

**digital**

**PRIORIS ZX**

**6000 MP SERIES**

**USER'S GUIDE**



# Prioris ZX 6000MP Series

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## User's Guide

Part Number: ER-930WW-UA. A01

**Digital Equipment Corporation**

**July 1996**

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### **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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# About This Guide

## Introduction

This guide describes how to operate, upgrade, configure, and troubleshoot your Prioris ZX 6000MP (Multi-Processing) Series. This guide will also help to familiarize you with all aspects of the server and provide a reference tool for questions you might have in the future.

If you are initially setting up your server, refer to the *Server Installation Guide*.

The *Server Installation Guide* identifies all the components that were shipped from the factory as well as how to connect the mouse, keyboard, monitor, and ac power.

The *Server Installation Guide* shows how to turn your server on for the first time and access the ServerWORKS Quick Launch program. You must run the ServerWORKS Quick Launch program to initially configure your server, create utility and device driver diskettes, and install an operating system.

## Audience

This guide is written specifically for anyone responsible for operating, configuring, and expanding the Prioris ZX 6000MP Series.

# Support Information

A variety of support information is available to help you set up, configure, and operate your Prioris ZX 6000MP Series. 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	<i>Server Installation Guide</i> to unpack, install internal components, connect external devices and power, and access the ServerWORKS Quick Launch program.
Load the supplied ServerWORKS software	<i>ServerWORKS Quick Launch Reference Guide</i> .  README information contained on the ServerWORKS Quick Launch CD-ROM disk.
Locate the major internal components of your Prioris ZX 6000MP Series	<i>Side Panel Labels</i> on your server's side panels.
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 User's Guide.  Supplied SCSI, RAID, and other options documentation.
Run diagnostics	<i>ServerWORKS Quick Launch Reference Guide</i> and the Quick Launch program on the supplied CD-ROM disk.  Supplied diagnostics documentation.

# Organization

This guide contains the following:

- Chapter 1: *Introduction*— This chapter provides general information about your server. For example: features, server software and support documentation, diagnostic software, server utilities and technical support, and providing a comfortable working environment.
- Chapter 2: *Server Utilities*— This chapter describes the server utilities that are supplied on the ServerWORKS Quick Launch CD-ROM disk.
- Chapter 3: *Server Components*— This chapter provides general information about your server's components. For example: procedures for removing the side panels, removing the server components, and information about the System Configuration Utility (SCU).
- 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: *Upgrading Your Server's CPU Module Configuration*— 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 main logic board and optional memory modules.
- Chapter 7: *Installing Optional Disk and Tape Drives*— This chapter describes how to install optional disk and 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 supported SCSI or 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: *Problem Solving and Troubleshooting*— This chapter describes initial and advanced troubleshooting solutions.
- Appendix A: *Technical Specifications*— This appendix lists server operating specifications. Main logic board and CPU module switch information is also included.
- 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.

# Conventions

Convention Example	Description
<i>Reference Guide</i>	Italics are typically used for titles, comments, and references to other sections of this document or other documents.
<code>c:\windows&gt;</code>	Monospaced text indicates information that your server or software displays. For example, a directory path or error message.
<code>SCU.BAT</code>	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
h	An h suffix to a numerical value denotes hexadecimal numbers. For example, 0F8h equals 0F8 hexadecimal.
I/O	Input/output
ISA	Industry standard architecture
MS-DOS™	Microsoft Disk Operating System
PCI	Peripheral component interconnect
POST	Power-on self test
RAID	Redundant array of independent devices
RAM	Random access memory
ROM	Read only memory

*continued*

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

## Special Notices

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



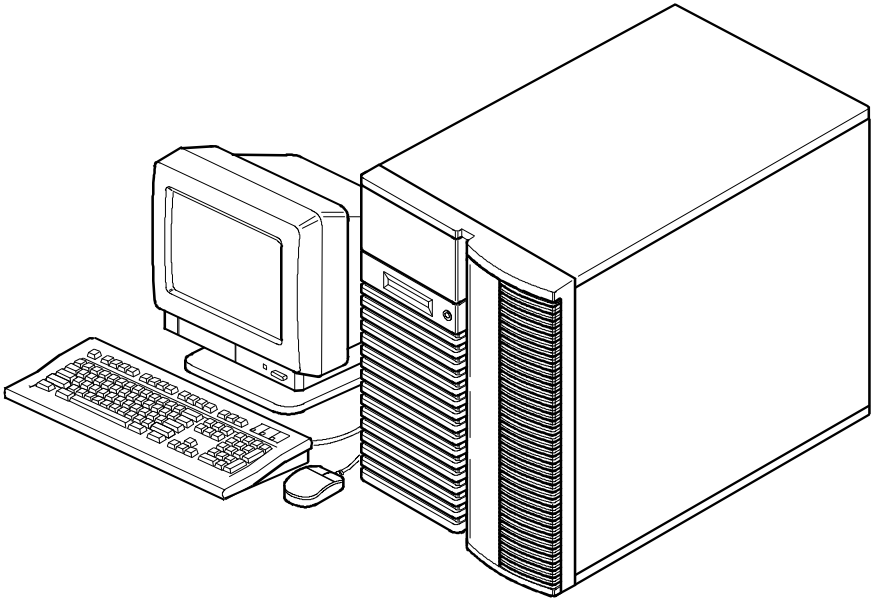
**WARNING:** Indicates the presence of a hazard that can cause personal injury if the hazard is not avoided.



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



**NOTES:** Used to provide additional information.



DEC00421

**Typical Prioris ZX 6000MP Series**



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

# 1

## Introduction

The Prioris ZX 6000MP Series are high-performance, highly-scaleable network and application servers featuring the latest in modular CPU and storage technology.

The Prioris ZX 6000MP Series provides the following features:

### Reliability/Availability

<i>CPU Module</i>	Single (1P) or Multiple (MP) Pentium Pro processor mode. Each CPU operates using a 64-bit memory interface and an internal L2 cache.
<i>Error Correction Code (ECC) Memory</i>	Recovery from single-bit cache and memory errors.
<i>Dual-Channel Storage Backplane</i>	Redundant disk subsystems using two SCSI controllers or one dual-channel controller.
<i>Power Supplies</i>	The Prioris ZX 6000MP Series is shipped with two power supplies for normal operation. In some configurations, the second power supply can be used for redundant operation.
<i>Variable Fan Speed</i>	Automatically adjusts fan speed according to ambient temperature.
<i>Internal Sensors</i>	Monitors internal server temperatures, fan operation, and power supply temperatures and voltages.

## Server Expansion

### *Flexible Memory Architecture*

Provides 4-way interleaved data path with ECC protection. Server memory can be upgraded from 64 MB to 2 GB using optional memory modules.

### *Four EISA Expansion Slots, Seven PCI Expansion Slots, and one shared EISA/PCI slot*

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 without use of an expansion slot.

### *Capacity for 10 internal SCSI Storage Devices*

Accommodates seven 3½-inch half-height drives in Storage Building Blocks (SBBs), two 5¼-inch, half-height drives (hard drives or tape drives), and one CD-ROM drive.

### *External I/O Ports*

Two serial ports and one parallel port support external options such as a printer, modem, or local terminal.

### *Wide-Ready SCSI Storage Backplane*

Allows for upgrades as new high-performance drives become available.

### *Hot Swap Disk Capability*

Allows replacement of SBB disk drives while the server is operating.

## Server Management

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

## Server Security

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



## Server Software and Documentation

The following software and documentation are supplied with your server:

- ServerWORKS software kit — contains ServerWORKS Quick Launch and ServerWORKS Manager.
    - 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 the software and documentation.
- Server documentation box — contains this User's Guide, 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 Install Software Conventional method in ServerWORKS Quick Launch, 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.*

# Important Ergonomic Information

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

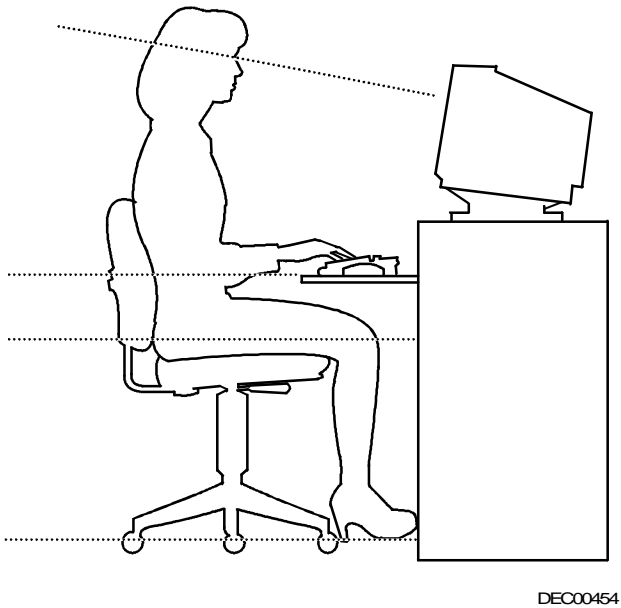
- Be comfortable in your work space.
- Change your posture frequently.
- Proceed according to the recommendations in the following table and figure.

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

*continued*

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

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



**Figure 1-1. Providing a Comfortable Working Environment**

# 2

## Server Utilities

### 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.

## SCSISelect Utility

Your Prioris server comes with an Adaptec controller and an onboard SCSISelect configuration utility. This utility allows you to change host controller settings without opening your server or handling the SCSI controller board.

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

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

## PHLASH.EXE

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

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 the Digital Bulletin Board (BBS).

## Using EPP3SMC.EXE

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

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

Note the path where your driver is located:

*C:\EPP\EPP3SMC.EXE*

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

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

*device=C:\lepp3smc.exe*

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



4. Press [Ctrl] + [Alt] + [Del] and reboot your server.
5. Run the SCU and choose the Parallel Port Group.
6. Choose 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, after adding a CPU module, or after adding memory modules.

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 ZX 6000MP Series 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.

## 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
```

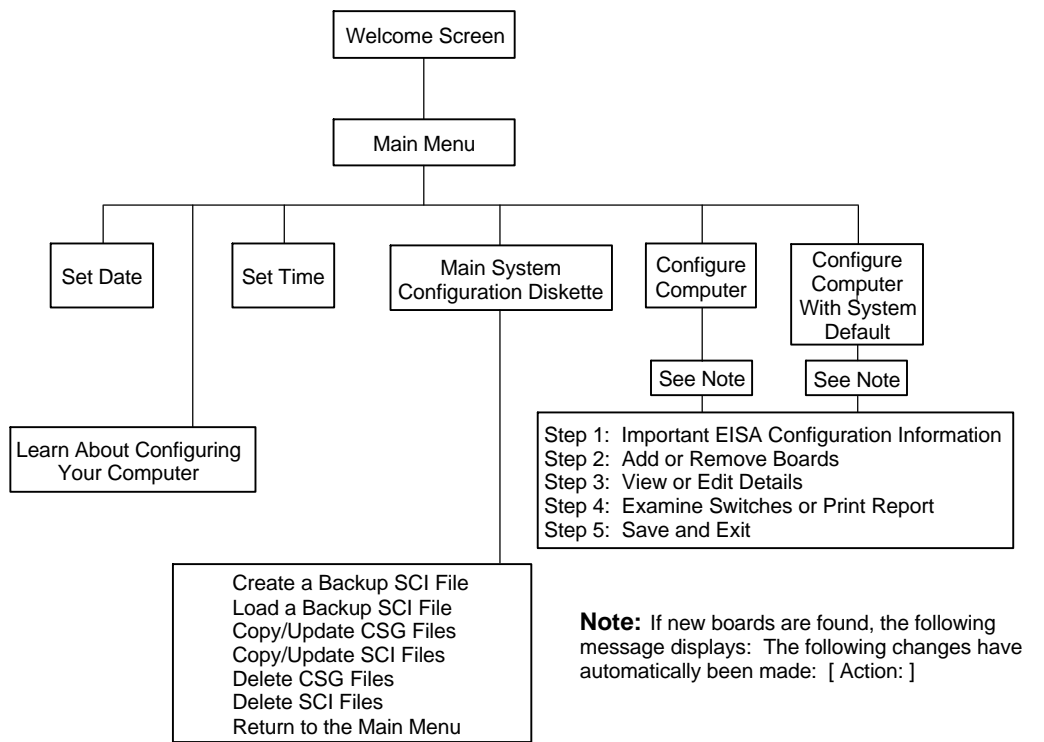
2. Using the *Install Software/Conventional* method in ServerWORKS Quick Launch, you can create a bootable SCU diskette.

Afterwards, you can run the SCU anytime using the diskette you created.

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



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



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Figure 2-1. SCU Main Menu Options

## 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.

## Configure Your Computer

This option provides step-by-step instructions on how to configure your server when adding, removing, or relocating expansion boards and when changing operating parameters.

Select one of the following menu options:

- “Configure Computer with System Default” — Loads the SCU default settings.
- “Configure Your 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 the 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

# 3

## Server Components

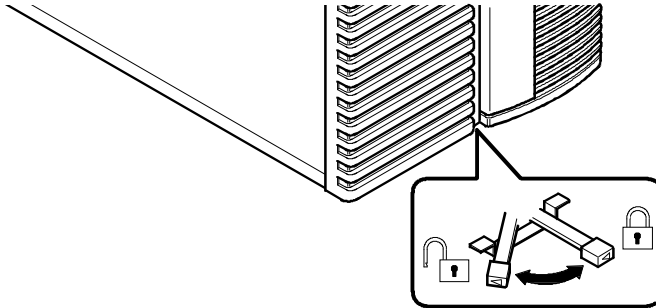
### Introduction

This chapter shows the location of the Prioris ZX 6000MP Series server internal components and describes how to prepare your server for installing options, including procedures for removing peripherals, and 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 server using 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 server.
4. Turn server off.
5. Unplug power cord from wall outlet.
6. Disconnect monitor's power cord from external ac outlet and data cable from server.



DEC00831

**Figure 3-1. Server Brake**

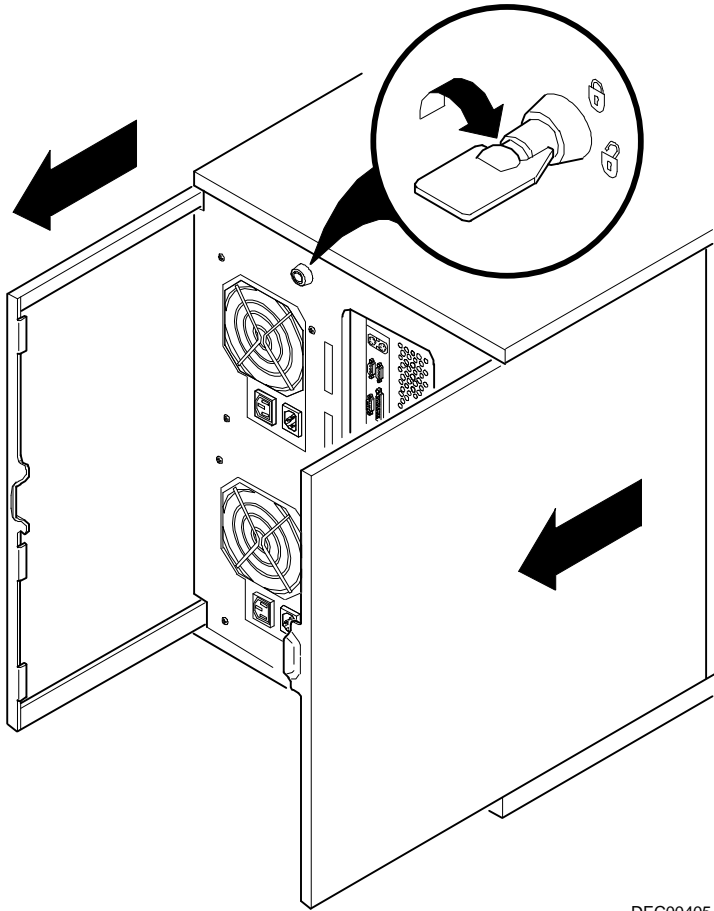
## Removing and Installing the Side Panels

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.

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

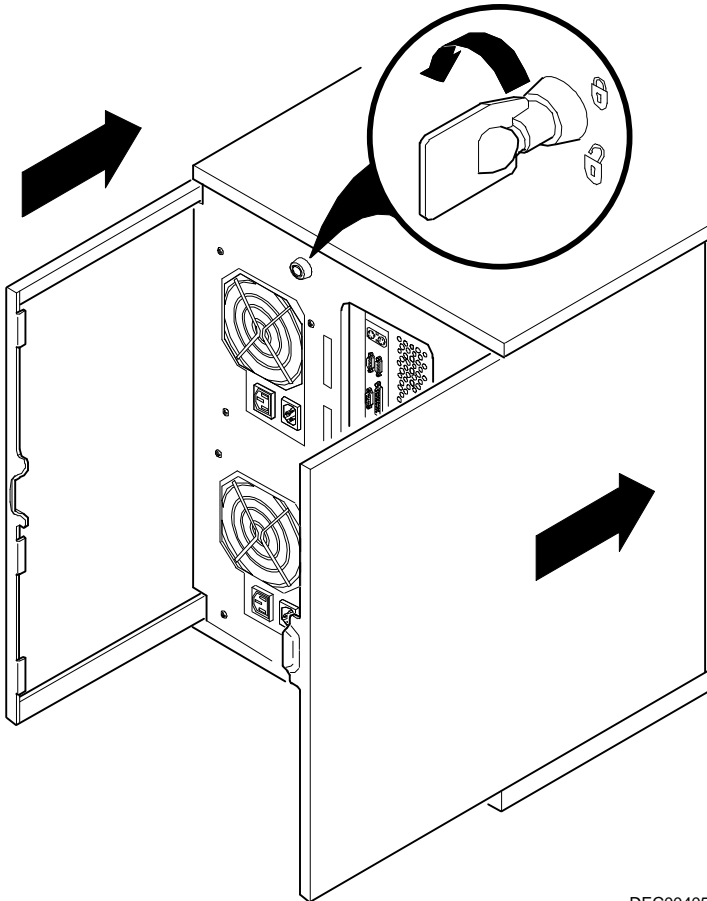


DEC00405-2

**Figure 3-2. Unlocking and Removing the Side Panels**

To install the side panels.

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

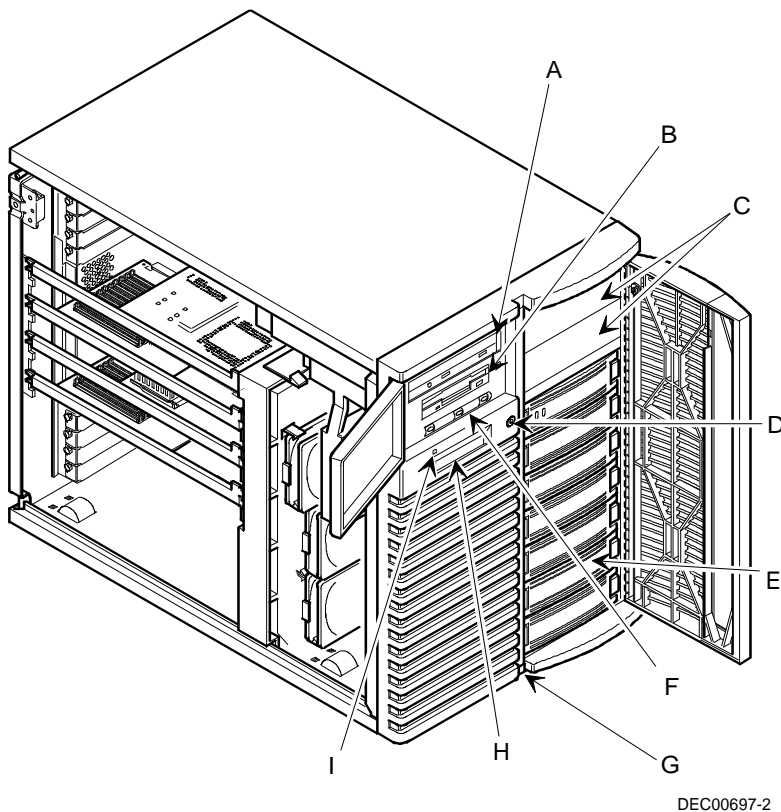


DEC00405-3

**Figure 3-3. Installing Side Covers**

# 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

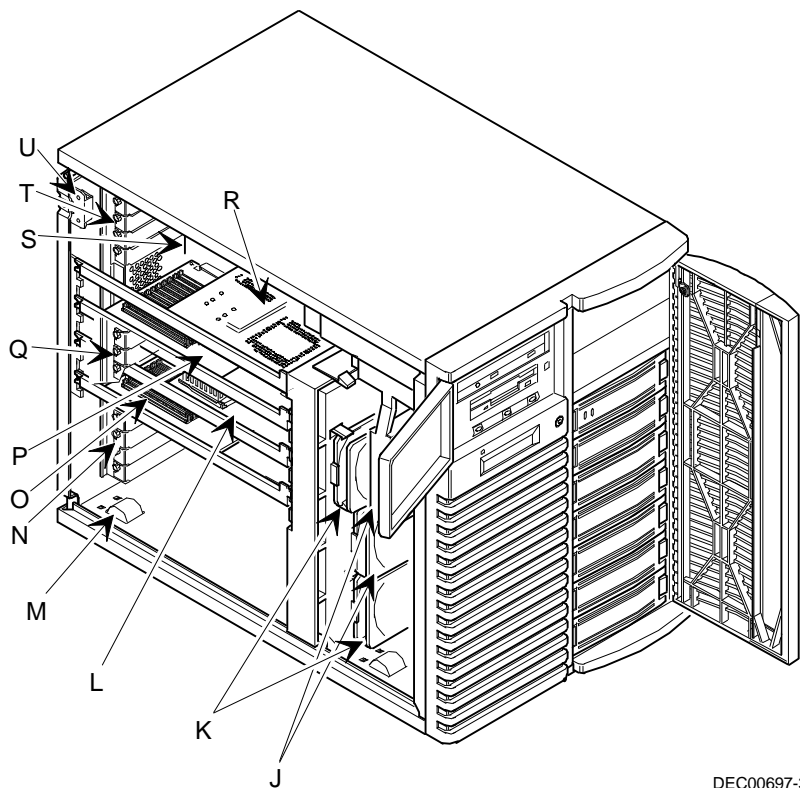


**Figure 3-4. Server Front View**



# Server Left Side View

Figure Legend	Component
J	Redundant cooling fans
K	Cooling fans
L	Terminator card or CPU module 2
M	Casters
N	Five EISA expansion slots (includes one shared EISA/PCI)
O	Memory module 2
P	Memory module 1
Q	Four primary PCI slots (includes one shared PCI/EISA slot)
R	CPU module 1
S	Location of main logic board
T	Four secondary PCI slots
U	Power switch interlock

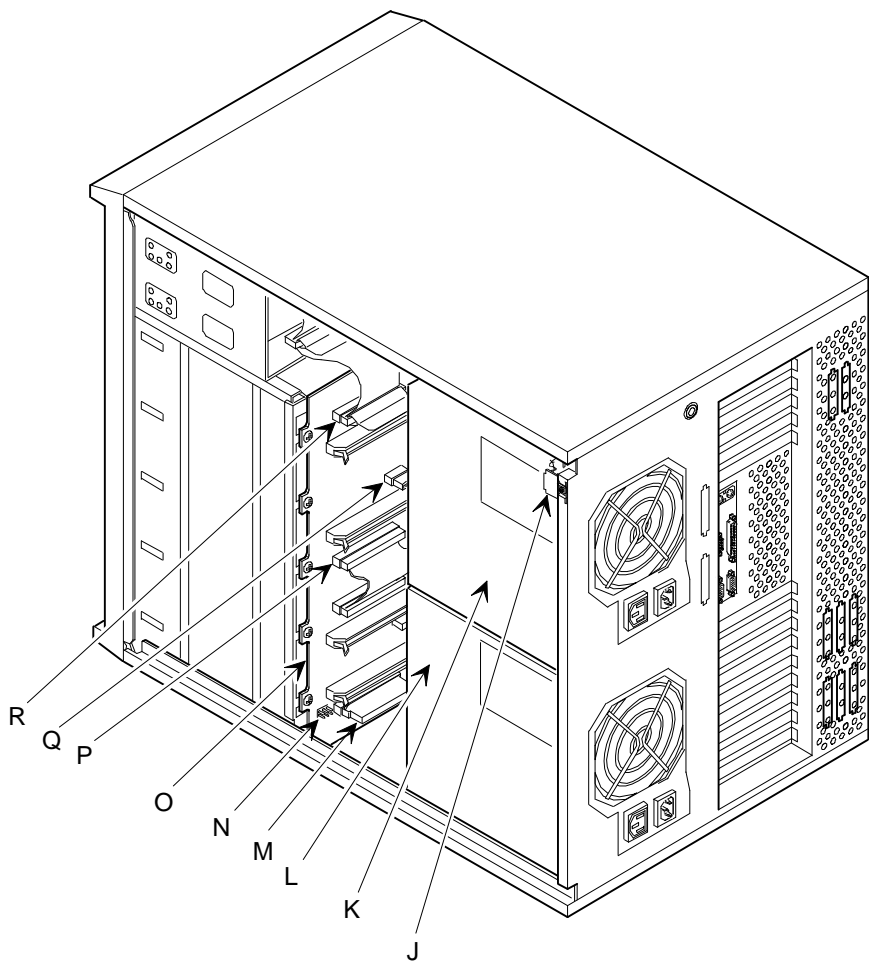


DEC00697-3

Figure 3-5. Server Left Side View

## Server Right Side View

Figure Legend	Component
J	Power interlock switch
K	Secondary power supply
L	Primary 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

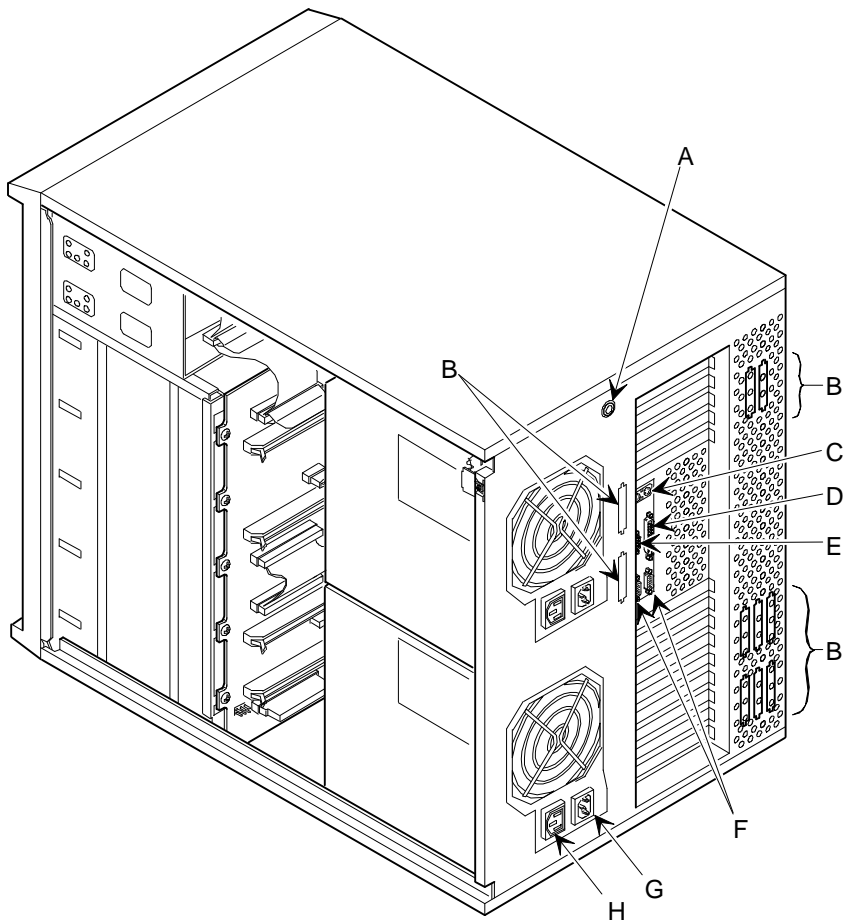


DEC00698-2

Figure 3-6. Server Right Side View

# Server Rear View

Figure Legend	Component
A	Keylock
B	SCSI knockouts (back panel)
C	Keyboard and mouse ports
D	Parallel port
E	Video port
F	Serial ports
G	ac power plug
H	ac power out/monitor plug



DEC00698-3

Figure 3-7. Server Rear View

# Main Logic Board Connectors

Figure Legend	Connector
A	EISA expansion slots (1 through 5); slot one is a shared EISA/PCI slot
B	Primary PCI expansion slots (1 through 4); slot four is a shared PCI/EISA slot
C	Memory module 2
D	Serial ports
E	Parallel port and video
F	Mouse and keyboard
G	Secondary PCI expansion slots (5 through 8)
H	Diskette drive
I	Storage Backplane Management (SBM)
J	3.3 V dc power
K	5 V dc power supply
L	Power control signal
M	Operator Control Panel (OCP)
N	Fan 2
O	Fan 1
P	CPU module 1
Q	Memory module 1
R	Eight primary SIMM sockets
S	CPU module 2 or terminator card
T	Fan 4
U	Speaker
V	Remote Server Management (RSM)
W	Fan 3

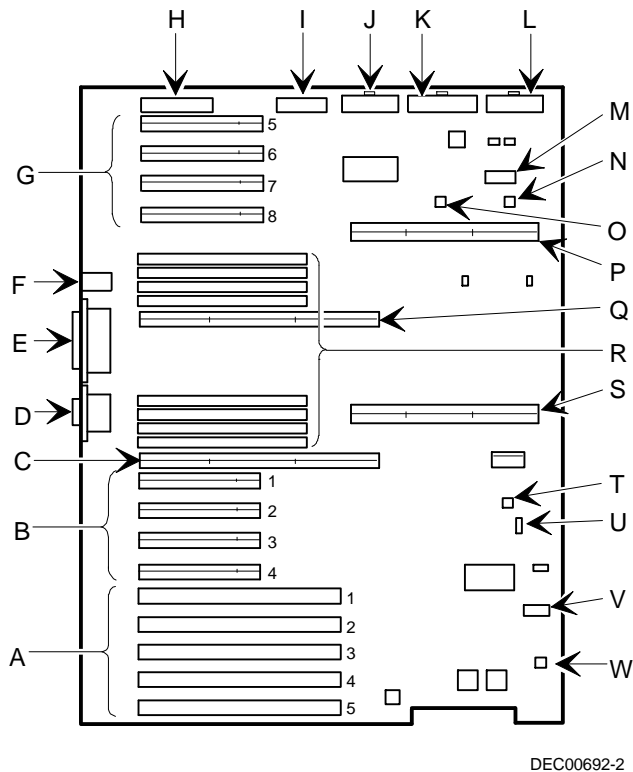


Figure 3-8. Main Logic Board Connectors



## Main Logic Board Components

Figure Legend	Component
A	Real-time clock/server battery
B	8031 ROM
C	Dip switch block
D	BIOS flash ROM

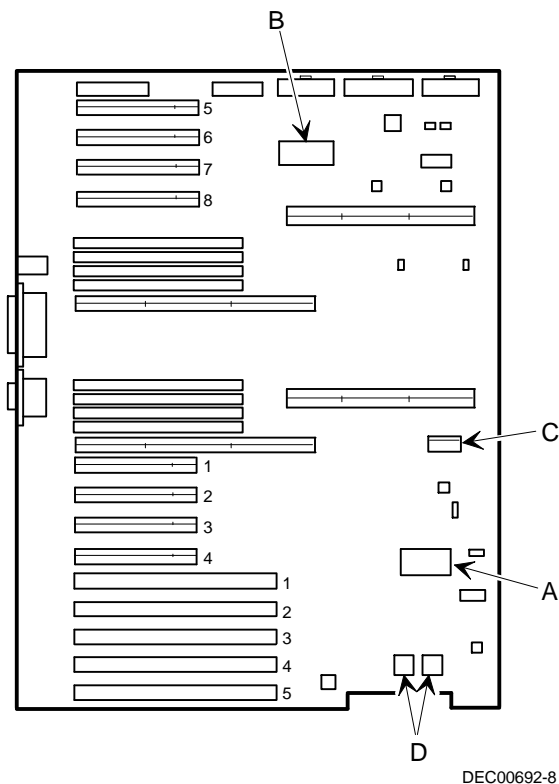


Figure 3-9. Main Logic Board Components

# CPU Module Components and Connectors

Figure Legend	Component/Connector
A	Outside CPU voltage regulator
B	Outside CPU ZIF socket
C	Inside CPU ZIF socket
D	Inside CPU voltage regulator
E	Inside/outside CPU frequency ratio DIP switches

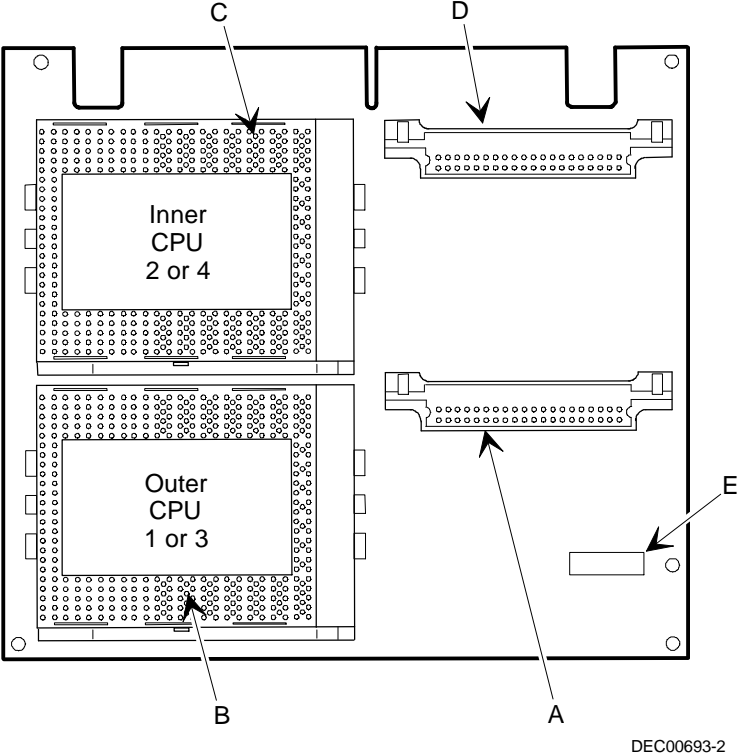


Figure 3-10. CPU Module Components and Connectors

## Tools Needed

Prior to installing an option, have the following available:

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

## Static Electricity

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

- Before touching any circuit board or component, 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.

To replace the RTC, perform the following:

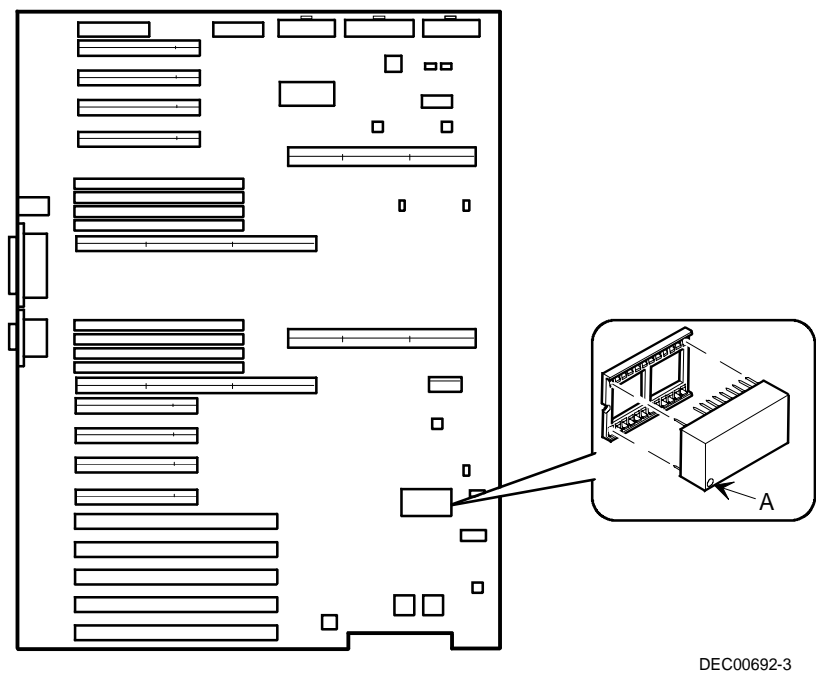
1. If you have not already done so, record server configuration settings using the SCU.
2. Turn off your server.
3. Disconnect external devices, ac power, and monitor power.
4. Unlock and remove left side panel.
5. Remove old RTC.



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

6. Install new RTC. Make sure pin 1 of the RTC is aligned with pin one on the socket (A, Figure 3-11).
7. Replace and lock left side panel.
8. Connect external devices and restore power.

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 Utilities."*



**Figure 3-11. Replacing the Server Battery/RTC**

# 4

## Server Management

### Introduction

The Prioris ZX 6000MP Series server is configured with hardware that supports server management, including an 8031 processor with multiple I<sup>2</sup>C busses for server status reporting.

### Managing Your Server

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

1. Obtaining information about the server and its modules.
2. Notifying you of any changes to modules 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 ZX 6000MP series server provides the following system information for the main logic board, CPU modules, and memory modules 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

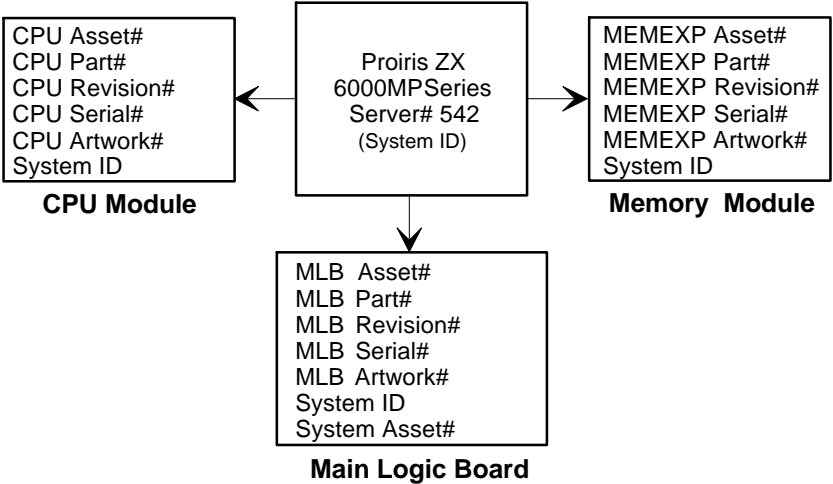
The System ID is also located on the main logic board, CPU module, and memory modules. The System ID contains the following information:

- Model number — Server model number
- Serial number — Server serial number
- System asset number — User definable field for tracking the system

The main logic board, CPU module(s), and memory modules 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, CPU modules, and memory modules (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 a component.

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



DEC00918

Figure 4-1. Proiris ZX 6000MP Series Server Component Information

## 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, CPU, and memory modules configured in the server. For example, if you change a module in your server, you must run the SCU to re-synchronize the System ID (server model number and serial number) in that module's memory. The SCU will check the new module and will detect the System ID mismatch.

You may view the details for a particular module simply by selecting that module. The Serial number, Revision number and Asset number for that module displays. The SCU then lists the server model number and server serial number information stored on that 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 ZX 6000MP 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.

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 network by Autodiscovering all SNMP network resources and displays the nodes gathered 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.

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

*Refer to Chapter 4, "Managing Server on Other Platforms," in the ServerWORKS Manager Administrator User's Guide for more information.*

# Server Status

There are two types of information displayed when your Prioris ZX 6000MP 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.

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.
	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.
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 error or over temperature condition).	The server will shutdown.
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*

Component	Possible Failures	Result
CPU temperature sensing	The temperature exceeds the warning level.	An error message displays for one minute, a beep sounds, and the redundant fans activate.
	The temperature rise exceeds the upper limit.	The server will shutdown.
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 <sup>(1)</sup>	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

<sup>(1)</sup> Count down codes are displayed on your server’s monitor.

*continued*



POST Code Descriptions	Count Down Code <sup>(1)</sup>	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

<sup>(1)</sup> Count down codes are displayed on your server's monitor.

*continued*

Boot Code Descriptions	Normal OCP Display	OCP Error Display	Beep Codes
Do a complete RAM test			3-3-3-3-3
Boot the flash program			1
Boot code was read OK			3-1-1

## 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 ZX 6000MP Series server OCP panel. Also included are possible actions to take if a problem persists. If this action does not alleviate the problem, contact Digital Multi Customer Services (MCS) group.

## OCF Status and Error Messages

Status	Normal OCP Display	OCF Error Display	Description of Error Display/Action
CPU ambient temperature	CPU1 temp=xxxC	CPU1 over heat	Temperature of CPU 1 is out of range.
	CPU2 temp=xxxC	CPU2 over heat	Temperature of CPU 2 is out of range.
	CPU3 temp=xxxC	CPU3 over heat	Temperature of CPU 3 is out of range.
	CPU4 temp=xxxC	CPU4 over heat	Temperature of CPU 4 is out of range.
			Action: Verify fans are operational.
			Action: Check that heat sink is correctly attached to the CPU chip.
Power supply status	P/S1 OK	P/S1 fail	Power supply 1 is not working.
	P/S2 OK	P/S2 fail	Power supply 2 is not working.
			Action: Check that power supply cables and connectors are connected correctly.
Fan status	Sys fans OK	Sys fan 1 fail	Fan 1 is not working.
		Sys fan 2 fail	Fan 2 is not working.
		Sys fan 3 fail	Fan 3 is not working.
		Sys fan 4 fail	Fan 4 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.
		CPU3 fail	Internal defect of CPU 3 or internal temperature exceeds the upper limit.
		CPU4 fail	Internal defect of CPU 4 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.

*continued*

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  VRM2 y.yyV=x.xxV  VRM3 y.yyV=x.xxV  VRM4 y.yyV=x.xxV	Voltage Regulator Module (VRM) 1 should be y.yy volts and is being measured at x.xx volts.  VRM 2 should be y.yy volts and is being measured at x.xx volts.  VRM 3 should be y.yy volts and is being measured at x.xx volts.  VRM 4 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

# 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	Normal Voltage Range	Server Error Occurs	Server Shutdown Occurs
+12	-4 to + 5	+11.1 to +13.0 V	<+9.0 V	>+13.8 V
+5	-2 to + 5	+4.80 to +5.35 V	<+4.3 V	>+5.80 V
+3.43	-1 to + 1	+3.32 to +3.54 V	<+3.0 V	>+3.80 V
-12	-10 to + 10	-13.7 to -10.3 V	>-9.0 V	<-14.2 V
VGTL	-10 to + 10	+1.32 to +1.68 V	<+1.10 V	>+1.80 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 Temperature Warning Levels

Warning Level	Upper Limit	Backup Fan Activated
>85 °C	>90 °C	>82 °C

# 5

## Upgrading Your Server's CPU Module Configuration

### Introduction

Installing a higher-performance CPU module or a second 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 CPU modules.

### Configuration Guidelines

- Use only Digital-supplied CPU modules.
- A CPU upgrade can be done by installing a higher-performance CPU module.
- The supplied terminator card must be installed in CPU slot 2 when using a single CPU module configuration.
- Remove the supplied terminator card from CPU slot 2 prior to installing a second CPU module.
- CPU speed and cache size on a second CPU module must be identical to the primary CPU module.
- If removing a CPU module from the server, remove the module from slot 2 and replace with a terminator card.



## Server CPU Module Configurations

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

CPU Configuration	Slot 1	Slot 2
1P	1 processor CPU	Terminator
2P	2 processor CPU	Terminator

## CPU Module Upgrade Configurations

You can upgrade your Prioris ZX 6000MP Series server with a two processor CPU module. With this upgrade, the following CPU module configurations are available:

CPU Configuration	Slot 1	Slot 2
3P	1 processor CPU	2 processor CPU
4P	2 processor CPU	2 processor CPU

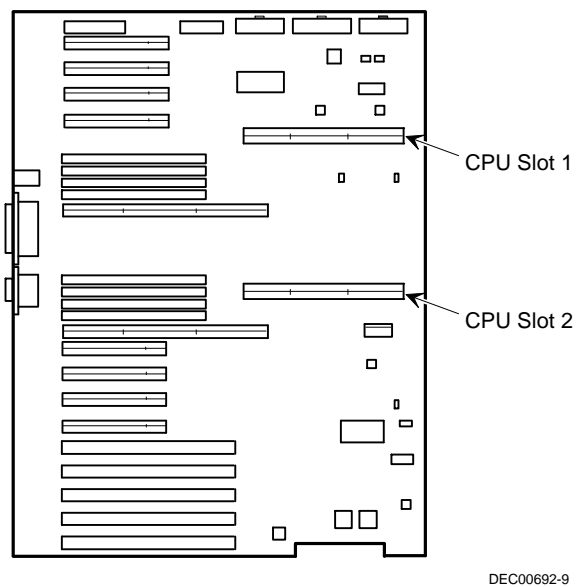


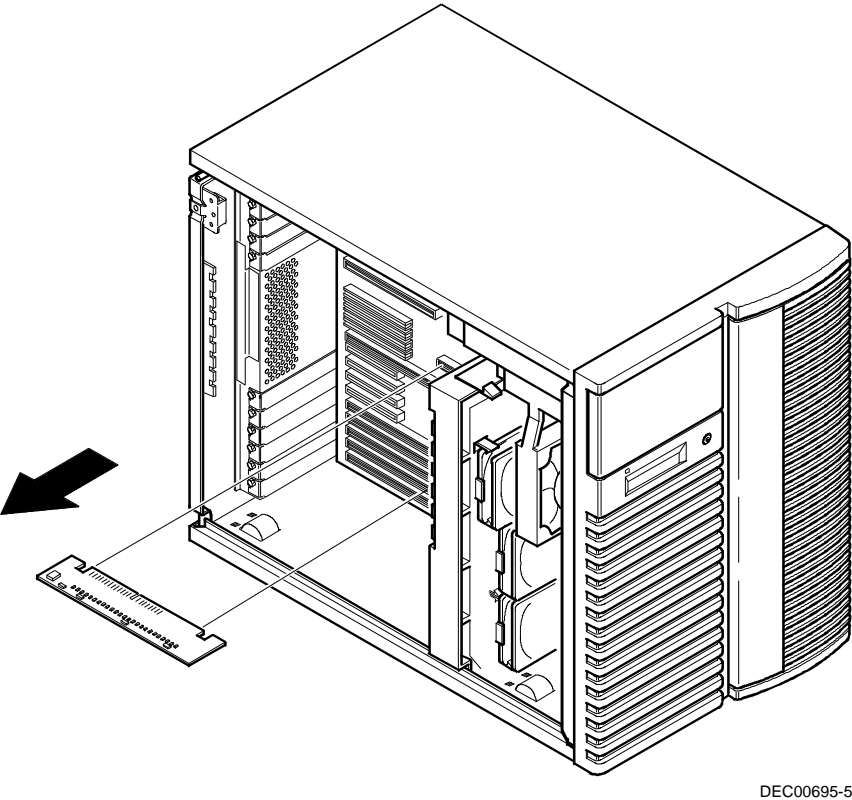
Figure 5-1. CPU Slot Locations

## 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 the remove left side panel.
5. Carefully remove the terminator from CPU slot 2 and place in an antistatic package (see Figure 5-2).
- 6 Remove the CPU module, two regulators, and retaining bracket from the antistatic package. Check switch J19 on the CPU module for the appropriate switch settings.

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



**Figure 5-2. Removing the Terminator Card**

7. Install the regulators in their appropriate slots on the CPU module.

*Refer to Appendix A, "Technical Specifications," Figure A-2 for the location of the regulator slots.*

8. Install the CPU module in slot 2. 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 two rows of gold fingers on its edge that plug into the main logic board slot. The CPU module must be pushed firmly in the slot to engage both rows of gold fingers or your server might not power up on boot.

9. Replace and lock the left side panel.

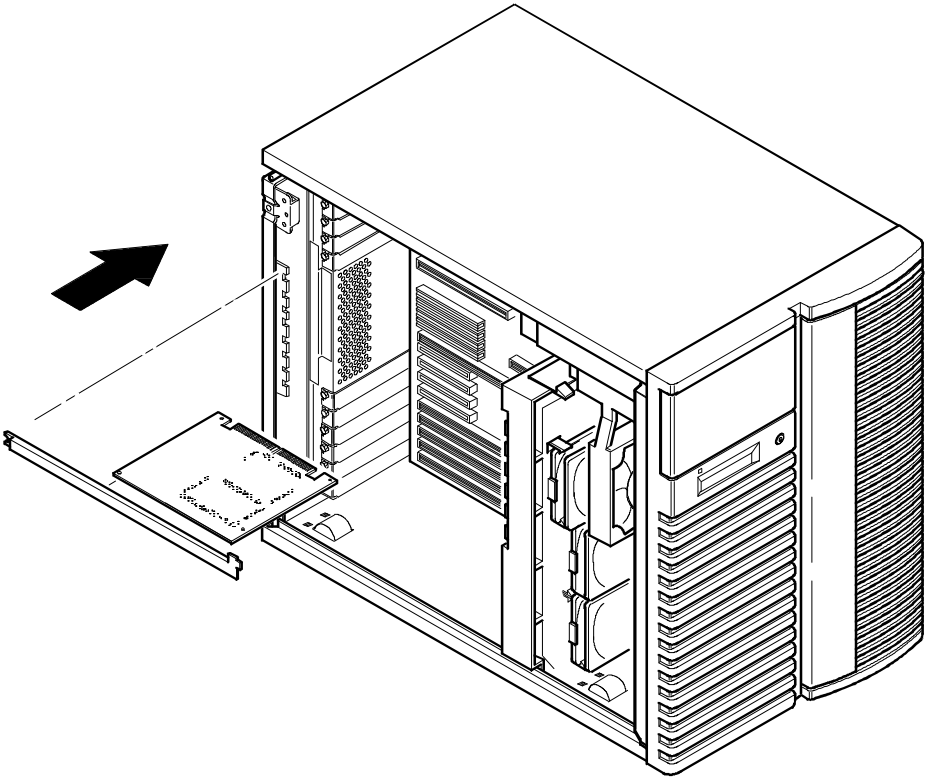


**NOTE:** Your server will not power up with the side panel removed.

10. Connect all external devices and restore power.
11. 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 Utilities."*



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**Figure 5-3. Installing a CPU Module**



# 6

## Installing Additional Memory

### Introduction

By adding more memory, you can run larger and more complicated software on your server. Your Prioris ZX 6000MP Series server supports up to 2 GB of standard parity memory using single in-line memory modules (SIMMs). Your server's memory can be increased by adding SIMMs on the main logic board (MLB) and optional memory modules.



**NOTE:** The MLB must be fully populated before adding optional memory modules. Two memory modules are required when upgrading memory.

Also, you must order the SIMMs for the memory modules separately.

This chapter provides the memory configuration guidelines that must be followed prior to installing additional SIMMs into your Prioris ZX 6000MP Series server. It also provides the procedures for installing additional SIMMs on the MLB and memory modules, and for installing memory modules.

Memory installation begins with Bank 0 on the MLB. Further upgrades require that both memory modules be installed in order to support four-way interleaving. Complete banks (8 SIMMs) must be installed in Bank 1 of both memory module 1 and 2 before adding SIMMs to Bank 2, etc.



The Prioris ZX 6000MP Series server provides a four-way interleaved memory system, with a minimum supported memory of 64 MB. Memory is configured in banks, with each bank containing four interleaves (thus the term four-way interleaving). The MLB contains Bank 0, with four interleaves (Interleave 0-3) for a total of eight SIMMs (two SIMMs per interleave). Memory module 1 contains banks 1, 2, and 3 with interleaves 0 and 1; memory module 2 contains banks 1, 2, and 3 with interleaves 2 and 3.

*Refer to the “Memory Interleave Upgrade Path” section listed later in this chapter.*

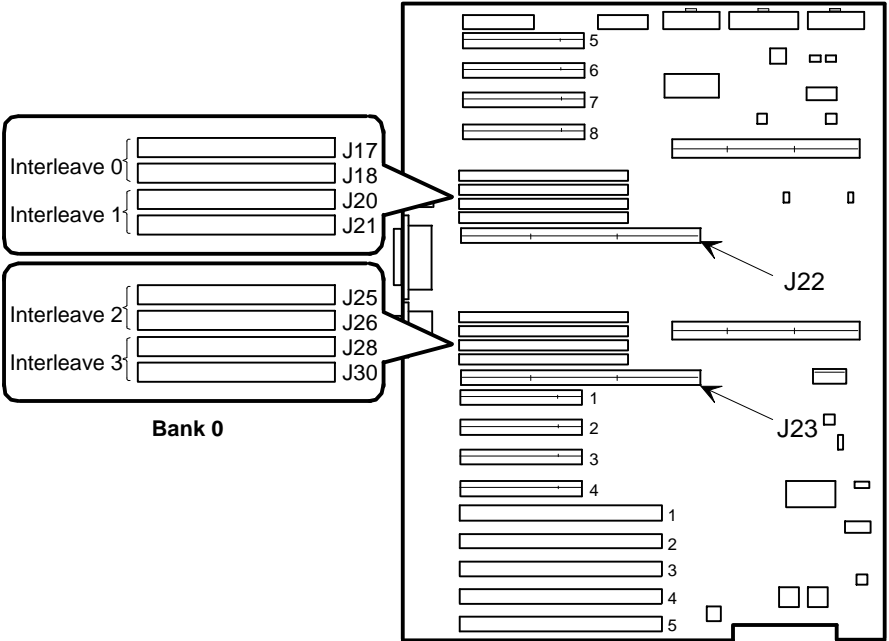
**Server SIMMs Requirements**

Supported SIMMs	36-bit SIMMs, 60 ns access time, standard parity memory only (no ECC SIMMs). ECC logic is provided on the main logic board and memory modules. No more than 24 DRAM devices on each SIMM due to loading.
Supported densities	8, 16, 32, and 64 MB (refer to the memory configuration guidelines for additional information)
Minimum server memory supported	64 MB (1P server configuration) 128 MB (2P server configuration)
Maximum server memory supported	2 GB

## Memory Configuration Guidelines

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

- Each memory bank on the main logic board and memory modules must contain eight SIMMs.
- Minimum memory supported on main logic board is 64 MB (using eight 8 MB SIMMs) for 1P server configurations and 128 MB (using 16 MB SIMMs) for 2P server configurations.
- Maximum memory supported on main logic board is 512 MB (using eight 64 MB SIMMs).
- Maximum system memory (main logic board and memory modules) is 2 GB.
- Bank 0 (interleaves 0-3) is located on the main logic board (Figure 6-1).
- Banks 1, 2, 3 are located on memory module 1 (interleave 0-1).
- Banks 1, 2, 3 are located on memory module 2 (interleave 2-3).
- 8 MB and 64 MB SIMMs cannot be installed with SIMMs of any other size. Installing illegal combinations of SIMMs will result in a “DRAM combination error, system halt” message when the server is booted, and the server will not boot.
- 16 MB and 32 MB SIMMs can be installed together (refer to memory bank configuration tables in the memory configurations section later in this chapter).

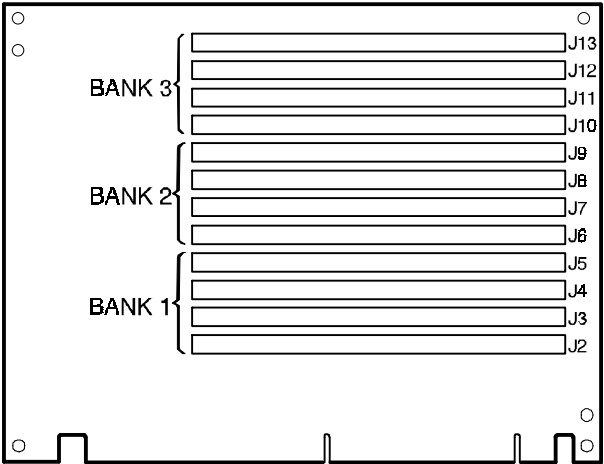


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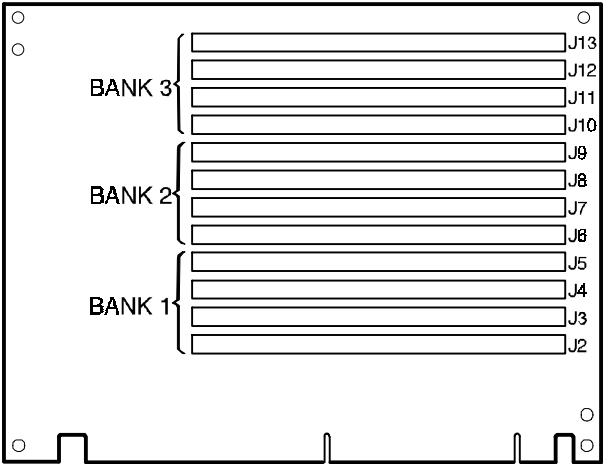
Main Logic Board		Interleave 0		Interleave 1		Interleave 2		Interleave 3	
	Bank 0	J17	J18	J20	J21	J25	J26	J28	J30
Memory Modules	Bank 1	J02	J03	J04	J05	J02	J03	J04	J05
	Bank 2	J06	J07	J08	J09	J06	J07	J08	J09
	Bank 3	J10	J11	J12	J13	J10	J11	J12	J13
		Memory Module 1 in Slot 1 (J22)					Memory Module 2 in Slot 2 (J23)		

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Figure 6-1. MLB SIMM Interleave and Bank 0 Locations



Memory Module 1



Memory Module 2

DEC00696

Figure 6-2. Memory Module 1 and 2 SIMM Bank Locations

## Installing SIMMs (MLB)



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

To install a SIMM on the MLB, complete the following:

1. Power down your server.
2. Disconnect the ac power, any and all external devices, and monitor power.
3. Unlock and remove the left side panel.
4. 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 in the bottom of socket. Tip the SIMM upright until both retaining clips engage (B, C, Figure 6-3).

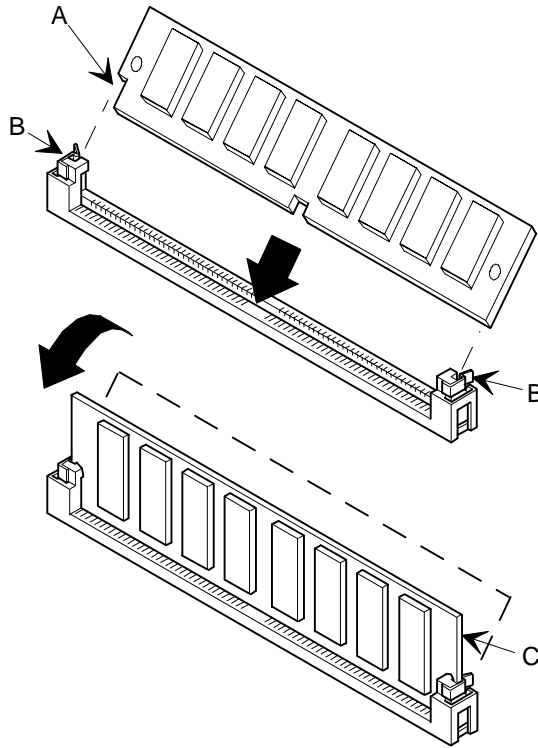
5. Install the remaining SIMMs (total of 8 SIMMs for Bank 0 on the MLB).



**NOTE:** If you are installing additional SIMMs using memory modules 1 and 2, refer to the, *Installing SIMMs (Memory Modules)* section later in this chapter.

6. Reinstall and lock the left side panel.
7. Connect all external devices and restore power to the server.
8. Run the SCU. Select Configure Computer from the main menu, and then select Save and Exit to configure your server for the additional memory.

*Refer to Chapter 2, "Server Utilities."*



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**Figure 6-3. Installing a SIMM (MLB)**

## Upgrading Memory

You can upgrade memory on your Prioris ZX 6000MP Series server by adding memory modules. You must add two modules when expanding memory.

The following rules apply with upgrading memory using memory modules 1 and 2:



**NOTE:** Eight SIMMs must be installed in Bank 0 on the MLB before adding memory modules.

1. Install two memory modules when expanding memory.
2. Install SIMMs in Bank 1 on each memory module, followed by Bank 2 and 3 as required.

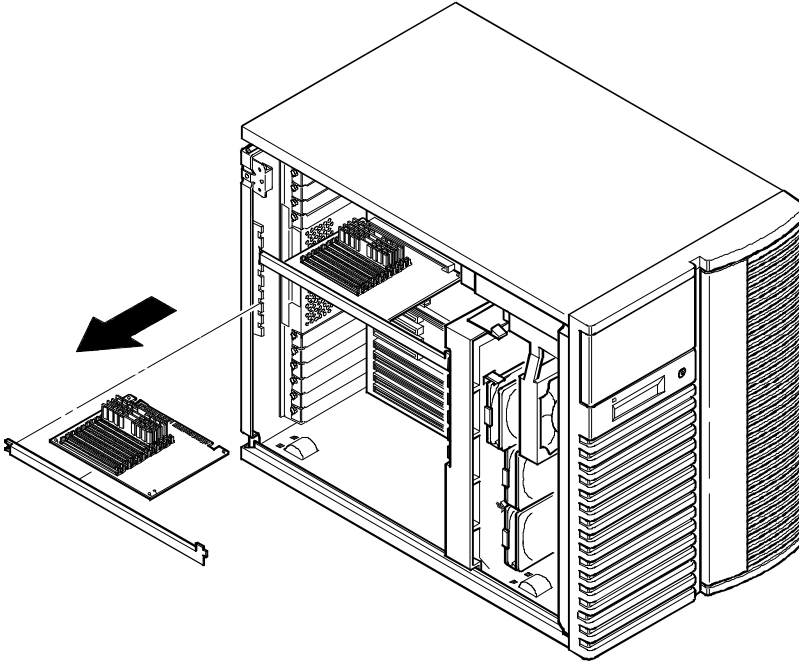
## Installing SIMMs (Memory Module)



**NOTE:** Prior to installing additional memory in your Prioris ZX 6000MP 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.
4. Remove the memory module retaining bracket for memory modules 1 and 2 (see Figure 6-4).
5. Carefully remove the memory modules 1 and 2 from the MLB and place them on an antistatic surface.



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**Figure 6-4. Memory 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 6-5). 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 6-5).

7. Install the remaining SIMMs in complete banks on memory modules 1 and 2.

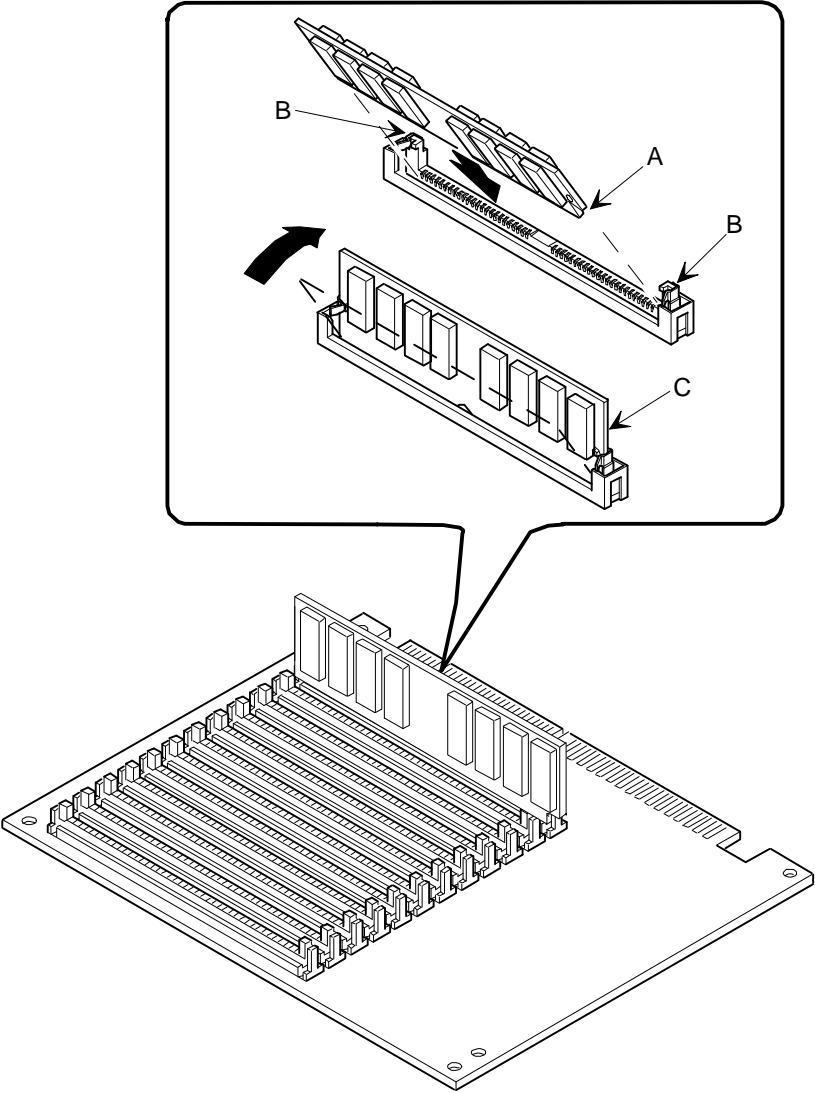


**NOTE:** Half of banks 1, 2, and 3 are on each memory module.

*Refer to the Memory Configuration Guidelines section.*

8. Replace both memory modules and secure them with the retaining brackets.
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.

*Refer to Chapter 2, "Server Utilities."*



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**Figure 6-5. Installing a SIMM (Memory Module)**

## Memory Interleaving Upgrade Path

The following table details the Prioris ZX 6000MP Series server memory upgrade path.

Memory Upgrade Path	Bank 0	Bank 1	Bank 2	Bank 3
MLB (4-way interleaving)	Interleave 0-3 (8 SIMMs)			
Memory module 1		Interleave 0-1 (4 SIMMs)	Interleave 0-1 (4 SIMMs)	Interleave 0-1 (4 SIMMs)
Memory module 2		Interleave 2-3 (4 SIMMs)	Interleave 2-3 (4 SIMMs)	Interleave 2-3 (4 SIMMs)

## Supported Memory Configurations

The following table lists the SIMM combinations supported by the Prioris ZX 6000MP Series.

<b>Bank 0 (8 SIMMs)</b>	<b>Bank 1 (8 SIMMs)</b>	<b>Bank 2 (8 SIMMs)</b>	<b>Bank 3 (8 SIMMs)</b>	<b>Total</b>
8 MB				64 MB <sup>(1)</sup>
8 MB	8 MB			128 MB
8 MB	8 MB	8 MB		192 MB
8 MB	8 MB	8 MB	8 MB	256 MB
16 MB				128 MB
16 MB	16 MB			256 MB
16 MB	16 MB	16 MB		384 MB
16 MB	16 MB	16 MB	16 MB	512 MB
32 MB				256 MB
32 MB	16 MB			384 MB
32 MB	16 MB	16 MB		512 MB
32 MB	16 MB	16 MB	16 MB	640 MB
32 MB	32 MB			512 MB
32 MB	32 MB	16 MB		640 MB
32 MB	32 MB	16 MB	16 MB	768 MB
32 MB	32 MB	32 MB		768 MB
32 MB	32 MB	32 MB	16 MB	896 MB
32 MB	32 MB	32 MB	32 MB	1024 MB
64 MB				512 MB
64 MB	64 MB			1024 MB
64 MB	64 MB	64 MB		1536 MB
64 MB	64 MB	64 MB	64 MB	2048 MB

<sup>(1)</sup> 1P server configurations only

# Memory Troubleshooting

The Prioris ZX 6000MP Series server POST can detect memory errors when it boots. The error can be isolated to one of two SIMMs on the MLB and memory modules 1 and 2.

The memory error message format is as follows:

<Type of error>: <Location>

Where:

Type of error:	Correctable error	
	Uncorrectable error	
Location:	Main Logic Board	J17/J18
		J20/J21
		J25/J26
		J28/J30
	Memory Module 1 (J22)	J02/J03
		J04/J05
		J06/J07
		J08/J09
		J10/J11
		J12/J13
	Memory Module 2 (J23)	J02/J03
		J04/J05
		J06/J07
		J08/J09
		J10/J11
		J12/J13

Example:

Uncorrectable Error : Main Logic Board J17/J18

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.

# 7

## Installing Optional Disk and Tape Drives

### 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 maximum of nine hard disk drives can be configured in the server.
  - Seven Storage Building Block (SBB) drives.
  - Two half-height disk drives located in the two bays above the SBB assembly location.
- A full-height tape drive occupies two half-height 5¼-inch drive bays.

### SBB Configuration Guidelines

- SSBs must only be installed in the hot-swap bay area.
- A maximum of seven 3½-inch half-height SSBs can be installed.

## CD-ROM Drive Configuration Guidelines

- The factory installed SCSI CD-ROM drive has its SCSI ID set to 6 (in most configurations).
- The CD-ROM drive should always be connected to the factory installed Adaptec SCSI controller 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 host adapter. 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 SCSI host adapter, 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 host adapter, no other devices will be seen beyond the second connector.



## Boot Device

- The SCSI host adapter with the lowest BIOS address is identified by the server as the “primary” SCSI host adapter. When loading the operating system from a SCSI SBB, this primary or boot drive must be connected to the primary SCSI host adapter.
- To improve server performance, you might want to distribute the SCSI devices across the SCSI host adapters.
- Each operating system has different limitations regarding the number of SCSI host adapters that are supported. Refer to your operating system documentation for additional information.

## 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 host adapter if it is in the middle of the daisy chained SCSI cable. If you remove the host adapter 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.
- Do not mix wide and narrow SBBs on the narrow bus.
- 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 host adapter 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 6.
- Narrow (8-bit) devices on a wide cable count as two SCSI IDs. For example, the narrow CD-ROM drive SCSI ID is 6 so SCSI ID 14 is no longer available. The 8-bit CD-ROM device counts as two devices on a 16-bit wide data path.

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

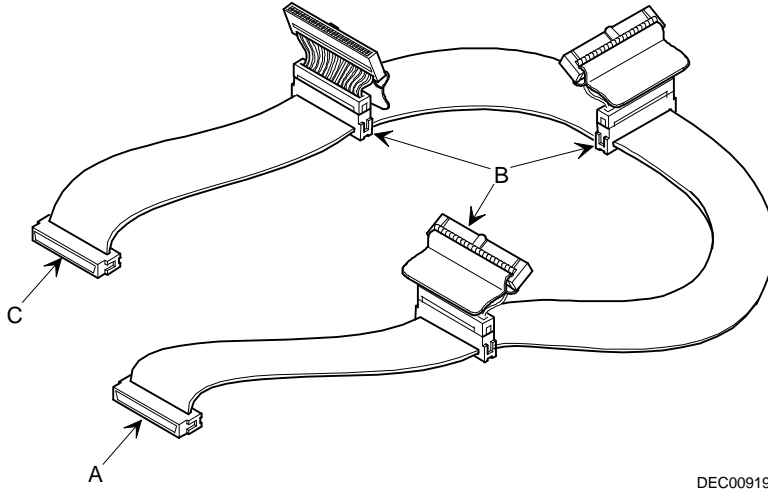
**Single/Dual SCSI Bus Target ID Settings (J181 on Storage Backplane)**

Jumpers Set	None	W1 <sup>(1)</sup>	W2	W3	W1+W2	W1+W3	W2+W3	W1+W2+W3
<b>SCSI Bus 1</b>								
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
<b>SCSI Bus 2 or Jumper Cable</b>								
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

<sup>(1)</sup> Factory default settings

**Cables**

- The standard internal five connector wide SCSI cable includes (see Figure 7-1):
  - One wide SCSI 68-pin connector to connect to the wide SCSI host adapter (A, Figure 7-1).
  - Three wide-to-narrow adapters to connect to the narrow CD-ROM drive and other narrow devices (B, Figure 7-1).
  - One wide connector to connect the SCSI host adapter to channel A of the storage backplane. A cable terminator is supplied if this connector is not used to connect to the storage backplane (C, Figure 7-1).



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**Figure 7-1. Five Connector SCSI Cable**

- A jumper cable is supplied to connect the two storage backplane segments together to make a single SCSI channel.
- Two internal terminators are supplied for the storage backplane; one to terminate Channel A and the other to terminate Channel B.
- Two additional wide cable with two wide SCSI 68-pin unshielded connectors are supplied to connect Channel A or Channel B to a separate controller or channel.

## 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 7-2). 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

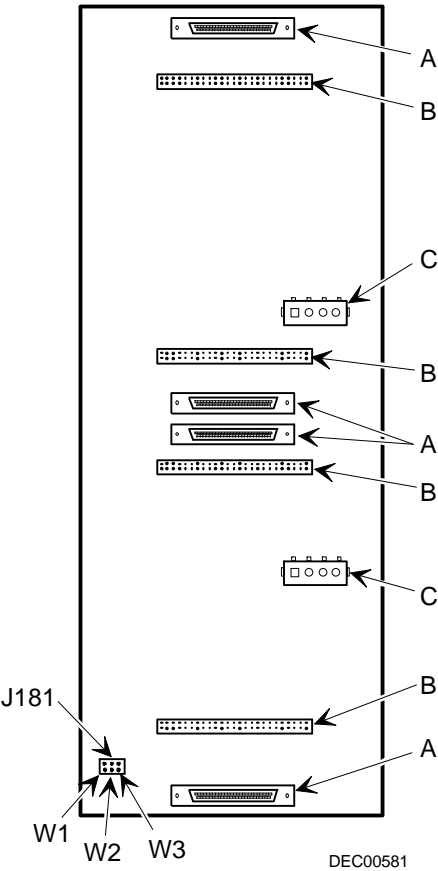


Figure 7-2. Storage Backplane

## Installing Optional Drives

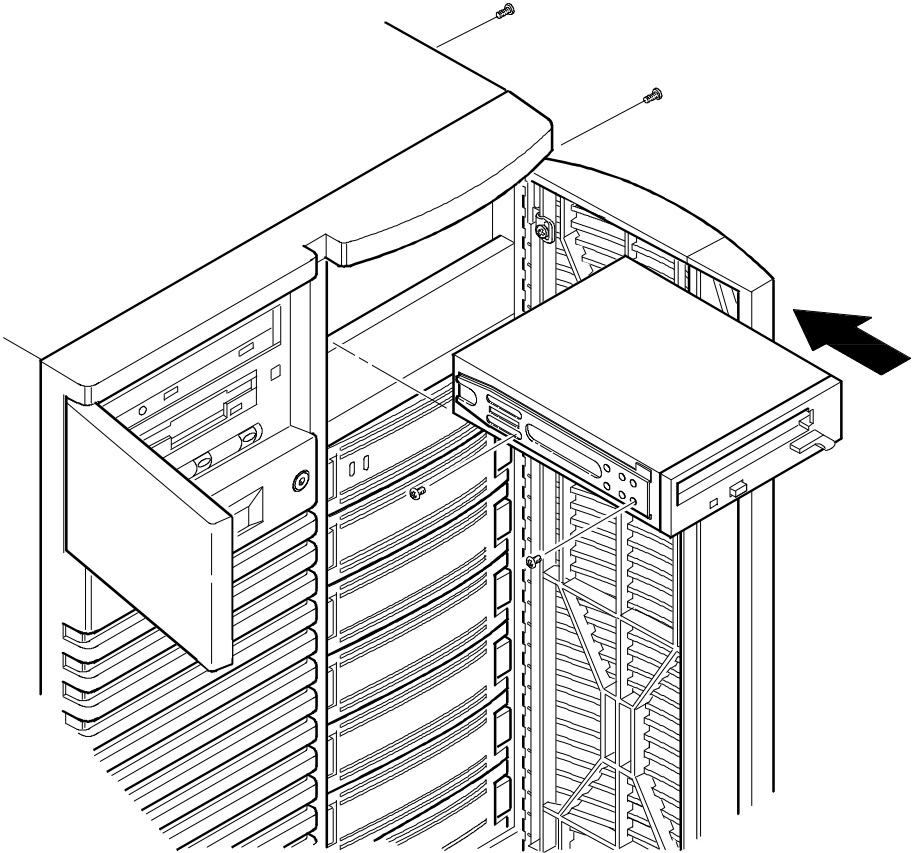
Your server has three drive bay areas. Optional drives such as a SCSI disk drive, a diskette drive, a SCSI CD-ROM, and a SCSI tape are installed in these drive bay areas. The three drive bay areas are:

- Left-front access drive bay area—This area has one 5¼-inch SCSI CD-ROM drive (standard on the Prioris ZX 6000MP Series).
- Top-right front access drive bay area—This area has room for two wide (68-pin) or narrow (50-pin) 5¼-inch or 3½-inch half-height SCSI devices or one full-height, 5¼-inch device. Devices can include diskette drives, CD-ROMs, 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.

## **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 the remove 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.



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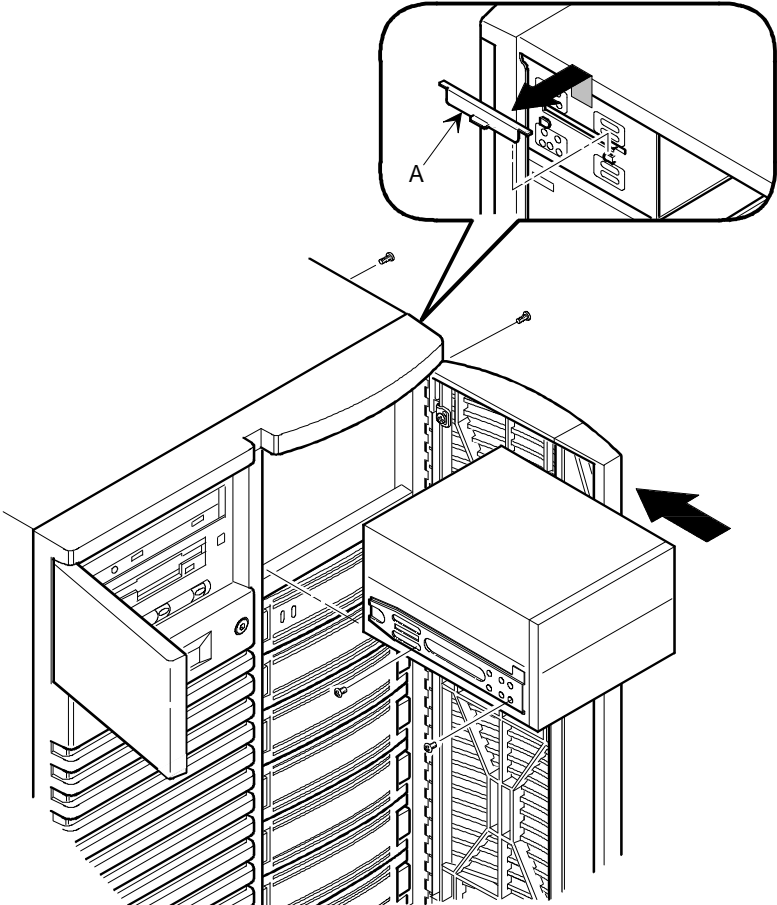
**Figure 7-3. Installing a Half-Height 5 1/4-Inch Device Into Top-Right Drive Bay**



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

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

1. Turn off your server.
2. Disconnect all external devices, ac power, and monitor power.
3. Unlock and the remove 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 7-4) 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.

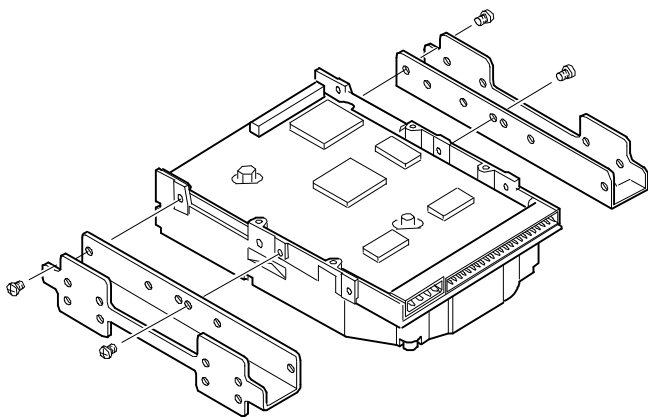


DEC00634-2

**Figure 7-4. Installing a Full-Height 5¼-Inch Device Into Top-Right Drive Bay**

## **Expansion Brackets**

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



DEC00723

**Figure 7-5. 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).

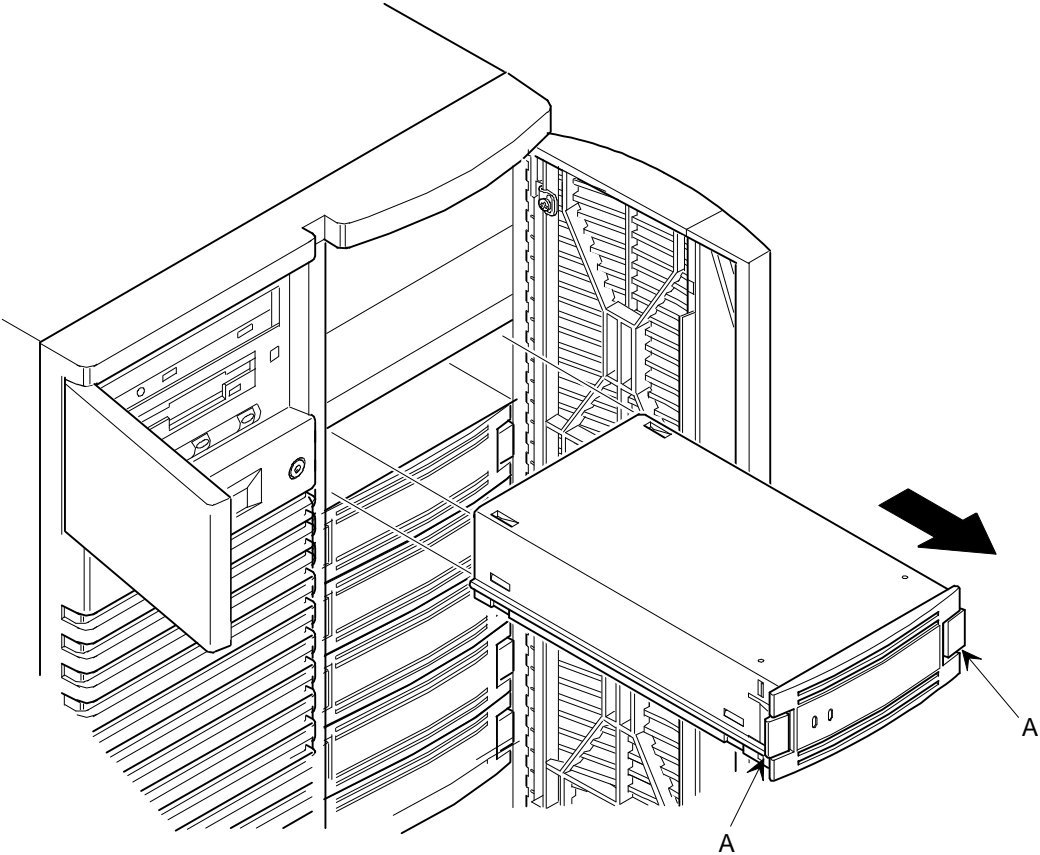


**NOTE:** Not all SCSI host adapters support the hot-swap method. Refer to your SCSI host adapter documentation to determine if the hot-swap method is supported.

Also, you might need to reconfigure your server to recognize the devices you installed.

Use the following procedure to install or replace an SBB:

1. Unlock and the open 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 7-6).
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 7-6. Installing a Device Into the Hot-Swap Drive Bay**

## 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**

<b>Activity Status LED</b>	<b>Fault Status LED</b>	<b>Indication</b>
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.



## External Storage

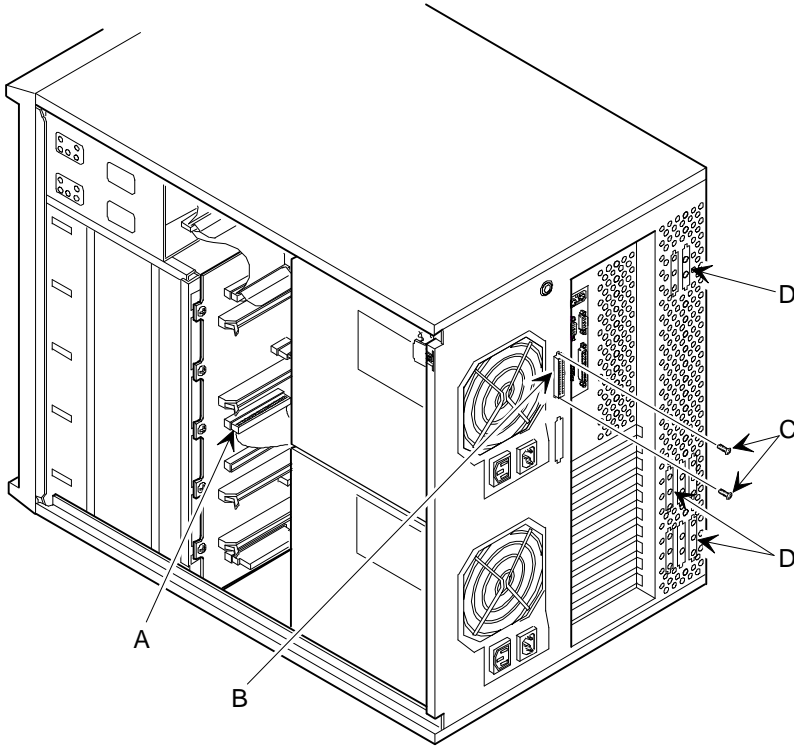
You can use additional SCSI cables and/or host adapters to connect external SCSI devices to your server. Consult your Digital sales representative for information on SCSI options and cables.

### Connecting an External SCSI Bus to the Storage Backplane

To connect an external SCSI bus to the storage backplane:

1. Power down the Prioris ZX 6000MP Series server.
2. Unlock and remove the right side panel.
3. Remove the secondary power supply:
  - a. Disconnect the cable harness from the rear of the secondary power supply.
  - b. Remove the four screws that secure the secondary power supply in the chassis.
  - c. Remove the secondary power supply from the chassis.
4. Remove the terminator from the storage backplane for the bus you want to connect.
5. Connect the wide SCSI 68-pin unshielded cable connector (part no. FR-PCXAR-WG) to the storage backplane (A, Figure 7-7).
6. Using a screwdriver, gently pry away one of the SCSI knockouts at the rear panel (B, Figure 7-7).
7. Screw the wide SCSI 68-pin or narrow SCSI 50-pin external shielded connector to the rear panel (C, Figure 7-7).
8. Connect the external SCSI device making sure the external device is properly terminated.

9. Replace the secondary power supply:
  - a. Place the secondary power supply into the chassis.
  - b. Place the SCSI bus cable above the power supply mounting bracket.
  - c. Secure the secondary power supply in the chassis with the four screws removed in step 3.
  - d. Connect the cable harness to the rear of the power supply.



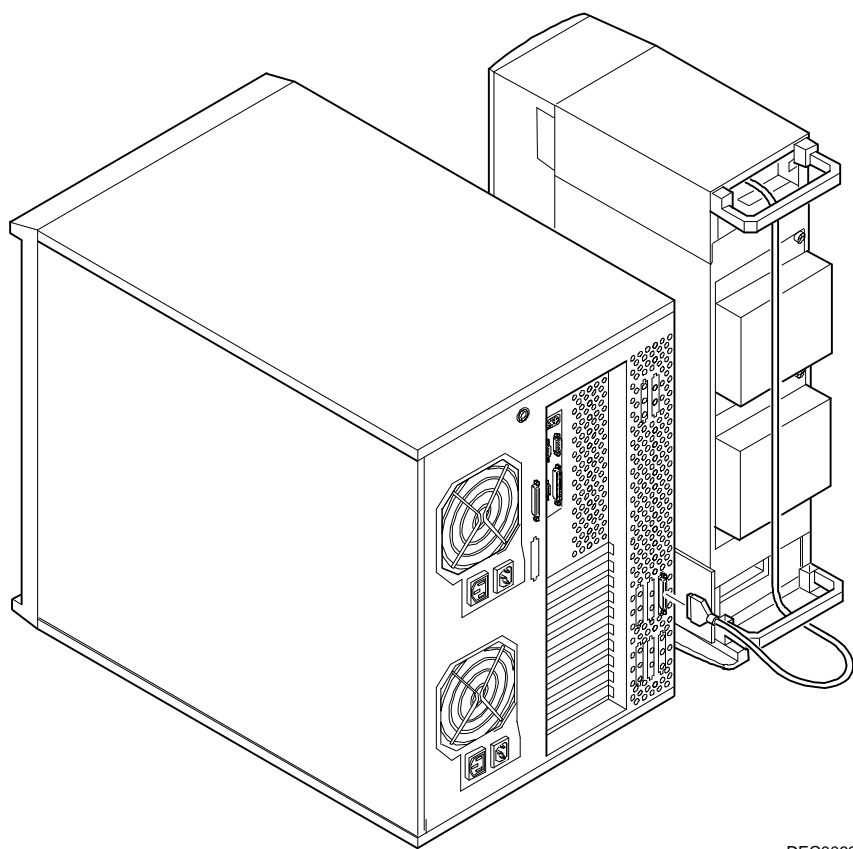
DEC00444

**Figure 7-7. External SCSI Bus Connections**

## Connecting an External Device to a SCSI Controller

To connect an external SCSI bus to a controller:

1. Power down the Prioris ZX 6000MP 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 7-7).
4. Connect the wide SCSI 68-pin unshielded cable connector (part no. FR-PCXAR-WG) 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.



DEC00626

**Figure 7-8. Example of Connecting an External SCSI Storage Box to a SCSI Controller**



# 8

## Installing Expansion Boards

### 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 NIC.

### ISA/EISA Expansion Board Configuration Guidelines

- EISA slots one through five support industry-standard 32-bit EISA expansion or 16-bit ISA boards.
- EISA slot one is designated as a shared slot with PCI slot four. This means that only one expansion board can reside in EISA slot one or PCI slot four at any one time.
- ISA/EISA boards should be installed starting in EISA slot two. Install the shared EISA slot one last.
- 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.

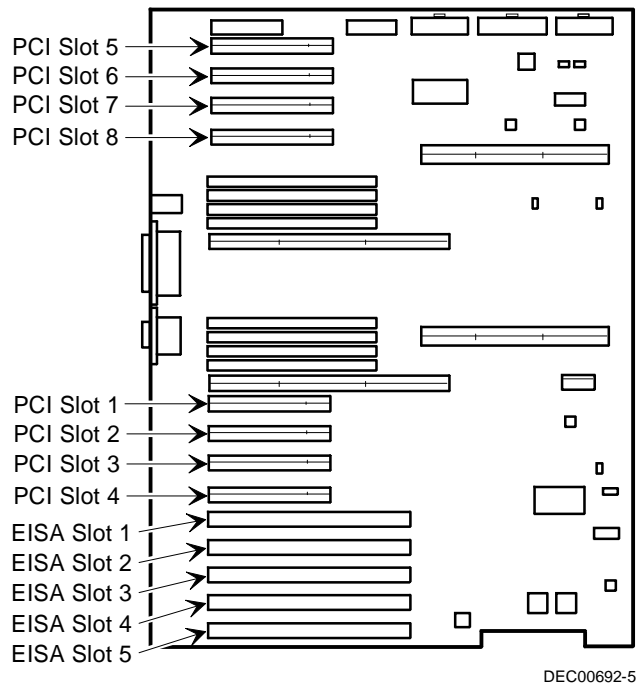


Figure 8-1. Expansion Board Slot Locations

## PCI Expansion Board Configuration Guidelines

- PCI slots one through eight support bus mastering 32-bit PCI expansion boards.
- PCI slot four is designated as a shared slot with EISA slot one. This means that only one expansion board can reside in PCI slot four or EISA slot one at any one time.
- PCI video expansion boards should always be installed in PCI slot one.



**NOTE:** It is recommended that you run the SCU after you install a PCI video expansion board to reallocate the onboard video resources.

- 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 the default IRQ, I/O port address, and ROM address for the expansion boards, and modify them. 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 boards and assign IRQ and I/O port addresses to these boards. Each PCI slot can have up to 4 IRQs assigned to it for use by the controller. ROM addresses for the PCI expansion boards will be assigned based on the PCI scan order and the available addresses not already assigned to ISA or EISA expansion boards. The SCU can be used to edit the ROM addresses of any controllers in the EISA bus or PCI busses 0 and 1.



## Identifying the Server Boot Device

The server boot device can be defined in the SCU. For a bootable CD-ROM or SBB drive to be the boot device, it must be attached to a SCSI controller which has the lowest ROM address on either the EISA or PCI bus. The SCSI controller must be installed on EISA or PCI bus 0. Your server is configured from the factory with bootable CD-ROM support for the Quick Launch program. In the event that the CD-ROM does not boot:

1. Verify that the "Bootable CD-ROM" is enabled in the *SCSISelect* utility (under Advanced Configuration Options).

*Refer to the "SCSISelect Utility" section in Chapter 2.*

2. Ensure that the CD-ROM drive is attached correctly to the Adaptec controller expansion board and that the board is the lowest ROM address of all the storage controllers in the server.

Additionally, when the Quick Launch CD-ROM creates and loads utilities onto the hard disk drive's partition on the server, it will choose the first hard disk drive that is found during the server scan sequence.

## Server Bus Scan Order

ROM addresses on PCI expansion boards are assigned based on the PCI scan order and what addresses are available at the time of the scan. The bus scan order is as follows:

1. The EISA bus is scanned first, in ascending order from slot 1 to 5. This means that if there is an EISA SCSI adapter and a PCI SCSI adapter in the server, the EISA SCSI adapter will be scanned first followed by the PCI adapter. The EISA ROM address will be either its default setting or what was last set using the SCU. The PCI adapter will be assigned the next available ROM address.

2. The PCI bus is then scanned in this order:

PCI slots 1-4 are fixed to be on PCI bus 0, and are scanned in ascending order. Each slot represents a different PCI device number on PCI bus 0 as shown below:

- Slot 1 PCI Bus 0, Device 6
- Slot 2 PCI Bus 0, Device 7
- Slot 3 PCI Bus 0, Device 8
- Slot 4 PCI Bus 0, Device 9

For each controller 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 on board. They would represent a single device on PCI bus 0 if installed in PCI slots 1-4.

In the case of the Adaptec 3940W, there is one additional PCI bus onboard with two SCSI channels. If the 3940W controller is installed in slot 1 of PCI bus 0, then the PCI bus on the 3940W would be assigned as PCI bus 1, the two SCSI channels on that controller would be seen as devices on PCI bus 1.

Once all the controllers on PCI bus 0 (slots 1-4) have been scanned, the secondary PCI bus is scanned (slots 5-8). This PCI bus is assigned the next available bus number. Thus the slot assignments would be:

- Slot 5 PCI Bus N+1, Device 1
- Slot 6 PCI Bus N+1, Device 2
- Slot 7 PCI Bus N+1, Device 3
- Slot 8 PCI Bus N+1, Device 4

Where N is the last PCI bus number assigned.

## 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 controller, 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 controller 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 controller 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 controller would be the boot device.

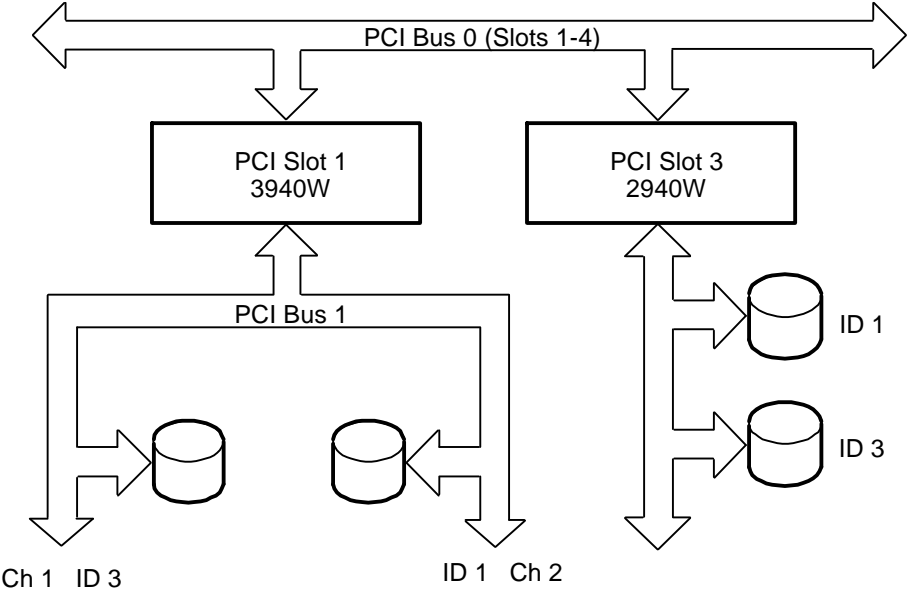
To boot from a bootable drive on the 2940W, the SCU would have to be run to change the address of the Mylex RAID controller to a higher address, such as D0000h, and then the SCU would assign C8000h to the 2940W, and that drive would become the boot device.

### Example 2:

PCI Slot 1	PCI SCSI controller, such as a 3940W Drive on Channel 1 SCSI ID 3 Drive on 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 3940W.

The 3940W contains a PCI bus internally, and that bus is scanned next (PCI bus 1). Channel 1 and then Channel 2 of the 3940W are detected in that order. 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, then the boot device would be the first drive detected during the scan, which is the drive on Channel 1 of the 3940W (see Figure 8-2).



DEC00830

**Figure 8-2. EISA/PCI Scan Order**

## 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, the Adaptec 3940W SCSI controller has 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 the Adaptec 3985 SCSI controller. This controller 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 Adaptec 3985 SCSI 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 VGA

In this case, the first two embedded references are devices on the controller in PCI Slot 1, while the last two are associated with the controller in PCI Slot 2.

## **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 (e.g. IRQ, Option ROM address), 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, I/O Port, and memory assignments. Select Available resources to view unassigned IRQs, DMAs, I/O ports, and memory addresses.

### **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.



## 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 Your 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.”*

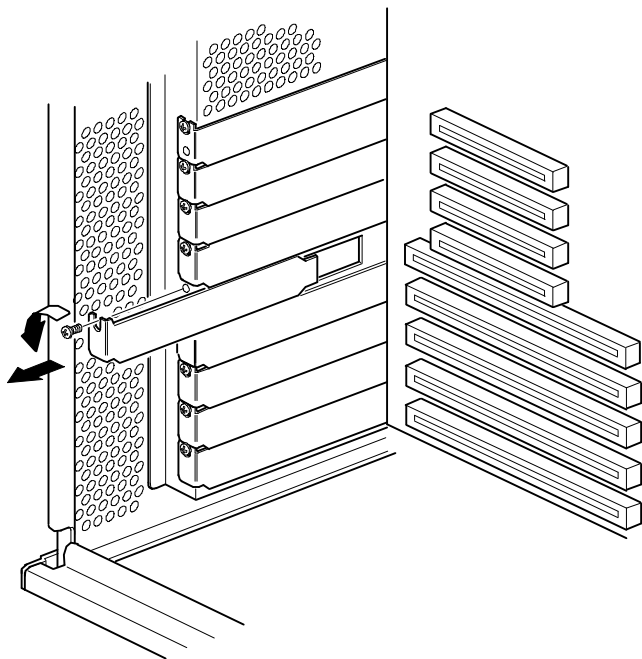
## Installing ISA Expansion Boards

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.



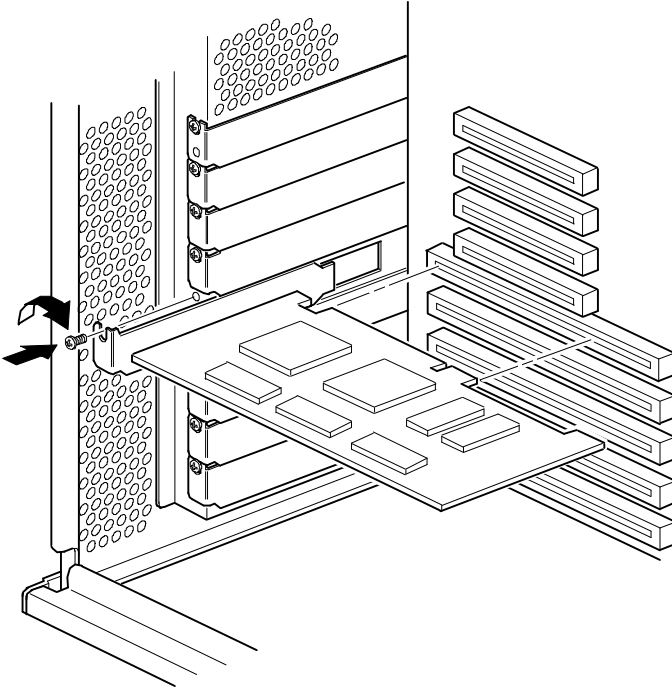
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**Figure 8-3. Removing a Metal Filler Plate**

6. Insert the new ISA expansion board into the slot 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.



DEC00699-3

**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.

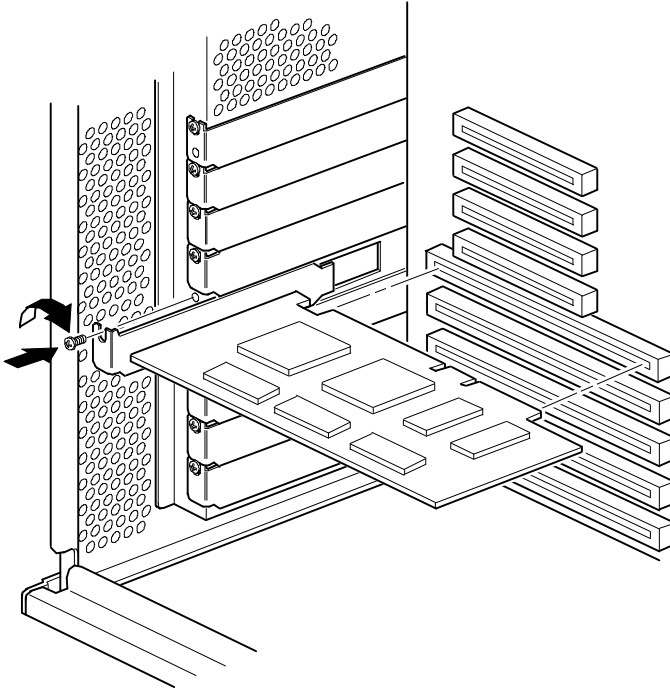
1. Turn off your server.
2. Disconnect all external devices, ac power, and monitor power.
3. Unlock and remove the left side panel.
4. Unscrew and remove the metal filler plate from the selected EISA expansion slot (see Figure 8-3).
5. Insert the new EISA expansion board into the socket and push it firmly 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.*



DEC00699-4

**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 Your Computer` menu.

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



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

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:



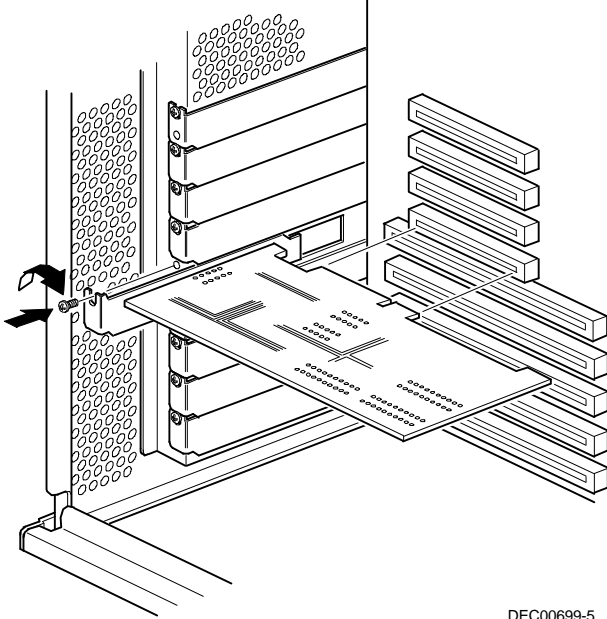
**NOTE:** Read and fully understand your optional expansion board's documentation before installing the expansion board.

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.

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.



DEC00699-5

**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



**CAUTION:** Before installing a PCI video expansion board, make sure the appropriate PCI slot options group is enabled. Failure to do so might cause your server to operate incorrectly.

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 Your 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, DMA, and memory 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.

It is recommended that you run the SCU after you install a PCI video expansion board to reallocate the onboard video.

Make sure you switch the video signal cable from the onboard video connector to the connector on the PCI video expansion board.

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



## Relocating Expansion Boards

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

1. Start the SCU 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 Your 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.

# 9

## Connecting SCSI and RAID Adapters

### Introduction

This chapter contains the configuration guidelines that must be followed when connecting SCSI or RAID adapters to optional disk 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 4 so SCSI ID 12 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 host adapter settings to fit your specific configuration.

*Refer to Chapter 7 for additional SCSI configuration guidelines.*

## RAID Configuration Guidelines

- Fault management must be supported and enabled by the host adapter 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.
- Use narrow SBB disk drives with a narrow RAID host adapter.
- 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	1
		(minimum to maximum)	(minimum to maximum)

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

## Host Adapter Cable Configurations

The following sections describe the available host adapter cable configurations for your Prioris ZX 6000MP Series.

### Single Channel SCSI Configuration

To connect SCSI devices to a single channel, 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 SCSI 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 the lock 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.

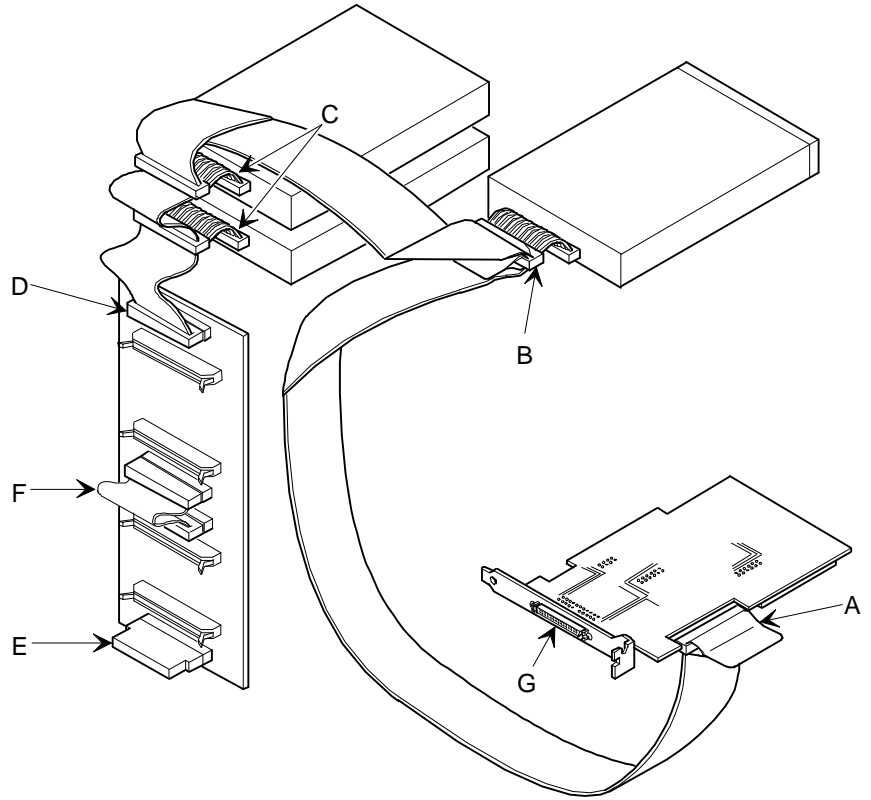
*Refer to Chapter 2, "Server Utilities," and to your SCSI and RAID documentation for additional configuration information.*



**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	Single channel, wide SCSI host adapter (such as a 2940W)
B	Wide SCSI 68-pin-to-narrow SCSI 50-pin adapter cable to CD-ROM drive
C	Wide SCSI 68-pin-to-narrow SCSI 50-pin adapter cable to top-right drive bay
D	Backplane, wide SCSI 68-pin connector
E	Terminator <sup>(1)</sup>
F	Jumper cable
G	External SCSI connector

<sup>(1)</sup> This terminator can be removed and replaced with a wide SCSI 68-pin cable to connect to an external SCSI device.



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
**Figure 9-1. Single Channel SCSI Configuration**

## Two Channel SCSI Configuration

To connect SCSI devices to two separate SCSI channels, perform the following. Note that A channel is connected to external device(s); B channel is connected to internal device(s).

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 9-2.
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 Utilities," and to your SCSI and RAID documentation for additional configuration information.*

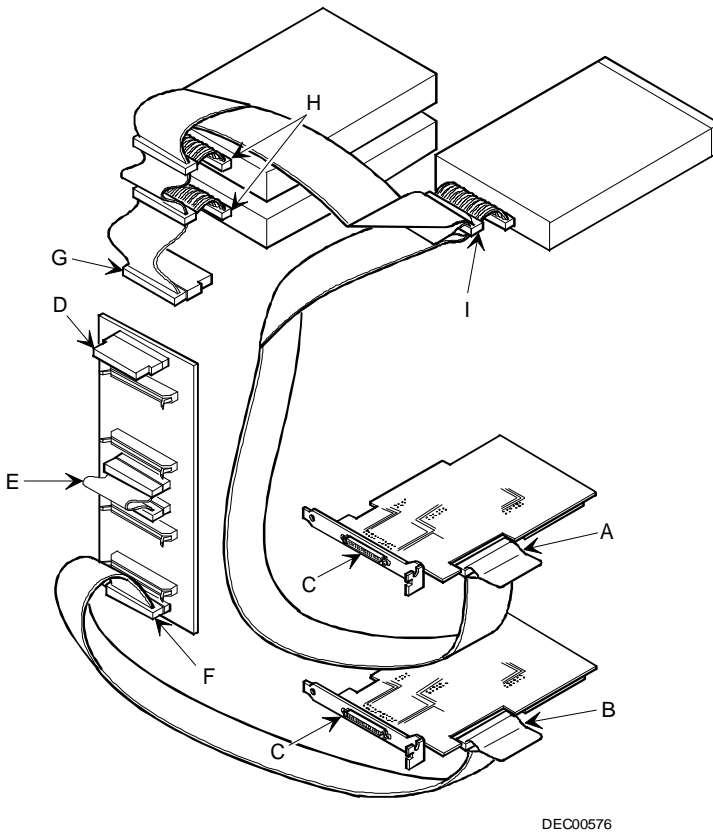


**NOTE:** Servers with this configuration are shipped with an additional terminator to enable you to split the storage backplane.

Figure 9-2 Legend	Component
A	Single channel, wide SCSI host adapter (such as a 2940W) to an external device
B	Wide SCSI or RAID host adapter to the internal backplane
C	External SCSI connector
D	Backplane terminator
E	Jumper cable
F	Backplane, wide SCSI 68-pin connector

*continued*

Figure 9-2 Legend	Component
G	Cable terminator
H	Wide SCSI 68-pin-to-narrow SCSI 50-pin adapter cable to top-right drive bay
I	Wide SCSI 68-pin-to-narrow SCSI 50-pin adapter cable to CD-ROM drive



**Figure 9-2. Two Channel SCSI Configuration**



### Three Channel SCSI Configuration

To connect SCSI devices to three separate channels, perform the following. Note that A channel is connected to external device(s); BG and BF channels are connected to internal device(s).

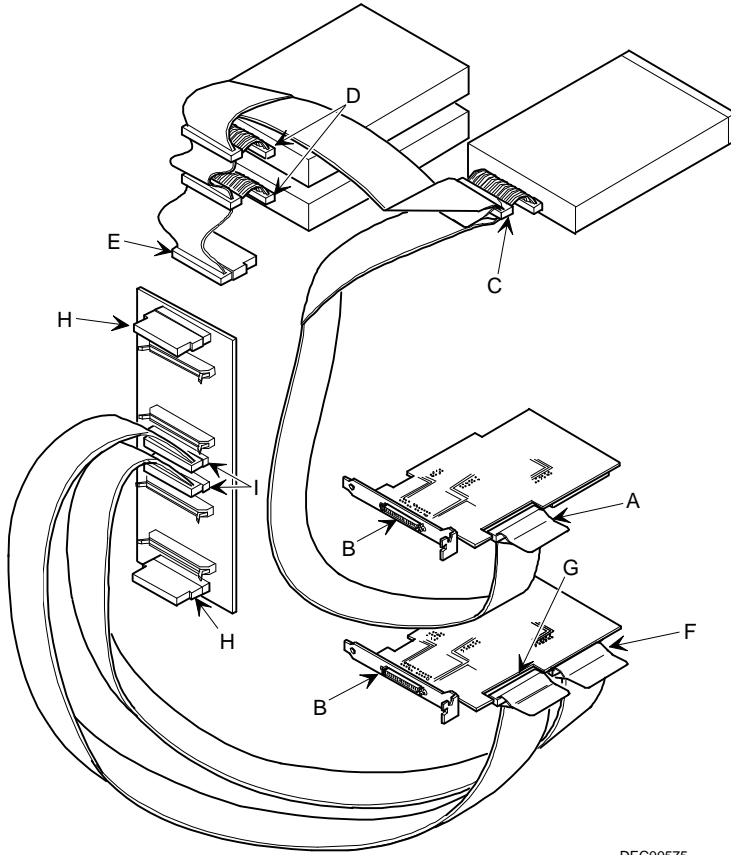
- 1. Power down the server.
- 2. Disconnect all peripheral devices from the server.
- 3. Unlock and remove the server side panel.
- 4. Disconnect the power cable from the 5¼-inch device, if used.
- 5. Connect the SCSI cables as shown in Figure 9-3.
- 6. If using the top 5¼-inch drive bay, connect the 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 Utilities," and to your RAID documentation for additional configuration information.*

Figure 9-3 Legend	Component
A	Single channel, wide SCSI host adapter (such as a 2940W) to an external device
B	External SCSI connector to the internal backplane
C	Wide SCSI 68-pin-to-narrow SCSI 50-pin adapter cable to CD-ROM drive
D	Wide SCSI 68-pin-to-narrow SCSI 50-pin adapter cable to top-right drive bay
E	Cable terminator
F	Connection from wide SCSI or RAID host adapter (channel 1, host adapter) to internal backplane
G	Connection from wide SCSI or RAID host adapter (channel 0, host adapter) to internal backplane

*continued*

Figure 9-3 Legend	Component
H	Terminator
I	Backplane, wide SCSI 68-pin connector (makes crossover from channel 1 to channel 0)



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**Figure 9-3. Three Channel SCSI Configuration**



# 10

## Server Security Features

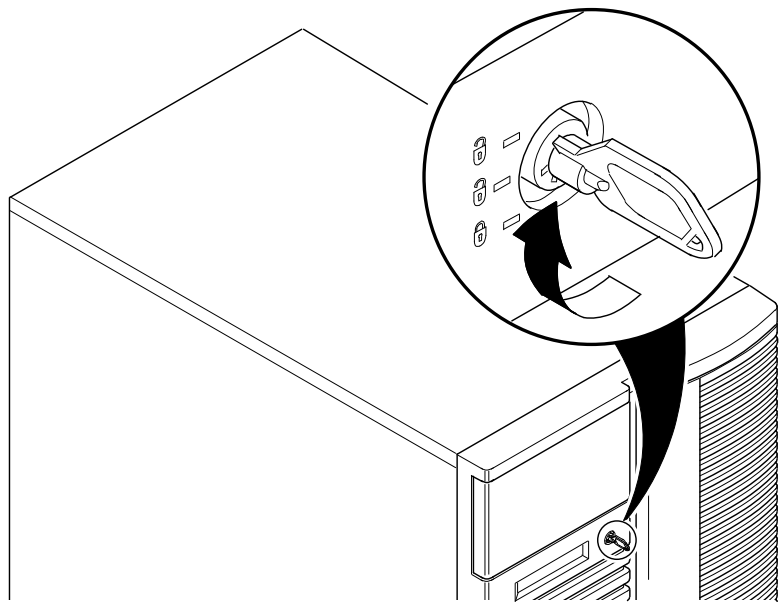
### Introduction

Server security is important to prevent theft or accidental loss of software and hardware. The Prioris ZX 6000MP Series 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.

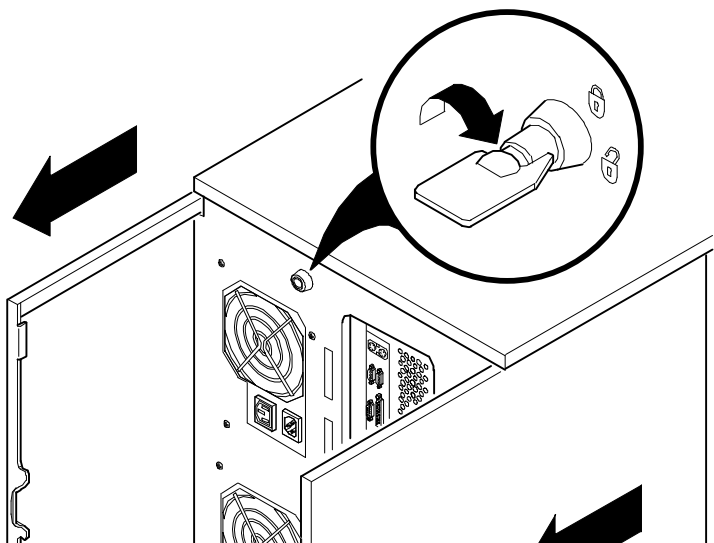


**Figure 10-1. Front Panel Security Doors Lock**

# 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 Digital service representative or authorized dealer for information on replacing lost keys.



**Figure 10-2. Left and Right Side Panel Lock**

## Supervisor Password

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

Perform the following steps to set a supervisor password:

1. Turn on your server and allow the POST to complete.  
If POST detects an error refer to 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 J35-SW4 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 J35-SW4 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.*



## 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.

# 11

## Problem Solving and Troubleshooting

### Introduction

This chapter provides initial troubleshooting procedures. The tables that follow list specific problems, probable causes, and recommended actions to take if your server fails. 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 ZX 6000MP Series.

- 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.
- Run the SCU.

*Refer to Chapter 2, “Server 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 Utilities,” for additional information.*

- Contact Digital Services for software or hardware related problems.



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

If you are a self-maintenance customer, call your Digital service representative for assistance and recommendations. Refer to the “Service Area” on the server CD-ROM for the phone numbers in your area.

# Server Troubleshooting

Problem	Possible Cause	Action
No response when the server is turned on.	Server is not plugged in.	Turn off the server, plug it in, and then turn it back on again.
	No power at the wall outlet.	Use another wall outlet.
	Main logic board failed.	Contact your Digital service representative.
	Main logic board 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.
	Terminator card not seated properly (1P and 2P configurations only).	Reseat terminator card.
	Terminator card not installed.	Install terminator card.
	Side panels removed.	Install side panels.
	Power supply failed.	Contact your Digital service representative.

*continued*

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 Digital service representative.
	Monitor has failed.	Replace monitor or contact your Digital service representative.
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 SCSISelect.
	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.
	Memory module installed incorrectly.	Reinstall memory module.
	Memory module failed.	Replace memory module.

*continued*

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 Digital service representative.
No response to mouse commands.	Mouse might be password protected by a local or remote control program.	Enter the keyboard and mouse password.
	Mouse is not connected.	Power down the server and connect the mouse.
	Mouse is connected to the keyboard port.	Power down the server and connect the mouse to the mouse port.
	Mouse driver not installed.	Install the appropriate mouse driver.
	Mouse trackball dirty.	Clean trackball.
Server operates correctly but application software does not.	Mouse failed.	Replace mouse or contact your Digital service representative.
	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 Digital service representative.
	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*



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 host adapter has failed.	Contact your Digital service representative.
	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI host adapter and rear panel connector or external SCSI device and rear panel connector.	Refer to 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. <b>CAUTION:</b> 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 hard disk drive cannot read or write information.	SCSI device has failed.	Replace SCSI device.
	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.

## 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 Digital service representative.
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 Digital service representative.
Distorted, rolling, or flickering screen display, or wrong/uneven color.	Monitor incorrectly adjusted.	Adjust accordingly.
	Monitor signal cable incorrectly installed.	Straighten any bent connector pins and then reconnect.

*continued*

Problem	Possible Cause	Action
Color monitor displaying monochrome.	Server was turned on before the monitor was turned on.	Turn off the server, turn on the monitor, then turn the server back on.
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.
Power is on but indicator shows no activity.	Tray open.	Close the tray.
	No disc or tray is open.	Insert a disk and close the tray.
Disk is spinning but drive is idle.	Check cable connections.	Make sure cables are correctly connected.
	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.

# 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 controller.	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 Digital service representative.

## Technical Specifications

### 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	64 MB minimum (1P server configuration) 128 MB minimum (2P server configuration)  Up to 2.0 GB ECC-protected memory on main logic board and two memory modules, using 8, 16, 32, or 64 MB SIMMs.
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	2,438 m (8,000 ft) maximum
Nonoperating	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 (one slot is a shared PCI/EISA slot). These slots support +5 V dc.

## PCI Local Bus Expansion Slots

The main logic board contains eight PCI local bus expansion slots (one slot is a shared PCI/EISA slot). These slots support:

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

## 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 <sup>(1)</sup>	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

<sup>(1)</sup> 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.

## Main Logic Board Switch Settings

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

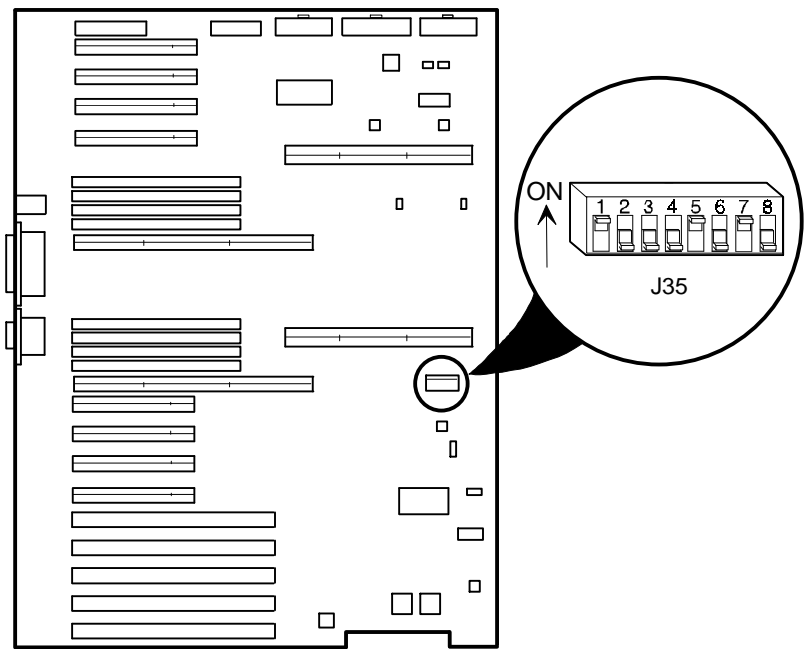


**CAUTION:** Do not touch any electronic component unless you are safely grounded. Wear a grounded wrist strap or touch an exposed metal part of the server chassis. A static discharge from your fingers can result in permanent damage to electronic components.

Feature	Function	Setting	Description
BIOS upgrade	Disabled Enabled <sup>(1)</sup>	J35-SW1, off J35-SW1, on <sup>(1)</sup>	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 <sup>(1)</sup> Recovery mode	J35-SW2, off <sup>(1)</sup> J35-SW2, on	If your BIOS upgrade failed, refer to the README.TXT file that came with the BIOS upgrade.
Boot block update	Disabled <sup>(1)</sup> Enabled	J35-SW3, off <sup>(1)</sup> J35-SW3, on	Set this switch to disabled (OFF) position to prevent unauthorized personnel from changing the BIOS boot block.
Password clear	Normal mode <sup>(1)</sup> Password clear (MFG test)	J35-SW4, off <sup>(1)</sup> J35-SW4, 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	Not installed <sup>(1)</sup> Installed	J35-SW5, on <sup>(1)</sup> J35-SW5, off	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 <sup>(1)</sup> Clear	J35-SW6, off <sup>(1)</sup> J35-SW6, 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.
CPU bus speed	60 MHz 66 MHz <sup>(1)</sup>	J35-SW7, off J35-SW7, on <sup>(1)</sup>	Determines the CPU clock speed for the installed CPU(s). 200 MHz processor = 66 MHz 166 MHz processor = 66 MHz
Reserved	Reserved	J35-SW8, off <sup>(1)</sup>	This switch should always be OFF.

(1) Factory default setting

ON = switch closed; OFF = switch open



DEC00692-6

**Figure A-1. Main Logic Board Switch Location**

# CPU Module Switch Settings

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



**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
Reserved	J19-SW8, up <sup>(1)</sup>	This switch should always be UP position
Inner CPU core/bus ratio	J19-SW7, down	2 (120/133 MHz)
	J19-SW6, down	
	J19-SW5, down	
	J19-SW7, up <sup>(1)</sup>	5/2 (150/166 MHz)
	J19-SW6, down <sup>(1)</sup>	
	J19-SW5, down <sup>(1)</sup>	
	J19-SW7, up <sup>(2)</sup>	3 (180/200 MHz)
	J19-SW6, down <sup>(2)</sup>	
	J19-SW5, up <sup>(2)</sup>	
	J19-SW7, down	7/2 (210/233 MHz)
	J19-SW6, down	
	J19-SW5, up	
	J19-SW7, down	4 (240/266 MHz)
	J19-SW6, up	
	J19-SW5, down	
	J19-SW7, up	9/2 (270/300 MHz)
	J19-SW6, up	
	J19-SW5, down	
	J19-SW7, down	5 (300/330 MHz)
	J19-SW6, up	
	J19-SW5, up	
	J19-SW7, up	11/2 (330/366 MHz)
	J19-SW6, up	
	J19-SW5, up	

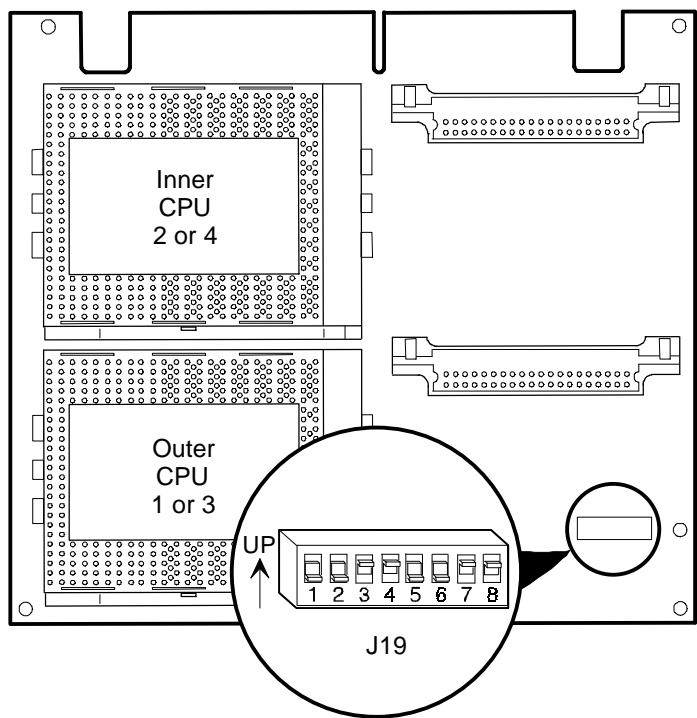
(1) Factory default setting for 166 MHz CPU  
(2) Factory default setting for 200 MHz CPU

*continued*

Feature	Setting	Description
Reserved	J19-SW4, up <sup>(1)</sup>	This switch should always be UP position
Outer CPU core/bus ratio	J19-SW3, down J19-SW2, down J19-SW1, down	2 (120/133 MHz)
	J19-SW3, up <sup>(1)</sup> J19-SW2, down <sup>(1)</sup> J19-SW1, down <sup>(1)</sup>	5/2 (150/166 MHz)
	J19-SW3, down <sup>(2)</sup> J19-SW2, down <sup>(2)</sup> J19-SW1, up <sup>(2)</sup>	3 (180/200 MHz)
	J19-SW3, up J19-SW2, down J19-SW1, up	7/2 (210/233 MHz)
	J19-SW3, down J19-SW2, up J19-SW1, down	4 (240/266 MHz)
	J19-SW3, up J19-SW2, up J19-SW1, down	9/2 (270/300 MHz)
	J19-SW3, down J19-SW2, up J19-SW1, up	5 (300/330 MHz)
	J19-SW3, up J19-SW2, up J19-SW1, up	11/2 (330/366 MHz)

(1) Factory default setting for 166 MHz CPU

(2) Factory default setting for 200 MHz CPU



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Figure A-2. CPU Module Switch Location

# B

## Device Mapping

### Introduction

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

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 7FFFF	Main memory	512 KB
80000 to 9FFFF	Main/PCI/EISA/ISA memory	128 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 E7FFF	EISA/ISA/PCI adapter RAM after POST completes Used by BIOS Setup during POST	32 KB
E8000 to EFFFF	EISA/ISA and buffer memory	32 KB
F0000 to FFFFF	System BIOS memory	64 KB

# CPU I/O Address Map

Range (hexadecimal)	Function
0000 to 0CF7	PCI I/O space
0CF8	Configuration space enable register
0CF9	Turbo and reset control register
0CFA to 6FFF	EISA/PCI I/O space
0CFC	Configuration space data register
0D00 to 6FFF	EISA/PCI I/O space
7000 to BFFF	PCI I/O space
C000 to CFFF	PCI configuration space
D000 to FFFF	PCI I/O space

## 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)

## 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

# DMA Channel Assignment

Channel	Controller	Function
0	1	Refresh
1	1	Not used
2	1	Diskette controller (if enabled)
3	1	Not used
4	2	Cascade DMA
5	2	Not used
6	2	Not used
7	2	Not used



PCI Configuration Space Address Map

PCI Bus No.	Device No.	Device
0	14	OMC
0	19	Primary PCI bridge
0	2	EISA bridge
0	6	PCI slot 1 <sup>(1)</sup>
0	7	PCI slot 2
0	8	PCI slot 3
0	9	PCI slot 4
0	D	PCI VGA Trio32/64
0	1A	Secondary PCI bridge
1	1	PCI slot 5
1	2	PCI slot 6
1	3	PCI slot 7
1	4	PCI slot 8

<sup>(1)</sup> Install a VGA expansion board in PCI slot 1, if used.  
PCI slots 5-8 are located in the secondary PCI.

### 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.

System - Prioris ZX Series Server

Menu Fields	Settings	Comments
System processor type	Not user selectable	Displays the type of the processor that is resident on the main logic board.
System processor clock	Not user selectable	Displays the clock of the processor that is resident on the main logic board.
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.
	[memory amount], AT-bus space enabled at E00000h, 2M	
	[memory amount], AT-bus space enabled at C00000h, 4M	
System extended memory mode	Compatibility(1)	Selects the means for supporting extended memory above 64 MB. Select [Compatibility] for using conventional service in BIOS.
	Non-compatibility	Select [Non-Compatibility] for memory support above 64 MB when using Windows NT v3.1 or above.
System information	Not user selectable	Displays the version of the server BIOS. Also, the resources occupied by the server BIOS can be viewed via this selection
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 reserved resources	Not user selectable Installed as a default <sup>(1)</sup>	Always shown as installed. Select [Enter] to display the Asset number of the server. The Asset number can be changed by the user.
Main logic board information	Not user selectable Installed as a default <sup>(1)</sup>	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 1 information	Not user selectable Installed as a default <sup>(1)</sup>	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 2 information	Not user selectable Not installed as a default <sup>(1)</sup>	If CPU module 2 is installed, select [Enter] to display CPU module 2 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.
Memory module 1 information	Not user selectable Installed	If memory module 1 is installed, select [Enter] to display memory module 1 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.
Memory module 2 information	Not user selectable Installed	If memory module 2 is installed, select [Enter] to display memory module 2 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.

<sup>(1)</sup> Factory default setting

Diskette Drive Group

Menu Fields	Settings	Comments
Integrated diskette controller	Enabled <sup>(1)</sup> 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 <sup>(1)</sup> 3.5" 2.88 MB drive	Sets the size and density of diskette drives.
Diskette drive B	Not Installed <sup>(1)</sup> 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 <sup>(1)</sup> 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 <sup>(1)</sup> 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.

<sup>(1)</sup> Factory default setting

Boot Options Group

Menu Fields	Settings	Comments
Boot option	A: then C: <sup>(1)</sup> C: then A: C: only A: only	Each time your server boots, it will load your operating system from the sequence selected.
POST errors	Enabled <sup>(1)</sup> Disabled	If enabled, the server pauses and displays POST errors. To continue, Press <F1>.
Floppy check	Enabled <sup>(1)</sup> Disabled	Enabling this option forces the server to verify the diskette type during boot.
Summary screen	Enabled <sup>(1)</sup> Disabled	Enables or disables the ability to display your server's configuration during boot.
OCP soft banner	Not installed <sup>(1)</sup> Installed	If installed, you can define a 16 character string that appears on the Operator Control Panel (OCP).

<sup>(1)</sup> Factory default setting

Integrated Peripherals Group

Menu Fields	Settings	Comments
Video type	VGA or EGA <sup>(1)</sup> CGA 80 columns Monochrome	Sets the video controller type.
Monitor type	Color <sup>(1)</sup> Monochrome	Sets the type of monitor connected to your server: Color or Monochrome.
Mouse port	Disabled Enabled <sup>(1)</sup>	Enables or disables the onboard PS/2 style mouse port.
Parallel port	Disabled	Selects the Enhanced Parallel Port (ECP) mode.
	Compatible mode	Selects the standard printer connection.
	Bi-Directional Mode <sup>(1)</sup>	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) <sup>(1)</sup> 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) Enable at: 2F8h-2FFh (IRQ3) <sup>(1)</sup> Enable at: 3E8h-3Efh (IRQ4) Enable at: 2E8h-2Efh (IRQ3)	Enables or disables onboard serial port 2 at the specified address and IRQ.

<sup>(1)</sup> Factory default setting

# Keyboard Features Group

Menu Fields	Settings	Comments
NumLock	Auto <sup>(1)</sup> 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 <sup>(1)</sup> Enabled	Enables or disables the audible key click feature.
Keyboard auto-repeat rate	30/sec <sup>(1)</sup> 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	¼ sec 1/2 sec <sup>(1)</sup> ¾ sec 1 sec	Sets the delay time after a key is held down before it begins to repeat a keystroke.

<sup>(1)</sup> Factory default setting



Shadow Options Group

Menu Fields	Settings	Comments
Shadow video BIOS ROM	Enabled <sup>(1)</sup> 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 <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow CC00h-CFFFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow D0000h-D3FFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow D4000h-D7FFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow D8000h-DBFFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow DC000h-DFFFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.

<sup>(1)</sup> Factory default setting

## Security Options Group

Menu Fields	Settings	Comments
Supervisor password	Not installed <sup>(1)</sup> 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 <sup>(1)</sup> 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 <sup>(1)</sup>	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 <sup>(1)</sup> 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 <sup>(1)</sup>	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 <sup>(1)</sup> 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 <sup>(1)</sup> Daily Weekly Monthly	Allows you to display a backup reminder message at boot (daily, every Monday, or the 1 <sup>st</sup> of every month).
Virus check reminder	Disabled <sup>(1)</sup> Daily Weekly Monthly	Allows you to display a virus check reminder message at boot (daily, every Monday, or the 1 <sup>st</sup> of every month).

<sup>(1)</sup> Factory default setting

Cache Options Group

Menu Fields	Settings	Comments
Internal cache	Enabled <sup>(1)</sup> Disabled	Enables or disables your server's CPU internal cache operation.
External cache	Disabled Write through Write back <sup>(1)</sup>	Allows you to select the external cache operation type.
Cache system BIOS ROM	Enabled <sup>(1)</sup> Disabled	Enables or disables caching request for server BIOS ROM (F0000h to FFFFFh).
Cache video ROM	Enabled <sup>(1)</sup> Disabled	Enables or disables the server to cache the video BIOS in the C000 to C7FFh segment.

<sup>(1)</sup> Factory default setting

Advanced Control Group

Menu Fields	Settings	Comments
OPBC CPU to PCI Write Posting	Disabled Enabled <sup>(1)</sup>	When enabled, allows CPU writes to the PCI to be posted in the compatibility OPB chipset.
OPBC PCI to CPU Write Posting	Disabled Enabled <sup>(1)</sup>	When enabled, allows PCI writes to the CPU to be posted in the compatibility OPB chipset.
OPBC CPU Line Read Pre-Fetch	Disabled Enabled <sup>(1)</sup>	When enabled, allows the compatibility OPB chipset's PCI memory read line commands to pre-fetch additional CPU cache lines.
2nd OPB CPU to PCI Write Posting	Disabled Enabled <sup>(1)</sup>	When enabled, allows CPU writes to the PCI to be posted in the 2nd OPB chipset.
2nd OPB PCI to CPU Write Posting	Disabled Enabled <sup>(1)</sup>	When enabled, allows PCI writes to the CPU to be posted in the 2nd OPB chipset.

<sup>(1)</sup> Factory default setting

*continued*

Menu Fields	Settings	Comments
2nd OPB CPU	Disabled	When enabled, allows the 2nd OPB's PCI memory read line commands to pre-fetch additional CPU cache lines.
Line Read Pre-Fetch	Enabled <sup>(1)</sup>	
CPU in order queue depth	8 <sup>(1)</sup> 1	Allows you to select the depth of the CPU in-order-queue.
APIC & MP table	Disabled MPS 1.1 MPS 1.4 <sup>(1)</sup>	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. <b>Note:</b> This parameter must be disabled for NetWare 3.12 single processor systems.
ECC interrupt	Disabled <sup>(1)</sup> IRQ14, Shared IRQ14, Non-Shared IRQ15, Shared IRQ15, Non-Shared	Enables the Error Correction Code (ECC) interrupt. If enabled, you can select IRQ14 or IRQ15 as the ECC interrupt. You can also define the IRQ as shared with other devices, such as EISA or PCI devices.
GAT mode	Enabled <sup>(1)</sup> Disabled	Should be enabled only when an ISA bus mastering card is installed in the server. Disable it for all other configurations.
System arbitration	CPU Bus first <sup>(1)</sup> EISA Bus first Full Rotation	This option controls the operating modes of the server's PCI arbiter. The arbiter controls the arbitration priorities for EISA, PCI, and CPU buses.

<sup>(1)</sup> Factory default setting

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.
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

### 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.
3. Disconnect the monitor cable from the back of the server.
4. Disconnect the keyboard cable from the back of the server.
6. Disconnect the mouse cable from the back of the server.
7. Disconnect any other external peripheral devices, such as printers and modems.
8. Insert a drive protection card in all 5¼-inch and 3½-inch diskette drives (if applicable). If you do not have drive protection cards, use blank diskettes.
9. Package the server as described in the following section, "Packing the Server."

## Packing the Server

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

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



## **Installing the Server at a New Location**

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

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