Prioris HX 6000 Series Server
Service Maintenance Manual

Part Number: ER-B50WW-SM. A01

Digital Equipment Corporation

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FCC ID: A09-B5XWW

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

All external cables connecting to this basic unit need to be shielded. For cables connecting to option cards, 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.

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Preface *P*

This *Service Maintenance Manual* is a troubleshooting guide that can be used for reference when servicing Prioris HX 6000 Series servers.

Digital reserves the right to make changes to this *Service Maintenance Manual* without notice. Accordingly, the illustrations and procedures in this document might not apply to all Prioris HX 6000 Series servers to be serviced since many of the diagnostic tests are designed to test more than one product.

> **CAUTION:** Digital recommends that only A+ certified engineers attempt to repair this equipment. All troubleshooting and repair procedures are detailed to support subassembly/module level exchange. Because of the complexity of the individual boards and subassemblies, no one should atttempt to make repairs at the component level or make modifications to any printed circuit board. Improper repairs can create a safety hazard. Any indications of component replacement or circuit board modifications might void any warranty or exchange allowances.

Organization

This guide contains the following:

- Chapter 1: *Introduction*— This chapter provides information about your server such as: features, server software and documentation, diagnostic software, server utilities and technical support, and ergonomic information.

- Chapter 2: *Server Software and Utilities*— This chapter describes the server software and utilities that are supplied with your server.

- Chapter 3: *Server Components*— This chapter provides information about the server's components and associated procedures such as removing the side panels.

- Chapter 4: *Server Management* — This chapter describes how to manage your server using a network manager, specifically Digital's ServerWORKS Manager. It also provides a list and description of error messages that might display and error codes that might sound if a failure occurs.

- Chapter 5: *CPU Module Upgrade Configurations*— This chapter describes how to upgrade your server with higher-performance CPU modules.

- Chapter 6: *Installing Additional Memory*— This chapter describes how to install additional memory on the CPU module.

- Chapter 7: *Installing Disk and Tape Drives*— This chapter describes how to install optional disk drives, tape drives, and an external storage box.

- Chapter 8: *Installing Expansion Boards*— This chapter describes how to install ISA, EISA, and PCI expansion boards.

- Chapter 9: *Connecting SCSI and RAID Adapters*— This chapter describes how to connect mass storage devices to the onboard SCSI controller or to supported RAID adapters.

- Chapter 10: *Server Security Features*— This chapter describes the various security features that are available to prevent server or data theft.

- Chapter 11: *Troubleshooting*— This chapter describes initial and advanced troubleshooting solutions.

- Chapter 12: *Field Service Replacement*— This chapter describes field service replacement procedures. For example, the main logic board, power supplies, fans, etc.

- Chapter 13: *Field Service Illustrated Parts Breakdown*— This chapter lists orderable part numbers for Field Replaceable Units (FRUs).

- Chapter 14: *Field Service Notes*— This chapter enables field service personnel to record pertinent service information.

- Chapter 15: *Product Reference and Support*— This chapter lists product reference and support information.

- Appendix A: *Technical Specifications*— This appendix lists server operating specifications. Also included is switch information on the main logic board and CPU module.

- Appendix B: *Device Mapping*— This appendix provides a series of tables listing mapping and address information related to server memory and various main logic board devices (keyboard controller, interrupt controller, Direct Memory Access (DMA) controller, etc.).

- Appendix C: *SCU Features*— This appendix lists the available SCU resource and configuration options.

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

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Conventions

Convention Example	Description
Installation Guide	Italics are typically used for titles, comments, and references to other sections of this document or other documents.
`c:\windows>`	Monospaced text indicates information that your server or software displays. For example, a directory path or error message.
`SCU.BAT`	Monospaced text can also indicate a command that you need to enter to run an application or utility.
[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.

Abbreviations

Abbreviation	Meaning
BIOS	Basic input/output system
CPU	Central processing unit
DIMM	Dual in-line memory module
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

continued

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

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Special Notices

Three kinds of special notices are used in this System Reference 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: Used to provide additional information.
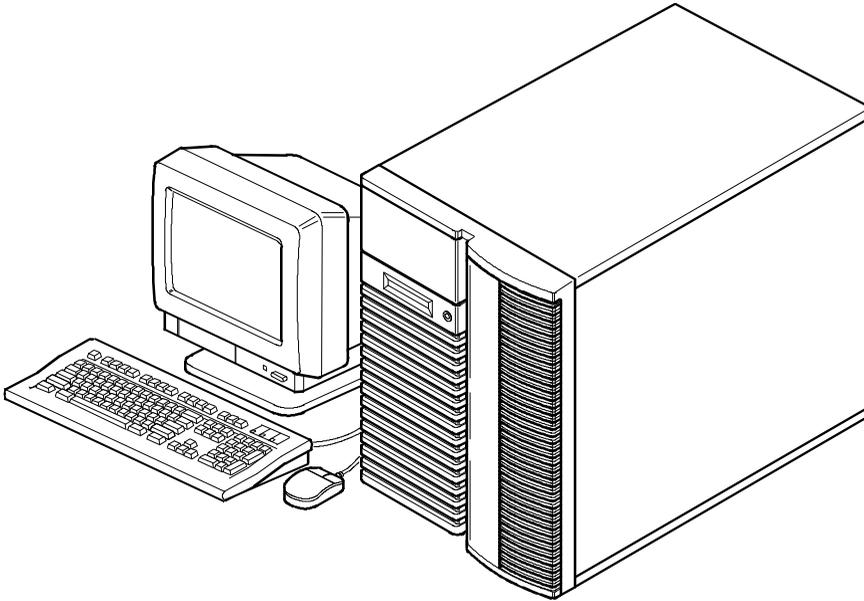
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Typical Prioris HX 6000 Series Server

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

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Introduction *1*

The Prioris HX 6000 Series server is a high-performance, highly-scaleable network and application server featuring the latest in modular CPU and storage technology.

The Prioris HX 6000 Series server provides the following features:

Reliability/Availability

CPU Module	Single (1P) or Dual (2P) Pentium Pro processor mode. Each CPU operates using a 64-bit memory interface and an internal L2 cache.
Error Correction Code (ECC) Memory	Recovery from single-bit cache and memory errors.
Dual-Channel Storage Backplane	Redundant disk subsystems using integrated SCSI controllers or expansion storage controllers.
Power Supply	The Prioris HX 6000 Series server is shipped with one power supply for normal operation.
Variable Fan Speed	Automatically adjusts fan speed according to ambient temperature.
Internal Sensors	Monitors internal server temperatures, fan operation, and power supply temperatures and voltages.

Server Expansion

Flexible Memory Architecture	ECC memory support. Server memory can be upgraded from 32 MB to 512 MB using the installed CPU module.
Five EISA Expansion Slots and Six PCI Expansion Slots	Accommodates industry-standard expansion boards such as network, Small Computer System Interface (SCSI), Redundant Array of Integrated Disks (RAID), and modems.
Integrated SVGA Video Controller	Supports management and configuration applications locally (on the main logic board) without use of an expansion slot.
Two Integrated SCSI controllers	Support for both narrow and fast wide external and internal SCSI devices.
Capacity for 11 internal SCSI Storage Devices	Accommodates one CD-ROM drive (standard), a 3 1/2 inch floppy (standard), seven 3½-inch half-height drives in Storage Building Blocks (SBBs), and two narrow (50-pin) half-height, 5¼-inch devices; or one full-height, 5¼-inch device (CD-ROMs or tape drives).
External I/O Ports	Two serial ports and one parallel port to support external options such as a printer, modem, or local terminal.
Wide-Ready SCSI Storage Backplane	Supports high-performance drives.
Hot Swap Disk Capability	Allows replacement of SBB disk drives while the server is operating.
External network ports	One 10/100Base-T (10/100 Mb/s) port, one 10Base-2 (10 Mb/s) port to support external network connections, and one 10Base-5 (AUI) port.
Integrated Network Controller	Provided by a Digital Ethernet Controller on the main logic board.

Server Management

Server Diagnostics	Allows local and remote diagnosis of server problems.
Hardware Configuration	Allows local and remote server configuration.
Unique Asset Management	Unique server identifier in non-volatile memory provides easy asset management.
Firmware Upgrade Utility	Upgrades firmware versions.
Operator Control Panel (OCP)	Back-lit, 16-character display for diagnostic and error messages.
Hard Drive Indicator Lights	Provides immediate status information on SBB hard drive activity or failure.

Server Security

Key Lock	Limits access to server components.
Interlock Sensor Switches	Automatically turns off server power if either side panel is removed when the server power is on.

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Server Software and Documentation

The following software and documentation are supplied with your server:

- ServerWORKS Manageability Suite — contains ServerWORKS Quick Launch, ServerWORKS Manager, and licenses.

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

    Refer to the ServerWORKS Quick Launch Reference Guide and the ReadMe.txt file, which is located on the Quick Launch CD-ROM.

    - ServerWORKS Manager consists of two CD-ROMs, several floppy diskettes, User Guide, and supporting documentation.

- Server documentation box — contains this System Reference, an Installation Guide, a Documentation Overview, Warranty information, Options manuals, and Registration Card.

    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.

Diagnostic Software

Diagnostic software is shipped with your server on the Quick Launch CD-ROM. 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 server installation process, the diagnostic software will be automatically copied to a subdirectory on the MS-DOS partition (only if you selected the option to create an MS-DOS partition). This allows you to run the diagnostic software anytime from the MS-DOS partition you created.

2. Using the Installations & Utilities button and then selecting the Utilities page from the ServerWORKS Quick Launch CD-ROM, you can create a bootable diagnostic software diskette. This allows 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.

NOTE: Digital strongly recommends that you copy the diagnostics to a diskette and use this diskette to run the diagnostics on your server.

Server Utilities and Technical Support

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" located in the ServerWORKS Quick Launch program that is on your CD-ROM disk.

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Important Ergonomic Information

After the server is installed, it is important to apply the following ergonomic information.

- 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.

continued

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.).

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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.
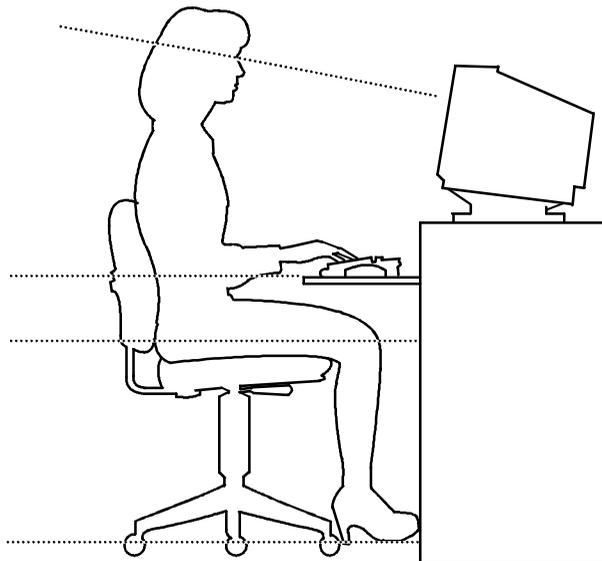
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Figure 1-1. Providing a Comfortable Working Environment

Server Software and Utilities *2*

Introduction

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

- SCSI*Select* Utility— This utility allows 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 allows you to configure your RAID array.

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

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

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

- ServerWORKS Quick Launch— This software is used to install a network operating system onto the server. The CD-ROM also contains various drivers and on-line documentation.

- Diagnostics— This utility is used to verify server operation.

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SCSI*Select* Utility

Your Prioris server comes with two onboard Adaptec 7880 SCSI controllers and a SCSI*Select* configuration utility.   This utility allows you to change host controller settings without opening your server.

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.

- You must let the Adaptec controller spin up the drive before pressing [Ctrl] + [A] so you can perform low-level formatting.

To start the SCSI*Select* configuration utility:

Press [Ctrl] + [A] when the Adaptec BIOS banner appears during the boot process and before the end of the device information display.

RAID Configuration Utility

RAID-ready Prioris HX 6000 Series servers include a Mylex RAID host adapter and RAID configuration utility. 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. These manuals are provided as either hard-copy manuals or are located on the Quick Launch CD-ROM as on-line files under the "Documentation" button.

PHLASH.EXE

All servers have BIOS software in a flash (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.

You can upgrade your server's BIOS to future releases by executing the flash utility located in the BIOS update kit.

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 Digital's BBS at (508) 496-8800.

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.

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

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

6. Choose either EPP 1.7 or EPP 1.9 mode.

   Selection is based on which EPP your printer supports. If you do not know which EPP your printer supports, use the default setting.

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.

Refer to "Starting the SCU" described later in this chapter.

Refer to Appendix C, "SCU Features," for more details about the SCU.

Refer to the ServerWORKS Quick Launch Reference Guide and the ReadMe.txt file, which is located on the Quick Launch CD-ROM, for additional information.

When to Run the SCU

Always run the SCU each time you add, remove, or relocate ISA, PCI and/or EISA expansion boards to reconfigure server resources (IRQs, I/O address, memory address, etc.). You should also run the SCU if the main logic board changed or after adding memory to the installed CPU module.

If the main logic board changes or a CPU module is added, run the SCU (select the option "Configure Computer") to update the serial numbers of the components. For more information on how to change the serial numbers, refer to Chapter 4, "Obtaining Information About Your Server."

Typically, your server displays a message such as `Run SCU Utility.....Press F1 to Continue.` Select how you want to access and run the SCU by following the instructions displayed on the SCU screens.

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. Before you can configure your server, you must copy the CFG files (and overlays if applicable) supplied with the additional EISA expansion boards you installed to either the SCU directory on your hard disk drive or the SCU diskette that you created earlier.

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 6000 Series 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 on the SCU diskette you created when you ran ServerWORKS Quick Launch and has a default name of SYSTEM.SCI.

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Starting the SCU

The SCU is located on your ServerWORKS Quick Launch CD-ROM disk. 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.

You can start 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 was copied to the MS-DOS partition on your hard disk drive. This allows 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. Creating a bootable SCU diskette by using the Quick Launch CD-ROM and selecting the *Installations & Utilities* button and then the *Utilities* page. On the *Utilities* page, select the appropriate BIOS level for the server that the SCU is being created for (if this is being done on the server, the default BIOS that is highlighted is the BIOS of that server).

    Afterwards, you can run the SCU anytime by booting the diskette you created.

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

    NOTE: If EISA (in some cases, 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.
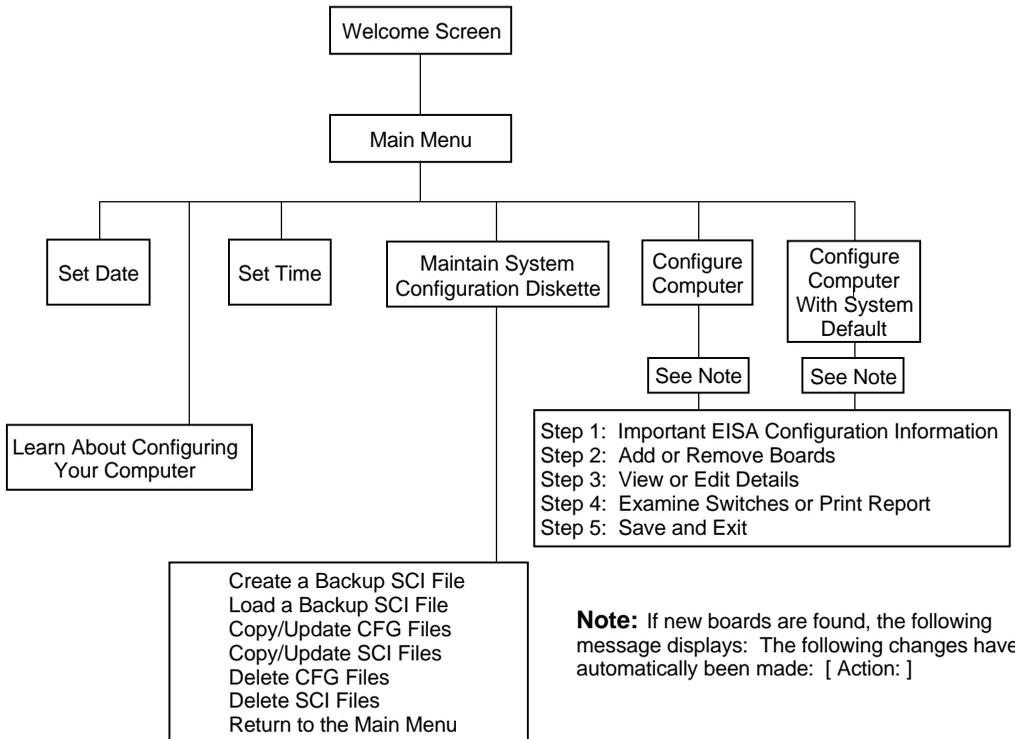
Figure 2-1. SCU Main Menu Options

Welcome Screen

Main Menu

Set Date

Set Time

Maintain System
Configuration Diskette

Configure
Computer

Configure
Computer
With System
Default

See Note

See Note

Step 1: Important EISA Configuration Information
Step 2: Add or Remove Boards
Step 3: View or Edit Details
Step 4: Examine Switches or Print Report
Step 5: Save and Exit

Learn About Configuring
Your Computer

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

Note: If new boards are found, the following
message displays: The following changes have
automatically been made: [Action:]

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Using the SCU

To use the SCU:

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

    If POST detects an error refer to Chapter 4, "Server Management," and take the appropriate steps to correct the problem. After the problem has been resolved, restart the server.

2. Start the SCU using one of the three methods described previously.

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.

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.

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Configure 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.

Select one of the following menu options:

- "Configure Computer with System Default" —— Loads the SCU default settings.

- "Configure Computer" —— Instructions are displayed. Complete the instructions if you are performing an initial configuration on your server. If this is a subsequent configuration, refer to the appropriate menu item to update your server's configuration.

  Refer to Chapter 8, "Installing Expansion Boards," for board installation information.

Setting the Date and Time

Use these two SCU options to reset the date and time maintained by your server's battery.

To access this menu item:

1. Start the SCU using one of the three methods described in "Starting the SCU."

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 System Configuration Diskette

Select this option to maintain Configuration (CFG) files and System Configuration Information (SCI) files.

To access this menu item:

1. Start the SCU using one of the three methods described in "Starting the SCU."

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

3. Select the `Maintain System Configuration Diskette` option, and then press [Enter].

4. Select a menu item and complete the displayed instructions for that item.

Afterwards, 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

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ServerWORKS Quick Launch

Quick Launch is used to install the server's Network Operating System (NOS). In addition to providing quick and seamless NOS installation, Quick Launch also provides drivers, documentation, and the ability to make diskettes of utilities such as diagnostics. For more information, refer to the Quick Launch Reference Guide.

Diagnostics

The diagnostics for the server are located on the Quick Launch CD-ROM. In addition, the manual is also located on the CD-ROM in an on-line format. The Quick Launch CD-ROM can be used to make a floppy diskette of the diagnostics. For more information, refer to the Quick Launch Reference Guide.

Server Components *3*

Introduction

This chapter shows the location of the Prioris HX 6000 Series server internal components and procedures for unlocking and removing the side panels. A procedure for installing a new server battery/Real-Time Clock (RTC) is also included.

Disconnecting External Devices and Power

Before removing the side panels, perform the following:

1. Secure the server using the brake (see Figure 3-1).

2. Shut down any applications that are currently running, then shut down the operating system.

3. Turn off power to all external devices connected to the server.

4. Turn the server off.

5. Unplug the power cord from the wall outlet.

6. Disconnect the monitor's power cord from the external ac outlet and the data cable from the server.
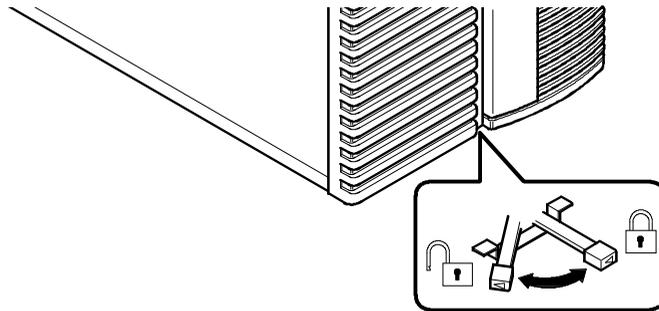
DEC00831

Figure 3-1. Server Brake

Removing and Installing 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 inhibit power to your server when activated. You might injure yourself or damage your server if you attempt to bypass these switches.

PRIORIS HX 6000

1.   Unlock the side panels.

2.   Slide the panels to the rear of the server.
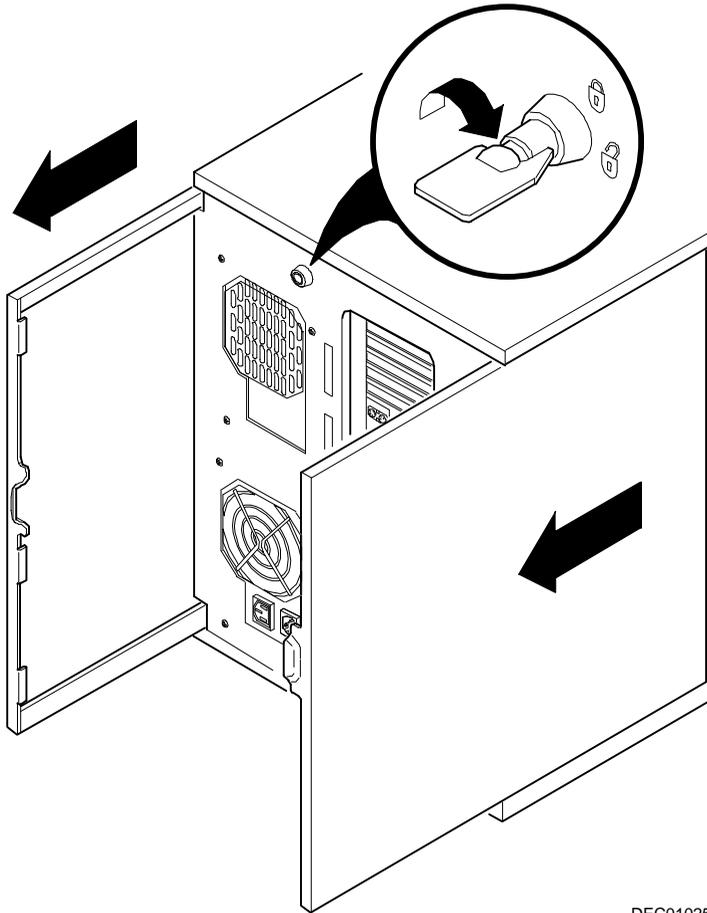
DEC01025-2

Figure 3-2. Unlocking and Removing the Side Panels

To install the side panels.

1.   Slide the panels to the front of the server.

2.   Lock the side panels.
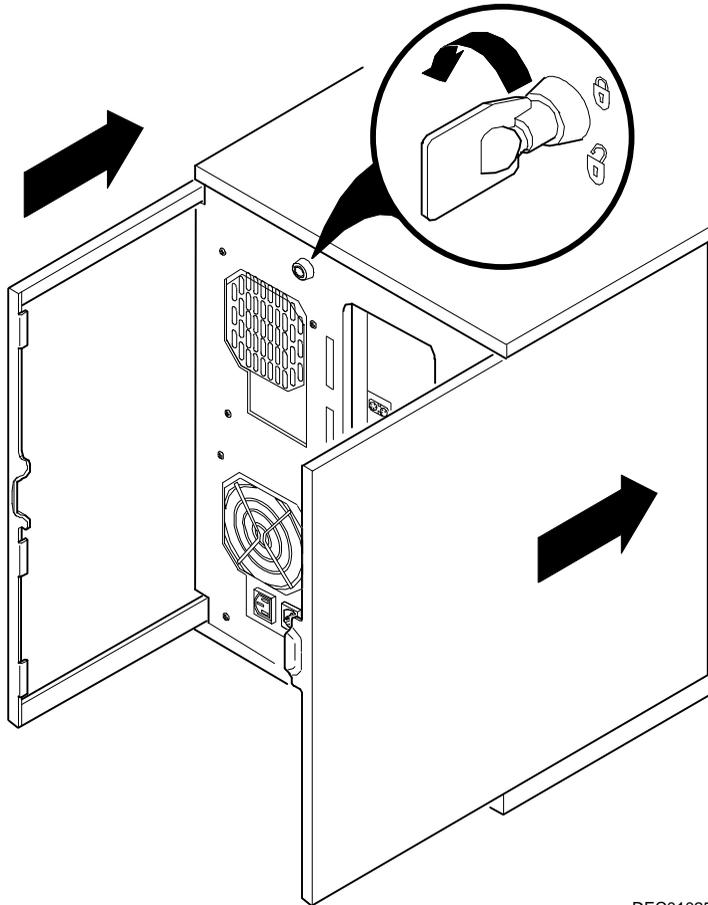
DEC01025-3

Figure 3-3. Installing the Side Panels

Server Front View

Figure Legend	Component
A	CD-ROM drive
B	3½-inch diskette drive
C	Front access 5¼-inch or 3½-inch half-height drive bays
D	3-way security lock
E	Integral hot-swap device bay for Storage Building Blocks (SBBs)
F	Power, OCP, and reset buttons
G	Brake
H	Operator control panel (OCP)
I	Power indicator
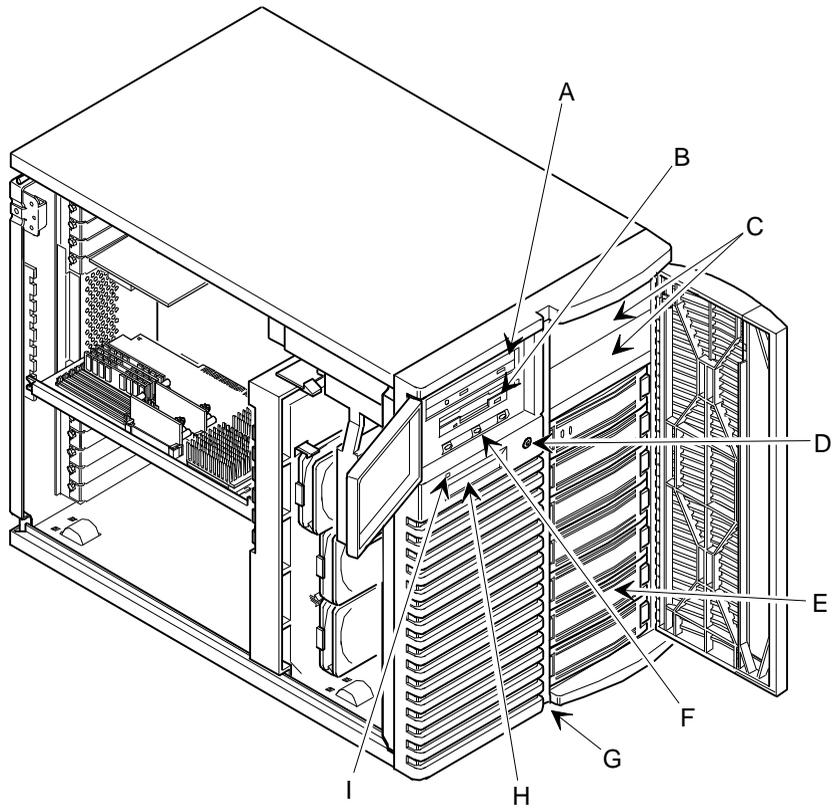
DEC01026-2

Figure 3-4. Server Front View

Server Left Side View

Figure Legend	Component
J	Redundant cooling fans
K	Cooling fans
L	Casters
M	Five EISA expansion slots
N	CPU module
O	Three primary PCI slots
P	Location of main logic board
Q	Ethernet daughter card
R	Three secondary PCI slots
S	Power switch interlock
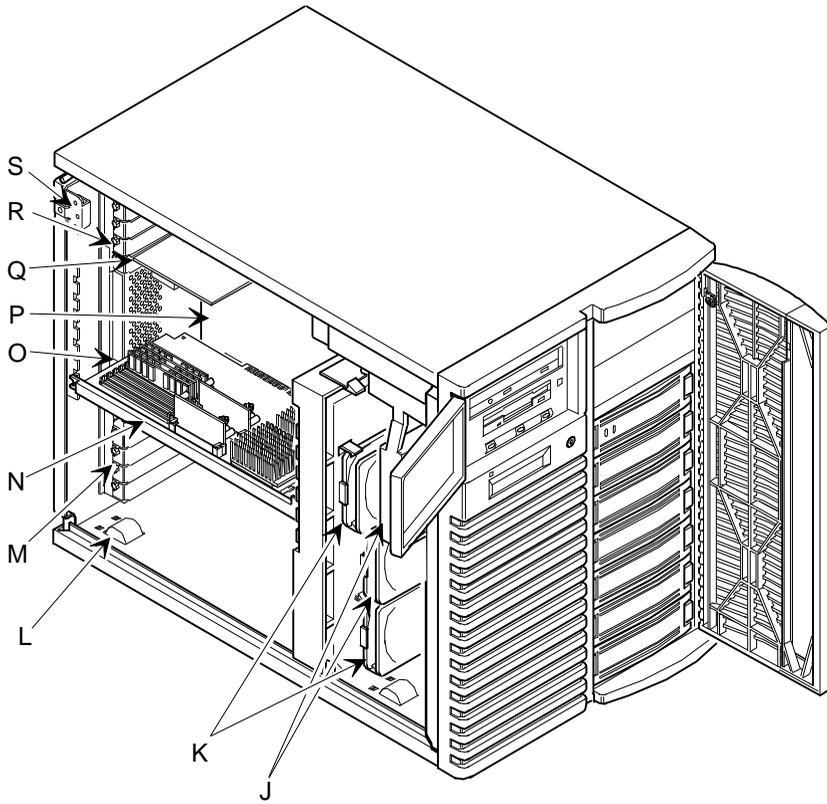
DEC01026-3

Figure 3-5. Server Left Side View

Server Right Side View

Figure Legend	Component
J	Fan
K	Power interlock switch
L	Power supply
M	Storage backplane SCSI terminator
N	SCSI address jumpers (J181)
O	Storage backplane
P	Jumper cable
Q	Power plug
R	Wide SCSI 68-pin connector
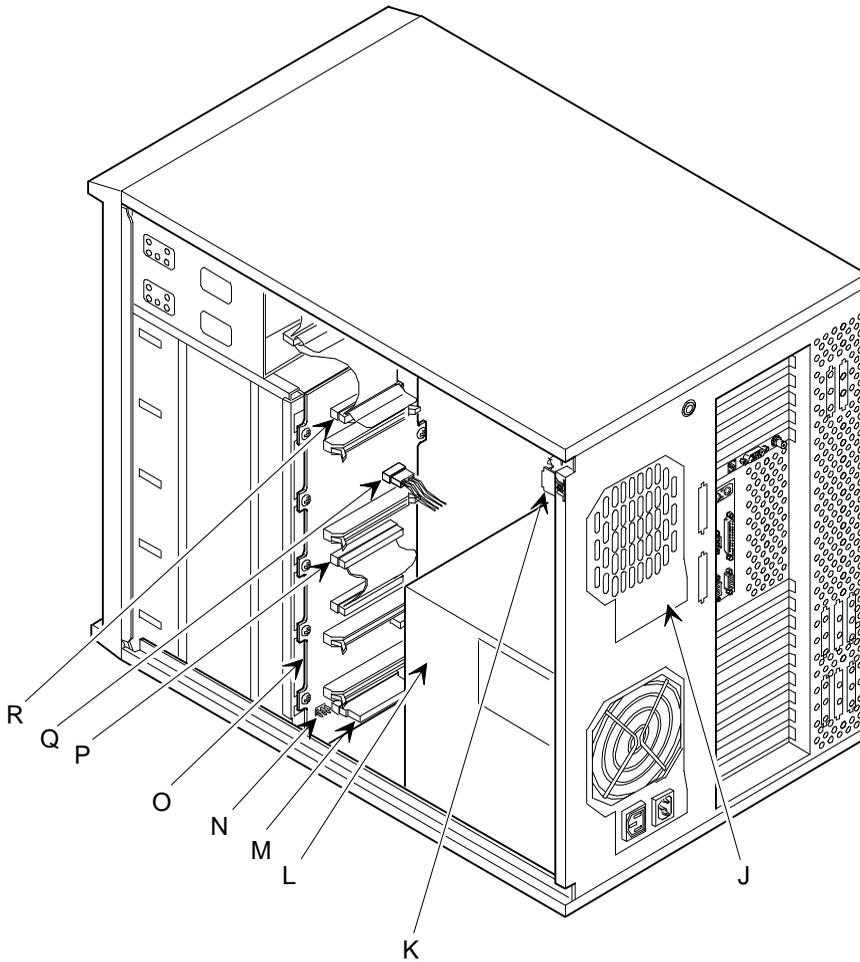
DEC01027-2

Figure 3-6. Server Right Side View

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Server Rear View

Figure Legend	Component
A	SCSI knockouts (back panel)
B	Keylock
C	10Base-T port connector (RJ45)
D	10Base-2 port connector (BNC)
E	10Base-5 connector (AUI)
F	Keyboard and mouse ports
G	Parallel port
H	Video port
I	Serial ports
J	ac power plug
K	ac power out/monitor plug
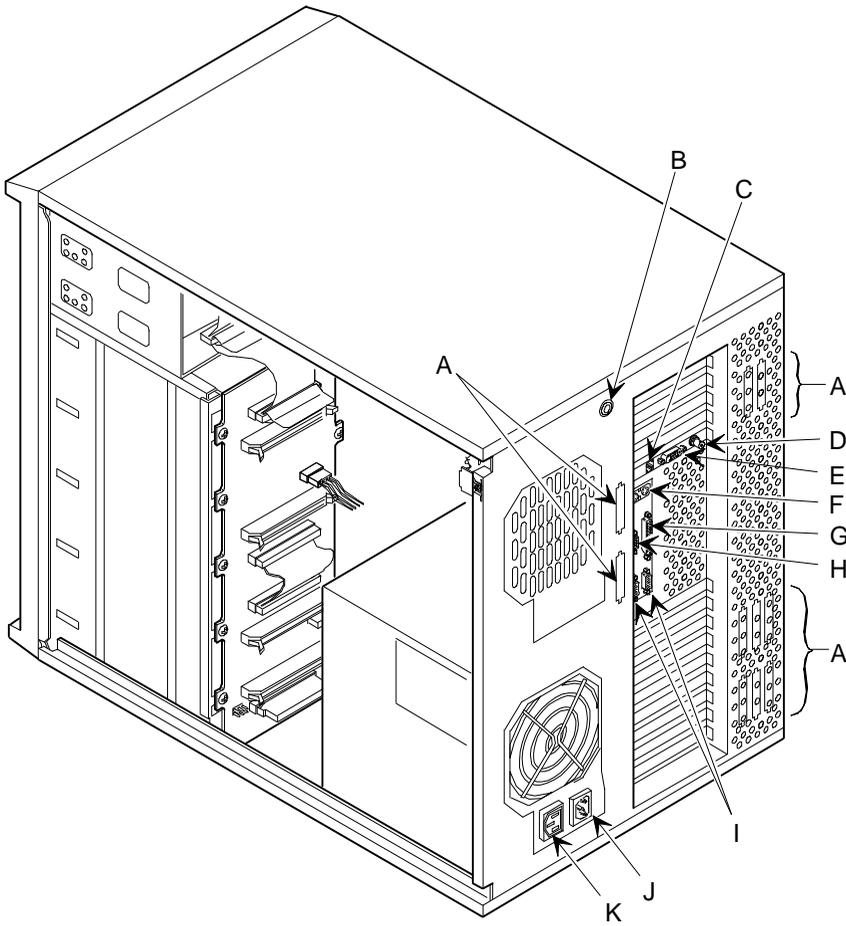
DEC01027-3

Figure 3-7. Server Rear View

Main Logic Board Connectors

Figure Legend	Connector
A	EISA expansion slots (1 through 5)
B	Remote Server Management (RSM)
C	Primary PCI expansion slots (1 through 3)
D	Serial ports
E	Parallel port and video
F	Mouse and keyboard
G	Ethernet connector
H	Secondary PCI expansion slots (4 through 6)
I	Diskette drive
J	68-pin wide SCSI connector (channel B)
K	Fan 5
L	3.3 V dc power
M	5 V dc power supply
N	Power control signal
O	Operator Control Panel (OCP)
P	68-pin wide SCSI connector (channel A)
Q	50-pin narrow SCSI connector (channel A)
R	Fan 2 (redundant)
S	Fan 1
T	CPU module
U	Fan 4 (redundant)
V	Speaker
W	Fan 3
X	MREQ slot 5 jumper
Y	MREQ slot 4 jumper

DEC01028-2

Figure 3-8. Main Logic Board Connectors

Main Logic Board Components

Figure Legend	Component
A	Video controller
B	Ethernet controller
C	SCSI controllers
D	8031 ROM
E	Dip switch block
F	Real-time clock/server battery
G	BIOS flash ROM

DEC01028-3
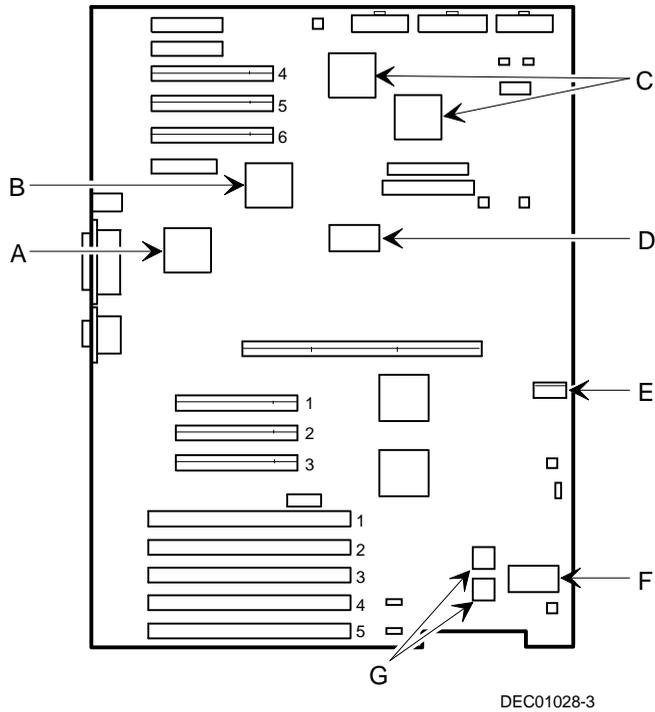
Figure 3-9. Main Logic Board Components

CPU Module Components and Connectors

Figure Legend	Component/Connector
A	Eight memory SIMM sockets
B	Inside CPU #1 ZIF socket
C	Outside CPU #2 ZIF socket
D	Outside CPU #2 voltage regulator
E	Inside CPU #1 voltage regulator
F	Inside/outside CPU frequency ratio DIP switches
G	Manufacturing test jumpers
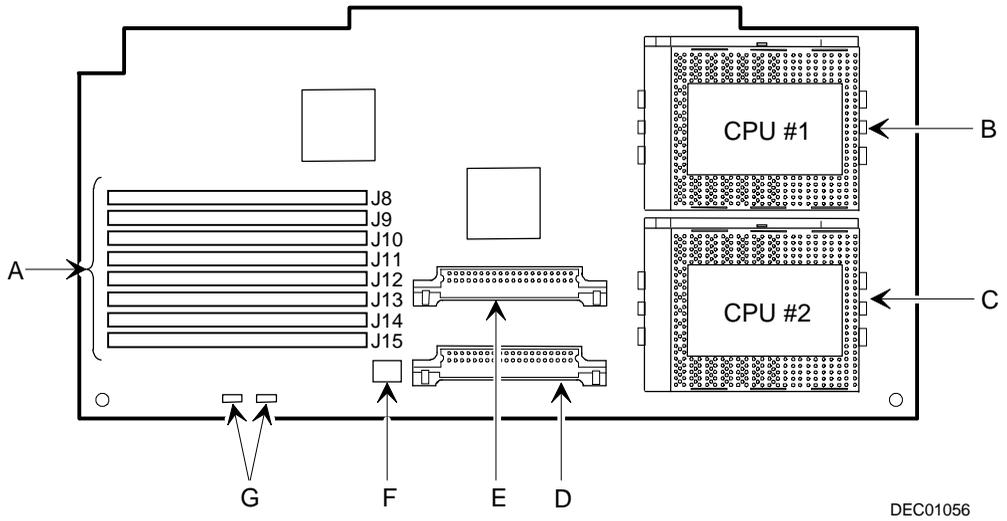
Figure 3-10. CPU Module Components and Connectors

Ethernet Daughter Card Components and Connectors

Figure Legend	Component/Connector
A	10Base-T port connector (RJ45)
B	10Base-5 connector (AUI)
C	10Base-2 port connector (BNC)
D	Ethernet interface connector
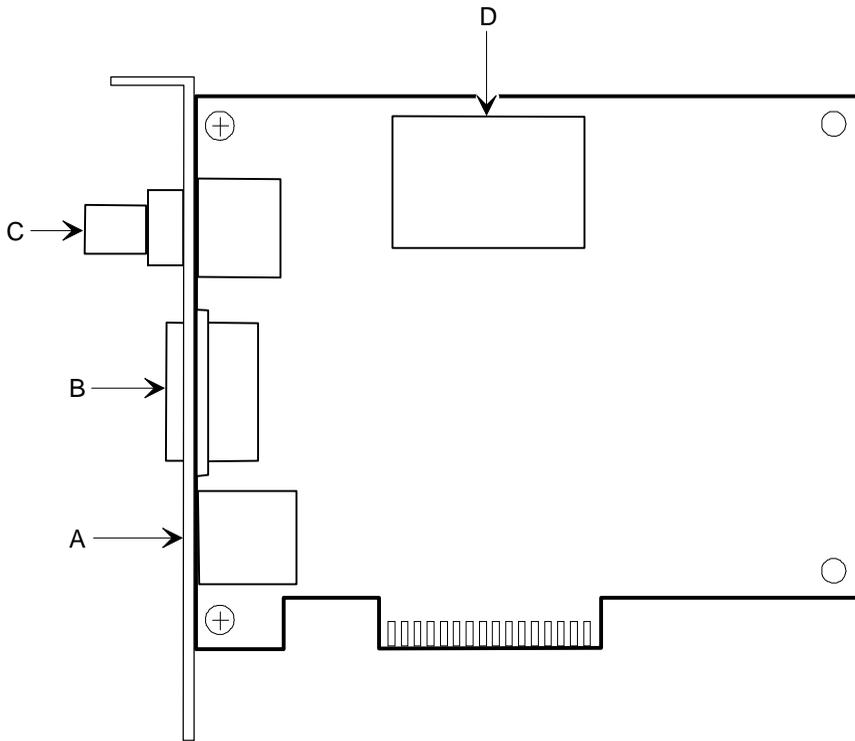
DEC01030-2

Figure 3-11. Ethernet Daughter Card Components and Connectors

Tools Needed

Prior to installing an option, have the following available:

- A Phillips screwdriver

- An antistatic wrist strap

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, put on a properly-grounded, anti-static wrist strap.

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

- Keep clothing away from circuit boards and components.

- Keep circuit boards in anti-static bags.

Replacing the Server 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/RTC. The Digital part number for this device is 21-39151-01.

To replace the battery/RTC, perform the following:

1. If you have not already done so, record server configuration settings using the SCU.

2. Turn off your server.

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

4. Unlock and remove the left side panel.

5. Remove the old battery/RTC (see Figure 3-12).

> ⚠ **CAUTION:** Depending on your locality, your server's battery/RTC might be considered hazardous waste. Make sure you follow any state or local statute to properly dispose of the old battery/RTC because of its imbedded lithium battery.

6. Install the new battery/RTC. Make sure pin 1 of the battery/RTC is aligned with pin one on the socket (A, Figure 3-12).

> ⚠ **CAUTION:** Danger of explosion if the server battery/RTC is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. If you have questions, consult your nearest authorized service provider.

7. Replace and lock the left side panel.

8. Connect external devices and restore power.

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9. Reboot and run the SCU:

    a.   Select `Configure Computer` from the SCU screen.

    b.   Select `View and Edit Details` from the displayed screen.

    c.   Edit the configuration settings to match what was recorded in step 1.

    d.   Select `Save and Exit` to configure your server.

Refer to Chapter 2, "Server Software and Utilities."
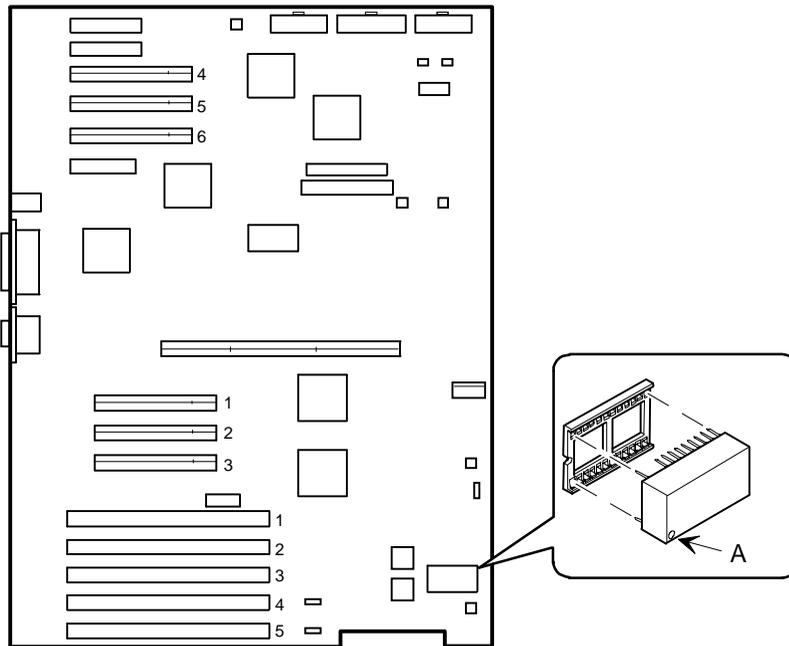
DEC01028-4

Figure 3-12. Replacing the Server Battery/RTC

Server Management 4

Introduction

The Prioris HX 6000 Series server is configured with hardware that supports server management, including an 8031 processor with multiple I^2C busses for server status reporting.

Managing Your Server

The Prioris HX 6000 Series server allows you to perform the following server management functions:

- Monitor main logic board voltage and cooling fan status

- Monitor CPU module voltage, temperature and status

- Detect and automatically correct single-bit ECC errors

The Prioris HX 6000 Series server allows you to manage your server and its main components by:

1. Obtaining information about the main logic board and the CPU module.

2. Notifying you of any changes to the main logic board or CPU module on your server.

Information can be obtained either through the SCU or through System Management Software such as ServerWORKS Manager.

Obtaining Information about Your Server

The Prioris HX 6000 Series server provides the following system information for the main logic board and the CPU module configured on your server:

- Asset number — User definable field for tracking these components

- Part number — Digital part number

- Revision number — Board assembly revision number

- Serial number — Serial number of the board assembly

- Artwork number — Revision of the printed circuit board

The System ID is also located on the main logic board and CPU module. The System ID contains the following information:

- Model number — Server model number

- Serial number — Server serial number

- System asset number — User definable field for tracking the system

The main logic board and CPU module each contain memory where specific information and System ID information is stored. The main logic board also stores the server's System Asset number (see Figure 4-1).

Information is available for the server's main logic board and CPU module (such as part numbers, revisions, serial numbers, etc.). You can also assign Asset numbers to these components. In addition, the software can detect when you change your server configuration by adding or removing either component.

You can obtain information about your server's configuration by running the SCU or by using System Management Software.

CPU Asset#
CPU Part#
CPU Revision#
CPU Serial#
CPU Artwork#
System ID

CPU Module

Prioris HX
6000 Series
Server (System ID)

MLB Asset#
MLB Part#
MLB Revision#
MLB Serial#
MLB Artwork#
System ID
System Asset#
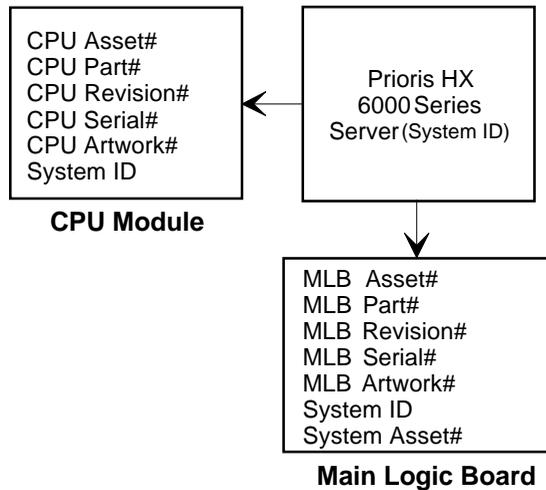
Main Logic Board

DEC01031

Figure 4-1. Prioris HX 6000 Series Server Component Information

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4-3

Obtaining Information Using the SCU

You can use the SCU to check the Serial number, Revision number, and Asset number for the main logic board and CPU configured in the server. For example, if you change the main logic board or CPU module in your server, you must run the SCU to re-synchronize the System ID (server model number and serial number) in the main logic board or CPU module's memory. The SCU will check the new main logic board or CPU module and will then detect the System ID mismatch.

You can view the details for the main logic board or CPU module simply by selecting either the main logic board or CPU module. Once selected, the Serial number, Revision number, and Asset number displays. The SCU then lists the server model number and server serial number information stored on the main logic board or CPU module. You can then confirm the correct model number and serial number. This data is available on the label located on the server back panel.

Refer to Appendix C, "SCU Features," for more detailed information about the SCU.

Obtaining Information Using Server Management Software

Your Prioris HX 6000 Series server is shipped with ServerWORKS™ Manager software. ServerWORKS Manager is a workgroup and server management product for Digital's family of servers. ServerWORKS Manager utilizes the Simple Network Management Protocol (SNMP) environment to assist the Network or Server administrator by constantly monitoring the network for problems.

ServerWORKS Manager is based on an open architecture that enables seamless integration and interoperability with popular enterprise management software packages such as Digital's POLYCENTER Manager/NetView, Hewlett-Packard's OpenView UX for Windows, and IBM's Netview/6000 AIX. Also included with ServerWORKS Manager are Network Operating System (NOS) Agents for Windows NT V3.51, Novell NetWare™ V3.12 and V4.x, and SCO UNIX V5.0. The OS/2 NOS includes its own agent and can also be managed from ServerWORKS Manager.

ServerWORKS Manager allows the Network or Server Administrator to perform the following functions on your server:

- Manage Digital PC print, file, and application servers supported by Prioris Intel servers using a Windows-based graphical user interface (GUI) for point and click simplicity.

- Display server component information that provides critical information such as CPU and file system utilization and information about the network interface.

- Automatically builds a database of the network by Autodiscovering all SNMP network resources and displays the nodes discovered during Autodiscovery on a color-coded topological map.

- Poll all network devices at intervals defined by the administrator.

- Perform an in-depth network analysis to continuously monitor the status of the network.

- Set alarms and alerts for specified events on all network devices, as well as the network itself, to spot problems early and avoid costly downtime.

    Refer to the ServerWORKS Manager Administrator User's Guide for more information on how to use ServerWORKS Manager to view and be notified of events on the server.

You can also manage the Prioris HX 6000 Series server with other SNMP-based managers.

Refer to the chapter on Managing Servers using other SNMP based Managers in the ServerWORKS Manager Administrator User's Guide for more information.

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Displaying Server Status Using the Hardware

There are two types of information displayed when your Prioris HX 6000 Series server is operating:

- Normal status messages

- Error messages

During normal operation, Power On Self Test (POST) and boot messages are displayed on the monitor. Some POST messages are also displayed on the OCP panel. When an error occurs, an error message is displayed on both the monitor and OCP panel and a beep is sounded from the server's speaker.

These messages can also be seen by using ServerWORKS Manager to monitor the server.

The following table lists the possible failures that could occur.

Server Status

Component	Possible Failures	Result
Main logic board voltages: +12, +5, +3.3, and -12V	The voltages are outside of the power good range.	An error message displays and a warning beep sounds.
	The voltage exceeds the upper limit.	The server will shutdown after 5 minutes.
	The voltage falls below the lower limit.	A warning message displays and a warning beep sounds.
Fans 1, 2, 3, 4	The primary fans (fans 1 and 3) fail.	The redundant fans will activate.
	The primary fans (fans 1 and 3) and redundant fans (fans 2 and 4) do not operate.	The server will shutdown after 10 minutes.
Fan 5	The rear fan fails.	A message displays and a warning beep sounds.
CPU module voltages	The voltages are outside of the power good range.	A message displays and a warning beep sounds.
	The voltage exceeds the upper limit.	A warning message displays and a warning beep sounds.
	The voltage falls below the lower limit.	A warning message displays and a warning beep sounds.
CPU failure	A CPU failure:	
	• Internal	An error message displays and a warning beep sounds.
	• Over temperature	Usually caused by a fan failure and the result is that the server shuts down.
CPUs present	The incorrect number of CPUs are present in the server.	A message displays indicating the number of CPUs are present in the server.

continued

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Component	Possible Failures	Result
CPU temperature sensing	The temperature exceeds 82 °C (179.6 °F).	The backup fans will activate without any warning.
		If the temperature drops below 80 °C (176 °F), the backup fans will be turned off.
	The temperature exceeds the warning level (>85 degrees C; >185 °F).	A warning message displays and a warning beep sounds. If the temperature exceeds the warning level for more than five minutes, the server will shut down.
	The temperature exceed the upper limit (>90 °C; >194 °F).	The server will shut down.
Power supplies present	The incorrect number of power supplies are present with good status in the server.	A message displays indicating the number of power supplies present in the server.
Power supply failure	The temperature exceeds the upper limit or the voltages are out of range.	Power supply shuts down, an error message displays, and a beep sounds.

POST OCP Messages

The following table lists the messages, both normal and error, that will display on the server's OCP panel during POST and any beeps that might sound when an error occurs.

> **NOTE:** To disable the speaker, press the middle button located below the OCP once after a beep sounds. To enable it, repress the button once.

POST/Boot Codes

POST Code Descriptions	Count Down Code[1]	Normal OCP Display	OCP Error Display	Beep Codes
BIOS ROM checksum				1-2-2-3
Test DRAM refresh				1-3-1-1
Test 8742 keyboard controller				1-3-1-3
RAM failure on address line xxxx				1-3-4-1
RAM failure on data bits xxxx of low byte of memory bus				1-3-4-3
RAM failure on data bits xxxx of high byte of memory bus				1-4-1-1
Check ROM copyright notice				2-1-2-3
Unexpected interrupts test	230	Unexpected int		2-2-3-1

[1] Count down codes are displayed on your server's monitor.

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POST Code Descriptions	Count Down Code[1]	Normal OCP Display	OCP Error Display	Beep Codes
Shadow ROMs	220	Shadow ROMs test		
Test DRAM refresh 512K and 640K	210	512-640K DRAM		
Extended memory test	200	Ext. mem test	Memory test fail	
Set cache registers	190	Set cache regs.		
Cache configuration	180	Cache config.	Cache fail	
Real-time clock test	170	Real time clock	RTC fail RTC dead battery CMOS chksum bad	
Keyboard test	160	Keyboard test	KBC-8042 fail Keyboard fail	
Initial hardware interrupt	150	Init HW int		
Co-processor test	140	Co-processor test		
Serial ports test	130	Ser. Ports test		
Parallel ports test	120	Par. ports test		
Initiate onboard SIO	110	Init super I/O		
Mouse test	100	Mouse test		
Testing diskette drives	90	Floppy disk test	FDD A or B error	
Testing hard disk drives	80	Hard disk test		
CPU search	50	Search other CPU		
Search for option ROMs		Scan option ROM	OPROM chksum bad	1-2
Enable IRQs	20	Enable IRQs		
Setting time of day	10	Set time of day		
One short beep before boot				1

[1] Count down codes are displayed on your server's monitor.

OCP Messages

During certain failure conditions, including out-of-range conditions, an error message will display on the OCP panel and a corresponding error code will sound from the server's speaker.

NOTE: To disable the speaker, press the middle button located below the OCP once after a beep sounds. To enable it, repress the button once.

Hot keys are defined in BIOS as [CTRL] + [ALT] +[1] and enable toggling of the OCP display status messages just as though the OCP button were pressed.

NOTE: Hot keys do not work during POST or during host server request service from the OCP.

If you do not press keys or buttons for some time, the LCD backlight will be disabled until you press a key. The time is set by the host server.

You can examine the server status messages by pressing the OCP switch located on the front panel repeatedly to sequence through the status list. The OCP switch is disabled during POST, during host request service from the 8031, or if an error is detected. The following table lists and describes the status messages and the error messages that display on the Prioris HX 6000 Series server OCP panel. Also included are possible actions to take if a problem persists. If this action does not alleviate the problem, contact your authorized service provider.

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OCP Status and Error Messages

Status	Normal OCP Display	OCP Error Display	Description of Error Display/Action
CPU ambient temperature	CPU1 temp=xxxC CPU2 temp=xxxC	CPU1 over heat CPU2 over heat	Temperature of CPU 1 is out of range. Temperature of CPU 2 is out of range.
			Action: Verify fans are operational.
Power supply status	P/S1 OK	P/S1 fail	Power supply 1 is not working.
			Action: Check that power supply cables and connectors are connected correctly.
Fan status	Sys fans OK	Sys fan 1 fail Sys fan 2 fail Sys fan 3 fail Sys fan 4 fail Sys fan 5 fail	Fan 1 is not working. Fan 2 is not working. Fan 3 is not working. Fan 4 is not working. Fan 5 is not working.
			Action: Check that fan connectors are connected correctly.
CPU status	6000MPn n = CPU number	CPU1 fail	Internal defect of CPU 1 or internal temperature exceeds the upper limit.
		CPU2 fail	Internal defect of CPU 2 or internal temperature exceeds the upper limit.
		No CPU exists	No CPUs are present in the server.
			Action: Reboot server and check if the failed CPU is still malfunctioning during POST.

Status	Normal OCP Display	OCP Error Display	Description of Error Display/Action
System voltages	Sys voltages OK	Sys +12V = xxxV Sys +5V = xxxV Sys 3.4V = xxxV Sys -12V = -xxxV	+12V is out of tolerance. + 5V is out of tolerance. +3.4V is out of tolerance. -12V is out of tolerance.
			Action: Check that power supply cables and connectors are connected correctly.
CPU voltages	CPU voltages OK	VRM1 y.yyV=x.xxV	Voltage Regulator Module (VRM) 1 should be y.yy volts and is being measured at x.xx volts.
		VRM2 y.yyV=x.xxV	VRM 2 should be y.yy volts and is being measured at x.xx volts.
			Action: Diagnose whether the VRM or the CPU module is bad.
Memory size information	xxxxxMB		
System BIOS revision	BIOS Vx.yy		x = main version yy = sub-version
8031 BIOS revision	8031 Vx.yy		x = main version yy = sub-version
System date/time	yyyy/mm/dd hh:mm		yyyy = year mm = month dd = day hh = hour mm = minute

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Server CPU Voltage and Temperature Ranges

The following tables list the CPU and Voltage Regulator Module (VRM) operating voltage and temperature ranges.

CPU Voltage Range

Nominal	Nominal Tolerance Percentage	Normal Voltage Range	Server Error Occurs	Server Shutdown Occurs
+12	-10 to + 10	+10.8 to +13.2 V	<+9.0 V	>+13.8 V
+5	-5 to + 5	+4.75 to +5.25 V	<+4.3 V	>+5.80 V
+3. 3	-1 to + 1	+3.0 to +3.6 V	<+3.0 V	>+3.81 V
-12	-10 to + 10	-13.2 to -10.8 V	>-9.0 V	<-13.8 V
VGTL	-10 to + 10	+1.35 to +1.65 V	<+1.26 V	>+1.72 V

VRM Voltage Range

VRM Voltage	Power Good Range	Lower Limit	Upper Limit
2.1 V	+1.95 to 2.25 V	<+1.89 V	>+2.31 V
2.2 V	+2.04 to 2.35 V	<+1.98 V	>+2.42 V
2.3 V	+2.14 to 2.46 V	<+2.07 V	>+2.53 V
2.4 V	+2.23 to 2.46 V	<+2.16 V	>+2.64 V
2.5 V	+2.32 to 2.68 V	<+2.25 V	>+2.75 V
2.6 V	+2.42 to 2.78 V	<+2.34 V	>+2.86 V
2.7 V	+2.51 to 2.89 V	<+2.43 V	>+2.97 V
2.8 V	+2.60 to 3.00 V	<+2.52 V	>+3.08 V
2.9 V	+2.70 to 3.10 V	<+2.61 V	>+3.19 V
3.0 V	+2.79 to 3.21 V	<+2.70 V	>+3.30 V
3.1 V	+2.88 to 3.32 V	<+2.79 V	>+3.41 V
3.2 V	+2.97 to 3.42 V	<+2.88 V	>+3.52 V
3.3 V	+3.07 to 3.53 V	<+2.97 V	>+3.63 V
3.4 V	+3.16 to 3.64 V	<+3.06 V	>+3.74 V
3.5 V	+3.25 to 3.75 V	<+3.15 V	>+3.84 V

CPU Module Upgrade Configurations **5**

Introduction

Installing a higher-performance CPU module increases the capabilities of your server. This chapter describes the configuration guidelines that must be followed prior to upgrading as well as detailed procedures on removing and installing a CPU module.

Configuration Guidelines

- Use only Digital-supplied CPU modules.

- A CPU upgrade can be done by installing a higher-performance CPU module.

Server CPU Module Configurations

The following table lists the available CPU module configurations (see Figure 5-1):

CPU Configuration	Number of CPUs
1P 256 KB cache	1 processor CPU
1P 512 KB cache	1 processor CPU
2P 256 KB cache	2 processor CPU
2P 512 KB cache	2 processor CPU

CPU Module Upgrade Configurations

You can upgrade your Prioris HX 6000 Series server with either a 1P 512 KB cache, a 2P 256 KB cache, or a 2P 512 KB cache. The upgrades are as follows:

Previous CPU Configuration	New CPU Configurations Available
1P 256 KB cache	1P 512 KB cache
	2P 256 KB cache
	2P 512 KB cache
1P 512 KB cache	2P 256 KB cache
	2P 512 KB cache
2P 256 KB cache	2P 512 KB cache
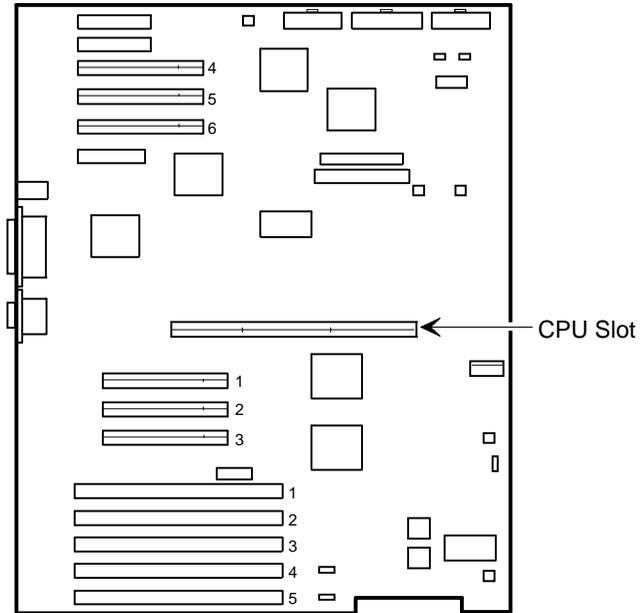
DEC01028-7

Figure 5-1. CPU Slot Location

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5-3

Upgrading to a New CPU Module Configuration

To upgrade:

1. Shut down the operating system software.

2. Turn off your server.

3. Disconnect all external devices, ac power, and monitor power.

4. Unlock and remove the left side panel.

5. Remove the CPU module (see Figure 5-2).
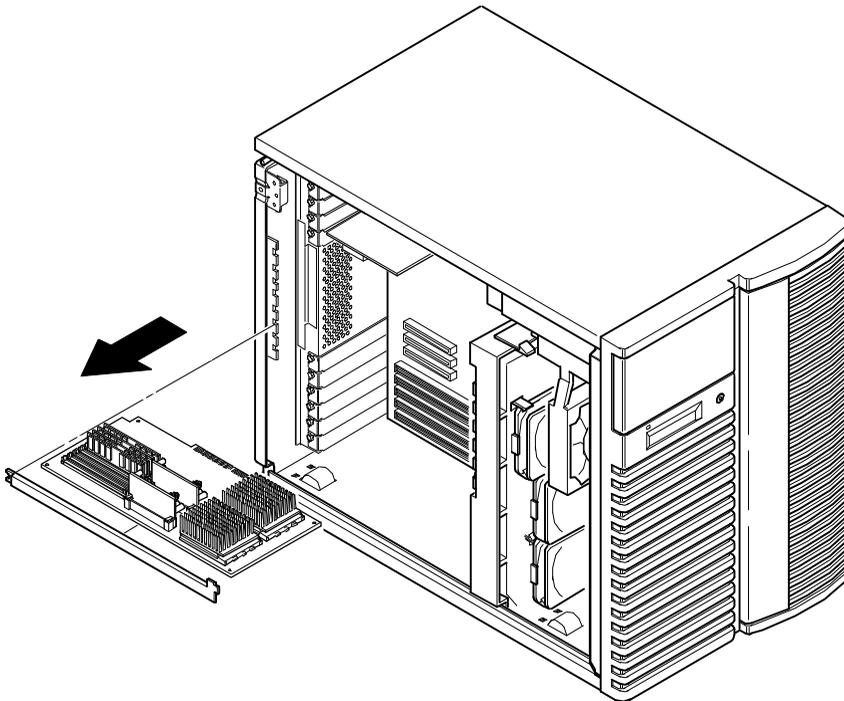
DEC01024

Figure 5-2. Removing the CPU Module

6. Remove the server memory (SIMMs) from the old CPU module:

   a. Press the SIMM retaining clips out.

   b. Push the SIMM down and pull it out of the socket.

   c. Repeat steps a. and b. to remove the remaining SIMMs.

   Refer to Chapter 6, "Installing Additional Memory," for more information.
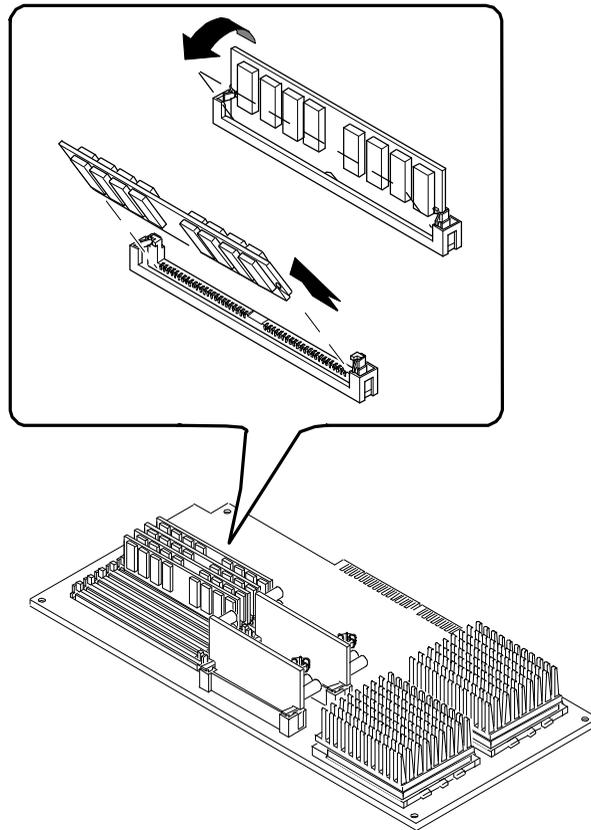
DEC01066-2

Figure 5-3. Removing SIMMs

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5-5

7. Remove the CPU module, two regulators, and retaining bracket from the antistatic package. Check switch SW4 on the CPU module for the appropriate switch settings.

   Refer to Appendix A, "Technical Specifications," for switch descriptions and locations.

8. Install the regulators in their appropriate slots on the CPU module.
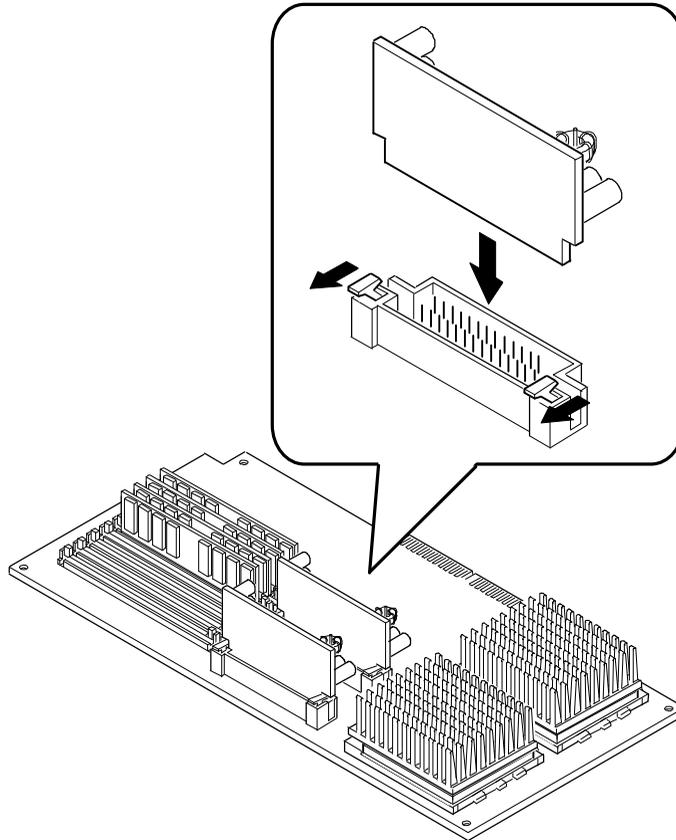
DEC01032-3

Figure 5-4. Installing the Regulators

9. Install the CPU module in the slot (see Figure 5-5). Install the retaining bracket and secure the captive screw located on the bracket to the chassis.

▲ **CAUTION:** Make sure you align the CPU module with the corresponding slot number on the card guide label. Failure to do so might cause faulty CPU module and/or server operation.

Also, the CPU module has a row of gold fingers on its edge that plug into the main logic board slot. The CPU module must be pushed firmly into the slot to engage the gold fingers or your server might not power up on boot.

10. Replace and lock the left side panel.

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

11. Connect all external devices and restore power.

12. Run the SCU, select Configure Computer, select View and Edit Details, and then select Save and Exit.

This allows your server to recognize the new CPU module configuration.

Refer to Chapter 2, "Server Software and Utilities."
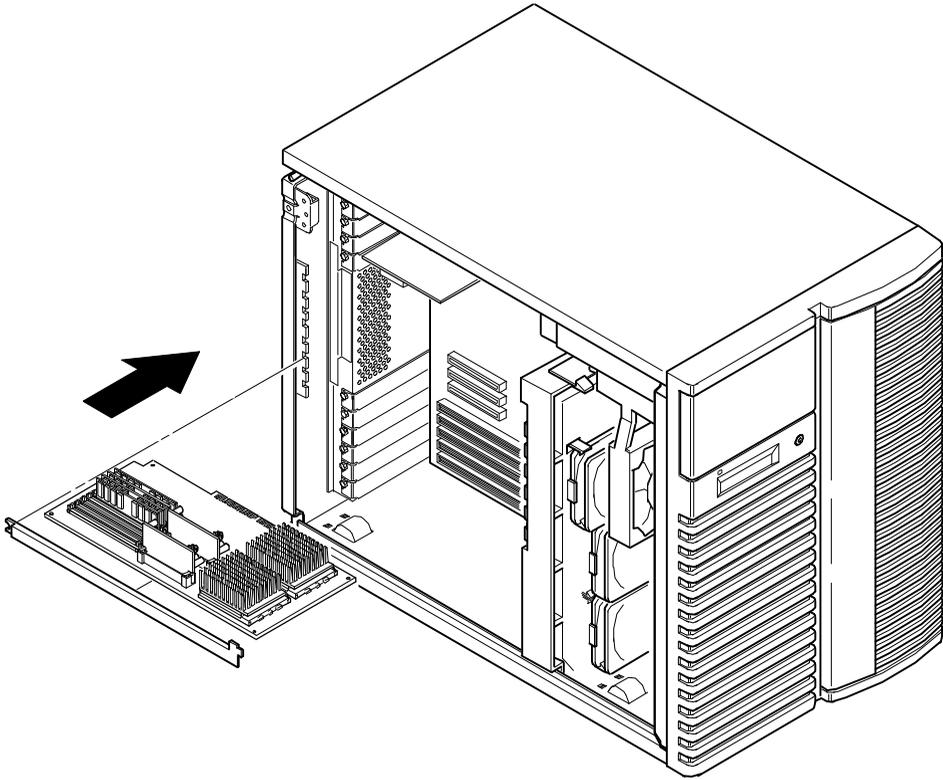
PRIORIS HX 6000

DEC01024-3

Figure 5-5. Installing a CPU Module

Installing Additional Memory *6*

Introduction

By adding more memory, you can run larger and more complicated software on your server. Your Prioris HX 6000 Series server supports up to 256 MB of EDO memory or up to 512 MB of Fast-Page memory using single in-line memory modules (SIMMs). Your server's memory can only be increased by adding SIMMs on the installed CPU module.

This chapter provides the memory configuration guidelines that must be followed prior to installing additional SIMMs on the installed CPU module.

The Prioris HX 6000 Series server provides a two-way interleaved memory system, with a minimum supported memory of 32 MB. Memory is configured in banks, with each bank containing two SIMMs (thus the term two-way interleaving). The CPU module contains Banks 0 through 3, with two SIMMs per bank.

Server SIMMs Requirements

Supported SIMMs	36-bit SIMMs, 60 ns access time, EDO memory
	or
	36-bit SIMMs, 60 ns access time, Fast-Page memory
Supported densities	8, 16, and 32 MB of EDO memory or 64 MB of Fast-Page memory (refer to the memory configuration guidelines for additional information)
Minimum server memory supported	32 MB
Maximum server memory supported	512 MB

Memory Configuration Guidelines

The memory configuration guidelines for the Prioris HX 6000 Series server are as follows:

- Each memory bank on the CPU module must contain two SIMMs which must be the same size and type.

- Install memory starting at Bank 0.

- Minimum memory supported is 32 MB.

- Maximum memory supported is 512 MB.

- 60 ns SIMMS are supported.
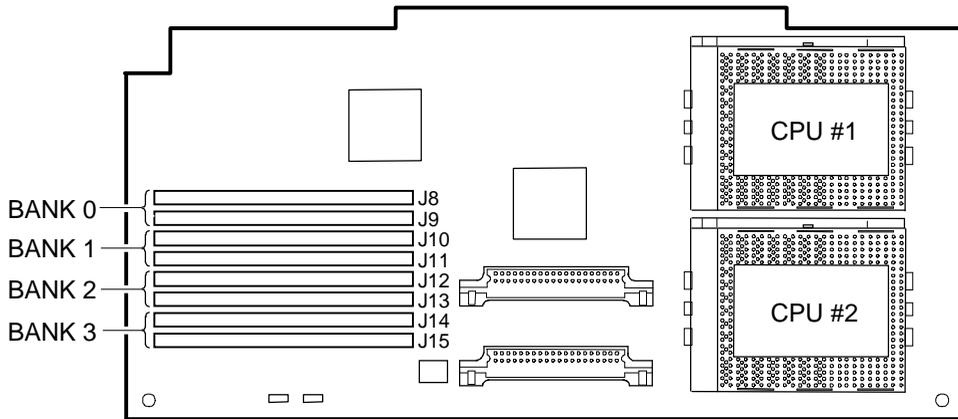
DEC01029-3

Figure 6-1. CPU Module SIMM Bank Locations

Upgrading Memory

You can upgrade memory on your Prioris HX 6000 Series server by adding SIMMs on the installed CPU module. You must add two SIMMs (per bank) when expanding memory starting from Bank 0.

Installing SIMMs

NOTE: Prior to installing additional memory in your Prioris HX 6000 Series server, refer to the previous section to verify the memory configuration you have planned conforms to all memory configuration guidelines.

To install SIMMs, perform the following:

1. Power down your server.

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

3. Unlock and remove the left side panel.

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4. Remove the CPU module retaining bracket.

5. Carefully remove the CPU module from the main logic board and place it on an antistatic surface.
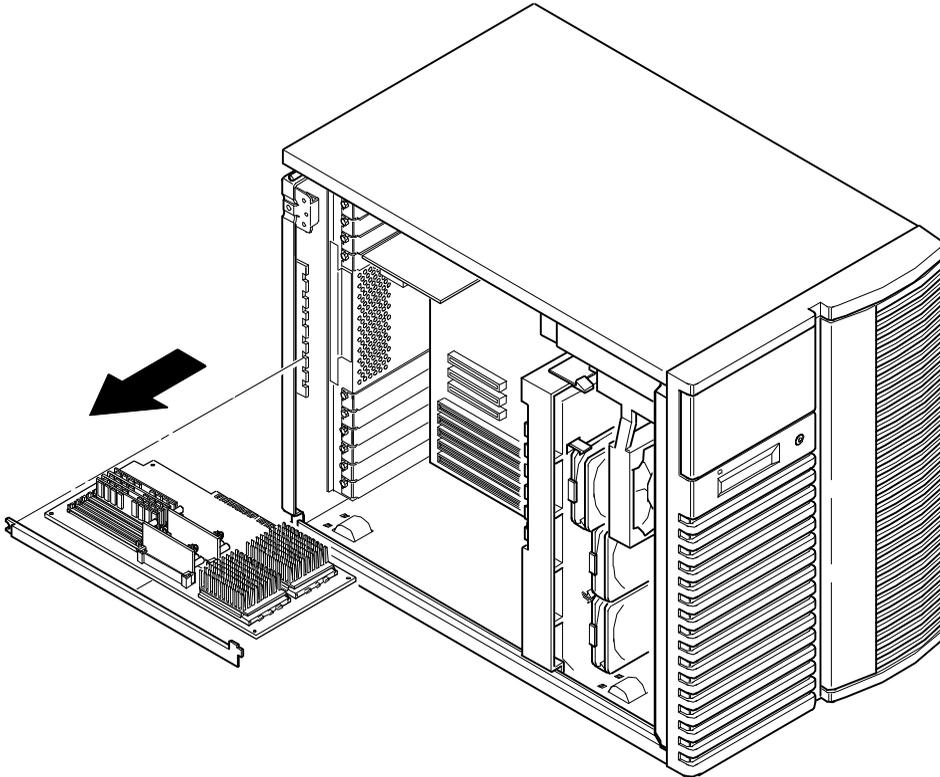
DEC01024

Figure 6-2. CPU Module Removal

6. Install a SIMM into a socket at a 45 degree angle away from the edge connector.

    Make sure the notch is oriented as shown (A, Figure 6-3). Rock the SIMM gently until it completely engages the bottom of the socket. Tip the SIMM upright until both retaining clips engage (B, C, Figure 6-3).

7. Install the remaining SIMMs in complete banks on the CPU module.

8. Replace the CPU module.

9. Replace and lock the left side panel.

10. Connect all external devices and restore power.

11. Run the SCU. Select Configure Computer from the main menu, and then select Save and Exit to configure your server for the additional memory.

    For more information, refer to Chapter 2, "Server Software and Utilities."
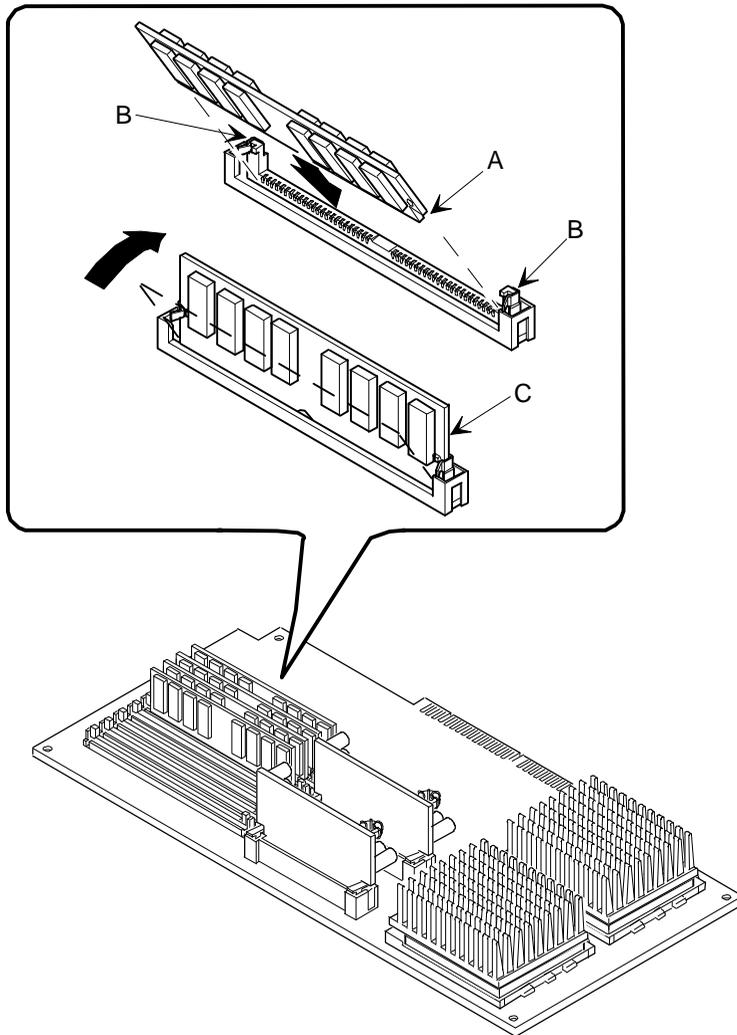
PRIORIS HX 6000

DEC01032-2

Figure 6-3. Installing a SIMM

Memory Troubleshooting

The Prioris HX 6000 Series server POST can detect memory errors when it boots.
The error can be isolated to a pair of SIMMs on the installed CPU module.

The memory error message format is as follows:

```
<Type of Error>:   <Location>
```

Where:

<Type of Error>	Correctable error	
	Uncorrectable error	
<Location>	CPU Module	J8/J9
	CPU Module	J10/J11
	CPU Module	J12/J13
	CPU Module	J14/J15

Example:

Uncorrectable Error : CPU Module J8/J9

If a correctable error occurs, the BIOS will display: "Press <F1> to resume" after the
server boots.

If an uncorrectable error occurs, the server will halt after the memory test.

To isolate to the failing SIMM, replace one of the two SIMMs which was indicated in
the POST error message with a similar SIMM and then rerun POST. If the same
error message occurs, replace the second SIMM with the SIMM that was previously
removed.

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Installing Disk and Tape Drives 7

Introduction

This chapter describes the configuration guidelines that must be followed prior to installing optional disk and tapes and an external storage box. Detailed installation procedures are also included.

Tape Drive Configuration Guidelines

- Tape drive(s) should be installed in the upper-right 5¼-inch drive bays.

- A full-height tape drive occupies two half-height 5¼-inch drive bays.

SBB Configuration Guidelines

- A maximum of seven hard disk drives can be installed and configured in the server.

    - Seven Storage Building Block (SBB) drives.

- SBBs must only be installed in the hot-swap bay area.

CD-ROM Drive Configuration Guidelines

- The factory installed SCSI CD-ROM drive has its SCSI ID set to 5.

- The CD-ROM drive should always be connected to the onboard Adaptec SCSI controller (Channel A) to support the bootable ServerWORKS Quick Launch CD.

SCSI Configuration Guidelines

The following sections describe the SCSI configuration guidelines that must be adhered to so your server operates correctly after installing and connecting SCSI devices.

SCSI ID and Termination

- Your server supports up to 10 internal SCSI devices, including seven SBBs, one CD-ROM drive, and two half-height devices located in the bays above the SBB area.

- These devices can be connected on either wide or narrow busses, single or multiple channels. Limitations on connecting these devices might also be based on the manufacturer's design.

Setting IDs and Termination

- Each device on the channel must be assigned to a unique SCSI ID number. The narrow SCSI bus supports eight devices in the range of 0-7.

- The wide SCSI bus supports 16 devices in the range of 0-15. In either bus, the SCSI ID "7" usually is assigned to the SCSI controller. This can be changed in the configuration utility.

- Both ends of the SCSI bus must be terminated. In most cases, one side of the termination will be a soft switch setting on the main logic board, set in the configuration utility. The other termination can be found on a SCSI device as a jumper setting, the last connector of a bus cable using an in-line SCSI terminator, or a Digital terminator located on the SBB backplane.

- If a device such as a CD-ROM drive has a terminator jumper installed and the CD-ROM drive is plugged into the second connector on the cable from the SCSI controller, no other devices will be seen beyond the second connector.

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Boot Device

- The SCSI controller with the lowest BIOS address is identified by the server as the "primary" SCSI controller. When loading the operating system from a SCSI SBB, this primary or boot drive must be connected to the primary SCSI controller.

- To improve server performance, you might want to distribute the SCSI devices across the SCSI controllers.

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

External Channel

- Make sure that the SCSI ID you select for the external SCSI devices do not conflict with other devices installed in the server on the same bus.

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

- For proper operation, the length of the SCSI cable for each channel must not exceed 1 meter (3.28 ft)*. This includes the length of the internal cable plus the length of the external cable to the bulkhead.

- You will need to disable termination on the controller if it is in the middle of the daisy chained SCSI cable. If you remove the controller termination, make sure both ends of the SCSI cable are properly terminated.

* According to Digital specifications

Storage Backplane

- SBBs must only be installed in the hot-swap bay area.

- A maximum of seven SBBs can be installed.

- A SCSI ID for each SBB is assigned by the jumper settings on the storage backplane.

  Refer to the Single/Dual SCSI Bus Target ID Settings table in the Drive ID section.

- The storage backplane is factory-defaulted as one complete channel on a wide SCSI bus. Split the backplane by removing the jumper cable between SBBs four and five. Terminate both sides of the backplane properly.

Drive ID

- 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 controller to set SCSI IDs greater than seven.

- Your CD-ROM drive and tape drive IDs must be set manually via jumpers on the device. Refer to your manufacturer's documentation for information on setting drive IDs. The factory installed CD-ROM drive has its SCSI ID set to 5.

- Narrow (8-bit) devices on a wide cable count as two SCSI IDs. For example, the narrow CD-ROM drive SCSI ID is 5 so SCSI ID 13 is no longer available. The 8-bit CD-ROM device counts as two devices on a 16-bit wide data path. Make sure that a unique SCSI ID is selected for each SCSI device located on each SCSI bus.

  Refer to the Single/Dual SCSI Bus Target ID Settings table for detailed SCSI ID settings.

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Single/Dual SCSI Bus Target ID Settings (J181 on Storage Backplane)

Jumpers Set	None	W1[1]	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								
SBB slot4 ID=	0	4	0	8	4	12	8	12
SBB slot5 ID=	1	5	1	9	5	13	9	13
SBB slot6 ID=	2	6	2	10	6	14	10	14

[1] Factory default settings

Cables

- Narrow SCSI cable with five connectors connected to the narrow Adaptec 7880 SCSI controller on the main logic board to the CD-ROM and then to the two 5.25-inch drive bays and an active termination.

- For a split backplane — wide SCSI cable with two connectors connected to the wide Adaptec 7880 SCSI controller (Channel A) on the main logic board to the top 68-pin wide SCSI connector on the storage backplane.

- For a split backplane — wide SCSI cable with two connectors connected to the wide Adaptec 7880 SCSI controller (Channel B) on the main logic board to the botttom-middle 68-pin wide SCSI connector on the storage backplane.

    NOTE: The wide SCSI cables can also be used to connect Channel A or Channel B to a separate controller or channel.

- A jumper cable is supplied to connect the two storage backplane segments together to make a single SCSI channel.

- One additional wide cable to connect to the external SCSI knockouts.

Storage Backplane

Your storage backplane supports seven hot-swap devices split between two SCSI bus sections: SCSI Channel A and SCSI Channel B (see Figure 7-1). SCSI Channel A is the upper bus section and consists of four SCSI device connections. SCSI Channel B is the lower bus section and consists of three SCSI device connections. These channels can be configured as two independent SCSI buses or as one SCSI bus by installing a wide SCSI jumper cable.

Figure Legend	Description
A	Wide SCSI connectors (68-pin)
B	Narrow SCSI connectors (50-pin)
C	Power connectors
J181 (W1, W2, and W3)	SCSI ID jumper block

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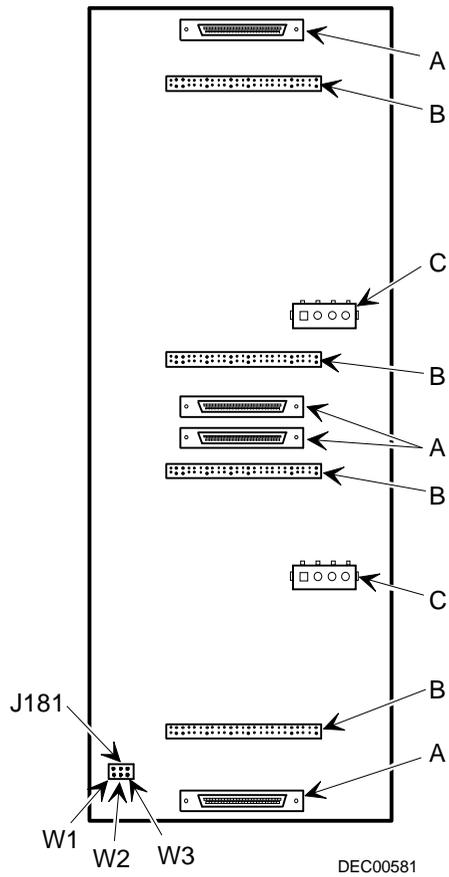
Figure 7-1. Storage Backplane

Installing Optional Drives

Your server has three drive bay areas. Optional drives such as a SCSI disk drive, a SCSI CD-ROM, and a SCSI tape 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 diskette drive (standard on the Prioris HX 6000 Series server).

- Top-right front access drive bay area—This area has room for two narrow (50-pin) 5¼-inch half-height SCSI devices or one full-height, 5¼-inch device. Devices can include CD-ROM drives or tape drives.

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

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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 all external devices, ac power, and monitor power.

3. Unlock and remove the side panels.

4. Unlock and open the door.

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

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

7. Insert the device into the drive bay slot from the front.

8. Secure the device to the slot using the supplied mounting screws.

9. If applicable, replace the plastic filler panel.
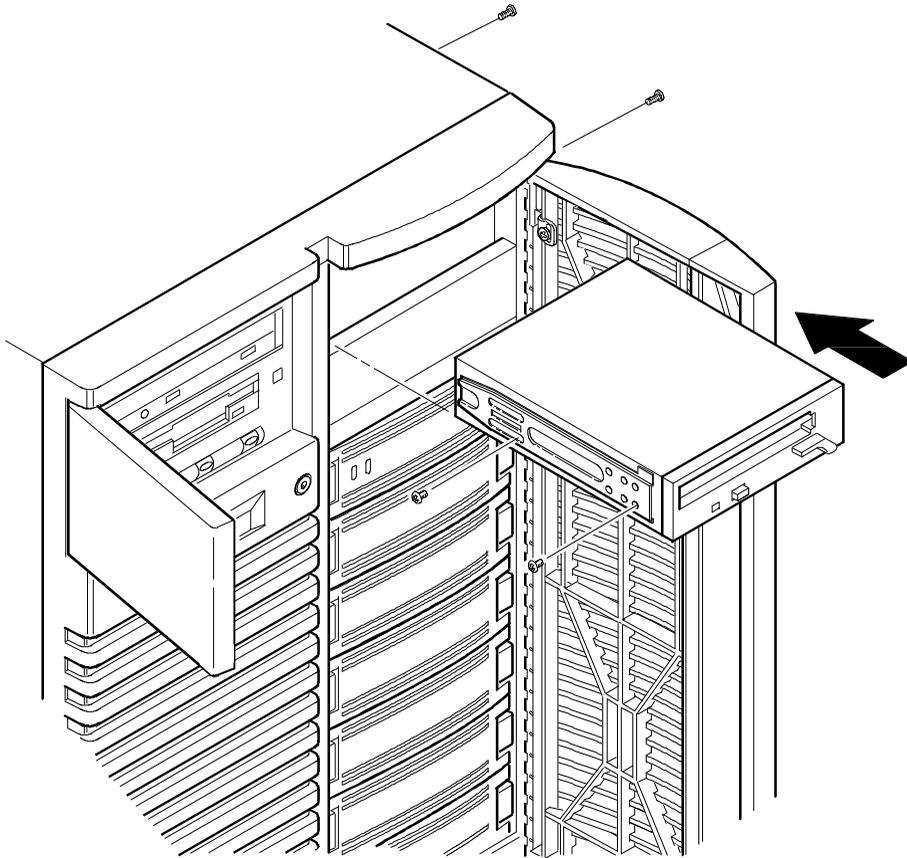
DEC00409-2

Figure 7-2. Installing a Half-Height 5¼-Inch Device Into Top-Right Drive Bay

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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 all external devices, ac power, and monitor power.

3. Unlock and remove the side panels.

4. Unlock and the open door.

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

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

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

8. Insert the device into the drive bay from the front.

9. Secure the device using the four supplied mounting screws.

10. If applicable, replace the plastic filler panels.
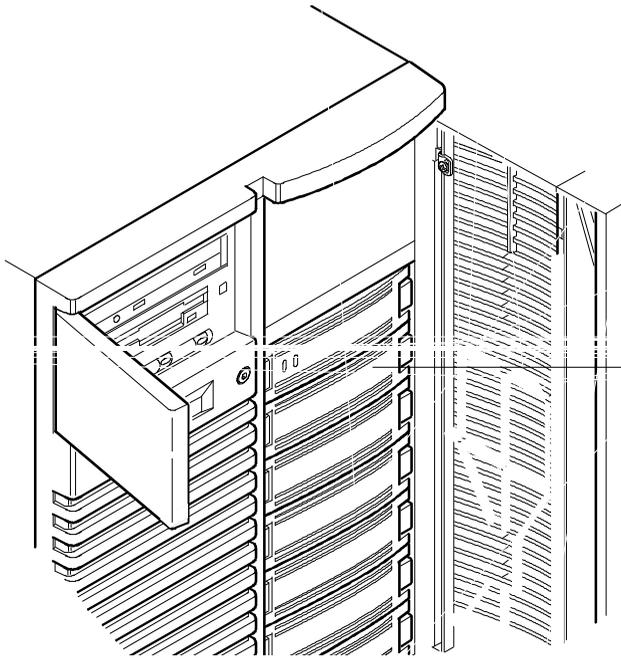
Expansion Brackets

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.
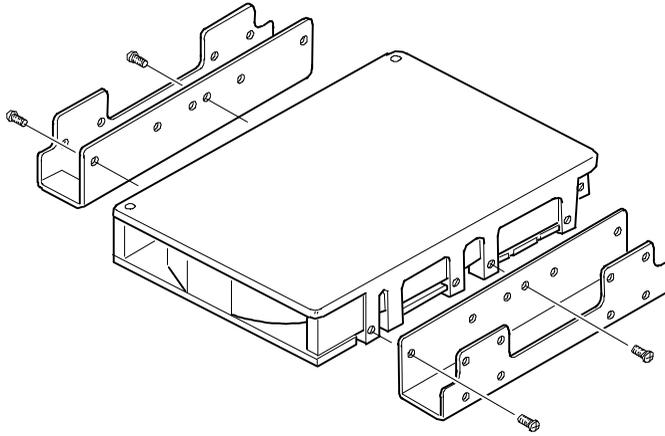
DEC00723

Figure 7-4. Installing Expansion Brackets

Hot-Swap Drive Bay

Hot-swapping allows you to remove or install an SBB while the server remains on-line and active but not accessing the device being swapped. This eliminates 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:** 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 the right front door.

2. Remove the filler panel or SBB by pressing the two tabs together to pull filler panel or SBB out (A, Figure 7-5).

3. Insert the 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 the lock door.
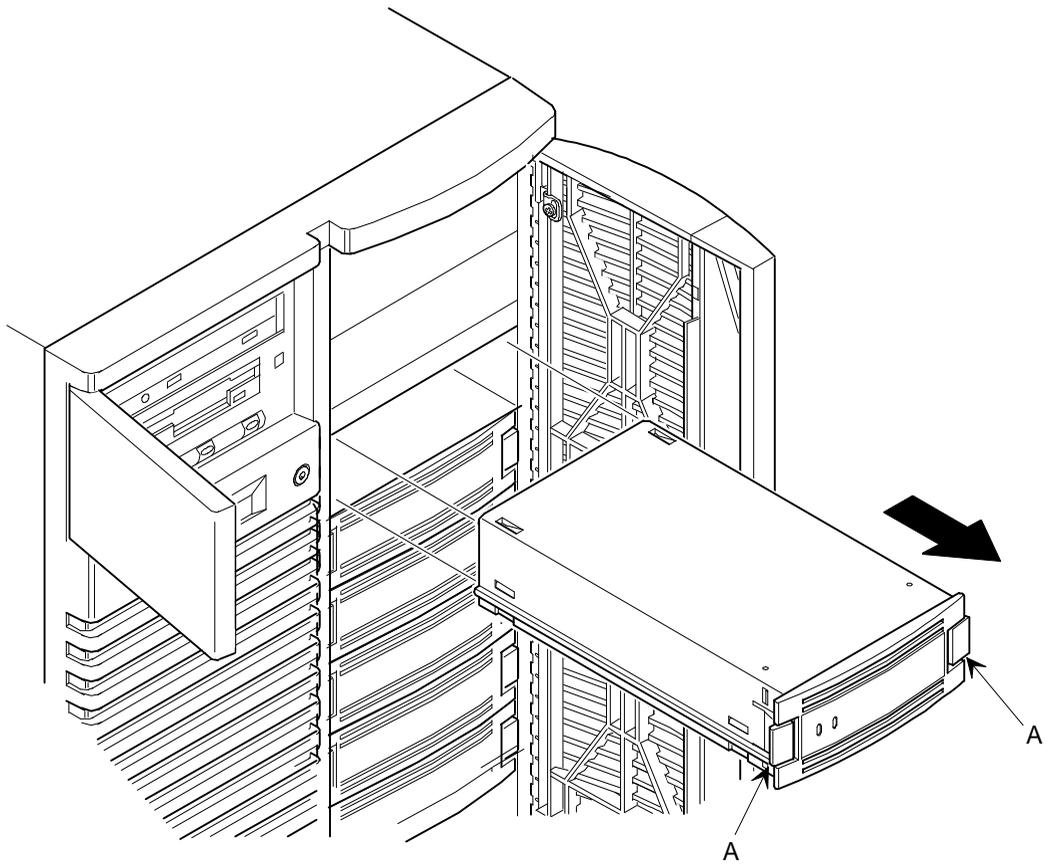
DEC00443-2

Figure 7-5. Installing a Device Into the Hot-Swap Drive Bay

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SBB LED Status Indicators

The hot-swap backplane monitors SBB 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 adapters, removing a SBB when the left LED is on or flashing can cause the loss or corruption of data.

- For RAID adapters, 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.

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External Storage

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

Connecting an External SCSI Bus to the Storage Backplane

To connect an external SCSI bus to the storage backplane:

1. Power down the Prioris HX 6000 Series server.

2. Unlock and remove the right side panel.

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

4. Connect the wide SCSI 68-pin unshielded cable connector to the storage backplane (A, Figure 7-6).

5. Using a screwdriver, gently pry away one of the SCSI knockouts at the rear panel (B, Figure 7-6).

6. Screw the wide SCSI 68-pin or narrow SCSI 50-pin external shielded connector to the rear panel (C, Figure 7-6).

7. Connect the external SCSI device making sure the external device is properly terminated.
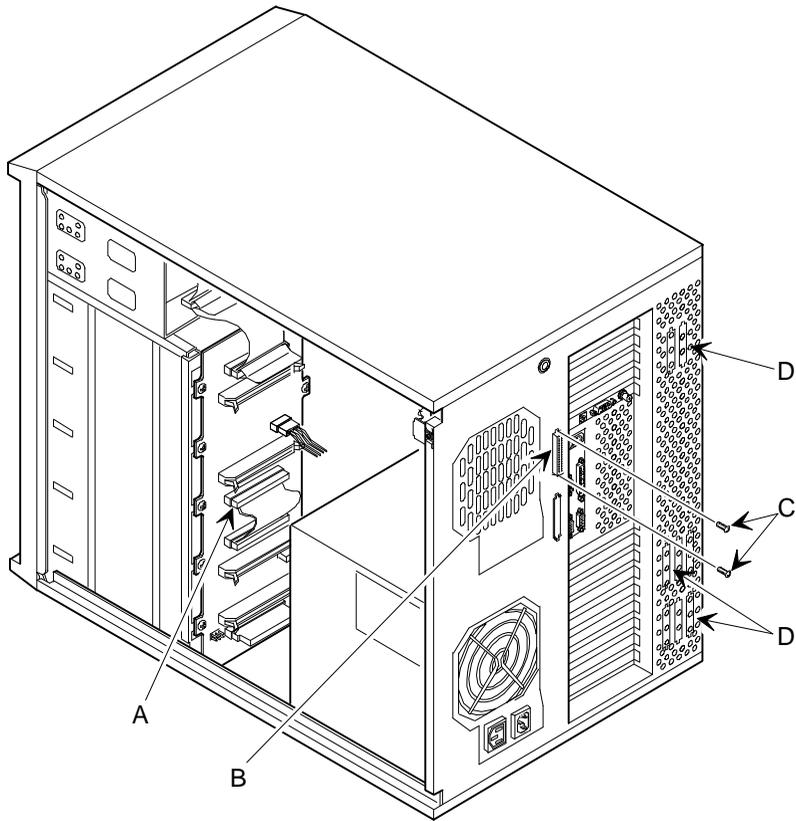
DEC01033

Figure 7-6. External SCSI Bus Connections

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Connecting an External Device to a SCSI Controller

To connect an external SCSI bus to a controller:

1. Power down the Prioris HX 6000 Series server.

2. Unlock and remove the left side panel.

3. Using a screwdriver, gently pry away one of the SCSI knockouts located on the rear air flow panel (D, Figure 7-6).

4. Connect the wide SCSI 68-pin unshielded cable connector from the inside connector on the knock-out panel to the external SCSI connector on the SCSI controller.

5. Screw the appropriate (wide SCSI 68-pin or narrow SCSI 50-pin) external shielded connector to the selected connector on the outside of the knock-out panel.

6. Connect the external SCSI device making sure the external device is properly terminated.
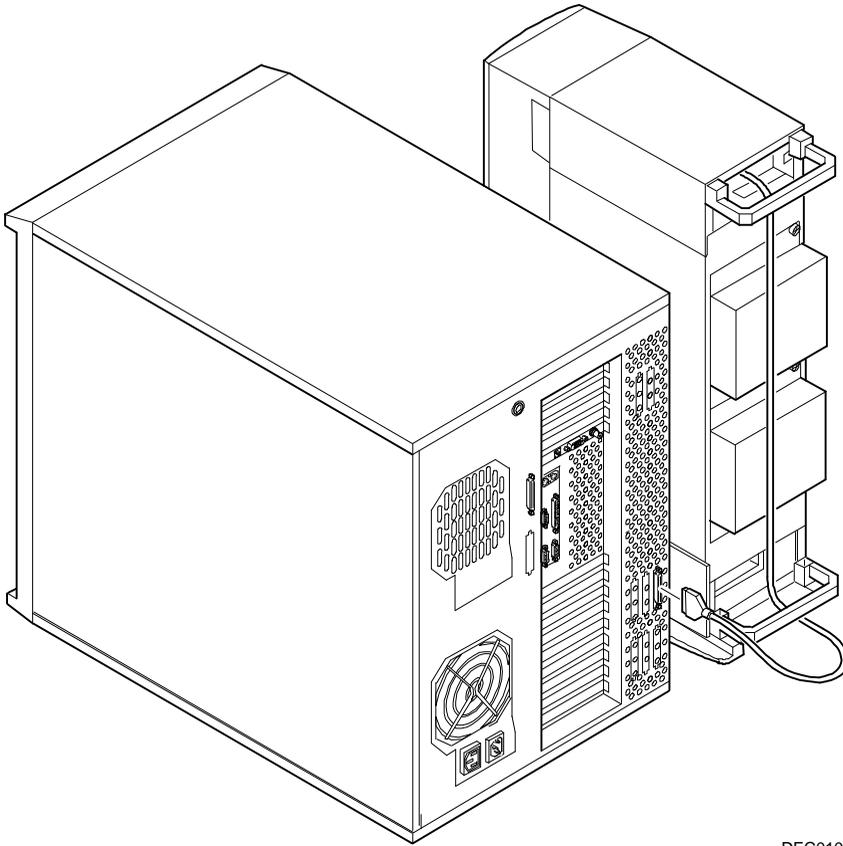
DEC01034

**Figure 7-7. Example of Connecting an External SCSI Storage Box to a
SCSI Controller**

Installing Expansion Boards 8

Introduction

This chapter contains the configuration guidelines that must be followed prior to installing ISA, EISA or PCI expansion boards as well as detailed installation procedures. Note that EISA and PCI expansion boards can be SCSI, RAID, and Network Interface Cards (NIC).

ISA/EISA Expansion Board Configuration Guidelines

- EISA slots one through five support industry-standard 32-bit EISA expansion or 16-bit ISA boards.

- ISA/EISA boards should be installed starting in EISA slot one.

- You must run the SCU after installing any EISA expansion board.

- You must run the SCU before installing any ISA expansion board to view assigned IRQs and addresses for other options.

- Follow the slot numbers on the plastic card guide to align any ISA/EISA expansion board.

- RSM card (optional) is installed in EISA slot 1.

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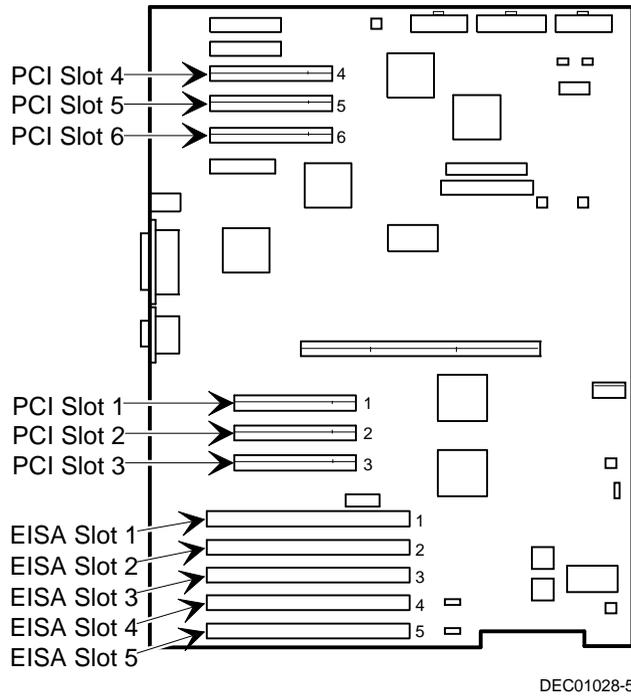
Figure 8-1. Expansion Board Slot Locations

PCI Expansion Board Configuration Guidelines

- PCI slots one through six support bus mastering 32-bit PCI expansion boards.

- PCI video expansion boards should always be installed in PCI Bus 0, slot one to three.

  NOTE: Your server's BIOS will automatically disable the onboard video controller when a video expansion board is installed. Connect the video cable to the video expansion board and the server will boot normally.

- The SCU automatically scans the PCI bus and will assign an IRQ and I/O port address for any new PCI board installed in the server.

Configuring Your EISA/PCI Expansion Boards Using the SCU

When installing EISA and PCI expansion boards in your server, the SCU must be run to configure these boards.

For EISA expansion boards, the SCU will allow you to review/modify the default IRQ and I/O port address. These values are saved in the SCI file and can be loaded using that file when the SCU is rerun.

For PCI expansion boards, the SCU will autodetect the PCI expansion boards and assign IRQs to the PCI expansion boards. The ROM addresses for these PCI expansion boards will be assigned based on the PCI scan order and address availability.

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Boot Devices

The SCU allows you to define the boot device location as:

- Embedded SCSI Channel A

- Embedded SCSI Channel B

- PCI expansion slot

For the embedded SCSI channels, the boot device will be the first bootable device found starting at SCSI ID 0 on that channel. The boot device on an expansion board will be determined by the server boot sequence and PCI scan order. These are discussed in the next sections.

Server Boot Sequence

The server boot sequence is as follows:

1. If a CD-ROM drive is enabled and a bootable CD-ROM is put in this drive, the server ignores all other settings and boots from the CD-ROM.

2. If a CD-ROM is not present, the operating system can boot from either drive A or C depending on how an option in the SCU has been set. This option determines which drive is selected first as the boot device.

    One option is A: then C: (default). In this case, the server first selects drive A to boot the operating system. If a diskette is not inserted in drive A, the server then selects drive C: to boot the operating system.

    If the setting is C: then A:, then drive C: is selected as the boot drive first. If a bootable operating system is not found, then drive A: is selected.

> **NOTE:**   If C: then A: is selected, the Quick Launch CD-ROM might not be bootable.

Drive C can be attached to an embedded SCSI controller (SCSI Channel A or B), an EISA expansion board, or a PCI expansion board.

The location of drive C is determined by the server scan sequence described next.

Server Scan Sequence

If the boot device is neither the CD-ROM drive or the diskette drive, then the operating system will be found on drive C. The location of drive C can be determined as follows:

1. The search for a bootable device is started from a low ROM address to a high ROM address (starting at C8000h). The boot device with the lower address gets higher priority to be assigned as drive C then those with higher addresses.

2. The EISA bus is scanned first. If an EISA expansion board is configured to occupy the C8000h address, then it becomes the boot device.

3. The PCI bus is scanned next. If the embedded PCI SCSI Channel A or B is enabled using the SCU, then it is the boot device. If "PCI slots" is the selected SCU option, then the boot device is determined by the PCI scan sequence:

    a. PCI busses are scanned in ascending order starting with bus 0. Bus 0 is fixed onboard (Slots 1, 2, and 3).

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b. For each bus, the scanning sequence is also in ascending order starting from device 0 to device 1Fh.

For each device found, the server scans to see if there are any additional PCI busses on that controller. As PCI busses are detected, they are assigned the next available PCI bus number in sequence. Controllers such as the Adaptec 2940W and the Mylex RAID controllers (1, 2, or 3 channel) have no additional PCI busses onboard. They would represent a single device on PCI bus 0 if installed in PCI slots 1 - 3. In contrast, a 2-channel SCSI controller might have a PCI to PCI bridge chip onboard which serves as the PCI bus for the two SCSI channels. For example, if this controller were installed in Slot 1 (PCI Bus 0) then the PCI bus onboard the controller behind the bridge chip would be PCI bus 1, and the two SCSI channels on that controller would be seen as devices on PCI bus 1. Once all the controllers on PCI Bus 0 have been scanned, the secondary PCI bus is scanned (slots 4 - 6). This PCI bus is assigned the next available bus number.

The slot priorities are summarized as:

Priority	Slot #
1	Slot 1 (Bus 0, Device 0Dh)
2	Slot 2 (Bus 0, Device 0Eh)
3	Slot 3 (Bus 0, Device 0Fh)
4	Slot 4 (Bus N+1, Device 08h)
5	Slot 5 (Bus N+1, Device 09h)
6	Slot 6 (Bus N+1, Device 0Ah)
7	Embedded SCSI Channel A (Bus N+1, Device 0Eh)
8	Embedded SCSI Channel B (Bus N+1, Device 0Fh)

Scan Order Depending on SCU Boot Sequence Preference

Here are the scan priorities for the three SCU boot sequence preferences:

1. Embedded SCSI Channel A — If the embedded SCSI Channel A is selected, it is scanned first, then the embedded SCSI channel B is scanned and finally, PCI slots 1 - 6 are scanned.

2. Embedded SCSI Channel B — If the embedded SCSI Channel B is selected, it is scanned first, then the embedded SCSI channel A is scanned and finally, PCI slots 1 - 6 are scanned.

3. PCI Slots — If "PCI Slots" is selected, PCI slots 1 - 6 are scanned first, then the embedded SCSI Channel A is scanned, and finally the embedded SCSI Channel B is scanned.

Examples of Boot Device Assignment

In each of these examples, the assumption is that "PCI Slots" is the selected boot sequence preference in the SCU.

Examples of EISA/PCI Scan Order

Example 1:

PCI Slot 1   PCI SCSI controller, such as a 2940W
           Drive at SCSI ID 0

EISA Slot 4   EISA RAID host adapter, such as a Mylex RAID 3 channel
           Drive on Channel 1 SCSI ID 0
           Drive on Channel 2 SCSI ID 4
           Drive on Channel 3 SCSI ID 2

Assume for this example that the Mylex RAID host adapter ROM address is defaulted to CC000h. Assume also that we have used the RAID configuration utility to create a server logical drive 0. Given this example, the Mylex RAID host adapter on the EISA bus would be scanned first, with a ROM address of CC000h. The 2940W Adaptec controller on the PCI bus would be scanned next. The 2940W requires 32 KB for initialization (even though it only occupies 10 KB after optimization). As there is only 16KB ROM address space between C8000h and CC000h, the 2940W would be assigned the next 32KB block of ROM address space starting at D0000h. The server logical drive 0 on the Mylex RAID host adapter would be the boot device.

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To boot from a bootable drive on the 2940W, the SCU would have to be run to change the address of the Mylex RAID host adapter to a higher address, such as D0000h, and during POST, the BIOS will scan the PCI bus and assign C8000h to the 2940W, and that drive would become the boot device.

Example 2:

PCI Slot 1	PCI 2 channel SCSI controller with an onboard PCI to PCI bridge chip to an internal PCI bus where the 2 SCSI controllers are attached.
	Drive on SCSI Channel 1 (lowest PCI device number) SCSI ID 3
	Drive on SCSI Channel 2 SCSI ID 1
PCI Slot 3	PCI SCSI controller such as a 2940W
	Drives at SCSI ID 1, 3

In this example, the scanning begins with PCI slot 1 (PCI bus 0) and the two channel SCSI controller. The two channel SCSI controller has an internal PCI bus, which is now seen as PCI bus 1. Channel 1 and Channel 2 of this controller are detected in that order, as Channel 1 has a lower PCI device number. Finally the 2940W is detected in PCI Slot 3. The first device found during the scan that is bootable will be the boot device. So, if all the drives in this example were bootable, the boot device would be the drive attached to Channel 1 on PCI Bus 1 of the two channel SCSI controller (see figure 8-2).
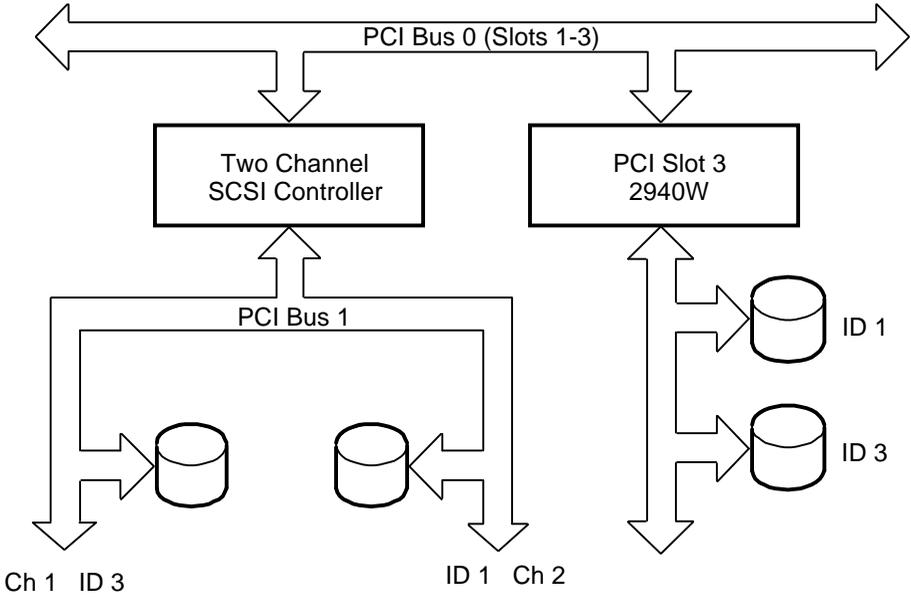
DEC01035

Figure 8-2. EISA/PCI Scan Order

PRIORIS HX 6000

Identifying PCI Devices in the SCU

The SCU automatically scans for PCI devices and assigns resources to them. PCI devices appear in the SCU as either assigned to a slot, or as embedded devices.

If a PCI expansion board uses one or more interrupts, but none of the interrupts are shared, then the SCU will contain an entry for each interrupt used by that PCI expansion board. As an example, assume a 2-channel SCSI controller with a PCI-to-PCI bridge chip with two devices behind it, each requiring an interrupt. If the expansion board were installed in PCI Slot 1, the entry in the SCU might look similar to this:

- PCI 1   PCI SCSI Controller   IRQ15

- PCI 1   PCI SCSI Controller   IRQ14

If a PCI expansion board uses one or more interrupts, but the interrupts are shared, then the SCU will display an entry for an interrupt in that slot, and the remaining devices that share that interrupt will be shown as "embedded" devices. Consider a controller that has a PCI-to-PCI bridge chip with three devices sharing one interrupt and the fourth device using a second interrupt. If this expansion board were installed in PCI Slot 4, the entry in the SCU might look similar to this:

- PCI 4   PCI SCSI Controller   IRQ10

- PCI 4   PCI Memory Controller   IRQ2(9)

- Embedded PCI SCSI Controller

- Embedded PCI SCSI Controller

In this case, the two interrupts are shown, with devices sharing the interrupt shown as embedded devices.

Onboard devices always appear as embedded devices. The onboard VGA controller, as an example, would appear as:

- Embedded VGA

When the number of PCI devices exceeds 10, any additional devices will appear as embedded devices, even if they require an IRQ assigned to them. The embedded devices are listed in the order in which they were detected.   To associate embedded devices with particular PCI expansion boards, you must know the number of devices (excluding PCI-to-PCI bridges, which are not listed in the SCU) on each PCI expansion board. If there are many embedded devices, start matching the PCI expansion boards in the highest slot number with the embedded devices at the bottom of the list (above the embedded VGA device). As an example, assume that a server has two controllers installed, one in PCI Slot 1 and the other in PCI Slot 2. The SCU might show the following:

- PCI 1   PCI SCSI Controller   IRQ15

- PCI 1   PCI Memory Controller   IRQ14

- PCI 2   PCI SCSI Controller   IRQ10

- PCI 2   PCI Memory Controller   IRQ2(9)

- Embedded PCI SCSI Controller

- Embedded PCI SCSI Controller

- Embedded PCI SCSI Controller

- Embedded PCI SCSI Controller

- Embedded PCI SCSI Controller (7880)

- Embedded PCI SCSI Controller (7880)

- Embedded PCI Ethernet Controller

- Embedded PCI VGA

In this case, the first two embedded references are devices on the controller in PCI slot 1, the next two are associated with the controller in PCI slot 2, and the final references are for the onboard controllers.

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Advanced Menu in the SCU

The Advanced menu in the SCU allows you to lock/unlock resources and view system resource assignments. To enter this menu, run the SCU and select View or edit details (Step 3). Press F7 for the Advanced menu. A description of each of the options in the Advanced menu follows.

Locking of Resources

The SCU allows you to lock resources for any EISA/PCI expansion board installed in the server. This allows you to assign resources to that expansion board (such as IRQ), and then to keep those resources assigned to that expansion board even if the SCU is rerun. This is most frequently used to prevent the ROM address on the bootable controller from being reassigned in the event that new expansion boards are added to the server.

Enter the Advanced menu in the SCU.

The first item in this list is Lock/unlock boards. Press Enter to select. The list of integrated and installed options is shown. Move to the option whose resources you want to lock and press Enter. An exclamation point (!) appears to the left of that option indicating that the resources associated with that option have been fixed and will not change when the SCU is run. To unlock the resource, press Enter again, and the exclamation point disappears. Press F10 to complete this operation.

View Additional System Information

The SCU provides information to the user regarding resource assignments and availability. Information on installed expansion boards, assigned and available resources can also be viewed.

Enter the Advanced menu in the SCU.

Select View additional system information menu. Select Board specifications to view slot allocations.   Select System specifications to view detailed information for each EISA/PCI device including board ID, length, etc. Select Used resources to view IRQ and I/O Portassignments. Select Available resources to view unassigned IRQs, DMAs and I/O port addresses.

NOTE: The memory address shown might not be correct.

Set Verification Mode Menu

The SCU allows you to select whether you would like to be automatically notified of changes in your server's configuration, or whether you would like to verify the configuration manually.

Enter the Advanced menu in the SCU.

Select Set verification mode menu. Choose Automatic to enable the server to verify the configuration routinely when the SCU is invoked, or select Manual to enable verification of the configuration using the Verify option in the Step 3 screen.

Maintain SCI File Menu

You can save the system configuration information to a file.

Enter the Advance menu in the SCU.

Select Maintain SCU files menu. Select Open... to display information from a previously created .SCI file. The current configuration information will be lost. Select Save as... to save the current configuration information to a file.

Installing Expansion Boards

The following sections describe how to install ISA, EISA, and PCI expansion boards. Detailed procedures on running the SCU before installing ISA expansion boards and after installing EISA and PCI expansion boards are also included.

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Adding ISA Expansion Boards

Perform the following steps before installing ISA expansion boards:

1. Start the SCU using one of the three methods described in Chapter 2, "Starting the SCU."

2. Select step 2 from the `Configure Computer` menu: 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 Switches or Print Report," 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.

   Refer to "Installing ISA Expansion Boards."

Installing ISA Expansion Boards

To install an ISA expansion board:

NOTE: Read and fully understand your optional expansion board's documentation before installing the expansion board.

1. Run the SCU.

2. Turn off your server.

3. Disconnect the external devices, ac power, and monitor power.

4. Unlock and remove the left side panel.

5. Unscrew and remove the metal filler plate from the selected ISA expansion slot.
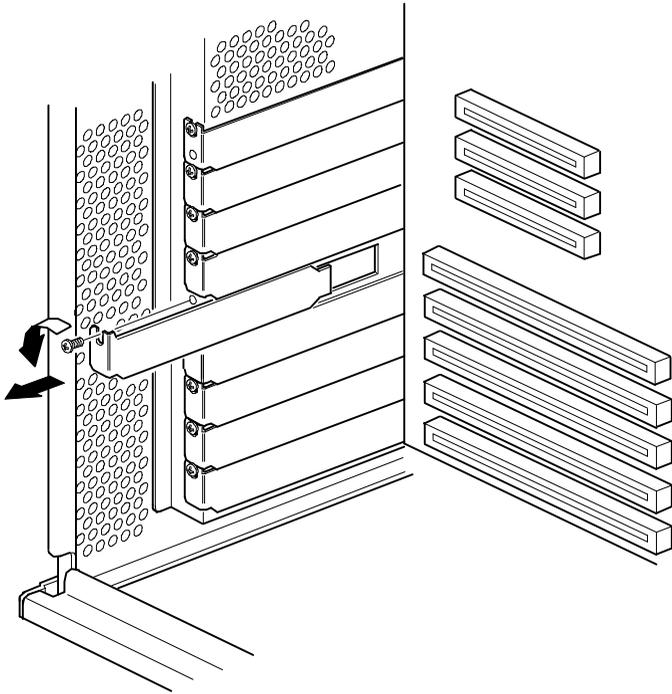
DEC01036-2

Figure 8-3. Removing a Metal Filler Plate

6. Insert the new ISA expansion board into the socket and push it firmly into place.

> **NOTE:** Make sure the ISA expansion board lines up with the slot number on the plastic card guide label.
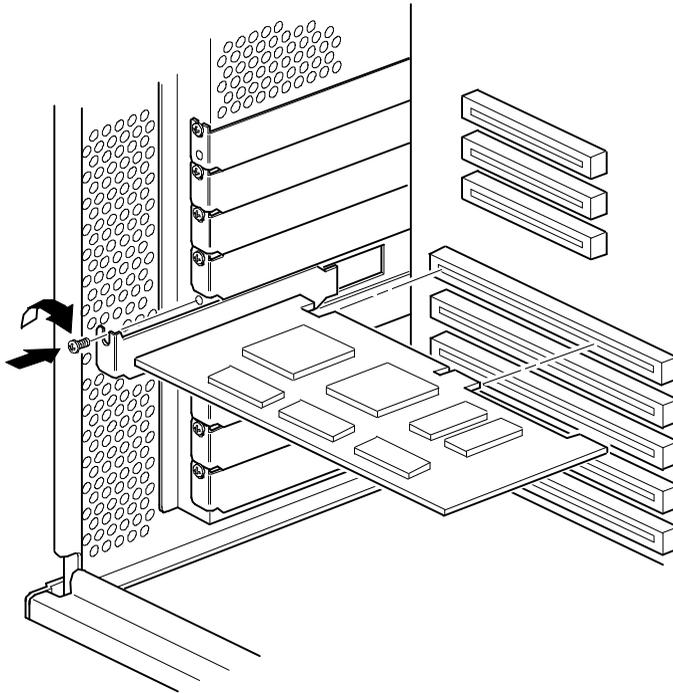
DEC01036-3

Figure 8-4. Installing an ISA Expansion Board

7. Secure the ISA expansion board to the slot with the screw removed in step 5.

8. Replace and lock the left side panel.

9. Connect all external devices and restore power.

Installing EISA Expansion Boards

To install an EISA expansion board:

> **NOTE:** Read and fully understand your optional expansion board's documentation before installing the expansion board.

1. Turn off your server.

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

3. Unlock and remove the left side panel.

4. Unscrew and remove the metal filler plate from the selected EISA expansion slot (see Figure 8-3).

5. Insert the new EISA expansion board into the socket and push it firmly into place.

> **NOTE:** Make sure the EISA expansion board lines up with the slot number on the plastic card guide label.

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

7. Replace and lock the left side panel.

8. Connect all external devices and restore power.

9. Run the SCU.

   Refer to "Adding EISA Expansion Boards" for detailed information on running the SCU.

PRIORIS HX 6000
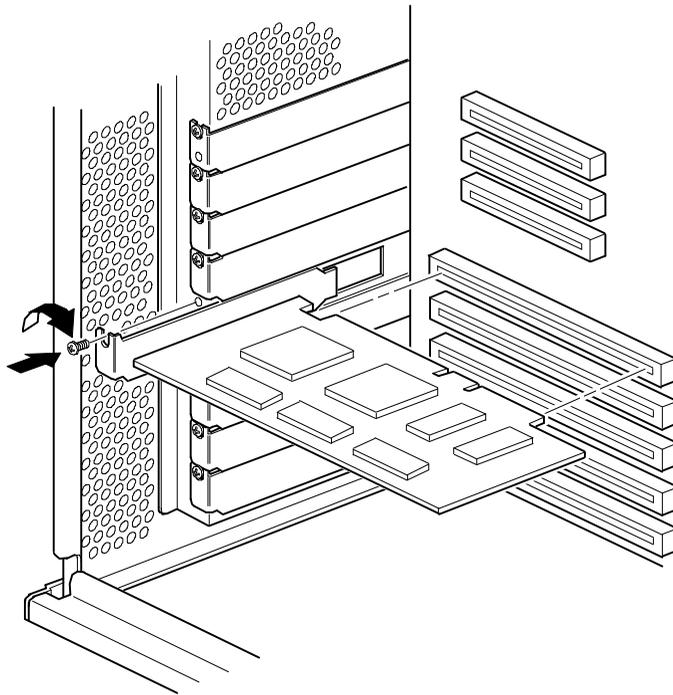
DEC01036-4

Figure 8-5. Installing an EISA Expansion Board

Adding EISA Expansion Boards

Perform the following steps after installing EISA expansion boards:

1. Start the SCU using one of the three methods described in Chapter 2, "Starting the SCU."

    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.

2. 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 Computer` menu.

3. From the `Configure 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.

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

Installing PCI Expansion Boards

To install a PCI expansion board:

> **NOTE:** Read and fully understand your optional expansion board's documentation before installing the expansion board.

1. Turn off your server.

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

3. Unlock and remove the left side panel.

4. Unscrew and remove the metal filler plate from the selected PCI expansion slot.

PRIORIS HX 6000

5. Insert the new PCI expansion board into the socket and push it firmly into place.

    NOTE: Make sure the PCI expansion board lines up with the slot number on the plastic card guide label.
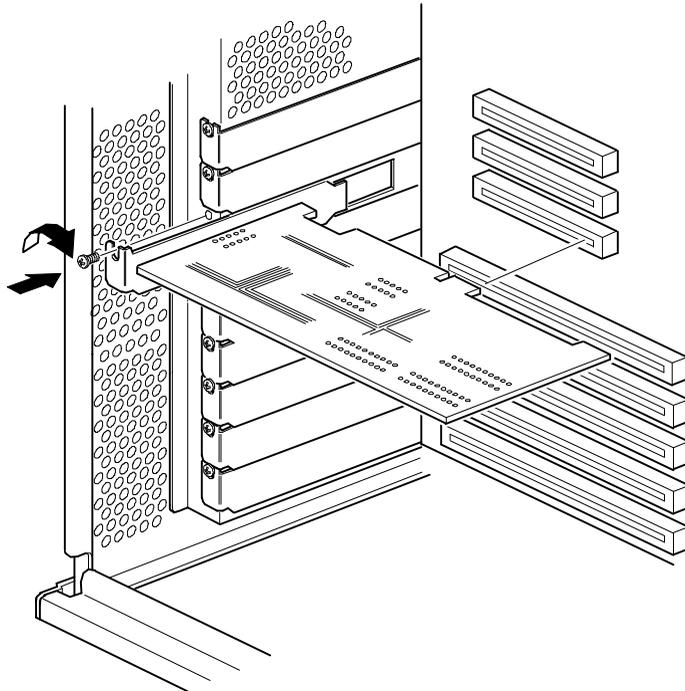
DEC01037

Figure 8-6. Installing a PCI Expansion Board

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

7. Replace and lock the left side panel.

8. Connect all external devices and restore power.

9. Run the SCU.

    Refer to "Adding PCI Expansion Boards" for detailed information on running the SCU.

Adding PCI Expansion Boards

Perform the following steps after installing PCI expansion boards:

1. Start the SCU using one of the three methods described in Chapter 2, "Starting the SCU."

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

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

4. The SCU automatically scans for PCI devices and will assign resources to them. Verify that the resources assigned (e.g., IRQ's) are supported by the PCI device under the operating system you are loading onto your server.

    Refer to the documentation that shipped with your PCI device.

    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:** You can view IRQ and DMA assignments at any time while you are running the SCU by pressing [F7]. The "View Additional System Information" screen displays. Select either `Used Resources` or `Available Resources` from this screen.

    Your server's BIOS will automatically disable the onboard video controller when a video expansion board is installed. Connect the video cable to the video expansion board and the server will boot normally.

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

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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 using one of the three methods described in Chapter 2, "Starting the SCU."

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

3. Select step 2 from the Configure Computer menu: 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.

Connecting SCSI and RAID Adapters *9*

Introduction

This chapter contains the configuration guidelines that must be followed when connecting SCSI or RAID adapters to optional disk drives, CD-ROM drives, and tape drives.

SCSI Configuration Guidelines

- Fast and wide SCSI supports up to 16 devices per channel.

- Narrow devices on a wide cable count as two SCSI IDs. For example, the narrow CD-ROM drive SCSI ID is 5 so SCSI ID 13 is no longer available. The narrow CD-ROM device counts as two devices on a 16-bit wide data path.

- When a narrow SCSI adapter is installed, the narrow SCSI bus only supports up to eight SCSI devices.

- Select the disk drives in the SBB bays for hot-swap support in a RAID server.

- Do not connect wide SCSI devices to a narrow SCSI adapter.

- Run the SCSI and/or RAID configuration utility to change controller settings to fit your specific configuration.

  Refer to Chapter 8 for additional SCSI configuration guidelines.

RAID Configuration Guidelines

- Fault management must be supported and enabled by the controller for disk drive hot swapping.

- When adding a RAID host adapter to a server that does not have RAID installed, use the RAID software to configure your server for RAID operation.

- Select the disk drives in the SBB bays for hot-swap support in a RAID server.

- Use the same capacity disk drives in a RAID group, otherwise the difference in disk drive capacity will be lost.

- The maximum number of logical disk drives in a RAID group is eight.

- To maximize the I/O performance of your multi-channel RAID subsystem, connect each disk drive in a RAID group on a separate SCSI channel. This enables the RAID host adapter concurrent access to all disk drives.

- Supported RAID levels include: 0, 1, 0+1, 5, and RAID 7 (JBOD).

RAID	Description	Drives Per RAID Group (1 Channel)	Drives Per RAID Group (3 Channel)
0	Striping - no redundancy	2 - 7	2 - 8
1	Mirroring	2	2
0 + 1	Striping and mirroring	3 - 7	3 - 8
5	Striping with parity	3 - 7	3 - 8
7	Single disk - no redundancy (factory default)	1 (minimum to maximum)	1 (minimum to maximum)

Note: Each RAID server comes configured as RAID 7 or JBOD (Just a Bunch of Disks)

SCSI Controller Cable Configurations

The following sections describe the available SCSI controller cable configurations for your Prioris HX 6000 Series server. The following lists the configurations:

- Single backplane

- Split backplane using onboard SCSI controllers

- Split backplane using two-channel RAID controller

Single Backplane SCSI Configuration

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

1. Power down the server.

2. Disconnect all peripheral devices from the server.

3. Unlock and remove the server side panel.

4. Connect the cables as shown in Figure 9-1.

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

6. Replace and lock the side panels.

7. Connect all external devices and then power on your server.

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

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

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

Figure 9-1 Legend	Component
A	Adaptec 7880 narrow SCSI 50-pin connector (Channel A)
B	Narrow SCSI 50-pin connector to CD-ROM drive
C	Narrow SCSI 50-pin connector to top-right drive bay
D	Narrow SCSI 50-pin terminator
E	Wide SCSI 68-pin connector to backplane
F	Adaptec 7880 68-pin wide SCSI connector (Channel B)
G	Jumper cable
H	Wide SCSI 68-pin terminator[1]

[1] This terminator can be removed and replaced with a wide SCSI 68-pin cable to connect to an external SCSI device.
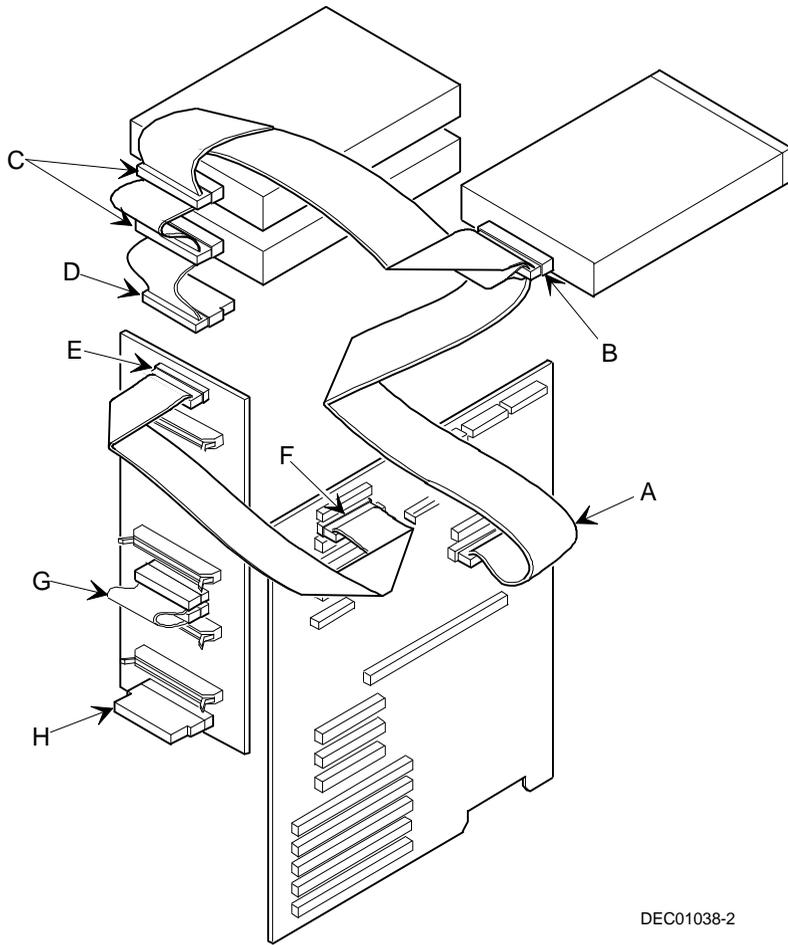
DEC01038-2

Figure 9-1. Single Backplane SCSI Configuration

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Split Backplane Using Onboard SCSI Controllers Configuration

To connect SCSI devices to two SCSI channels and to allow the CD-ROM drive to share the SCSI bus with the top four SBB drives, perform the following:

1. Power down the server.

2. Disconnect all peripheral devices from the server.

3. Unlock and remove the server side panel.

4. Disconnect the power cable from the 5¼-inch device, if used.

5. Connect the cables as shown in Figure 9-2.

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

7. Replace and lock the side panels.

8. Connect all external devices and then power on your server.

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

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

Figure 9-2 Legend	Component
A	Adaptec 7880 narrow SCSI 50-pin connector (Channel A)
B	Narrow SCSI 50-pin connector to CD-ROM drive
C	Narrow SCSI 50-pin connector to top-right drive bay
D	Narrow SCSI 50-pin terminator
E	Wide SCSI 68-pin connector to backplane, SCSI bus 1 on storage backplane
F	Adaptec 7880 68-pin wide SCSI connector (Channel B), SCSI bus 2 on storage backplane
G	Wide SCSI 68-pin terminator
H	Wide SCSI 68-pin connector to backplane, SCSI bus 2 on storage backplane
I	Adaptec 7880 68-pin wide SCSI connector (Channel A), SCSI bus 1 on storage backplane
J	Wide SCSI 68-pin terminator[1]

[1] This terminator can be removed and replaced with a wide SCSI 68-pin cable to connect to an external SCSI device.
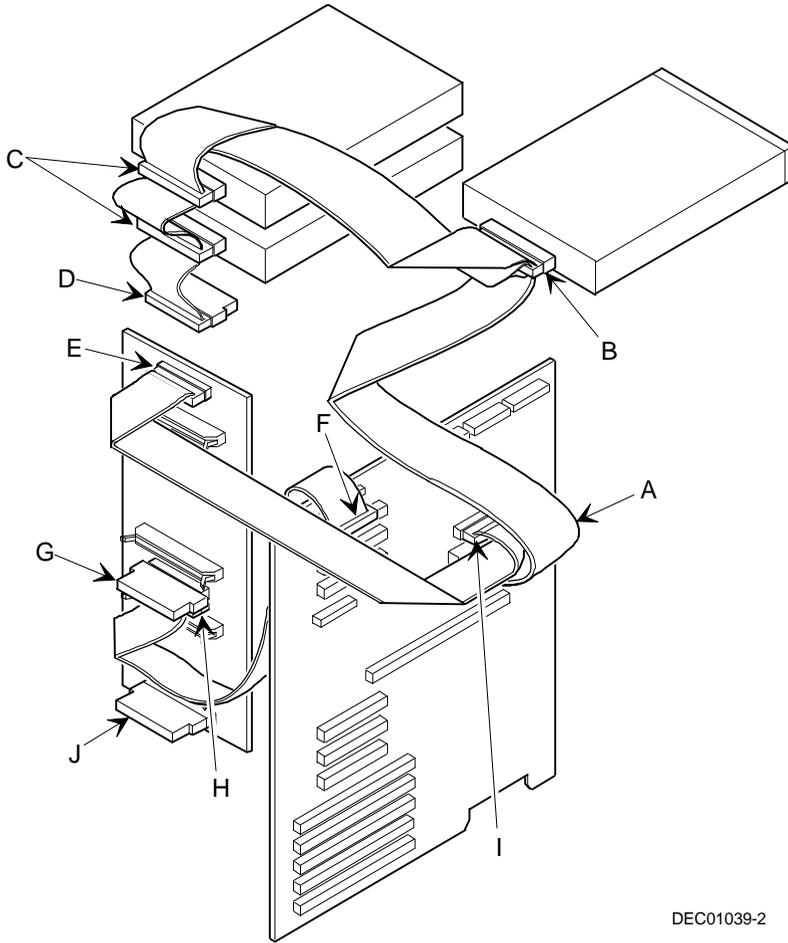
Figure 9-2. Split Backplane Using Onboard SCSI Controllers Configuration

DEC01039-2

PRIORIS HX 6000

Split Backplane Using Two-Channel RAID Controller Configuration

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

1. Power down the server.

2. Disconnect all peripheral devices from the server.

3. Unlock and remove the server side panel.

4. Disconnect the power cable from the 5¼-inch device, if used.

5. Connect the cables as shown in Figure 9-3.

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

7. Replace and lock the side panels.

8. Connect all external devices and then power on your server.

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

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

Figure 9-3 Legend	Component
A	Adaptec 7880 narrow SCSI 50-pin connector (Channel A)
B	Narrow SCSI 50-pin connector to CD-ROM drive
C	Narrow SCSI 50-pin connector to top-right drive bay
D	Narrow SCSI 50-pin terminator
E	Wide SCSI 68-pin connector to backplane (RAID Channel 1), SCSI bus 1 on storage backplane
F	Wide SCSI 68-pin terminator
G	Wide SCSI 68-pin terminator[1]
H	Wide SCSI 68-pin connector to backplane (RAID Channel 2), SCSI bus 2 on storage backplane
I	RAID expansion board connector (Channel 1)
J	RAID expansion board connector (Channel 2)

[1] This terminator can be removed and replaced with a wide SCSI 68-pin cable to connect to an external SCSI device.
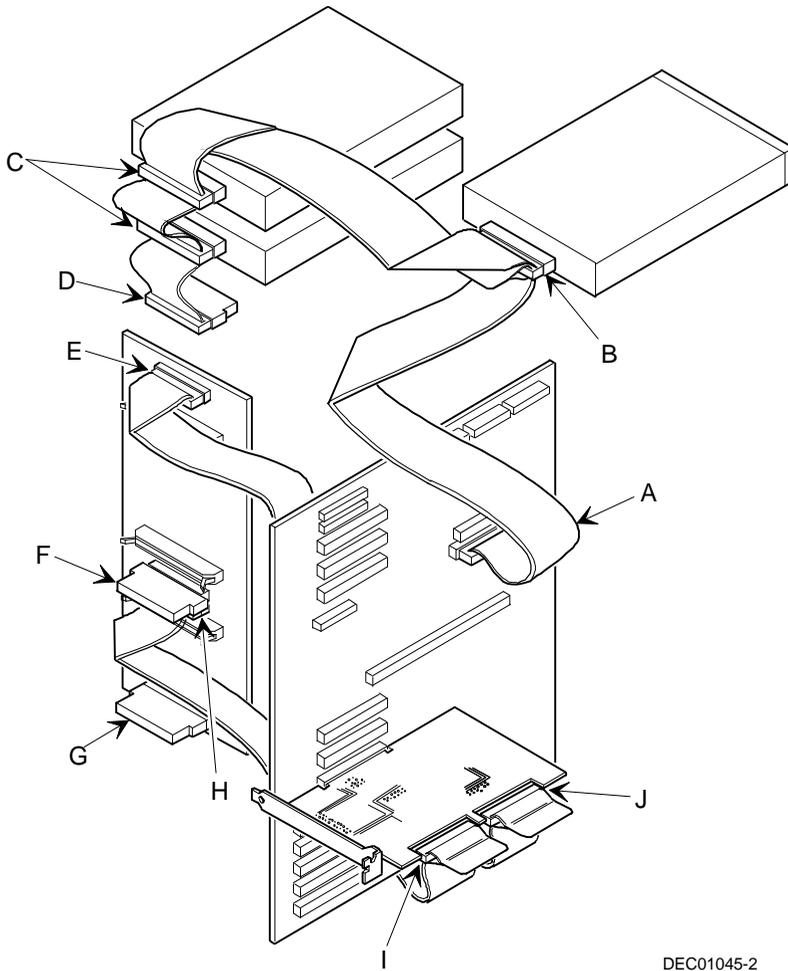
DEC01045-2

Figure 9-3. Split Backplane Using Two-Channel RAID Controller Configuration

PRIORIS HX 6000

Server Security Features *10*

Introduction

Server security is important to prevent theft or accidental loss of software and hardware. The Prioris HX 6000 Series 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.
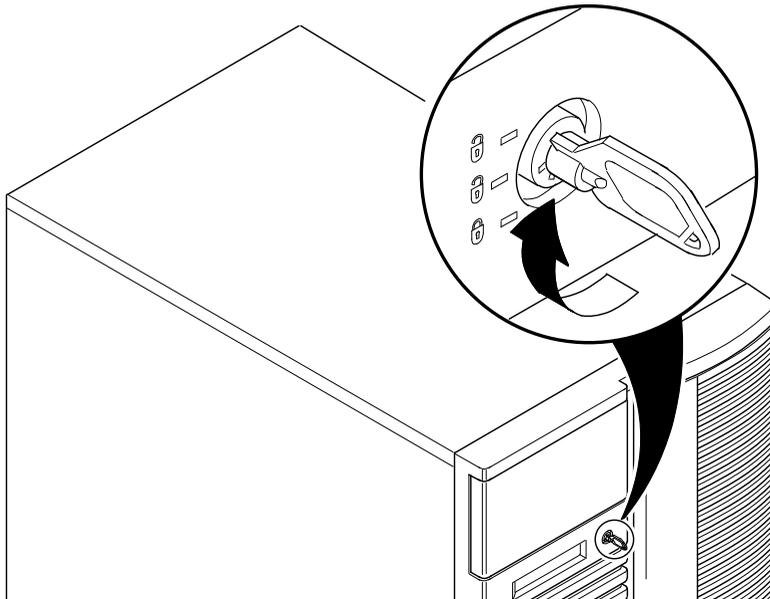
Figure 10-1. Front Panel Security Doors Lock

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 authorized service provider or authorized dealer for information on replacing lost keys.
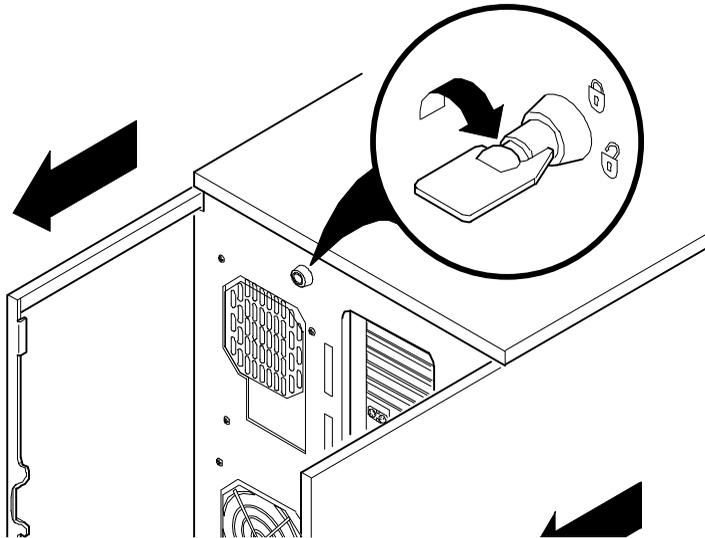
Figure 10-2. Left and Right Side Panel Lock

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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 Chapter 4, "Server Management," and take the appropriate steps to correct the problem. After the problem has been resolved, restart the server.

2. Either 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 switch SW1 to password clear (switch on).

   Refer to Appendix A, "Technical Specifications," Main Logic Board Switch Settings, and Figure A-1 for additional information.

3. Reconnect your server and turn it on.

   Booting your server with this switch in the down position erases the existing password(s).

4. Turn off your server and remove the left side panel.

5. Change switch SW1 to normal mode (switch up).

6. Reconnect your server and turn it on.

7. Using the SCU, assign a new password.

   Refer to Appendix C, "SCU Features," for more information.

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Additional Security Features

Additional server security features are available as options in the SCU and through main logic board switch settings.

The SCU includes the following setup options to improve server security:

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

- Network Server —— Setting this option to `Enabled` will allow the server to boot without a keyboard connected to the server.

- Fixed Disk Boot Sector —— Setting this option to `Write Protected` prevents writing to the hard disk drive boot sector.

Troubleshooting *11*

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. Tables include:

- Server Troubleshooting

- Disk Drive Troubleshooting

- SBB Troubleshooting

- Tape Drive Troubleshooting

- Monitor Troubleshooting

- CD-ROM Troubleshooting

- Diskette Drive Troubleshooting

- RAID Troubleshooting

    Refer to Chapter 4, "Server Management," for a list of messages that might display.

    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 6000 Series 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.

- Refer to Chapter 4, "Server Management," if the POST detects an error.

- 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. Refer to the next section "Running the Diagnostics."

- Run the SCU.

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

- Run SCSISelect if you have problems after connecting a SCSI device.

  Refer to Chapter 2, "Server Software and 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 authorized service provider for assistance and recommendations. Refer to the "Service Area" on the server CD-ROM for the phone numbers in your area.

Running the Diagnostics

The Prioris HX 6000 server comes with an advanced set of diagnostic utilities that are used to identify and correct problems that are encountered when configuring or troubleshooting the server.

The diagnostics are available from:

- The Utilities folder on the ServerWORKS Quick Launch CD-ROM. Use Quick Launch to create a bootable diagnostics disk. To run the diagnostics, insert the diskette and reboot the server.

- The server's MS-DOS partition (if the partition was created during the Quick Launch installation process). To run the diagnostics from the MS-DOS partition, enter:

```
c:\diag\diagnose.bat
```

The server reboots, at the boot to selection, select MS-DOS.

> **NOTE:** When running diagnostics from diskette, the "User Test" on disk #2 cannot be run.

Once the diagnostics are started, the main screen appears.

A menu option is selected by using the up and down arrow keys to move to the item and to highlight it and then pressing [Enter]. Pressing the right or left arrow key displays a different menu.

For additional information on running the diagnostics, refer to the on-line manual which is located on Quick Launch under the "Documentation" button.

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Diagnostics Utility Keys

Key	Description
<Esc>	Either exits the diagnostics (if a test are not running) or halts the current test (if a test is running)
<Alt> <H>	Displays/hides the destructive tests on the hard disk drive, diskette drive, and SCSI test menus
<Enter>	Run the highlighted diagnostics test
<F1>	Displays help screens
<F2>	Edit batch parameters
<F3>	Load batch parameters
<F4>	Save batch parameters
<F5>	Select or deselect the current test
<F6>	Select or deselect the tests on a specific diagnostics menu
<F7>	Select or deselect all diagnostics tests
<F10>	Run the selected test or tests

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 authorized service provider.
	Main logic board switches incorrectly set.	Set all appropriate switches.
	CPU module has failed.	Reseat the CPU module.
	CPU module switches incorrectly set.	Make sure all switches are correctly set.
	Side panels removed.	Install side panels.
	Power supply failed.	Contact your authorized service provider.

continued

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Problem	Possible Cause	Action
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 authorized service provider.
	Monitor has failed.	Replace monitor or contact your authorized service provider.
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 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 9.
	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 incorrectly after installing a CPU module.	CPU module installed incorrectly.	Reinstall CPU module.
	SCU indicates an error after installing a CPU module.	Remove CPU module and reboot. If server boots without errors, replace CPU module.

continued

Problem	Possible Cause	Action
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 8.
	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).	Memory configured incorrectly.	Check that the memory configuration is according to the memory guidelines explained Chapter 6, "Installing Additional Memory."
	SIMMs installed incorrectly.	Remove SIMMs and reinstall.
	SIMMs have failed.	Replace SIMMs.
	CPU module installed incorrectly.	Reinstall CPU module.
	CPU module failed.	Replace CPU module.

continued

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Problem	Possible Cause	Action
No response to keyboard 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 authorized service provider.
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.
	Mouse trackball dirty.	Clean trackball.
	Mouse failed.	Replace mouse or contact your authorized service provider.
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 3 and Appendix C.

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 7.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	SCSI host adapter has failed.	Contact your authorized service provider.
	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI host adapter, SCSI device or backplane.	Refer to Chapter 9 for cabling information.
	SCSI device has failed.	Replace SCSI device.

continued

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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 7.
	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 9.
	SCSI controller has failed.	Contact your authorized service provider.
	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI controller and rear panel connector or external SCSI device and rear panel connector.	Refer to Chapter 9 for cabling information.
	SCSI device has failed.	Replace SCSI device.

continued

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. **CAUTION:** Formatting the SCSI hard disk drive will destroy all the data on the drive.
	SCSI device drivers not installed or incorrectly installed on SCSI boot hard disk drive.	Properly install all required SCSI device drivers. Refer to Chapter 2.
	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.
	SCSI device has failed.	Replace SCSI device.
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 7 for additional information.

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SBB Troubleshooting

Problem	Possible Cause	Action
SBB fault LED lit.	Disk drive failed.	Replace disk drive.
SBB activity and fault LEDs lit.	Disk drive hung or has failed.	Replace disk drive.
SBB fault LED flashing.	Disk drive failed and is spinning down.	Replace disk drive.
SBB fault status LED is either on or off; fault status LED flashing.	Disk drive is active and spinning down due to a fault.	Correct the fault or replace the disk drive.

Tape Drive Troubleshooting

Problem	Possible Cause	Action
Tape will not load.	Tape inserted incorrectly.	Insert the tape with the arrow on the cassette pointing towards the drive.
Cannot write data to a tape.	Tape write-protected.	Slide the write-protect tab on the cassette to the closed position.
Tape will not eject.	Tape jammed in drive.	Using a small screwdriver, rotate the motor shaft clockwise to bring threading mechanism to the initial loading position.
		If necessary, press the ratchet mechanism to tighten the tape before ejecting.
		Continue to turn the motor shaft clockwise until the tape can be lifted out of the drive mechanism and ejected from the drive.

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 authorized service provider.
No screen display.	Configuration error.	Run the SCU to configure the server for video operation.
	Monitor brightness and contrast controls are incorrectly set.	Adjust the monitor brightness and contrast controls.
	Monitor has failed.	Replace monitor, or contact your authorized service provider.
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

PRIORIS HX 6000

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.
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 the documentation supplied with your monitor.

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 7.
	Tray open.	Close the tray.
Power is on but indicator shows no activity.	No disc 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.

Diskette Drive Troubleshooting

Problem	Possible Cause	Action
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."
	Disabled in SCU.	Run the SCU and enable the diskette drive.
Server does not boot from a target diskette drive.	Drive ID incorrectly set.	Make sure the drive ID is correctly set. Refer to the documentation that came with the diskette drive.
	Diskette drive not enabled.	Run the SCU and 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.
Cannot write to target diskette drive.	Diskette drive write protected.	Run the SCU and disable the diskette write protection option.

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RAID Troubleshooting

Problem	Possible Cause	Action
SBB fault LED lit.	Disk drive failed.	Replace disk drive.
SBB activity and fault LEDs lit.	Disk drive hung or has failed.	Replace disk drive.
SBB fault LED flashing.	Disk drive failed and is spinning down.	Replace disk drive.
SBB fault status is either on or off; fault status LED flashing.	Disk drive is active and spinning down due to a fault.	Correct the fault or replace the disk drive.
Replaced SBB drive does not spin up to speed.	SBB drive not seen by RAID host adapter.	Manually rebuild the SBB drive.
		Remove the SBB drive, wait 20 seconds, reinsert SBB drive. Wait one minute and then rebuild the SBB drive.
Multiple SBB drives have failed.	No power available.	Restore power, run the RAID configuration utility and change the state of any failed (FLD) SBB drive to optimal (OPT).
		Run the RAID configuration utility and check for bad blocks on the SBB drives. Repair any bad blocks.
SBB drive not seen by RAID host adapter.	SCSI cable not connected.	Check all SCSI connections.
	Incorrect SCSI termination.	Properly terminate the SCSI bus.
	Duplicate SCSI IDs on the bus.	Check SBB drive SCSI ID settings.
	Defective SBB drive.	Replace SBB drive.
	SBB drive improperly inserted.	Reinsert SBB drive.
	Defective RAID host adapter SCSI channels.	Replace the RAID host adapter or contact your authorized service provider.

Service Procedures *12*

Introduction

The following sections provide detailed service instructions for Prioris HX 6000 Series servers.

△ **CAUTION:** 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 the computer to discharge any static electricity.

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

Recommended Tools

Have the following tools available:

- Multimeter (4½-inch digit)

- Phillips screwdriver

- Antistatic wrist strap

Other Materials Needed

Cleaning agent should be an all purpose cleaner that is used in-house.

Special Tools Required

None.

Remedial Diagnostic Test Software

Supplier information:

AMI Diagnostics
6145-F Northbelt Parkway
Norcross, GA 30071, U.S.A.
Voice: 1-770-246-8600
FAX: 1-770-246-8791
Support: 1-770-246-8645
Internet: http://www.megatrends.com

Internal pointer for AMI:

http://pcbu.ako.dec.com/

To get the released diagnostics for servers, select servers, and then software.

Virus Software Information

F-PROT, Virus Detection and Cleanup Software, latest version.

Supplier information:

North America, South America, Australia and New Zealand
Command software Systems Inc.
Tel: +1-407-575 3200
FAX: 1-407-575-3026

BIOS Version Information

Refer to the Digital Bulletin Board Service (BBS) for the latest information on BIOS upgrades by calling:

In the United States: (508) 496-8800

Restoring the Module Serial Number

When the main logic board or CPU module is replaced, the serial number stored on the main logic board or CPU module must be updated using the SCU. After a change, the part number is displayed as invalid.

Removing and Replacing Components

The following sections provide removal and replacement procedures for the following Prioris HX 6000 Series server components:

NOTE: The removal and replacement procedures for the remaining server components can be found in Chapters 3 through 8.

- Power supply

- Diskette drive

- CD-ROM drive

- Cooling fans

- Secondary cooling fan 2

- Cooling fan 5

- Speaker

- Main logic board

- Storage backplane

- Casters

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Removing and Replacing the Power Supply

1. Turn off the server.

2. Remove the ac power cord and monitor cables, if applicable.

3. Unlock and remove the right side panel.

4. Disconnect the wire harness connectors from the power supply.

5. Remove the four screws from the rear of the chassis.

6. Remove the power supply.

7. Replace the power supply by performing the removal steps in reverse order.
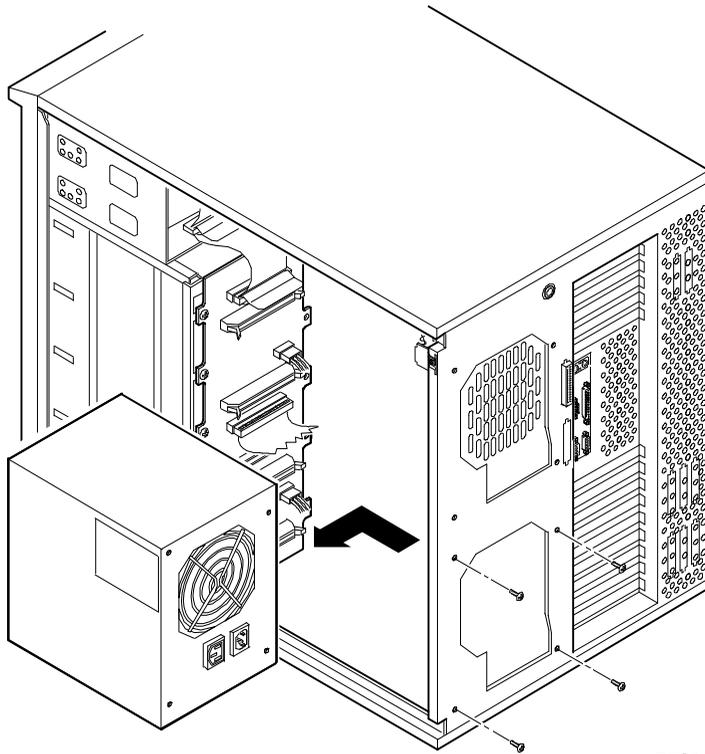
DEC01071

Figure 12-1. Removing and Replacing the Power Supply

Removing and Replacing the Diskette Drive

1. Turn off the server.
2. Unlock and remove the left side panel.
3. Open the door.
4. Disconnect the power and data cables from the drive.
5. Remove the two screws from the drive bay.
6. Slide the drive out from the front of the drive bay.
7. Replace the diskette drive by performing the removal steps in reverse order.
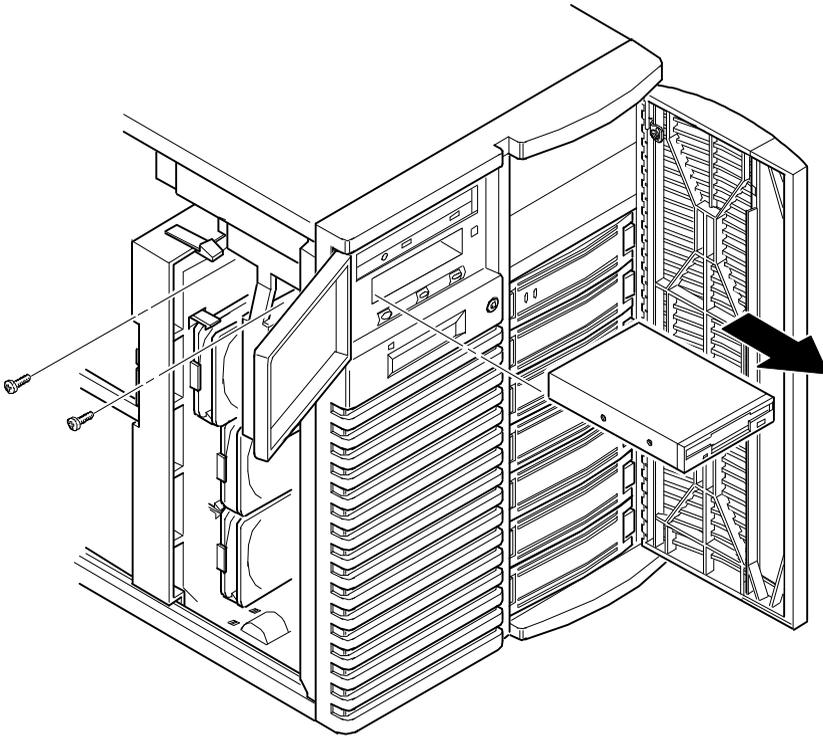
DEC01077-2

Figure 12-2. Removing and Replacing the Diskette Drive

Removing and Replacing the CD-ROM Drive

1. Turn off the server.

2. Unlock and the remove left side panel.

3. Open the door.

4. Disconnect the power and data cables from the CD-ROM drive.

5. Remove the two screws from the drive bay.

6. Slide the drive out from the drive bay by applying pressure at the rear of the CD-ROM drive.

7. Remove the right side bracket from the right side of the CD-ROM drive.

8. Set jumpers on the new CD-ROM drive identical to those on the removed CD-ROM drive.

9. Replace the CD-ROM drive by performing the removal steps in reverse order.
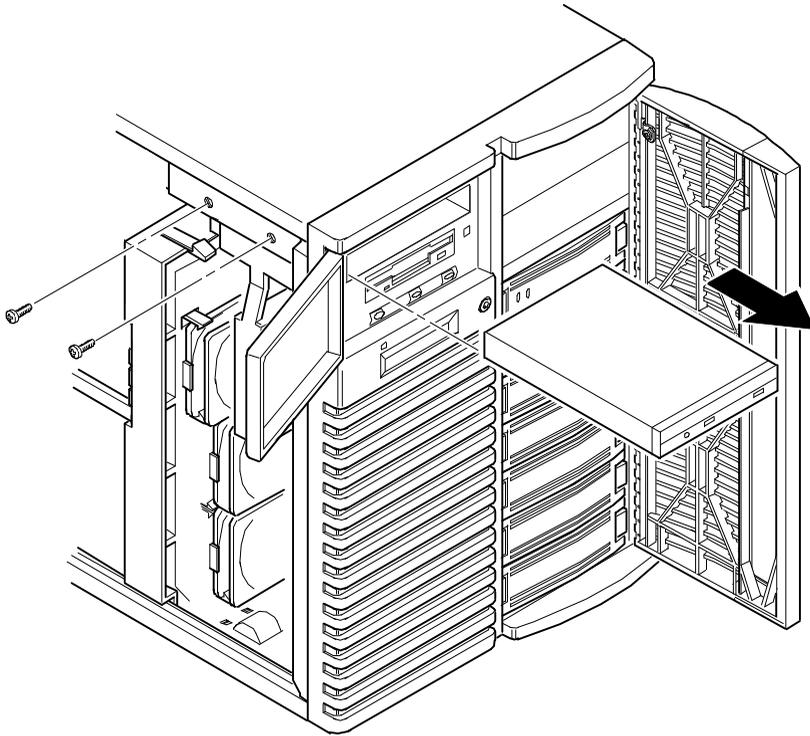
DEC01077-3

Figure 12-3. Removing and Replacing the CD-ROM Drive

Removing and Replacing a Cooling Fan

The following procedure can be used to remove primary cooling fan 1, secondary cooling fan 4, and primary cooling fan 3.

1. Turn off the server.
2. Unlock and remove the left side panel.
3. Disconnect the fan cable from the main logic board.
4. Release the fan from the plastic tabs.
5. Remove the fan from the chassis.
6. Replace the fan by performing the removal steps in reverse order.
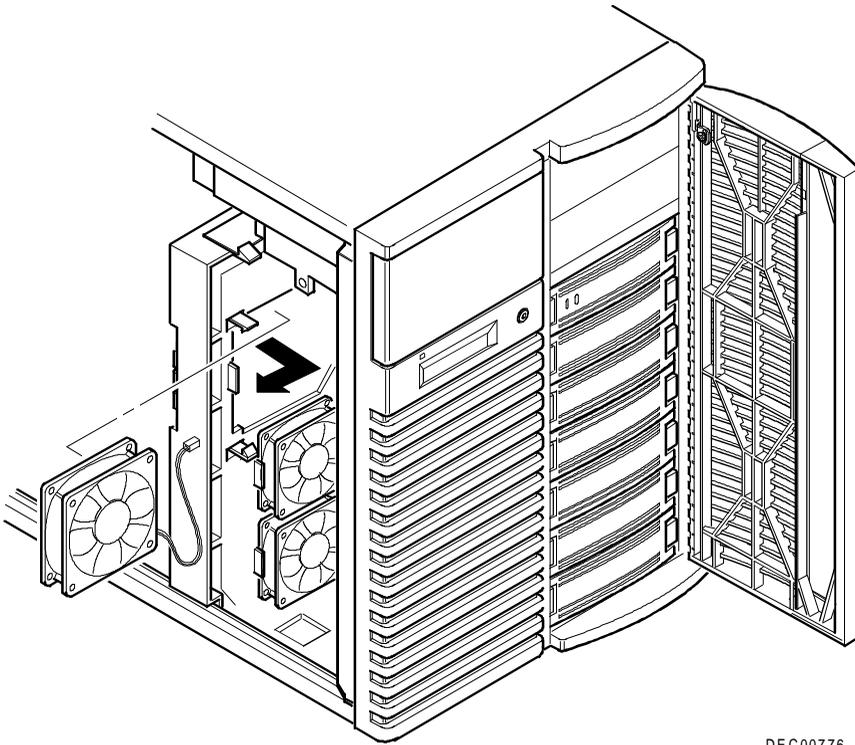
DEC00776

Figure 12-4. Removing and Replacing a Cooling Fan

PRIORIS HX 6000

Removing and Replacing the Secondary Cooling Fan 2

1. Turn off the server.

2. Unlock and remove the left side panel.

3. Disconnect the fan cable from the main logic board.

4. Remove the screw.

5. Remove the fan from the chassis.

6. Remove the fan from the bracket.

7. Replace the fan by performing the removal steps in reverse order.
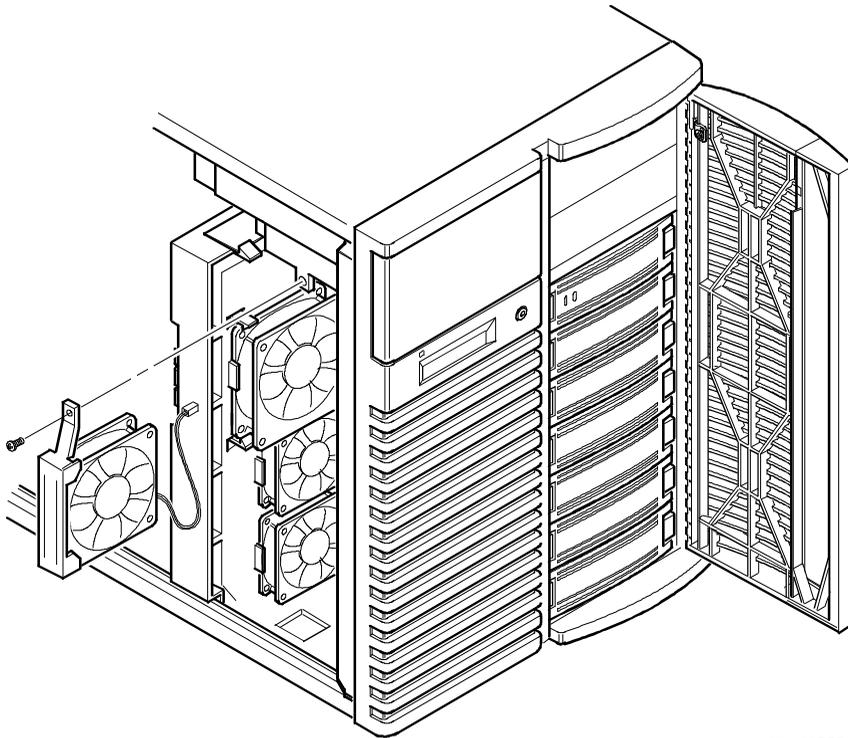
DEC00777

Figure 12-5. Removing and Replacing the Secondary Cooling Fan 2

Removing and Replacing Cooling Fan 5

1. Turn off the server.

2. Unlock and remove the left and right side panel.

3. Disconnect the fan cable from the main logic board.

4. Remove the four screws securing the fan and brace to the chassis.

5. Remove the fan and brace from the chassis.

6. Remove the four screws securing the fan to the bracket.

7. Replace the fan and bracket by performing the removal steps in reverse order.
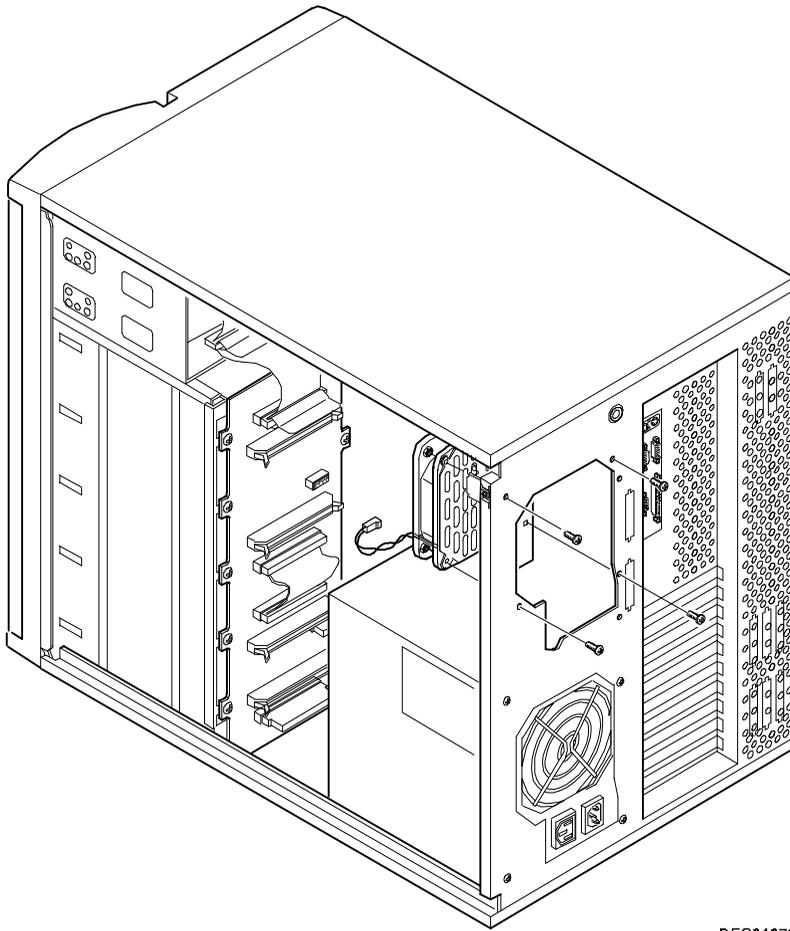
DEC01078

Figure 12-6. Removing and Replacing Cooling Fan 5

Removing and Replacing the Speaker

1. Turn off the server.

2. Unlock and remove the left side panel.

3. Disconnect the speaker cable from the main logic board.

4. Remove the speaker from the chassis.

5. Replace the speaker by performing the removal steps in reverse order.
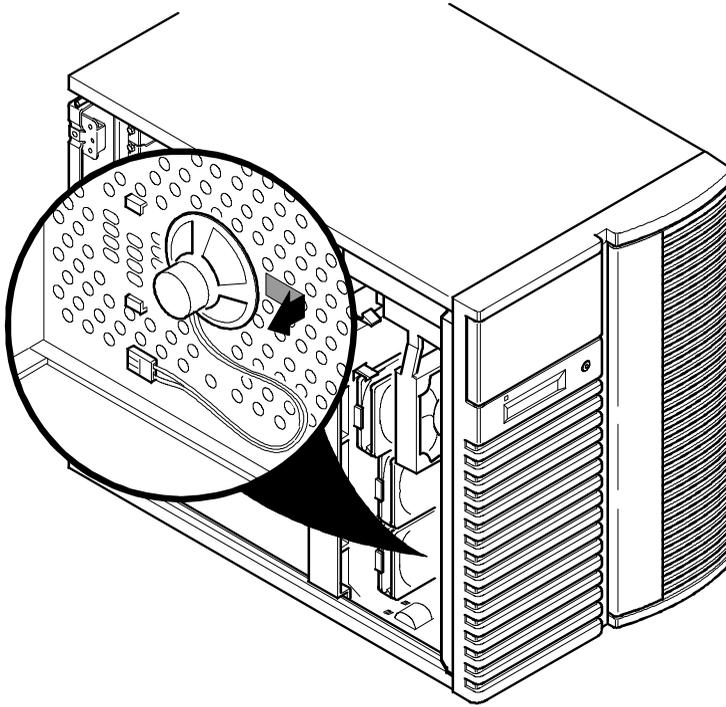
DEC00778

Figure 12-7. Removing and Replacing the Speaker

PRIORIS HX 6000

Removing and Replacing the Main Logic Board

1. Turn off the server.

2. Disconnect all external cables from the I/O expansion modules located at the rear of server.

3. Unlock and remove the left side panel.

4. Disconnect all cables from the main logic board.

5. Record all EISA and PCI slot assignments before removing the expansion boards.

6. Remove the expansion boards, CPU module, and network card.

7. Remove the two screws securing the main logic board to the chassis (A, Figure 12-8).

8. Loosen the six standoff screws (B, Figure 12-8).

9. Slide the main logic board to the right to release it from the standoffs.

10. Remove the main logic board from the chassis.

11. Configure switch SW1 on the new main logic board.

12. If the new main logic board does not have a battery/RTC, remove the battery/RTC from the old main logic board and replace it on the new main logic board.

13. Align the main logic board over the six standoff screws and then slide it to the left.

14. Reinstall and tighten the two screws removed in step 7.

15. Tighten the six standoff screws loosened in step 8.

16. Using the side panel label as a reference, reconnect all cables to the main logic board.

17. Using information recorded in step 5, reinstall the expansion boards, CPU module, and network card to their original configuration.

18. Reconnect all external and internal cable connections.

19. Reinstall and lock the left and right side panel.

20. Turn on the server.

21. Run the SCU to configure the server and restore the system management information.
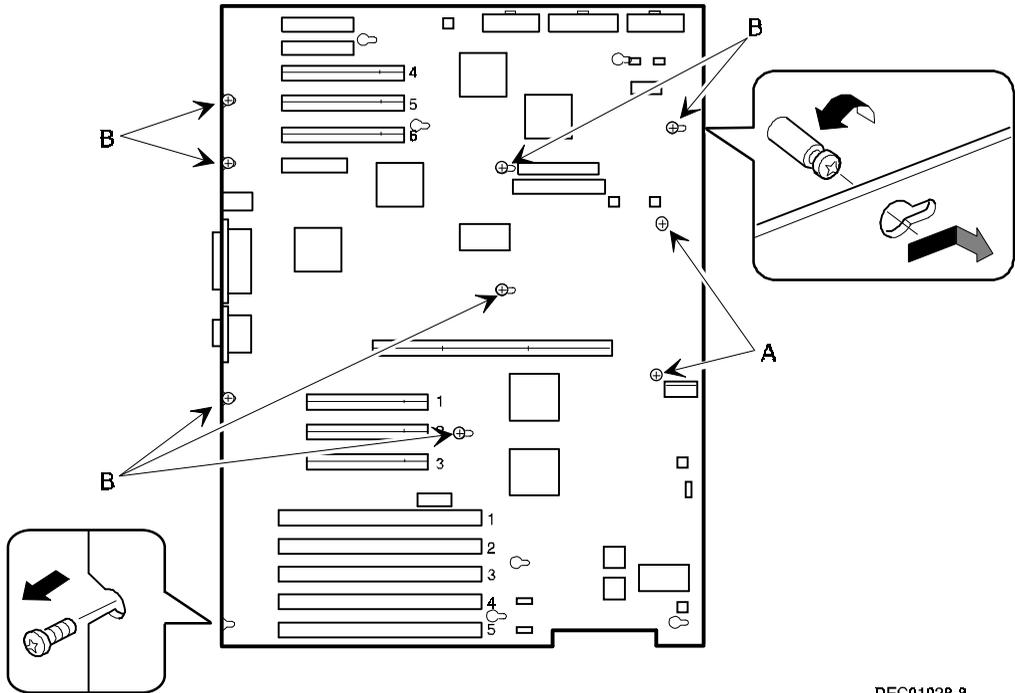
DEC01028-8

Figure 12-8. Removing and Replacing the Main Logic Board

Removing and Replacing the Storage Backplane

1. Turn off the server.

2. Unlock and remove the right side panel.

3. Record all cable configuration information.

4. Disconnect all cables and terminators.

5. Before removing SBB devices, record how they are configured.

6. Remove all devices connected to storage backplane.

7. Remove the ten screws.

8. Remove the storage backplane from the chassis.

9. Configure the J181 jumpers located on new storage backplane so they are identical to settings on storage backplane being replaced. Also configure jumper cables and terminators as they were previously configured on the storage backplane being replaced.

10. Install the new storage backplane into the chassis.

11. Reinstall and tighten the ten screws securing the storage backplane in chassis.

12. Using the configuration information recorded in step 5, replace the SBB devices.

13. Using the cabling information recorded in step 3, reconnect the cables and terminators.

14. Replace and lock the right side panel.
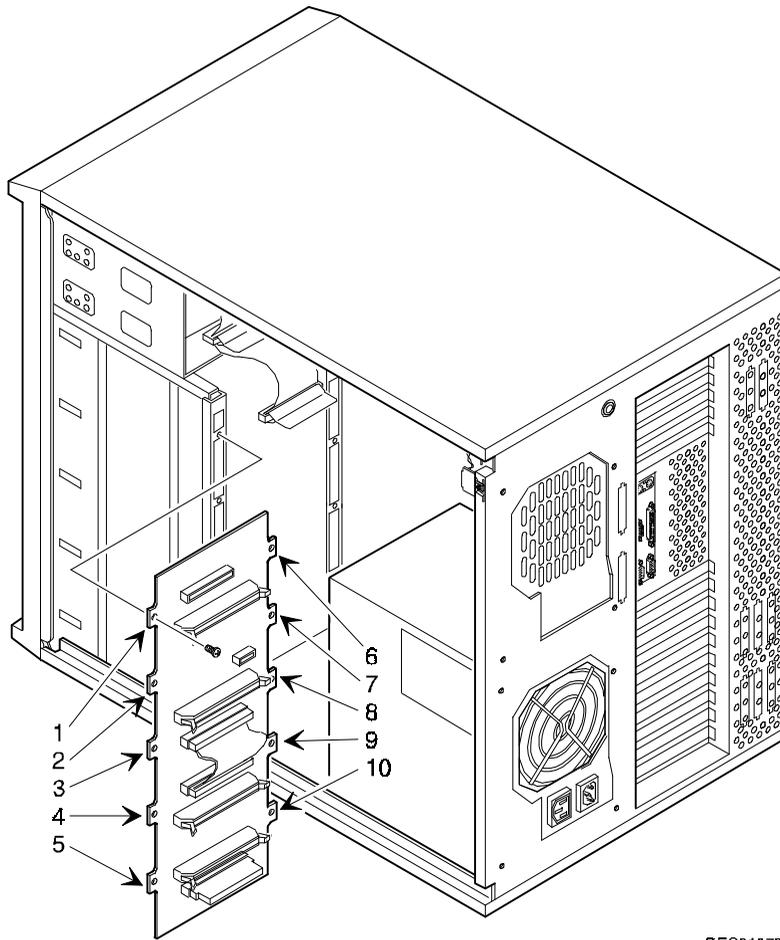
DEC01079

Figure 12-9. Removing and Replacing the Storage Backplane

Removing and Replacing a Caster

1. Turn off the server.

2. Carefully lay the server on its side.

   Note that the right and left casters are different.

3. If removing the left- or right-front caster, release the server brake. Otherwise, skip to step 4.

4. Remove the screw.

5. Release the caster from metal tab.

6. Remove the caster from the chassis.

7. Replace the caster by performing the removal steps in reverse order.
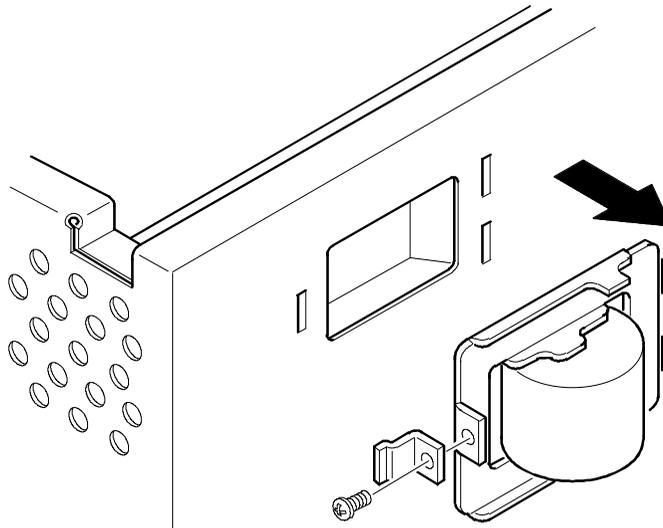
DEC00779

Figure 12-10. Removing and Replacing a Caster

PRIORIS HX 6000

Field Service IPB *13*

Introduction

Following is an illustrated parts breakdown for the Prioris HX 6000 Series server. Parts tables and support illustrations include: server front view, server left-side view, and server right-side/rear view.

Server Front View

Figure Legend	Orderable Spare Part	Description
1	70-31674-05 70-31901-05	Enclosure assembly, frost white Enclosure subassembly (without power supply), frost white
2	70-31898-03	Front bezel assembly, frost white
3	74-49277-01	Push button (3)
4	54-23594-01	OCP module
5	30-43447-01	LCD,DV16100 S2FTLY
6	70-31897-01 70-31897-02	Caster left (front and back) Caster right (front and back)
7	12-39309-04	Speaker assembly, 270 mm
8	74-49365-01	Drive holder (CD-ROM, right side)
9	12-43231-04	Front keylock assembly
10	70-30796-05	Cover assembly, 5.25-inch drive, frost white
11A 11B	74-48642-01 74-48642-02	SBB rail, right SBB rail, left
12	70-31906-02	Door assembly, frost white
13	70-31675-02	Side panels (left and right), frost white
14	30-48019-01	5.25-inch, half-height quad speed CD-ROM, frost white
15	00-PCXRJ-AD	3.5-inch, floppy disk drive, 1.44 MB, frost white
16	RZ28C-VW RZ29C-VW	2 GB 3.5-inch SCSI BB 4 GB 3.5-inch SCSI BB
17	74-49586-01	Brake assy, frost white
18	70-31918-02	Door assy, driver
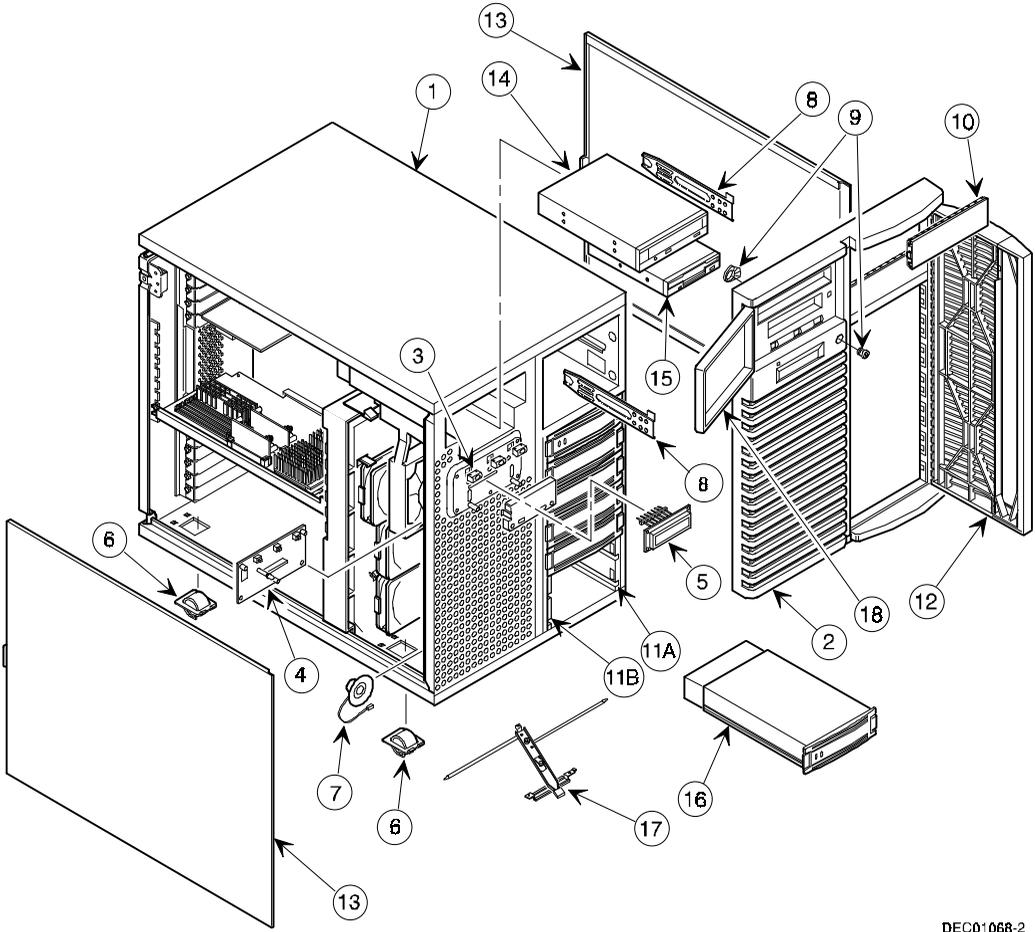
DEC01068-2

Figure 13-1. Server Front View

PRIORIS HX 6000

Server Left-Side View

Figure Legend	Orderable Spare Part	Description
1A	12-41569-02	Primary fan
1B	12-41569-06	Secondary fan
2	17-04096-01	Flat 10-pin cable assembly (OCP power/data cable)
3	21-39151-01	Real-time clock (server battery)
	(or substitute part 21-39151-02)	
4	54-24568-01	Main logic board
5	54-24576-01	Module, 10/100 base Enet daughter card
6	54-24590-01	CPU module without CPU
	70-32544-01	Single P6 200 256 cache CPU module
	70-32544-02	Dual P6 200 256 cache CPU module
	70-32544-03	Single P6 200 512 cache CPU module
	70-32544-04	Dual P6 200 512 cache CPU module
7	70-32520-01	Retainer assembly (for CPU module)
8	20-47282-17	EDO SIMM, 8 MB
	54-24123-AA	EDO SIMM, 64 MB
	20-47283-17	EDO SIMM, 16 MB
	20-47281-17	EDO SIMM, 32 MB
	54-24123-AA	SIMM, 128 MB
9	17-03460-08	Flat 34-pin cable assembly (for diskette drive)
10	17-03895-06	50-pin SCSI cable assembly (five connectors), for CD-ROM
11	17-04143-04	68-pin SCSI cable assembly (two connectors unshielded) (2)
12	17-04142-01	Cable assembly, 68COND, SCSI-3, 1 male, 2 female (connects to external SCSI knockout
13	54-24052-01	CPU module VRMs
14A	12-44211-01	Primary fan
14B	12-44211-01	Secondary fan
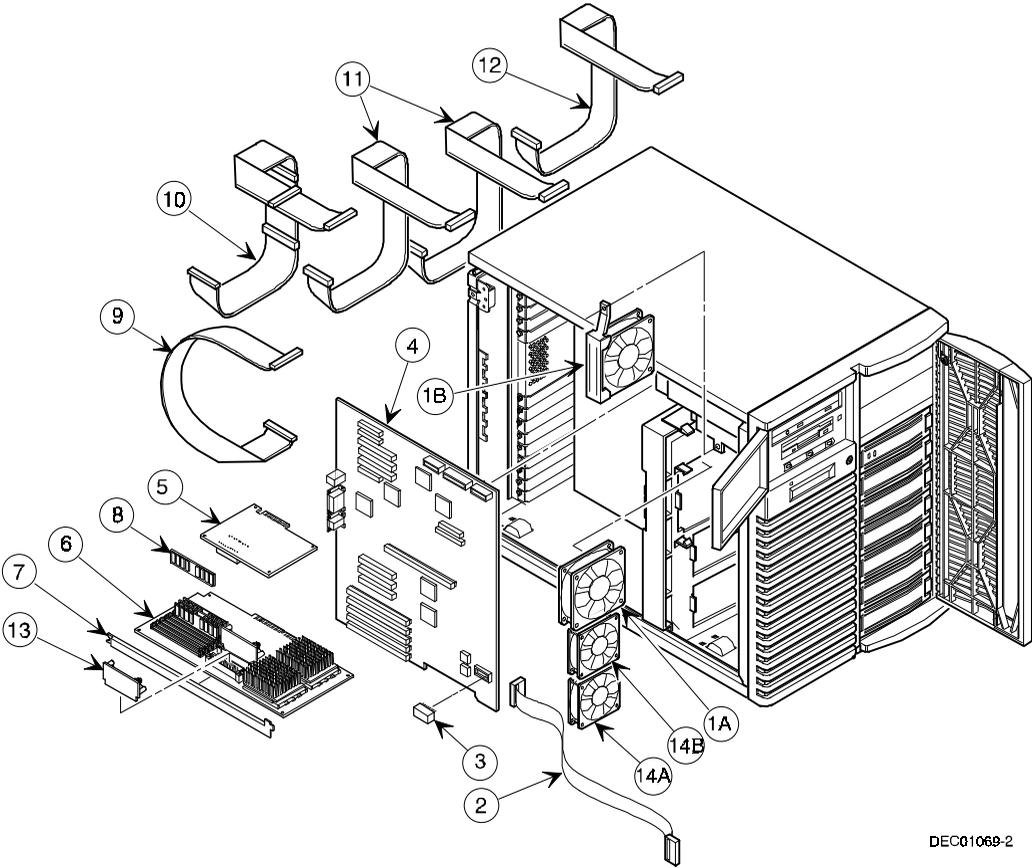
Figure 13-2. Server Left-Side View

DEC01069-2

PRIORIS HX 6000

Server Right-Side/Rear View

Figure Legend	Orderable Spare Part	Description
1	70-31919-01	Door lock assembly
2	12-37977-04	Rear keylock assembly
3	70-31909-01	Micro switch cable assembly
4	74-48300-01	I/O expansion board cover bracket
5	30-43120-01	Power supply (1)
6	70-31890-01	Wire assembly (three wires)
7	70-31894-01	Wire assembly (12 wires)
8	70-31928-01	System power wire assembly
9	17-04143-02	68-pin SCSI cable assembly (jumper cable)
10	12-41768-03	SCSI terminator 68-position single-ended
11	54-23384-02	Hot-swap backplane module
12	12-41569-07	Fan assy, 120 x 120 MM
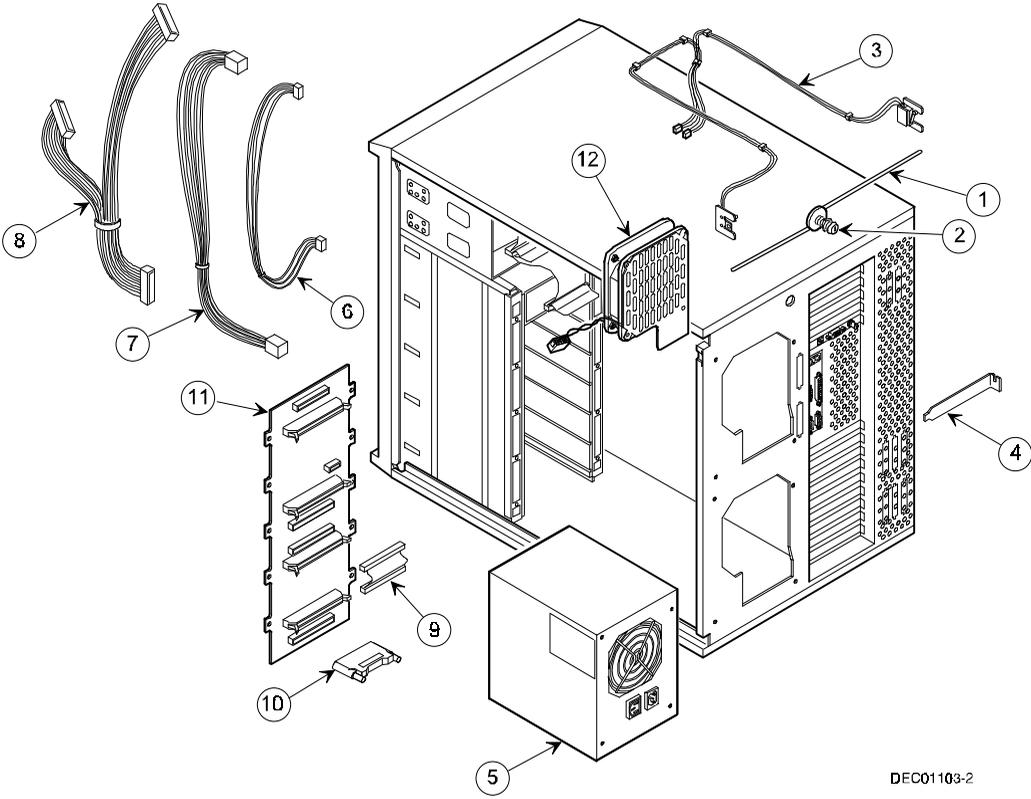
Figure 13-3. Server Right-Side/Rear View

PRIORIS HX 6000

Miscellaneous

Orderable Spare Part	Description
30-42584-01	Proteon EISA token ring NIC
30-41854-01	14.4 bps data/fax modem
30-42291-01	28.8 data/14.4 fax modem
30-43529-02	Adapter, host, PCI SCSI wide 2-channel (3940W)
30-48127-01	Adaptec 3940W
30-46890-02	Rev C controller, 2-channel, RAID with battery (FR-PCTAR-BD)
30-48115-02	Rev E controller, 2-channel, RAID with battery (FR-PCTAR-BD)
30-47636-01	Battery backup (FR-PCTAR-UB)
PCXLA-NA	Keyboard, frost white
PCXLN-AB	PS/2 2-button mouse, frost white

Labels and Nameplates

Orderable Spare Part	Description
74-49386-42	Nameplate, Prioris HX 6000 Series
36-44556-01	Warning label, power switch
36-45369-05	Label, user info guide (right)
36-45369-04	Label, user info guide (left)

Field Service Notes *14*

Field Service Notes

PRIORIS HX 6000

Field Service Notes

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Field Service Notes

Product Reference and Support 15

Introduction

A variety of support information is available to help you set up, configure, and operate your Prioris HX 6000 Series server. This information comes in the form of README information, on-line help, electronic books, or as printed material.

If you want to...	Refer to the...
Set up your server	*Server Installation Guide* to unpack, install internal components, connect external devices and power, and access the ServerWORKS Quick Launch program.
Load the supplied ServerWORKS software	*ServerWORKS Quick Launch Reference Guide*. README information contained on the ServerWORKS Quick Launch CD-ROM disk.
Locate the major internal components of your Prioris HX 6000 Series server	*Side Panel Label* on the inside of your server's right and left side panels.

If you want to...	Refer to the...
Upgrade and configure your server after installing optional components (for example, a CPU module, memory, mass storage devices, SCSI or RAID adapters, etc.)	Information supplied in this System Reference. Supplied SCSI, RAID, and other options documentation. These are supplied as either manuals or as files on the Quick Launch CD-ROM.
Run diagnostics	*ServerWORKS Quick Launch Reference Guide* and the Quick Launch program on the supplied CD-ROM disk. Supplied diagnostics documentation which is on the Quick Launch CD-ROM.

Technical Specifications A
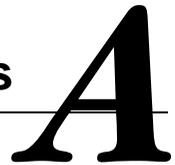
Introduction

This appendix provides the following technical characteristics for your server:

- Server specifications
- EISA expansion slots
- PCI expansion slots
- Power supply input power requirements
- Power supply output specifications
- Power cord requirements
- Main logic board switch settings
- CPU module switch settings

Server Specifications

The following sections list the server performance, dimensions and environmental specifications.

Performance Specifications

Attributes	Specification
Bus clock	
EISA	7.5/8.33 MHz
PCI	30/33 MHz
Data I/O	
EISA	8-bit, 16-bit, and 32-bit
PCI	32-bit
Memory DRAM	32 MB minimum
	512 MB maximum
	Supports 36-bit, 60 ns EDO memory and Fast-Page memory
System flash ROM BIOS	128 KB
VGA flash ROM BIOS	128 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 lb.)

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 five 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

PRIORIS HX 6000

Power Supply 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

Power Supply Output Specifications

Your server family power supply provides the following output ratings:

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

- +3.3 V dc   0 A min, 37.4 A max.

- +12 V dc   0.5 A min, 11 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 +3.3 V dc maximum total output: 355 W.
+5 V dc and +3.3 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).

- One power cord is required for each installed power supply.

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Environmental Features

This product has been designed with several features intended to reduce environmental impact in manufacturing, use, and end-of-life disposition.

Ozone Depleting Substances (ODS)

This product and its shipping package do not contain nor are they manufactured with Class I ODS, as defined in Title VI, section 611 of the clean air act amendments of 1990.

Use of asbestos

Digital Equipment Corporation does not use asbestos in any form in the manufacturing of its products.

Recycled paper in documentation

User documentation is printed on paper with a post-consumer recycled content of between 10 and 60%.

Use of PVC in enclosure pieces

Polyvinylchloride (PVC) is not used in plastic enclosure pieces.

Design for disassembly/re-cycling

This product has been designed for ease of disassembly so that materials can be easily separated for recycling at the end of the product's useful life. One type of fastener is generally used to minimize tools required to disassemble. Plastic components have been marked with standard identification symbols to facilitate separation for recycling. Snap fit fastening techniques have been used, where possible, to reduce disassembly effort. Fastening of dissimilar materials can be disconnected, allowing materials to be separated for recycling.

Environmental packaging features

The outer container on this product is made from unbleached, natural Kraft corrugated fiberboard which can be readily recycled in most areas. Protective cushioning pieces are made from expandable polypropylene which is more efficient than other foams and requires less material to provide equivalent protection, thereby reducing packaging waste. The cushioning pieces are marked with the Society of the Plastics Industry (SPI) material identification symbol for polypropylene to facilitate recycling.

Main Logic Board Switch and Jumper Settings

The following table lists the main logic board switch settings, jumper settings, and factory-default settings. Figure A-1 shows the switch and jumper locations.

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 server chassis. A static discharge from your fingers can result in permanent damage to electronic components.

PRIORIS HX 6000

Feature	Function	Setting	Description
BIOS upgrade	Disabled[1] Enabled	SW1-1, off[1] SW1-1, on	Your main logic board's flash BIOS upgrade switch must be set to the disabled (OFF) position 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.
Recovery mode	Normal mode[1] Recovery mode	SW1-2, off[1] SW1-2, on	If your BIOS upgrade failed, refer to the README.TXT file that came with the BIOS upgrade.
Boot block update	Disabled[1] Enabled	SW1-3, off[1] SW1-3, on	Set this switch to disabled (OFF) position to prevent unauthorized personnel from changing the BIOS boot block.
Password clear	Normal[1] Password clear (MFG test)	SW1-4, off[1] SW1-4, on	If you forget your password, set this switch to the password clear (ON) position and then restart your server. Refer to Chapter 9 for more information.
RSM installed	Installed Not installed[1]	SW1-5, off SW1-5, on[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 RSM and change the switch position to the installed (OFF) position.
NVRAM	Normal operation[1] Clear	SW1-6, off[1] SW1-6, on	Clears contents of NVRAM. Set only in the case when a configuration change using the SCU did not complete successfully (e.g. power failed while configuring), or a configuration was defined which no longer allows the server to boot. The BIOS settings will return to their default values, and the SCU will need to be rerun to reconfigure the server.
Reserved	Reserved	SW1-7, off[1]	This switch should always be OFF.
Reserved	Reserved	SW1-8, off[1]	This switch should always be OFF.
MREQ slot 4	No delay[1] delay one EISA clock	J56, pins 1 and 2[1] J56, pins 2 and 3	Allows you to delay a memory request to EISA slot 4 by one EISA clock or no delay. **Note:** If the installed EISA expansion board has an Intel 82355 BMIC chip, the the jumper should be set to delay one EISA clock.
MREQ slot 5	No delay[1] delay one EISA clock	J57, pins 1 and 2[1] J57, pins 2 and 3	Allows you to delay a memory request to EISA slot 5 by one EISA clock or no delay. **Note:** If the installed EISA expansion board has an Intel 82355 BMIC chip, the the jumper should be set to delay one EISA clock.

(1) Factory default setting

ON = switch closed; OFF = switch open

DEC01028-6
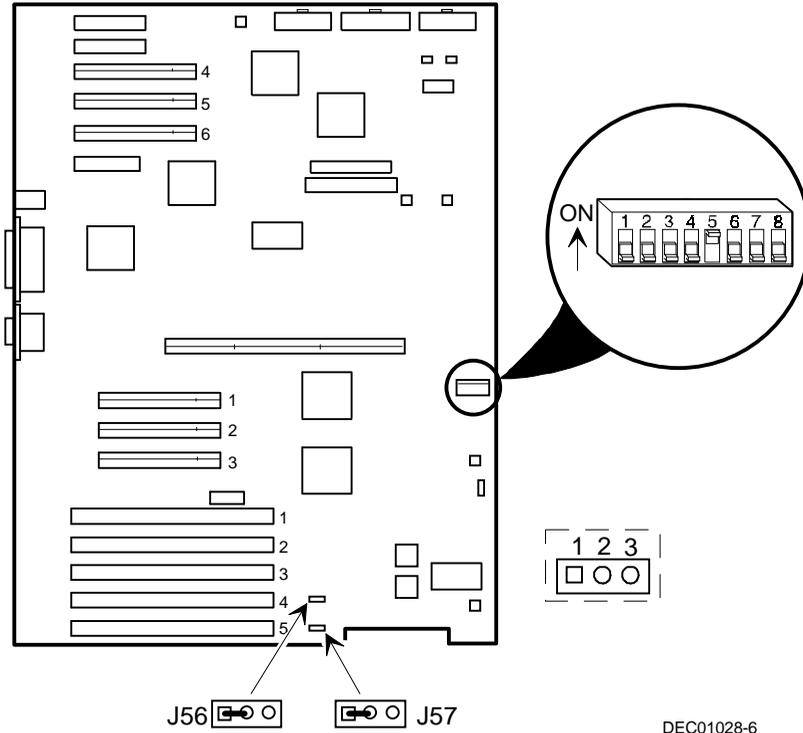
Figure A-1. Main Logic Board Switch and Jumper Locations

CPU Module Switch and Jumper Settings

The following table lists the CPU module switch settings, jumper settings, and factory default settings. Figure A-2 shows the switch and jumper locations.

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 server chassis. A static discharge from your fingers can result in permanent damage to electronic components.

Feature	Setting	Description
Bus frequency	SW4-1, up SW4-1, down[1]	60 MHz 66 MHz
Bus/core frequency ratio	SW4-2, down SW4-3, down SW4-4, down	2x
	SW4-2, up SW4-3, down SW4-4, down	2.5x
	SW4-2, down[1] SW4-3, up[1] SW4-4, down[1]	3x
	SW4-2, up SW4-3, up SW4-4, down	3.5x
	SW4-2, down SW4-3, down SW4-4, up	4x
Manufacturing test point	J16, installed J16, not installed[1]	This jumper should not be installed
Manufacturing test point	J17, installed J17, not installed[1]	This jumper should not be installed

(1) Factory default setting for 200 MHz CPU

DOWN = switch closed (ON); UP = switch open (OFF)
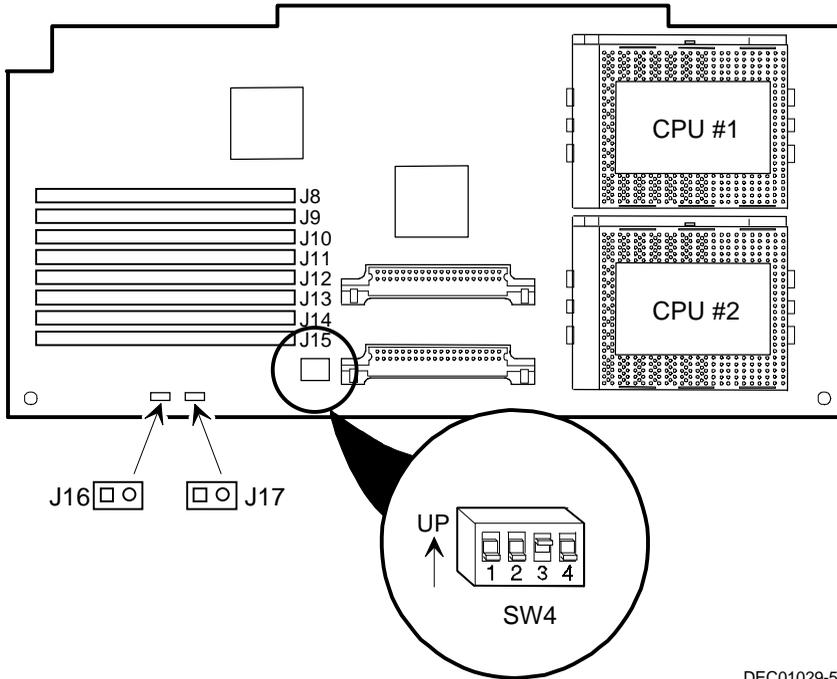
DEC01029-5

Figure A-2. CPU Module Switch and Jumper Locations

Device Mapping B

Introduction

This appendix provides a series of tables listing map and address information related to server memory and various main logic board devices (such as keyboard controller and interrupt controller).

Your server memory and address locations are allocated at the factory to operate within a standard environment. However, due to the number of optional devices and/or expansion boards that are available, sometimes memory and address locations need to be changed. For example, some expansion boards require a specific memory location. If that location is already allocated, a memory conflict results and the expansion board will not operate as expected. Note that some memory, I/O and interrupt locations can be changed using the SCU.

CAUTION: Before changing any memory or address location, refer to the documentation supplied with the optional device, expansion board, or software application and make sure adequate information is available. If not, contact the option or software manufacturer for further information.

CPU Memory Address Map

Address Range	Function	Size
00000 to 9FFFF	Main memory	640 KB
A0000 to BFFFF	PCI/EISA/ISA video buffer memory	128 KB
C0000 to C7FFF	Video memory BIOS	32 KB
C8000 to DFFFF	PCI/EISA/ISA expansion board BIOS and buffer memory	96 KB
E0000 to EFFFF	EISA/ISA adapter RAM (non-shadow)	64 KB
F0000 to FFFFF	System BIOS memory	64 KB

I/O Address Map

Range (hexadecimal)	Function
060 to 064	Keyboard/mouse controller
0F0 to 0FF	Math co-processor
1F0 to 1F7	IDE controller (if enabled)
278 to 27F	LPT2 (if enabled)
2E8	COM4 (if enabled)
2F8	COM2 (if enabled)
378 to 37F	LPT1 (if enabled)
3BC to 3BE	LPT3 (if enabled)
3E8	COM3 (if enabled)
3F0 to 3F7	Diskette controller (if enabled)
3F8	COM1 (if enabled)

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Server Interrupt Levels

Interrupt Number	Interrupt Source
IRQ1	Keyboard controller
IRQ3	COM2, COM4 (if enabled)
IRQ4	COM1, COM3 (if enabled)
IRQ6	Diskette controller (if enabled)
IRQ7	LPT1, LPT2, LPT3 (if enabled)
IRQ12	Mouse interrupt
IRQ13	Math co-processor

PCI Configuration Space Address Map

PCI Bus No.	Device No.	Device
0	00h	Host bridge
0	07h	EISA bridge
0	0Dh	PCI slot 1
0	0Eh	PCI slot 2
0	0Fh	PCI slot 3
0	11h	Secondary PCI bridge
0	12h	PCI VGA trio 32/64
1	08h	PCI slot 4
1	09h	PCI slot 5
1	0Ah	PCI slot 6
1	0Dh	DC21142 Ethernet controller
1	13h	Primary and secondary 7880 Ultra SCSI controllers

SCU Features *C*
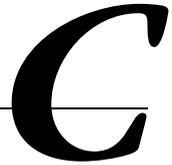
Introduction

After entering the SCU, you can edit a variety of resources and configure your server for the most optimized condition. The following tables list the SCU options that are available in the SCU.

PRIORIS HX 6000

System - Prioris HX Series Server

Menu Fields	Settings	Comments
System processor type	Not user selectable	Displays the type of the processor that is resident on the CPU module.
System processor clock	Not user selectable	Displays the clock of the processor that is resident on the CPU module.
System base memory	Not user selectable	Displays the amount of base (conventional) memory each time your server boots.
System extended memory	[memory amount], AT-bus space disabled[1]	Displays the amount of extended memory each time your server boots.
	[memory amount], AT-bus space enabled at F00000h, 1M	You can select disabling or enabling one of three memory ranges that could be used by expansion boards.
System extended memory mode	Compatibility[1] Non-compatibility	Selects the means for supporting extended memory above 64 MB. Select [Compatibility] for using conventional service in BIOS.
		Select [Non-Compatibility] for memory support above 64 MB when using Windows NT v3.1 or above.
System reserved resources	Not user selectable	Displays the SCU configuration and file overlay information. Reserved resources are also shown.
System BIOS Language	English[1] Spanish French German Italian	Selects the language to display POST messages.

[1] Factory default setting

System Management Group

Menu Fields	Settings	Comments
System information	Not user selectable Installed as a default[1]	Select [Enter] to display the Asset number of the server and the System ID. The Asset number can be changed by the user.
Main logic board information	Not user selectable Installed as a default[1]	Select [Enter] to display main logic board information including Asset number, Serial number, Artwork Revision number, Model number, and System ID. The Asset number is the only item that can be changed by the user.
CPU module information	Not user selectable Not installed as a default[1]	Select [Enter] to display CPU module information including Asset number, Serial number, Artwork Revision number, Model number, and System ID. The Asset number is the only item that can be changed by the user.

(1)   Factory default setting

Diskette Drive Group

Menu Fields	Settings	Comments
Integrated diskette controller	Enabled[1] Disabled	Enables or disables the onboard diskette controller. The onboard diskette controller must be disabled if an external diskette controller performs the interfacing to the diskette drives.
Diskette drive A	Not Installed 5.25" 360 KB drive 5.25" 1.2 MB drive 3.5" 720 KB drive 3.5" 1.44 MB drive[1] 3.5" 2.88 MB drive	Sets the size and density of diskette drives.
Diskette drive B	Not Installed[1] 5.25" 360 KB drive 5.25" 1.2 MB drive 3.5" 720 KB drive 3.5" 1.44 MB drive 3.5" 2.88 MB drive	Sets the size and density of diskette drives.
Exchange diskette drives	Disabled[1] Enabled	Allows you to logically exchange physical diskette drive designation. Enabling this function allows you to boot diskette software that is compatible with physical drive B: instead of physical drive A:.
Diskette write protection	Disabled[1] Enabled	Enables or disables the selected diskette drives to be write-protected at the disk drive level. Enabling this option means writing data to a diskette is prohibited. However, you can still read data from the diskette.

(1)   Factory default setting

Boot Options Group

Menu Fields	Settings	Comments
Boot option	A: then C: [1] C: then A: C: only A: only	Each time your server boots, it will load your operating system from the sequence selected. Note, if "C: then A:" is selected, the Quick Launch CD-ROM might not be bootable.
Boot sequence preference	Embedded PCI SCSI channel A[1] Embedded PCI SCSI channel B PCI slots	Select the channel that the boot device will be attached to. If the boot device is attached to a PCI expansion board, select the PCI slots option and the server will boot from the first boot device found attached to a PCI expansion board as it scans the PCI bus.
POST errors	Enabled[1] Disabled	If enabled, the server pauses and displays POST errors. To continue, Press <F1>.
Diskette check	Enabled[1] Disabled	Enabling this option forces the server to verify the diskette type during boot.
Summary screen	Enabled[1] Disabled	Enables or disables the ability to display your server's configuration during boot.
OCP soft banner	Not installed[1] Installed	If installed, you can define a 16 character string that appears on the Operator Control Panel (OCP).

Integrated Peripherals Group

Menu Fields	Settings	Comments
Video type	VGA or EGA[1] CGA 80 columns Monochrome	Sets the video controller type.
Monitor type	Color[1] Monochrome	Sets the type of monitor connected to your server: Color or Monochrome.

[1] Factory default setting

continued

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Menu Fields	Settings	Comments
Mouse port	Disabled Enabled[1]	Enables or disables the onboard PS/2 style mouse port.
Parallel port	Disabled	Selects the Enhanced Parallel Port (ECP) mode.
	Compatible mode[1]	Selects the standard printer connection.
	Bi-Directional Mode	Selects the PS/2 compatible mode to receive data.
	EPP 1.7 mode EPP 1.9 mode	Selecting EPP 1.7 or EPP 1.9 is based on what EPP version your printer supports. If you are not sure what version your printer supports, use the default setting.
	ECP mode	Sets the Extended Capabilities Port (ECP) mode.
Serial port 1	Disabled Enable at: 3F8h-3FFh (IRQ4)[1] Enable at: 2F8h-2FFh (IRQ3) Enable at: 3E8h-3Efh (IRQ4) Enable at: 2E8h-2Efh (IRQ3)	Enables or disables onboard serial port 1 at the specified address and IRQ.
Serial port 2	Disabled Enable at: 3F8h-3FFh (IRQ4)[1] Enable at: 2F8h-2FFh (IRQ3) Enable at: 3E8h-3Efh (IRQ4) Enable at: 2E8h-2Efh (IRQ3)	Enables or disables onboard serial port 2 at the specified address and IRQ.

[1] Factory default setting

Menu Fields	Settings	Comments
Embedded PCI SCSI channel A	Enabled[1] Disabled	When enabled, this device will be recognized by the server. When disabled, this will not be recognized by the server and will be ignored during the PCI scan sequence.
Embedded PCI SCSI channel B	Enabled[1] Disabled	When enabled, this device will be recognized by the server. When disabled, this will not be recognized by the server and will be ignored during the PCI scan sequence.
Embedded PCI ethernet	Enabled[1] Disabled	When enabled, this device will be recognized by the server. When disabled, this will not be recognized by the server and will be ignored during the PCI scan sequence.

[1] Factory default setting

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Keyboard Features Group

Menu Fields	Settings	Comments
NumLock	Auto[1] Off On	Selects the power on state for Numlock. If Auto is selected, the server turns on Numlock if it detects a numeric keypad.
Key Click	Disabled[1] Enabled	Enables or disables the audible key click feature.
Keyboard auto-repeat rate	30/sec[1] 26.7/sec 21.8/sec 18.5/sec 13.3/sec 10/sec 6/sec 2/sec	Sets the number of times a second to repeat a keystroke while you hold the key down.
Keyboard auto-repeat delay	1/4 sec 1/2 sec[1] 3/4 sec 1 sec	Sets the delay time after a key is held down before it begins to repeat a keystroke.

[1] Factory default setting

Shadow Options Group

Menu Fields	Settings	Comments
Shadow video BIOS ROM	Enabled[1] Disabled	The main logic board reserves an area of DRAM for a copy of video BIOS ROM. This DRAM called "shadow memory" is write-protected and has the same addresses as the video BIOS ROM locations. When you shadow video BIOS ROM, the ROM image is copied into an appropriate area in DRAM. This increases the server's performance because the video BIOS instructions are in fast DRAM instead of low speed ROM. For PCI VGA devices, video BIOS is always shadowed in C0000h-C7FFFh, regardless of this field's setting.
Shadow C8000h-CBFFFh	Disabled[1] Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow CC00h-CFFFFh	Disabled[1] Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow D0000h-D3FFFh	Disabled[1] Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow D4000h-D7FFFh	Disabled[1] Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow D8000h-DBFFFh	Disabled[1] Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow DC000h-DFFFFh	Disabled[1] Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.

[1] Factory default setting

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Security Options Group

Menu Fields	Settings	Comments
Supervisor password	Not installed[1] Installed	Allows you to set a supervisor password.
		If set, you will be prompted to enter a password prior to accessing the SCU.
User password	Not installed[1] Installed	Can only be set in the condition that the Supervisor password is set. This password functions with "Password on Boot" or "Quick Lock Hot-Key."
Password on boot	Enabled Disabled[1]	Enables or disables password entry on boot. If enabled, the server will prompt you to enter the password, either the User password or the Supervisor password.
Quick lock hot-key	Disabled[1] [Alt]-[Ctrl]-[F1] through [Alt]-[Ctrl]-[F12]	Enables or disables the Quick Lock function. When enabled, you can lock both the keyboard and PS2 mouse by pressing the defined hot key, [Alt]-[Ctrl]-[key].
		During the lock state, if a user password is entered, the keyboard and PS2 mouse will function again.
Diskette access	Supervisor User[1]	If set to supervisor, the diskette can only be accessed if the server is booted via a supervisor password. Otherwise, the diskette is free to be accessed.
Network server	Disabled[1] Enabled	When enabled, the server does not require a keyboard to function and therefore, keyboard error messages which might occur during POST will be ignored.
System backup reminder	Disabled[1] Daily Weekly Monthly	Allows you to display a backup reminder message at boot (daily, every Monday, or the 1st of every month).
Virus check reminder	Disabled[1] Daily Weekly Monthly	Allows you to display a virus check reminder message at boot (daily, every Monday, or the 1st of every month).

[1] Factory default setting

Cache Options Group

Menu Fields	Settings	Comments
L1 cache	Not user selectable; Always enabled	Indicates that the processor L1 cache is enabled.
L2 cache	Not user selectable; Always enabled	Indicates that the processor L2 cache is enabled.
Cache system BIOS ROM	Enabled[1] Disabled	Enables or disables caching request for server BIOS ROM (F0000h to FFFFFh).
Cache video ROM	Enabled[1] Disabled	Enables or disables the server to cache the video BIOS in the C000 to C7FFh segment.

[1] Factory default setting

Advanced Control Group

Menu Fields	Settings	Comments
CPU to PCI Write Posting	Enabled Disabled[1]	Enables CPU writes to PCI to be posted in the OPB.
PCI to DRAM Pipeline	Enabled Disabled[1]	Enables pipelining of PCI to DRAM write cycles.
APIC & MP table	Disabled MPS 1.1 MPS 1.4[1]	Applicable to single processor configurations only, always enabled for Multi-Processing (MP) operating system configurations. When set to MPS 1.1 or MPS 1.4, the CPU's Advanced Programmable Interrupt Controller (APIC) is enabled, and the MP table used by MP operating systems will be created.
		Note: This parameter must be disabled for NetWare 3.12 single processor systems.
Error Correction Code Interrupt	Enabled[1] Disabled	When ECC is disabled, parity generation and checking is enabled.
PCI Parity Check	Enabled[1] Disabled	Enables or disables the PCI parity checking.

[1] Factory default setting

PRIORIS HX 6000

EISA or PCI Devices Group

Menu Fields	Settings	Comments
EISA [slot#] - [device]		You can edit resources provided by the expansion board's vendor. Please refer to the menu displayed on this item.
PCI [slot#] - [device] function 1	Enabled Disabled	Whenever PCI devices are installed in the PCI slots, the device is automatically added. You can enable or disable this device. If enabled, you can set the related resources based on the menu the SCU displays. The [device] is either SCSI or Ethernet.
Embedded - [device] PCI function 1	Enabled Disabled	Three kinds of PCI devices can be identified as Embedded devices. The first are onboard PCI devices. The second are the PCI devices beyond 10 PCI devices that have been identified and shown as the normal PCI devices. The third are the PCI devices that share the same IRQ with the PCI devices displayed as the normal PCI devices. When enabled, all the resources shown on the menu can be changed.
Embedded - PCI VGA controller PCI function 1	Enabled Disabled	Onboard PCI VGA device.
Standard VGA resources	Enabled Disabled	Enables or disables the compatible VGA resources.

Caring for Your Server D

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 glass cleaning 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.

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

5. 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 the 3½-inch diskette drive. If you do not have a drive protection card, use a blank diskette.

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.

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Installing the Server at a New Location

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