

**digital**

**PRIORIS  
ZX 5000 MP  
SERVER  
USER'S GUIDE**



# Prioris ZX 5000 MP Series Server

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## User's Guide

Part Number: ER-A60WW-UA. A01

**Digital Equipment Corporation**

**January 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

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

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

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

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

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

Read the instructions for correct handling.

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

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

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



**ADVARSEL!** Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskifning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

**WARNING:** Explosionsfara vid ifelaktigt batterbyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikatens instruktion.

**VAROITUS:** Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

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# About This Guide

This guide describes how to operate, upgrade, configure, and troubleshoot your Prioris ZX 5000 MP Series Server family. This guide will also help to familiarize you with all aspects of the server and provide a reference tool for questions you might have in the future.

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

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

## Audience

This guide is written specifically for anyone responsible for operating, configuring, and expanding the Prioris ZX 5000 MP Series Server family.

## Organization

This guide contains the following:

- Chapter 1: *Introduction*—This chapter provides general information about your server. For example: server software and support documentation, diagnostic software, server utilities and technical support, restarting your server, providing a comfortable working environment, identifying server model and serial numbers, and learning where to obtain help.
- Chapter 2: *Server Utilities*— This chapter describes the server utilities that are supplied on the ServerWORKS Quick Launch CD-ROM disk.
- Chapter 3: *Expanding Your Server*—This chapter explains how to unlock and remove the side panels, install or replace main logic board options, install CPU modules, install memory modules, and mass storage devices.

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

- Chapter 4: *Problem Solving and Troubleshooting*—This chapter describes initial and advanced troubleshooting solutions.
- Chapter 5: *Server Security Features*—This chapter describes the various security features that are available to prevent server or data theft.
- Appendix A: *Technical Specifications*—This appendix lists vital server operating specifications and main logic board jumper information.
- Appendix B: *Server Messages*—This appendix describes the power-on self test (POST) and run-time error messages, including recommended corrective actions.
- Appendix C: *Device Mapping*—This appendix contains tables listing your server's memory map, I/O address map, interrupt map, and DMA map.
- Appendix D: *Caring For Your Server*—This appendix provides suggestions for cleaning and moving your server.

# Conventions

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<b>Convention Example</b>	<b>Description</b>
<i>kp</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.
1 234 567	Spaces are used in large numbers instead of commas.

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## Abbreviations

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<b>Abbreviation</b>	<b>Meaning</b>
BIOS	Basic input/output system
CPU	Central processing unit
DMA	Direct memory access
DRAM	Dynamic random access memory
ECC	Error correction code
ECP	Extended capabilities port
EISA	Extended industry standard architecture
EPP	Enhanced parallel port
FRU	Field replaceable unit
IDE	Integrated drive electronics
h	An h suffix to a numerical value denotes hexadecimal numbers. For example, 0F8h equals 0F8 hexadecimal.
I/O	Input/output
ISA	Industry standard architecture
LED	Light emitting diode
MS-DOS	Microsoft Disk Operating System
PCI	Peripheral component interconnect
POST	Power-on self test
RAID	Redundant array of inexpensive 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	Microsoft Windows application software
ZIF	Zero insertion force

## Special Notices

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



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



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



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



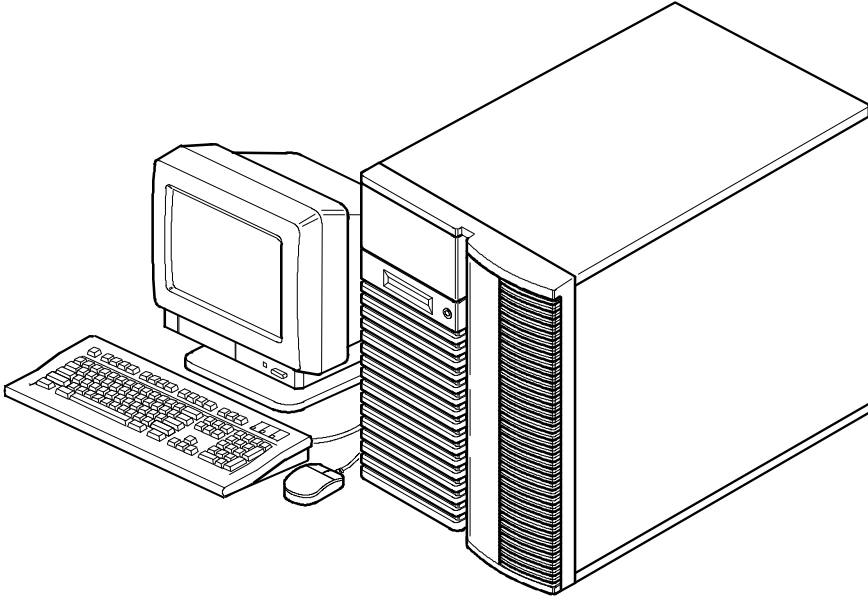
## Related Documentation

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

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

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

SCSI, RAID, diagnostics, and other options manuals are also available.



DEC00421

### Typical Prioris ZX 5000 MP Series Server



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

# 1

## Introduction

The Prioris ZX 5000 MP Series is a family of high-performance, highly-scalable network and application servers featuring the latest in modular CPU and storage technology. The Prioris ZX 5000 MP Series family of servers also provide investment protection through CPU upgrade technology. This technology enables you to easily upgrade to a higher-performance CPU by simply installing a new CPU module or modules.

Prioris ZX 5000 MP Series Servers provide the following features:

- |                                 |   |
|---------------------------------|---|
| <i>CPU Module</i>               | <p>True symmetrical multi-processing (SMP) Intel Pentium one (1P), two (2P), three (3P), or four (4P) processor options available. All processor options use a 128-bit memory interface and support a 32-bit PCI interface.</p> <p>Also, 1P CPU modules contain a 512 KB burst write-back cache module; 2P CPU modules contain a 1 MB burst write-back cache per CPU.</p> |
| <i>Memory Module</i>            | <p>One or two memory modules available. Each module uses Error Checking and Correcting (ECC) memory architecture and supports 2-way interleaving. Each memory module can be expanded to hold up to 384 MB of memory.</p>  |
| <i>Onboard SCSI Controllers</i> | <p>Two onboard Adaptec® 7870 Fast Wide SCSI-2 controllers. These controllers support 8-bit (narrow SCSI) data path widths at a data transfer rate of 10 MB/sec and 16-bit (wide SCSI) at a data transfer rate of 20 MB/sec. As PCI masters, these controllers can also support data transfer rates of 133 MB/sec.</p>   |
| <i>PCI RAID Adapter</i>         | <p>Single or dual-channel PCI RAID adapter board in RAID-ready servers enables you to manage data distribution using multiple disk drives.</p>  |

<i>Integrated Device Array Storage Bay</i>	Supports up to seven 3½-inch, wide or narrow SCSI, hot-swap devices for configuring a mass storage array using Storage Building Blocks (SBBs).
<i>Expansion Slots</i>	Four EISA slots, three PCI slots, and two shared EISA/PCI slots for a total of nine slots for maximum expandability.
<i>Onboard Video Controller</i>	Onboard Cirrus 5424 video controller. 512 KB video RAM (expandable to 1 MB) supporting 800 x 600 at 256 colors and 1024 x 768 at 16 colors.
<i>Redundant Fans and Power Supply</i>	For added reliability, your server has redundant fans for cooling and the option to add a second power supply or an additional fan.
<i>Operator Control Panel (OCP)</i>	Back-lit, 32-character LCD display that shows power-on status messages each time your server boots. The Operator Control Panel can be lit by pressing a manual switch on the front bezel.
<i>ServerWORKS Quick Launch</i>	Enables you to install your operating system and configure your server from a single CD-ROM disk application.
<i>ServerWORKS Manager</i>	Enables a network administrator to monitor critical PC server statistics and vital CPU component information necessary to maintain a healthy network.
<i>Pedestal Cabinet</i>	Optional floor-mounted pedestal cabinet available. This cabinet is modular with its own power supply blowers and SCSI cable connectors.
<i>Operating System Compatibility</i>	Certified operating systems include: Novell NetWare 3.12 or 4.02, Novell Unixware, SCO UNIX server products and MPX, Windows NT server 3.5, Windows for Workgroups 3.11, OS/2, Banyan Vines (Native), and PATHWORKS 5.x.

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



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

## Server Software and Support Documentation

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

- ServerWORKS software kit — contains ServerWORKS Quick Launch and ServerWORKS Manager.
  - ServerWORKS Quick Launch contains a bootable CD-ROM disk and reference guide. The Quick Launch program steps you through the initial server setup and operating system installation process.
  - ServerWORKS Manager contains the software and documentation for installing the ServerWORKS Manager LAN management tool.

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

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

## Diagnostic Software

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

1. During your operating system installation process, the diagnostic software is automatically copied to a subdirectory on the MS-DOS partition. This enables you to run the diagnostic software anytime from the MS-DOS partition you created.
2. Using the Install Software Conventional method in ServerWORKS Quick Launch, you can create a bootable diagnostic software diskette. This enables you to run the diagnostic software anytime using the diskette you created.

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

## Server Utilities and Technical Support

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

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

## Restarting Your Server

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

## Important Information

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

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

---

<b>Adjust</b>	<b>So . . .</b>
Chair	<p>Feet are flat on the floor.</p> <p>Legs are vertical forming a right angle to the floor.</p> <p>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.</p> <p>Your upper body is erect and your lower back is supported with a backrest.</p>
Keyboard or mouse	<p>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.</p> <p>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.</p> <p>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.</p>

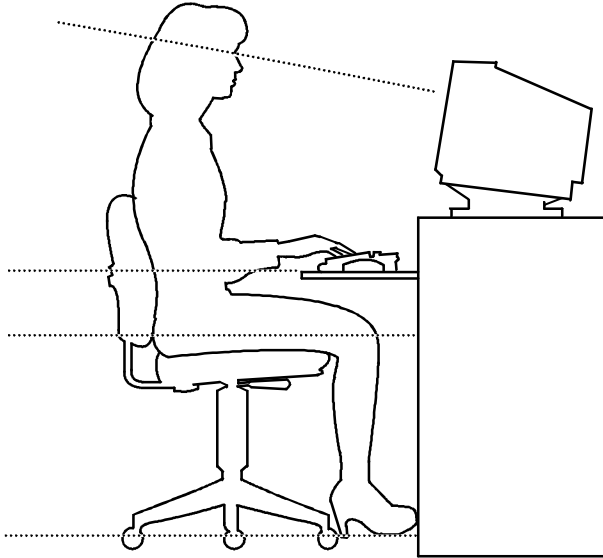
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*continued*



<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.



DEC00454

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

## Identifying Model and Serial Numbers

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



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

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

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

## Getting Help

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

---

# 2

## Server Utilities

### Introduction

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

- **SCSI *Select* Utility**— This utility enables you to configure and view settings of the installed Adaptec SCSI controllers and SCSI devices.
- **RAID Configuration Utility** — This utility is available for RAID-ready servers only. This utility enables you to configure your RAID array.
- **Flash Memory Update** — This utility enables you to update or restore your server's BIOS and EISA/PCI configuration information.
- **System Configuration Utility (SCU)** — This utility enables you to configure your server when relocating, adding, or removing EISA/ISA/PCI expansion boards and when changing your server's factory-defined BIOS Setup options.

## SCSISelect Utility

Your Prioris ZX 5000 MP Series Server comes with dual Adaptec AIC-7870 fast/wide SCSI-2 controllers and a SCSISelect configuration utility. This utility enables you to change host controller settings without opening your server.

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.

To start the SCSISelect configuration utility:

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

When the SCSISelect configuration utility appears, follow the instructions on your screen to configure the SCSI controller and run SCSI disk drive utilities.

## RAID Configuration Utility

RAID-ready Prioris ZX 5000 MP Series Servers include a Mylex RAID controller and RAID configuration utility. If your RAID controller was factory installed, the RAID configuration utility appears when you boot your server with the ServerWORKS Quick Launch CD-ROM disk. Use this utility to configure your RAID array.

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

## Flash Memory Update Program

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

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

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

## System Configuration Utility (SCU)

The SCU enables you check or change your server's configuration. The SCU is PCI-aware, and complies with both EISA and ISA plug and play standards. You must run the SCU each time you add, remove, or relocate an EISA or ISA expansion board. Running the SCU is optional for plug and play and PCI expansion boards.

Each EISA expansion board comes with a diskette that contains a configuration (.CFG) file. The .CFG file describes the board's characteristics and the server resources that the board requires. The configuration registers on PCI and plug and play expansion boards contain the same type of information that an EISA .CFG file does. Your server's main logic board also comes with a .CFG file.

The SCU uses the information provided by .CFG files, configuration registers, NVRAM, and the information that you enter, to specify a particular configuration. The SCU then configures the server by writing the configuration information to flash memory.

The SCU stores most of the configuration values in the battery-maintained memory (NVRAM) of the real-time clock (RTC), and the rest of them in flash memory. These values take effect each time you boot the server. POST checks the values against the actual hardware configuration; if they do not agree, it generates an error message. You must then run the SCU to specify the correct configuration before the server boots. Pressing F1 on the keyboard, in response to the BIOS prompt during POST, activates the BIOS Setup.

The SCU modifies the CMOS RAM and EISA NVRAM, under your direction. The BIOS POST routines and the ISA plug and play Auto Configuration Manager (ACM) actually configure the hardware.

The SCU always updates the checksums for both areas so that the BIOS can detect any potential data corruption before the actual hardware configuration takes place. If the data is corrupted, the BIOS requests that you configure the server before it can boot.



## Locating the SCU

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

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

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

```
SCU.BAT
```

2. Using the *Install Software Conventional* method in ServerWORKS Quick Launch, you can create a bootable SCU diskette. This enables you to run the SCU anytime using the diskette you created.
3. You can run the SCU by inserting the Quick Launch CD-ROM disk, rebooting the server, and pressing the right [ALT] key during the boot process to display the SCU.



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

## Starting and Using the SCU

To start and run the SCU:

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

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

2. Start the SCU from the DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.
3. From the MS-DOS Startup menu select one of the following:
  1. Execute AMISCU
  2. Execute AMISCU (baseboard configuration only)
  3. Execute AMISCU using the Overlay Lite

4. When the SCU title appears, press any key to continue.

Afterwards, follow the instructions on your screen to access the SCU main menu.

5. From the main menu, press the up or down arrow to highlight an item and then press [Enter] to select it. If you are using a mouse, point to an item and double-click the left button to select it. Press [F1] at any time for help about a selection.

If you need additional information about configuring your server, select “Step 1: About System Configuration.”

## SCU Options

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



**NOTE:** The server also has a BIOS Setup utility available to change your server's BIOS settings. Although the BIOS Setup utility is separate from the SCU, the SCU will automatically update the BIOS settings. In most cases, your server will operate according to the most recent changes regardless of which utility you use to make changes. However, Digital recommends that you use the SCU to configure your server each time you add hardware, remove hardware, or change server settings to ensure that your server operates properly.

The following menu fields might not reflect current BIOS or SCU revisions. Refer to the BIOS Setup utility screens, the SCU, and any associated on-line help for more information.

## Systems Group

Menu Fields	Settings	Comments
System identification and version information	Not user selectable	Displays the server identification string.
System identification string		
Config and overlay version	Not user selectable	Displays the configuration and overlay version.
BIOS version string	Not user selectable	Displays the BIOS version string.
MP spec version	Not user selectable	Displays the multi-processor specification version.

## System Processor Modules

Menu Fields	Settings	Comments
CPU 1 in slot 1	Not user selectable	Displays the installed CPU type.
CPU 2 in slot 1	Not user selectable	Displays the installed CPU type.
CPU 1 in slot 2	Not user selectable	Displays the installed CPU type.
CPU 2 in slot 2	Not user selectable	Displays the installed CPU type.

## System Processor Status

Menu Fields	Settings	Comments
CPU 1 in slot 1	Not user selectable	Displays the fault status of the installed CPU.
CPU 2 in slot 1	Not user selectable	Displays the fault status of the installed CPU.
CPU 1 in slot 2	Not user selectable	Displays the fault status of the installed CPU.
CPU 2 in slot 2	Not user selectable	Displays the fault status of the installed CPU.

## System Performance

Menu Fields	Settings	Comments
Power-on speed option	Fast Slow	Determines the CPU speed used by your server each time you turn it on or reboot.
Secondary IOAPIC control option	Enable secondary IOAPIC Disable secondary IOAPIC	

## Memory Subsystem Group

Menu Fields	Settings	Comments
Base memory options	640KB base memory 512KB base memory	Displays the current amount of base (conventional) memory.
Shadowing ISA ROMs options: C000 C4000 C8000 CC000 D0000 D4000 D8000 DC000 E0000 E4000	Enable Disable	Allows you to enable or disable shadowing and caching of individual segments of ROM to increase server performance. <b>Caution:</b> Some option ROMs do not operate properly when shadowed. <b>Note:</b> Press Ctrl-E to enable all addresses; press Ctrl-D to disable all addresses.
Extended memory options: Cache	Cache mode: Write-back Disabled Write-through	Selects the installed cache module type or enables you to disable the installed cache module.
1MB ISA hole	1MB ISA hole control: Disabled Enabled	Allows you to enable or disable the dedicated 1 MB ISA memory hole. Enable this option if an ISA expansion board requires this memory space.

## Onboard Disk Controllers

Menu Fields	Settings	Comments
Onboard floppy controller	Enabled Disabled	Enables or disables the onboard diskette controller.

## Onboard Communication Devices

Menu Fields	Settings	Comments
Serial port 1 configuration	COM1:3F8-IRQ 4 COM2:2F8-IRQ 3 COM3:3E8-IRQ4 COM4:2E8-IRQ3 Port 1 disable	Enables or disables onboard serial port 1 at the specified address.  <b>Note:</b> If your server is connected to a network, see your System Administrator.
Serial port 2 configuration	COM2:2F8-IRQ 3 COM1:3F8-IRQ 4 COM3:3E8-IRQ4 COM4:2E8-IRQ3 Port 2 disable	Enables or disables onboard serial port 2 at the specified address.  <b>Note:</b> If your server is connected to a network, see your System Administrator.
Parallel port 1	LPT1:378-IRQ 7 LPT2:278-IRQ 5 LPT3:3BC-IRQ 7 Parallel port disable	Enables or disables the onboard port at the specified address.
Parallel port mode	Parallel port mode ISA-compatible Parallel port mode PS/2 Parallel port mode: ECP on LPT1 ECP on LPT2 ECP on LPT3 Parallel port mode extended (not valid with LPT3)	Compatible mode - standard printer connection. Bi-directional mode - PS/2 compatible mode and able to receive data. Sets the extended capabilities port mode.  Sets the enhanced parallel port mode.
Parallel port DMA (valid only with ECP mode)	No DMA DMA channel 3 DMA channel 5 DMA channel 7	Allows you to select one of three DMA channels when using the parallel port mode ECP option.

## Floppy Drive Subsystems Group

Menu Fields	Settings	Comments
Floppy drive A	3.5 inch 1.44/1.25 MB drive 5.25 inch 360 KB drive 5.25 inch 1.2 MB drive 3.5 inch 720 KB drive 3.5 inch 2.88 MB drive Disabled or not installed	Sets the size and density of diskette drives.
Floppy drive B	3.5 inch 1.44/1.25 MB drive 5.25 inch 360 KB drive 5.25 inch 1.2 MB drive 3.5 inch 720 KB drive 3.5 inch 2.88 MB drive Disabled or not installed	Sets the size and density of diskette drives.

## Language Support Group

Menu Fields	Settings	Comments
Current language	English (US) Español (SP) Italiano (IT) Français (FR) Deutsch (GR)	Enables you to select a desired language.



## KB and Mouse Subsystem Group

Menu Fields	Settings	Comments
Numlock	Off at boot On at boot	Selects the keyboard Numlock option.
Typematic speed	Auto Fast (7 char. sec) Medium (4 char. sec) Slow (1 char. sec)	Sets the number of times a second to repeat a keystroke while you hold the key down.
Mouse control option	Mouse auto detected	This option auto detects whether or not a mouse is connected to the server.

## Console Redirection

Menu Fields	Settings	Comments
Select COM port for redirection	Disable redirection Redirection on COM1 Redirection on COM2	Enables you to redirect your server's COM1 or COM 2 serial ports.
Serial port baud rate	2400 baud 9600 baud 19.2K baud 115.2K baud	Enables you to set a specific baud rate for modem data transfers.
Hardware flow control	None CTS/RTS CTS/RTS & Xoff/Xon	Enables you to set hardware flow control options for modem data transfers.
Select terminal type	ANSI	Enables you to select the ANSI terminal type for modem data transfers.

## Security Subsystems Group

Menu Fields	Settings	Comments
Administrative password option	Enter password Verify password	Type your administrative password in the enter password field.  Verify your administrative password by typing it in the verify password field.
User password option	Enter password Verify password	Type your user password in the enter password field.  Verify your user password by typing it in the verify password field.
Hot key option	Enable Disable	Enables or disables your server's hot key option.
Lock out timer	10 minutes to 127 minutes	Enter the number of minutes of keyboard inactivity to lock your server's keyboard. Once locked, an administrative or user password is required to unlock the keyboard.
Secure boot mode	Enable Disable	Enables or disables your server's secure boot mode option.
Video blanking	Enabled Disabled	Enables or disables your server's video blanking option.
Floppy writes	Enabled Disabled	Enabling this option keeps unauthorized personnel from copying server data onto diskettes.

## Boot Subsystem Group

Menu Fields	Settings	Comments
Boot options: First boot device Second boot device Third boot device Fourth boot device	Boot disabled Boot floppy Boot hard disk Boot IDE CD-ROM Boot network	Each time your server boots, it will load your operating system from the sequence selected.
Display <F1> for setup message during POST	Enabled Disabled	Enables or disables the <F1> setup prompt each time your server boots.
Require user interaction on POST errors	Enabled Disabled	Enabling this option causes your server to pause and display a setup entry or resume the boot prompt if an error occurs at boot.  Disabling this option causes your server to always attempt to boot regardless of a setup entry or error.

## SCSI ROM BIOS Options Group

Menu Fields	Settings	Comments
SCSI-A ROM BIOS scan	Enable Disable	Enables or disables your server's SCSI-A ROM BIOS scan option.
SCSI-B ROM BIOS scan	Enable Disable	Enables or disables your server's SCSI-B ROM BIOS scan option.

## LCD Subsystem Group

Menu Fields	Settings	Comments
LCD display string enable or disable	Enable Disable	Enables or disables your server's LCD display string option.
LCD display string before OS boot	Enable Disable	Enables or disables your server's LCD display string before OS boot option.

## Management Subsystem Group

Menu Fields	Settings	Comments
Temperature/voltage limit control	Press <Enter> to display limits	Enables you to set temperature and voltage limits to ensure proper server operation.
A/D channel enable switch	Press <Enter> to display A/D channels	Enables you to enable or disable A/D channel switches to ensure proper server operation.
Speaker options	Enable Disable	Enables you to turn on or turn off your server's speaker.
Scan user flash area	Enable Disable	Allows you to scan your server's flash BIOS area.
System management options:		
System management mode	Enable Disable	Enables or disables your server's system management mode option.
SMM time stamp source	POST capture Real-time clock	Determines the SMM time stamp source.
Event logging	Disable Enable	Enables or disables your server's event logging option.

## Memory Boards Subsystem Group

Menu Fields	Settings	Comments
ECC memory: First board Second board	Not user selectable	Displays whether or not an ECC memory module is installed in one or both memory slots.

## Reserved System Resources

Menu Fields	Settings	Comments
Reserved VGA resources	Not user selectable	Allows you to disable your server's onboard VGA controller. Otherwise, this option auto detects the VGA controller

# 3

## Expanding Your Server

### Introduction

This chapter lists the tools required to expand your server, explains how to prevent component damage from static electricity, provides preliminary setup procedures for server expansion, and describes how to unlock and remove the server's side panels. Also included in this chapter are instructions for replacing or modifying the following hardware:

- CPU module
- Memory
- Server battery/real-time clock (RTC)
- Video memory
- Optional ISA, EISA and PCI local bus expansion boards
- Mass storage devices
- Secondary rear cooling fan
- Redundant power supply

## Tools Needed

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

## Static Electricity

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

- Before touching any circuit board or component, touch the metal frame of your server to discharge any static electricity.
- Keep circuit boards and components away from non-conductors.
- Keep clothing away from circuit boards and components.
- Keep circuit boards in anti-static bags.

## **Disconnect External Devices and Power**

Before removing the side panels, perform the following:

1. Turn off power to all external devices connected to server.
2. Turn server off.
3. Disconnect power from wall outlet.
4. Disconnect power cord and monitor cord from server.



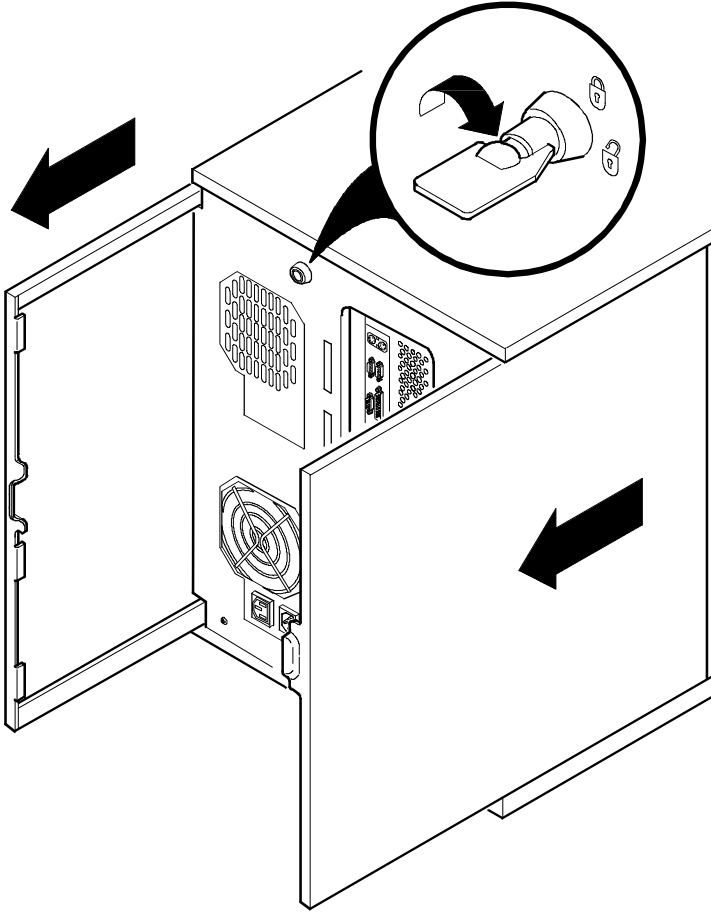
## Removing the Side Panels

To remove the side panels, perform the following:



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

1. Unlock side panels.
2. To remove the side panels, pull them towards the rear of the server and then slide them off.



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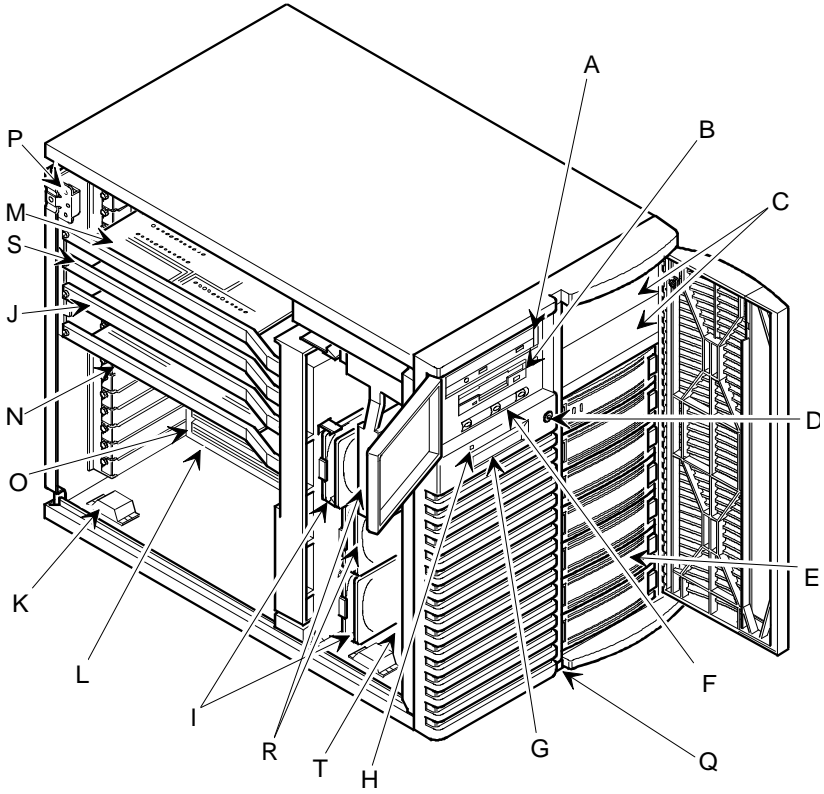
**Figure 3-1. Unlocking and Removing the Side Panels**

## Server Components (Left Side)

---

Figure Legend	Component
A	CD-ROM drive
B	3½-inch diskette drive
C	Front access 5¼-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	Operator control panel (OCP)
H	Power indicator
I	Cooling fans
J	CPU module 1 (CPU 1)
K	Casters
L	Expansion board slots: four ISA/EISA and three PCI and two ISA/PCI combo slots
M	Memory module 1 (MEM 1)
N	CPU module 2 (CPU 2)
O	Main logic board
P	Power switch interlock
Q	Brake
R	Redundant fans
S	Memory module 2 (MEM 2)
T	Power fan and control board (inside server between fans and front bezel)

---



DEC00725-2

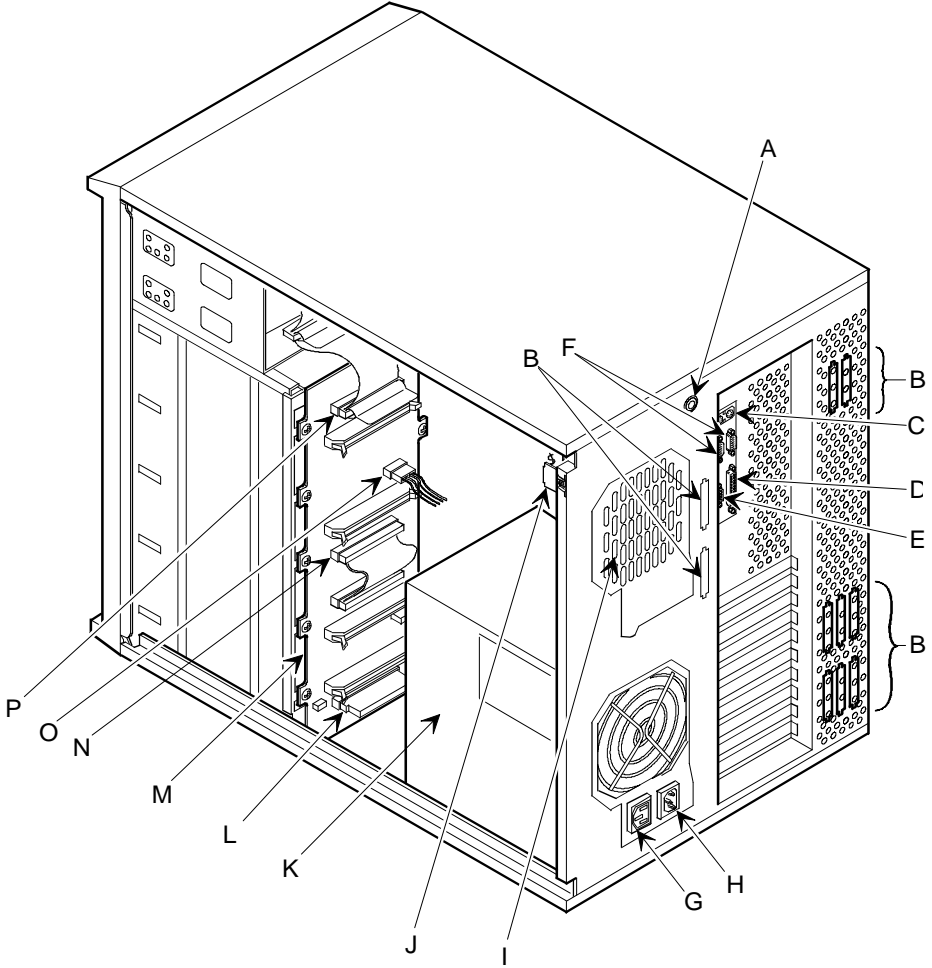
**Figure 3-2. Server Components (Left Side)**

## Server Components (Right Side)

---

Figure Legend	Component
A	Keylock
B	SCSI knockouts (back panel)
C	Keyboard (left) and mouse (right) ports
D	Parallel port (right)
E	Video port (left)
F	Serial port 1 (right) serial port 2 (left)
G	Monitor plug
H	AC power plug
I	Secondary rear cooling fan or redundant power supply
J	Power interlock switch
K	Power supply
L	Storage backplane SCSI terminator
M	Storage backplane
N	Jumper cable
O	Power plug
P	68-pin SCSI connector

---

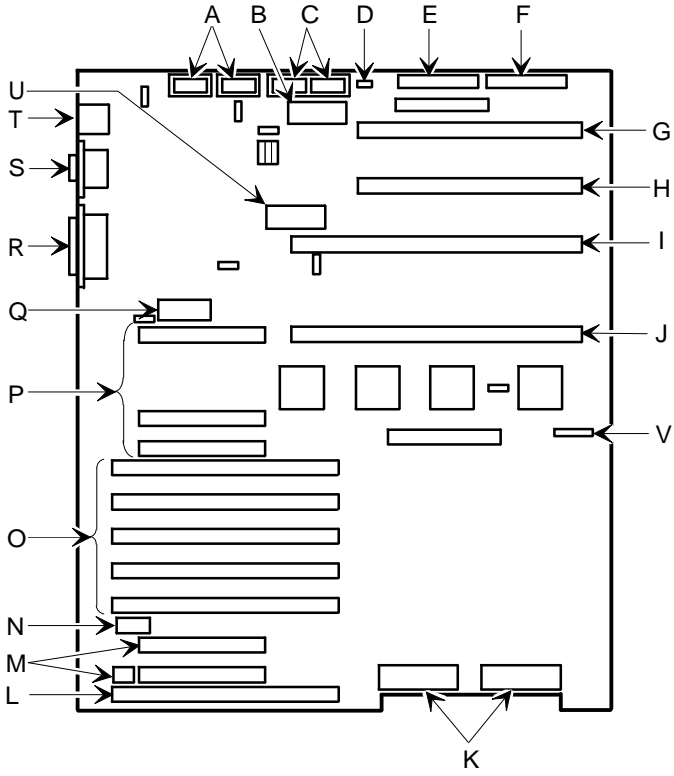


DEC00736-2

**Figure 3-3. Server Components (Right Side)**

## Main Logic Board Components/Connectors

Figure Legend	Components
A	6-pin power connectors (PS3 and PS4)
B	+3.3 V dc power connector (PS5)
C	12-pin power connector (PS1 and PS2)
D	Power supply enable connector
E	Diskette drive connector
F	Power fan and control board connector
G	Memory slot 1 connector (primary)
H	Memory slot 2 connector (expansion)
I	CPU module slot 1 connector (primary)
J	CPU module slot 2 connector (secondary)
K	Wide SCSI channels A (right) and B (left) connectors
L	EISA master expansion board slot 6 (M6)
M	PCI expansion board slots (P2-1 and P2-2)
N	PCI +3.3 V dc power connector (PS6)
O	EISA master expansion board slots 1-5 (M1-M5)
P	PCI expansion board slots (P1-1, P1-2, and P1-3)
Q	Video memory socket
R	Parallel port (top) and VGA port (bottom) connectors
S	Serial ports 1 (top) and 2 (bottom) connectors
T	PS/2-compatible keyboard (bottom) and mouse (top) connectors
U	Real-time Clock (RTC)
V	26-pin VGA feature connector (output only)



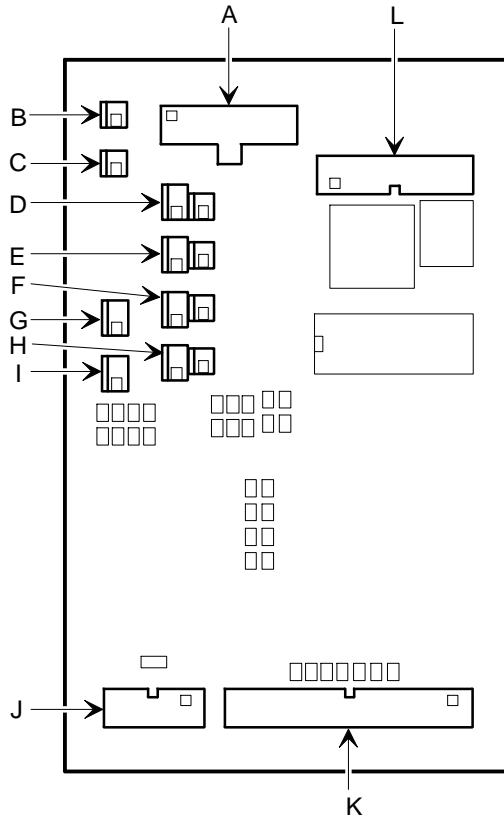
DEC00726-2

**Figure 3-4. Main Logic Board Components/Connectors**



## Power Fan and Control Board Connectors

<b>Figure Legend</b>	<b>Component</b>
A	Power connector
B	Doorlock 2 connector
C	Doorlock 1 connector
D	Fan 1 connector
E	Fan 2 connector
F	Fan 3 connector
G	MLB2 connector
H	Fan 4 connector
I	MLB1 connector
J	RSM connector
K	Main logic board control and data connector
L	OCP connector



DEC00796

**Figure 3-5. Power Fan and Control Board Connectors**

## Upgrading your CPU Module Configuration

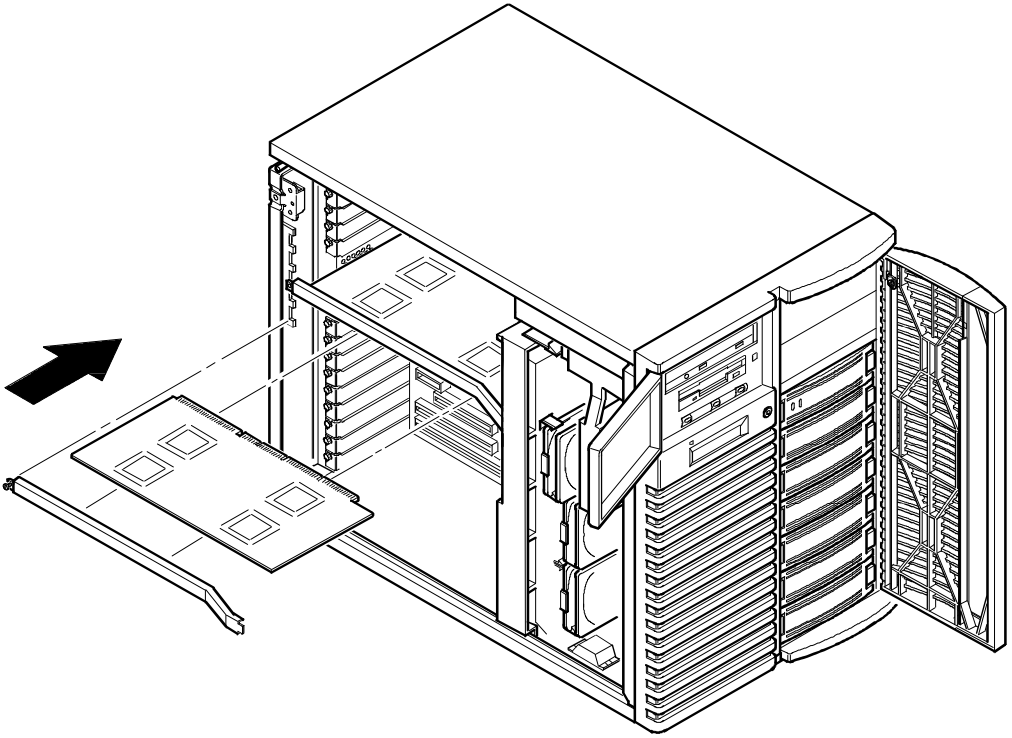
The Prioris ZX 5000 MP Series Server one or two (1P, 2P) processor configurations include a single CPU module. The Prioris ZX 5000 MP Series Server three or four (3P, 4P) processor configurations include two CPU modules. The following procedure can be used to upgrade 1P or 2P CPU modules to 3P or 4P CPU modules.

1. Turn off your server.
2. Disconnect external devices, ac power, and monitor power.
3. Unlock and remove left side panel.
4. Install the new CPU module and secure with retaining bracket in CPU slot 2.
5. Replace and lock left side panel.



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

6. Connect external devices and restore power.
7. Run the SCU to configure your server for the new CPU module(s).  
*Refer to Chapter 2, "Server Utilities," for information on running the SCU.*



DEC00727-2

**Figure 3-6. Installing a CPU Module**

## Removing and Replacing a Memory Module

Your server comes with a single memory module installed in the primary (MEM 1) slot. The memory module supports up to 384 MB of memory, a 64-bit memory interface, and 2-way interleaving. You can increase your server's overall performance by adding memory to the existing memory module or by installing an additional memory module in the memory expansion (MEM 2) slot. Adding a second memory module enables your server to support up to 768 MB of memory.



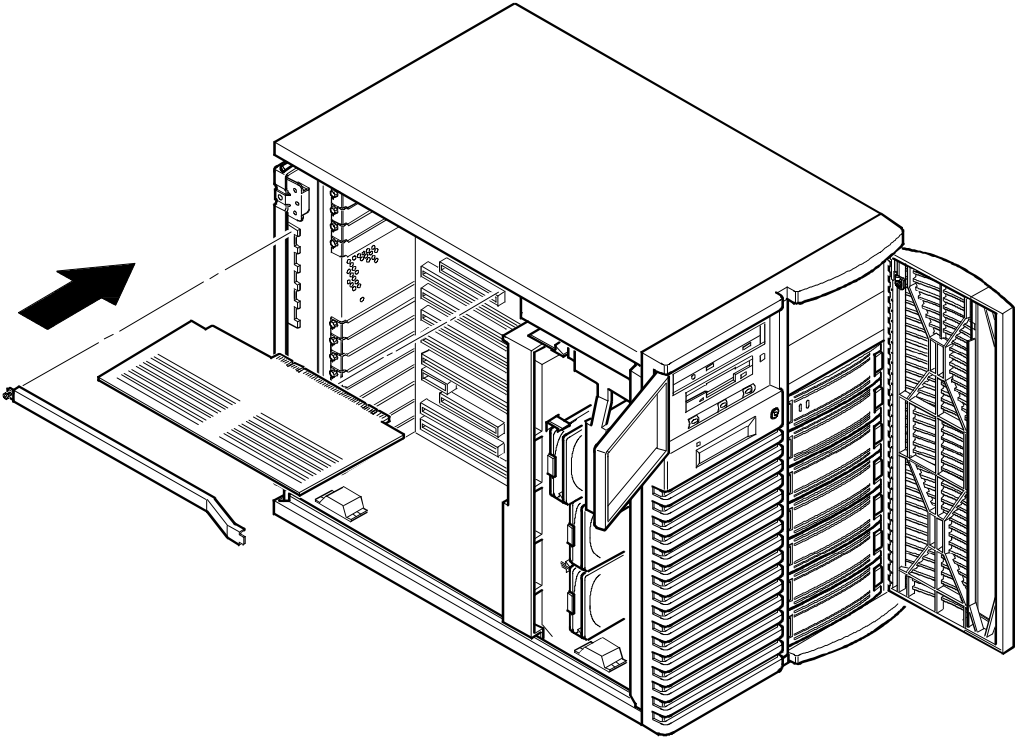
**NOTE:** Due to height limitations, do not install SIMMs taller than **one inch**. Installing SIMMs taller than one inch can interfere with an adjacent CPU module or memory module.

Also, make sure you completely fill the primary memory module (MEM 1 slot) before installing a second memory module in the memory expansion (MEM 2 slot).

The following procedure can be used to remove and replace any memory module.

1. Turn off your server.
2. Disconnect external devices, ac power, and monitor power.
3. Unlock and remove left side panel.
4. Remove memory module retaining bracket.
5. Carefully remove memory module from main logic board and place it on an antistatic surface.
6. Add additional server memory onto existing memory module.  
*Refer to "Installing Additional Server Memory," for more information.*
7. Replace memory module and secure with retaining bracket.

8. Replace and lock left side panel.
9. Connect external devices and restore power.
10. Run the SCU to configure your server for the additional amount of memory.



DEC00727-3

**Figure 3-7. Removing/Installing a Memory Module**

## Installing Additional Server Memory

Adding more memory to the existing memory module or installing an additional memory module enables your server to run larger, more complicated software and run it quicker.

Each memory module contains three sets of memory banks (banks 1 through 3). Each bank consists of four SIMM sockets. Your server comes with at least 32 MB of memory installed in bank 1. When adding additional memory make sure you:

- Install 36-bit SIMMs having an access time of 80 ns or less.
- Fill one bank (four sockets) at a time using the same SIMM size, type, and speed (8 MB, 16 MB, and 32 MB densities are available).



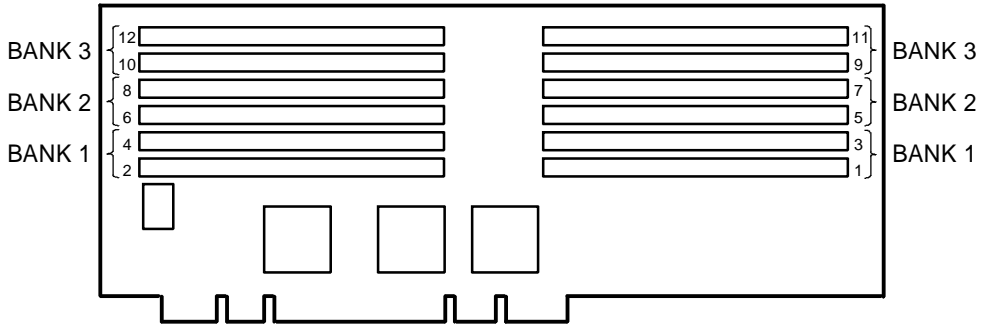
**CAUTION:** Mixing dissimilar metals might cause SIMM failure. Install SIMMs with tin-lead alloy plated edge connectors only in tin-lead alloy plated sockets. Install SIMMs with gold-lead alloy plated edge connectors only in gold-lead alloy plated sockets.

- Fill bank 1 before bank 2 and banks 1 and 2 before bank 3.

*Refer to “Memory Configurations” for a list of SIMM combinations supported by your Prioris ZX 5000 MP Series Servers and to “Installing a SIMM” for detailed instructions on installing SIMMs.*

In addition, the physical memory addresses shift depending on the SIMM size and the number of sockets filled on the ECC memory module. Starting with bank 1, address 0 is always in the last row of SIMM-filled sockets; for example:

- If you install SIMMs in only sockets 1-4, then memory address 0 is in sockets 3 and 4 of bank 1.
- If you install SIMMs in sockets 1-8, then memory address 0 shifts to sockets 7 and 8 of bank 2.
- If you install SIMMs in sockets 1-12, then memory address 0 shifts to sockets 11 and 12 of bank 3.



DEC00728

**Figure 3-8. SIMM Socket Locations and Bank Designations**



## Memory Configurations

The following table lists the SIMM combinations supported by your Prioris ZX 5000 MP Series Server for the primary memory module. This table also applies to a second memory module that you can install in the memory expansion (MEM 2) slot.

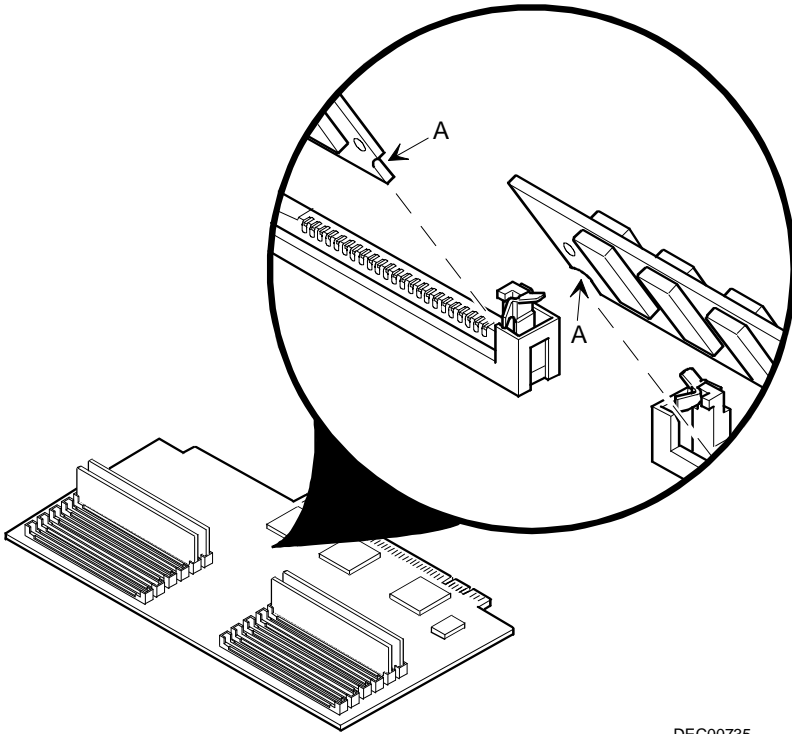
<b>Bank 1 (sockets 1-4)</b>	<b>Bank 2 (sockets 5-8)</b>	<b>Bank 3 (sockets 9-12)</b>	<b>Total Memory</b>
8 MB			32 MB
8 MB	8 MB		64 MB
16 MB			64 MB
8 MB	8 MB	8 MB	96 MB
16 MB	16 MB		128 MB
32 MB			128 MB
16 MB	16 MB	16 MB	192 MB
32 MB	32 MB		256 MB
32 MB	32 MB	32 MB	384 MB

## Installing a SIMM

To install a SIMM, perform the following:

1. Turn off your server.
2. Disconnect external devices, ac power, and monitor power.
3. Unlock and remove left side panel.
4. Remove memory module retaining bracket and memory module (see Figure 3-7).

5. Orient notched edge of SIMM (A, Figure 3-9) so its facing toward center of memory module. The small notch at middle of bottom edge of SIMM mates with raised area in SIMM socket.



DEC00735

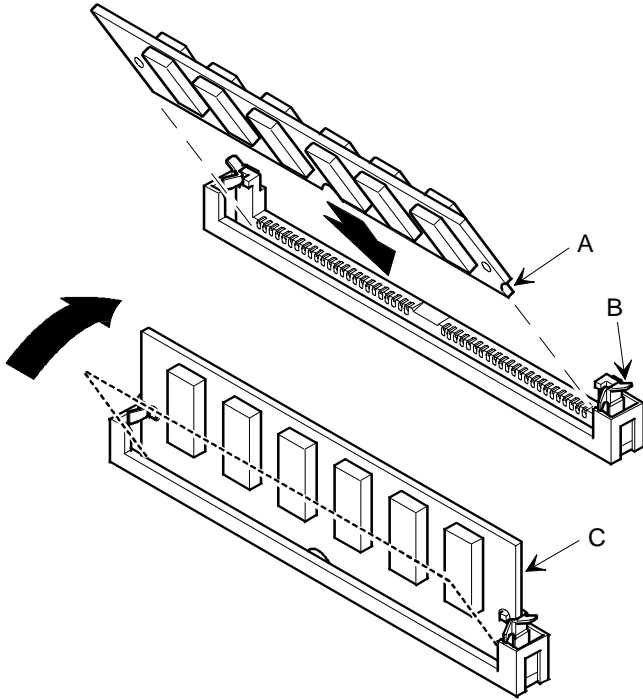
**Figure 3-9. SIMM Orientation**

6. Position SIMM at a 45 degree angle relative to socket on memory module (A, Figure 3-10).
7. Beginning with bank 1 (sockets 1-4), insert bottom edge of SIMM into socket.

Rock SIMM gently until it completely engages bottom of socket. Tip SIMM upright until both retaining clips engage (B, C, Figure 3-10).

5. Replace memory module (component side down )and secure with retaining bracket.
6. Replace and lock left side panel.
7. Connect external devices and restore power.
8. Run the SCU to configure your server for the additional memory.

*Refer to Chapter 2, "Server Utilities," for information on running the SCU.*



DEC00724

**Figure 3-10. Installing a SIMM**

## Replacing Your Server's Battery/Real Time Clock (RTC)



**CAUTION:** Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

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.

To replace the server battery, perform the following:

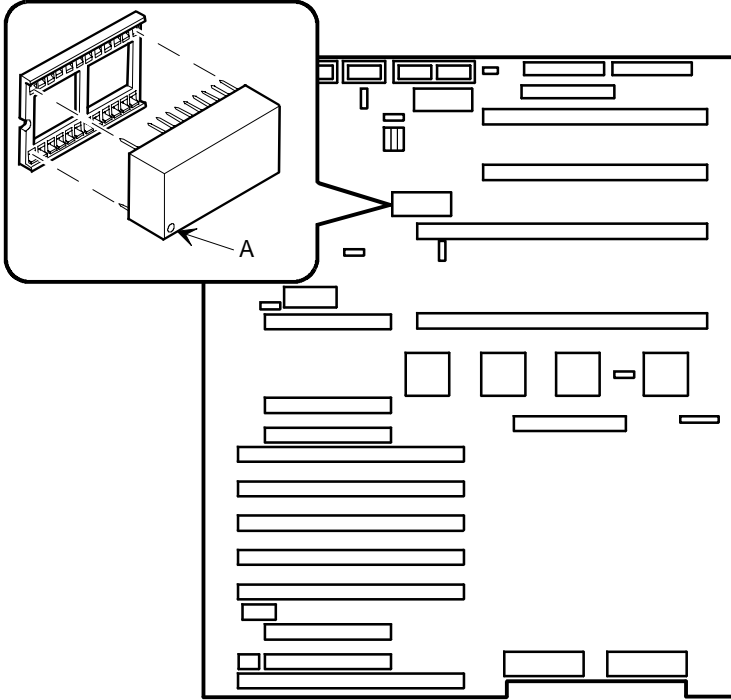
1. Turn off your server.
2. Disconnect external devices, ac power, and monitor power.
3. Unlock and remove left side panel.
4. Remove old battery.



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

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

*Refer to Chapter 2, "Server Utilities," for information on running the SCU.*



DEC00726-3

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

## Installing Video Memory

The server's main logic board comes with 512 KB of onboard video memory. Increasing the video memory buffer size to 1 MB by installing a 256 K x 16,

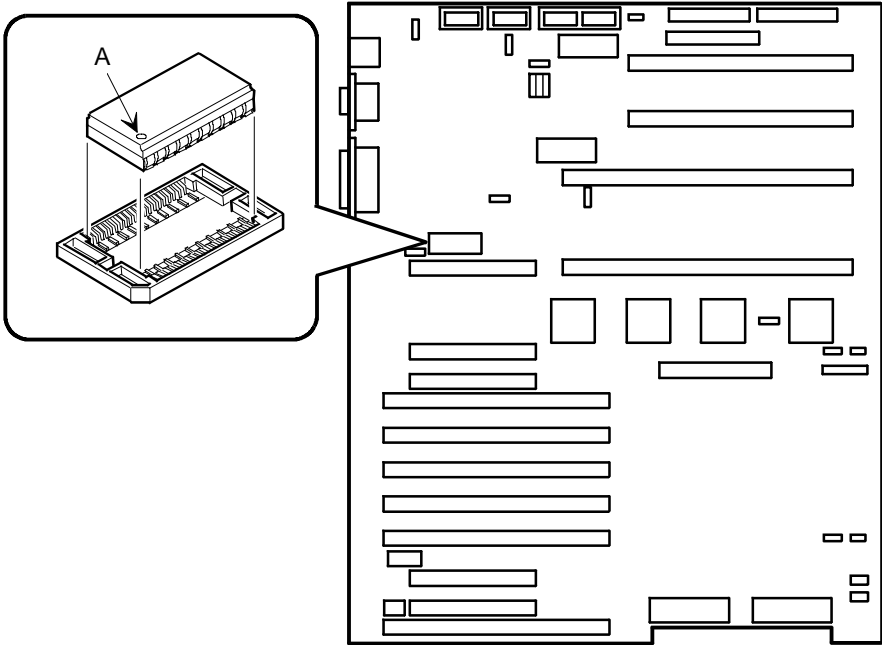
70 ns fast-page video DRAM chip enables the video controller to support 132-column text modes and high resolution graphics with 1280 x 1024 x 16 colors. Depending on the environment, the controller displays up to 64,000 colors in some video resolutions. To install video memory:

1. Turn off your server.
2. Disconnect external devices, ac power, and monitor power.
3. Unlock and remove left side panel.
4. If necessary, remove the CPU module from the CPU 1 (primary) slot.

*Refer to the CPU module removal procedures described earlier in this chapter.*

5. Install the video DRAM chip. Make sure pin 1 of the video DRAM chip is aligned with pin one on the socket (A, Figure 3-12).
6. If necessary, install the CPU module removed in step 4.
7. Replace and lock left side panel.
8. Connect external devices and restore power.
9. Run the SCU to configure your server for the additional video memory.

*Refer to Chapter 2, "Server Utilities," for information on running the SCU.*



DEC00726-4

**Figure 3-12. Installing Video Memory**

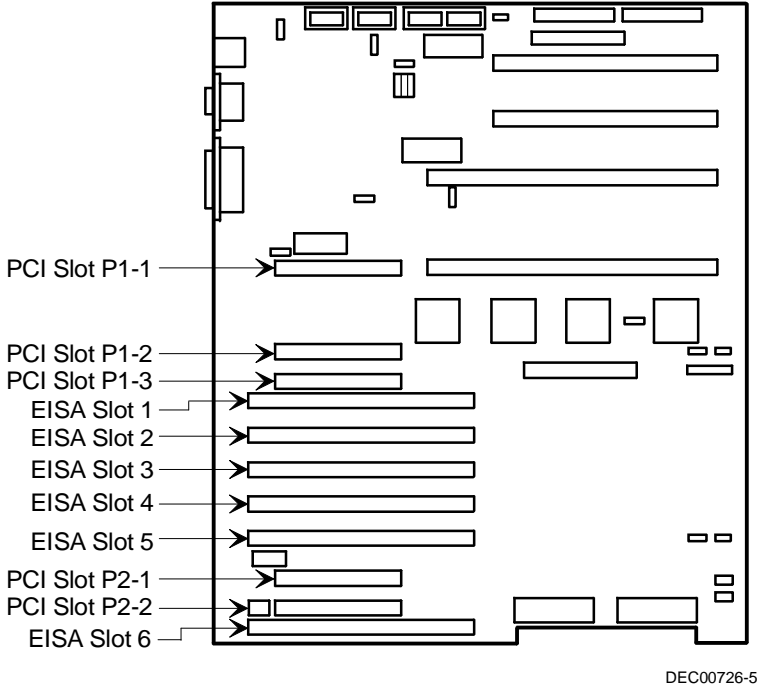


## Installing Expansion Boards

Your Prioris ZX 5000 MP Series Server's main logic board contains 11 expansion board slots for installing up to nine EISA or PCI expansion boards. Six of the slots support industry-standard 32-bit EISA expansion boards. The remaining five expansion slots support 32-bit PCI local bus expansion boards.

### EISA Expansion Slots

The six EISA bus slots on the main logic board support industry-standard 32-bit EISA expansion boards for performance enhancement (refer to the following table. Each EISA bus master expansion board installed in the server gets to own the bus based on a priority level. Bus ownership occurs in this EISA slot sequence: M1, M2, M3, M4, M5, M6, M1, M2, etc.



**Figure 3-13. Prioris ZX 5000 MP Series Server Expansion Board Slots**

Your server's EISA bus provides:

- 32-bit memory addressing
- Type A transfers at 5.33 MB per second
- Type B transfers at 8 MB per second
- Burst transfers at 33 MB per second
- 8-, 16-, or 32-bit data transfers
- Automatic translation of bus cycles between EISA and ISA masters
- Interrupt sharing

Slot Designation	Description
EISA slot 1 (M1)	Supports extended industry-standard 32-bit EISA expansion boards  Designated as a shared slot with PCI slot P1-3 <sup>(1)</sup>
EISA slots 2 through 5 (M2-M5)	Supports extended industry-standard 32-bit EISA expansion boards
EISA slot 6 (M6)	Supports extended industry-standard 32-bit EISA expansion boards  Designated as a shared slot with PCI slot P2-2 <sup>(1)</sup>

<sup>(1)</sup> Only one expansion board can reside in EISA slot 1 and 6 or PCI slot P1-3 and P2-2 at any one time. These slots have to share the expansion slot opening at the rear panel.

## PCI Expansion Slots

The five PCI bus slots on the main logic board support bus mastering 32-bit PCI expansion boards for performance enhancement.



**NOTE:** One of the PCI slots (P1-1) is in line with a CPU module slot (CPU 2). If you install a CPU module in this slot, you cannot use the PCI slot.

The PCI bus provides:

- 32- and 64-bit memory addressing
- +5 V dc and + 3.3 V dc signaling environments
- Burst transfers at 133 MB per second
- 8-, 16-, or 32-bit data transfers
- Plug-and-play configuration
- PeerBus to maximize throughput

Slot Designation	Description
PCI slots P1-1, P1-2	Supports bus mastering 32-bit PCI expansion boards
PCI slot P1-3	Supports bus mastering 32-bit PCI expansion boards Designated as a shared slot with EISA slot 1 <sup>(1)</sup>
PCI slot P2-1	Supports bus mastering 32-bit PCI expansion boards
PCI slot P2-2	Supports bus mastering 32-bit PCI expansion boards Designated as a shared slot with EISA slot 6 <sup>(1)</sup>

<sup>(1)</sup> Only one expansion board can reside in EISA slot 1 and 6 or PCI slot P1-3 and P2-2 at any one time. These slots have to share the expansion slot opening at the rear panel.

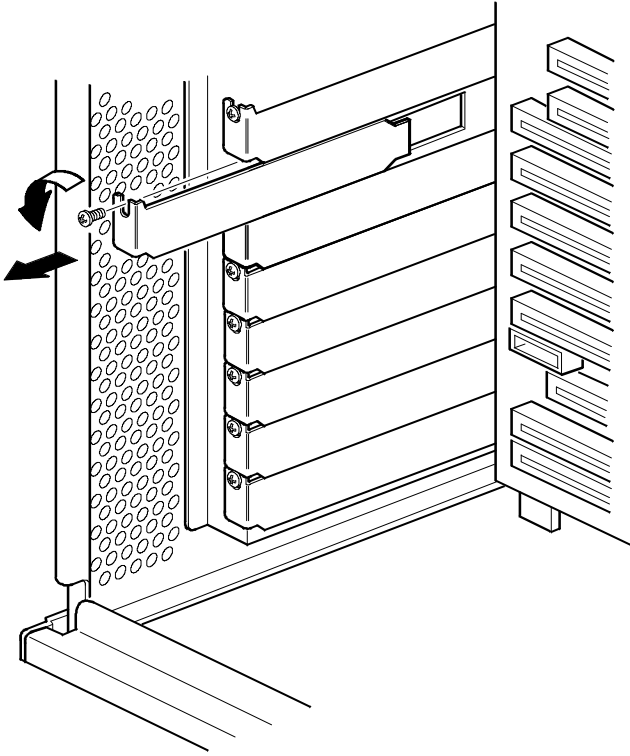
## Installing ISA Expansion Boards

You must run the SCU prior to installing any ISA expansion board. Running the SCU enables you to assign the proper server resources so ISA expansion boards operate correctly. Afterwards, you must manually set the corresponding jumpers and/or switch settings on each ISA expansion board to match the SCU assigned server resources. To install an ISA expansion board:



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

1. Run the SCU.  
*Refer to Chapter 2, "Server Utilities," for information on running the SCU.*
2. Turn off your server.
3. Disconnect external devices, ac power, and monitor power.
4. Unlock and remove left side panel.
5. Unscrew and remove metal filler plate from selected expansion slot.



DEC00730-2

**Figure 3-14. Removing a Metal Filler Plate**

6. Insert new expansion board into socket and push expansion board firmly into place.
7. Secure expansion board to slot with screw removed in step 5.
8. Replace and lock left side panel.
9. Connect external devices and restore power.

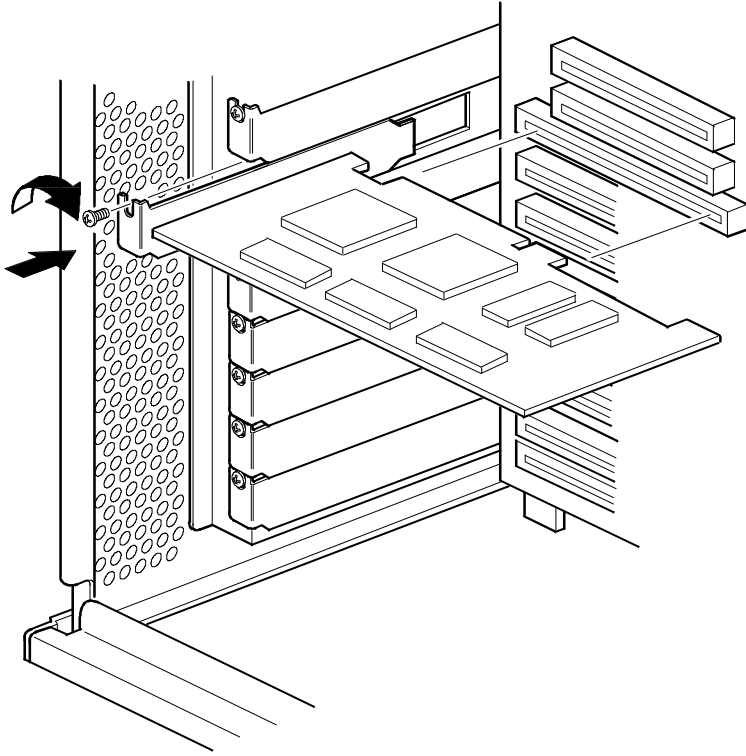
## Installing EISA Expansion Boards

You must run the SCU after installing any EISA expansion board. Running the SCU enables you to assign the proper server resources so EISA expansion boards operate correctly. To install an EISA expansion board:



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

1. Turn off your server.
2. Disconnect external devices, ac power, and monitor power.
3. Unlock and remove left side panel.
4. Unscrew and remove metal filler plate from selected expansion slot (see Figure 3-14).

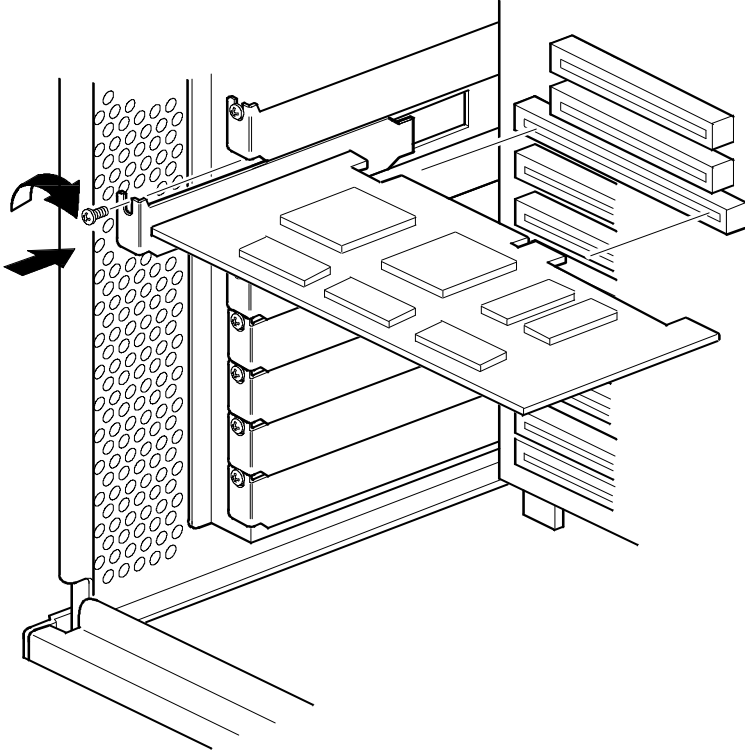


DEC00730-4

**Figure 3-15. Installing an ISA Expansion Board**



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



DEC00730-4

**Figure 3-16. Installing an EISA Expansion Board**

6. Secure expansion board to slot with screw removed in step 4.
7. Replace and lock left side panel.
8. Connect external devices and restore power.
9. Run the SCU to configure any EISA expansion board that you installed.

*Refer to Chapter 2, "Server Utilities," for information on running the SCU.*

## Installing PCI Expansion Boards

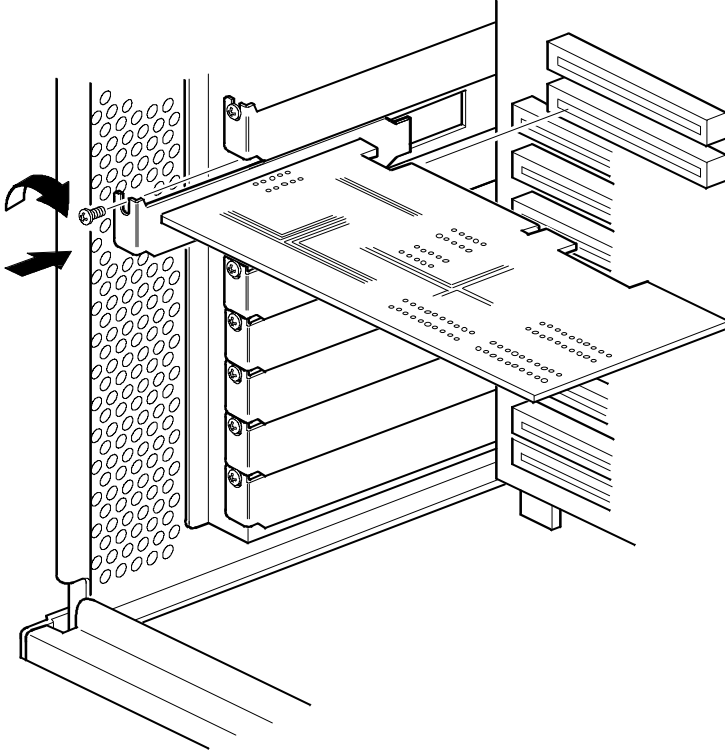
Your Prioris ZX 5000 MP Series Server automatically detects and then assigns the proper server resources to PCI expansion boards once they are installed. To install a PCI expansion board:



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

1. Turn off your server.
2. Disconnect external devices, ac power, and monitor power.
3. Unlock and remove left side panel.
4. Unscrew and remove metal filler plate from selected expansion slot (see Figure 3-14).

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



DEC00730-3

**Figure 3-17. Installing a PCI Expansion Board**

6. Secure expansion board to slot with screw removed in step 4.
7. Replace and lock left side panel.
8. Connect external devices and restore power.

## Adding Mass Storage Devices

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

- Left-front access drive bay area—This area has one 5¼-inch SCSI CD-ROM drive and one 3½-inch diskette drive (standard on all Prioris ZX 5000 MP Series Servers).
- Top-right front access drive bay area—This area has room for two wide (68-pin) or narrow (50-pin) 5¼-inch or 3½-inch half-height SCSI devices or one full-height, 5¼-inch device .
- Lower-right front access drive bay area—This area has room for seven 3½-inch, wide or narrow Fast SCSI-2, hot-swap devices.

## Onboard SCSI Controllers

The main logic board includes two Adaptec® AIC-7870 wide/fast SCSI-2 controller chips—channels A and B—integrated as PCI bus masters. These controllers support data path widths of 8-bit (narrow SCSI) at a data transfer rate of 10 MB/sec and 16-bit (wide SCSI) at a data transfer rate of 20 MB/sec. As PCI bus masters, these controllers support data transfer rates of 133 MB/sec.

You can connect up to seven 8-bit narrow SCSI devices or up to fifteen 8-bit fast and/or 16-bit wide SCSI devices (as long as no more than seven 8-bit fast devices are used), with one controller to each channel. For example, tape drives, printers, optical media drives, and other devices.

The SCSI controller provides active negation outputs, controls for external differential transceivers, a disk activity output, and a SCSI terminator power-down control.

Active negation outputs reduce the chance of data errors by actively driving both polarities of the SCSI bus and avoiding indeterminate voltage levels and common-mode noise on long cable runs. The SCSI output drivers can directly drive a 48 mA, single-ended SCSI bus with no additional drivers.

No additional logic, termination, or resistor loads are required to connect up to seven 8-bit narrow SCSI devices or up to fifteen 16-bit wide SCSI devices to each SCSI-2 channel on the main logic board.

## SCSI Configuration Guidelines

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

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

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

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

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

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

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

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

## SCSI Cables

Your server is supplied with the following cables:

- One wide (68-pin) five connector cable assembly. This cable assembly includes:
  - One wide 68-pin connector to connect to the SCSI controller.
  - Three wide-to-narrow adapters to connect the narrow (50-pin) CD-ROM drive and the two 5.25" bay devices for SCSI operation.
  - One wide (68-pin) connector to connect the SCSI controller to Channel A of the hot-swap backplane (if required). A cable terminator is supplied if this connector is not used to connect to Channel A.

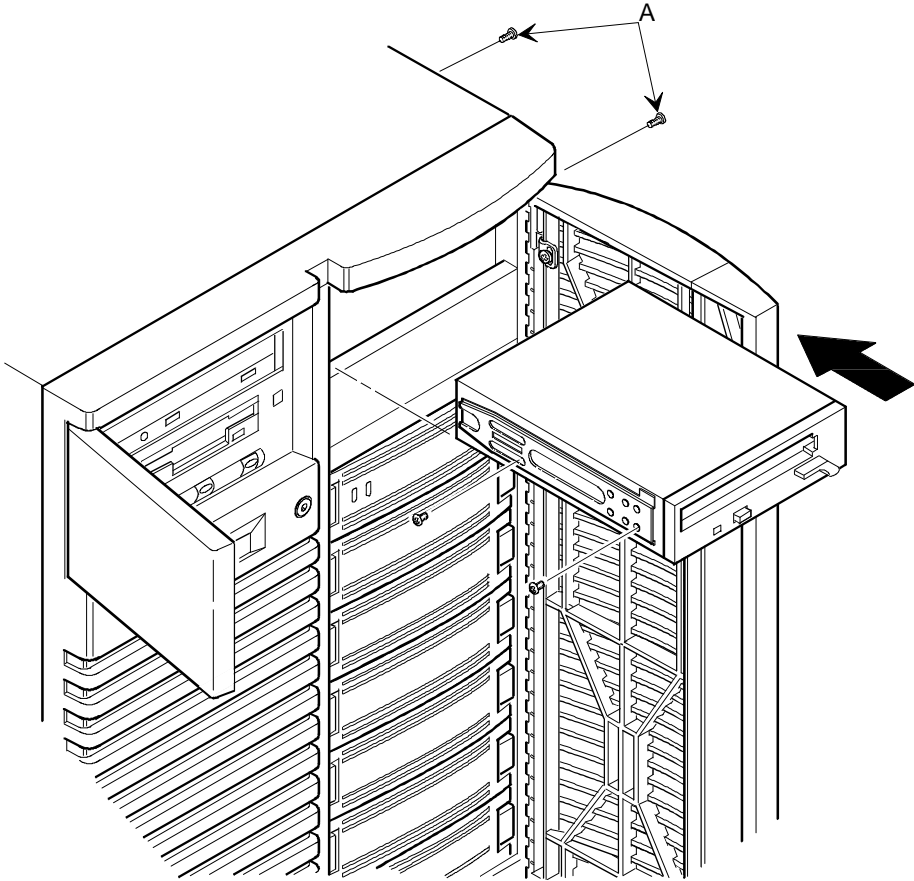
- One 68-pin-to-68-pin jumper cable to connect the two hot-swap backplane segments together to make a single SCSI channel.
- Two 68-pin internal backplane terminators (one for channel A and one for channel B).
- Two additional wide cables with two 68-pin unshielded connectors to split the backplane.

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

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

1. Turn off your server.
2. Disconnect external devices, ac power, and monitor power.
3. Unlock and remove side panels.
4. Unlock and open door.
5. Remove plastic filler panel by pushing it out from inside server.
6. Remove bracket from drive bay (inside, left) and attach it to device.
7. Insert device into drive bay slot from front.
8. Secure device to chassis using supplied mounting screws (A, Figure 3-18).
9. If applicable, replace plastic filler panel.

*Refer to “Connecting SCSI Devices” later in this Chapter.*



DEC00409-2

**Figure 3-18. Installing a Half-Height 5 1/4-Inch Device Into Top-Right Drive Bay**

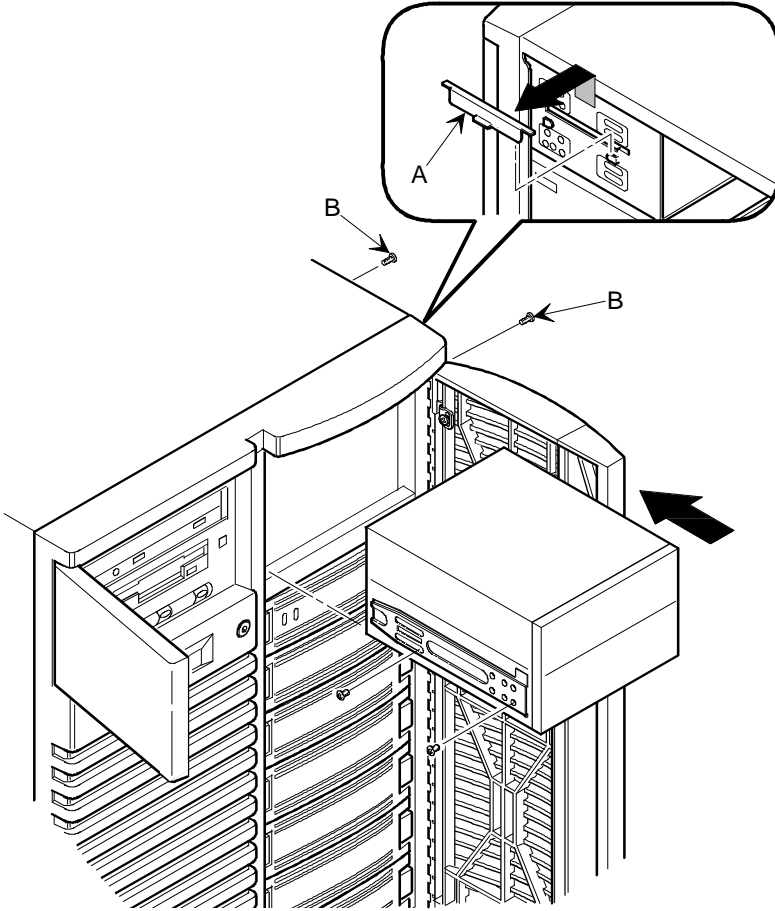


## Installing a Full-Height 5¼-Inch Device into the Top-Right Drive Bay

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 external devices, ac power, and monitor power.
3. Unlock and remove side panels.
4. Unlock and open door.
5. Remove both plastic filler panels by pushing them out from inside server.
6. Remove bottom brackets from inside of drive bay and attach them to device.
7. Remove divider bracket from right side of drive bay (A, Figure 3-19).
8. Insert device into drive bay from front.
9. Secure device to chassis using supplied mounting screws. (B, Figure 3-19).
10. Replace plastic filler panels.

*Refer to “Connecting SCSI Devices” later in this Chapter.*

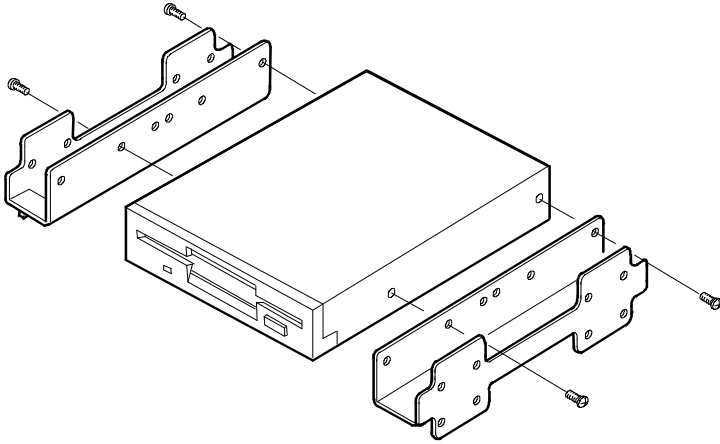


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**Figure 3-19. Installing a Full-Height 5 1/4-Inch Device Into Top-Right Drive Bay**

## **Expansion Brackets**

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



DEC00723

**Figure 3-20. Installing Expansion Brackets**

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

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

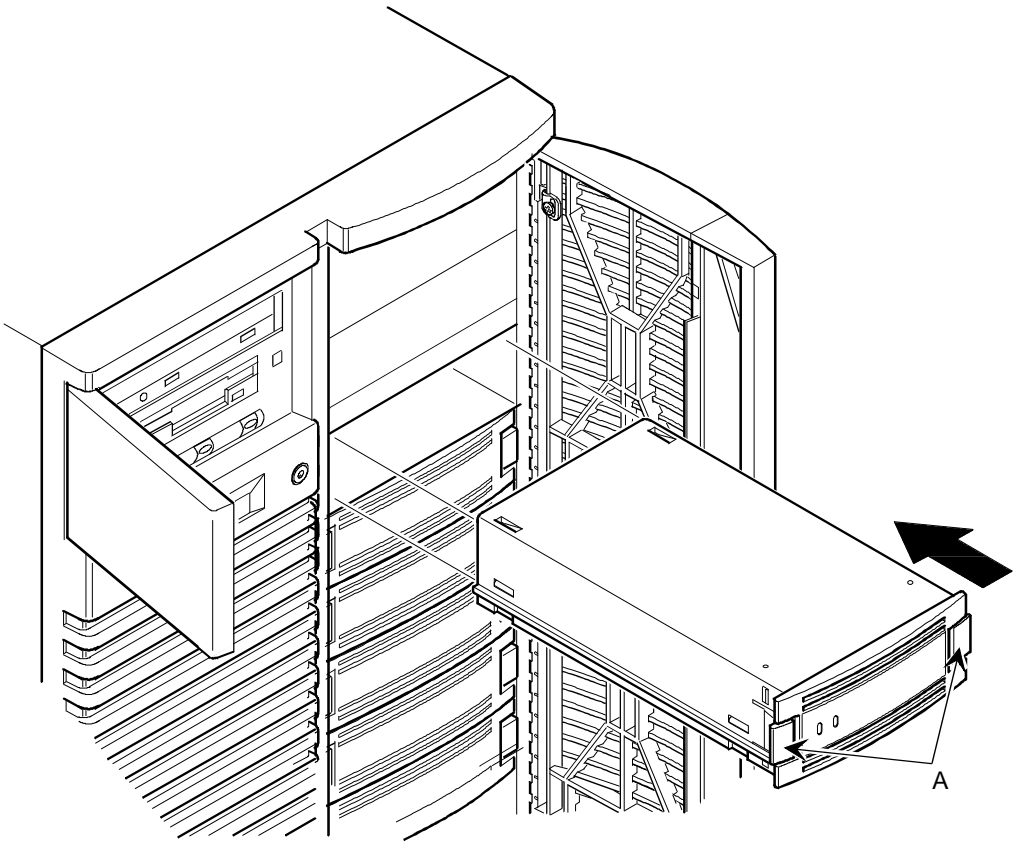


**NOTE:** Not all SCSI controllers support the hot-swap method. Refer to your SCSI controller documentation to determine if the hot-swap method is supported.

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

Use the following procedure to install or replace an SBB:

1. Unlock and open right side door.
2. Remove filler panel or SBB by pressing the two tabs together to pull filler panel or SBB out (A, Figure 3-21).
3. Insert new SBB into the guide slots and push it in until it is fully seated and the mounting tabs engage the shelf.
4. Close and lock door.



DEC00443-2

**Figure 3-21. Installing a Device Into the Hot-Swap Drive Bay**

## SBB LED Status Indicators

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

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



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

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

### SBB Status LEDs

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

## Connecting SCSI Devices

Your server supports up to 10 internal SCSI devices. Additional SCSI devices can be added to your server by using the main logic board's SCSI B connector or by installing an EISA- or PCI-based SCSI controller installed in an available expansion slot in conjunction with an external SCSI expansion box.

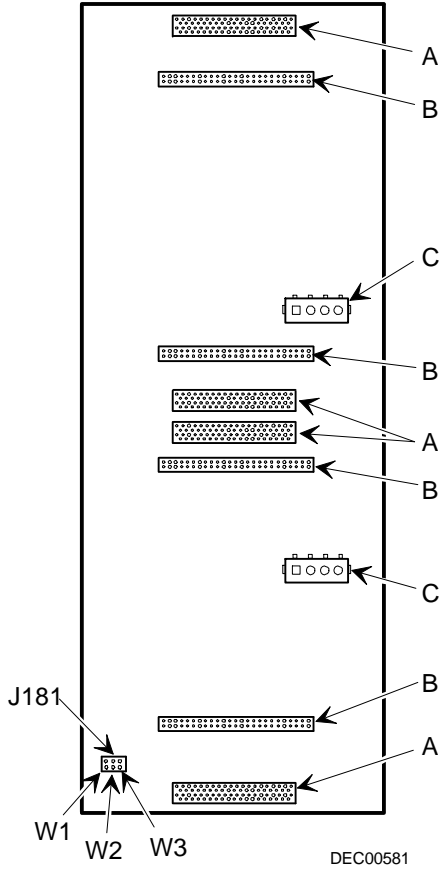
## Storage Backplane

Your storage backplane supports seven hot-swap devices split between two SCSI bus sections (see Figure 3-22). SCSI bus A and SCSI bus B. SCSI bus A is the upper section and consists of four SCSI device connections. SCSI bus B is the lower bus section and consists of three SCSI device connections. These buses can be configured as two independent SCSI buses or as one SCSI bus by installing a wide SCSI jumper cable. Figures 3-23 through 3-26 show the available cable configurations.

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



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



**Figure 3-22. Storage Backplane**

## SCSI Drive IDs

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

- The SCSI ID addressing is independent of the single or dual SCSI bus arrangement. Make sure you select unique SCSI IDs for all SCSI devices on the SCSI bus.
- You must use a wide SCSI host adapter to set SCSI IDs greater than seven.
- Your CD-ROM drive and tape IDs must be set manually. Refer to your manufacturer's documentation for information on setting drive IDs.



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

**Single/Dual SCSI Bus Target ID Settings**

Jumpers Set	None	W1	W2	W3	W1+W2	W1+W3	W2+W3	W1+W2+W3
<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

## Single Channel SCSI Configuration

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

1. Connect the SCSI cables as shown in Figure 3-23.
2. If using top 5¼-inch drive bay, connect appropriate power cable to device.
3. Replace and lock side panels.
4. Connect external devices and restore power.
5. Run *SCSISelect* to configure your server.

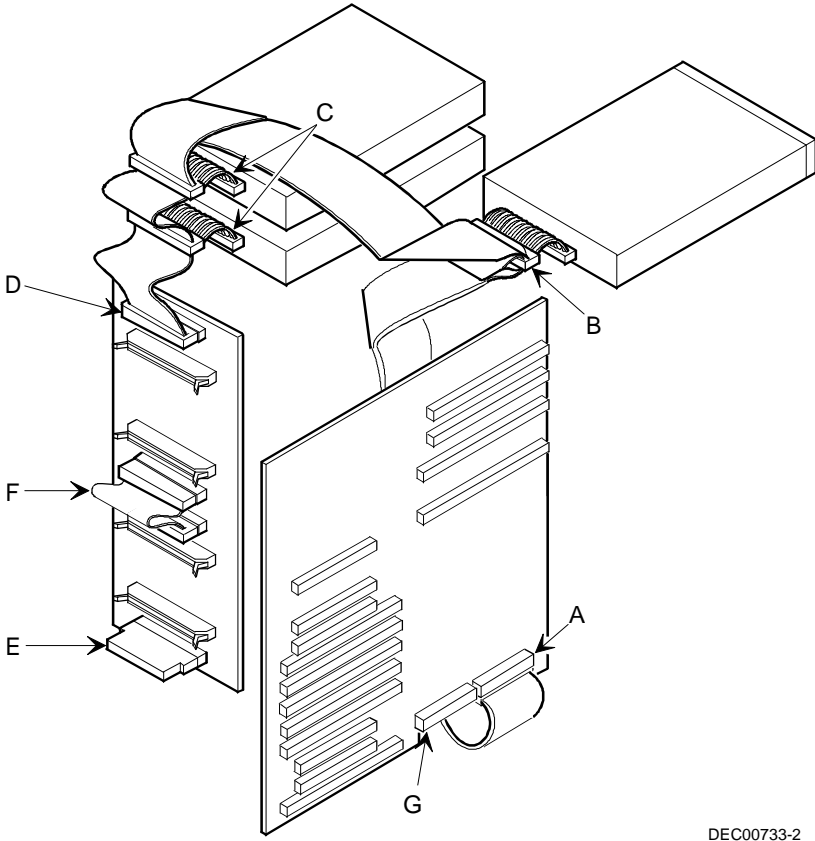
*Refer to Chapter 2, "Server Utilities," and to your SCSI documentation for additional configuration information.*



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

<b>Figure 3-23 Legend</b>	<b>Component</b>
A	Adaptec 7870 narrow/wide SCSI connector (SCSI bus A)
B	68-pin-to-50-pin adapter cable to CD-ROM drive
C	68-pin-to-50-pin adapter cable to top-right drive bay
D	Backplane, 68-pin connector
E	Terminator <sup>(1)</sup>
F	Jumper cable
G	External SCSI connector

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



DEC00733-2

**Figure 3-23. Single Channel SCSI Configuration**

## Two Channel SCSI Configuration

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

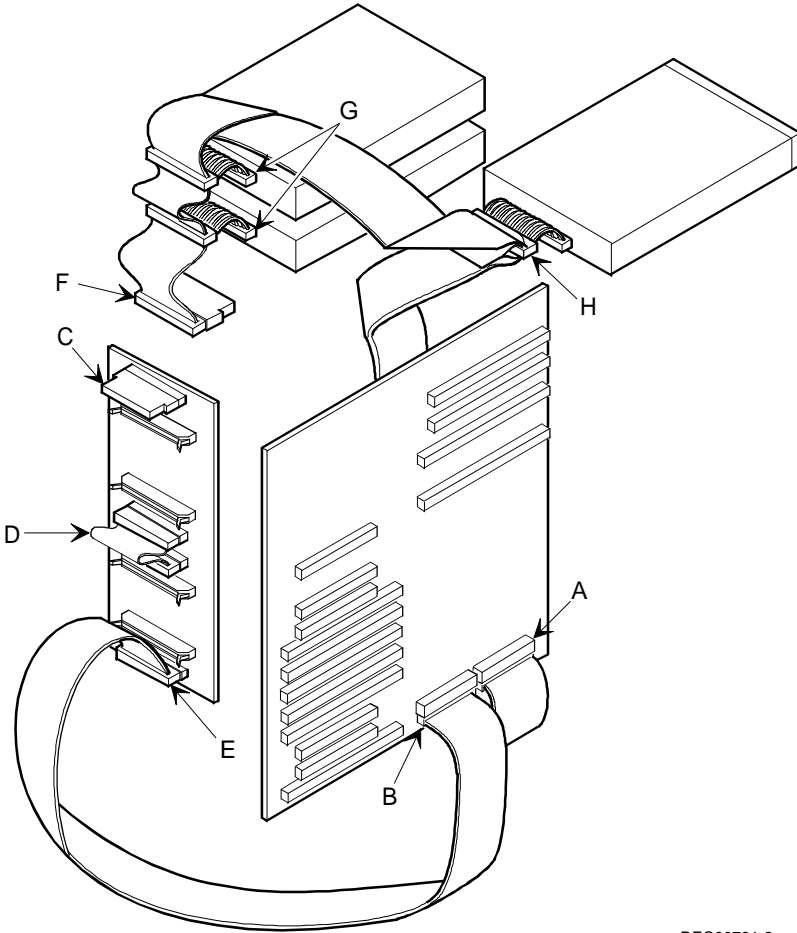
1. Connect the cables as shown in Figure 3-24.
2. If using top 5¼-inch drive bay, connect appropriate power cable to device.
3. Replace and lock side panels.
4. Connect external devices and restore power.
5. Run *SCSISelect* to configure your server.

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



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

<b>Figure 3-24 Legend</b>	<b>Component</b>
A	Adaptec 7870 narrow/wide SCSI connector (SCSI bus A)
B	Adaptec 7870 narrow/wide SCSI connector (SCSI bus B)
C	Backplane terminator
D	Jumper cable
E	Backplane, 68-pin connector
F	Cable terminator
G	68-pin-to-50-pin adapter cable to top-right drive bay
H	68-pin-to-50-pin adapter cable to CD-ROM drive



DEC00731-2

**Figure 3-24. Two Channel SCSI Configuration**



## Single Channel SCSI and Single Channel RAID Configuration

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

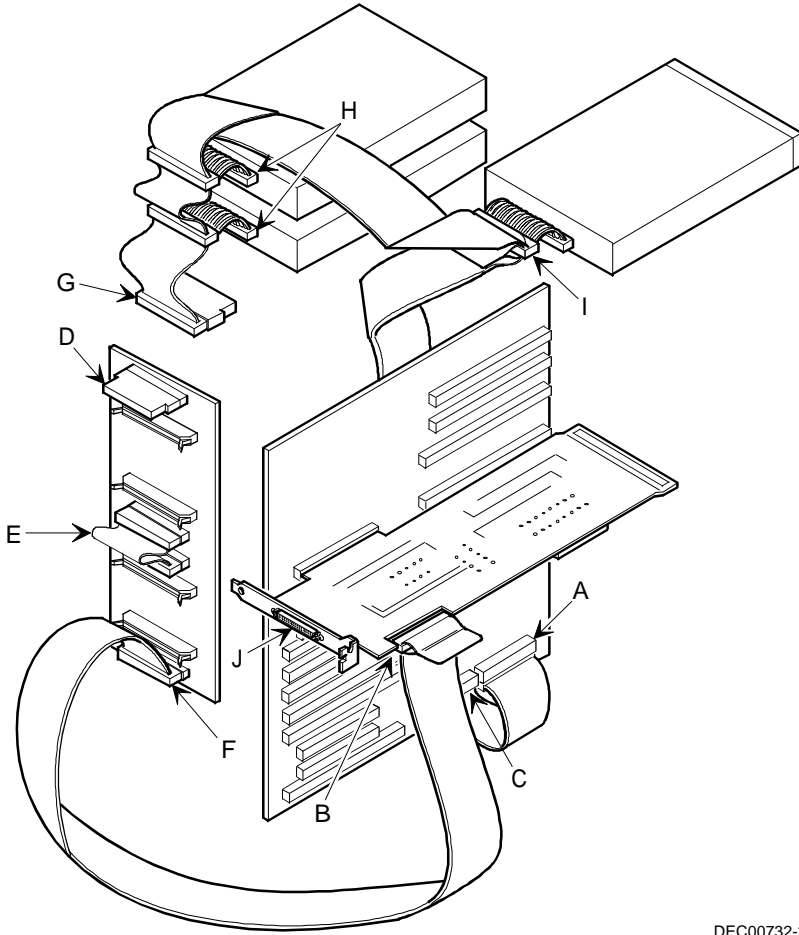
1. Connect the cables as shown in Figure 3-25.
2. If using top 5¼-inch drive bay, connect appropriate power cable to device.
3. Replace and lock side panels.
4. Connect external devices and restore power.
5. Run *SCSISelect* and/or RAID utilities to configure your server.

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



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

<b>Figure 3-25 Legend</b>	<b>Component</b>
A	Adaptec 7870 narrow/wide SCSI connector (SCSI bus A)
B	Mylex RAID controller (channel 1)
C	Adaptec 7870 narrow/wide SCSI connector (SCSI bus B)
D	Backplane terminator
E	Jumper cable
F	Backplane, 68-pin connector
G	Cable terminator
H	68-pin-to-50-pin adapter cable to top-right drive bay
I	68-pin-to-50-pin adapter cable to CD-ROM drive
J	External SCSI connector



DEC00732-2

**Figure 3-25. Single Channel SCSI and Single Channel RAID Configuration**

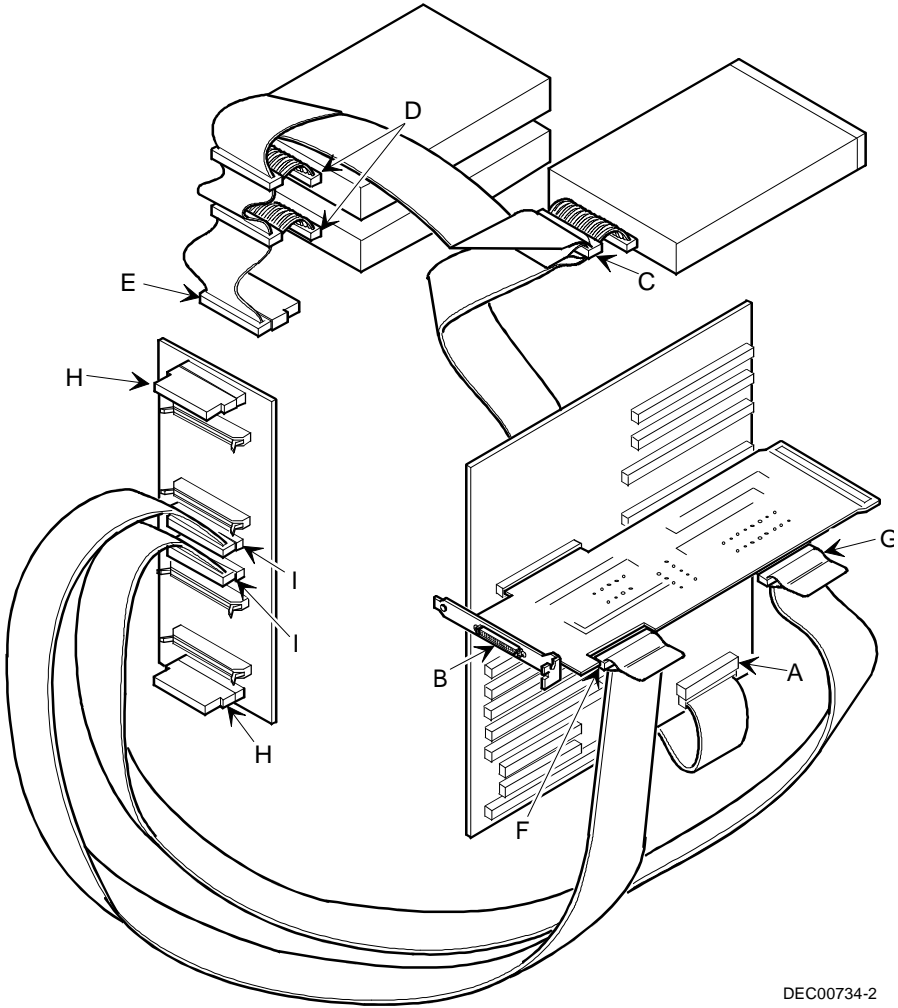
## Single SCSI and Dual RAID Channel Configuration

To connect devices to a single channel SCSI and a dual channel RAID configuration, perform the following:

1. Connect the SCSI cables as shown in Figure 3-26.
2. If using top 5¼-inch drive bay, connect appropriate power cable to device.
3. Replace and lock side panels.
4. Connect external devices and restore power.
5. Run *SCSISelect* 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.*

<b>Figure 3-26 Legend</b>	<b>Component</b>
A	Adaptec 7870 narrow/wide SCSI connector (SCSI bus A)
B	External SCSI connector
C	68-pin-to-50-pin adapter cable to CD-ROM drive
D	68-pin-to-50-pin adapter cable to top-right drive bay
E	Cable terminator
F	Mylex RAID controller (channel 1)
G	Mylex RAID controller (channel 0)
H	Backplane terminator
I	Backplane, 68-pin connector



DEC00734-2

**Figure 3-26. Single Channel SCSI and Dual Channel RAID Configuration**

## Using Multiple or Multi-Channel SCSI Controllers

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

- The SCSI controller with the lowest BIOS address is identified by the server as the “primary” SCSI controller. If you are loading the operating system from a SCSI hard disk drive, this primary or boot drive must be connected to the primary SCSI controller. The SCSI address of the primary SCSI hard disk drive must be set to the lowest SCSI address connected to the SCSI controller.
- To improve server performance, you might want to distribute the SCSI devices across the SCSI controllers. When arranging SCSI devices, make sure each device connected to a SCSI controller is assigned a unique SCSI address.
- Each operating system has different limitations regarding the number of SCSI controllers that are supported. Refer to your operating system documentation for additional information.
- SCSI IDs on one channel do not interfere with the IDs on another channel. This applies when using two SCSI controllers that implement a different bus as well as dual channels on a single SCSI controller.

## External SCSI Bus

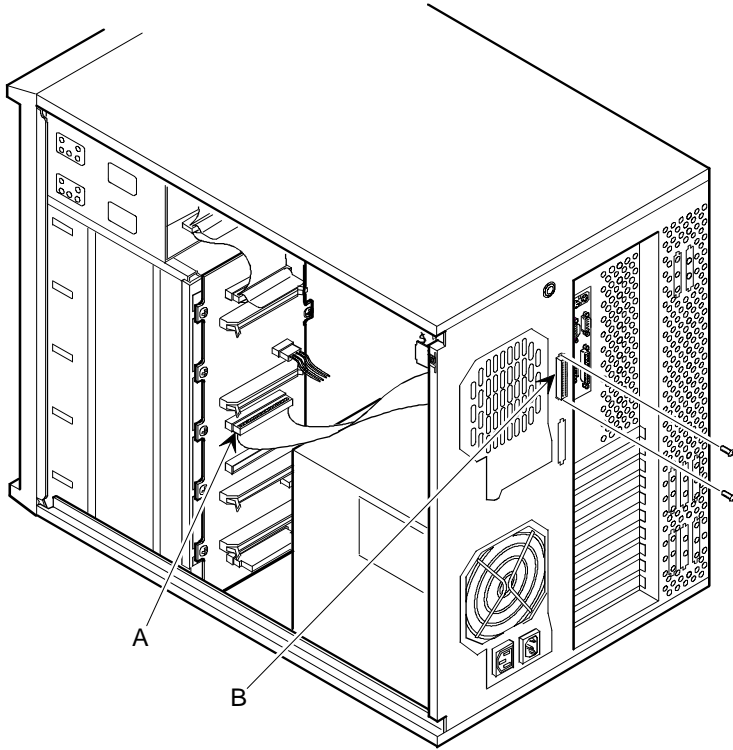
You can use additional SCSI cables and/or controllers to connect external SCSI devices to your server. Consult your Digital sales representative for information on SCSI options and cables.

To connect the storage backplane to an external SCSI bus:

1. Remove the terminator from the storage backplane for the bus you want to connect.
2. Connect the 68-pin unshielded cable connector (part no. FR-PCXAR-WG) to the storage backplane (A, Figure 3-27).
3. Using a screwdriver, gently pry away one of the SCSI knockouts at the rear panel (see Figure 3-27).
4. Screw the 68-pin or 50-pin external shielded connector to the rear panel (B, Figure 3-27).
5. Connect the external SCSI device making sure the external device is properly terminated.



**NOTE:** You can also connect directly to your main logic board's SCSI bus B connector.



DEC00444

**Figure 3-27. External SCSI Bus Connections**



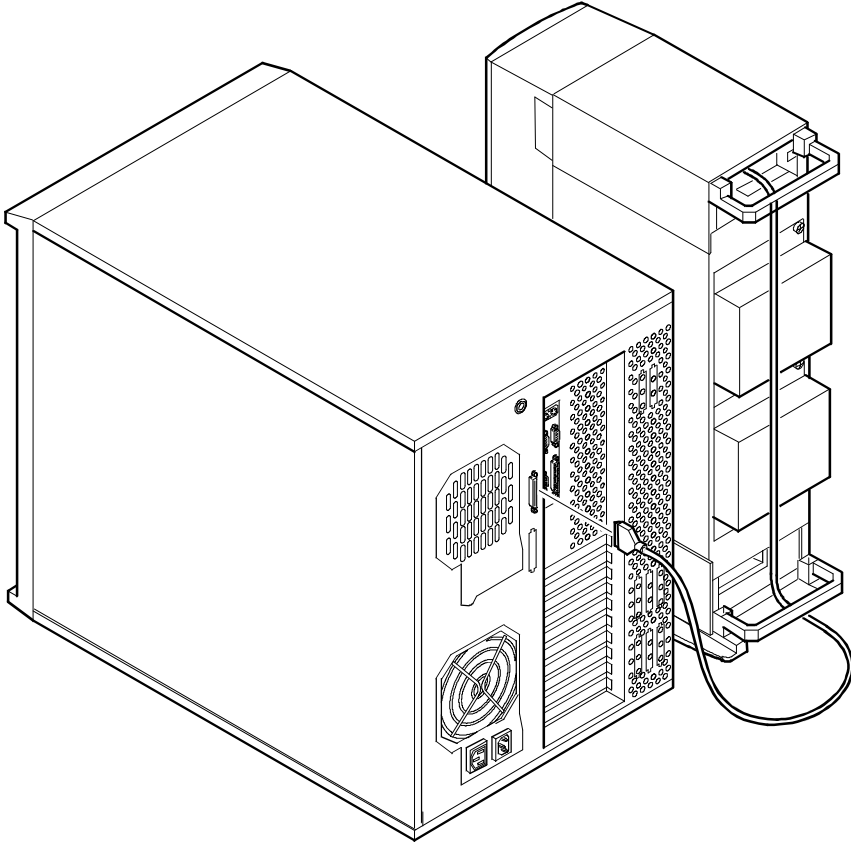
## Connecting an External SCSI Storage Box

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

1. Connect the storage backplane to an external SCSI bus.  
*Refer to "External SCSI Bus" described earlier in this chapter.*
2. Connect the external device making sure the SCSI bus is properly terminated.
3. Run *SCSISelect* and/or RAID utilities to configure your server.

## External SCSI Bus Guidelines

- Make sure that the SCSI addresses you select for the external SCSI devices do not conflict with other devices in the server.
- Make sure that the external SCSI bus is terminated properly.
- For proper operation, the length of the SCSI cable must not exceed 1 meter (3.28 ft).
- Use only a high-density external connector.



DEC00626

**Figure 3-28. Connecting an External SCSI Storage Box**

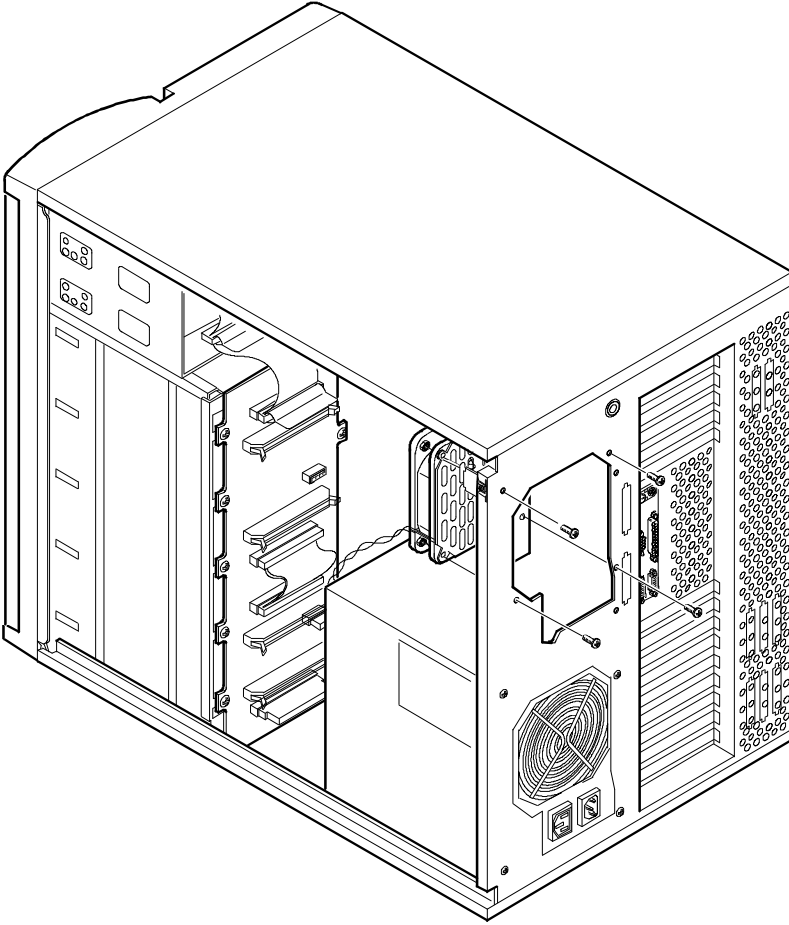
## Replacing the Secondary Rear Cooling Fan

Replace the secondary rear cooling fan as follows:

1. Turn off your server, disconnect external devices, ac power, and monitor power.
2. Unlock and remove the right side panel.
3. Disconnect fan's 15-pin power cable from the power harness.
4. Remove screws securing cooling fan and metal plate to rear of server.

Remove cooling fan and metal plate.

5. Install new cooling fan and metal plate.  
Secure using screws removed in step 4.
6. Connect the fan's 15-pin power cable to the power harness.
7. Replace and lock right side panel.
8. Connect external devices and restore power.



DEC00609

**Figure 3-29. Replacing the Secondary Rear Cooling Fan**

## Installing an Optional Power Supply

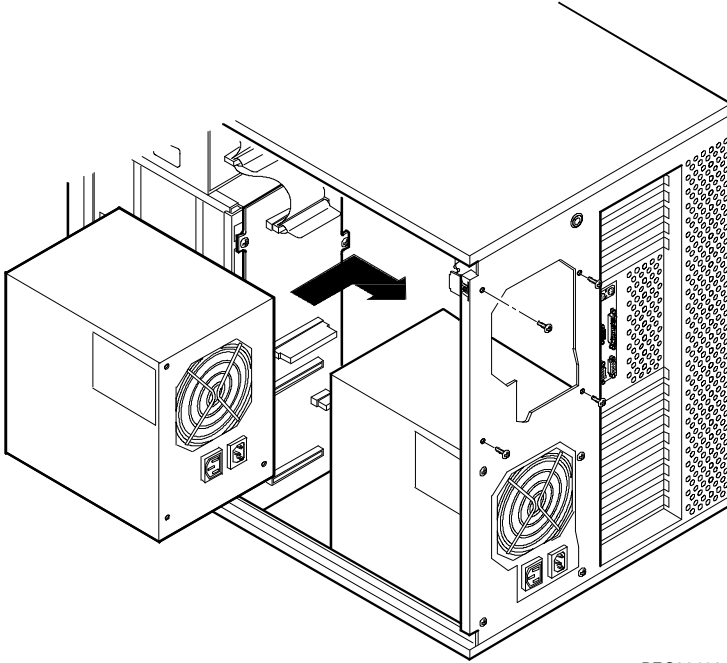
To increase your server's reliability, you can add a second power supply. Each power supply provides uninterrupted backup should one power supply fail.

To install an optional power supply, perform the following:

1. Turn off your server.
2. Disconnect external devices, ac power, and monitor power.
3. Unlock and remove right side panel.
4. Remove secondary rear cooling fan.
5. Install optional power supply making sure it fully engages two locking tabs on inside (center plane) wall of chassis.

Secure power supply to rear of chassis using screws removed in step 4.

6. Connect remaining power cables from the wiring harness in same manner as lower power supply.
7. Replace and lock left side panel.
8. Connect external devices and restore power.



DEC00419-2

**Figure 3-30. Installing an Optional Power Supply**

## Installing the Side Covers

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

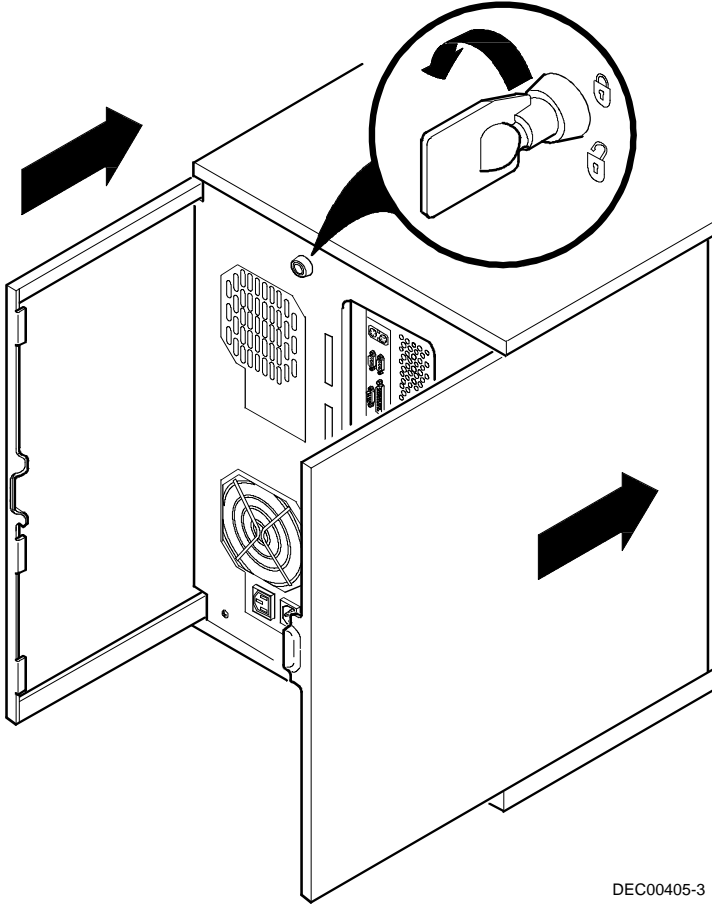


Figure 3-31. Installing Side Covers

# 4

## Problem Solving and Troubleshooting

### Introduction

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

- Server Troubleshooting
- Disk Drive Troubleshooting
- Monitor Troubleshooting
- CD-ROM Troubleshooting

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

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



## Initial Troubleshooting

Follow these general procedures to troubleshoot your Prioris ZX 5000 MP Series Server.

- Record all configuration information and have it readily available.
- Turn off your server, wait until all hard disk drives completely spin down, and then turn it back on.
- If the POST detects an error refer to Appendix B, “Server Messages,” and take the appropriate steps to correct the problem. After the problem has been resolved, restart the server.
- Ensure that all cables and connections are secure.
- Make sure all necessary video, printer, and application device drivers are properly installed.
- Try not to troubleshoot more than one problem at a time.
- Try to duplicate the problem.
- Run the diagnostic software.
- Run the SCU.

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

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

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

- Contact Digital Services for software or hardware related problems.



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

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

# Server Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
No response when the server is turned on.	Server is not plugged in.	Turn off the server, plug it in, and then turn it back on again.
	No power at the wall outlet.	Use another wall outlet.
	Main logic board failed.	Contact your Digital service representative.
	Main logic board jumpers incorrectly set.	Set all appropriate jumpers.
	CPU module has failed.	Reseat the CPU module. If failure continues, contact your Digital service representative.
	No memory module or SIMMs installed.	Install SIMMs and memory module.
	Side panels removed.	Install side panels.
	Power supply failed.	Contact your Digital service representative.
Power is on, but there is no screen display.	Monitor 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.	Contact your Digital service representative.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
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.
	OCP has failed.	Contact your Digital service representative.
Power is on but cooling fans do not work.	Fans disconnected from main logic board.	Connect the fans.
	One or more fans failed.	Replace the fan(s) or contact your Digital service representative.
Server operates incorrectly after installing a CPU module.	CPU module installed incorrectly.	Reinstall CPU module.
	Primary CPU module has failed.	Replace CPU module.
	Secondary CPU module has failed.	Remove CPU module and reboot. If server boots without errors, replace CPU module.
Server operates incorrectly after installing optional expansion board.	Expansion board installed incorrectly.	Remove expansion board and reinstall.
	Did not run SCU to configure expansion board after installation.	Run the SCU to properly configure expansion board. Refer to Chapter 2.
	Did not install CFG file for expansion board.	Run SCU and add CFG file (if necessary).
	Expansion board has failed.	Remove expansion board and reboot. If server boots without errors, replace expansion board.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Server operates incorrectly after installing optional memory (SIMMs).	SIMMs installed incorrectly.	Remove SIMMs and reinstall.
	SIMMs have failed.	Reorder SIMMs. Make sure SIMMs are installed in the appropriate memory banks and are completely filled. If problem persists, replace SIMMs.
	Memory module installed incorrectly.	Reinstall memory module.
No response to keyboard commands.	Memory module failed.	Replace memory module.
	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.
	Mouse failed.	Replace mouse or contact your Digital service representative.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Server operates correctly but application software does not.	Application software installed incorrectly.	Refer to your application software documentation.
	CPU speed setting causes conflict with application software.	Run the SCU and reduce CPU speed setting. Refer to Chapter 2.
	Having system cache enabled causes conflict with application software.	Run the SCU and disable system cache. Refer to Chapter 2.
Server does not boot from CD-ROM drive.	SCSI device has failed.	Contact your Digital service representative.
	CD-ROM drive is not connected to the Adaptec controller.	Connect the CD-ROM drive to the onboard 7870 Adaptec controller. Refer to Chapter 3.
	CD-ROM drive not configured as a bootable device.	Change the CD-ROM setting to "bootable" using <i>SCSISelect</i> .
	CD-ROM disk is not bootable.	CD-ROM disk media must be bootable to boot from CD-ROM disk.
	SCSI device has failed.	Make sure CD-ROM disk is bootable. If failure continues, contact your Digital service representative.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
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."
	Diskette drive has failed.	Secure ribbon cable and other connectors on back of diskette drive. If failure continues, contact your Digital service representative.

## Disk Drive Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
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.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	SCSI controller has failed.	Contact your Digital service representative.
	Loose SCSI cable.	Secure all cable connections.
Server does not recognize an external SCSI device.	SCSI cable incorrectly installed between SCSI controller, SCSI device or backplane.	Refer to "SCSI Guidelines" in Chapter 3 for cabling information.
	SCSI device jumpers incorrectly set.	Refer to the supplied kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied kit installation instructions.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	SCSI controller has failed.	Contact your Digital service representative.
	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI controller and rear panel connector or external SCSI device and rear panel connector.	Refer to "SCSI Guidelines" in Chapter 3 for cabling information.

*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 3.
	Operating system software is not installed on the SCSI boot hard disk drive.	Install the appropriate operating system.
	Requested partition does not exist.	Partition the SCSI hard disk drive and then reload the operating software.
	SCSI boot hard disk drive at wrong SCSI address.	Set SCSI boot hard disk drive to lowest "primary" SCSI address.
Server does not boot from a target diskette drive.	Drive ID incorrectly set.	Make sure the drive ID is correctly set. Refer to the documentation that was supplied with the diskette drive.
	Diskette drive not enabled.	Run the BIOS Setup utility to enable the diskette drive.
	Diskette boot option disabled.	Run the SCU and set boot option A then C.
	Diskette does not contain start-up files.	Insert a diskette with the correct start-up files.
	Diskette drive is empty.	Insert a diskette that contains an operating system.
	Diskette is worn or damaged.	Try another diskette.
	Loose cables.	Secure all cable connections.

*continued*



<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
SCSI hard disk drive cannot read or write information.	Incorrect disk drive jumper settings.	Refer to the supplied kit installation instructions.
	Loose or incorrectly installed cables.	Make sure all cables are correctly installed.
	SCSI hard disk drive is not correctly formatted or partitioned.	Format and partition as required using the supplied operating system.
	SCSI hard disk has failed.	Secure ribbon cable and other connectors on back of SCSI hard disk drive. If failure continues, contact your Digital service representative.
SBB failure.	Check SBB status LEDs for a drive failure indication.	Refer to Chapter 3 for additional information.

## Monitor Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
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.
No screen display.	Power indicator is defective.	Contact your Digital service representative
	Configuration error.	Run the SCU to configure the server for VGA operation.
	Monitor brightness and contrast controls are incorrectly set.	Adjust the monitor brightness and contrast controls.
No monitor display while loading Windows video drivers.	Monitor has failed.	Secure all cables and power connections. If failure continues, contact your Digital service representative.
	Monitor type incorrectly set.	Set the correct monitor type.
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*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
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.
Monitor display not centered while loading Windows video drivers.	Monitor type incorrectly set.	Set the correct monitor type.

## CD-ROM Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
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.
	Accessing wrong drive.	Make sure correct SCSI ID is assigned. Refer to Chapter 3.
Power is on but indicator shows no activity.	Tray open.	Close the tray.
	No disk 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.

# 5

## Server Security Features

### Introduction

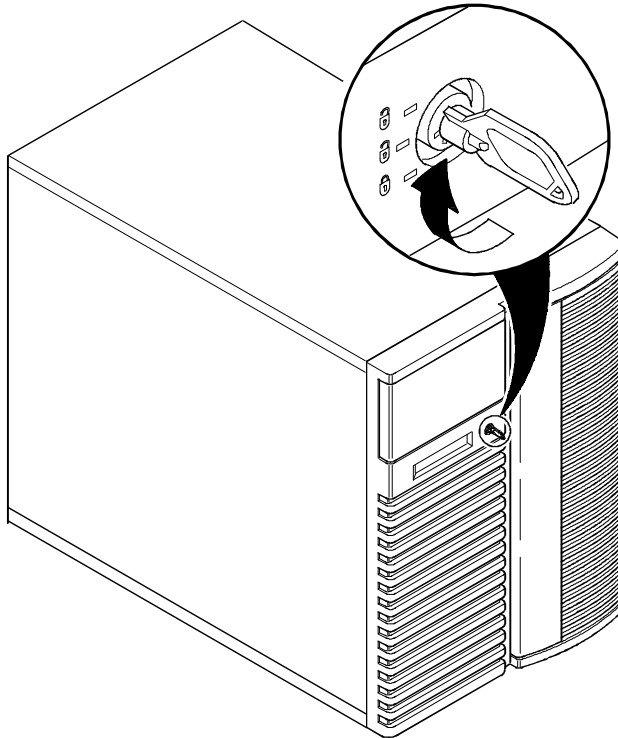
Server security is important to prevent theft or accidental loss of software and hardware. The Prioris ZX 5000 MP Series Server provides the following levels of protection:

- Left and right security door lock—located at the front of your server.
- Left and right side panel lock—located at the rear of your server
- Administrative and user 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.

1. Insert key into keylock at bottom position.
2. Turn key clockwise to first unlock position to open left-front security door,
3. Turn key clockwise to second unlock position to open right-front security door.



DEC00406

**Figure 5-1. Front Panel Security Doors Lock**

## Left and Right Side Panel Lock

Your server has a chassis keylock used to prevent unauthorized removal of the left and right side panels.

1. Insert key as shown and turn clockwise to release left and right side panels.
2. Insert key as shown and turn counter clockwise to lock left and right side panels.

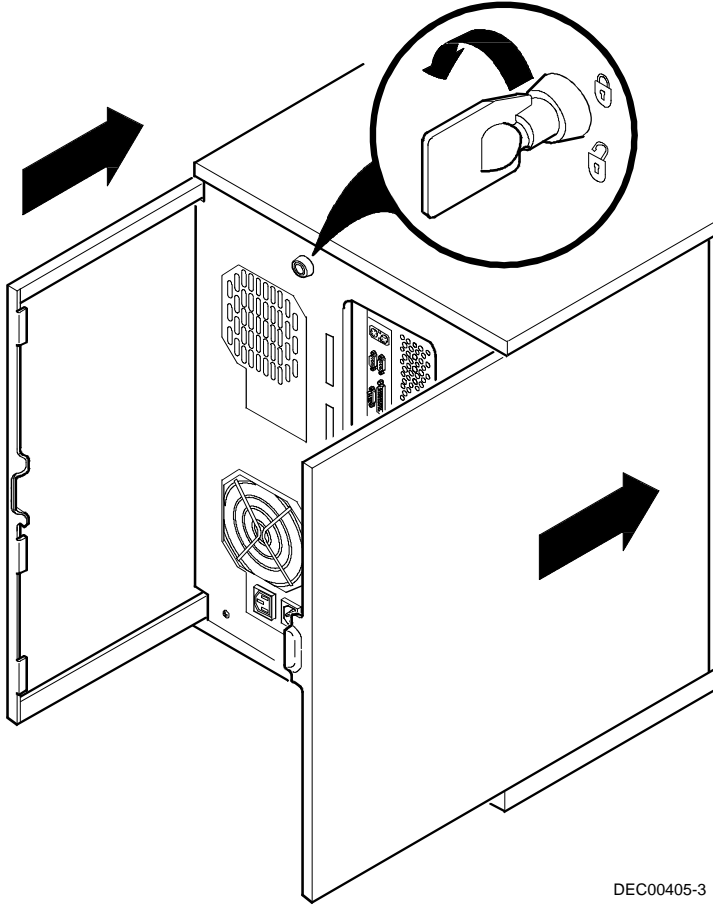


**NOTE:** The server keys fit both the front keylock and rear chassis lock.



**CAUTION:** Be careful not to lose your server keys. Losing these keys prevents you from removing the left and right side panel. Contact your Digital service representative or authorized dealer for information on replacing lost keys.

Also, write down your key ID number for future use in case your server keys are ever lost.



DEC00405-3

**Figure 5-2. Left and Right Side Panel Lock**

## Administrative and User Password

Your server has two password levels that you can set to prevent unauthorized access to your server files or BIOS Setup utility. If you set an administrative password, you will be prompted to enter a password before accessing the SCU or BIOS Setup utility.

Perform the following steps to set an administrative and user password using the SCU:

1. Turn on your server and allow POST to complete without errors.
2. Start the SCU from the DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.
3. Access the *Security Subsystems Group* menu and then select the `Administrative Password Option`.
4. Type in an administrative password in the `Enter Password` field and then press [Enter].

To confirm, type in your administrative password in the `Verify Password` field and then press [Enter].

5. If desired, set a user password.

Highlight the `Set User Password Option` field and then follow the method described in steps 4 and 5.

6. Exit the SCU and then reboot your server.

Your server runs the POST and then prompts you for the 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. Place the S8C1 switch position 2 to the ON position.

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

3. Reconnect your server and turn it on.

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

4. Turn off your server and remove the left side panel.
5. Place the S8C1 switch position 2 to the OFF position.
6. Reconnect your server and turn it on.
7. Using the SCU, assign a new password.

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

## Additional Security Features

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

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

- **Display <F1> for Setup Message during POST** — Setting this option to `Disabled` prevents unauthorized personnel from entering the BIOS Setup utility each time your server is turned on or reset. Display <F1> for Setup Message during POST appears as an <F1> Setup prompt on your monitor screen each time your server boots.

If you select `Disable`, the server does not inform you when to press <F1> to enter Setup. You can still enter Setup by pressing <F1> before POST completes.

- **Floppy Writes** — Setting this option to `Disabled` prevents unauthorized personnel from writing data to a diskette.
- **Video Blanking** — Setting this option to `Enabled` requires a password to reactivate the monitor after a set period of keyboard inactivity.
- **Reset and Power Switch Locking** — Setting this option to `Enabled` prevents the power and reset switches from being locked out during secure mode.

Your main logic board's Enable Flash Write switch (S8C1-3) should also be set to OFF to prevent unauthorized personnel from loading a new server BIOS. Loading a new server BIOS might enable someone to override other server security features or introduce a virus into your server.

# A

## Technical Specifications

### Introduction

This appendix provides the following technical characteristics for your server:

- Server specifications
- CPU specifications
- Power supply and input power requirements
- Current specifications
- Server current usage
- Power cord requirements
- Main logic board switches
- Main logic board jumpers
- Power fan and control board jumper

## Server Specifications

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

### Performance Specifications

Attributes	Specification
Bus clock	
EISA	8.33 MHz
PCI	33 MHz
Data I/O	
EISA	8-bit, 16-bit, and 32-bit
PCI	32-bit
Memory module DRAM	32 MB minimum. Up to 384 MB on each ECC memory module, using 8, 16, or 32 MB SIMMs.
Flash memory BIOS	512 KB (includes AMI BIOS, BIOS setup utility, EISA/PCI configuration information, POST, video BIOS, and SCSI BIOS)

### Server Dimensions

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

## Environmental Specifications

Attributes	Specification
Operating temperature	10°C to 35°C (50°F to 95°F)
Storage temperature	–20°C to 65°C (–4°F to 149°F)
Operating humidity (noncondensing)	20% to 80% relative humidity, maximum wet bulb 35°C (95°F)
Storage humidity (noncondensing)	10% to 90% relative humidity, maximum wet bulb 65°C (149°F)
Altitude	
Operating	2,000 m (6,000 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

## Power Supply and Input Power Requirements

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

Rated Voltage Range	Maximum Range	Rated Input Current <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

## Current Specifications

Your server family power supply provides the following output ratings:

- +5 V dc                      2.5 A min, 52 A max.
- +3.43 V dc                0 A min, 37.4 A max.
- +12 V dc                    0.5 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 +3.43 V dc maximum total output: 355 W.

+5 V dc and +3.43 V dc and +12 V dc maximum total output: 420 W.

Power supply total output: 450 W maximum.

## Power Cord Requirements

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

- UL and CSA Listed or Recognized cordage rated for use at 250 V ac with a current rating that is at least 125% of the current rating of the product. In Europe, the cordage must have the <HAR> mark.
- The ac plug is terminated in a grounding-type male plug designed for use in the region. It must also have marks showing certification by an agency acceptable in the region.
- The connector at the server end is an IEC type CEE-22 female connector.
- The maximum length is 4.5 meters (14.5 feet).

## Main Logic Board Switches/Jumpers

The following table lists the main logic board switches/jumpers and factory-default settings. Figure A-1 shows the locations of the main logic board switch/jumper pins.



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

### Main Logic Board Switch Settings

Switch	Description	Setting	Description
S8C1-1	Clear CMOS Protect CMOS <sup>(1)</sup>	SW1, On SW1, Off <sup>(1)</sup>	Keep this switch in the factory default (OFF) position at all times and only use when instructed by a Digital service representative. Unauthorized use can cause your server to operate incorrectly.
S8C1-2	Clear password Enable password <sup>(1)</sup>	SW2, On SW2, Off <sup>(1)</sup>	If you forget your password, set this switch to (ON) and then restart your server. Refer to Chapter 5 for more information.
S8C1-3	Enable flash write <sup>(1)</sup> Disable flash	SW3, On <sup>(1)</sup> SW3, Off	Your main logic board's flash upgrade switch must be set to (disable flash) 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.

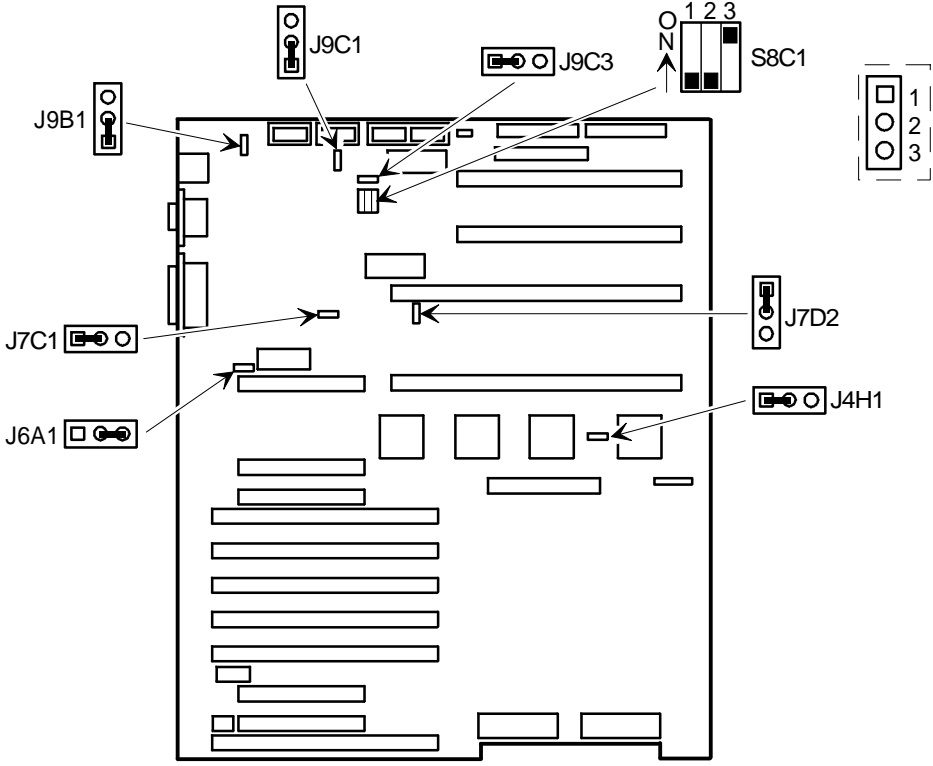
<sup>(1)</sup> Factory default setting



## Main Logic Board Jumper Settings

Jumper	Description	Setting	Description
Test development vehicle	Enable <sup>(1)</sup>	J4H1, pins 1 and 2 <sup>(1)</sup>	Enables you to install and use a TDV module in slot CPU2.
	Disable	J4H1, pins 2 and 3	
Video Sleep	Register 46E8 Register 3C3 <sup>(1)</sup>	J6A1, pins 1 and 2 J6A1, pins 2 and 3 <sup>(1)</sup>	After a period of keyboard inactivity, the video sleep register blanks out the monitor. You must enter a password to reactivate the monitor and keyboard.
Program boot block	Disable <sup>(1)</sup>	J7C1, pins 1 and 2 <sup>(1)</sup>	Set this jumper to disable to prevent unauthorized personnel from changing the BIOS boot block.
	Enable	J7C1, pins 2 and 3	
Boot block	Disable <sup>(1)</sup>	J7D2, pins 1 and 2 <sup>(1)</sup>	If your BIOS upgrade failed, refer to the README.TXT file that came with the BIOS upgrade.
	Enable	J7D2, pins 2 and 3	
Floppy drive 1 (FD1)	1.44 MB <sup>(1)</sup>	J9B1, pins 1 and 2 <sup>(1)</sup>	Enables you to configure the diskette drive port for 2.88 MB drives that support automatic size detection.
	2.88 MB	J9B1, pins 2 and 3	
Floppy drive 0 (FD0)	1.44 MB <sup>(1)</sup>	J9C1, pins 1 and 2 <sup>(1)</sup>	Enables you to configure the diskette drive port for 2.88 MB drives that support automatic size detection.
	2.88 MB	J9C1, pins 2 and 3	
Power control	Enable <sup>(1)</sup>	J9C3, pins 1 and 2 <sup>(1)</sup>	Enables power supply maintenance voltage control using the RTC.
	Disable	J9C3, pins 2 and 3	

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



DEC00726-6

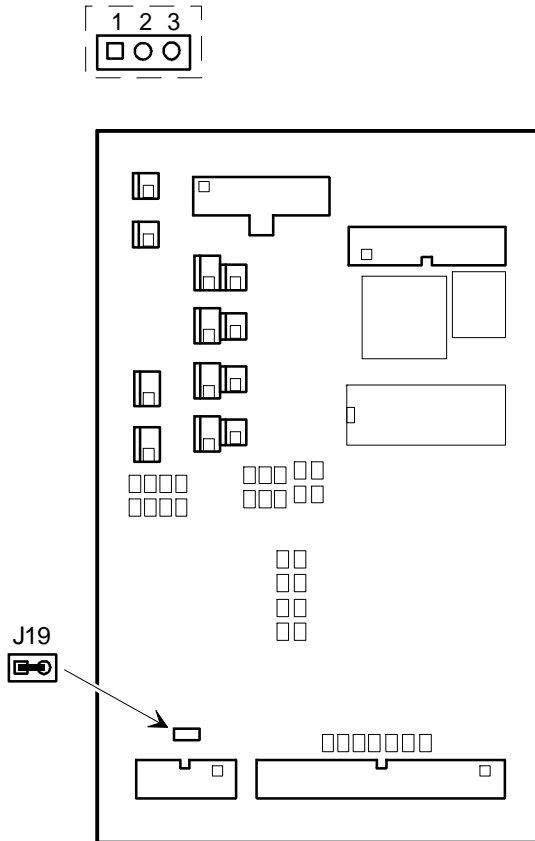
Figure A-1. Main Logic Board Jumper Locations

## Power Fan and Control Board Jumper Settings

The following table lists the power fan and control board jumper settings and factory-default setting. Figure A-2 shows the location of the power fan and control board jumper pins.

Jumper	Description	Setting	Description
RSM	Not installed <sup>(1)</sup> Installed	J19, jumpered <sup>(1)</sup> J19, open	If you add Digital's Remote Server Management (RSM) option to your server, you will need to connect the RSM reset cable to the RSM connector and install the J19 jumper.

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



DEC00796

**Figure A-2. Power Fan and Control Board Jumper Settings**

# B

## Server Messages

### Introduction

This appendix lists server messages you might see or hear when you turn on power. The server groups messages as follows:

- Error and informational messages
- POST error codes and messages

### Error and Informational Messages

When you turn on your server, POST displays messages that provide information about the server. If a failure occurs, POST emits beep codes that indicate errors in hardware, software, or firmware. If POST can display a message on your monitor screen, it causes the speaker to beep twice as the message appears.

## POST Beep Codes

POST cannot display messages when an error occurs before the monitor is initialized. Instead, it emits a beep code. The beep code is a series of individual beeps, each equal in length. Write down any beep code for your Digital service representative.

Beeps	Error Message	Conditions
1	Refresh failure	Memory refresh circuitry on the main logic board is faulty
2	Parity error can't be reset	Parity error in the first 64 KB memory
3	Base 64 KB memory failure	Memory failure in first 64 KB memory
4	Timer not operational	Timer on main logic board not operational or memory failure in first 64 KB memory
5	Processor failure	CPU on main logic board generated an error
6	8042 gate A20 failure	BIOS cannot switch to protected mode Keyboard controller might be bad
7	Processor exception interrupt error	Processor exception interrupt error
8	Display memory read/write error	Video controller is missing or its memory is faulty (not a fatal error)
9	ROM checksum error	ROM checksum value does not match encoded value in BIOS
10	CMOS shutdown register read/write error	Shutdown register for CMOS RAM failed

## POST Error Codes and Messages

The BIOS indicates errors by writing an error code to the PS/2-standard logging area in the Extended BIOS Data Area, and by displaying a message on the screen, which is preceded by the POST Error Code. The BIOS logs the error code in the Critical Event Logging area.

<b>Code</b>	<b>Error Message</b>
0002	Primary Boot Device Not Found
0010	Cache Memory Failure Do Not Enable Cache
0015	Primary Output Device Not Found
0016	Primary Input Device Not Found
0041	EISA ID Mismatch for Slot
0043	EISA Invalid Configuration for Slot
0044	EISA config NOT ASSURED!
0045	EISA Expansion Board Not Ready in Slot
0047	EISA CMOS Configuration Not Set
0048	EISA CMOS Checksum Failure
0049	EISA NVRAM Invalid
0060	Keyboard Is Locked ... Please Unlock It
0070	CMOS Time & Date Not Set
0080	Option ROM has bad checksum
0083	Shadow of PCI ROM Failed
0084	Shadow of EISA ROM Failed
0085	Shadow of ISA ROM Failed
0131	Floppy Drive A:
0132	Floppy Drive B:
0135	Floppy Disk Controller Failure

*continued*

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<b>Code</b>	<b>Error Message</b>
0140	Shadow of System BIOS Failed
0170	Disabled CPU slot #
0171	CPU Failure - Slot 1, CPU # 1
0172	CPU Failure - Slot 1, CPU # 2
0173	CPU Failure - Slot 2, CPU # 1
0174	CPU Failure - Slot 2, CPU # 2
0171	Previous CPU Failure - Slot 1, CPU # 1
0172	Previous CPU Failure - Slot 1, CPU # 2
0173	Previous CPU Failure - Slot 2, CPU # 1
0174	Previous CPU Failure - Slot 2, CPU # 2
0175	CPU modules are incompatible
0180	Attempting to boot with failed CPU
0191	CMOS Battery Failed
0195	CMOS System Options Not Set
0198	CMOS Checksum Invalid
0289	System Memory Size Mismatch
0295	Address Line Short Detected
0297	Memory Size Decreased
0299	ECC Error Correction failure
0301	ECC Single bit correction failed, Correction Disabled
0302	ECC Double bit Error
0310	ECC Address failure, Partition #
0370	Keyboard Controller Error
0373	Keyboard Stuck Key Detected

---

*continued*

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<b>Code</b>	<b>Error Message</b>
0375	Keyboard and Mouse Swapped
0380	ECC SIMM failure, Board in slot 1 SIMM #
0392	ECC SIMM failure, Board in slot 2 SIMM #
0430	Timer Channel 2 Failure
0440	Gate-A20 Failure
0441	Unexpected Interrupt in Protected Mode
0445	Master Interrupt Controller Error
0446	Slave Interrupt Controller Error
0450	Master DMA Controller Error
0451	Slave DMA Controller Error
0452	DMA Controller Error
0460	Fail-safe Timer NMI Failure
0461	Software Port NMI Failure
0465	Bus Timeout NMI in Slot
0467	Expansion Board NMI in Slot
0501	PCI System Error
0510	PCI Parity Error
0710	System Board Device Resource Conflict
0711	Static Device Resource Conflict
0800	PCI I/O Port Conflict
0801	PCI Memory Conflict
0802	PCI IRQ Conflict
0803	PCI Error Log is Full
0810	Floppy Disk Controller Resource Conflict

---

*continued*



## Server Messages

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<b>Code</b>	<b>Error Message</b>
0811	Primary IDE Controller Resource Conflict
0812	Secondary IDE Controller Resource Conflict
0815	Parallel Port Resource Conflict
0816	Serial Port 1 Resource Conflict
0817	Serial Port 2 Resource Conflict
0820	Expansion Board Disabled in Slot
0900	NVRAM Checksum Error, NVRAM Cleared
0903	NVRAM Data Invalid, NVRAM Cleared
0905	NVRAM Cleared By Jumper
0982	I/O Expansion Board NMI in Slot
0984	Expansion Board Disabled in Slot
0985	Fail-safe Timer NMI
0986	System Reset caused by Watchdog Timer
0987	Bus Timeout NMI in Slot

---

# C

## Device Mapping

### Introduction

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, 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.

## Memory Map

Address Range (hex)	Amount	Function
0000_0000–0003_FFFF	256 KB	Base server memory (fixed)
0004_0000–0007_FFFF	256 KB	Base server memory (fixed)
0008_0000–0009_FFFF	128 KB	Base server memory or ISA memory enabled in Setup
000A_0000–000B_FFFF	128 KB	ISA video frame buffer
000C_0000–000E_FFFF	192 KB	Expansion board video BIOS (can be shadowed) AIC-7870 SCSI BIOS (can be shadowed)
000F_0000–000F_FFFF	64 KB	ISA memory, server BIOS (fixed)
0010_0000–00EF_FFFF	14 MB	Server memory or unused
00F0_0000–00FF_FFFF	1 MB	Server memory or EISA/ISA memory
0100_0000–3FFF_FFFF	1 008 MB	Server memory or unused
4000_0000–BFFF_FFFF	1 024 MB	EISA memory or I/O slave memory
C000_0000–C1FF_FFFF	32 MB	Memory mapped math coprocessor
C200_0000–FEBF_FFFF	944 MB	EISA memory or I/O slave memory
FEC0_0000–FEC0_0FFF	4 KB	I/O APIC #1
FEC0_1000–FEC0_1FFF	4 KB	I/O APIC #2
FEC0_2000–FEC0_2FFF	4 KB	I/O APIC #3
FEC0_3000–FEC0_3FFF	4 KB	I/O APIC #4
FEC0_4000–FFDF_4FFF	32 752 KB	EISA memory or I/O slave memory
FFE0_0000–FFFF_FFFF	32 KB	EISA (BIOS/SCU)

## I/O Map

I/O Address(es)	Resource
0000–001F	DMA controller 1
0020–0021	Interrupt controller 1
0022–0023	EISA bridge configuration space access ports
0024–0025	AIP configuration space access ports
0026–0027	Configuration space access ports
0040–005F	Programmable timer
0060, 0064	Keyboard controller
0061	NMI status and control register
0070	NMI mask (bit 7) and RTC address (bits 6:0)
0071	Real-time clock (RTC)
0080–008F	DMA low page register
0092	System control port A ( PC-AT control port)
00A0–00BF	Interrupt controller 2
00C0–00DF	DMA controller 2
00F0	Clear NPX error
00F8–00FF	x87 numeric co-processor
0102	Video display controller
0170–0177	Secondary hard disk controller (IDE)

*continued*

## Device Mapping

<b>I/O Address(es)</b>	<b>Resource</b>
01F0–01F7	Primary hard disk controller (IDE)
0200–0207	Game I/O port
0220–022F	Serial port
0238–023F	Serial port
0278–027F	Parallel port 3
02E8–02EF	Serial port 2
02F8–02FF	Serial port 2
0338–033F	Serial port 2
0370–0375	Secondary diskette drive
0376	Secondary IDE
0377	Secondary IDE/diskette drive
0378–037F	Parallel port 2
03B4–03BA	Monochrome display port
03BC–03BF	Parallel port 1 (primary)
03C0–03CF	Enhanced graphics adapter
03D4–03DA	Color graphics controller
03E8–03EF	Serial port
03F0–03F5	Diskette disk controller
03F6–03F7	Primary IDE - secondary diskette drive
03F8–03FF	Serial port 1 (primary)

*continued*

<b>I/O Address(es)</b>	<b>Resource</b>
0400–043F	DMA controller 1, extended mode registers
0461	Extended NMI / reset control
0462	Software NMI
0464	Last EISA bus master granted
0480–048F	DMA high page register
04C0–04CF	DMA controller 2, high base register
04D0–04D1	Interrupt controllers 1 and 2 control register
04D4–04D7	DMA controller 2, extended mode register
04D8–04DF	Reserved
04E0–04FF	DMA channel stop registers
0678-067A	Parallel port (ECP)
0778-077A	Parallel port (ECP)
07BC-07BE	Parallel port (ECP)
0800–08FF	NVRAM
0C80–0C83	EISA system identifier registers
0C84	Board revision register
0C85–0C86	BIOS function control
0CF8	PCI CONFIG_ADDRESS register
0CFC	PCI CONFIG_DATA register
n000–n0FF	EISA slot n I/O space (n = 1 to F)
x100–x3FF	ISA I/O slot alias address

*continued*

<b>I/O Address(es)</b>	<b>Resource</b>
n400–n4FF	EISA slot n I/O space (n = 1 to F)
x500–x7FF	ISA I/O slot alias address
n800–n8FF	EISA slot n I/O space (n = 1 to F)
x900–xBFF	ISA I/O slot alias address
nC00–nCFF	EISA slot n I/O Space (n = 1 to F)
xD00–xFF	ISA I/O slot alias address
46E8	Video display controller

## EISA Slot Assignments

<b>EISA Slot (hex)</b>	<b>Device</b>
0	System board
1–8	EISA expansion boards
9–A	Embedded SCSI
B	Memory module
C	Memory module (expansion module)
D	Primary PCI segment
E	CPU1 module
F	CPU2 module

## Direct Memory Access Channels

Channel	Device
0	(expansion board)
1	(expansion board)
2	Diskette drive
3	IDE hard disk drive
4	Reserved
5	(expansion board)
6	(expansion board)
7	(expansion board)



## Interrupts

IRQ	Device
NMI	Parity error
0	Interval timer
1	Keyboard buffer full
2	Reserved, cascade interrupt from slave PIC
3	Onboard serial port B (COM2), if enabled
4	Onboard serial port A (COM1), if enabled
5	Parallel port LPT2, if enabled
6	Onboard diskette (floppy) controller, if enabled
7	Parallel port LPT1, if enabled
8	Real-time clock (RTC)
9	Video
10	COM3; if enabled, it can be set for EISA expansion boards using the SCU
11	COM4; if enabled, it can be set for EISA expansion boards using the SCU AIC-7870; if enabled, it can be set for EISA expansion boards using the SCU
12	Onboard PS/2 mouse port, if enabled
13	Math coprocessor error

*continued*

<b>IRQ</b>	<b>Device</b>
14	IDE hard drive controller, if enabled
15	User definable; using the SCU, it can be set for the following: <ul style="list-style-type: none"> <li>• EISA expansion boards</li> <li>• IDE hard drive controller</li> <li>• onboard video, programmable to 9, 10, 11, or 15</li> <li>• onboard SCSI, programmable to 9, 10, 11, or 15 (SCU limits SCSI to three choices)</li> </ul>

## PCI Interrupts

<b>IRQ</b>	<b>Device</b>
any IRQx	SCSI channel A INTA
any IRQx	SCSI channel B INTA
any IRQx	PCI-0 INTA
any IRQx	PCI-0 slot B INTA
any IRQx	PCI-0 slot x INTB
any IRQx	PCI-0 slot A INTA
any IRQx	PCI-0 slot B INTA
any IRQx	PCI-0 slot C INTA
any IRQx	PCI-0 slot x INTB
any IRQx	PCI-0 and 1 slot x INTC
any IRQx	PCI-0 and 1 slot x INTD
any IRQ or NMI, or SMI	INT1 slot MEM1
any IRQ or NMI, or SMI	INT2 slot MEM2

# D

## Caring For Your Server

### Introduction

This appendix describes how to:

- Clean the outside of the server
- Clean the monitor screen
- Clean the mouse
- Pack and move the server



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

### Cleaning the Server

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

### Cleaning the Screen

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

## Cleaning the Mouse

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

Perform the following steps to clean a mouse ball:

1. Turn the mouse over and release the ball cover.
2. Place the mouse cover and ball on a clean surface.
3. Lightly dampen a cotton swab with a mild detergent, and clean the ball and the inside of the mouse.
4. Replace the ball and mouse ball cover.

## Moving the Server

Perform the following steps before shipping or moving the server:

1. Back up all files stored on all hard disk drives.
2. Turn off the server (the monitor automatically shuts off).
3. Disconnect the power cord from the wall outlet, then from the back of the server.
3. Disconnect the monitor cable from the back of the server.
4. Disconnect the keyboard cable from the back of the server.
6. Disconnect the mouse cable from the back of the server.
7. Disconnect any other external peripheral devices, such as printers and modems.
8. Insert a drive protection card in all 5¼-inch and 3½-inch diskette drives (if applicable). If you do not have drive protection cards, use blank diskettes.
9. Package the server as described in the following section, "Packing the Server."

## **Packing the Server**

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

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

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

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

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