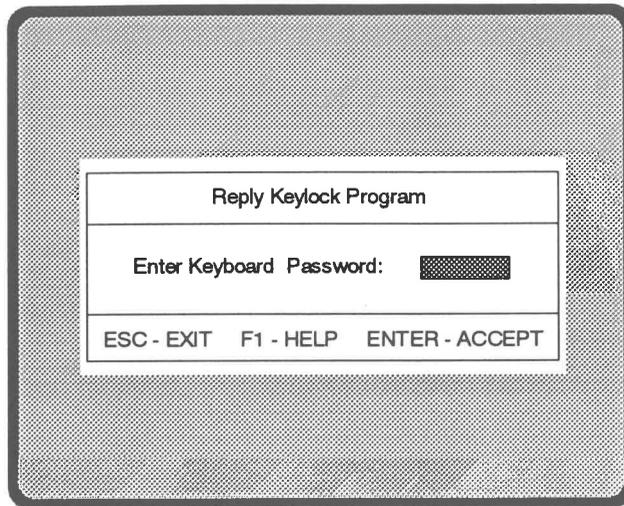


Figure 4-14 Keylock Program Window

4.2.4 Parking Hard Disk Drive Heads

If you plan to move a computer that has an ST 506 hard disk drive, you should park the hard disk drive heads by following these steps:

1. From the **Main Menu**, select **Utilities** and press Enter.
2. From the **Utility Menu**, select **Park Hard Drive Heads** and press Enter (see Figure 4-15).
3. A message appears, notifying you that the computer is ready to move and that it should be turned off.

NOTE: Figure 4-15 is a composite of the windows you will see while carrying out this procedure. It is intended to show the program sequence.

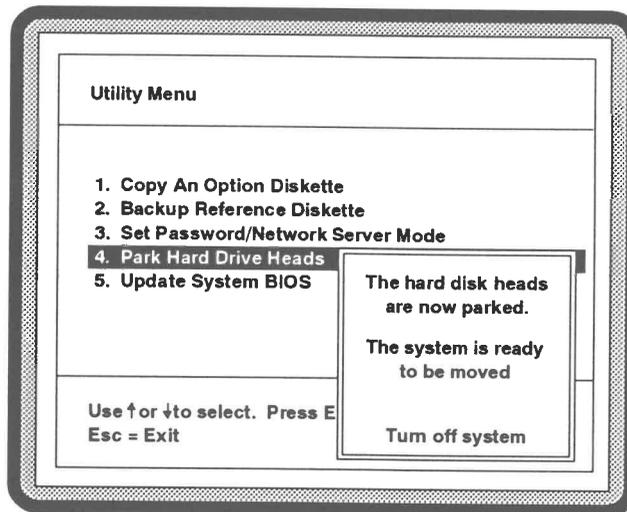


Figure 4-15 Parking Hard Disk Drive Heads

CHAPTER 5

Troubleshooting

This chapter provides basic troubleshooting instructions, information regarding the use of the Reply Reference Diskette to isolate computer failures, and lists of error messages with corresponding repair suggestions.

This chapter describes troubleshooting procedures for isolating Reply system board failures. The chapter is organized into the following four sections:

1. Troubleshooting Tips
2. Troubleshooting problems at initial startup
3. Using Subassembly Diagnostics
4. Analyzing error codes

5.1 TROUBLESHOOTING TIPS

When approaching a hardware problem, try to determine:

- What caused the problem?
- What was working before the problem occurred?
- What event , if any, occurred before the assembly stopped working?
- Was a new assembly added that changed or caused the failure?

If the cause of the problem cannot be isolated, follow these steps:

1. Turn off the computer and all attached peripheral devices.
2. Remove all assemblies except the basic ones needed to operate the computer. These include the following:
 - System board
 - Keyboard
 - Power supply
 - Diskette drive
 - Video display
 - One bank of memory (two memory modules)

3. Turn on the computer and repeat the startup procedure. If the computer does not function with the essential subassemblies, continue with the Startup Troubleshooting in Section 5.2.

If the computer functions properly with the essential subassemblies, progressively insert the subassemblies you removed earlier, one at a time. After each subassembly is added, test the computer to ensure it still functions properly. If a particular subassembly is failing, proceed to the Subassembly Diagnostics in Section 5.3 to test it with the diagnostic program.

5.2 TROUBLESHOOTING PROBLEMS AT INITIAL STARTUP

This section describes procedures you can use to isolate problems that occur during initial startup. Begin with "Preliminary Checks" and proceed sequentially through the "Startup Sequence."

5.2.1 Preliminary Checks

1. Turn the computer off.
2. Remove the computer cover as described in Chapter 2, Section 2.6.

 **DANGER:** Observe caution when working on the computer with the cover removed. Dangerous voltages are present that can cause severe electrical shock. The following procedures should only be performed by experienced technicians.

3. Verify that each adapter and connector is properly seated on the Reply system board.
4. Leave the cover off. Verify that the power, display, and keyboard cables are properly connected to their respective connectors on the computer back panel.
5. Continue with the startup sequence in Section 5.2.2.

5.2.2 Startup Sequence

Insert the Reply Reference Diskette in Drive A and turn on the computer. Observe the following conditions:

1. The green *Power-Good* LED on the front panel lights
2. The cooling fan in the power supply rotates
3. The BIOS identification appears on the display
4. The memory self-test runs
5. The diskette drive in-use indicator turns on and the read/write head resets
6. An audible beep is heard from the speaker
7. DOS and the Reference Diskette are read by the diskette drive
8. The Reply logo appears; press the Enter key. The Main Menu appears.

If the diskette drive in-use indicator comes on, but the Reply logo does not appear, the diskette may be defective. Replace the diskette with a Reference Diskette that you know works and try the startup sequence again.

If one of the items listed above failed, continue with this section for repair suggestions. If the startup sequence passed, refer to Subassembly Diagnostics in Section 5.3 to isolate a particular device fault. For error messages that appear on the display at startup or during Subassembly Diagnostics, refer to Error Code Definitions in Section 5.5 for a description of the fault.

5.2.2.1 Startup Checks

Is the green Power-Good LED on the front panel on?

- No
- Turn the computer and all attached peripheral devices off. Disconnect the computer power cable from the power outlet. Disconnect the DC power connector from the Reply system board at J2. Connect the computer power cable to the power outlet. Turn the computer on. If the green LED remains off, replace the power supply. If the LED lights, turn the computer off. Connect the DC power connector to the Reply system board at J2. Remove all other connections to the Reply system board. Turn the computer on.
 - If the LED remains off, replace the Reply system board.
 - If the LED lights, turn off the computer and connect the system board connections one at a time. After each connection, turn on the computer. Isolate the device preventing the power LED from coming on and replace it.

Is the fan in the power supply turning?

- No
- Turn the computer off. Replace the power supply assembly. If the problem persists, replace the Reply system board.

Does the BIOS information appear on the display?

- No
- Ensure the display power is on and the brightness control is centered. Check the video connection to the Reply system board. First, replace the display. Second, replace the Reply system board.

Does the memory self-test pass?

- No
- If the computer has more than one bank of memory, remove all the memory modules except for two modules in one of the memory banks. If the memory test continues to fail, replace the memory modules. If the problem persists, replace the Reply system board.

Does the diskette in-use indicator come on?

- No – Ensure the diskette drive cable is properly seated in the Reply system board and the drive itself. If the problem persists, replace in order: diskette drive interface cable, diskette drive, Reply system board.

Is the speaker beep heard?

- No – Replace in order: cable connecting the speaker to the Reply system board, speaker, Reply system board.

Does the Reply logo appear on the display?

- No – Replace in order: Reference Diskette, diskette drive, then the Reply system board.

5.3 SUBASSEMBLY DIAGNOSTICS

The Reply Reference Diskette included in the 60/80 Upgrade Kit provides a comprehensive suite of tests that fully check the Reply system board and devices connected to it. The subsections that follow tell you how to select tests and specify testing parameters. Additionally, Subsections 5.3.2 through 5.3.9 provide information about those tests that are interactive, thus requiring your responses.

5.3.1 Loading Tests and Specifying Testing Parameters

Load the diagnostics and specify testing parameters by following these steps:

1. Insert the Reply Reference Diskette in Drive A and start the computer.
2. When the Reply logo appears, press any key to display the **Main Menu** (the **Main Menu** appears after a 5-second delay, even if you do not press Enter).
3. From the **Main Menu**, select the **Test The Computer** option and press Enter (see Figure 5-1). Follow the prompts until the **Test Group Query Window** appears.

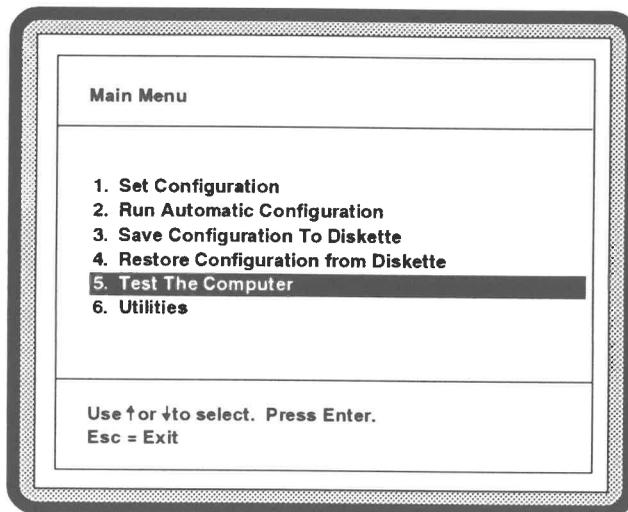


Figure 5-1 Computer Test Option

4. The list of devices on the left of the **Test Group Query Window** are those that will be tested (see Figure 5-2). The computer automatically compiles this list based on the devices it has sensed. If no changes to the test list are required, press **Y** (yes) to continue with this program and proceed to step 5. If you do want to modify the test status of a device (that is, change from being tested to not being tested or vice versa) press the **N** key. The **Test List Correction Window** appears as shown in Figure 5-3.

Select the device you want to change to a different status using the cursor arrows, then press **Enter**. The selected device will be moved to the other list. After all corrections have been made, press the **Esc** key. The **Test Group Query Window** appears once again. Press the **Y** key to proceed with the test program.

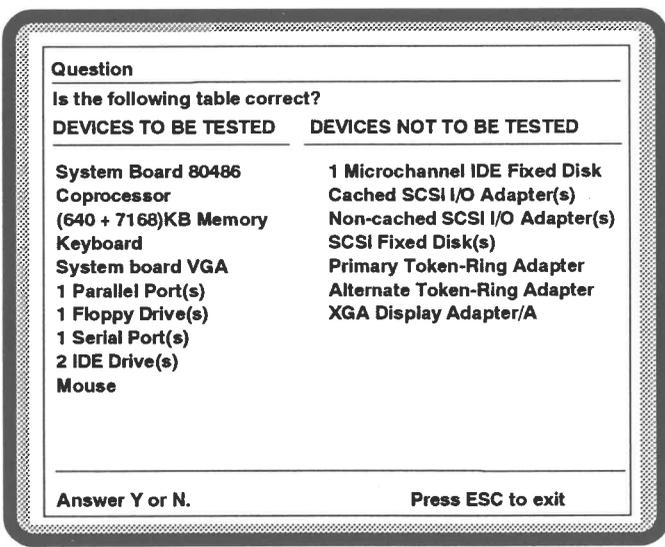


Figure 5-2 Test Group Query Window

Make corrections to table of devices	
DEVICES TO BE TESTED	DEVICES NOT TO BE TESTED
System Board 80486	1 Microchannel IDE Fixed Disk
Coprocessor	Cached SCSI I/O Adapter(s)
(640 + 7168)KB Memory	Non-cached SCSI I/O Adapter(s)
Keyboard	SCSI Fixed Disk(s)
System board VGA	Primary Token-Ring Adapter
1 Parallel Port(s)	Alternate Token-Ring Adapter
1 Floppy Drive(s)	XGA Display Adapter/A
1 Serial Port(s)	
2 IDE Drive(s)	
Mouse	
Esc - Exit	F1 - Help
← ↑ ↓ → - Move Cursor	Enter - Select

Figure 5-3 Test List Correction Window

NOTE: When the **Device Selection Menu** is displayed as described in the step that follows, you may specify the manner in which error information will be logged during testing. Normally, error information is written exclusively to the display. However, you may choose to also log error information to a printer or diskette. If you wish to make such modifications to error logging, see Section 5.4.

5. When the **Device Selection Menu** is displayed (see Figure 5-4), selecting the **Test all Devices** option will provide the most comprehensive computer testing (you can also select just one specific device to be tested). Information regarding the tests that require operator response is presented in Sections 5.3.2 through 5.3.9. The tests are presented in the sequence in which they would run, had you selected **Test all Devices**. After making your selection, press Enter.

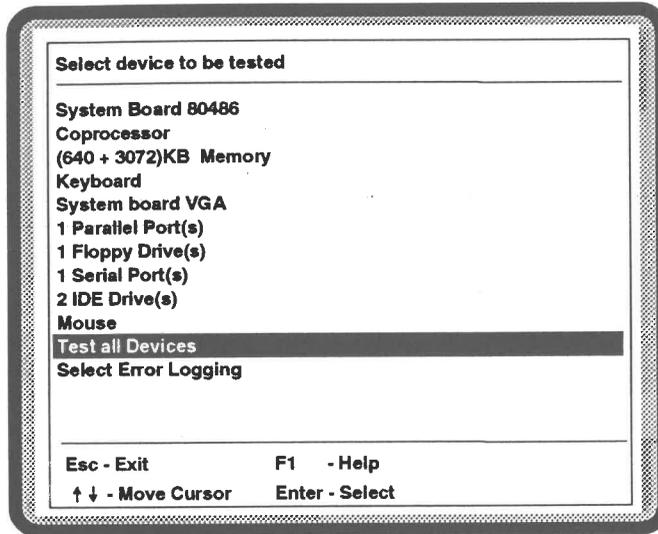


Figure 5-4 Device Selection Menu

6. The **Test Duration Menu** now appears (see Figure 5-5). The **Test Duration Menu** offers three testing methods. Highlight the appropriate testing method, considering the information that follows, and press Enter.

The **Run tests one time** option runs the selected test one time and returns to the **Test Duration Menu**. The **Run tests continuously** option runs the selected test until you press CTRL-C, which returns the program to the **Device Selection Menu**. If an error is encountered, an error message appears momentarily on the display and the program then continues to run. The **Run tests continuously, stop on error** option operates the same as **Run tests continuously**, except when an error occurs, the test stops permanently with the error information on the display.

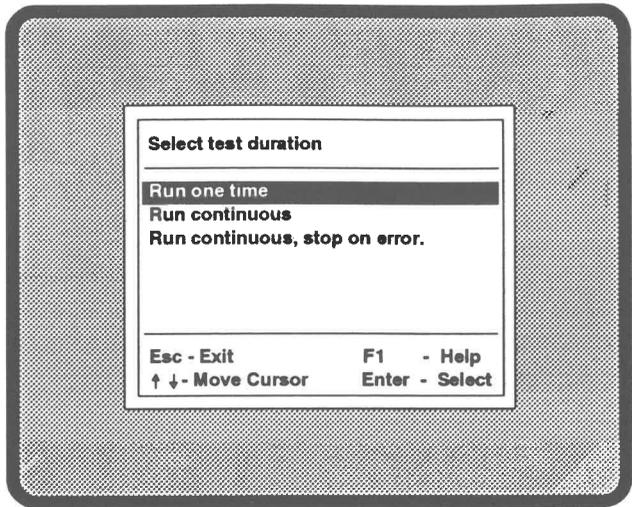


Figure 5-5 Test Duration Menu

5.3.2 Memory Tests

If you are testing all devices, the Memory Tests follow the System Board and Coprocessor Tests. You can also load and run the Memory Tests individually (see Section 5.3.1) The tests begin with the **Select Memory Test Menu** (see Figure 5-6). Run the test by following these steps:

1. Highlight the memory test(s) you want to run. Press Enter.
2. The memory test(s) begin. The duration of the tests is dependent upon the amount of memory the computer contains. A fully loaded computer may take several minutes to complete the test. You can monitor test progress by observing the information that appears on the display (see Figure 5-7).
3. Upon test completion, the **Select Memory Test Menu** appears once again. Pressing Esc key will begin the next test (if other device tests were selected) or return to the **Device Selection Menu** if the memory tests were run individually.

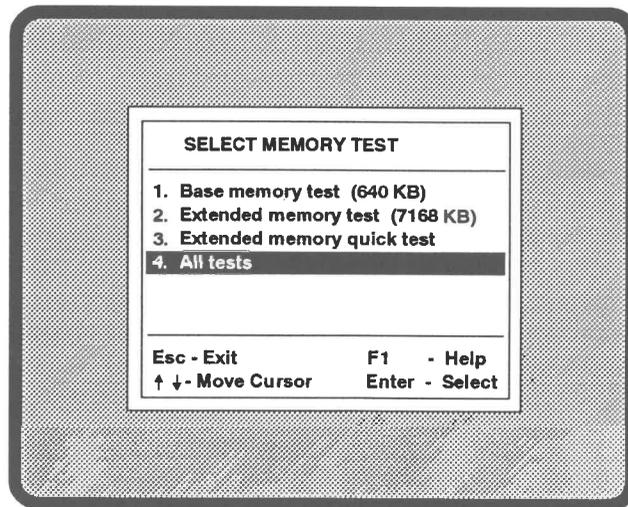


Figure 5-6 Memory Test Selection

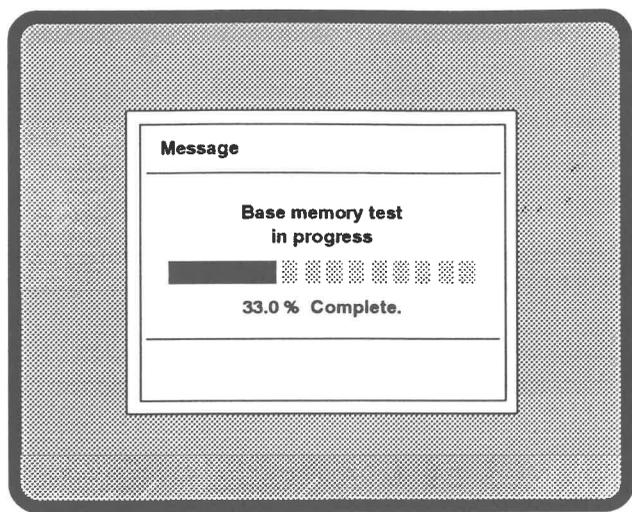


Figure 5-7 Checking Memory Test Progress

5.3.3 Keyboard Test

If you are testing all devices, the Keyboard Test follows the Memory Tests. You can also load and run the Keyboard Test individually (see Section 5.3.1).

The keyboard controller is tested. When the graphic representation of the keyboard appears, press each key to verify proper operation (correct operation is indicated when the image of the key becomes highlighted in red). Upon successful completion of the Keyboard Test, press CTRL-Y. If you are running the Keyboard Test individually, the **Device Selection Menu** is once again displayed, otherwise the next test begins.

5.3.4 System Board VGA Test

If you are testing all devices, the System Board VGA Test follows the Keyboard Test. You can also load and run the System Board VGA Test individually (see Section 5.3.1). The test consists of several images that display text and colors. Once the test has begun, respond by following these steps:

1. Press the Enter key when prompted, to confirm that what you see matches what the prompt indicates you *should* see.
2. Part way through the test, the window illustrated in Figure 5-8 appears. A multi-frequency display is required to support the higher resolution modes. Since the on-board video controller supports the video modes, but the display may not, you must define the capabilities of your display.
3. Press the appropriate key (Y or N) to continue the test. Once the test is complete, the program returns to the **Device Selection Menu** (if you are running the System Board VGA Test individually) or continues with the next test.

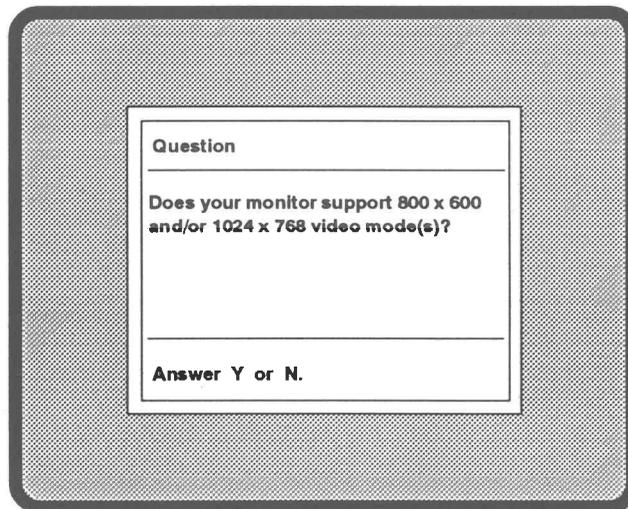


Figure 5-8 Defining Display Specifications

5.3.5 Parallel Port Test

If you are testing all devices, the Parallel Port Test follows the System Board VGA Test. You can also load and run the Parallel Port Test individually (see Section 5.3.1).

NOTE: If you want to run this test using a loop back connector, you must install the connector on the parallel port before you begin the test from the **Device Selection Menu**.

The Parallel Port Test checks the computer by sending a known data pattern to the parallel port and reading the data pattern from the port (see Figure 5-9). If the two patterns match, the test passes. A complete Parallel Port Test, to the system board connector, requires a loop back connector. The loop back connector pin assignments are shown in Figure 5-10.

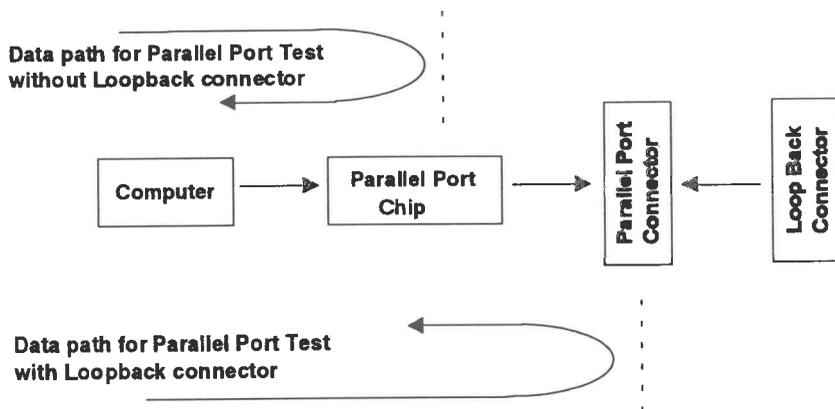


Figure 5-9 Parallel Port Test Data Path

Once the Parallel Port Test begins, it runs to completion without requiring operator responses. Upon test completion, the program returns to the **Device Selection Menu** (if you are running the Parallel Port Test individually) or continues with the next test.



Figure 5-10 Parallel Loop Back Connector

5.3.6 Diskette Drive Test

If you are testing all devices, the Diskette Drive Test follows the Parallel Port Test. You can also load and run the Diskette Drive Test individually (see Section 5.3.1).

The Diskette Drive Test verifies the read/write and operation capabilities of the installed diskette drive(s). Once the Diskette Drive Test is loaded, the program halts on the **Diskette Test Menu** (see Figure 5-11). Remove the Reference Diskette from Drive A and insert a formatted scratch diskette into the drive (*data will be destroyed on this diskette*). If you have a second diskette drive, you will also need a scratch diskette for it. Leave the default selection of **Read/Write Diskette Test** intact (for the most complete test) and press Enter. Follow the instructions on the display to run the tests.

Drive A is tested. Upon successful completion of the tests for Drive A, the **Diskette Test Menu** once again appears. If you have a second diskette drive to test, move the cursor to the **Select Current Diskette** option and press Enter. At the **Select Default Drive Menu**, specify Drive B and press Enter. Following the instructions given above, run the diskette tests for Drive B.

When you have tested all drives, press Esc. The program returns to the **Device Selection Menu** (if you are running the Diskette Drive Test individually) or continues with the next test.

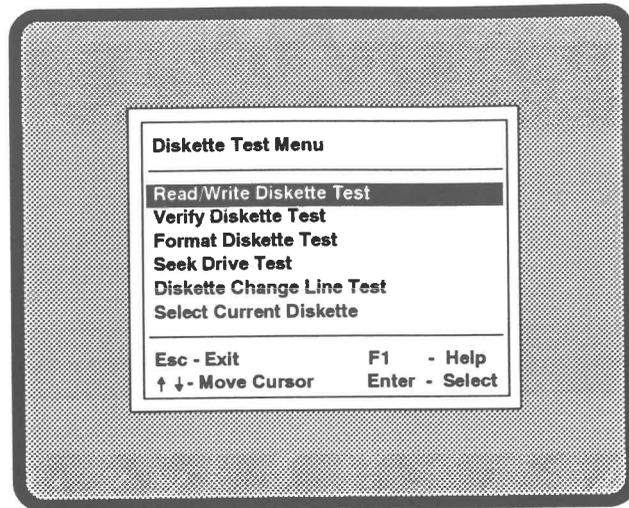


Figure 5-11 Diskette Test Menu

5.3.7 Serial Port Test

If you are testing all devices, the Serial Port Test follows the Diskette Drive Test. You can also load and run the Serial Port Test individually (see Section 5.3.1).

NOTE: If you want to run this test using a loop back connector, you must install the connector on the serial port before you begin the test from the **Device Selection Menu**.

The Serial Port Test sends a known data pattern to the serial port and reads the data pattern received from the port (see Figure 5-12). If the two patterns match, the test passes. A complete Serial Port Test, to the system board connector, requires a loop back connector. The loop back connector pin assignments are shown in Figure 5-13.

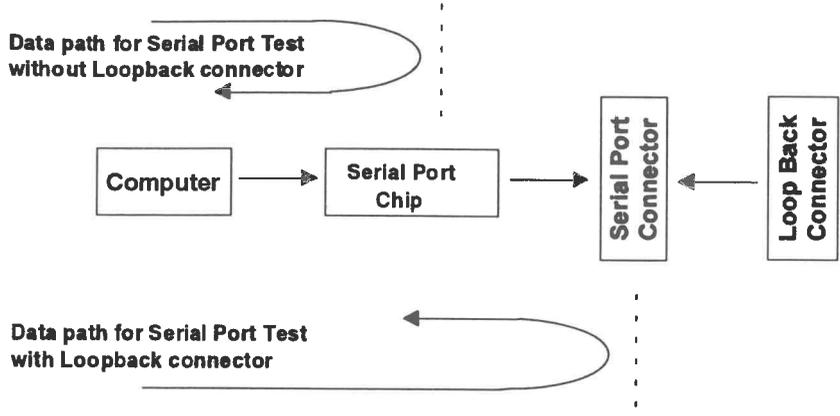


Figure 5-12 Serial Port Test Data Path

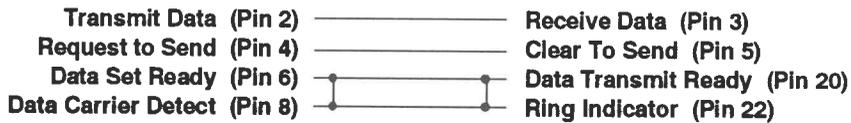


Figure 5-13 Serial Loop Back Connector

Once the Serial Port Test begins, it runs to completion without requiring operator responses. The program returns to the **Device Selection Menu** (if you are running the Serial Port Test individually) or continues with the next test.

5.3.8 SCSI Hard Disk Drive Test

The SCSI Hard Disk Drive Test can be run individually or as part of a test group (see Section 5.3.1). Once the test is loaded, follow these steps to select and test the hard disk drive(s):

1. After the diagnostic constructs the test menu, a selection menu similar to the one shown in Figure 5-14 appears on the display.

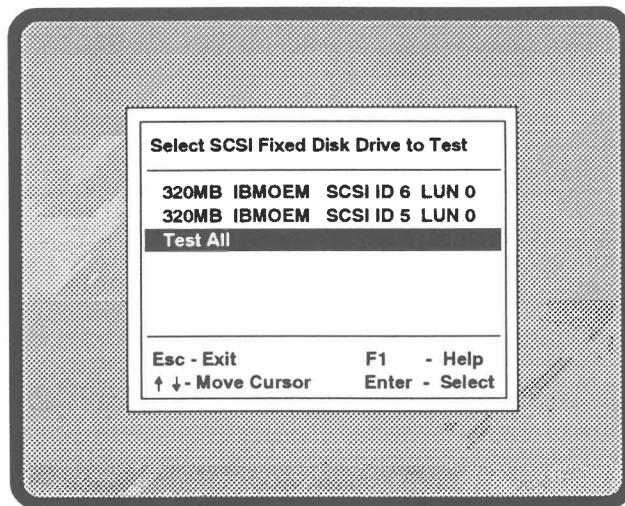


Figure 5-14 SCSI Fixed Disk Selection Menu

2. Select the hard disk drive(s) you want to test and press Enter.
3. You will be queried as to whether or not you want the data on the hard disk verified. Selecting *Y* is a more extensive test, checking every cylinder and sector. However, the test takes longer. Selecting *N* is a quick test, which checks read capability, seek capabilities, and other drive functions. Specify *Y* or *N*.

4. You can monitor test progress by observing the display. See Figure 5-15 for a sample of the SCSI Hard Disk Test progress information.
5. Once the test is complete, the program returns to the **Select SCSI Fixed Disk Drive Menu**. Press the Esc key to exit the test. The program returns to the **Device Selection Menu** (if you are running the SCSI Hard Disk Test individually) or continues with the next test.

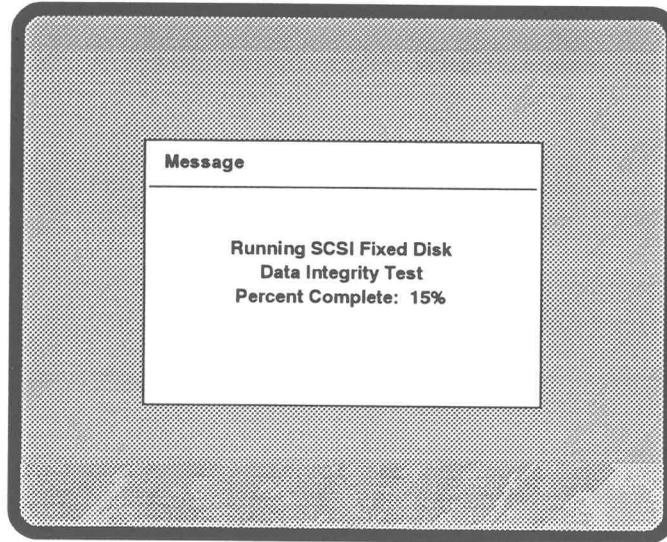


Figure 5-15 SCSI Hard Disk Test in Progress

5.3.9 AT IDE Hard Disk Drive Test

The AT IDE Hard Disk Test can be run individually or as part of a test group (see Section 5.3.1). If your computer has two AT IDE hard disk drives, the program will halt with the **Drive Selection Menu** showing (see Figure 5-16). Select the drive(s) you want to test and press Enter. Once the test begins, you can monitor progress by observing the display (Figure 5-17).

These tests can take as much as 30 minutes to run. Once the test is complete, the program returns to the **Drive Selection Menu**. Press the Esc key to exit the test. The program returns to the **Device Selection Menu** (if you are running the AT IDE Hard Disk Test individually) or continues with the next test.

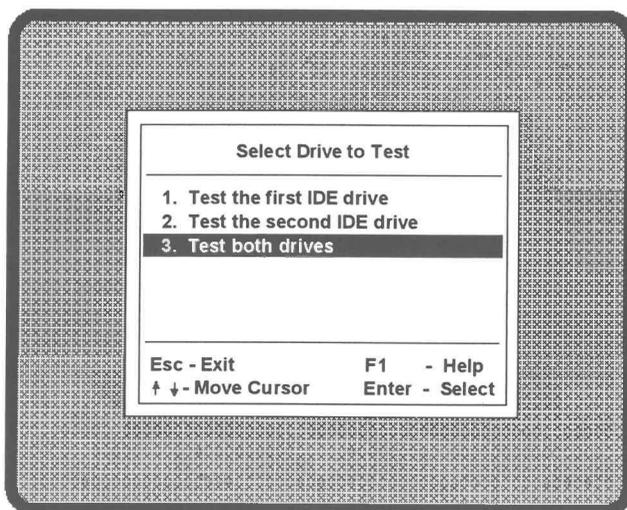


Figure 5-16 AT IDE Hard Disk Drive Selection Menu

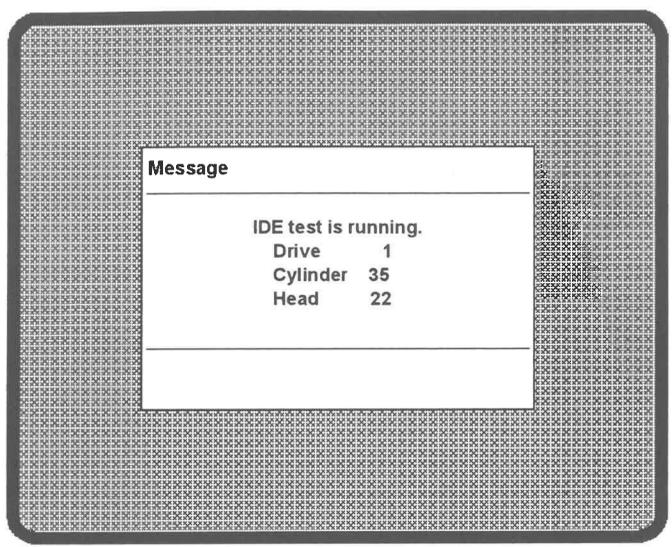


Figure 5-17 AT IDE Hard Disk Test in Progress

5.4 ERROR LOGGING

When you run the Subassembly Diagnostics, component failures normally result in error messages that appear on the display. You can log the same messages to a printer or diskette. The following steps describe the process of specifying the printer or diskette drive as error logging devices.

1. After you have loaded the diagnostic tests and the **Device Selection Menu** appears (see Section 5.3.1), select the **Select Error Logging** option and press Enter.
2. The **Error Logging Selection Menu** appears as shown in Figure 5-18.
3. Following the instructions on the display, specify the device(s) to which you want errors logged (that is, screen only, screen and LPT1, or screen and diskette) and press Enter.

4. The program then returns to the **Device Selection Menu**.
5. If you chose to log errors to diskette, insert a formatted diskette into Drive A (be sure the diskette is not write-protected).

NOTE: When you log errors to diskette you cannot run the *Read/Write Diskette Test* nor the *Format Diskette Test* as part of the diagnostic test routine. These tests will write over any error logging information on the diskette.

6. Proceed with normal test procedures as described in Section 5.3.1.

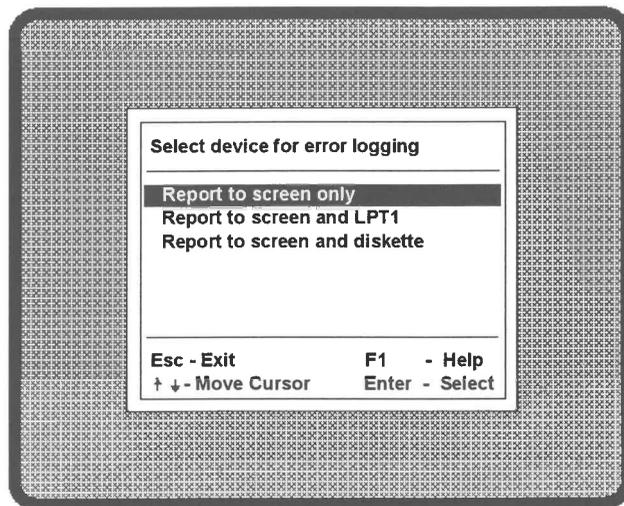


Figure 5-18 Error Logging Selection Menu

5.4.1 Retrieving Error Logs from Diskette

The error information written to diskette resides in a file named **ERRORS.LOG**. To access the error information, put the diskette in Drive A and enter *type a:errors.log* at the DOS prompt. An example of error information is as follows:

<u>09:19</u>	<u>10/26/92</u>	-	<u>(301)</u>	<u>Keyboard</u>	<u>Keyboard Test Failed</u>
↑	↑		↑	↑	↑
Time	Date		Error Code	Test Module	Error Message

021060114 SIGL

5.5 ERROR CODE DEFINITIONS

Error codes may appear on the display as a result of failure during Power-on Diagnostics (POD) or if a fault is detected during Subassembly Diagnostics. Tables 5-1 and 5-2 provide POD and Subassembly Diagnostic error code definitions, respectively. Also, the tables indicate the unit(s) being tested when the error occurred.

If two error codes appear on the display, you should try to resolve the one listed first, since this failure may have led to the subsequent failure.

Table 5-1 Power-On Diagnostics Error Codes

Unit Tested	Error Code	Description
System board	001	Flag register failed
	002	CPU register failed
	003	ROM did not checksum
	004	8255 DMA controller failed
	005	8253 timer failed
System board and memory modules	006	Base 64K failed address test
	007	Base 64K failed RAM test
System board	008	8259 interrupt controller failed
	009	Hot interrupt occurred
	010	System timer does not interrupt
	011	CPU still in protected mode
	012	DMA page registers failed
	013	Refresh is not occurring
	014	8742 is not responding
	015	Could not enter protected mode
	016	GDT or IDT failed (Protected Mode)
Continued on the next page		

Table 5-1 Power-On Diagnostics Error Codes (Continued)

Unit Tested	Error Code	Description
System board	017	LDT register failed (Protected Mode)
	018	Task register failed
	019	LSL instruction failed
	020	LAR instruction failed
	021	VERR/VERW failed
	022	8742 A20 failed
	023	Exception failed/unexpected
System board and memory modules	024	Shutdown during memory test
System board	025	Copyright checksum error
	026	Dynamic memory sizing
	027	Initialize chipset
	028	BMS did not checksum
	029	Copy to shadow RAM failed
	030	CRC error
	032	POS register test failed
	033	Failed CMOS Read/Write test
	034	Failed NVRAM Read/Write test
	035	Flash ROM contents are invalid
	080	Hardware initialization failed
	081	Timer initialization failed
	082	DMA initialization failed
	083	8259 initialization failed
	084	POS register initialization failed
	085	Memory controller initialization failed
	096	CMOS test failed
097	Video test failed	
099	Protected mode interrupt test failed	
Continued on the next page		

Table 5-1 Power-On Diagnostics Error Codes (Continued)

Unit Tested	Error Code	Description
System Board	100	A20 line test failed
	101	Line test failed
System board and memory modules	102	Memory test failed
	103	Extended memory test failed
System board	104	Timer interrupt failed
	105	RTC interrupt failed
System board and keyboard	106	Keyboard test failed
System board	108	RS232 test failed
	109	Parallel port test failed
	110	Dual card test failed
System board and diskette drive	111	Diskette drive test failed
System board and hard disk drive	112	Hard disk drive test failed
System board	113	Keylock test failed
System board and pointing device	114	Pointing device test failed
System board	115	Flash ROM test failed
	144	Failure during RAM setup
	145	Failure during CPU speed calculation
	146	Failure during configuration check
	147	Failure during BIOS initialization
	148	Failure during POD bootstrap
	149	Failure during IC reset
	150	Failure during system board POS
	151	Failure during VGA POD and setup
	152	Failure during adapter POS
Continued on the next page		

Table 5-1 Power-On Diagnostics Error Codes (Continued)

Unit Tested	Error Code	Description
System board	160	Exception 0 during POD
	161	Exception 1 during POD
	162	Exception 2 during POD
	163	Exception 3 during POD
	164	Exception 4 during POD
	165	Exception 5 during POD
	166	Exception 6 during POD
	167	Exception 7 during POD
	168	Exception 8 during POD
	169	Exception 9 during POD
	170	Exception A during POD
	171	Exception B during POD
	172	Exception C during POD
	173	Exception D during POD
	192	System board memory failure
	193	I/O channel check
	194	Watchdog timer time out
195	Bus time out	

Table 5-2 Subassembly Diagnostics Error Codes

Unit Tested	Error Code	Description
System board	101	Failed processor flags test
	102	Failed processor register test
	103	Failed DMA page register test
	104	Failed DMA register test
	105	Real-Time Clock failed
	106	Failed video POS register test
	107	Failed system POS register test
	108	Failed hot interrupt test
	109	Failed interrupt mask register test
	110	Failed NMI test
	111	Failed CMOS RAM test
	112	Failed extended CMOS
	113	Failed 80287 test
	114	Failed timer reg test - Channel 0
	115	Failed timer reg test - Channel 2
	116	Failed timer reg test - Channel 3
	117	Failed cache controller register
	118	Failed cache controller memory
	119	Mismatch between actual cache size and configured cache size
	120	Failed i486 cache memory
Memory	201	Base memory address failure
	202	Extended memory address failure
	203	Base memory data failure
	204	Extended memory data failure
	205	Extended memory quick test failure
Keyboard	301	Keyboard controller test failure
	320	Gate A20 test failure
Parallel ports	401	Parallel line failure
	402	General parallel failure
	403	No paper failure
	404	Printer time-out failure
	405	Parallel external loop back failure
Continued on the next page		

Table 5-2 Subassembly Diagnostics Error Codes (Continued)

Unit Tested	Error Code	Description
Diskette drive	603	Bad command
	604	Bad address mark
	605	Record not found
	606	Bad reset
	607	Initialization failed
	608	DMA boundary
	609	Bad sector
	610	Bad track
	611	Bad ECC
	612	ECC corrected
	613	Controller failed
	614	Bad seek
	615	Time-out
	616	Not ready
	617	Undefined error
Coprocesor	702	Addition test failure
	703	Subtraction test failure
	704	Multiplication test failure
	705	Division test failure
	706	Logarithm test failure
	707	Pi test failure
	708	Tangent test failure
	709	Square root test failure
Serial ports	1101	Serial baud rate test failure
	1102	Serial data test failure
	1103	Serial line test failure
	1111	Serial external loop back test failure
Continued on the next page		

Table 5-2 Subassembly Diagnostics Error Codes (Continued)

Unit Tested	Error Code	Description
Mouse port	8001	Mouse controller clock stuck low
	8002	Mouse controller clock stuck high
	8003	Mouse controller data stuck low
	8004	Mouse controller data stuck high
	8005	Unknown mouse controller failure
	8006	Set remote mode failure
	8007	Set stream mode failure
	8008	Disable mouse failure
	8009	Enable mouse failure
	8010	Read data failure
	8011	Mouse reset failure
	8012	Set default failure
On-board VGA	1801	VGA memory address line failure
	1802	VGA single plane failure
	1803	VGA four plane failure
	1804	VGA sequencer controller failure
	1805	VGA graphics controller failure
	1806	VGA attribute controller failure
	1807	VGA DAC failure
ESDI hard disk (Integrated Micro Channel hard disk drive)	10451	POS register ID test failure
	10490	Writing sector buffer RAM error
	10491	Reading sector buffer RAM error
	10492	Sector buffer miscompare error
	10499	Unsupported number of cylinders
		Illegal number of ESDI drive sectors
		Illegal number of ESDI heads
		Unknown ROM revision level
		Error getting ROM revision level
		Reset failure Drive C
		Error getting drive parameters
		Error getting BIOS time-out value
		Error during ESDI read/write test
Error during ESDI read verify test		
Error during ESDI seek test		

APPENDIX A

Specifications

This appendix provides the Reply system board specifications, as well as the specifications for associated options.

A.1 SPECIFICATIONS AND OPTIONS

The Reply system board specifications are given in Table A-1, while associated options are provided in Table A-2.

Table A-1 Reply System Board Specifications

Features	Specifications
Processor	486DX/33 or 486DX2/66 (standard options at time of order); support for 487SX
RAM (Standard) Maximum on-board Type	4MB 128MB 2, 4, 8, 16MB memory modules of the following types are supported: "Industry standard" x 36 parity, 72-pin SIMMs "IBM Proprietary" x 36 parity, 72-pin SIMMs "Industry standard" x 40 ECC, 72-pin SIMMs (For maximum performance, 70ns memory modules are recommended.)
Firmware CBIOS ABIOS	Resident on system board Resident on system board
Diskette Drive Support	Onboard 82077 supports 1.44MB or 2.88MB diskette drives, or a tape backup unit
Hard Disk Support	Support for a maximum of two hard disk drives in any of these combinations: 2 ST 506, 2 ESDI, 2 ATA, 1 ATA and 1 ST 506, or 1 ATA and 1 ESDI; also, support for 2 ATA and a maximum of 5 SCSI hard disk drives.
External Ports Serial Parallel Video Keyboard Pointing device	One enhanced, bi-directional with DMA support One, enhanced, bi-directional with DMA support One, SVGA with GUI accelerator; 1MB Video Memory One, PS/2 compatible One, PS/2 compatible mouse
Expansion Slots	One 16-bit Micro Channel Seven 32-bit Micro Channel, including one with extended video
Continued on the next page	

Table A-1 Reply System Board Specifications (Continued)

Features	Specifications
Secondary Cache Memory	128KB direct-mapped, write-through, non-sectored, zero-wait-state secondary cache (quad in-line package)
Operating System Support	DOS 3.30 or higher IBM OS/2 1.2, 1.3, 2.0, 2.1 Microsoft Windows NT IBM AIX™ PS/2 SCOT™ UNIX™
Network Systems Support	OS/2 LAN Server, MS LAN Manager™, Novell NetWare™, Banyan™ Vines
Video characteristics Text/Graphics support Display modes	Cirrus VGA controller, 16-bit, 72-Hz with GUI accelerator SVGA, VGA, EGA, MCGA, CGA modes supported, providing up to 16 million colors 640 x 480, 256 colors, 8 bits/pixel 640 x 480, 32K colors, 16 bits/pixel 640 x 480, 64K colors, 16 bits/pixel 640 x 480, 16M colors, 24 bits/pixel 800 x 600, 16 colors, 4 bit planes 800 x 600, 256 colors, 8 bits/pixel 800 x 600, 32K colors, 16 bits/pixel 800 x 600, 64K colors, 16 bits/pixel 1024 x 768, 16 colors, 4 bit planes (interlaced or non-interlaced) 1024 x 768, 256 colors, 8 bits/pixel (interlaced or non-interlaced) 1280 x 1024, 16 colors, 4 bit planes (interlaced)
Environmental Limits Temperature Altitude	Operating: 60° F to 90° F (15.6° C to 32.2° C) Non-operating: 50° F to 109° F (10° C to 43° C) 0 to 7000 feet maximum

Table A-2 Options

Option	Description
ATA Hard Disks	170MB, 210MB or 540MB hard disk drives
SCSI Hard Disks	540MB and 1.37GB hard disk drives are available. Optionally available is also a SCSI adapter.
Memory	Expanded memory options are available to a maximum of 128MB on the system board. Each option includes two memory modules of the same density (2MB, 4MB, 8MB, or 16MB).

APPENDIX B

Updating the BIOS

This appendix describes how to update the system BIOS using the Reply Reference Diskette.

B.1 OVERVIEW

The Reply system board contains the normal system BIOS ROM and a secondary BIOS ROM, called the Flash ROM. The Flash ROM is used to update the BIOS without changing the BIOS ROM component. A new version of the BIOS can be downloaded from update code available over the Reply Bulletin Board (see Chapter 2, Section 2.1) or on a Reply BIOS Update Diskette.

The BIOS in the Flash ROM is run from cached memory. Without the Flash ROM the computer runs significantly slower.

The computer attempts to start from the Flash ROM first. If the Flash ROM is not valid, an error message appears and the computer starts from the BIOS ROM.

B.2 RUNNING THE UPDATE PROGRAM

The BIOS update utility on the Reference Diskette is used to copy the BIOS code from an update diskette to the Flash ROM. To update BIOS, follow these steps:

1. Insert the Reference Diskette in Drive A and start the computer.
2. When the Reply logo appears, press any key to continue.
3. When the **Main Menu** appears, select **Utilities** and press Enter.
4. From the **Utility Menu**, select **Update System BIOS** and press Enter (see Figure B-1).

NOTE: Figure B-1 is a composite of the windows you will see while carrying out this procedure. It is intended to show a portion of the program sequence.

5. You will be prompted to insert a BIOS update diskette with the appropriate update data in Drive A. Insert the diskette and press Enter. A selection window appears showing the BIOS data files that reside on the diskette.
6. If the selection window lists more than one BIOS file, select the appropriate file and press the Enter key.

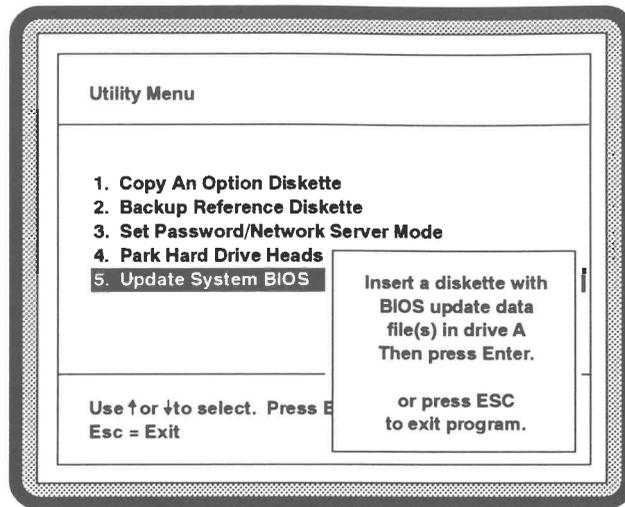


Figure B-1 Selecting the BIOS Update Utility

7. A confirmation window appears. Press the *Y* key to continue the update.
8. A second confirmation window appears. Press the *N* key to continue the BIOS update operation.
9. You are prompted to insert the Reference Diskette in Drive A. Remove the BIOS update diskette and insert the Reference Diskette in Drive A.
10. A flashing window appears, indicating the BIOS code is being copied to the Flash ROM. If the update is disturbed in some manner, repeat the update process beginning at step 1.
11. When the update is complete, a message to recycle the power appears on the display. Turn the computer off. Wait several seconds and turn the computer back on, allowing it to start from the flashed BIOS.

APPENDIX C

Clearing CMOS Memory

This appendix provides instructions for clearing the configuration data currently resident in the Reply system board CMOS memory.

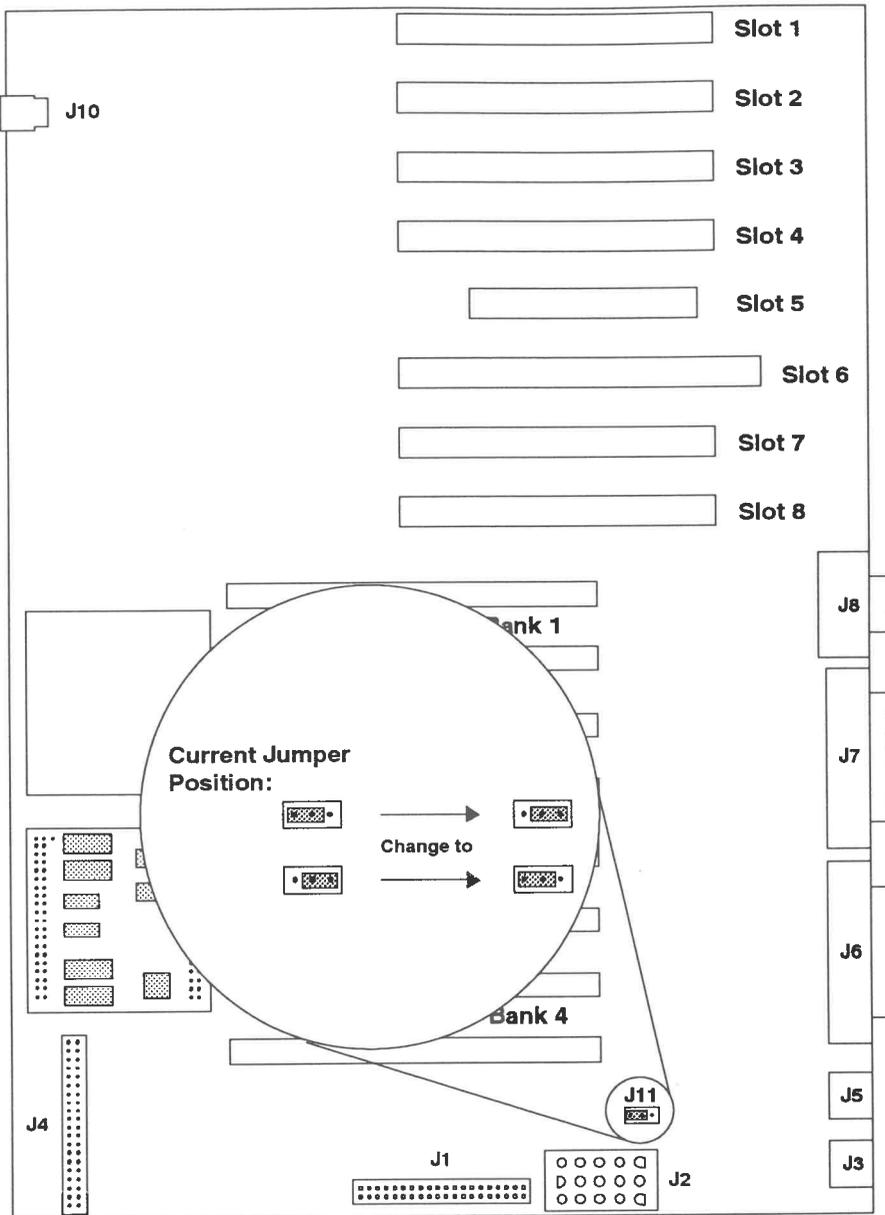
If you forget your system password or if you want to clear the configuration data currently set in CMOS memory, use jumper J11 on the Reply system board as follows:

1. Turn off the computer and all attached peripheral devices.
2. Remove the side cover as described in Chapter 2, Section 2.6.
3. On the Reply system board, locate jumper J11 near the DC power socket (see Figure C-1).
4. Move the jumper from its current position to its adjacent position and leave it there (see Figure C-1).

The CMOS configuration is cleared by switching the jumper from one position to the other. The jumper remains in its new position until the next time you decide to clear CMOS.

5. Install the computer side cover.
6. Insert the Reply Reference Diskette into Drive A.
7. Turn on the computer. An "Invalid Configuration" message appears on the display.
8. If you have not previously saved the computer configuration resident in CMOS memory to the Reference Diskette, reconfigure your computer by running either the Set Configuration program or the Automatic Configuration program (see Chapter 4). Be sure to save the new configuration to CMOS memory.

If you *have* saved your computer configuration on the Reference Diskette, run the Restore Configuration utility (see Chapter 4, Section 4.1.4). If you are clearing CMOS memory because you forgot your password, set a new password before you restart your computer. You must then save your configuration to the Reference Diskette again to include the new password.



C
Clearing CMOS

Figure C-1 CMOS Jumper Settings

INDEX

- Adapter
 - Installation 2-17
 - Removal 2-12
- ADF files 1-5, 4-19
- Arbitration
 - Parallel port 4-9
- Automatic Configuration
 - Defaults 4-5, 4-6, 4-9, 4-10
 - Operation 4-13, 4-14
- Back Panel 1-4, 1-5, 2-4
- Base memory configuration 4-5
- BIOS updating B-1
- Bulletin Board System 2-2, B-2
- Cache
 - Configuration 4-9
 - Secondary 1-2, A-3
- Checklist
 - Installation 1-3
- Clearing CMOS 4-22, 4-26, C-1
 - Jumper location C-3
- Configuration
 - AT IDE hard disk drive 4-9
 - Automatic Configuration 4-13
 - Date 4-5
 - Diskette drives 4-5, 4-6
 - Memory 4-5, 4-6, 4-10
 - Parallel port 4-9
 - Restore configuration 4-17
 - Save Configuration 4-15
 - SCSI devices 4-3, 4-4, 4-7, 4-11
 - Serial ports 4-9
 - Set Configuration 4-2 – 4-13
 - Slots 4-8
 - Time 4-5
- Configuration file 4-15, 4-17
- Conventions v
- Cover
 - Installation 2-7, 2-8
 - Lock 2-7
 - Removal 2-7, 2-8
- Date configuration 4-5
- Diagnostic tests 5-4, 5-7
 - AT IDE hard disk drive 5-21
 - Diskette drive 5-16
 - Error logging 5-22
 - Keyboard 5-13
 - Loading tests 5-7
 - Memory 5-12
 - Parallel port 5-15
 - SCSI hard disk drives 5-19
 - Serial port 5-17
 - Specifying parameters 5-7
 - VGA 5-14
- Diskette drives
 - Configuration 4-5, 4-6
 - Interface location 2-18
 - Support 1-2, A-2
- Display drivers 1-6
- EMI Shield
 - Installation 2-16, 2-17
 - Removal 2-14

- Environmental Specifications A-3
- Error log
 - Retrieval 5-23
 - Specifying output device 5-22,5-23
- Error Messages/codes
 - Power-on diagnostic 5-24
 - Subassembly diagnostic 5-4, 5-24, 5-28
- ESD damage prevention 2-5
- Expansion slots
 - Configuration 4-8
 - Location 3-3
- Extended memory configuration 4-6, 4-10
- Flash ROM (see BIOS)
- Grounding plate removal 2-15
- Hard disk drives
 - AT IDE configuration 4-9
 - SCSI configuration 4-3, 4-4, 4-7, 4-11
- Installation
 - Adapters 2-17
 - Hard disk drives 2-17
 - Memory modules 3-2
 - Processors 3-2, 3-5
 - System board 2-16
- Jumper J11 (CMOS) C-2, C-3
- Keyboard
 - Password 4-27
 - Port 2-4
 - Test 5-13
- Loop back connector
 - Parallel port 5-15, 5-16
 - Serial port 5-17, 5-18
- Memory
 - Cache 1-2, A-3
 - Configuration 4-5, 4-6, 4-10
 - Installation 3-2
 - Option 1-2, 1-4, 3-2, A-4
 - Specification A-2, A-4
 - Test 5-12
- Modem specification (BBS) 2-2
- Mouse Port 2-4
- Network
 - Password 4-25, 4-26
 - Support A-3
- Num Lock key 4-10
- Operating system A-3
- Options A-4
 - Copying diskette 4-19
 - Installing (see Installation)
- Parallel port
 - Configuration 4-9
 - Location 2-4
 - Loop back connector specifications 5-16

- Passwords
 - Canceling power-on 4-26
 - Changing power-on 4-25
 - Clearing 4-26
 - Keyboard 4-27
 - Network 4-25, 4-26
 - Operation (power-on) 4-25
 - Operation (network) 4-26
 - Setting power-on 4-23
- Ports
 - Locations 2-4
- Power light 5-5
- Power socket
 - Input 2-4
- Processor
 - Installation 3-2, 3-5
 - Support 1-2, 3-5, A-2
- RAM (see memory)
- Reference Diskette
 - Backing up 4-21
 - Description 4-1, 4-2, 4-19, 5-7
- Safety vi
- Saving CMOS configuration 4-7
- SCSI device configuration 4-3, 4-4, 4-7, 4-11
- Serial port
 - Configuration 4-9
 - Location 2-4
- Service
 - Phone number 2-2
- Set Configuration 4-2 – 4-13
- Slot configuration 4-8
- Slot Setup Window 4-8
- Subassembly Diagnostics
 - (see Diagnostic tests)
- System board
 - connectors 2-18
 - features 1-2
 - installation 2-16
 - layout 2-18
 - removal 2-9
 - specifications A-2, A-3
- Tests (see Diagnostic tests)
- Time configuration 4-5
- Tools 2-3
- Troubleshooting 5-1
- Typematic rate 4-10
- Utilities 4-19
 - Copy an option diskette 4-19
 - Reference diskette backup 4-21
 - Setting passwords 4-22
 - Parking hard disk drive heads 4-29
 - Updating BIOS B-1
- Video
 - Drivers 1-6
 - Port Location 2-4
 - Test 5-14
- Wrist strap (using) 2-5, 2-6



Reply Corporation • 4435 Fortran Drive, San Jose, CA 95134
408.942.4804 • 800.955.5BY5(5295) • FAX 408.942.4897
Printed in U.S. A. • Part Number 42000157 • Rev. A • 6/93