digital

PRIORIS HX SERVER
USER'S GUIDE

Prioris HX Server

User's Guide

Part Number: ER-881WW-UA. A01

Digital Equipment Corporation

FCC ID: A09-88XWW

The FCC wants you to know...

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna

- Increase the separation between the equipment and receiver

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

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

The user may find the following booklet prepared by the Federal Communications Commission helpful: *How to Identify and Resolve Radio-TV Interference Problems.* This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402. Stock No. 004-00398-5.

All external cables connecting to this basic unit need to be shielded. For cables connecting to option boards, see the option manual or installation instructions.

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

This equipment is in the 2nd Class category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential area.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read the instructions for correct handling.

This equipment meets or exceeds requirements for safety in the U.S. (UL 1950), Canada (CSA C22.2 No. 950), and Europe (EN 60950/IEC 950) with Nordic requirements.

This equipment meets or exceeds the ergonomic requirements of ZH1/618 and is certified to bear the GS mark by TUV Rheinland of Germany.

This equipment has been tested for radio frequency emissions and has been verified to meet VDE 0871 Class B.

Contents

About This Guide

1

Introduction

2

Server Utilities

3
Expanding Your Server

4
Problem Solving and Troubleshooting

5
Server Security Features

A
Technical Specifications

B
Server Messages

C
Caring For Your Server

Figures

Contents

About This Guide

Introduction

This guide describes how to operate, upgrade, configure, and troubleshoot your Prioris HX Server family. This guide will also help to familiarize you with all aspects of the server and provide a reference tool for questions you might have in the future.

If you are initially setting up your server, refer to the Installation Guide and the ServerWORKS Quick Launch program (supplied on a CD-ROM disk). The Installation Guide identifies all the components that were shipped from the factory as well as how to connect the mouse, keyboard, monitor, and ac power. The Installation Guide also shows how to turn your server on for the first time and access the ServerWORKS Quick Launch program. You must run the ServerWORKS Quick Launch program to initially configure your server, create utility and device driver diskettes, and install an operating system.

For more information, refer to the ServerWORKS Quick Launch Reference Guide.

Audience

This guide is written specifically for anyone responsible for operating, configuring, and expanding the Prioris HX Server family.

Organization

This guide contains the following:

- Chapter 1: *Introduction*—This chapter provides general information about your server. For example: server software and support documentation, diagnostic software, server utilities and technical support, restarting your server, providing a comfortable working environment, identifying server model and serial numbers, and learning where to obtain help.

- Chapter 2: *Server Utilities*— This chapter describes the server utilities that are supplied on the ServerWORKS Quick Launch CD-ROM disk.

- Chapter 3: *Expanding Your Server*—This chapter explains how to unlock and remove the side panels, install or replace main logic board options, install CPU modules, install memory modules, and mass storage devices.

  Also, refer to your SCSI, RAID, and other options documentation.

- Chapter 4: *Problem Solving and Troubleshooting*—This chapter describes initial and advanced troubleshooting solutions.

- Chapter 5: *Server Security Features*—This chapter describes the various security features that are available to prevent server or data theft.

- Appendix A: *Technical Specifications*—This appendix lists vital server operating specifications and main logic board jumper information.

  Refer to the User Documentation in Quick Launch for CPU module information.

- Appendix B: *Server Messages*—This appendix describes the power-on self test (POST) and run-time error messages, including recommended corrective actions.

- Appendix C: *Caring For Your Server*—This appendix provides suggestions for cleaning and moving your server.

Conventions

Convention Example	Description
kp	An italicized word or phrase represents text or commands you must enter.
`c:\windows>`	Monospaced text indicates information that your server or software displays. For example, a directory path or error message.
[Enter]	Square brackets surrounding text represents a keyboard key.
[Ctrl]+[Alt]+[Del]	A plus sign indicates that the keys shown should be pressed at the same time.
1 234 567	Spaces are used in large numbers instead of commas.

Abbreviations

Abbreviation	Meaning
BIOS	Basic input/output system
CPU	Central processing unit
DMA	Direct memory access
DRAM	Dynamic random access memory
ECC	Error correction code
ECP	Extended capabilities port
EISA	Extended industry standard architecture
EPP	Enhanced parallel port
FRU	Field replaceable unit
IDE	Integrated drive electronics
h	An h suffix to a numerical value denotes hexadecimal numbers. For example, 0F8h equals 0F8 hexadecimal.
I/O	Input/output
ISA	Industry standard architecture
MS-DOS™	Microsoft Disk Operating System
PCI	Peripheral component interconnect
POST	Power-on self test
RAID	Redundant array of independent devices
RAM	Random access memory
ROM	Read only memory

continued

Abbreviation	Meaning
RTC	Real-time clock
SBB	Storage building block
SCSI	Small computer system interface
SCU	System Configuration Utility
SIMM	Single in-line memory module
VGA	Video graphics array
Windows	Microsoft Windows application software
ZIF	Zero insertion force

Special Notices

Three kinds of special notices are used in this guide to emphasize specific information.

WARNING: indicates the presence of a hazard that can cause personal injury if the hazard is not avoided.

CAUTION: indicates the presence of a hazard that might cause damage to hardware or that might corrupt software.

NOTES: are used to provide additional information.

Related Documentation

An *Installation Guide* is available as a supplement to the information provided in this user's guide. Use the Installation Guide to install and configure your server.

A ServerWORKS *Quick Launch* program comes with your server on a CD-ROM disk. This easy-to-use program enables you to install one of several supported operating systems and provides a single source for all server documentation, technical support information, diagnostics, and other related product information.

README files come with your ServerWORKS Quick Launch CD-ROM disk or as printed material. This README information can help you setup, configure, and operate your server. Digital recommends that you read this information first.

SCSI, RAID, diagnostics, and other options manuals are also available.
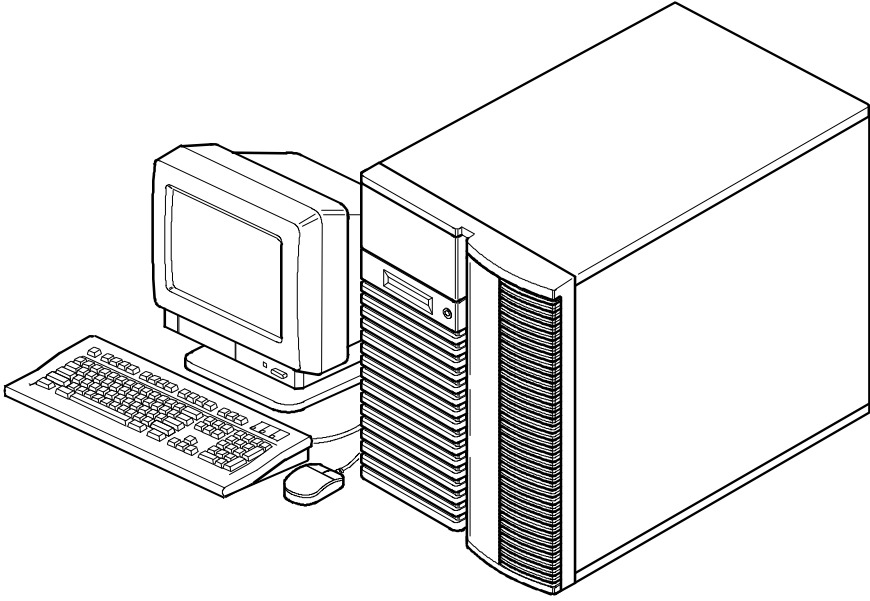
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Typical Prioris HX Server

NOTE: Your monitor, keyboard, and mouse might look different.

1
Introduction

The Prioris HX Server family is a family of high-performance, highly-scaleable network and application servers featuring the latest in modular CPU and storage technology. Developed using the following state-of-the-art technology, the Prioris HX Servers are the most advanced servers in their class.

CPU Module	Single (1P) or dual (DP) Intel Pentium™ processor mode capable. Both operate using a 64-bit memory interface and a standard single 256 KB external cache. All modes support a 32-bit PCI interface.
Memory Module	One memory module supports two SIMM types. 64-bit parity configuration with eight SIMM sockets capable of supporting 16 MB to 512 MB of parity memory or 32 MB to 256 MB of ECC memory.
PCI Fast/Wide SCSI-2 Adaptec 2940W Controller	A single-channel PCI Fast Wide SCSI-2 adapter board occupies a single PCI option slot in all servers. Two channel wide and narrow SCSI-2 adapter boards are available as options.
Integrated Device Array Storage Bay	Supports up to seven 3½-inch, wide or narrow SCSI, hot-swap devices for configuring a mass storage array using Storage Building Blocks (SBBs).

RAID Controllers	RAID ready servers enable you to manage data distribution using multiple disk drives and specialized array controllers.
Expansion Slots	Six EISA and six PCI slots with bridge support for a total of 12 slots for maximum expandability.
Redundant Fans and Power Supply	For added reliability, your server has redundant fans for cooling and the option to add a second power supply.
Operator Control Panel (OCP)	Back-lit, 16-character LCD display that shows power-on status messages each time your server boots. The operator control panel can be lit by pressing a manual switch on the front bezel.
ServerWORKS Quick Launch	Enables you to install your operating system and configure your server from a single CD-ROM disk application.
ServerWORKS Manager	Enables a network administrator to monitor critical PC server statistics and vital CPU component information necessary to maintain a healthy network.

The remainder of this chapter provides additional information about your server's supplied software and support documentation, restarting your server, identifying server model and serial numbers, providing a comfortable working environment, and obtaining help.

NOTE: You might have ordered additional options such as hard disk drives, tape back-up systems, CD-ROMs, or modems that have been factory installed in your server. The documentation and any related diskettes for these options have also been provided. Save this material for future reference.

Server Software and Support Documentation

The following software and support documentation is supplied with your server:

- ServerWORKS software kit — contains ServerWORKS Quick Launch and ServerWORKS Manager.

    - ServerWORKS Quick Launch contains a bootable CD-ROM disk and reference guide. The Quick Launch program steps you through the initial server setup and operating system installation process.

    - ServerWORKS Manager contains the software and documentation for installing the ServerWORKS Manager LAN management tool.

    Refer to the Installation Guide and the README files on the ServerWORKS Quick Launch CD-ROM disk for more information.

- Server documentation box — contains this User's Guide, an Installation Guide, a Documentation Overview, Warranty information, a Diagnostics manual, Options manuals, and Registration Card.

Diagnostic Software

Diagnostic software and support documentation came with your server. This software contains an advanced set of diagnostic utilities that can be used to identify and correct problems you might encounter when installing, configuring, or using your server. There are two ways to access the supplied diagnostic software:

1. During your operating system installation process, the diagnostic software is automatically copied to a subdirectory on the MS-DOS partition. This enables you to run the diagnostic software anytime from the MS-DOS partition you created.

2. Using the Install Software Conventional method in ServerWORKS Quick Launch, you can create a bootable diagnostic software diskette. This enables you to run the diagnostic software anytime using the diskette you created.

   For additional information, read any README files that are on the diagnostic diskette you created.

Server Utilities and Technical Support

The most current server utilities and technical support information is available on the Quick Launch CD-ROM disk and the Digital Bulletin Board Service (BBS). For access to the Digital BBS in the USA, dial (508) 496-8800.

If you need additional information, access "Service Information" in the ServerWORKS Quick Launch program that came on your CD-ROM disk.

Restarting Your Server

Method	How to Invoke	Action Performed
Hard boot	Turn the server off, then on, by pressing the power On/Off button at the front of the server.	Runs memory tests and clears all terminate stay resident programs (TSRs) and memory registers.
Soft boot	Press [Ctrl]+[Alt]+[Del].	Does not run memory tests but clears all terminate stay resident programs (TSRs) and memory registers (operating system specific).
Reset	Press the Reset button at the front of the server.	Same as a hard boot.

Important Information

Under circumstances of poor posture or poor setup, certain recent scientific articles suggest that injuries may occur. Other articles suggest that there is no cause and effect. Because the safety of our users is a great concern, it is important to take these precautions:

- Be comfortable in your work space.
- Change your posture frequently.
- Proceed according to the recommendations in the following table and figure.

Adjust	So . . .
Chair	Feet are flat on the floor.
	Legs are vertical forming a right angle to the floor.
	Your weight is off your thighs and they are horizontal. Keep the back of your knees away from the seat so you do not compress the area behind them, which could restrict the blood flow.
	Your upper body is erect and your lower back is supported with a backrest.
Keyboard or mouse	Your wrists are straight and do not bend more than 15 degrees. They may be supported when resting but not on sharp edges. Type comfortably, with no more key pressure than needed to feel the contact point.
	Upper arms are straight down at your sides, elbows are close to your sides and support your arm weight. Forearms are at a 70 degree to 90 degree angle.
	If you use a mouse, rest your hand on the mouse so your wrist is not on the work surface. Operate the mouse close to your body's centerline.

Adjust	So . . .
Head	Avoid neck strain. Your head should incline downward, but no more than 15 to 20 degrees.
Monitor	No higher than the level of your eyes and at the correct distance for your vision.
	Avoid eye fatigue, which can be caused by glare, image quality, uncomfortable furniture, eye height, and uncorrected vision. If you cannot focus to read at different distances, you may need special glasses. Relax your eyes periodically by looking at distant objects.
Work breaks	Take periodic work breaks. Morning, lunch, and afternoon breaks during the 8-hour workday meet most recommendations. Take advantage of work breaks to move around and do other activities.
Lighting	Avoid direct lighting or sunlight on the screen, which causes glare and reflections. Place lighting behind or to the side of your work area, and distribute the lighting evenly on your work area.
	Your server's monitor screen has an antiglare treatment to reduce glare. Adjust the brightness and contrast controls as needed.
Noise	Keep background noise at a minimum. Background noise above 65 dBA is tiring. Sound-absorbing materials (curtains, carpeting, and acoustic tile) can help reduce background noise.
Temperature	20 to 23 degrees C (68 to 74 degrees F).
Humidity	30% to 70%.
Ventilation	Provide adequate air ventilation to avoid fatigue and to operate the equipment.
Space between set ups	> 70 cm (28 in.) center to center, preferably > 152 cm (60 in.).

IMPORTANT: If you experience pain or discomfort during use of the server, take a rest break and review the instructions for proper ergonomic setup and use. If the pain or discomfort continues after resuming use of the server, discontinue use and report the condition to your job supervisor or physician.
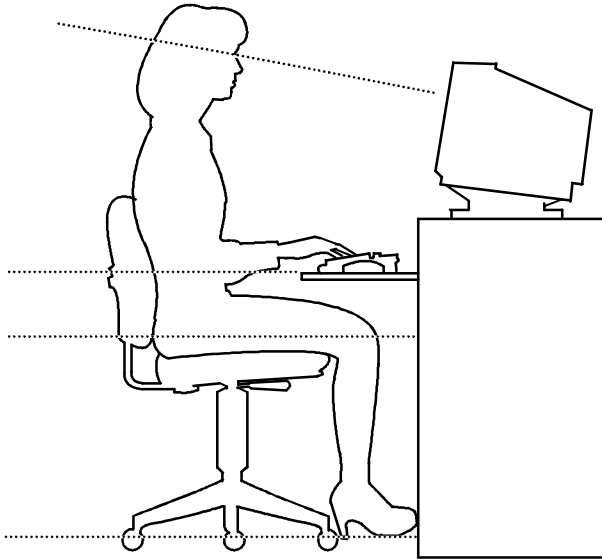
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Figure 1-1. Providing a Comfortable Working Environment

Identifying Model and Serial Numbers

All model and serial numbers for your server are located on the packing and shipping papers delivered with your server, plus on the individual components. The location of serial numbers on hard disk drives, expansion boards, diskette drives, and external equipment vary from one manufacturer to another. Accompanying literature with these products should illustrate or describe the location of model and serial numbers.

NOTE: Digital recommends that you do not record any internal serial numbers (for example, main logic board, CPU module, and so on) until there is a need to remove the server's outside panels.

Take a few moments to record the externally available model and serial numbers of your server's hardware components and keep this information in a safe place for future reference.

The model and serial number of the server is recorded on a label attached to the rear cover. The keys for the left and right security doors and the side panels have serial numbers engraved on them. For later reference, the serial number of the main logic board is located on the edge of the board. The serial number for the CPU module is located on the non-component side near the CPU ZIF socket.

Getting Help

If you need help regarding...	Refer to the
Installing your server	*Installation Guide*
Support and ordering information	Warranty and Service information.
Specific software application problems or questions	Operating system documentation, application software documentation, or contact the software manufacturer.
Product information and server disks	On-line information. Run the ServerWORKS Quick Launch program.

2
Server Utilities

Introduction

This chapter describes the utilities supplied with your server. Server utilities include:

- SCSI*Select* Utility— This utility enables you to configure and view settings of the installed Adaptec SCSI controllers and SCSI devices.

- RAID Configuration Utility — This utility is available for RAID-ready servers only. This utility enables you to configure your RAID array.

- Flash Utility — This utility enables you to update or restore your server's BIOS.

- EPP3SMC.EXE — This utility enables you to configure your server's parallel port as an enhanced parallel port (EPP).

- System Configuration Utility (SCU) — This utility enables you to configure your server when relocating, adding, or removing EISA/ISA/PCI expansion boards and when changing your server's factory-defined BIOS Setup options.

SCSI*Select* Utility

Your Prioris server comes with an Adaptec 2940W controller and SCSI*Select* configuration utility. This utility enables you to change host controller settings without opening your server or handling the SCSI controller board.

Use SCSI*Select* to:

- Check factory default settings for each device on the SCSI bus.
- Change SCSI device settings that might conflict with other SCSI devices.
- Perform low-level formatting on new SCSI disk drives.

To start the SCSI*Select* configuration utility:

Press Ctrl + A when the BIOS banner appears during the boot process.

Refer to the AHA-2940W User's Guide for more information on the SCSISelect configuration utility.

RAID Configuration Utility

RAID-ready Prioris servers include a Mylex RAID controller and RAID configuration utility. If your RAID controller was factory installed, the RAID configuration utility appears when you boot your server with the ServerWORKS Quick Launch CD-ROM disk. Use this utility to configure your RAID array.

Refer to the Mylex User's Manuals for more information.

Flash Utility

All servers have BIOS software in a read-only, non-volatile memory (ROM) chip. This BIOS initializes hardware and boots the operating system when the server is turned on. The BIOS also provides access to other services such as keyboard and disk drives.

Your server comes equipped with flash memory. This means that you can restore your server's BIOS simply by running the flash utility. You can also upgrade your server's BIOS to future releases by running the flash utility along with any flash BIOS update diskette if necessary.

Only use the flash utility to upgrade your server's BIOS if you are instructed to do so by an authorized Digital support representative. The flash utility and BIOS updates are available on the Digital Bulletin Board (BBS).

Using EPP3SMC.EXE

EPP3SMC.EXE is a device driver that can be accessed from the ServerWORKS Quick Launch CD-ROM disk. This device driver can be used to configure your parallel port as an enhanced parallel port (EPP). Before loading this device driver, check the documentation for the device you want to connect to the parallel port and make sure it supports EPP mode. If it does not, you do not need to load this device driver. If the device does support EPP mode, you should:

1. Locate the EPP3SMC.EXE file on the MS-DOS partition you created during the Quick Launch installation process.

    Note the path where your driver is located:

    C:\EPP\EPP3SMC.EXE

2. Edit your CONFIG.SYS file to enter the path for EPP3SMC.EXE.

    Refer to your MS-DOS documentation for information on editing your CONFIG.SYS file. For example a line in your CONFIG.SYS might be:

    device=C:\epp3smc.exe

3. Save the new version of your CONFIG.SYS file.

4. Press [Ctrl] + [Alt] + [Del] and reboot your server.

5. Run the SCU and choose the Parallel Port Group.

6. Choose EPP mode.

7. Exit the SCU to save the new setting.

    Your parallel port is now configured as an EPP port.

System Configuration Utility (SCU)

Your server was pre-configured at the factory using the System Configuration Utility (SCU). This means that your server's hardware (CPU, memory, cache, mass storage devices, expansion boards, etc.) has been identified and configured for optimum performance. If you need to make changes to this configuration, Digital recommends that you use the SCU along with the information provided in this section. You can access the SCU from your hard disk drive (if you created a MS-DOS partition during the ServerWORKS Quick Launch installation) or from the SCU diskette that you created using the ServerWORKS Quick Launch CD-ROM disk.

Refer to the ServerWORKS Quick Launch Reference Guide and the server's Installation Guide for initial server installation procedures.

Configuring Expansion Boards

Each time you add, remove, or relocate any EISA/ISA/PCI expansion board, you need to run the SCU to identify their operating characteristics, server resource requirements, and slot locations. Based on this information, the SCU will then automatically assign the proper server resources to EISA expansion boards, enable PCI boards, and inform you as to what jumper or switch settings need to be manually set on ISA expansion boards to avoid resource conflicts.

The SCU identifies an expansion board's operating characteristics and resource requirements through Configuration (.CFG) files. These files contain main logic board, EISA, PCI, and ISA expansion board vital characteristics and the server resources they require for proper operation. If you installed additional EISA expansion boards, make sure you copy the CFG files (and overlays if applicable) that were supplied with the expansion boards to either the SCU directory on your hard disk drive or the SCU diskette that you created before attempting to configure your server.

As an added feature, the SCU creates and stores all setup changes in a System Configuration (.SCI) file. Afterwards, this SCI file can be used on any Prioris HX Server that is equally configured and can serve as a backup to the EISA configuration stored in NVRAM memory. The SCI file is maintained in your SCU directory on your hard disk drive or the SCU diskette you created and has a default name of SYSTEM.SCI.

Locating the SCU

The SCU is located on your ServerWORKS Quick Launch CD-ROM disk. You can use the SCU in one of three ways:

1. During the Quick Launch boot process, if you selected to create a MS-DOS partition, the SCU is copied to the MS-DOS partition on your hard disk drive. This enables you to run the SCU anytime from the MS-DOS partition.

    At the MS-DOS prompt change to the SCU directory and type:

    `SCU.BAT`

2. Using the *Install Software Conventional* method in ServerWORKS Quick Launch, you can create a bootable SCU diskette. This enables you to run the SCU anytime using the diskette you created.

3. You can run the SCU by inserting the Quick Launch CD-ROM disk, rebooting the server, and pressing the right [ALT] key during the boot process to display the SCU.

    NOTE: If EISA or PCI cards have been added to your server, the SCU will be invoked automatically when you boot from the Quick Launch CD-ROM disk. The .SCI file is not saved when you use this method to run the SCU.

When to Run the SCU

Always run the SCU each time you add, remove, or relocate ISA, PCI and/or EISA expansion cards so no two boards use the same server resources (IRQs, I/O address, memory address, etc.).

Typically, your server displays a message such as `Run SCU Utility.....Press F1 to Continue`. If so, you must select how you want to access and run the SCU.

SCU Keyboard Function Keys

The following table lists the keyboard function keys used to scroll through the menu screens, and select specific menu items in the SCU.

Keyboard Key	Function
[↓]	Moves the cursor down one menu item.
[↑]	Moves the cursor up one menu item.
[→]	Moves the cursor one character to the right.
[←]	Moves the cursor one character to the left.
[Enter]	Displays the available user-selectable settings for the highlighted option or selects the highlighted menu item.
[F6]	Displays available resources (IRQs, DMAs, I/O ports, or memory) for the highlighted option.
[F10]	Press [F10] to complete a step.
[F1]	Displays the selected menu item's help screen.
[Esc]	Returns the monitor screen to the previously selected menu item.

Starting and Using the SCU

The SCU options are shown in Figure 2-1. If this is your first time using the SCU, it is recommended that you select "Learn About Configuring your Computer" for detailed information on using the SCU. If this is a subsequent session, refer to the appropriate sections in this chapter to change your server's configuration.
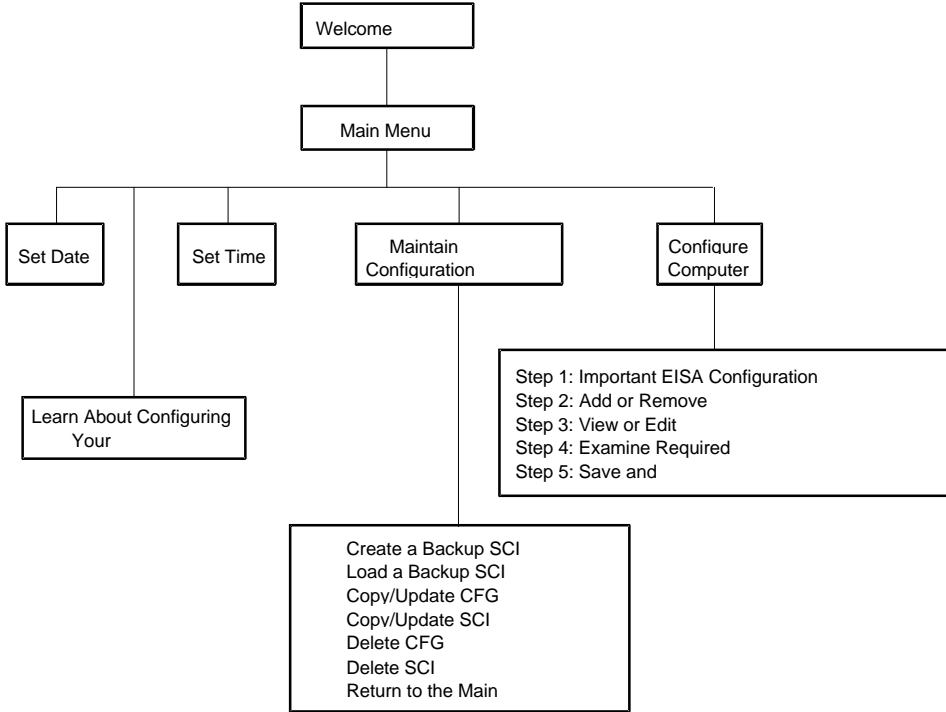
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Figure 2-1. SCU Main Menu Options

To start and use the SCU:

1. Turn on your server and allow the POST to complete.

   If POST detects an error refer to Appendix B, "Server Messages," and take the appropriate steps to correct the problem. After the problem has been resolved, restart the server.

2. Start the SCU from the MS-DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.

3. Press [Enter] to display the SCU introductory screen.

   NOTE: The SCU contains help pop-up screens for any selected menu item. Press [F1] at anytime to display a help screen. Press [Esc] to remove a help screen.

4. If no configuration errors appear, the Welcome screen displays.

   Press [Enter] to display the Main menu.

   If a configuration error appears, the Welcome screen displays information about the error and tells you to reconfigure your server.

5. Step through the menu items to familiarize yourself with the SCU. Press F1 from any SCU menu for help.

Configure Your Computer

This option provides step-by-step instructions on how to configure your server when adding, removing, or relocating expansion boards and when changing operating parameters (BIOS Setup options). If you are accessing this menu item for the first time, it is recommended that you follow the "Configure Your Computer" menu options in order. If this is a subsequent session, refer to the appropriate menu item to update your server's configuration.

Adding ISA Expansion Boards

Perform the following steps to add ISA expansion boards to your server configuration:

1. Start the SCU from the MS-DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.

2. From the `Configure Your Computer` menu, select "Step 2: Adding and Removing Boards," and update the list of expansion boards and options to include any ISA expansion boards you are going to install in your server.

3. Select "Step 4: Examine Required Switches," to check the required switch and jumper settings of the ISA expansion boards.

4. Select "Step 5: Save and Exit," to save your configuration and exit the SCU.

5. Turn off your server and install the ISA expansion boards, manually setting the necessary switches and jumpers.

Adding EISA Expansion Boards

Perform the following steps to add EISA expansion boards to your server configuration:

1. Turn off your server and install the EISA expansion boards.

    Refer to Chapter 3, "Expanding Your Server," for detailed instructions on installing expansion boards.

2. Start the SCU from the MS-DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.

    After your server boots, the following message appears:

    ```
    EISA Configuration Error - Run Configuration
    Utility
    ```

    This indicates that the EISA configuration changed since the last time the configuration was saved.

3. Press [Enter] to display the SCU main menu and then [Enter] again to continue.

    The SCU requests that you load all appropriate .CFG files for the newly installed EISA expansion boards. Afterwards, the SCU displays the Configure Your Computer menu.

4. From the `Configure Your Computer` menu, select "Step 3: View or Edit Details," to verify that all EISA expansion boards were installed and configured correctly.

> **NOTE:** An EISA expansion board might require an IRQ to be set. If so, select that board and choose an IRQ from the list provided. This list displays IRQs that are either not assigned or can be re-assigned. If you select an IRQ that conflicts with another expansion board in your server, a menu appears informing you of the expansion board that is in conflict, its current settings, and the settings that will change if you choose to set that IRQ.

5. Select "Step 5: Save and Exit," to save your configuration and exit the SCU.

Adding PCI Expansion Boards

> **CAUTION:** Before installing a PCI video expansion board:
>
> 1. Make sure you follow the instructions given below to set the PCI slot to *One IRQ Required*.
>
> 2. Disable onboard video. To disable onboard video, move the onboard VGA jumper (J17) to the `Disabled` position (Refer to Appendix A).
>
> 3. Install the PCI video card.
>
> 4. Make sure you switch the video signal cable from the onboard video connector to the connector on the PCI video expansion board.
>
> Failure to do so might cause your PCI video card and/or server to operate incorrectly.

Perform the following steps to add PCI expansion boards to your server configuration:

1. Turn off your server and install the PCI expansion boards. Note which slots the PCI expansion boards were installed into.

    Refer to Chapter 3, "Expanding Your Server," for detailed instructions on installing expansion boards.

2. Start the SCU from the MS-DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.

3. Press [Enter] to display the SCU welcome screen and then [Enter] again to continue.

4. From the `Configure Your Computer` menu, select "Step 3: View or Edit Details".

5. Highlight the appropriate `PCI slot Options Group` for each installed PCI expansion board then select `PCI Interrupt` and set it to `One IRQ Required`.

    Press [F6] to display the IRQ currently assigned and + or - to scroll through the remaining un-assigned IRQs to select the one you want.

    > **NOTE:** At any time you can view IRQ, DMA, and memory assignments while in the SCU by selecting [F7], the "View Additional System Information" menu. From this menu, select either `Used Resources` or `Available Resources`.

6. Select "Step 5: Save and Exit," to save your configuration and exit the SCU.

Relocating Expansion Boards

Perform the following steps **before** relocating an ISA expansion board and **after** relocating an EISA or PCI expansion board.

1. Start the SCU from the MS-DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.

2. Press [Enter] to display the SCU main menu and then [Enter] again to continue.

3. From the `Configure Your Computer` menu, select "Step 2: Adding and Removing Boards".

4. Highlight the expansion board you want to relocate, press [Enter], and then follow the instructions displayed on your monitor screen.

5. Select "Step 5: Save and Exit," to save your configuration and exit the SCU.

   If there are no resource conflicts, the new configuration information is saved to the .SCI file. If there is a conflict, you must resolve it before you can complete your server's configuration.

   NOTE: If you run the SCU from the ServerWORKS Quick Launch CD-ROM disk, the .SCI file is not saved. To save the .SCI file, you need to rerun the SCU from either your hard disk drive or from the SCU diskette you created.

Setting the Date and Time

Use these two SCU options to reset the date and time maintained by your server's battery. Note that it might be faster to change the date and time using the BIOS Setup options.

To access this menu item:

1. Start the SCU from the MS-DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.

2. Press [Enter] to display the SCU main menu.

3. Configure your server for the current date and time by selecting the `Set Date` and `Set Time` options.

Maintain the SCU Diskette

Select this option to maintain Configuration (CFG) files and System Configuration Information (SCI) files. The following menu options are available:

- Create a backup SCI file
- Load a backup SCI file
- Copy/update CFG files
- Copy/update SCI files
- Delete CFG files
- Delete SCI files
- Return to the Main Menu

To access this menu item:

1. Start the SCU from the MS-DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.

2. Press [Enter] to display the SCU main menu.

3. Highlight the appropriate Maintain the SCU Diskette option, Press [Enter], and then follow the instructions displayed on your monitor screen.

SCU Options

The following tables list the options that are available in the SCU (View or Edit details). Use the keyboard function keys to help you select options, change values, and display help information.

> **NOTE:** The server also has a BIOS Setup utility available to change your server's BIOS settings. Although the BIOS Setup utility is separate from the SCU, the SCU will automatically update the BIOS settings. In most cases, your server will operate according to the most recent changes regardless of which utility you use to make changes. However, Digital recommends that you use the SCU to configure your server each time you add hardware, remove hardware, or change server settings to ensure that your server operates properly.
>
> The following menu fields might not reflect current BIOS or SCU revisions. Refer to the BIOS Setup utility screens, the SCU, and any associated on-line help for more information.

If you need to access the BIOS Setup utility:

1. Reboot your server.
2. After the POST has successfully completed, press [F2] to access Setup.

System

Menu Fields	Settings	Comments
System processor type	Not user selectable	Displays the installed processor type.
System processor clock	Not user selectable	Displays the installed processor clock speed.
System base memory	Not user selectable	Displays the amount of base (conventional) memory each time your server boots.
System extended memory	Not user selectable	Displays the amount of extended memory each time your server boots.
System BIOS	Not user selectable	Displays the current BIOS version.

Diskette Drive Group

Menu Fields	Settings	Comments
Onboard diskette controller	Enabled Disabled	Enables or disables the onboard diskette controller.
Diskette drive A Diskette drive B	1.44 MB, 3½ 2.88 MB, 3½ Not Installed 360 KB, 5¼ 1.2 MB, 5¼ 720 KB, 3½	Sets the size and density of diskette drives.
Exchange diskette drives	Disabled Enabled	Enables you to logically exchange physical diskette drive designation.
Diskette write protection	Disabled Enabled	Enables or disables the selected diskette drive's write protect option.

Hard Disk Group

Menu Fields	Settings	Comments
Hard drive 1	Not installed	Your server does not support IDE hard disk drives.
Hard drive 2	Not installed	Your server does not support IDE hard disk drives.
Large disk access mode	DOS Other	Select DOS if you have MS-DOS installed.
		Select Other if you have another operating system installed.
		A large disk drive constitutes one that has more than 1024 cylinders, 16 heads, or 63 tracks per sector.

Boot Options Group

Menu Fields	Settings	Comments
Boot option	A: then C: C: then A: C: only	Each time your server boots, it will load your operating system from the sequence selected.
SETUP prompt	Enabled Disabled	Enables or disables the <F2> setup prompt each time your server boots.
POST errors	Enabled Disabled	Enabling this option causes your server to pause and display a setup entry or resume the boot prompt if an error occurs at boot. Disabling this option causes your server to always attempt to boot regardless of a setup entry or error.
Floppy check	Enabled Disabled	Enabling this option causes your server to verify the diskette type each time your server boots. Disabling this option speeds up the boot process.
Summary screen	Enabled Disabled	Enabling this option causes your server to display configuration parameters (in the form of a summary screen) during boot.

Keyboard Features Group

Menu Fields	Settings	Comments
Numlock	Auto Off On	Selects the keyboard option.
Keyclick	Disabled Enabled	Enables or disables the audible key click feature.
Keyboard auto-repeat rate	30/sec 2/sec 6/sec 10/sec 13.3/sec 18.5/sec 21.8/sec 26.7/sec	Sets the number of times a second to repeat a keystroke while you hold the key down.
Keyboard auto-repeat delay	1/2 sec 3/4 sec 1 sec 1/4 sec	Sets the delay time after a key is held down before it begins to repeat a keystroke.

Serial Port Group

Menu Fields	Settings	Comments
Serial port 1	Auto Disabled 3F8, IRQ 4 2F8, IRQ 3 3E8, IRQ4 2E8, IRQ3	Enables or disables onboard serial port 1 at the specified address. **Note:** If your server is connected to a network, see your System Administrator.
Serial port 2	Auto Disabled 3F8, IRQ 4 2F8, IRQ 3 3E8, IRQ4 2E8, IRQ3	Enables or disables onboard serial port 2 at the specified address. **Note:** If your server is connected to a network, see your System Administrator.

Parallel Port Group

Menu Fields	Settings	Comments
Parallel port 1	378, IRQ 7 278, IRQ 5 Auto Disabled 3BC, IRQ 7	Enables or disables the onboard port at the specified address.
Parallel port mode	EPP 1.7 EPP 1.9	Sets the enhanced parallel port mode.
	ECP	Sets the extended capabilities port mode.
	Compatible mode	Compatible mode - standard printer connection.
	Bi-directional mode	Bi-directional mode - PS/2 compatible mode and able to receive data.

Video Options Group

Menu Fields	Settings	Comments
Video type	EGA / VGA CGA 80x25 Monochrome	Sets the video controller type.

Shadow Options Group

Menu Fields	Settings	Comments
Shadow video BIOS ROM	Enabled Disabled	Enables or disables your server's shadow video ROM option.
Shadow 16K at: C8000h CC000h D0000h D4000h D8000h DC000h DFFFFh	Enabled Disabled	Allows you to enable or disable shadowing and caching of individual segments of ROM to increase server performance. **Caution:** Some option ROMs do not operate properly when shadowed.

Security Options Group

Menu Fields	Settings	Comments
Supervisor password	Press [Enter]	Enables you to set a supervisor password.
Password on boot	Enabled Disabled	Enables or disables the enter password on boot option.
		Note: This option requires prior setting of the supervisor password.
Diskette access	Supervisor User	Enables you to control who has access to diskette drives.
Fixed disk boot sector	Normal Write protect	Enables you to write protect the boot sector on your hard disk drive.
Network server	Disabled Enabled	This option keeps your server from being accessed during network operation.
System backup reminder	Disabled Daily Weekly Monthly	Enables or disables the system backup reminder message.
Virus check reminder	Disabled Daily Weekly Monthly	Enables or disables the virus check reminder message.

Cache Options Group

Menu Fields	Settings	Comments
Internal cache	Enabled Disabled	Enables or disables your server's internal cache.
External cache	Enable Disable	Enables or disables your server's external cache.
Cache system BIOS ROM	Enabled Disabled	Enables or disables caching control of the system BIOS system area.
Cache video ROM	Enabled Disabled	Enables or disables caching control of the video BIOS area.

Reserved System

Menu Fields	Settings	Comments
Reserved system resources	Not user selectable	Displays the current configuration file and overlay version.

Miscellaneous

Menu Fields	Settings	Comments
Mouse port	Disabled Enabled	Enables or disables the mouse port.
PCI arbiter priority	System default Pure rotating EISA slots PCI slots 4-6 CPU PCI slot 1 PCI slot 2 PCI slot 3	Selects the PCI arbiter priority scheme. Select "System Default" for optimal setting. Select "Pure Rotating" or a device with the highest priority if absolutely needed.
OCP saver timer	5 minutes 15 minutes 30 minutes Disabled	Selects disabling or a timer value. If a keyboard and mouse remains inactive for the specified time, the OCP will be set to an OFF state to increase the life of the OCP.
OCP backlight	On Off	Selects the power-on state of the OCP backlight.

PCI Slot Options Group: (PCI Slots 1-6)

Menu Fields	Settings	Comments
PCI slot # INTA INTD INTB INTC	None One IRQ required	Enables you to set an interrupt for an installed PCI expansion board.
PCI slot # default latency timer	Yes No	Enables you to use or not use the minimum latency required by a PCI expansion board.
PCI slot # device latency timer	40h through 38H	Enables you to set a specific latency timer in units of PCI clocks for a PCI expansion board.

VGA Graphics Controller

Menu Fields	Settings	Comments
VGA accelerator	Not installed Graphics: 　color and mono 　color 　mono Text: 　color and mono 　color 　mono	Enables you to set your onboard video controller to operate in graphics or text mode.
Vertical retrace interrupt	Interrupt disabled Interrupt enabled	Enables or disables an interrupt for your video's vertical retrace capabilities.

3
Expanding Your Server

Introduction

The following information will help you install, replace, or modify the following hardware:

- CPU module
- Memory modules
- Server battery/real-time clock (RTC)
- Optional EISA and PCI local bus expansion boards
- Mass storage devices
- Redundant power supply

Tools Needed

- A Phillips screwdriver
- An antistatic wrist strap (recommended, but not required)

Static Electricity

Static electricity collects on non-conductors such as paper, cloth, or plastic. A static discharge can be damaging even though you often cannot see or feel it. To prevent damage to circuit boards and/or components:

- Before touching any circuit board or component, touch the metal frame of your server to discharge any static electricity.

- Keep circuit boards and components away from non-conductors.

- Keep clothing away from circuit boards and components.

- Keep circuit boards in anti-static bags.

Disconnect External Devices and Power

Before removing the side panels, perform the following:

1. Turn off power to all external devices connected to server.

2. Turn server off.

3. Unplug power cord from wall outlet.

4. Disconnect power cord and monitor cord from server.

Removing the Side Panels

To remove the side panels, perform the following:

WARNING: Removing the side panels activates two interlock switches located at the top-left and top-right of your server. These switches turn off power to your server. You might injure yourself or damage your server if you attempt to bypass these switches.

1. Unlock side panels.
2. Slide panels to rear of server.
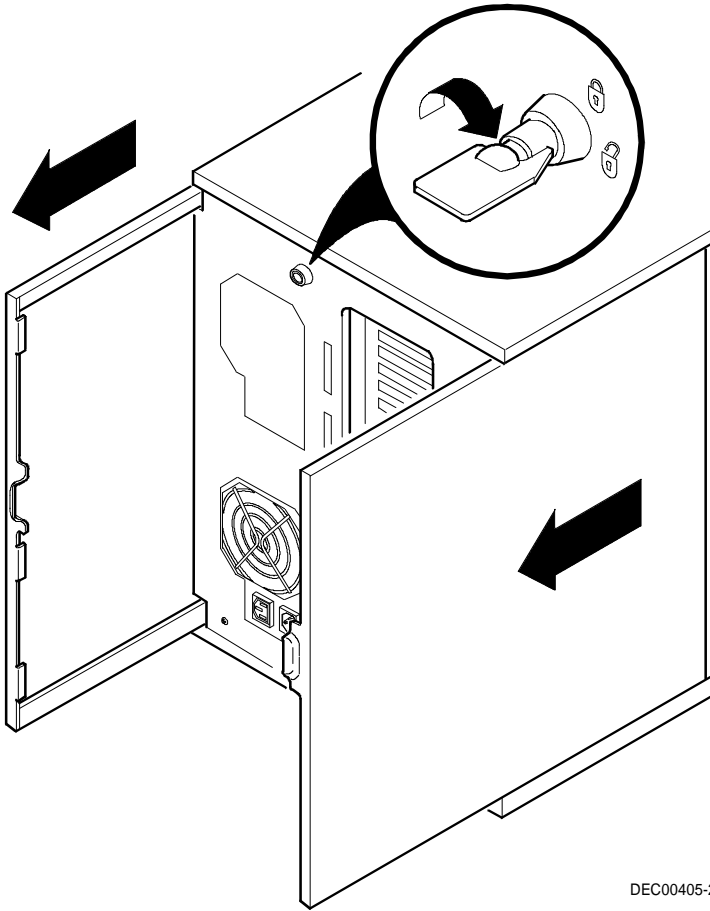
DEC00405-2

Figure 3-1. Unlocking and Removing the Side Panels

Server Components (Left Side)

Figure Legend	Component
A	Operator control panel
B	6 EISA expansion slots
C	Primary PCI 32-bit local bus expansion slots
D	CPU module
E	Main logic board
F	Memory module
G	3½-inch diskette drive
H	Front access 5¼-inch or 3½-inch half-height drive bays
I	CD-ROM drive bay
J	Integral hot-swap device bay (slots 0 through 6 from top to bottom)
K	Cooling fans
L	Interlock switch
M	Power, OCP, and reset buttons
N	Security keylock
O	Casters
P	Power indicator
Q	Secondary PCI 32-bit local bus expansion slots
R	Brake
S	Redundant fans
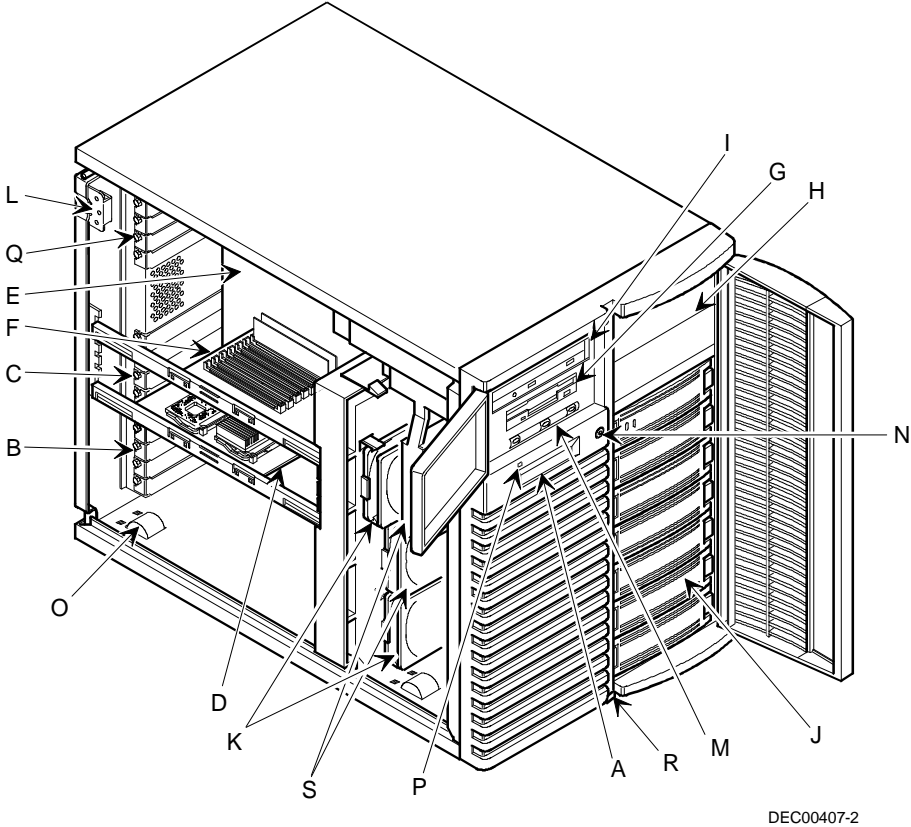
DEC00407-2

Figure 3-2. Server Components (Left Side)

Server Components (Right Side)

Figure Legend	Component
A	Keylock
B	SCSI knockouts (back panel)
C	Keyboard and mouse ports
D	Parallel port
E	Video port
F	Serial ports
G	AC power plug
H	AC power out/monitor plug
I	Optional fan or redundant power supply area
J	Power interlock switch
K	Power supply
L	Storage backplane SCSI terminator
M	Storage backplane
N	Jumper cable
O	Power plug
P	68-pin connector
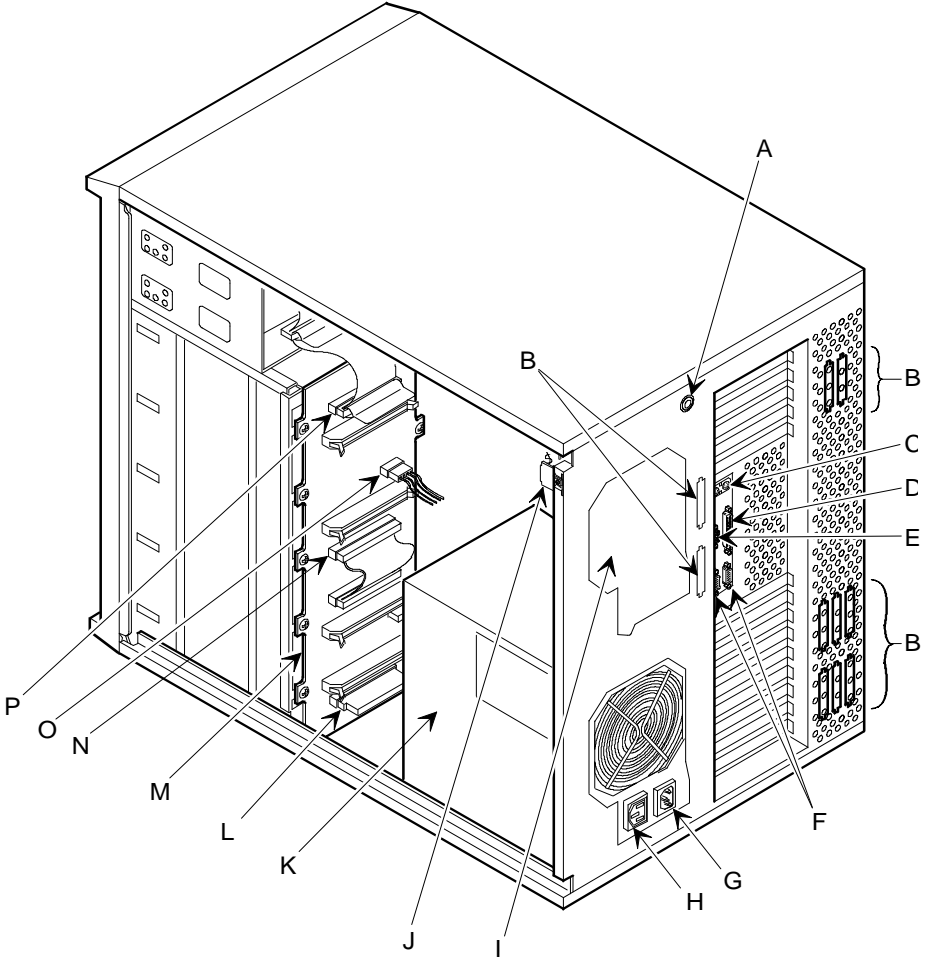
DEC00438-2

Figure 3-3. Server Components (Right Side)

Main Logic Board Components

Figure Legend	Components
A	5 V dc power supply connector
B	Diskette drive connector
C	Mouse and keyboard connections
D	Serial port connections
E	Parallel port and video connections
F	Six EISA expansion slots
G	Primary PCI expansion slots (1, 2, and 3)
H	Flash ROM BIOS
I	Dedicated CPU module connector
J	Dedicated memory module connector
K	Real-time clock/server battery
L	3.3 V dc power connector
M	Secondary PCI expansion slots (4, 5, and 6)
N	Video BIOS

DEC00400-2
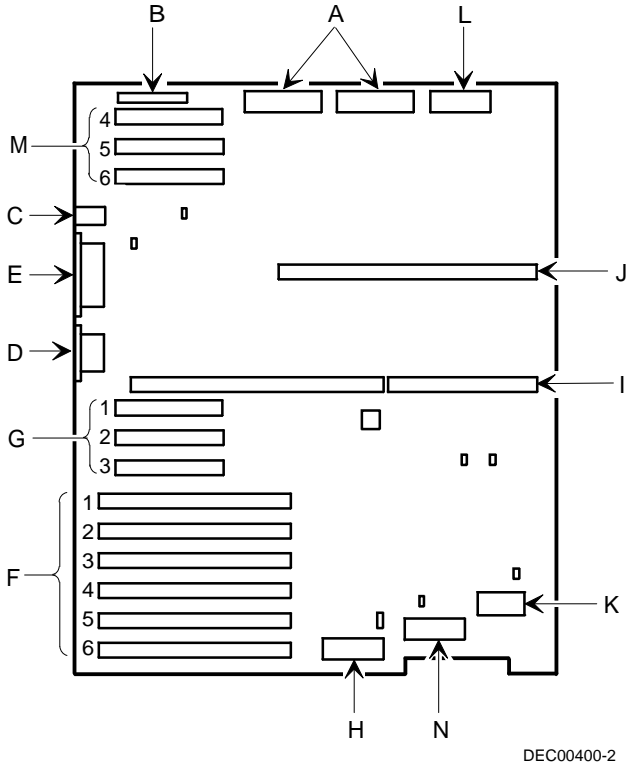
Figure 3-4. Main Logic Board Components

Remove the CPU Module

To remove the CPU module:

1. Turn off your server.

2. Disconnect external devices, ac power, and monitor power.

3. Unlock and remove left side panel.

4. Remove CPU module retaining bracket.

5. Carefully remove CPU module from main logic board.

   Refer to the User Documentation in Quick Launch for CPU module information.

6. Replace CPU module and retaining bracket.

7. Replace and lock left side panel.

   NOTE: Your server will not power up with the side panel removed.

8. Connect external devices and restore power.
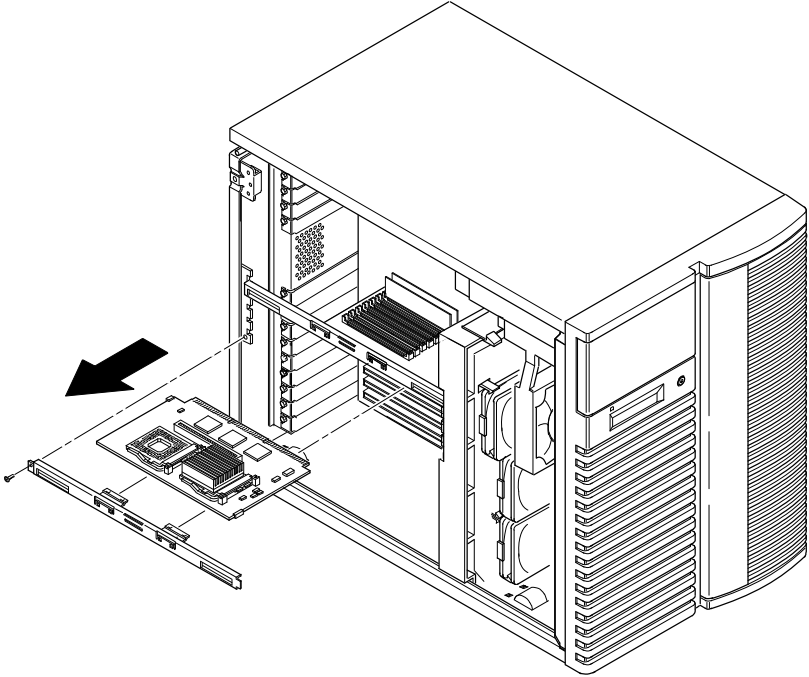
DEC00404-2

Figure 3-5. CPU Module Removal

Remove the Memory Module

To remove the memory module:

1. Turn off your server.

2. Disconnect external devices, ac power, and monitor power.

3. Unlock and remove left side panel.

4. Remove memory module retaining bracket.

5. Carefully remove memory module from main logic board.

6. Install a higher performance memory module or add additional server memory on existing memory module.

   Refer to "Installing Additional Server Memory," for more information.

7. Replace memory module retaining bracket.

8. Replace and lock left side panel.

9. Connect external devices and restore power.
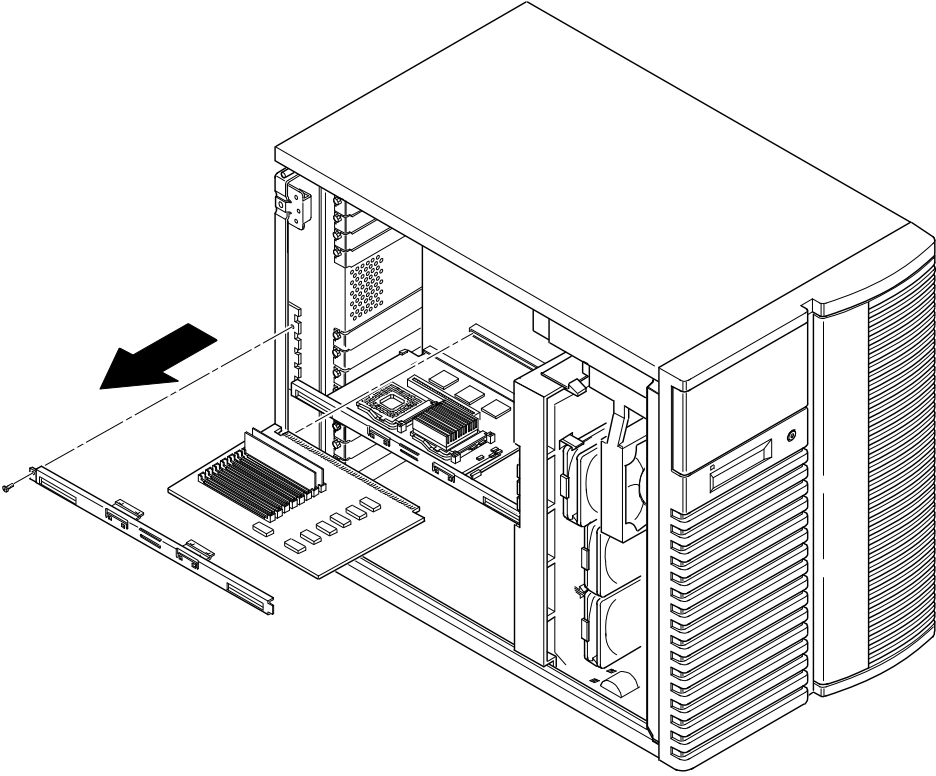
DEC00404-3

Figure 3-6. Memory Module Removal

Installing Additional Server Memory

Adding more memory allows your server to run larger, more complicated software and run it quicker.

Your server will support up to 512 MB of parity memory and 256 MB of ECC memory using SIMM sockets 0 through 7.

NOTE: You cannot mix ECC memory and parity memory.

Your server comes with at least 16 MB of memory. When adding additional memory make sure you:

- Install 36-bit SIMMs having an access time of 70 ns or less.

- Fill two sockets at a time using the same SIMM size, type, and speed
  (4 MB, 8 MB, 16 MB, 32 MB, and 64 MB densities are available for parity memory. 16 MB and 32 MB densities are available for ECC memory.).

- Fill sockets 0 and 1 before sockets 2 and 3, sockets 0 through 3 before sockets 4 and 5, and sockets 0 through 5 before sockets 6 and 7.

  Refer to "Memory Configurations" for a list of SIMM combinations supported by your Prioris HX Server family computer and to "Installing a SIMM" for detailed instructions on installing SIMMs.
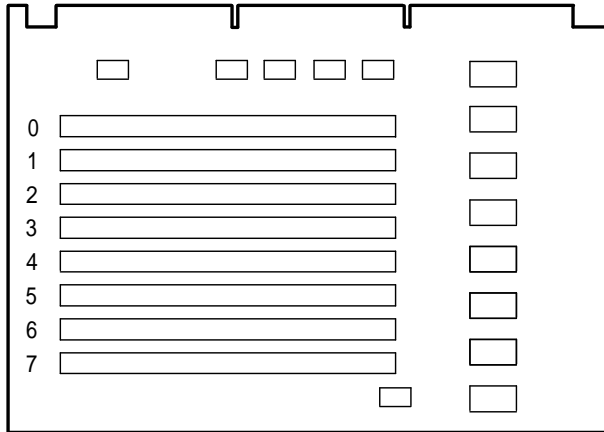
DEC00401

Figure 3-7. SIMM Socket Locations and Bank Designations

Memory Configurations

0	1	2	3	4	5	6	7	Total
4 MB	4 MB	4 MB	4 MB					16 MB
8 MB	8 MB							16 MB
4 MB	4 MB	4 MB	4 MB	4 MB	4 MB			24 MB
4 MB	4 MB	8 MB	8 MB					24 MB
4 MB	4 MB	4 MB	4 MB	8 MB	8 MB			32 MB
8 MB	8 MB	8 MB	8 MB					32 MB
16 MB	16 MB							32 MB
4 MB	4 MB	8 MB	8 MB	8 MB	8 MB			40 MB
4 MB	4 MB	16 MB	16 MB					40 MB
8 MB	8 MB	8 MB	8 MB	8 MB	8 MB			48 MB
8 MB	8 MB	16 MB	16 MB					48 MB
4 MB	4 MB	4 MB	4 MB	16 MB	16 MB			48 MB
4 MB	4 MB	8 MB	8 MB	16 MB	16 MB			56 MB
8 MB	8 MB	8 MB	8 MB	16 MB	16 MB			64 MB
16 MB	16 MB	16 MB	16 MB					64 MB
32 MB	32 MB							64 MB
4 MB	4 MB	32 MB	32 MB					72 MB
4 MB	4 MB	16 MB	16 MB	16 MB	16 MB			72 MB
4 MB	4 MB	4 MB	4 MB	32 MB	32 MB			80 MB
8 MB	8 MB	16 MB	16 MB	16 MB	16 MB			80 MB
8 MB	8 MB	32 MB	32 MB					80 MB
4 MB	4 MB	8 MB	8 MB	32 MB	32 MB			88 MB
8 MB	8 MB	8 MB	8 MB	32 MB	32 MB			96 MB
16 MB	16 MB	16 MB	16 MB	16 MB	16 MB			96 MB
16 MB	16 MB	32 MB	32 MB					96 MB
4 MB	4 MB	16 MB	16 MB	32 MB	32 MB			104 MB
8 MB	8 MB	16 MB	16 MB	32 MB	32 MB			112 MB
32 MB	32 MB	32 MB	32 MB					128 MB
16 MB	16 MB	16 MB	16 MB	32 MB	32 MB			128 MB
64 MB	64 MB							128 MB
4 MB	4 MB	32 MB	32 MB	32 MB	32 MB			136 MB
4 MB	4 MB	64 MB	64 MB					136 MB
8 MB	8 MB	32 MB	32 MB	32 MB	32 MB			144 MB
8 MB	8 MB	64 MB	64 MB					144 MB
4 MB	4 MB	4 MB	4 MB	4 MB	4 MB	64 MB	64 MB	152 MB
16 MB	16 MB	32 MB	32 MB	32 MB	32 MB			160 MB
16 MB	16 MB	64 MB	64 MB					160 MB

0	1	2	3	4	5	6	7	Total
8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	64 MB	64 MB	176 MB
32 MB	32 MB	32 MB	32 MB	32 MB	32 MB			192 MB
32 MB	32 MB	64 MB	64 MB					192 MB
16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	64 MB	64 MB	224 MB
32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	256 MB
32 MB	32 MB	64 MB	64 MB	64 MB	64 MB			256 MB
4 MB	4 MB	4 MB	4 MB	64 MB	64 MB	64 MB	64 MB	272 MB
8 MB	8 MB	8 MB	8 MB	64 MB	64 MB	64 MB	64 MB	288 MB
32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	64 MB	64 MB	320 MB
32 MB	32 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	448 MB
64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	512 MB

Only 16 MB and 32 MB densities are available for ECC memory modules.

Installing a SIMM

To install a SIMM, perform the following:

1. Turn off your server.

2. Disconnect external devices, ac power, and monitor power.

3. Unlock and remove left side panel.

4. Remove memory module retaining bracket and memory module.

5. Install SIMM into socket on memory module at a 45 degree angle away from edge connector.

   Make sure notch is oriented as shown (A, Figure 3-8). Rock SIMM gently until it completely engages bottom of socket. Tip SIMM upright until both retaining clips engage (B, C, Figure 3-8).

6. Replace memory module and retaining bracket.

7. Replace and lock left side panel.

8. Connect external devices and restore power.

9. Run SCU to configure server for additional memory.
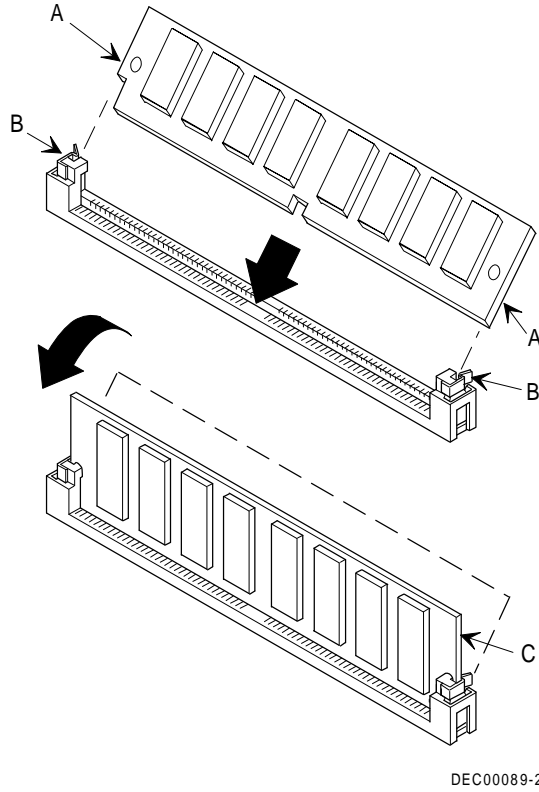
   Refer to Chapter 2, "Server Utilities."

DEC00089-2

Figure 3-8. Installing a SIMM

Replacing the Battery/Real Time Clock (RTC)

Your server's battery runs the server clock and retains any setup information when it is turned off. If your server ever fails to retain the correct date, time, or configuration settings when it is turned on, you need to replace your server's battery (Part Number 21-39151-01).

To replace the battery, perform the following:

1. Turn off your server.

2. Disconnect external devices, ac power, and monitor power.

3. Unlock and remove left side panel.

4. Remove old battery.

> **WARNING:** Depending on your locality, your server's battery might be considered hazardous waste. Make sure you follow any state or local statute to properly dispose of the old battery.

5. Install new battery. Make sure pin 1 of the battery is aligned with pin one on the socket (A, Figure 3-9).

6. Replace and lock left side panel.

7. Connect external devices and restore power.

8. Run the SCU to reconfigure server.

   Refer to Chapter 2, "Server Utilities."
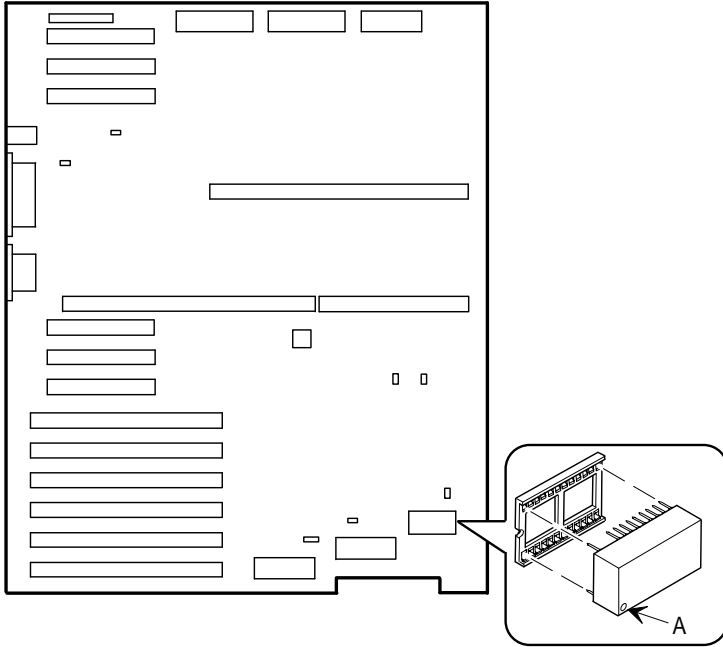
DEC00400-4

Figure 3-9. Replacing the Battery

Installing Expansion Boards

Your Prioris HX Server contains 12 expansion board slots. Six of the slots support industry-standard 32-bit EISA expansion boards. The remaining six expansion slots support 32-bit PCI local bus expansion boards. This enables your server to deliver maximum performance by using a faster data path for greater computing speed. It also improves the expandability of your server.

Expansion Slot Designation	Description
EISA slots 1 through 6	Supports industry-standard 32-bit EISA expansion boards
PCI slots 1 through 3 (primary)	Supports bus mastering 32-bit PCI expansion boards
PCI slots 4 through 6 (secondary)	

Some PCI expansion boards might need to be installed in a primary PCI slot.

PCI Slot 4
PCI Slot 5
PCI Slot 6

PCI Slot 1
PCI Slot 2
PCI Slot 3
EISA Slot 1
EISA Slot 2
EISA Slot 3
EISA Slot 4
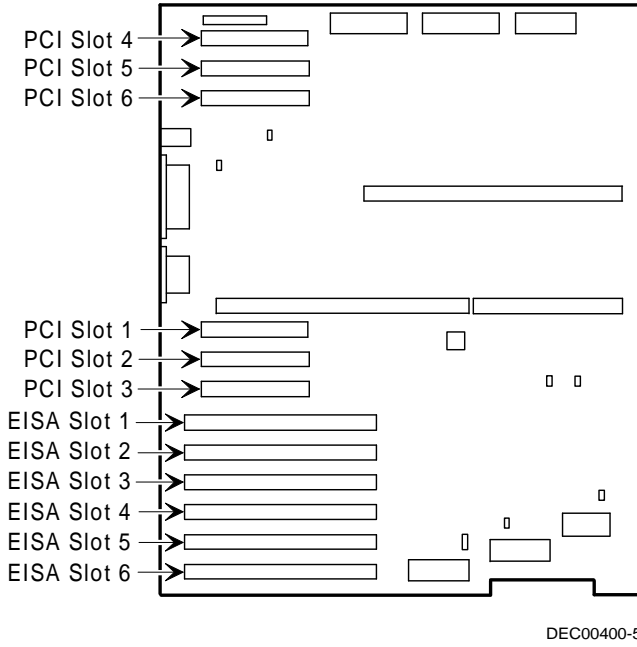EISA Slot 5
EISA Slot 6

DEC00400-5

Figure 3-10. Prioris HX Server Expansion Board Slots

To install an EISA or PCI local bus expansion board:

NOTE: Read and fully understand your optional expansion board's documentation before installing it.
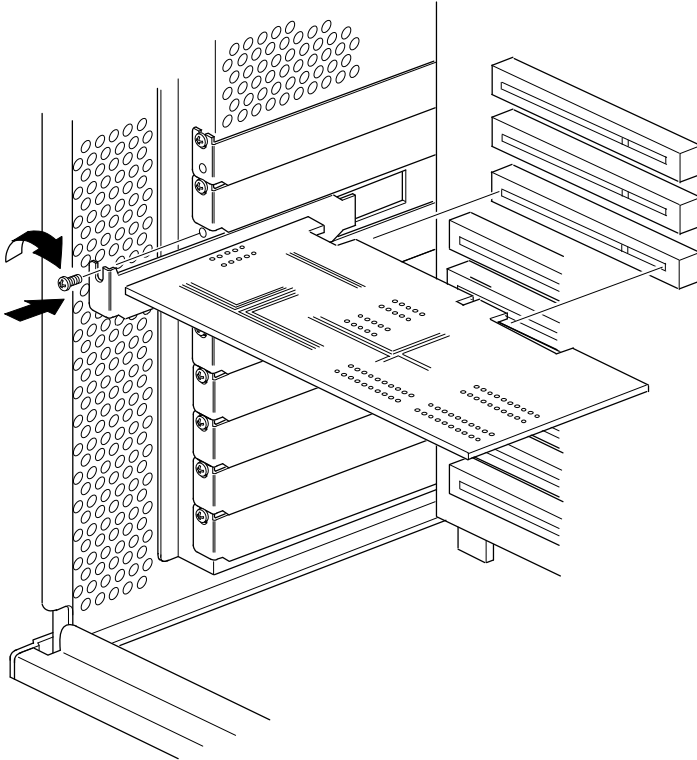
1. Turn off your server.

2. Disconnect external devices, ac power, and monitor power.

3. Unlock and remove left side panel.

4. Unscrew and remove metal filler plate from selected expansion slot.
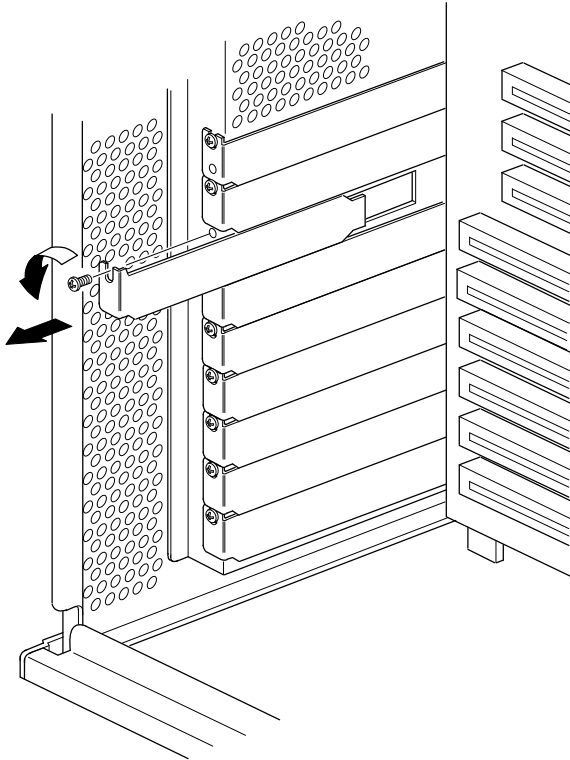
DEC00408-2

Figure 3-11. Removing a Metal Filler Plate

5. Insert new expansion board into socket.

    Push expansion board firmly into place.

DEC00408-3

Figure 3-12. Installing an Expansion Board

6. Secure expansion board to slot with screw removed in step 4.

7. Replace and lock left side panel.

8. Connect external devices and restore power.

9. Run SCU to configure server.

    Refer to Chapter 2, "Server Utilities."

Adding Mass Storage Devices

Your server has three drive bay areas. Mass storage devices such as SCSI hard disk drives, floppy diskette drives, SCSI CD-ROM drives, and SCSI tape backup systems are installed in these drive bay areas. The three drive bay areas are:

- Left-front access drive bay area—This area has one 5¼-inch SCSI CD-ROM drive and one 3½-inch diskette drive (standard on all Prioris HX Servers).

- Top-right front access drive bay area—This area has room for two wide
  (68-pin) or narrow (50-pin) 5¼-inch or 3½-inch half-height SCSI devices or one full-height, 5¼-inch device .

- Lower-right front access drive bay area—This area has room for seven
  3½-inch, wide or narrow Fast SCSI-2, hot-swap devices.

SCSI Configuration Guidelines

Your server configuration, SCSI adapter(s), and all SCSI devices must work together for optimum performance. When installing SCSI devices, use the following guidelines:

- The last physical SCSI devices on each end of the SCSI bus must be terminated. Your server is supplied with the necessary cables and terminators. If your SCSI device came with terminators installed, you must remove or disable the terminator from the device before you complete the installation.

  Refer to your SCSI device's manufacturer documentation for the terminator location.

- Each SCSI device (including the SCSI host adapter) must be configured with a unique ID number. SCSI host adapters usually default to ID 7. The SCSI CD-ROM drive defaults to ID 5. Use the remaining IDs 0 through 4 and 6 (narrow and wide adapters) and 8 through 15 (wide adapters only) to configure hard disk drives and other SCSI devices. Hard disk drives should be configured to start with SCSI ID 0 and the lower ID numbers. Also, note that the storage backplane has pre-configured ID settings.

  Refer to "SCSI Drive IDs" later in this chapter.

- SCSI device drivers are required to operate your SCSI devices. Your SCSI device drivers are located on the supplied CD-ROM disk. You can copy these SCSI device drivers onto diskettes using the ServerWORKS Quick Launch program on the CD-ROM disk.

  Refer to the Adaptec 7800 Family Manager Set User's Guide for more information.

- Use the SCSI*Select* configuration utility to check or change SCSI device settings.

SCSI Cables

Your server is supplied with the following cables:

- One wide (68-pin) five connector cable assembly. This cable assembly includes:

  - One wide 68-pin connector to connect to the SCSI host adapter.

  - Three wide-to-narrow adapters to connect the narrow (50-pin) CD-ROM drive and the two 5.25" bay devices for SCSI operation.

  - One wide (68-pin) connector to connect the SCSI host adapter to Channel A of the hot-swap backplane (if required). A cable terminator is supplied if this connector is not used to connect to Channel A.

- One 68-pin-to-68-pin jumper cable to connect the two hot-swap backplane segments together to make a single SCSI channel.

- Two 68-pin internal terminators (one for channel A and one for channel B).

- One additional wide cable with two 68-pin unsheilded connectors. This cable is used to split the storage backplane.
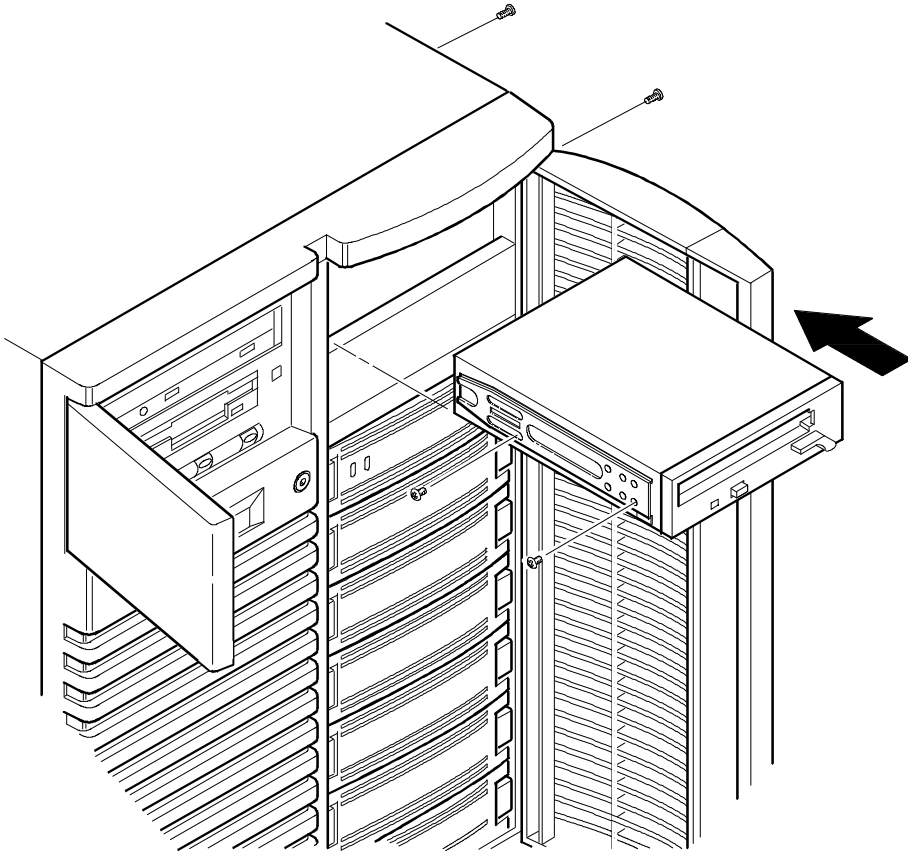
Installing a Half-Height 5¼-Inch Device into the Top-Right Drive Bay

To install a half-height 5¼-inch device into one of the top-right drive bay slots, perform the following:

1. Turn off your server.

2. Disconnect external devices, ac power, and monitor power.

3. Unlock and remove side panels.

4. Unlock and open door.

5. Remove plastic filler panel by pushing it out from inside server.

6. Remove bracket from drive bay (inside, left) and attach it to device.

7. Insert device into drive bay slot from front.

8. Secure device to slot using supplied mounting screws.

9. If applicable, replace plastic filler panel.

   *Refer to "Connecting SCSI Devices."*

DEC00409-2

Figure 3-13. Installing a Half-Height 5¼-Inch Device Into Top-Right Drive Bay

Installing a Full-Height 5¼-Inch Device into the Top-Right Drive Bay

To install a full-height 5¼-inch device into the top-right drive bay slots, perform the following:

1. Turn off your server.

2. Disconnect external devices, ac power, and monitor power.

3. Unlock and remove side panels.

4. Unlock and open door.

5. Remove both plastic filler panels by pushing them out from inside server.

6. Remove bottom brackets from inside of drive bay and attach them to device.

7. Remove divider bracket from right side of drive bay (A, Figure 3-14).

8. Insert device into drive bay from front.

9. Secure device using the four supplied mounting screws.

10. Replace plastic filler panels.

   *Refer to "Connecting SCSI Devices."*
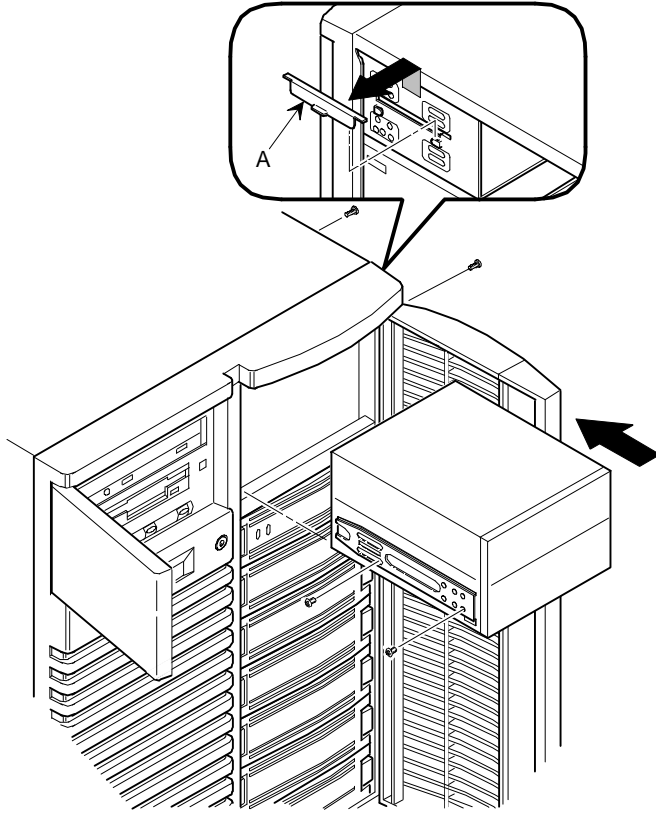
DEC00634-2

Figure 3-14. Installing a Full-Height 5¼-Inch Device Into Top-Right Drive Bay

Expansion Brackets

You can install 3½-inch half-height devices in the top-right drive bay. If you plan to install a 3½-inch device in a 5¼-inch drive bay slot, you must first install expansion brackets onto the device. Expansion brackets are either supplied with the device or can be purchased from Digital. Contact your local Digital sales representative for additional information.
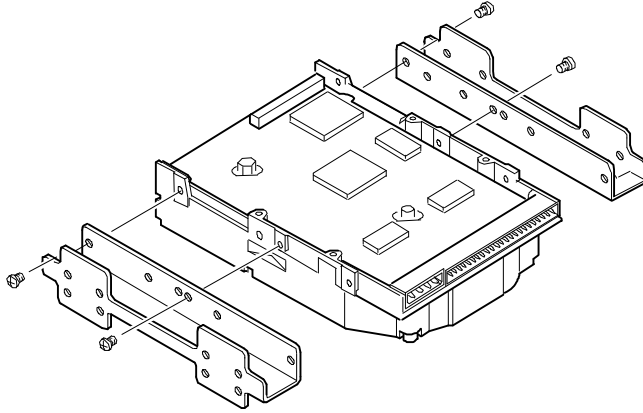
DEC00723

Figure 3-15. Installing Expansion Brackets

Installing or Replacing a Device Into the Hot-Swap Drive Bay

Hot-swapping allows you to remove or install an SBB while the server remains on-line and active eliminating interference with the server's operation. For SBBs, you can use the hot-swap method to replace a device providing that the device is not active (green activity LED is off).

> **NOTE:** Not all SCSI host adapters support the hot-swap method. Refer to your SCSI host adapter documentation to determine if the hot-swap method is supported.
>
> Also, you might need to reconfigure your server to recognize the devices you installed.

Use the following procedure to install or replace an SBB:

1. Unlock and open right side door.

2. Remove filler panel or SBB by pressing the two tabs together to pull filler panel or SBB out (A, Figure 3-16).

3. Insert new SBB into the guide slots and push it in until it is fully seated and the mounting tabs engage the shelf.

4. Close and lock door.
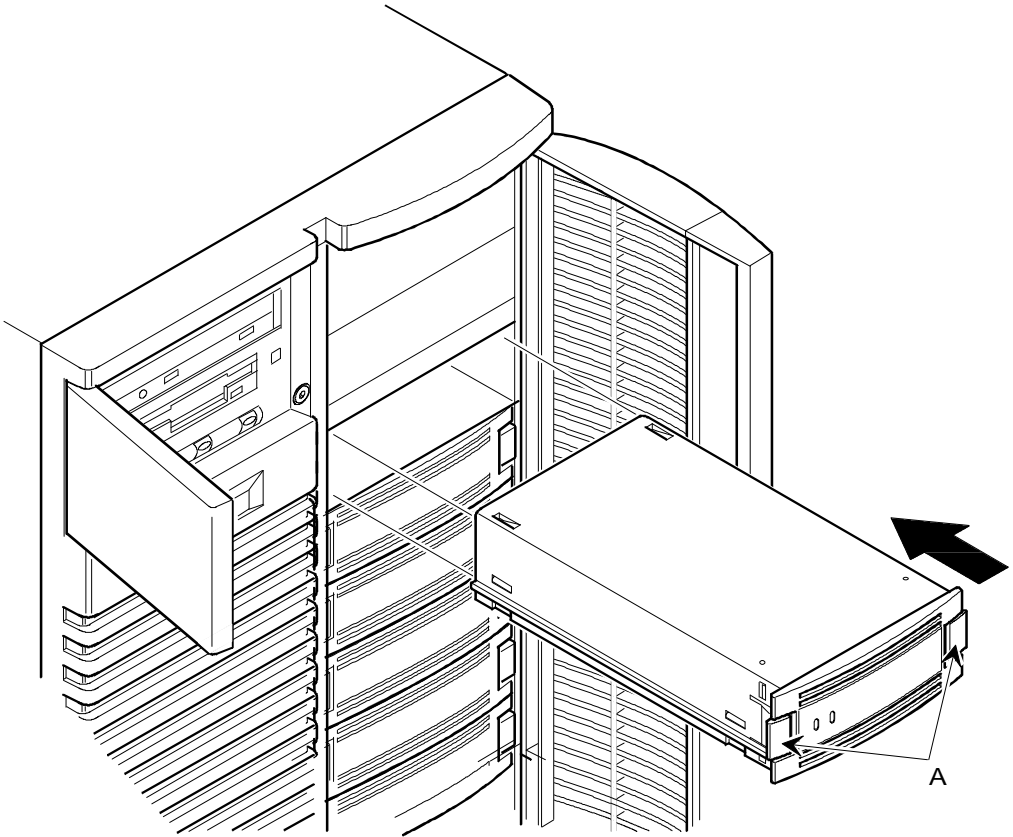
DEC00443-2

Figure 3-16. Installing a Device Into the Hot-Swap Drive Bay

SBB LED Status Indicators

The hot-swap backplane monitors shelf status to identify error conditions or failures. This status is displayed on the SBB LEDs. The left LED displays the device activity status and the right LED displays the fault status.

- The left LED (green) is the activity status LED and is on or flashing when the SBB is active.

△ **CAUTION:** For non-RAID servers, removing a SBB when the left LED is on or flashing can cause the loss or corruption of data.

- For RAID servers, the right LED (amber) is the SBB fault LED and indicates an error condition when it is either on or flashing.

SBB Status LEDs

Activity Status LED	Fault Status LED	Indication
On	Off	Device is operating properly
Flashing	Off	Device is operating properly
Off	Off	Device is inactive and operating normally. There is no fault.
On	On	Fault status, device is hung. Replace SBB.
Off	On	Fault status, device is inactive and spun down. Replace SBB.
On	Flashing	Fault status, device is active and spinning down due to a fault.

Connecting SCSI Devices

Your server supports up to 10 internal SCSI devices. Additional SCSI devices can be added to your server by using an EISA- or PCI-based SCSI host adapter installed in an available expansion slot in conjunction with an external SCSI expansion box.

Storage Backplane

Your storage backplane supports seven hot-swap devices split between two SCSI bus sections (see Figure 3-17). SCSI bus A and SCSI bus B. SCSI bus A is the upper section and consists of four SCSI device connections. SCSI bus B is the lower bus section and consists of three SCSI device connections. These buses can be configured as two independent SCSI buses or as one SCSI bus by installing a wide SCSI jumper cable. Figures 3-18 through 3-20 show the available cable configurations.

Contact your Digital sales representative for ordering information about SCSI cables and devices.

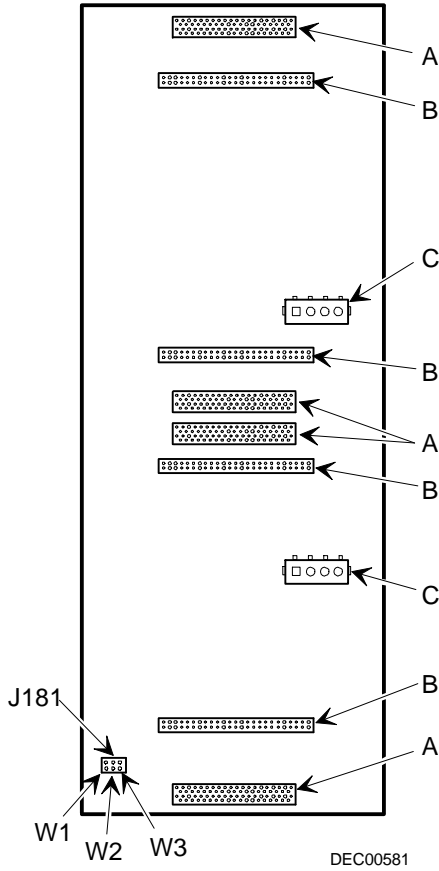| Figure Legend	Description
A	Wide SCSI connectors
B	Narrow SCSI connectors
C	Power connectors
J181 (W1, W2, and W3)	SCSI ID jumper block

Figure 3-17. Storage Backplane

SCSI Drive IDs

SCSI bus device addresses are automatically assigned in the hot-swap drive bay depending on the slot number in which they are installed. The address jumper on the storage backplane is used to override the default addresses. The default settings are listed in the following table and can be set manually to different addresses at your option. The storage backplane can be configured as two separate SCSI buses or as a single SCSI bus using a jumper cable. Note that:

- The SCSI ID addressing is independent of the single or dual SCSI bus arrangement. Make sure you select unique SCSI IDs for all SCSI devices on the SCSI bus.

- You must use a wide SCSI host adapter to set SCSI IDs greater than seven.

- Your CD-ROM drive and tape IDs must be set manually. Refer to your manufacturer's documentation for information on setting drive IDs.

NOTE: You can add narrow SCSI devices to a wide SCSI bus, however, because of the ID settings, narrow devices take up two IDs selections on a wide bus.

Single/Dual SCSI Bus Target ID Settings

Jumpers Set	None	W1	W2	W3	W1+W2	W1+W3	W2+W3	W1+W2+W3
SCSI Bus 1								
SBB slot0 ID=	0	0	8	0	8	0	8	8
SBB slot1 ID=	1	1	9	1	9	1	9	9
SBB slot2 ID=	2	2	10	2	10	2	10	10
SBB slot3 ID=	3	3	11	3	11	3	11	11
SCSI Bus 2 or Jumper Cable	0	4	0	8	4	12	8	12
	1	5	1	9	5	13	9	13
SBB slot4 ID=	2	2	2	10	6	14	10	14
SBB slot5 ID=								
SBB slot6 ID=								

Single Channel SCSI Configuration

To connect SCSI devices to a single channel, perform the following:

1. Connect the SCSI cables as shown in Figure 3-18.

2. If using top 5¼-inch drive bay, connect appropriate power cable to device.

3. Replace and lock side panels.

4. Connect external devices and restore power.

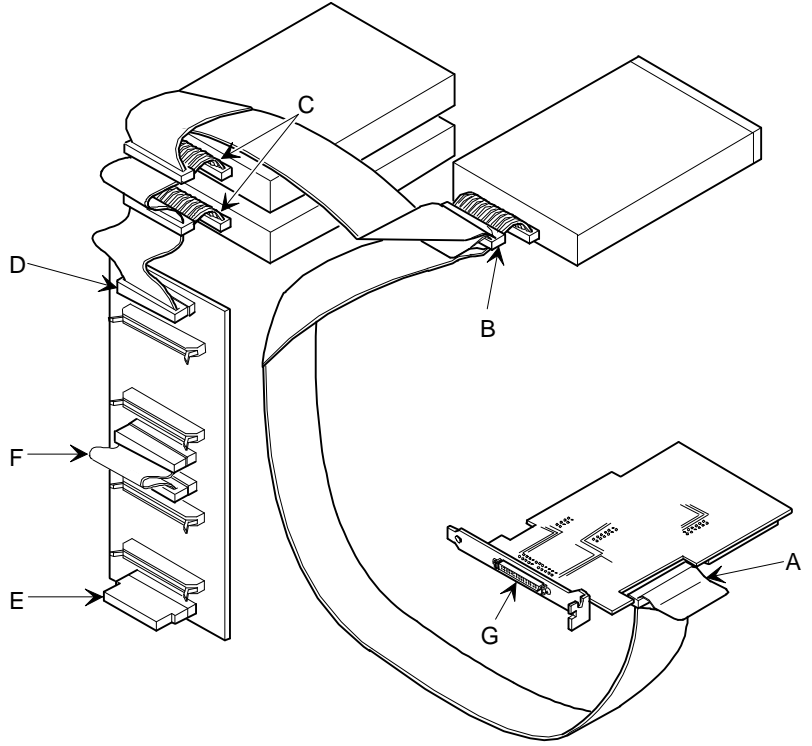5. Run SCU and/or RAID utilities to configure your server.

   Refer to Chapter 2, "Server Utilities," and to your SCSI and RAID documentation for additional configuration information.

   NOTE: Server's with this configuration are shipped with an additional terminator to enable you to split the storage backplane.

Figure 3-18 Legend	Component
A	Adaptec 2940W wide SCSI host adapter
B	68-pin-to-50-pin adapter cable to CD-ROM drive
C	68-pin-to-50-pin adapter cable to top-right drive bay
D	Backplane, 68-pin connector
E	Terminator[1]
F	Jumper cable
G	External SCSI connector

[1] This terminator can be removed and replaced with a 68-pin wide cable to connect to an external SCSI device.

DEC00571

Figure 3-18. Single Channel SCSI Configuration

Two Channel SCSI Configuration

To connect SCSI devices to two separate SCSI channels, perform the following:
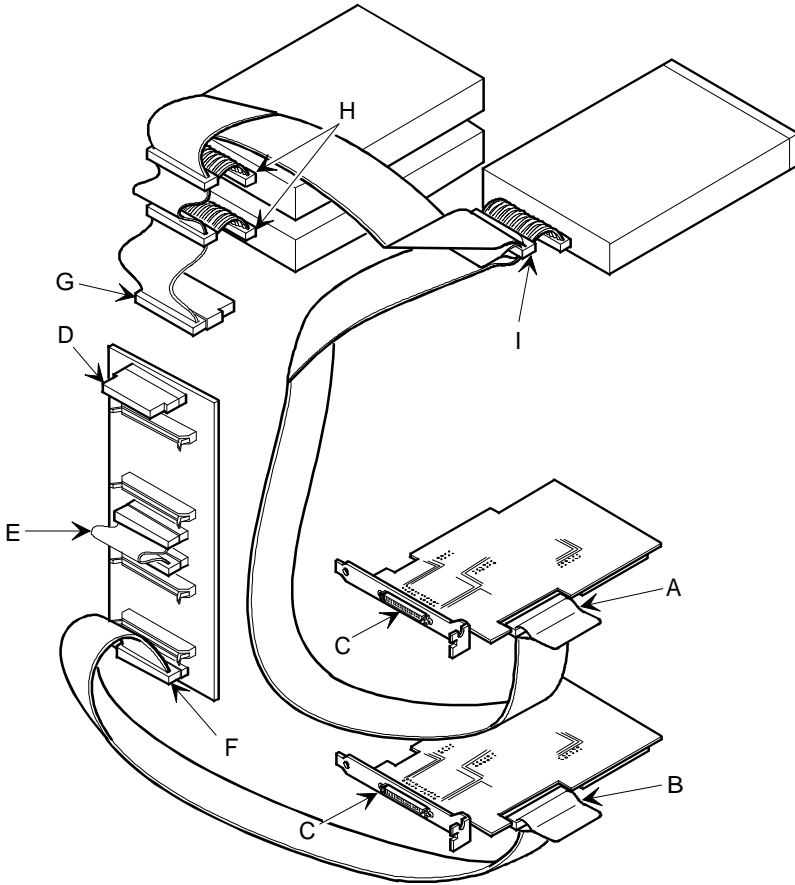
1. Connect the cables as shown in Figure 3-19.

2. If using top 5¼-inch drive bay, connect appropriate power cable to device.

3. Replace and lock side panels.

4. Connect external devices and restore power.

5. Run SCU and/or RAID utilities to configure your server.

   Refer to Chapter 2, "Server Utilities," and to your SCSI and RAID documentation for additional configuration information.

   NOTE: Server's with this configuration are shipped with an additional terminator to enable you to split the storage backplane.

Figure 3-19 Legend	Component
A	Adaptec 2940W wide SCSI host adapter
B	Wide SCSI or RAID host adapter
C	External SCSI connector
D	Backplane terminator
E	Jumper cable
F	Backplane, 68-pin connector
G	Cable terminator
H	68-pin-to-50-pin adapter cable to top-right drive bay
I	68-pin-to-50-pin adapter cable to CD-ROM drive

DEC00576
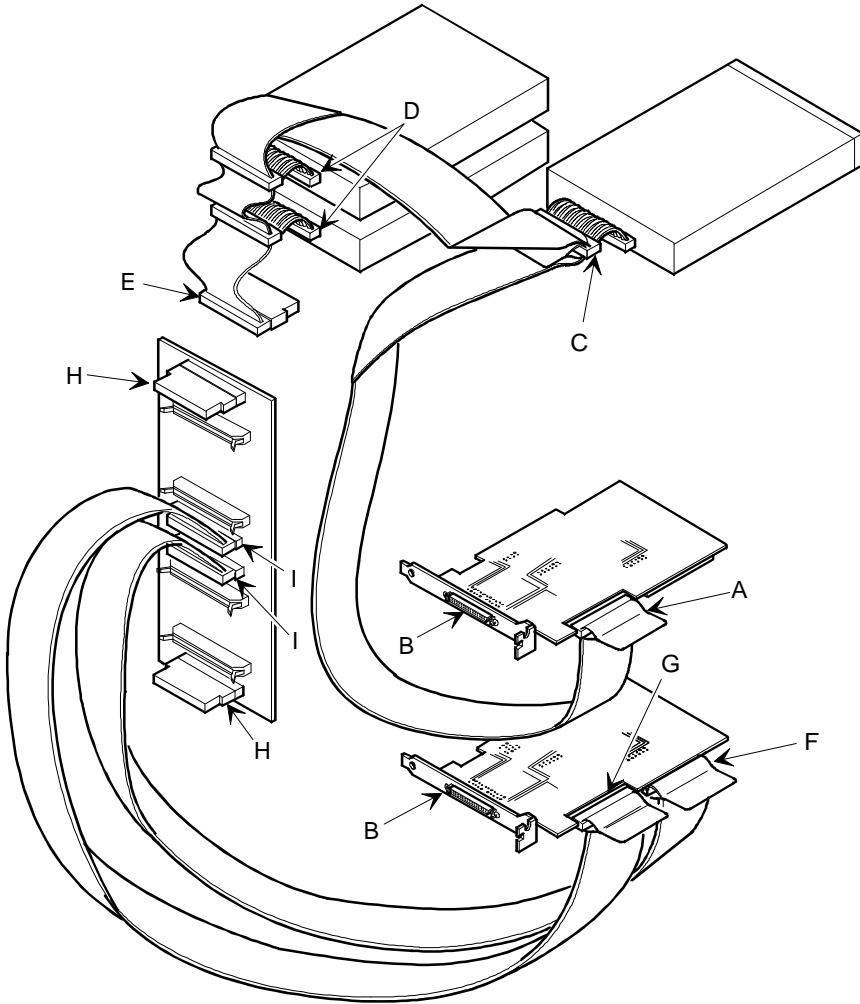
Figure 3-19. Two Channel SCSI Configuration

Three Channel SCSI Configuration

To connect SCSI devices to three separate channels, perform the following:

1. Connect the SCSI cables as shown in Figure 3-20.

2. If using top 5¼-inch drive bay, connect appropriate power cable to device.

3. Replace and lock side panels.

4. Connect external devices and restore power.

5. Run SCU and/or RAID utilities to configure your server.

   Refer to Chapter 2, "Server Utilities," and to your RAID documentation for additional configuration information.

Figure 3-20 Legend	Component
A	Adaptec 2940W wide SCSI host adapter
B	External SCSI connector
C	68-pin-to-50-pin adapter cable to CD-ROM drive
D	68-pin-to-50-pin adapter cable to top-right drive bay
E	Cable terminator
F	Wide SCSI or RAID host adapter (channel 1, host adapter)
G	Wide SCSI or RAID host adapter (channel 0, host adapter)
H	Terminator
I	Backplane, 68-pin connector

DEC00575

Figure 3-20. Three Channel SCSI Configuration

Using Multiple or Multi-Channel SCSI Host Adapters

The following guidelines apply if you configure your server using multiple or multi-channel SCSI host adapters.

- The SCSI host adapter with the lowest BIOS address is identified by the server as the "primary" SCSI host adapter. If you are loading the operating system from a SCSI hard disk drive, this primary or boot drive must be connected to the primary SCSI host adapter. The SCSI address of the primary SCSI hard disk drive must be set to the lowest SCSI address connected to the SCSI host adapter.

- To improve server performance, you might want to distribute the SCSI devices across the SCSI host adapters. When arranging SCSI devices, make sure each device connected to a SCSI host adapter is assigned a unique SCSI address.

- Each operating system has different limitations regarding the number of SCSI host adapters that are supported. Refer to your operating system documentation for additional information.

- SCSI IDs on one channel do not interfere with the IDs on another channel. This applies when installing two SCSI host adapters that implement a different bus as well as dual channels on a single SCSI host adapter.
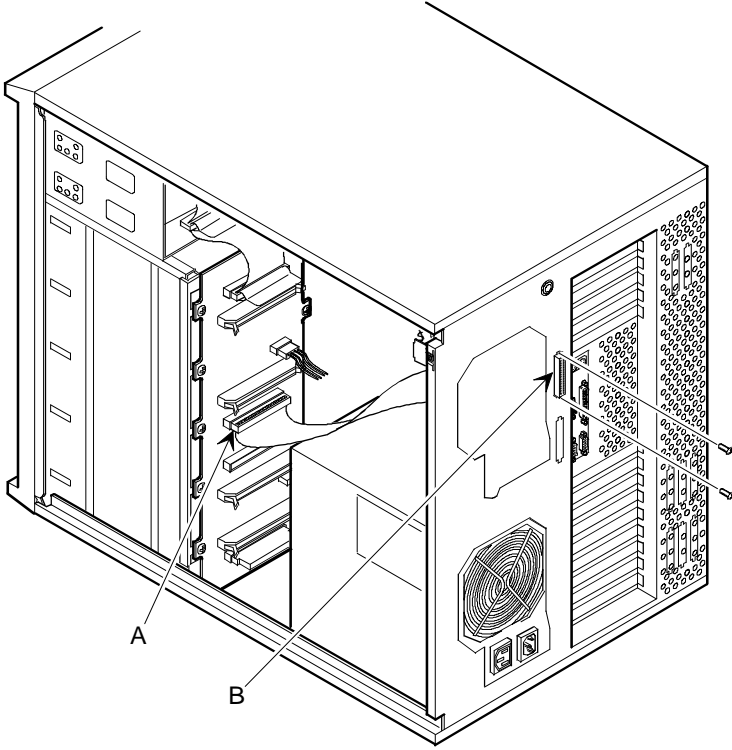
External SCSI Bus

You can use additional SCSI cables and/or host adapters to connect external SCSI devices to your server. Consult your Digital sales representative for information on SCSI options and cables.

To connect the storage backplane to an external SCSI bus:

1. Remove the terminator from the storage backplane for the bus you want to connect.

2. Connect the 68-pin unshielded cable connector (part no. FR-PCXAR-WG) to the storage backplane (A, Figure 3-21).

3. Using a screwdriver, gently pry away one of the SCSI knockouts at the rear panel (see Figure 3-21).

4. Screw the 68-pin or 50-pin external shielded connector to the rear panel (B, Figure 3-21).

5. Connect the external SCSI device making sure the external device is properly terminated.

> **NOTE:** You can also connect directly to the available external connector on the SCSI host adapter.

DEC00444

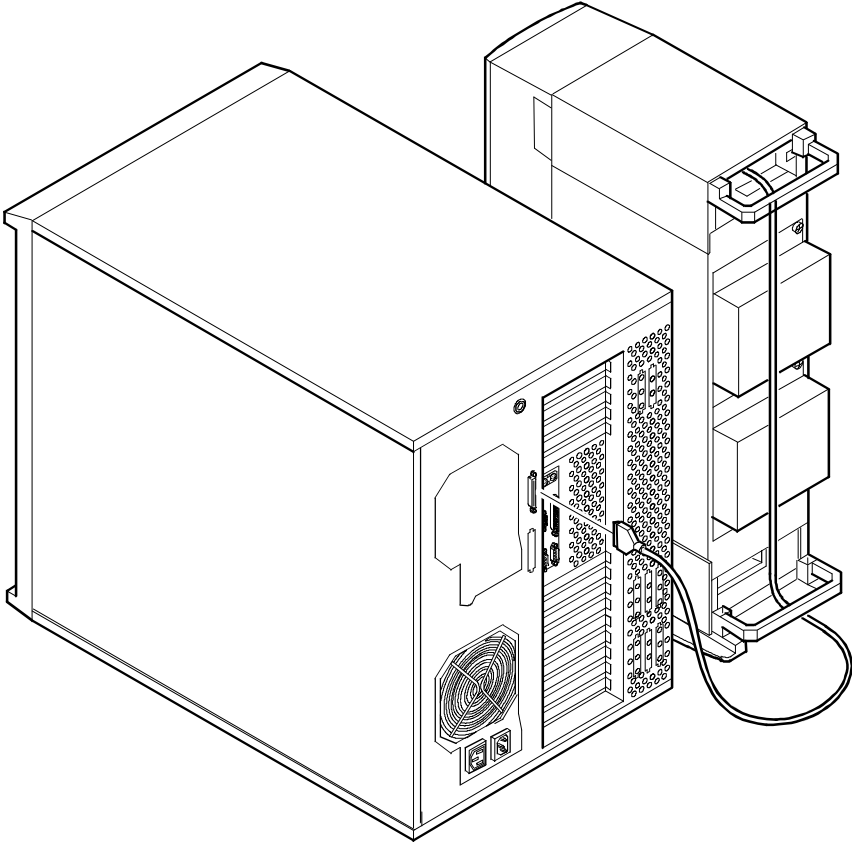**Figure 3-21. External SCSI Bus Connections**

Connecting an External SCSI Storage Box

To connect an external SCSI storage box, follow these instructions:

1. Connect the storage backplane to an external SCSI bus.

   Refer to "External SCSI Bus" described earlier in this chapter.

2. Connect the external device making sure the SCSI bus is properly terminated.

3. Run SCU and/or RAID utilities to configure your server.

External SCSI Bus Guidelines

- Make sure that the SCSI addresses you select for the external SCSI devices do not conflict with other devices in the server.

- Make sure that the external SCSI bus is terminated properly.

- For proper operation, the length of the SCSI cable must not exceed
  1 meter (3.28 ft).

- Use only a high-density external connector.

DEC00626

Figure 3-22. Connecting an External SCSI Storage Box
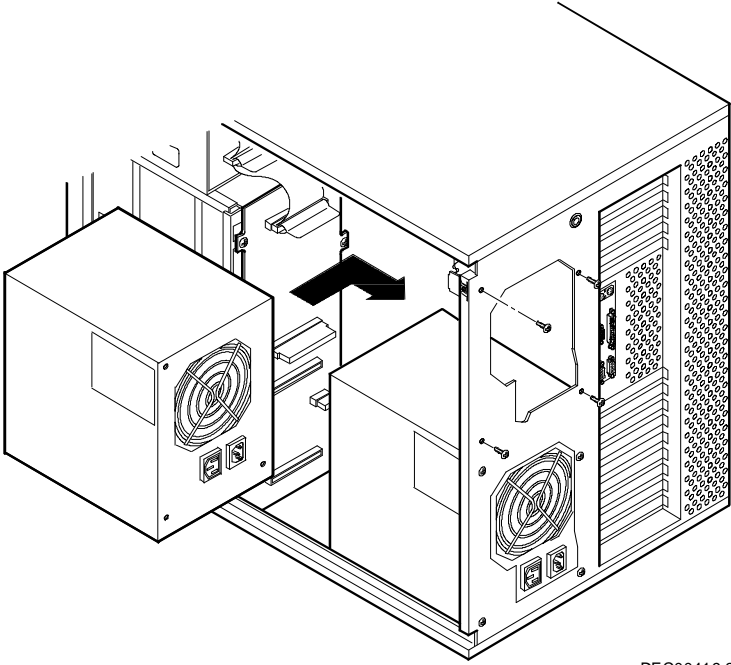
Installing an Optional Power Supply

To increase your server's reliability, you can add a second power supply. Each power supply provides uninterrupted backup should one power supply fail.

To install an optional power supply, perform the following:

1. Turn off your server.

2. Disconnect external devices, ac power, and monitor power.

3. Unlock and remove right side panel.

4. Remove metal panel from rear of chassis.

5. Install optional power supply making sure it fully engages two locking tabs at side of chassis.

   Secure power supply to rear of chassis using supplied screws.

6. Connect remaining power cables from the wiring harness in same manner as lower power supply.

7. Replace and lock left side panel.

8. Connect external devices and restore power.

DEC00419-2

Figure 3-23. Installing an Optional Power Supply

Installing the Side Covers

1. Slide panels to front of server.
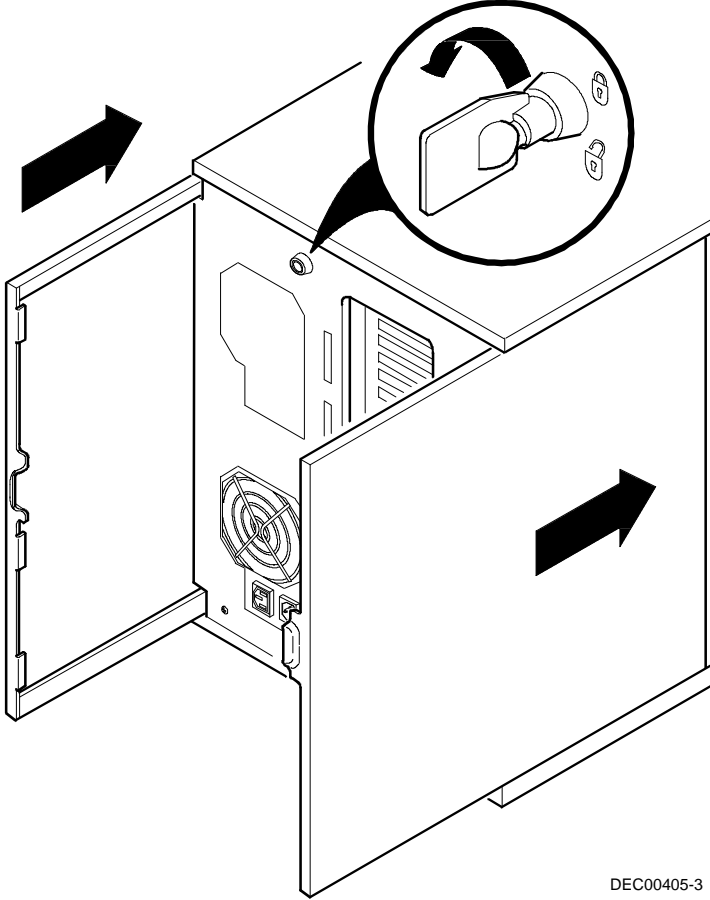
2. Lock side panels.

DEC00405-3

Figure 3-24. Installing Side Covers

4

Problem Solving and Troubleshooting

Introduction

This chapter provides initial troubleshooting procedures. The tables that follow list specific problems, probable causes, and recommended actions to take if your server fails after you configure it or after you install optional hardware or software.

- Server Troubleshooting

- Disk Drive Troubleshooting

- Monitor Troubleshooting

- CD-ROM Troubleshooting

Refer to Appendix B, "Server Messages," for a list of error messages that might appear during normal operation.

Refer to the documentation supplied with additional options if you are experiencing problems with specific options that you have installed.

Initial Troubleshooting

Follow these general procedures to troubleshoot your Prioris HX Server.

- Record all configuration information and have it readily available.

- Turn off your server, wait until all hard disk drives completely spin down, and then turn it back on.

- If the POST detects an error refer to Appendix B, "Server Messages," and take the appropriate steps to correct the problem. After the problem has been resolved, restart the server.

- Ensure that all cables and connections are secure.

- Make sure all necessary video, printer, and application device drivers are properly installed.

- Try not to troubleshoot more than one problem at a time.

- Try to duplicate the problem.

- Run the diagnostic software.

- Run the SCU.

    Refer to Chapter 2, "Server Utilities," to ensure the server is correctly configured for all installed hardware and software.

- If you have problems after connecting a SCSI device, open SCSI*Select* and verify that all settings have been correctly changed.

    Refer to Chapter 2, "Server Utilities," for additional information.

- Contact Digital Services for software or hardware related problems.

    NOTE: If you need to return a failed component, pack it in its original container and return it to Digital for service.

    If you are a self-maintenance customer, call your Digital service representative for assistance and recommendations.

Server Troubleshooting

Problem	Possible Cause	Action
No response when the server is turned on.	Server is not plugged in.	Turn off the server, plug it in, and then turn it back on again.
	No power at the wall outlet.	Use another wall outlet.
	Main logic board failed.	Contact your Digital service representative.
	Main logic board jumpers incorrectly set.	Set all appropriate jumpers
	CPU module failed.	Contact your Digital service representative.
	CPU module jumpers incorrectly set.	Make sure the jumpers are correctly set.
	No memory module or SIMMs installed.	Install SIMMs and memory module.
	Side panels removed.	Install side panels.
	Power supply failed.	Contact your Digital service representative.
Power is on, but there is no screen display.	Brightness and contrast controls are not correctly set.	Adjust the brightness and contrast controls.
	Monitor is off.	Turn on the monitor.
	Monitor cable is incorrectly installed.	Check all monitor connections.
	Incorrect video drivers installed.	Install the correct video drivers.
	Video controller has failed.	Contact your Digital service representative.

continued

Problem	Possible Cause	Action
Power is on but no OCP display.	OCP button not turned on or OCP backlight is disabled in SCU.	Press any keyboard key or OCP button at the front of the server.
		Make sure OCP backlight is set to ON in the SCU.
Server operates incorrectly after installing optional expansion board.	Expansion board installed incorrectly.	Remove expansion board and reinstall.
	Did not run SCU to configure expansion board after installation.	Run the SCU to properly configure expansion board. Refer to Chapter 2.
	Did not install CFG file for expansion board.	Run SCU and add CFG file (if necessary).
	Expansion board has failed.	Remove expansion board and reboot. If server boots without errors, replace expansion board.
Server operates incorrectly after installing optional memory (SIMMs) on the memory module.	SIMMs installed incorrectly.	Remove SIMMs and reinstall.
	SIMMs have failed.	Replace SIMMs.
	Memory module installed incorrectly.	Reinstall memory module.
	Memory module failed.	Replace memory module.

continued

Problem	Possible Cause	Action
No response to key-board commands.	Keyboard might be password protected by a local or remote control program.	Enter the keyboard password.
	Keyboard is not connected.	Power down the server and connect the keyboard.
	Keyboard is connected to the mouse port.	Power down the server and connect the keyboard to the keyboard port.
	Keyboard failed.	Replace keyboard or contact your Digital service representative.
No response to mouse commands.	Mouse might be password protected by a local or remote control program.	Enter the keyboard and mouse password.
	Mouse is not connected.	Power down the server and connect the mouse.
	Mouse is connected to the keyboard port.	Power down the server and connect the mouse to the mouse port.
	Mouse driver not installed.	Install the appropriate mouse driver. Refer to Chapter 2.
	Mouse trackball dirty.	Clean trackball.
	Mouse failed.	Replace mouse or contact your Digital service representative.

Problem	Possible Cause	Action
Server does not boot from CD-ROM drive.	CD-ROM drive is not connected to the Adaptec controller.	Connect the CD-ROM to the Adaptec controller. Refer to Chapter 3.
	CD-ROM drive not configured as a bootable device.	Change the CD-ROM setting to "bootable" using SCSI*Select*.
	CD-ROM disk is not bootable.	Contact your Digital representative for the latest BIOS.
Server operates correctly but application software does not.	Application software installed incorrectly.	Refer to your application software documentation.
	Having external cache enabled causes conflict with application software.	Run the SCU and disable external cache. Refer to Chapter 2.
Target diskette drive cannot read or write information.	Diskette is not formatted.	Format the diskette.
	Diskette is worn or damaged.	Try another diskette.
	Diskette is write-protected.	Slide the write-protect switch so the hole is not visible.
	Diskette drive is empty.	Insert a diskette.
	Diskette write protection enabled.	Run the SCU and set the Diskette Write Protection option to "Disabled."

Disk Drive Troubleshooting

Problem	Possible Cause	Action
Server does not recognize an internal SCSI device.	SCSI device jumpers incorrectly set.	Refer to the supplied kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied kit installation instructions and to the storage backplane jumper configuration in Chapter 3.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	Storage backplane incorrectly terminated.	Properly terminate the storage backplane. Refer to Chapter 3.
	SCSI host adapter has failed.	Contact your Digital service representative.
	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI host adapter, SCSI device or backplane.	Refer to "SCSI Guidelines" in Chapter 3 for cabling information.

Problem	Possible Cause	Action
Server does not recognize an external SCSI device.	SCSI device jumpers incorrectly set.	Refer to the supplied kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied kit installation instructions and to the storage backplane jumper configuration in Chapter 3.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	Storage backplane incorrectly terminated.	Properly terminate the storage backplane. Refer to Chapter 3.
	SCSI host adapter has failed.	Contact your Digital service representative.
	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI host adapter and rear panel connector or external SCSI device and rear panel connector.	Refer to "SCSI Guidelines" in Chapter 3 for cabling information.

Problem	Possible Cause	Action
Server does not boot from an internal SCSI hard disk drive.	SCSI boot hard disk drive not formatted.	Format the SCSI hard disk drive.
	SCSI device drivers not installed or incorrectly installed on SCSI boot hard disk drive.	Properly install all required SCSI device drivers.
	Operating system software is not installed on the SCSI boot hard disk drive.	Install the appropriate operating system.
	Requested partition does not exist.	Partition the SCSI hard disk drive and then reload the operating software.
	SCSI boot hard disk drive at wrong SCSI address.	Set SCSI boot hard disk drive to lowest "primary" SCSI address.
Server does not boot from a target diskette drive.	Drive ID incorrectly set.	Make sure the drive ID is correctly set (refer to Chapter 3).
	Diskette drive not enabled.	Run the SCU to enable the diskette drive.
	Diskette boot option disabled.	Run the SCU and set boot option A then C.
	Diskette does not contain start-up files.	Insert a diskette with the correct start-up files.
	Diskette drive is empty.	Insert a diskette that contains an operating system.
	Diskette is worn or damaged.	Try another diskette.
	Loose cables.	Secure all cable connections.

continued

Problem	Possible Cause	Action
SCSI hard disk drive cannot read or write information.	Incorrect disk drive jumper settings.	Refer to the supplied kit installation instructions.
	Loose or incorrectly installed cables.	Make sure all cables are correctly installed.
	SCSI hard disk drive is not correctly formatted or partitioned.	Format and partition as required using the supplied operating system.
SBB failure.	Check SBB status LEDs for a drive failure indication.	Refer to Chapter 3 for additional information.

Monitor Troubleshooting

Problem	Possible Cause	Action
Monitor power indicator is not on.	Monitor is turned off.	Turn on the monitor.
	Power cord is not connected.	Connect the power cord to the server.
	No power at wall outlet.	Use another outlet.
	Power indicator is defective.	Contact your Digital service representative
No screen display.	Configuration error.	Run the SCU to configure the server for correct video operation.
		Set the jumper for correct video operation. Refer to Appendix A.
	Monitor brightness and contrast controls are incorrectly set.	Adjust the monitor brightness and contrast controls.
No monitor display while loading Windows video drivers.	Monitor type incorrectly set.	Set the correct monitor type. Refer to Chapter 2.
Distorted, rolling, or flickering screen display, or wrong/uneven color.	Monitor incorrectly adjusted.	Adjust accordingly.
	Monitor signal cable incorrectly installed.	Straighten any bent connector pins and then reconnect.

continued

Problem	Possible Cause	Action
Color monitor displaying monochrome.	Server was turned on before the monitor was turned on.	Turn off the server, turn on the monitor, then turn the server back on.
	Video jumper incorrectly set.	Set the jumper for correct video operation. Refer to Appendix A.
Monitor fails to switch to high-resolution mode.	Appropriate high-resolution video drivers are not installed or incorrectly installed.	Correctly install all appropriate high-resolution video drivers. Refer to Chapter 2 and the documentation supplied with your monitor.
Monitor display not centered while loading Windows video drivers.	Monitor type incorrectly set.	Set the correct monitor type. Refer to Chapter 2.

CD-ROM Troubleshooting

Problem	Possible Cause	Action
Cannot access the CD-ROM drive. Error message reading drive x.	Device drivers not installed.	Install correct device drivers.
	No disk in the CD-ROM drive.	Insert a disk.
	Incorrect SCSI ID assigned.	Make sure correct SCSI ID is assigned. Refer to Chapter 3.
	Tray open.	Close the tray.
Power is on but indicator shows no activity.	No disk or tray is open.	Insert a disk and close the tray.
	Check cable connections.	Make sure cables are correctly connected.
Disk is spinning but drive is idle.	Application software not running.	Run application software.

5
Server Security Features

Introduction

Server security is important to prevent theft or accidental loss of software and hardware. The Prioris HX Server provides the following levels of protection:

- Left and right security door lock—located at the front of your server.

- Left and right side panel lock—located at the rear of your server

- Supervisor password

- Additional security features

Left and Right Door Security Lock

Your server has a three-way keylock used to prevent unauthorized access to the left- and right-front security doors. To open the left-front security door, insert the key into the keylock at the bottom position and then turn the key clockwise to the first unlock position. To open the right-front security door, continue to turn the key clockwise to the second unlock position. Note that your server keys fit both the front keylock and rear chassis lock.
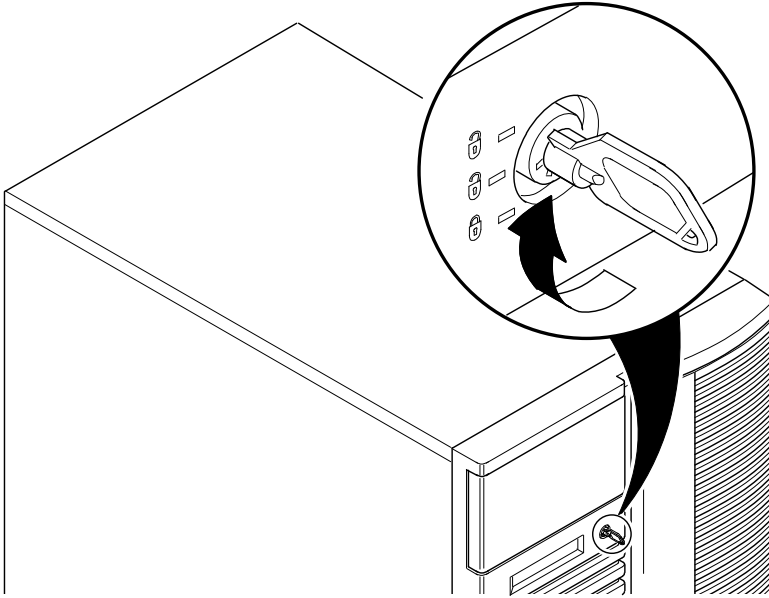
Figure 5-1. Front Panel Security Doors Lock

Left and Right Side Panel Lock

Your server has a chassis keylock used to prevent unauthorized removal of the left and right side panels. To release the left and right side panels, insert the key as shown and then turn to the right. Note that your server keys fit both the front keylock and rear chassis lock.

CAUTION: Be careful not to lose your server keys. Losing these keys prevents you from removing the side panels and opening the front security doors. Contact your Digital service representative or authorized dealer for information on replacing lost keys.
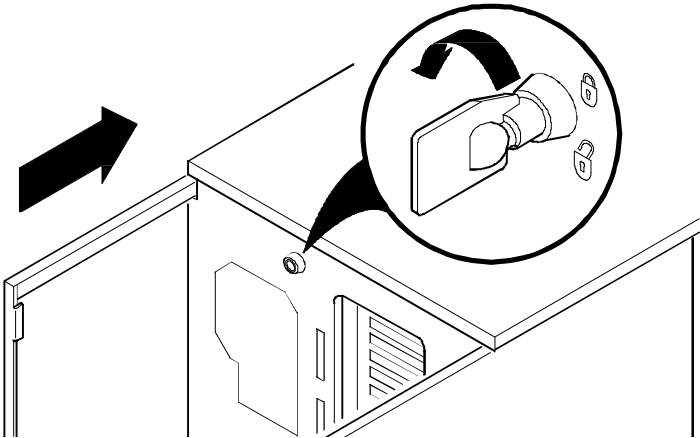
Figure 5-2. Left and Right Side Panel Lock

Supervisor Password

Your server has a password level that you can set to prevent unauthorized access to your server files. If you set a supervisor password, you will be prompted to enter it prior to accessing the SCU. If "Password On Boot" is enabled, you will be prompted to enter a password before your operating system boots.

Perform the following steps to set a supervisor password:

1. Turn on your server and allow the POST to complete.

   If POST detects an error refer to Appendix B, "Server Messages," and take the appropriate steps to correct the problem. After the problem has been resolved, restart the server.

2. Start the SCU from the MS-DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.

3. Press [Enter] to display the Main menu, select the `Configure Computer` option, then select the `View and Edit Details` option.

4. Highlight the `Security Options Group` and then press [Enter].

5. Highlight the `Supervisor Password` field and then press [Enter].

6. Select `Installed`.

7. Type in a supervisor password and then press [Enter].

   To confirm, type in your supervisor password a second time and then press [Enter].

8. Highlight the `Password On Boot` field and select `Enabled` if desired.

9. Exit the SCU and reboot your server so changes immediately take effect.

   Your computer runs the POST and then prompts you for the supervisor password you set.

If You Forget Your Password

Use the following procedure to erase a password from your server.

1. Turn off your server and remove the left side panel.
2. Change jumper J38 to password clear (jumper installed).

   Refer to Appendix A, "Technical Specifications," for jumper location and setting.

3. Reconnect your server and turn it on.

   Booting your server with this jumper installed erases the existing password(s).

4. Turn off your server and remove the left side panel.
5. Change jumper J38 to normal mode (jumper removed).
6. Reconnect your server and turn it on.
7. Using the SCU, assign a new password.

   Refer to Chapter 2, "Server Utilities," for more information.

Additional Security Features

Additional server security features are available as options in the SCU, BIOS Setup utility, and through main logic board jumpers.

The SCU and BIOS Setup utility include the following setup options to improve sever security:

- Setup Prompt — Setting this option to `Disabled` prevents unauthorized personnel from entering the BIOS Setup utility each time your server is turned on or reset. The Setup Prompt appears as an F2 Setup prompt on your monitor screen each time your server boots.

- Diskette Write Protection — Setting this option to enabled prevents unauthorized personnel from writing data to a diskette.

- Diskette Access — Setting this option to Supervisor or User controls who has access to any installed diskette drive.

- Network Server — Setting this option to disabled prevents unauthorized personnel from accessing your server during network operation.

Your main logic board's Flash ROM upgrade jumper (J41) should also be set to disable (jumper removed) to prevent unauthorized personnel from loading a new server BIOS. Loading a new server BIOS might allow someone to override other server security features or introduce a virus into your server.

A
Technical Specifications

Introduction

This appendix provides information about the technical characteristics of the Prioris HX Server.

- CPU specifications

- Server specifications

- EISA expansion slots

- PCI expansion slots

- Power supply and input power requirements

- Current requirements

- Power cord requirements

- Main logic board jumpers

CPU Specifications

CPU specifications vary depending on the type of CPU module installed in your server. Refer to the User Documenation in Quick Launch for CPU module information.

Server Specifications

The following sections list the Prioris HX Server performance, dimensions and environmental specifications.

Performance Specifications

Attributes	Specification

Bus clock
  EISA
  PCI
	
	7.5/8.33 MHz
	30/33 MHz

Data I/O
  EISA
  PCI
	
	8-bit and 16-bit
	32-bit

Memory module DRAM	8 MB minimum (up to 512 MB parity memory using 64 MB SIMMs and 256 MB ECC memory using 32 MB SIMMs)
Flash ROM BIOS	256 KB

Server Dimensions

Dimension	Specification
Width	371.94 mm (14.6 in.)
Length	589.33 mm (23.2 in.)
Height	513.87 mm (20.23 in.)
Weight	24.5 kg (54.02 lbs)

Environmental Specifications

Attributes	Specification
Operating temperature	10°C to 35°C (50°F to 95°F)
Storage temperature	-20°C to 65°C (-4°F to 149°F)
Operating humidity (noncondensing)	20% to 80% relative humidity, maximum wet bulb 35°C (95°F)
Storage humidity (noncondensing)	10% to 90% relative humidity, maximum wet bulb 65°C (149°F)

Altitude
  Operating
  Nonoperating
	
	2,438 m (8,000 ft) maximum
	4,876 m (16,000 ft) maximum

Shipping vibration	IAW Federal Standard 101, method 5019
Nonoperating shock	30 G, 25 ms halfsine

EISA Expansion Slots

The main logic board contains six EISA expansion slots. These slots support
+5 V dc.

PCI Local Bus Expansion Slots

The main logic board contains six PCI local bus expansion slots. These slots support:

- 5 V dc only PCI expansion boards
- 5/3.3 V dc universal PCI expansion boards
- Bus mastering

Power Supply and Input Power Requirements

The 450 W auto-sensing power supply provides five dc voltages: +12 V dc, −12 V dc, +5 V dc, −5 V dc, and 3.3 V dc. These voltages are used by the various components within the server. The following lists the input power requirements.

Rated Voltage Range	Maximum Range	Rated Input Current[1]	Operating Frequency Range
100 V ac-120 V ac	90 V ac-135 V ac	9.5 A	47 Hz - 63 Hz
220 V ac-240 V ac	180 V ac-265 V ac	5 A	47 Hz - 63 Hz

[1] Includes outlet current

Current Requirements

Your Prioris HX Server family power supply provides the following output ratings:

- +5 V dc   2.5 A min, 52 A max.

- +3.43 V dc   0 A min, 37.4 A max.

- +12 V dc   0 A min, 13 A max.

- −12 V dc   0 A min, 0.5 A max.

- −5 V dc   0 A min, 0.2 A max.

+5 V dc and +3.43 V dc maximum total output: 335 W.
+5 V dc and +3.43 V dc and +12 V dc maximum total output: 420 W.
Power supply total output: 450 W maximum.

Power Cord Requirements

The power cord used with this server must meet the following criteria:

- UL and CSA Certified cordage rated for use at 250 V ac with a current rating that is at least 125% of the current rating of the product. In Europe, the cordage must have the <HAR> mark.

- The ac plug is terminated in a grounding-type male plug designed for use in the region. It must also have marks showing certification by an agency acceptable in the region.

- The connector at the server end is an IEC type CEE-22 female connector.

- The maximum length is 4.5 meters (14.5 feet).

Main Logic Board Jumpers

Jumper pins allow you to set specific server parameters (see Figure A-1). They are set by changing the pin location of jumper blocks. A jumper block is a small plastic-encased conductor (shorting plug) that slips over the pins. To change a jumper setting, remove the jumper from its current location with your fingers. Place the jumper over the two pins designated for the desired setting. Press the jumper evenly onto the pins. Be careful not to bend the pins.

CAUTION: Do not touch any electronic component unless you are safely grounded. Wear a grounded wrist strap or touch an exposed metal part of the system box chassis. A static discharge from your fingers can result in permanent damage to electronic components.

Main Logic Board Jumper Settings

Feature	Description	Setting	Description
Onboard VGA	Enabled[1] Disabled	J17, jumpered[1] J17, open	Disable this jumper if you install a video controller expansion board.
VGA IRQ select	Enabled Disabled[1]	J9, jumpered J9, open[1]	Enable this jumper if your video controller requires an interrupt other than what was factory assigned.
Boot block update	Enabled[1] Disabled	J28, pins 1 and 2 jumpered[1] J28, pins 2 and 3 jumpered	Set this jumper to disabled to prevent unauthorized personnel from changing the BIOS boot block.
DSM	Install Not install[1]	J42, open J42, jumpered[1]	If you add Digital's Remote Server Management (RSM) option to your server, you will need to connect the RSM reset cable to connector DSM and change this jumper setting to open (Install).

[1] Factory default setting

continued

Feature	Description	Setting	Description
Recovery mode	Recovery mode Normal[1]	J39, jumpered J39, open[1]	If your BIOS upgrade failed, refer to the README.TXT file that came with the BIOS upgrade.
Password clear	Password clear (MFG test) Normal mode[1]	J38, jumpered J38, open[1]	If you forget your password, set this jumper to password clear and then restart your server. Refer to Chapter 5 for more information.
BIOS upgrade	Enabled[1] Disabled	J41, jumpered[1] J41, open	Your main logic board's flash ROM upgrade jumper must be set to disable to prevent unauthorized personnel from loading a new server BIOS. Loading a new server BIOS might allow someone to override other server security features or introduce a virus into your server.

[1] Factory default setting
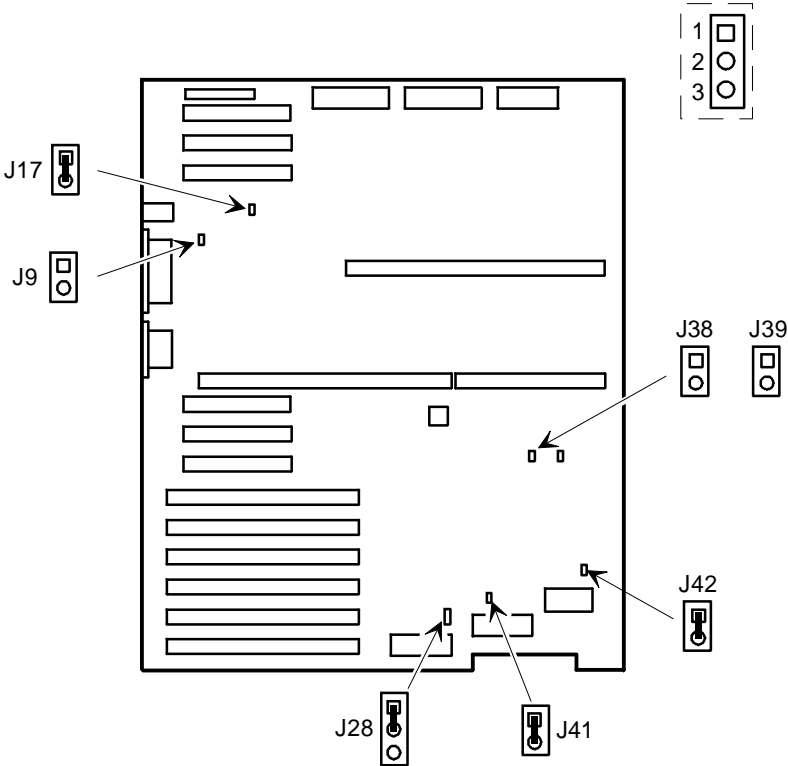
Figure A-1. Main Logic Board Jumper Locations

B

Server Messages

Introduction

This appendix lists the Prioris HX Server messages you might see or hear when you turn on power. The server messages are grouped as follows:

- POST and boot messages

- Operator Control Panel (OCP) messages

- Beep codes

POST Messages

The POST displays messages to alert you to errors in hardware, software, and firmware or to provide operating information about your server.

Each time the POST displays a message on your screen or the server's OCP, the server's speaker beeps twice. If an error occurs before the monitor is initialized, specific beep codes sound to alert you to a problem. The following table lists a general grouping of system messages. In addition, each message is accompanied by text describing the message and in most cases, a recommended solution to the problem.

NOTE: Italics indicate variable parts of a message such as memory addresses, hexadecimal values, and so on. These messages can differ at each occurrence.

POST and Boot Messages

Message	Description/Solution
nnnn Cache SRAM Passed	Where *nnnn* is the amount of server cache (in kilo-bytes) that tested successfully.
Diskette drive A error Diskette drive B error	Run the SCU. Check all connections. If the problem persists, contact your Digital service representative.
Entering SETUP	BIOS Setup utility runs.
Extended RAM Failed at offset: *nnnn*	Extended memory failed or configured incorrectly.
	Make sure SIMMs are installed correctly (see Chapter 4). If the problem persists, contact your Digital service representative.
	Run the SCU and restore all settings to original values.
Extended RAM Passed	Where *nnnn* is the amount of extended memory (in kilobytes) that tested successfully.
Failing Bits: *nnnn*	*nnnn* is a map of the bits at the RAM address which failed the memory test.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.
Fixed Disk 0 Failure Fixed Disk 1 Failure Fixed Disk Controller failure	Run the SCU. Check all connections. If the problem persists, contact your Digital service representative.
Incorrect Drive A type - run SETUP Incorrect Drive B type - run SETUP	Diskette drive A and/or B not correctly identified in the SCU. Run the SCU and properly identify diskette drive A and/or B.

continued

Message	Description/Solution
`Invalid NVRAM media type`	NVRAM access failed.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.

`Keyboard controller error`
`Keyboard error`
`Keyboard locked - Unlock key switch`
	Check the keyboard connection. If the connection is secure, the keyboard or keyboard controller might have failed. If the problem persists, contact your Digital service representative.

`Monitor type does not match CMOS - Run SETUP`	Run the SCU and set the correct monitor type.
`Operating system not found`	The operating system cannot be found on drive A or drive C.
	Run the SCU and correctly identify drive A or drive C.
	Correctly install the operating system. Refer to the supplied operating system documentation.
`Parity check 1 `*`nnnn`* `Parity check 2 `*`nnnn`*	Parity error found in the server bus. The BIOS attempts to locate the address and display it on your monitor screen.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.
`Press <F1> to resume, <F2> to Setup`	This message appears after any recoverable error message.
	Press <F1> to reboot or <F2> to enter the BIOS Setup utility to make any necessary changes.
`Real time clock error`	Real-time clock failed BIOS test.
	Replace the battery and then run the SCU to restore previous configuration information.

continued

Message	Description/Solution
Shadow RAM Failed at offset: *nnnn*	Shadow RAM failed.
	Run the SCU and disable failed shadow memory region.
nnnn Shadow RAM passed	Where *nnnn* is the amount of shadow RAM (in kilobytes) that tested successfully.
System battery is dead - Replace and run SETUP	Replace the battery and then run the SCU to restore previous configuration information.
System BIOS shadowed	This indicates that your server's BIOS was successfully copied to shadow RAM.
System cache error - Cache disabled	RAM cache failed.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.
System CMOS checksum bad - run SETUP	Run the SCU and ensure that all settings are correct. Save the configuration even if you have made no changes. If the problem persists, contact your Digital service representative.
System RAM failed at offset: *nnnn*	System RAM failed.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.
nnnn System RAM passed	Where *nnnn* is the amount of system RAM (in kilobytes) that tested successfully.
System timer error	Your server's timer test failed.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.

continued

Message	Description/Solution
UMB upper limit seg-ment address: nnnn	Displays the address of the upper limit of UMB. This indicates the released segments of the BIOS that can be reclaimed by a virtual memory manager.
Video BIOS shadowed	This indicates that your server's video BIOS was successfully copied to shadow RAM.

OCP Messages

Message	Description/Solution
Unexpected interrupts test	Checks for assigned interrupts other than what was factory installed.
Shadow ROMs	Determines whether or not your server's BIOS, SCSI, or video read only memory (ROM) is shadowed.
Test 512K to 640K DRAM	Determines whether or not your server is configured for 512 KB or 640 KB base memory.
Extended memory test	Determines the amount of extended memory installed in your server.
Set cache registers	Enables your server's internal or external cache.
Cache configuration	Determines if your server is equipped with both an internal cache and external cache.
Real time clock test	Determines whether or not your server's battery is working properly.
Keyboard test	Determines whether or not your server's keyboard is working properly.

continued

Message	Description/Solution
`Initial hardware interrupt`	Tests the status of your server's hardware interrupts.
`Coprocessor test`	Test the functionality of your server's coprocessor.
`Serial ports test`	Tests the functionality of your server's serial ports.
`Parallel ports tests`	Tests the functionality of your server's parallel ports.
`Initiate onboard super I/O`	Tests the functionality of your server's onboard super I/O.
`Testing diskette drives`	Tests and determines the number of diskette drives installed in your server.
`Scanning optional ROM`	Tests the functionality of any installed optional ROM.
`Searching the other CPUs`	Tests and determines the number of CPUs installed.
`Enable IRQs`	Enables your server's assigned IRQs.
`Setting time-of-day`	Sets the current time of day.
`Press <F1> to resume, <F2> to Setup`	This message appears after any recoverable error message.
	Press <F1> to reboot or <F2> to enter the BIOS Setup utility to make any necessary changes.
`Power supply 1 failure`	Power supply 1 failed.
`Power supply 2 failure`	Power supply 2 failed.
`Fan 1 failure`	Fan 1 failed.
`Fan 2 failure`	Fan 2 failed.
`Fan 3 failure`	Fan 3 failed.
`Fan 4 failure`	Fan 4 failed.
`System ready`	Server booted sucessfully.

Beep Codes

When POST finds an error and cannot display a message, the server's speaker emits a series of beeps to indicate the error and places a value in I/O port 80h. During POST, if the video configuration fails or if an external ROM module fails a checksum test, then your server beeps three times (one long beep, and two short beeps).

The following table lists other fatal errors and their associated beep codes. Each code represents the number of short beeps that are grouped together. Fatal errors (errors that lock up your server) are generally the result of a failed main logic board or some other add-on component (SIMM, BIOS, server battery, etc.). If you cannot resolve problems using the troubleshooting procedures in Chapter 5, contact your Digital service representative.

Beep Code	Error
2-2-3	BIOS ROM checksum
3-1-1	Test DRAM refresh
3-1-3	Test keyboard controller
3-4-1	Test 512K base address lines
3-4-3	Test 512K base memory
2-1-2-3	Check ROM copyright notice
2-2-3-1	Test for unexpected interrupts

C
Caring For Your Server

Introduction

This appendix describes how to:

- Clean the outside of the server

- Clean the monitor screen

- Clean the mouse

- Pack and move the server

CAUTION: Make sure you turn off the server and disconnect any external devices before doing any cleaning. When using a moistened cloth for cleaning, do not allow any excess fluid to leak into the server, keyboard, or monitor. Wait until the server is completely dry before applying power.

Cleaning the Server

Clean the outside of the server periodically with a soft cloth. Use a cloth lightly moistened with a mild detergent solution. Do not use solvents or abrasive cleaners.

Cleaning the Screen

If the monitor screen gets dirty, clean it with a sponge or chamois cloth lightly dampened with a mild detergent solution. Do not use solvents or abrasive cleaners.

Cleaning the Mouse

If your mouse cursor moves erratically across the screen, the ball on the bottom of the mouse is probably dirty.

Perform the following steps to clean a mouse ball:

1. Turn the mouse over and release the ball cover.

2. Place the mouse cover and ball on a clean surface.

3. Lightly dampen a cotton swab with a mild detergent, and clean the ball and the inside of the mouse.

4. Replace the ball and mouse ball cover.

Moving the Server

Perform the following steps before shipping or moving the server:

1. Back up all files stored on all hard disk drives.

2. Turn off the server (the monitor automatically shuts off).

3. Disconnect the power cord from the wall outlet, then from the back of the server.

3. Disconnect the monitor cable from the back of the server.

4. Disconnect the keyboard cable from the back of the server.

6. Disconnect the mouse cable from the back of the server.

7. Disconnect any other external peripheral devices, such as printers and modems.

8. Insert a drive protection card in all 5¼-inch and 3½-inch diskette drives (if applicable). If you do not have drive protection cards, use blank diskettes.

9. Package the server as described in the following section, "Packing the Server."

Packing the Server

If you are moving the server a short distance (from one room to another in the same building), you do not have to pack the server. If you are shipping the server or moving it by vehicle, pack the server to avoid damage.

Pack the server in the original packing material and containers. If you did not save the boxes and packing material, use a sturdy carton and cushion the server well to avoid damage.

Installing the Server at a New Location

After moving the server to a new location, follow the instructions in the *Installation Guide* to unpack it and install it.

Index

S