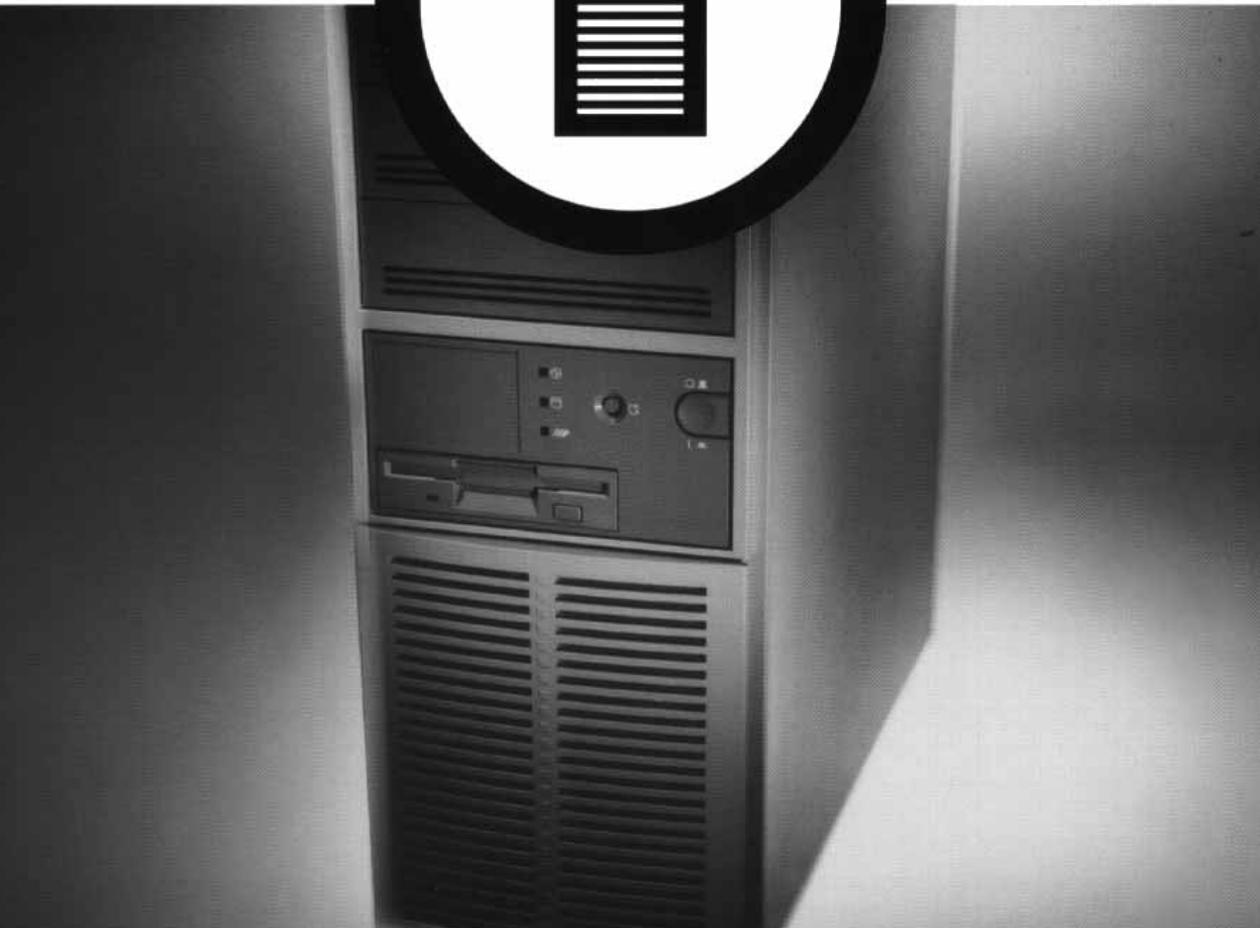**digital**

PRIORIS LX SERVER
USER'S GUIDE

Prioris LX Server
User's Guide

Part Number: ER-941WW-UA. A01

Digital Equipment Corporation

November 1995

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FCC ID: A09-94XWW

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.

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FIGURES

About This Guide

Introduction

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

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

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

Audience

This guide is written specifically for anyone responsible for operating, configuring, and expanding the Prioris LX 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 or replace CPU module options, and mass storage devices.

- 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, main logic board jumper information, and CPU module jumper information.

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

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

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

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

Conventions

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

Abbreviations

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

continued

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

Special Notices

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

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

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

NOTES: 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, diagnostics, and other options manuals are also available.
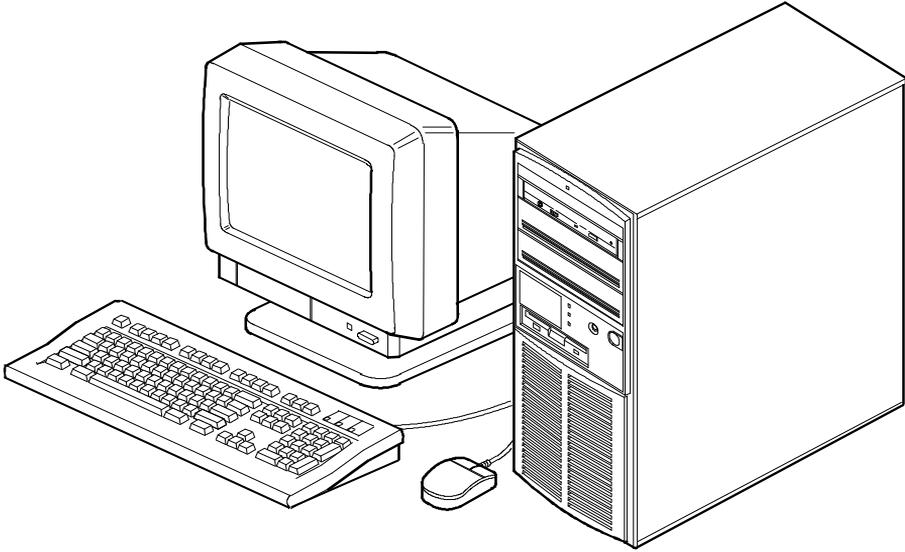
DEC00588

Typical Prioris LX Server

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

1
Introduction

The Prioris LX servers are a family of high-performance, i486 or Pentium™ processor-based, network, application, and file/print servers. These servers are the first in their class to offer an integrated PCI design that includes enhanced IDE, Fast SCSI-2, and support for full-duplex ethernet transmission (throughput to 20 Mb/sec).

The Prioris LX family of servers also provide investment protection through CPU upgrade technology. CPU upgrade technology enables you to easily upgrade to a higher-performance CPU by simply installing a new CPU module. Supported CPU modules are also designed to be chip-upgradable as future high-performance CPUs become available.

Your Prioris LX family of servers feature:

CPU/Memory Module Technology	Single socket Intel i486 or Pentium processor CPU module.
	Both CPU modules come standard with a 256 KB write-back secondary cache. The Pentium processor CPU module has a secondary cache upgrade socket for installing an optional 512 KB secondary cache. There is no cache upgrade for the i486 CPU module.
	The i486 CPU module contains 4 sockets capable of supporting up to 128 MB of standard parity memory (SIMMs).
	The Pentium processor CPU module contains 6 sockets capable of supporting up to 192 MB of standard parity memory (SIMMs).

PCI/EISA Bus Architecture	Seven expansion board slots are available for installing up to six EISA or PCI expansion boards[1]. Four of the slots support extended industry-standard 32-bit EISA expansion boards. The remaining three PCI local bus expansion slots support 32-bit PCI local bus expansion boards. This enables your server to deliver improved performance by using a higher speed data path.
	The PCI bus architecture supports 8, 16, and 32-bit data transfers at a transfer rate of 25, 30, or 33 MHz (depending on the selected CPU clock). The maximum PCI bus data transfer rate is 32-bits at 120 MB per second.
	The EISA bus architecture also supports 8, 16, and 32-bit data transfers at a transfer rate of 7.5 or 8.33 MHz (depending on the selected CPU clock).
Fast/Narrow Adaptec AIC-7850 SCSI-2 Controller	The onboard PCI Fast/Narrow Adaptec AIC-7850 SCSI-2 controller supports a data transfer rate of up to 10 MB/s as well as a variety of high-speed, high-performance features that greatly increases your server's data throughput.
Digital Onboard PCI Ethernet Controller	The onboard PCI Ethernet controller supports high data transfer rates for optimal network performance. Features include: Optimized system interface using two 256 byte on-chip FIFOs, high-performance 32-bit DMA architecture, full duplex (20 Mb/s) operation (10Base-T mode), and auto-configuration. The onboard PCI Ethernet controller supports 10Base-T and 10Base-2 connectors.

[1] Only one expansion board can reside in EISA slot 1 or PCI slot 3 at any one time. These slots have to share the expansion slot opening at the rear panel.

Onboard PCI Enhanced IDE Controller	Onboard PCI enhanced IDE controller supports up to four drives and 32-bit accesses under Windows applications.
Onboard Video Controller	The onboard Cirrus 5428 or 5429 video controller uses 512 KB of DRAM memory to display resolutions up to 800 x 600 at 256 colors and 1024 x 768 at 16 colors.
Support for Major Operating Systems	MS-DOS/Windows 3.1x, Windows for Workgroups, Windows NT, NetWare 3.12 and 4.x, SCO UNIX, Pathworks 5.x, OS/2 2.x, OS/2 Warp, and Banyan Vines.
ServerWORKS Quick Launch	Enables you to install your operating system and configure your server from a single CD-ROM disk application.
ServerWORKS Manager	Enables a network administrator to monitor critical PC server statistics and vital CPU component information necessary to maintain a healthy network.

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

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

Server Software and Support Documentation

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

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

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

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

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

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

Diagnostic Software

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

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

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

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

Server Utilities and Technical Support

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

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

Restarting Your Server

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

Important Information

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

- Be comfortable in your work space.

- Change your posture frequently.

- Proceed according to the recommendations in the following table and figure.

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

continued

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

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.
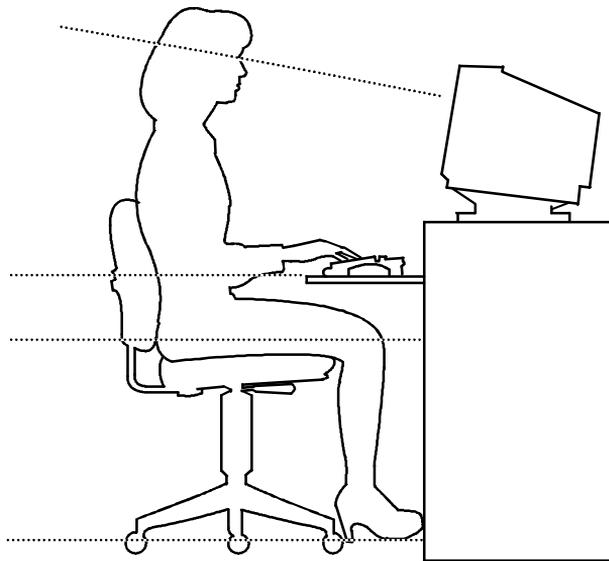
DEC00454

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 vary from one manufacturer to another. Accompanying literature with these products should illustrate or describe the location of model and serial numbers.

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

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

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

Getting Help

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

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

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

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

SCSI*Select* Utility

Your Prioris server comes with an onboard Adaptec 7850 controller and SCSI*Select* configuration utility. This utility enables you to change host controller settings without opening your server or handling the SCSI controller board.

Use SCSI*Select* to:

- Check factory default settings for each device on the SCSI bus.

- Change SCSI device settings that might conflict with other SCSI devices.

- Perform low-level formatting on new SCSI disk drives.

To start the SCSI*Select* configuration utility:

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

Flash Utility

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

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

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

Using EPP3SMC.EXE

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

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

   Note the path where your driver is located:

   C:\EPP\EPP3SMC.EXE

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

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

   device=C:\epp3smc.exe

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

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

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

6. Choose EPP mode.

7. Exit the SCU to save the new setting.

   Your parallel port is now configured as an EPP port.

System Configuration Utility (SCU)

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

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

Configuring Expansion Boards

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

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

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

Locating the SCU

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

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

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

    ```
    SCU.BAT
    ```

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

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

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

When to Run the SCU

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

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

SCU Keyboard Function Keys

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

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

Starting and Using the SCU

The SCU options are shown in Figure 2-1. If this is your first time using the SCU, it is recommended that you select "Learn About Configuring your Computer" for detailed information on using the SCU. If this is a subsequent session, refer to the appropriate sections in this chapter to change your server's configuration.
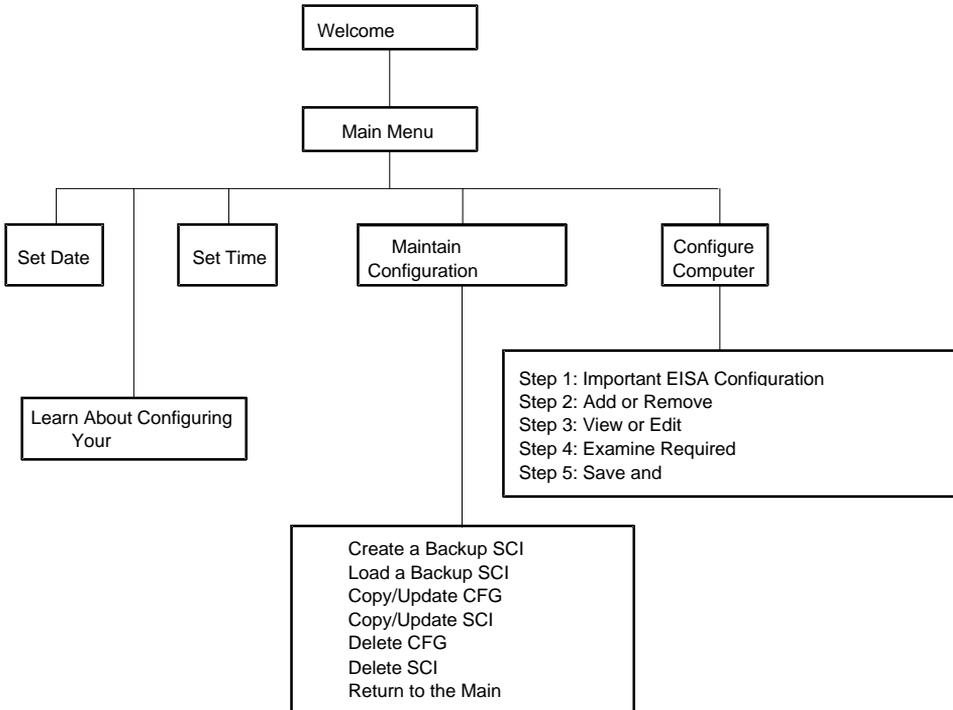
DEC00456

Figure 2-1. SCU Main Menu Options

To start and use the SCU:

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

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

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

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

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

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

   Press [Enter] to display the Main menu.

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

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

Configure Your Computer

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

Adding ISA Expansion Boards

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

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

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

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

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

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

Adding EISA Expansion Boards

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

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

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

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

   After your server boots, the following message appears:

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

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

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

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

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

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

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

Adding PCI Expansion Boards

> **CAUTION:** Before installing a PCI video expansion board:
>
> 1. Make sure you follow the instructions given below to enable the PCI slot and to assign an IRQ.
>
> 2. Disable onboard video. To disable onboard video, move the onboard VGA jumper (J9) to the `Disabled` position (Refer to Appendix A).
>
> 3. Install the PCI video card.
>
> 4. Make sure you switch the video signal cable from the onboard video connector to the connector on the PCI video expansion board.
>
> Failure to do so might cause your PCI video card and/or server to operate incorrectly.

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

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

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

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

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

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

5. Highlight the appropriate `PCI slot Options Group` for each installed PCI expansion board and then select `Enable Device` to configure your server.

    If an IRQ needs to be assigned for an installed PCI expansion board, select `PCI Interrupt` and set it to `One IRQ Required`.

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

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

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

Relocating Expansion Boards

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

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

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

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

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

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

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

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

Setting the Date and Time

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

To access this menu item:

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

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

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

Maintain the SCU Diskette

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

- Create a backup SCI file

- Load a backup SCI file

- Copy/update CFG files

- Copy/update SCI files

- Delete CFG files

- Delete SCI files

- Return to the Main Menu

To access this menu item:

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

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

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

SCU Options

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

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

If you need to access the BIOS Setup utility:

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

System

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

Diskette Drive Group

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

Hard Disk Group

Menu Fields	Settings	Comments
Onboard IDE hard disk controller	Enabled Disabled	Enables or disables the onboard IDE disk drive controller.
		Disable this option for SCSI operation.
Hard disk 1 / hard disk 2	Drive types 1 through 49	Enables hard drive size and specific parameters from a predetermined list of drive types. Drive types 2 and 3 or 48 and 49 are user definable for hard drives not listed in the BIOS drive table.[1][2]
User definable hard disks	Types 2 and 3 Types 48 and 49	The SCU allows types 2 and 3 or types 48 and 49 to be user definable.[2] [3]
HDD data transfer method	Standard PIO	Allows for a standard, compatible data transfer method (one data block per interrupt).
	Auto optimum	Allows the server's BIOS to automatically set up the installed drive for optimum performance (multiple data blocks per interrupt).
Large drive addressing	Standard	The drive's cylinder/head/sector values are used by the BIOS and operating system.
	LBA convert	Allows the server's BIOS to convert the logical cylinder/head/sector used by the operating system to the drive's cylinder/ head/ sector value.

[1] Drive type 48 or 49 information is aliased to drive type 2 or 3 when application software does not recognize drive types above 47.

(2) Auto-detection of IDE drive parameter is supported in types 2 and 3 and types 48 and 49.

(3) Some operating systems do not recognize hard disk drive types above 29.

Boot Options Group

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

Keyboard Features Group

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

Serial Port Group

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

Parallel Port Group

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

Video Options Group

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

Shadow Options Group

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

Security Options Group

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

Cache Options Group

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

Reserved System

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

Miscellaneous

Menu Fields	Settings	Comments
Mouse port	Disabled Enabled	Enables or disables the mouse port.
Local bus IDE adapter	Both Disabled Primary	Enables the onboard local bus IDE adapter. Your server supports up to four IDE devices. IDE adapter 0 is the primary IDE channel and supports a master/slave IDE drive configuration as IRQ14. IDE adapter 1 is the secondary IDE channel and supports a master/slave IDE drive configuration as IRQ15.
Memory parity check	Enabled Disabled	Enables or disables your server's memory parity check feature.
CPU to PCI posting	Disabled Enabled	Enables or disables the CPU to PCI write buffers. When enabled, these buffers temporarily store data between writes.
CPU to memory posting	Enabled Disabled	Enables or disables the CPU to DRAM write buffers. When enabled, these buffers temporarily store data between writes.
PCI arbiter priority	System default Pure rotating EISA slots PCI slots 4-6 CPU PCI slot 1 PCI slot 2 PCI slot 3	Selects the PCI arbiter priority scheme. Select "System Default" for optimal setting. Select "Pure Rotating" or a device with the highest priority if absolutely needed.
PCI to memory posting	Enabled Disabled	Enables or disables the PCI to DRAM write buffers. When enabled, these buffers temporarily store data between writes.
PCI burst write	Enabled Disabled	Enables or disables PCI memory burst write cycles.
EISA to PCI line buffer	Enabled Disabled	Enables or disables the EISA to PCI line buffer.

Power Options Group

Menu Fields	Settings	Comments
Power savings	Enabled Disabled	Enables or disables the following power management options.
Monitor suspend timer	30 min. 20 min 10 min. 5 min. 1 min. Disabled	Your server's monitor is placed in a suspended state if the keyboard and mouse remains inactive for a specified period of time. Keyboard or mouse activity returns the monitor to a full power state.
Monitor off timer	4 hr. 3 hr. 2 hr. 1.5 hr. 1 hr. Disabled	Your server's monitor is placed into an OFF state if the keyboard and mouse remains inactive for a specified period of time. Keyboard or mouse activity returns the monitor to a full power state.

PCI Slot Options Group: (PCI Slots 1-3)

Menu Fields	Settings	Comments
Enable device	Enabled Disabled	Enables or disables PCI slot 1, 2, or 3 I/O and memory cycle decoding.
PCI interrupt	None One IRQ required	Enables you to set an interrupt for an installed PCI expansion board.
Use default latency timer value	Yes No	Enables you to use or not use the minimum latency required by a PCI expansion board.
Latency timer value	40h through 38H	Enables you to set a specific latency timer in units of PCI clocks for a PCI expansion board.

Onboard SCSI Device Group

Menu Fields	Settings	Comments
Enable device	Enabled Disabled	Enables or disables your SCSI controller's I/O and memory cycle decoding.
PCI interrupt	None One IRQ required	Enables you to set an interrupt for the onboard SCSI controller.
Use default latency timer value	Yes No	Enables you to use or not use the minimum latency required by the onboard SCSI controller.
Latency timer value	40h through 38H	Enables you to set a specific latency timer in units of PCI clocks for the onboard SCSI controller.

Onboard Network Device Group

Menu Fields	Settings	Comments
Enable device	Enabled Disabled	Enables or disables your network control-ler's I/O and memory cycle decoding.
PCI interrupt	None One IRQ required	Enables you to set an interrupt for the on-board network controller.
Use default latency timer value	Yes No	Enables you to use or not use the minimum latency required by the onboard network controller.
Latency timer value	40h through 38H	Enables you to set a specific latency timer in units of PCI clocks for the onboard net-work controller.

VGA Graphics Controller

Menu Fields	Settings	Comments

VGA accelera-tor	Not installed
	
	Graphics:
	  color and mono
	  color
	  mono
	
	Text:
	  color and mono
	  color
	  mono
		Enables you to set your onboard video controller to operate in graphics or text mode.

Vertical retrace interrupt	Interrupt disabled Interrupt enabled	Enables or disables an interrupt for your video's vertical retrace capabilities.

3
Expanding Your Server

Introduction

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:

- Main logic board options:
    - CPU module
    - Memory
    - Secondary cache
    - Server battery
- Optional EISA and PCI local bus expansion boards
- Mass storage devices

Tools Needed

- A Phillips screwdriver

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

Static Electricity

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

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

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

- Keep clothing away from circuit boards and components.

- Keep circuit boards in anti-static bags.

Disconnect External Devices and Power

Before removing the side panels, perform the following:

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

2. Turn server off.

3. Unplug power cord from wall outlet.

4. Disconnect power cord and monitor cord from server.

Voltage Select Switch

If your server has a voltage select switch, it is factory set for the proper ac input power source available in your specific country.

CAUTION: The voltage selection switch must match the voltage supplied by your power outlet. In North America 115 volts is common. In other countries 230 volts is common. Ensure that the voltage selection switch is set to the correct voltage. If it is not set correctly, you can damage your computer.
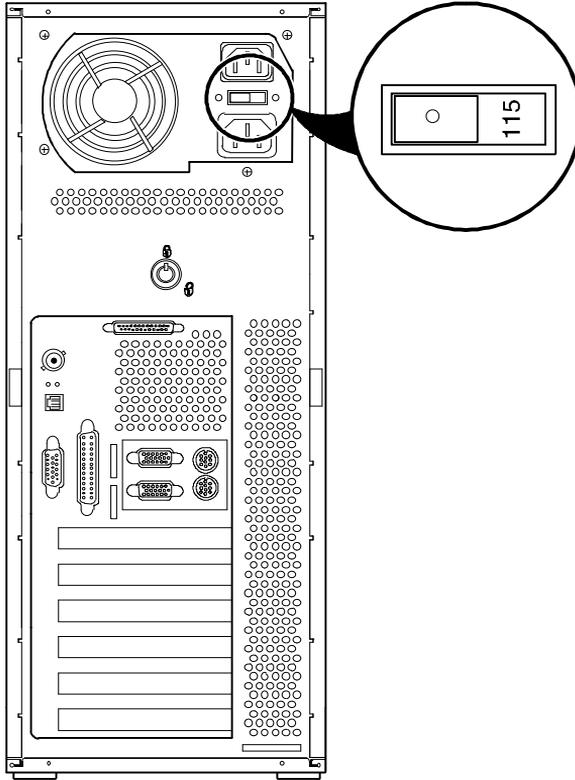
DEC00604-3

Figure 3-1. Voltage Select Switch Location

Unlocking and Removing Side Panels

To unlock the side panels, turn the chassis key clockwise to a horizontal position (see Figure 3-2).

WARNING: You might injure yourself or damage your server if you attempt to remove the side panels before un-plugging the ac and monitor power cords.

To remove the side panels, pull each one toward the rear of the server and then lift away.
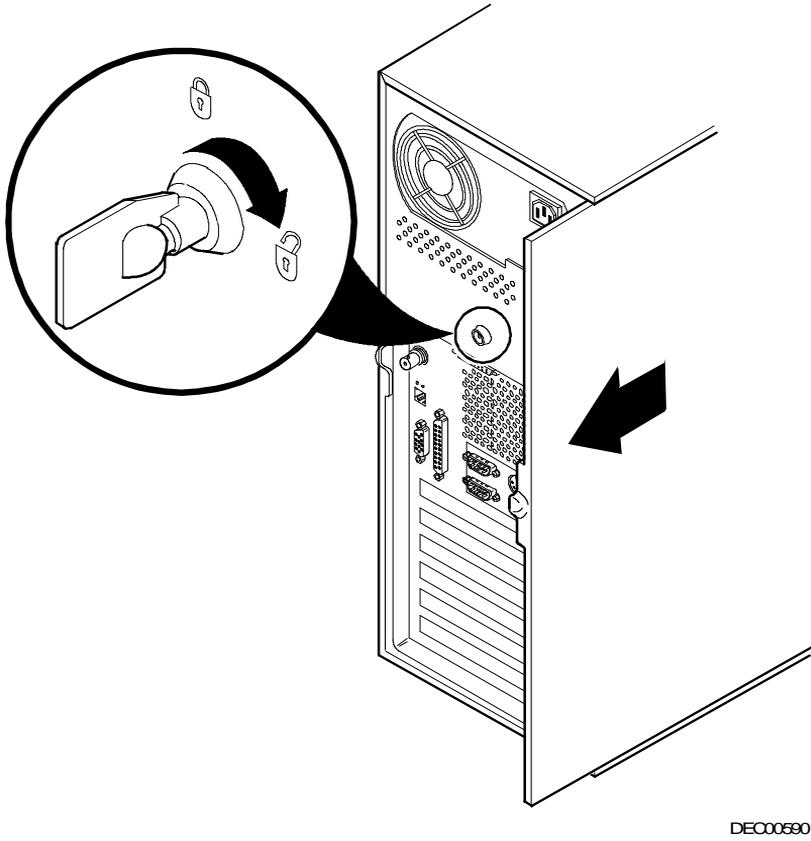
DEC00590

Figure 3-2. Unlocking and Removing the Side Panels

Server Components

Figure Legend	Component
A	Power supply
B	EISA and PCI 32-bit local bus expansion slots
	Refer to "Installing Expansion Boards," later in this chapter, for specific slot designations and locations
C	CPU and memory module (Pentium CPU module shown)
D	Main logic board
E	3½-inch diskette drive
F	Two additional 5¼-inch half-height drive bays
G	Hidden 3½-inch half-height drive bay
H	3½-inch, one-inch high drive bay
I	CD-ROM drive
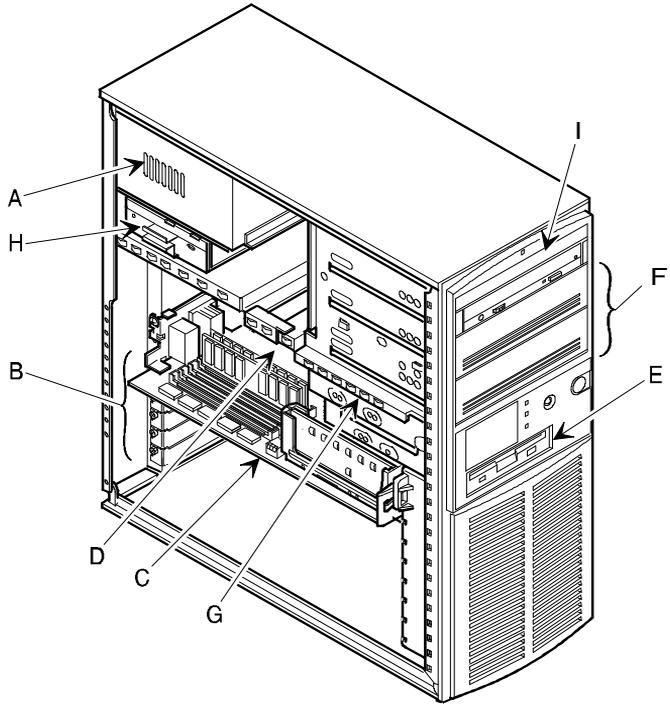
DEC00591-2

Figure 3-3. Server Components

Main Logic Board Components/Connectors

Figure Legend	Components
A	Power supply connector
B	Diskette drive connector
C	SCSI port connector
D	Ethernet 10Base-2 (BNC, thin-wire) connector
E	Parallel port connector/VGA connector
F	Two PCI expansion slots
G	Flash BIOS
H	Dedicated CPU module connector
I	Real-time clock/server battery
J	Primary IDE drive connector
K	Secondary IDE drive connector
L	Ethernet 10Base-T connector
M	Three EISA expansion slots
N	1 EISA and 1 PCI expansion slot (only one of these slots can be used at any one time)
O	Additional 6-pin PCB power connector
P	Fan connector
Q	Speaker connector
R	Connector for front panel indicators
S	V dc power connector
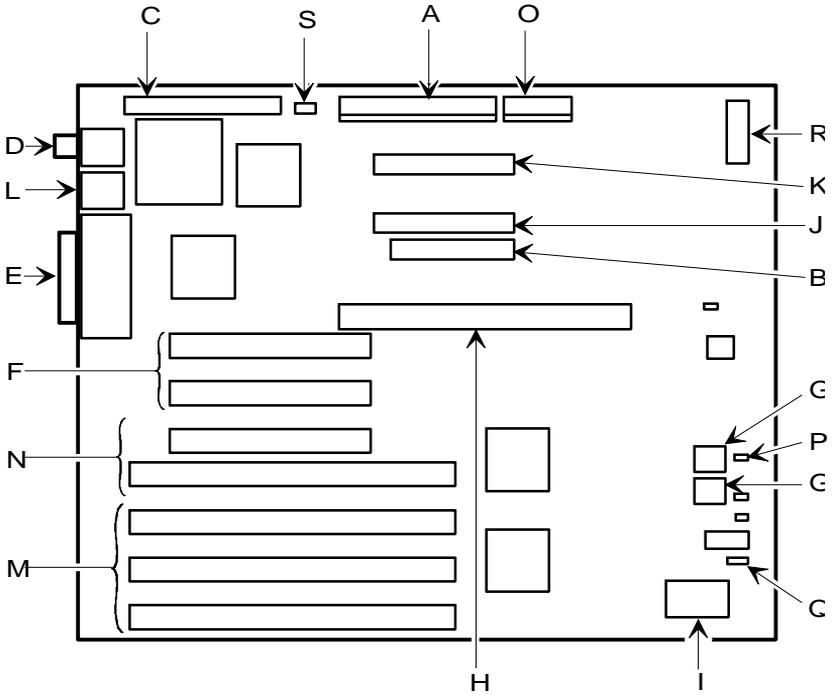
DEC00592-2

Figure 3-4. Main Logic Board Components/Connectors

i486 CPU Module Components/Connectors

Figure Legend	Component
A	CPU socket
B	Secondary cache
C	Server memory SIMM sockets
D	Two serial port connectors
E	Keyboard and mouse connectors
F	Switch settings
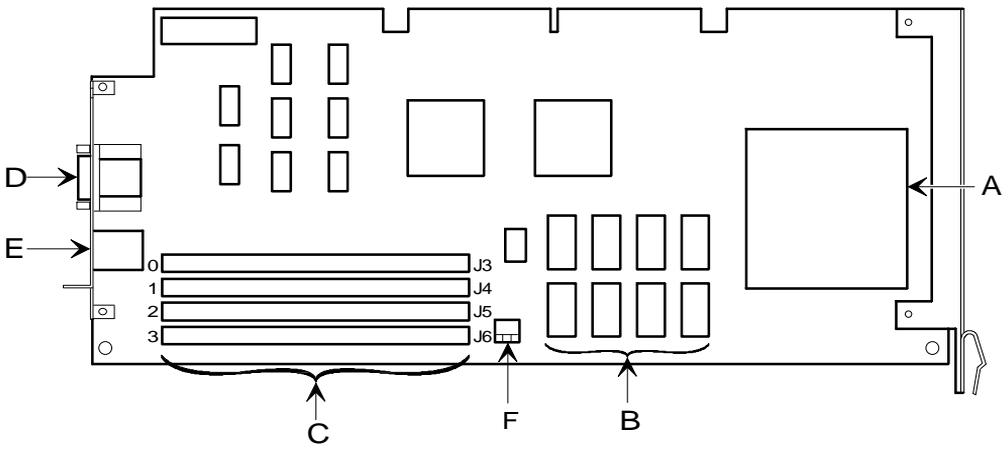
DEC00607-2

Figure 3-5. i486 CPU Module Components/Connectors

Pentium CPU Module Components/Connectors

Figure Legend	Component
A	Voltage regulator
B	CPU socket
C	Secondary cache socket
D	Server memory SIMM sockets
E	Serial port connectors
F	Keyboard and mouse connectors
G	Switch settings
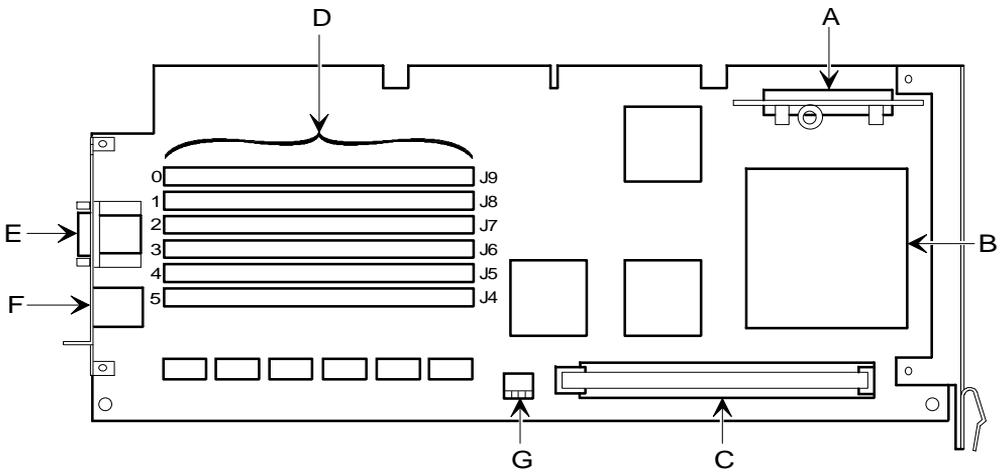
DEC00602-2

Figure 3-6. Pentium CPU Module Components/Connectors

Upgrading the CPU Module

Installing a higher-performance CPU module increases the capabilities of your server. It also enables you to upgrade with future CPUs, install additional server memory, and install a larger capacity secondary cache module (Pentium CPU module only). To upgrade your CPU module:

1. Turn off your server. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the server.

2. Unlock and remove the left side panel.

3. Remove the screw that secures the CPU module to your server's rear panel.

4. Grasping both ends of the CPU module, carefully remove it from the main logic board.

5. If you plan on installing additional server memory or a secondary cache module on your existing CPU module, place it on an anti-static surface.

   If not, store the CPU module in an anti-static package.

6. Install additional server memory. Refer to "Installing Additional Server Memory" later in this chapter.

7. Install a secondary cache module (Pentium CPU module only). Refer to "Installing a Secondary Cache Module" later in this chapter.

8. Prior to installing an upgraded or new CPU module, refer to Appendix A, "Technical Specifications," to see if any configuration switches need to be set.
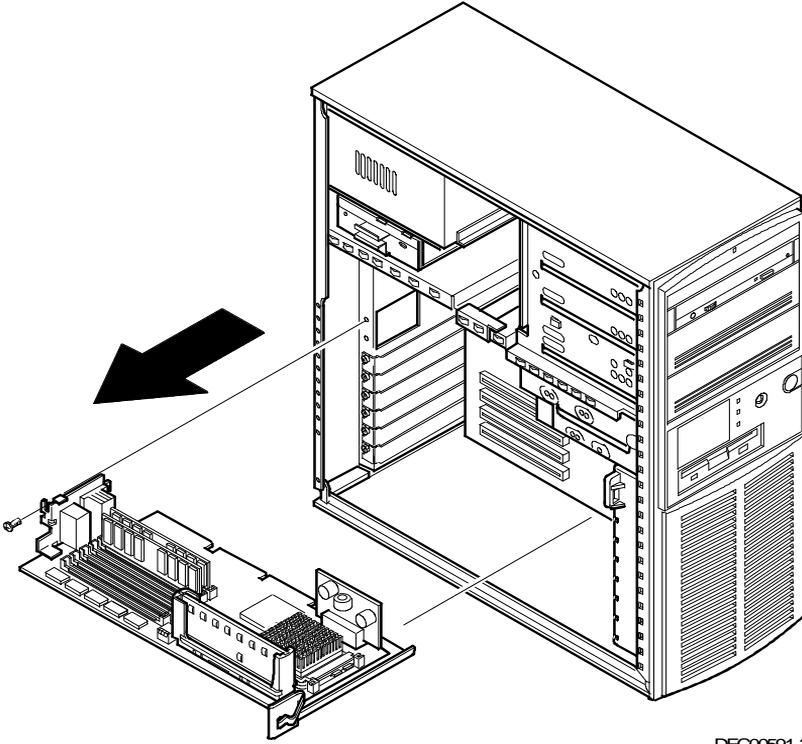
DEC00591-3

Figure 3-7. Removing the CPU Module (Pentium CPU Module Shown)

9. Install the CPU module.

   Make sure the metal bracket at the right-side of the CPU module is firmly seated against the plastic fan housing.
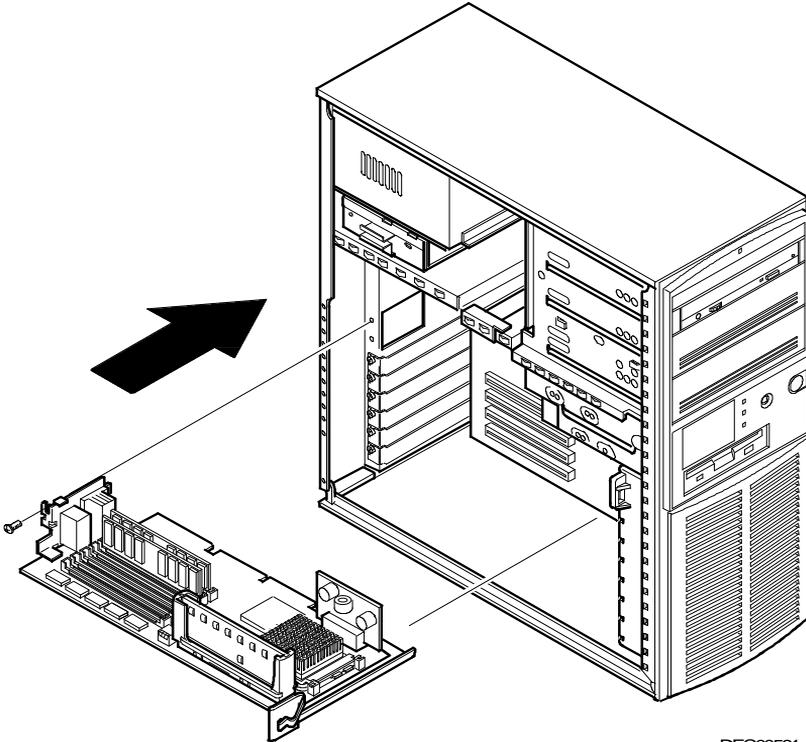
DEC00591-4

Figure 3-8. Replacing the CPU Module (Pentium CPU Module Shown)

10. Replace the screw to secure the CPU module to your server's rear panel.

11. Replace and lock the left side panel.

12. Reconnect the power cord and monitor cord to the back of the server. Reconnect any external devices and plug the power cord into the wall outlet.

13. Reboot and run the SCU.

    From the main menu select `Configure Computer` and then `View and Edit Details.`

    Select `Save` and `Exit` to configure your server for the CPU module.

Upgrading the CPU

Your CPU module is equipped with a ZIF socket (Socket 7 type) capable of supporting higher performance Pentium processors. Contact your Digital sales representative for CPU availability and ordering information for your computer.

To install a higher performance CPU:

1. Remove the CPU module.

2. Place the CPU module on an anti-static surface.

3. Lift up on the release lever to release the CPU.

Remove the CPU, noting its pin 1 orientation (A, Figure 3-9).
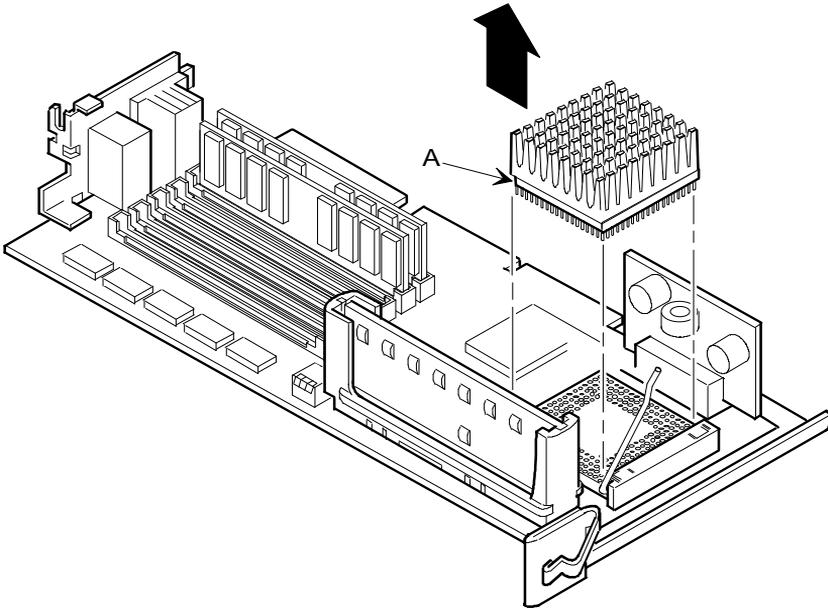
DEC00606-2

Figure 3-9. Releasing the CPU (Pentium CPU Module Shown)

4. Install the new CPU.

    Make sure pin 1 on the CPU is aligned with pin 1 on the ZIF
    socket. Pin 1 is located at the notched end of the CPU (A, Figure
    3-10).
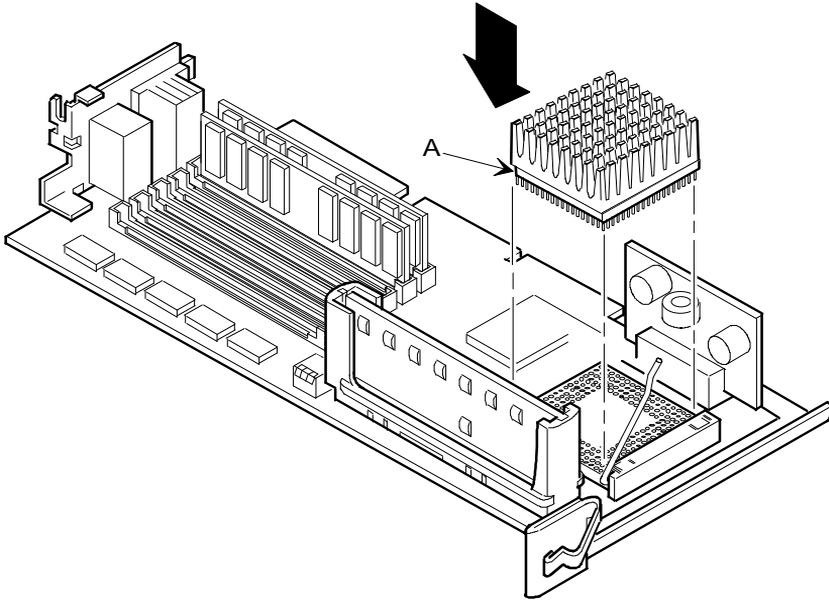
DEC00606-2

Figure 3-10. Installing a New CPU (Pentium CPU Module Shown)

5. Return the release lever to its original position.

6. Refer to Appendix A, "Technical Specifications," to see if any con-
    figuration switches need to be set.

7. Install and secure the CPU module to the main logic board.

Installing a Secondary Cache Module (Pentium CPU Module Only)

Your server's Pentium CPU module comes with a 256 KB write-back standard or burst secondary cache module. Standard cache refers to asynchronous cache; "burst" cache refers to synchronous (higher performance) cache. You can upgrade to a 512 KB secondary cache module by replacing the existing 256 KB cache module. To upgrade to a 512 KB cache, perform the following:

1. Turn off your server. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the server.

2. Unlock and remove the left side panel.

3. Remove the CPU module and place it on an antistatic surface.

4. Holding the 256 KB secondary cache module only by the top edge, carefully lift it away from the CPU module and place it in an antistatic package.

5. Holding the 512 KB secondary cache module only by the top edge, carefully insert it into the socket on the CPU module. Make sure it fully seats into the socket.

6. Install the CPU module making sure it is firmly seated into the socket.

7. Replace and lock the left side panel.

8. Reconnect the power cord and monitor cord to the back of the server. Reconnect any external devices and plug the power cord into the wall outlet.

9. Reboot and run the SCU.

    From the main menu select `Configure Computer` then select `View and Edit Details` to enable the external cache option. Select `Save` and `Exit` to configure your server for the secondary cache.
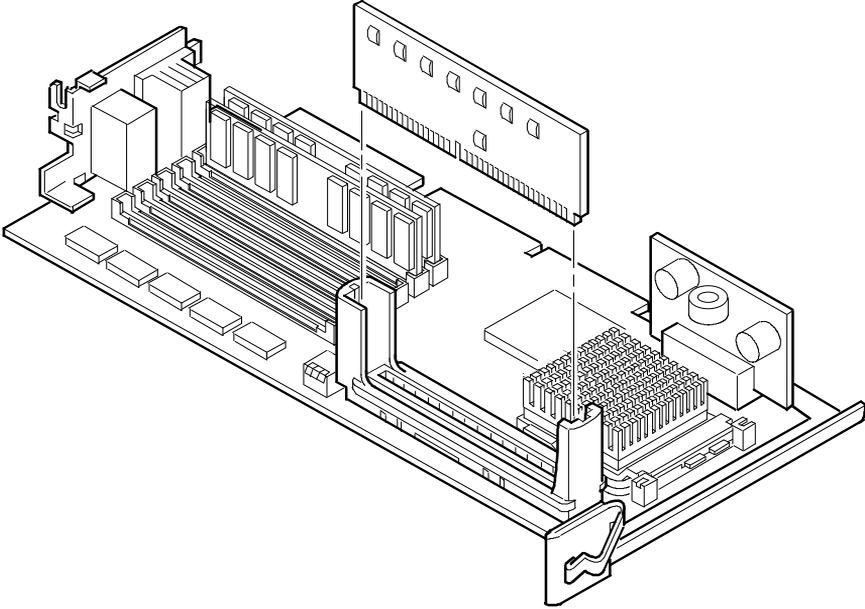
DEC00611

Figure 3-11. Installing a Secondary Cache Module

Installing Additional Server Memory

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

The amount of memory your server supports depends on the type of CPU module you have installed. If you have the i486 CPU module installed, your server will support up to 128 MB using 32 MB single in-line memory modules (SIMMs) in SIMM sockets 0 through 3 (J3 through J6). If you have the Pentium CPU module installed, your server will support up to 192 MB using 32 MB SIMMs in SIMM sockets 0 through 5 (J4 through J9).

Your server is shipped with at least 16 MB of memory. You can add 4 MB, 8 MB, 16 MB, or 32 MB SIMMs. When installing SIMMs:

- SIMMs must be installed in pairs. For example, a 32 MB SIMM in socket 0 and a 32 MB SIMM in socket 1. You cannot mix SIMM sizes within sockets.

- SIMMs must be the same type and speed.

- SIMMs must have an access time of 70 ns or less.

  Refer to the section, "Installing a SIMM or Memory Module," for detailed instructions on installing SIMMs.

Memory Configurations (i486 CPU Module)

SIMM 0	SIMM 1	SIMM 2	SIMM 3	Total
8 MB	8 MB			16 MB
8 MB	8 MB	4 MB	4 MB	24 MB
8 MB	8 MB	8 MB	8 MB	32 MB
16 MB	16 MB			32 MB
16 MB	16 MB	4 MB	4 MB	40 MB
16 MB	16 MB	8 MB	8 MB	48 MB
16 MB	16 MB	16 MB	16 MB	64 MB
32 MB	32 MB			64 MB
32 MB	32 MB	4 MB	4 MB	72 MB
32 MB	32 MB	8 MB	8 MB	80 MB
32 MB	32 MB	16 MB	16 MB	96 MB
32 MB	32 MB	32 MB	32 MB	128 MB
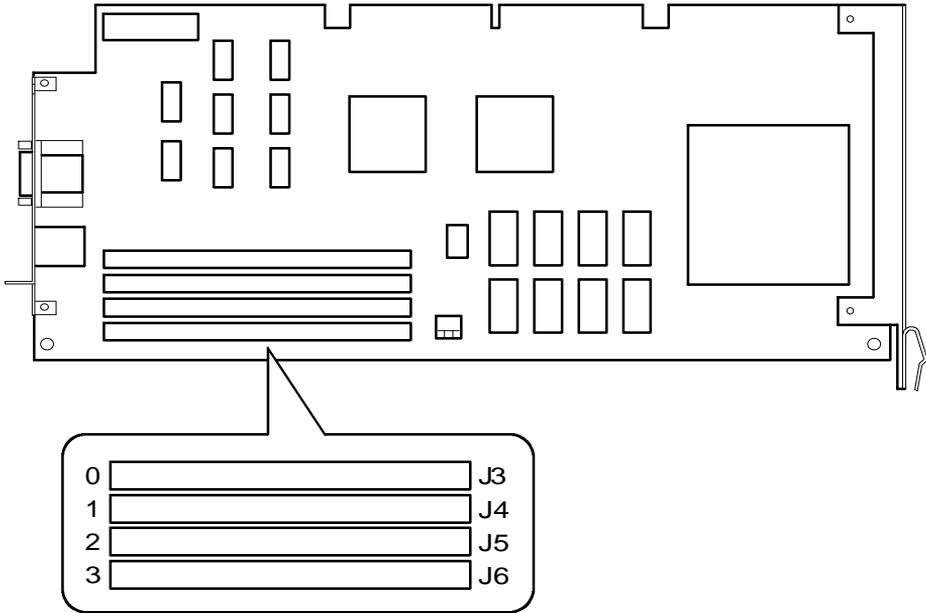
DEC00607-4

Figure 3-12. SIMM Socket Locations (i486 CPU Module)

Memory Configurations (Pentium CPU Module)

| SIMM 0	SIMM 1	SIMM 2	SIMM 3	SIMM 4	SIMM 5	Total
8 MB	8 MB					16 MB
8 MB	8 MB	4 MB	4 MB			24 MB
8 MB	8 MB	4 MB	4 MB	4 MB	4 MB	32 MB
8 MB	8 MB	8 MB	8 MB			32 MB
16 MB	16 MB					32 MB
8 MB	8 MB	8 MB	8 MB	4 MB	4 MB	40 MB
16 MB	16 MB	4 MB	4 MB			40 MB
8 MB	8 MB	8 MB	8 MB	8 MB	8 MB	48 MB
8 MB	8 MB	16 MB	16 MB			48 MB
16 MB	16 MB	4 MB	4 MB	4 MB	4 MB	48 MB
16 MB	16 MB	8 MB	8 MB	4 MB	4 MB	56 MB
16 MB	16 MB	16 MB	16 MB			64 MB
32 MB	32 MB					64 MB
32 MB	32 MB	4 MB	4 MB			72 MB
16 MB	16 MB	16 MB	16 MB	4 MB	4 MB	72 MB
8 MB	8 MB	16 MB	16 MB	16 MB	16 MB	80 MB
8 MB	8 MB	32 MB	32 MB			80 MB
32 MB	32 MB	8 MB	8 MB	4 MB	4 MB	88 MB
32 MB	32 MB	8 MB	8 MB	8 MB	8 MB	96 MB
16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	96 MB
32 MB	32 MB	16 MB	16 MB			96 MB
32 MB	32 MB	16 MB	16 MB	8 MB	8 MB	112 MB
32 MB	32 MB	32 MB	32 MB			128 MB
32 MB	32 MB	16 MB	16MB	16 MB	16 MB	128 MB
32 MB	32 MB	32 MB	32 MB	4 MB	4 MB	136 MB
32 MB	32 MB	32 MB	32 MB	8 MB	8 MB	144 MB
32 MB	32 MB	32 MB	32 MB	16 MB	16 MB	160 MB
32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	192 MB
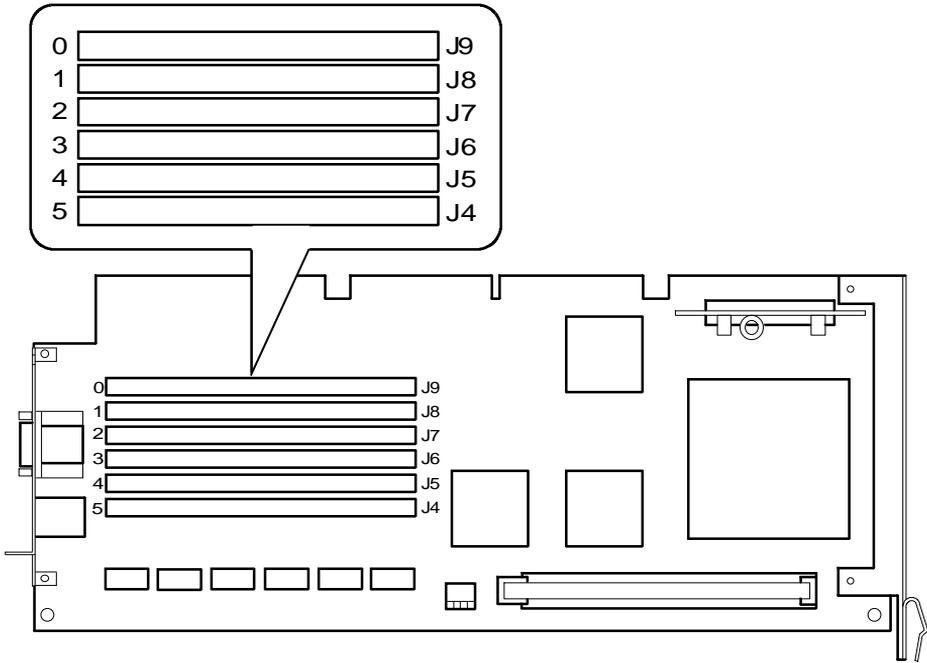
DEC00602-4

Figure 3-13. SIMM Socket Locations (Pentium CPU Module)

Installing a SIMM

To install a SIMM, perform the following:

1. Turn off your server. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the server.

2. Unlock and remove the left side panel.

3. Remove the CPU module and place it on an antistatic surface.

4. Install a SIMM into an appropriate socket on the CPU module at a 45 ° angle (A, Figure 3-14).

   Be sure that the notch is oriented as shown. Rock the SIMM gently until it is seated evenly into the bottom of the socket. Tip the SIMM upright until the retaining clips at the ends of the socket both engage. (B and C, Figure 3-14).

   CAUTION: Use care when installing SIMMs. The retaining clips on the sockets can break if the SIMM is not seated correctly in the socket.

5. Install the CPU module making sure it is firmly seated into the socket.

6. Replace and lock the left side panel.

DEC00089
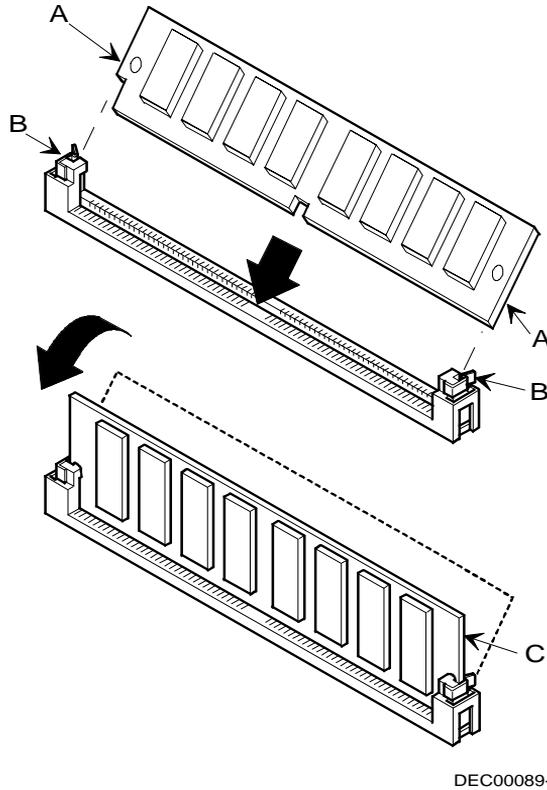
Figure 3-14. Installing a SIMM

7. Reconnect the power cord and monitor cord to the back of the server. Reconnect any external devices and plug the power cord into the wall outlet.

8. Reboot and run the SCU.

    From the SCU main menu, select `Configure Computer` then select `Save` and `Exit` to configure your server for the additional memory.

Replacing the Server Battery

The server 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 turned on, you need to replace the server's battery.

To replace the battery, perform the following steps:

1. Record your server's configuration settings using the SCU.

2. Turn off your server. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the server.

3. Unlock and remove the left side panel.

4. Remove the battery.

5. Install the new battery.

CAUTION: Make sure pin 1 on the battery is correctly aligned with the pin 1 location on the socket (A, Figure 3-15). The pin 1 location on the battery is designated by a white dot in the lower left corner of the battery. Incorrect installation may cause faulty server operation.

6. Replace and lock the left side panel.

7. Reconnect the power cord and monitor cord to the back of the server. Reconnect any external devices and plug the power cord into the wall outlet.

8. Reboot and run the SCU and configure your server using the re-corded configuration settings from step 1.
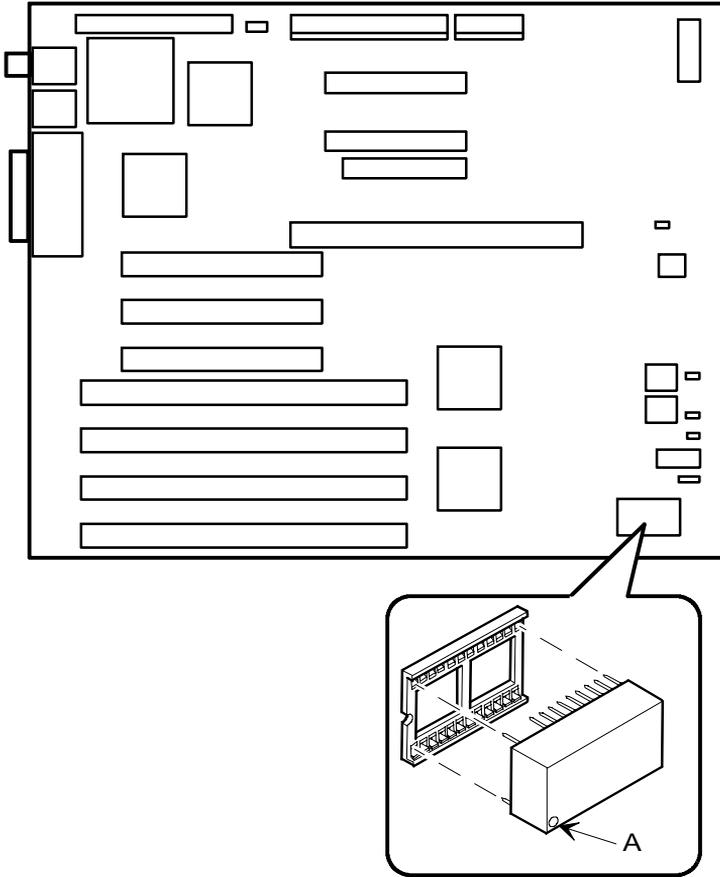
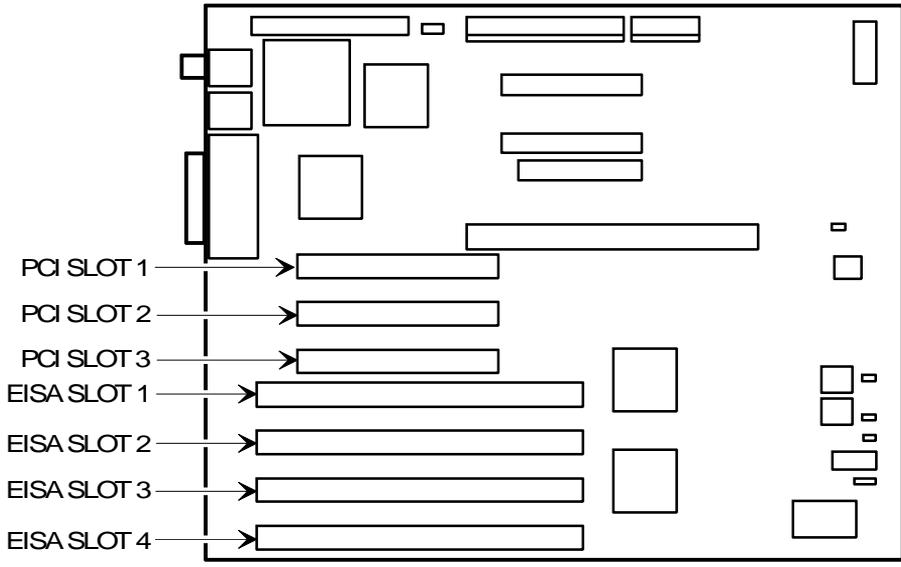DEC00592-3

Figure 3-15. Installing the Server Battery

Installing Expansion Boards

Your Prioris LX server contains seven expansion board slots for installing up to six EISA or PCI expansion boards. Four of the slots support extended industry-standard 32-bit EISA expansion boards. The remaining three PCI local bus expansion slots support 32-bit PCI local bus expansion boards. This enables your server to deliver improved performance by using a higher speed data path.

Expansion Slots

Expansion Slot Designation	Description
EISA slots 2, 3, and 4	Supports extended industry-standard 32-bit EISA expansion boards
EISA slot 1	Supports extended industry-standard 32-bit EISA expansion boards
	Designated as a shared slot with PCI slot 3[1]
PCI slots 1 and 2	Supports bus mastering 32-bit PCI expansion boards
PCI slot 3	Supports bus mastering 32-bit PCI expansion boards
	Designated as a shared slot with EISA slot 1[1]

[1] Only one expansion board can reside in EISA slot 1 or PCI slot 3 at any one time. These slots have to share the expansion slot opening at the rear panel.

PCI SLOT 1

PCI SLOT 2

PCI SLOT 3

EISA SLOT 1

EISA SLOT 2

EISA SLOT 3

EISA SLOT 4

DEC00592-4

Figure 3-16. Prioris LX Expansion Board Slots

Use the following procedures to install any EISA, ISA or PCI local bus expansion board.

> **NOTE:** Read and fully understand the documentation provided with the optional expansion board prior to installing it.
>
> Also, you must run the SCU to configure your server before installing any ISA expansion board.

1. Turn off your server. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the server.

2. Unlock and remove the left side panel.

3. Unscrew and remove the metal filler plate.

4. Insert the new expansion board into the socket in the main logic board. Push the board firmly into the socket.

    If necessary, use an appropriate card guide slot in the plastic fan assembly at the front of the chassis.

5. Replace the screw to secure the expansion board.

6. Replace and lock the left side panel.

7. Reconnect the power cord and monitor cord to the back of the server.

8. Reconnect any external devices and plug the power cord into the wall outlet.

9. Run the SCU to configure any EISA or PCI expansion boards that you installed.
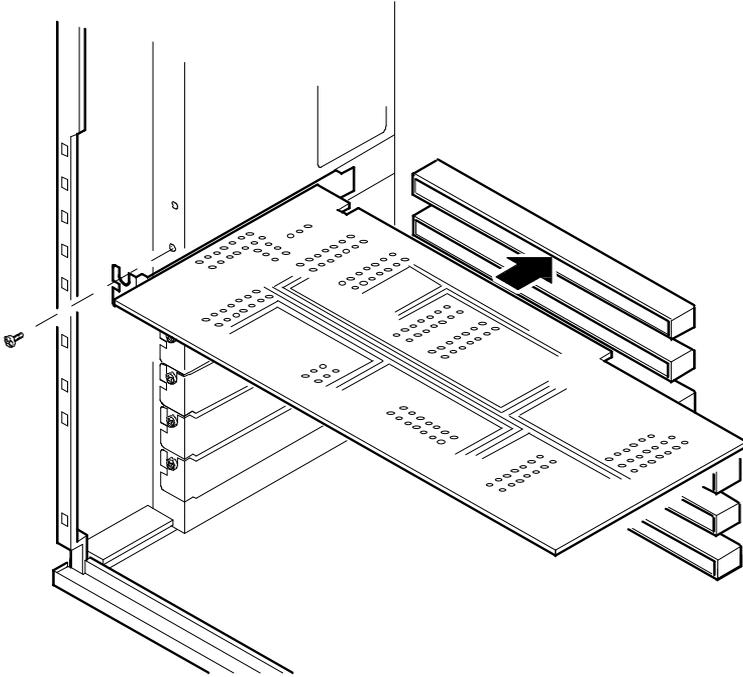
DEC00171

Figure 3-17. Installing an Expansion Board

Installing Mass Storage Devices

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

- Upper drive bay area—This area has room for three 5¼-inch half-height devices. Each drive bay is equipped with a removable panel to accommodate devices requiring front panel access.

  - The top drive bay contains a 5¼-inch SCSI CD-ROM drive (standard on all Prioris LX servers).

  - The bottom two bays of this area can be used to mount two half-height devices or one full-height device. The drive rails are removable to accommodate a full-height device.

- Lower drive bay area—This area has a drive bay assembly that holds a 3½-inch diskette drive (standard on all Prioris LX servers) and one hidden 3½-inch half-height device that needs no front panel access. This hidden bay is typically used for mounting the server's primary 1-inch high or 1.6-inch high hard disk drive.

- Rear drive bay area—This area has a drive bay assembly that holds a 3½-inch half-height device. This hidden bay is typically used for mounting an additional 1-inch high hard disk drive.

See Figure 3-2 to help you locate these bay areas on your Prioris LX server.

SCSI Configuration Guidelines

Your Prioris LX Server includes an onboard Adaptec AIC-7850 SCSI-2 controller. The AIC-7850 controller connects directly to the PCI local bus and supports up to seven industry-standard fast, narrow (8-bit), 50-pin SCSI-2 devices. Your server has been supplied with a standard 50-pin SCSI ribbon cable installed at the factory.

Additional SCSI devices can be added to your server by using an EISA- or PCI-based SCSI controller installed in an available expansion slot in conjunction with an external SCSI expansion box.

Your server configuration, SCSI controller, and all SCSI devices must work together for optimum performance. Use the following guidelines to configure your server and all SCSI devices.

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

- Your server is supplied with a fast, narrow (50-pin) connector cable assembly. This cable terminates at CD-ROM drive leaving four connectors for internal drives.

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

  NOTE: This cable does not support wide (68-pin) SCSI devices. A separate wide adapter must be added to the server to support wide SCSI devices.

- Each SCSI device (including the SCSI host adapter) must be configured with a unique ID number. SCSI host adapters usually default to ID 7. The SCSI CD-ROM drive defaults to ID 6. Use the remaining IDs 0 through 5 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.

- 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.

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

- If your server boots from a disk drive other than SCSI, make sure all SCSI device drivers are installed on that disk drive. SCSI devices can be used with an IDE drive only if the IDE drive is configured as drive C.

Expansion Brackets

You can install half-height devices in any of the three positions in the upper drive bay area. To install a 3½-inch device in the upper drive bay, you must first install expansion brackets onto the device. Expansion brackets will either be supplied with the device or can be purchased from Digital. Contact your local Digital representative for additional information.
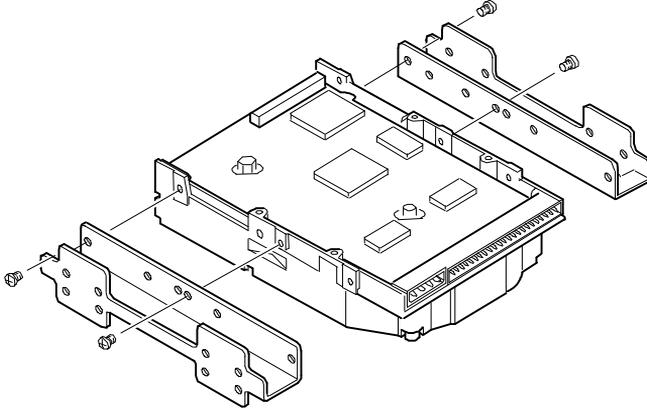
DEC00723

Figure 3-18. Installing Expansion Brackets on 3 1/2-inch Device

NOTE: The design of the expansion brackets might vary.

Installing Devices in the Upper Drive Bay Area

To install a device in the upper drive bay area perform the following steps:

1. Turn off your server. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the server.

2. Unlock and remove both side panels.

3. Using a screwdriver from either side, remove the plastic filler panel by gently prying it out from inside the server.
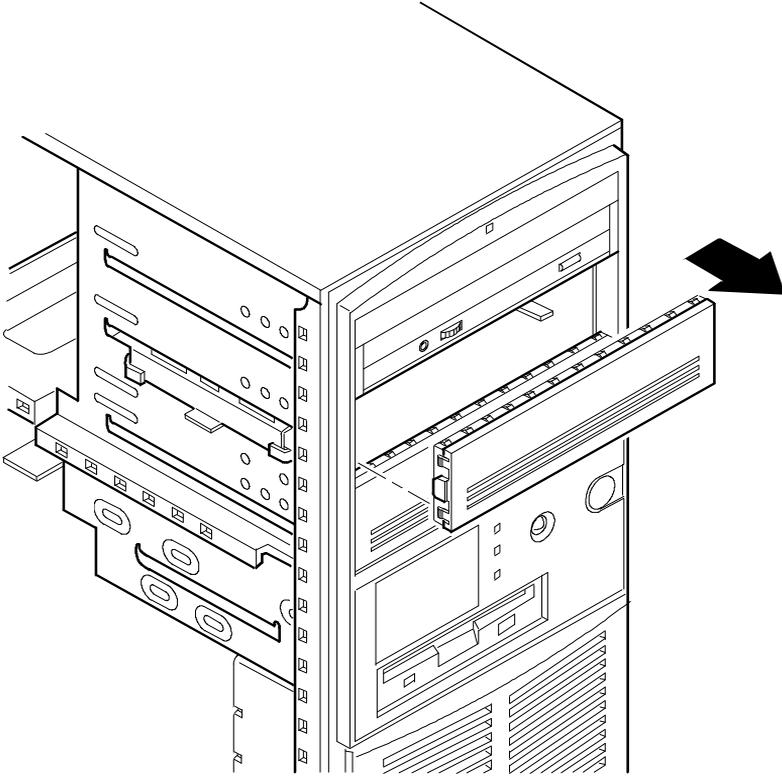
DEC00594-2

Figure 3-19. Removing Plastic Filler Panel from the Second Drive Bay

4. Insert the new device into the drive bay from the front.
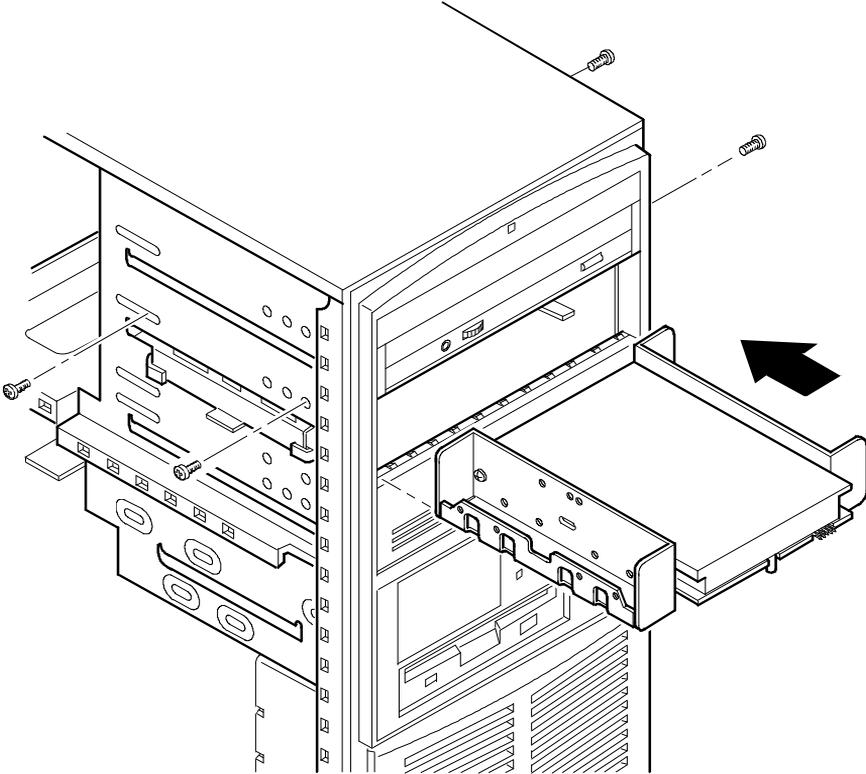
5. If necessary, replace the plastic filler panel.

6. Connect the power and data cables to the device.

    Refer to "Connecting Devices," later in this chapter.

DEC00594-3

Figure 3-20. Inserting a Device into the Second Drive Bay

Installing a Device in the Rear Drive Bay

NOTE: Only 3½-inch, one inch high devices can be installed into this drive bay area.

To install a device in the rear drive bay area perform the following steps:

1. Turn off your server. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the server.

2. Unlock and remove the left side panel.

3. While squeezing the two metal tabs together, remove the drive bay assembly from the server (A, Figure 3-21).
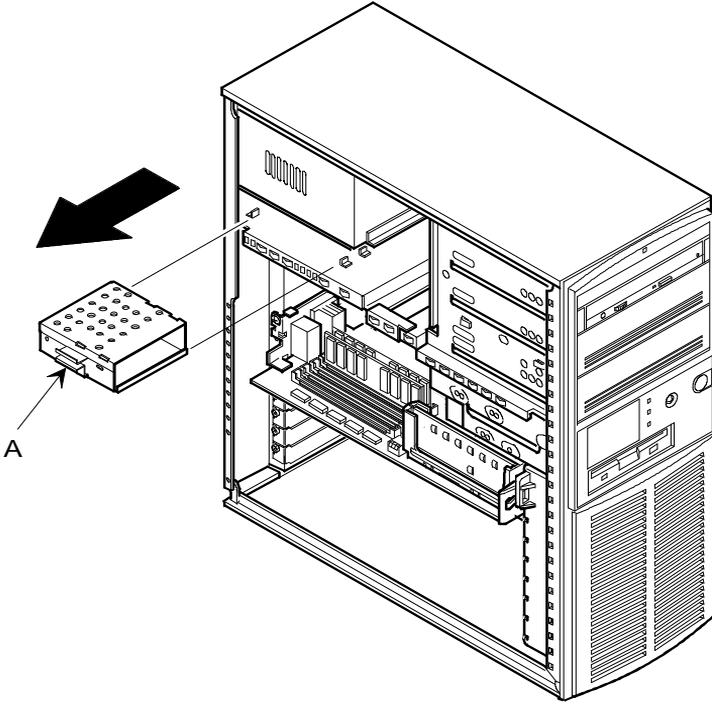
DEC00595-2

Figure 3-21. Removing the Rear Drive Bay Assembly

4. Install a 3½-inch device onto the assembly.
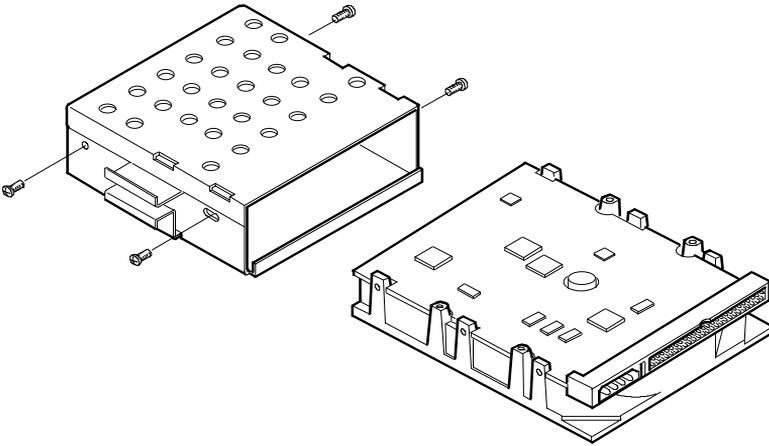
DEC00596

Figure 3-22. Attaching a 3½-Inch Device to the Rear Drive Bay Assembly

5. Install the rear drive bay assembly.

Make sure the assembly locks into place.

DEC00595-3

Figure 3-23. Installing the Rear Drive Bay Assembly

6. Connect the power and data cables to the device.

Refer to "Connecting Devices," later in this chapter.

Installing Devices in the Lower Drive Bay Area

The lower drive bay area holds two 3½-inch devices, typically a diskette drive and a hard drive. To upgrade the devices in the lower drive bay area, you must remove the entire drive bay assembly from your server and then remove the devices from the assembly and install the new devices. Perform the following steps:
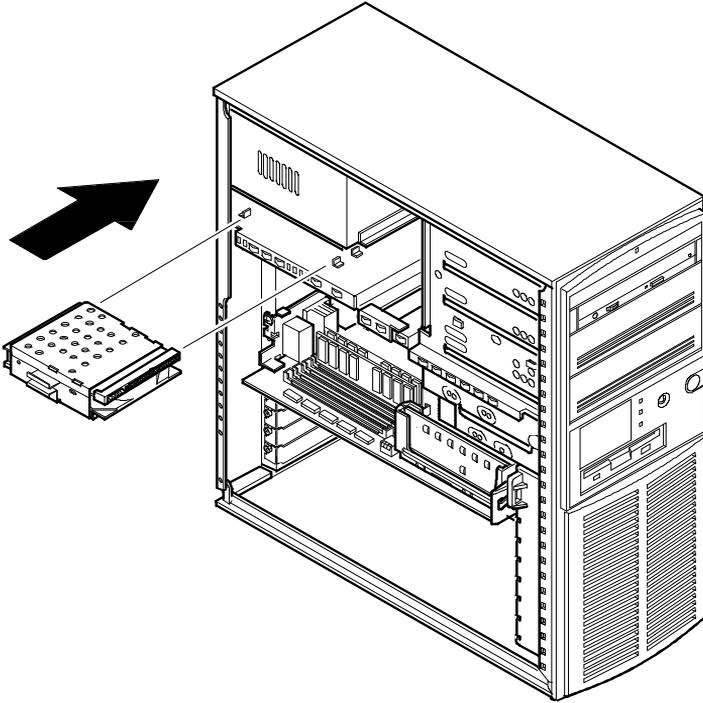
1. Turn off your server. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the server.

2. Unlock and remove the left side panel.

3. Remove the cables from the devices in the lower drive bay.

    Note the position of the cables so that you can reconnect them to the correct devices later.

4. Lift up on the retaining clip at the rear top of the drive bay assembly and slide the assembly to the rear of the server (A, Figure 3-24).

> **CAUTION:** Be sure to support the drive bay assembly so that it does not fall and damage circuit boards.
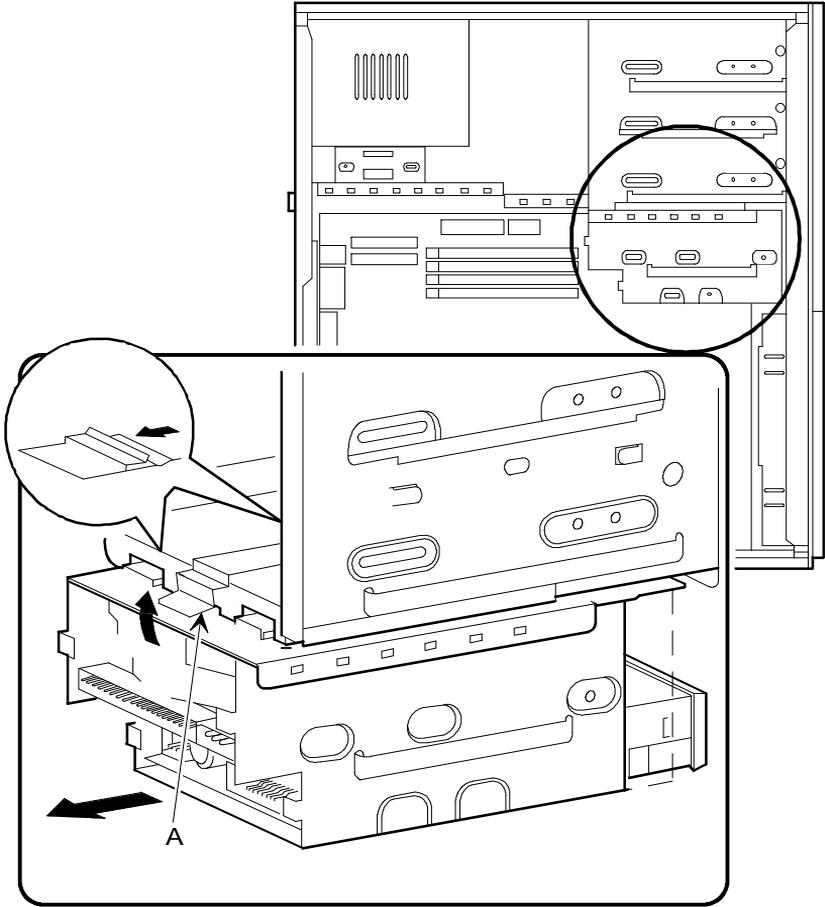
DEC00600

Figure 3-24. Removing the Lower Drive Bay Assembly

5. Remove a device by removing the screws on the side and sliding the device out of the lower bay assembly.

6. To install a new device, slide the device into the drive bay assembly and secure it with screws.

   Do not use the old screws; use the new screws included with the device. Sometimes the old screws are too long and will damage the internal mechanism of the device.

7. Replace the lower drive assembly in the server by sliding it forward until the retaining clip latches.

   NOTE: Make sure the retaining clip has latched to assure drive assembly stability.
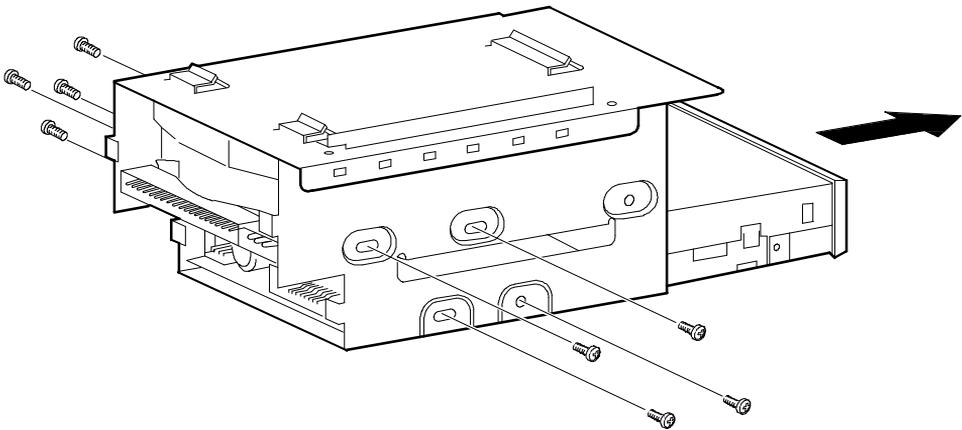
DEC00601

Figure 3-25. Removing the Lower Drive Bay Devices

8. Connect the power and data cables to the device.

   Refer to "Connecting Devices," later in this chapter.

Connecting Devices

To connect any device, perform the following:

1. Connect the data cable to the device.

    The data cable is usually a ribbon cable. Figure 3-26 shows a cabling configuration using one diskette drive. Figure 3-27 shows a cabling configuration using one primary IDE drive. Figure 3-28 shows a cabling configuration for two SCSI devices. Figures 3-26 through 3-28 show sample configurations. Other configurations are possible.

    NOTE: Be sure the cable is connected with the correct orientation. Most cables and sockets are keyed so that you cannot connect them backwards. If your cable or drive is not keyed, you must connect pin 1 of the cable to pin 1 of the socket.

    Pin 1 of the cable is on the edge with the colored stripe. Pin 1 of the socket should be marked number "1" at one end of the socket or with a number "1" printed on the circuit board near one end of the socket.

2. Connect a power cable to the device. Use one of the 4-pin connectors from the power supply.

3. If necessary, secure the device with two screws on each side. Use the screws that came with the device.

4. If the device is an internal device that has no front panel and is in-stalled in the upper drive bay area, replace the plastic filler panel.

5. Replace and lock both side panels.

6. Connect the power cord and monitor cord to the back of the server. Connect any external devices and plug the power cord into the wall outlet.

7. Run the SCU to reconfigure your server for diskette or IDE devices.

8. Run the SCSI configuration utility to reconfigure your server for SCSI devices.

Diskette Drive Connections

Figure Legend	Component
A	Power supply
B	Power connections
C	Diskette drive connections
D	Diskette drive
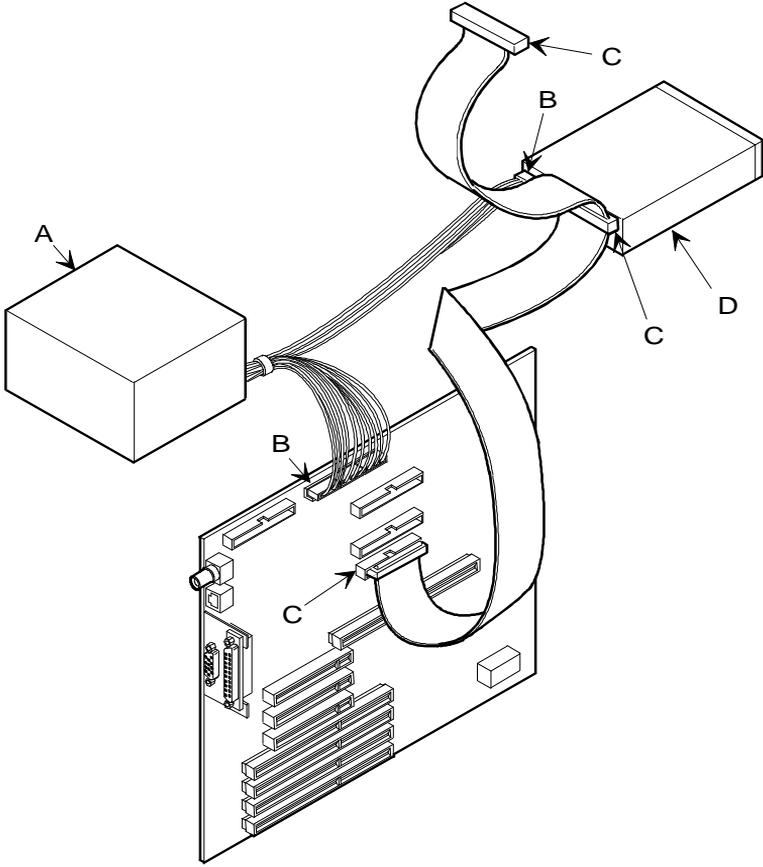
DEC00597-2

Figure 3-26. Diskette Drive Data Cable Connections

Primary and Secondary IDE Drive Data Cable Connections

Figure Legend	Component
A	Power supply
B	Power connections
C	Primary IDE drive connections
D	Primary IDE hard drive
E	Secondary drive connections
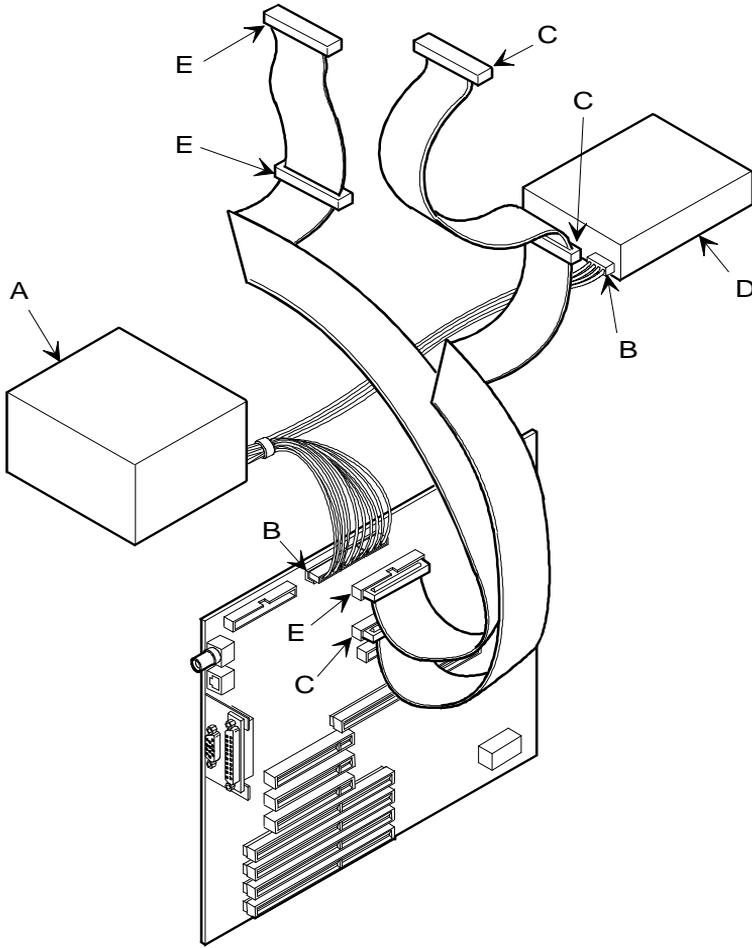
DEC00597-3

Figure 3-27. Primary and Secondary IDE Drive Data Cable Connections

SCSI Cable Connections

Figure Legend	Component
A	Power supply
B	Power connections
C	Internal SCSI cable (narrow)
D	SCSI connectors (narrow)
E	SCSI hard disk drive
F	CD-ROM drive
G	External SCSI connector
H	SCSI connector (reserved for rear drive bay)
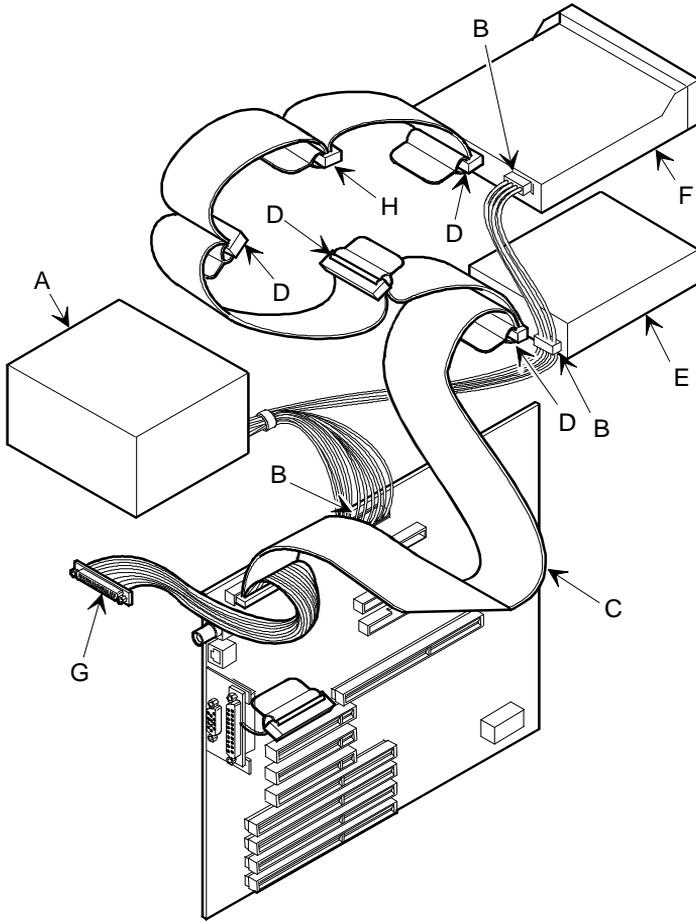
DEC00597-4

Figure 3-28. SCSI Cable Connections

Connecting an External Storage Box

You can use the SCSI connector at the rear of your server to connect an external storage box.

To connect an external storage box, follow these instructions:

1. Turn off your server. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the server.

2. Connect the external storage box to the SCSI connector at the rear of your server.

   Make sure the SCSI bus is properly terminated.

   Refer to "SCSI Configurations Guidelines" provided earlier in this chapter.

3. Reconnect the power cord and monitor cord to the back of the server. Reconnect any external devices and plug the power cord into the wall outlet.

4. Connect power to the external storage box.

5. Reboot and run the SCSI configuration utility to disable the on-board termination or reconfigure your SCSI devices.

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 total length of the SCSI cable must not exceed 3 meters (9.84 ft) this includes the cable inside your server, the cable from the server to the external storage box, and the cable inside the external storage box.

- Use only a high-density 50-pin SCSI-2 external connector.
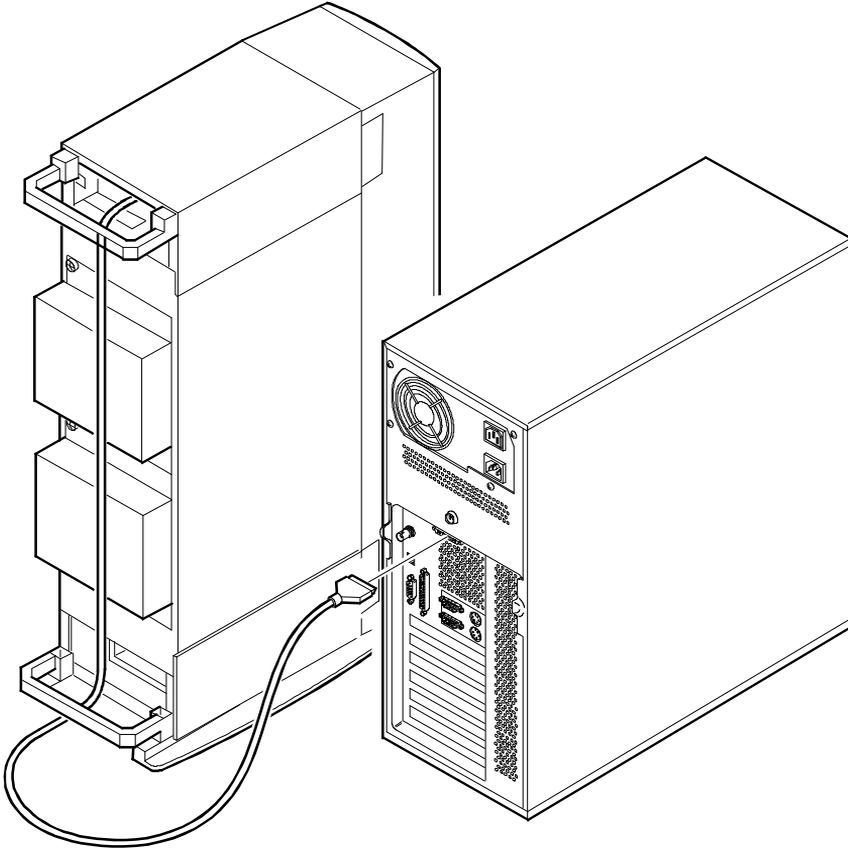
DEC00599

Figure 3-29. Connecting an External Storage Box

4

Problem Solving and Troubleshooting

Introduction

This chapter provides initial troubleshooting procedures and the following troubleshooting sections listing 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 LX server. For more detailed troubleshooting information, refer to the tables in the remainder of this chapter.

- 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 Power-On Self Test (POST) detects error(s) 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.

- Run the diagnostic software supplied with your server. Refer to the documentation for information on using the diagnostic software.

- Run the SCU.

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

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

  Refer to Chapter 2, "Configuring Your Server," for additional information.

- Contact your Digital service representative for software or hardware related problems. Run diagnostic software and have the information available before you contact Digital Services.

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

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

Server Troubleshooting

Problem	Possible Cause	Action
No response when the server is turned on.	Server is not plugged in.	Turn off the server, plug it in, and then turn it back on again.
	No power at the wall outlet.	Use another wall outlet.
	Main logic board jumpers incorrectly set.	Set all appropriate jumpers (Refer to Appendix A).
	CPU module failed.	Reseat the CPU module. If the problem still persists, contact your Digital service representative.
	CPU module switch setting incorrectly set.	Make sure the proper switch setting is correctly set. Refer to Appendix A for switch location and settings.
	Power supply failed.	Contact your Digital service representative.
	Main logic board failed.	Contact your Digital service representative.
Power is on, but there is no screen display.	Brightness and contrast controls are not correctly set.	Adjust the brightness and contrast controls.
	Monitor is off.	Turn on the monitor.
	Monitor cable is incorrectly installed.	Check all monitor connections.
	Incorrect video drivers installed.	Install the correct video drivers.
	Video controller failed.	Contact your Digital service representative.
	Power management features enabled.	Press any key on the keyboard to wake-up the monitor.

continued

Problem	Possible Cause	Action
The server is on, but the network does not start.	Network cable not connected.	Connect the network cable. See your system administrator for more information.
	Server did not connect to the network.	Make sure the sign-on script is correct. See your system administrator for more information.
		Onboard ethernet controller disabled. Run the SCU and enable the onboard ethernet controller.
	A server resource conflict exists with an installed expansion board.	Run the SCU to resolve all resource conflicts. Refer to Chapter 2 for information on running the SCU.
	Main logic board failed.	Contact your Digital service representative.

Problem	Possible Cause	Action
Server operates incorrectly after installing optional expansion board.	Expansion board installed incorrectly.	Reinstall following expansion board installation instructions.
	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 the SCU and add the CFG file (if necessary).
	Expansion board has failed.	Remove expansion board and reboot. If server boots without errors, replace expansion board.
Server operates incorrectly after installing optional SIMMs on the CPU module.	Did not run the SCU.	Run the SCU.
	SIMMs installed incorrectly.	Remove SIMMs and reinstall.
	CPU module installed incorrectly.	Correctly install the CPU module.
	SIMMs have failed.	Replace SIMMs.
		Make sure sockets are filled with the same SIMM size, speed, and type (refer to Chapter 3).

continued

Problem	Possible Cause	Action
Server operates incorrectly after installing secondary cache module on the CPU module.	Secondary cache memory installed incorrectly.	Remove secondary cache memory and reinstall.
	Secondary cache module failed.	Replace secondary cache module.
Server fails to retain setup information.	Server battery has failed.	Replace server battery (RTC).
Server does not boot from an IDE hard disk drive.	IDE drive type incorrect.	Run the SCU to identify the correct drive type.
		See drive type label on drive or consult drive documentation.
	Loose cables.	Secure all cable connections.
	Onboard IDE interface disabled.	Run the SCU and set the IDE controller to "Enabled."

continued

Problem	Possible Cause	Action
Server does not boot from an IDE hard disk drive.	Hard disk boot sector is missing.	For MS-DOS, boot from a MS-DOS diskette then enter the following commands: c: cd\dos fdisk/mbr
	There might be a boot sector virus.	Run anti-virus software.
	Operating system software is not installed on the IDE hard disk drive.	Install the appropriate operating system.
	IDE hard disk drive is not correctly formatted or the requested partition does not exist.	Format the IDE hard disk drive or partition the IDE hard disk drive using the supplied operating system software. **CAUTION:** Formatting the IDE hard disk drive will destroy all the data on the drive.
	There is no software on the requested partition.	Install software on the requested partition.
	IDE hard disk drive jumpers incorrectly set.	Refer to the supplied IDE hard disk drive kit installation instructions.

Problem	Possible Cause	Action
Server does not recognize an internal or external SCSI device.	SCSI device jumpers incorrectly set.	Refer to the supplied kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied kit installation instructions.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	SCSI cable not terminated.	Terminate the SCSI cable.
	SCSI device not plugged in.	Check power and SCSI cables.
	Hard disk boot sector is missing.	For MS-DOS, boot from a MS-DOS diskette then enter the following commands: c: cd\dos fdisk/mbr
	There might be a boot sector virus.	Run anti-virus software.
	Onboard SCSI controller disabled.	Run the SCU and enable the onboard SCSI controller option.
	SCSI controller has failed.	Contact your Digital service representative.

continued

Problem	Possible Cause	Action
Server does not recognize an internal or external SCSI device.	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI controller and SCSI device(s).	Refer to "SCSI Configuration Guidelines" in Chapter 3 for cabling information.
	SCSI cable incorrectly installed between SCSI controller and rear panel connector or external SCSI device(s) and rear panel connector.	Refer to "SCSI Configuration Guidelines" in Chapter 3 for cabling information.
	SCSI devices not configured.	Run the SCSI configuration utility to properly configure all SCSI devices.
Server does not boot from CD-ROM drive.	CD-ROM drive is not connected to the Adaptec controller.	Connect the CD-ROM to the Adaptec controller. Refer to Chapter 3.
	CD-ROM drive not configured as a bootable device.	Change the CD-ROM setting to "bootable" using SCSI*Select*.
	CD-ROM disk is not bootable.	Contact your Digital representative for the latest BIOS.

continued

Problem	Possible Cause	Action
Server does not boot from a SCSI hard disk drive.	Server not configured for SCSI hard disk drive operation.	Run the SCU and set the IDE controller option to "Disabled." This disables the onboard IDE interface.
		Note: If you have both IDE and SCSI hard disk drives installed, your server uses the IDE hard disk drive as the boot device.
	SCSI boot hard disk drive not formatted.	Format the SCSI hard disk drive.
		CAUTION: Formatting the SCSI hard disk drive will destroy all the data on the drive.
	SCSI device drivers not installed or incorrectly installed on the SCSI boot hard disk drive.	Properly install all required SCSI device drivers. Refer to Chapter 2.
	Operating system software is not installed on the SCSI 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. Run *fdisk* following the instructions in your MS-DOS documentation.
	SCSI boot hard disk drive at wrong SCSI address.	Set the SCSI boot hard disk drive to the lowest "primary" SCSI address.
Server does not boot from a target diskette drive.	Onboard diskette controller disabled.	Run the SCU and set the diskette controller option to "Enabled."
	Diskette drive not enabled.	Run the SCU to enable the diskette drive.
	Diskette drive password protected.	Supervisor password set. See your system administrator for further instructions.

continued

Problem	Possible Cause	Action
Server does not boot from a target diskette drive.	Incorrect diskette drive type.	Run the SCU and select the correct drive type.
	Diskette boot option disabled.	Run the SCU and set the proper boot sequence.
	Diskette might not be bootable.	Use a bootable diskette.
	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.

Problem	Possible Cause	Action
No response to keyboard commands	Keyboard might be password protected by a local or remote control program.	Enter the keyboard password.
	Keyboard is not connected.	Power down the server and connect the keyboard.
	Keyboard is connected to the mouse port.	Power down the server and connect the keyboard to the keyboard port.
	Keyboard failed.	Replace keyboard or contact your Digital service representative.
	Server operation halted.	Reboot server.
No response to mouse activity	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 trackball dirty.	Clean trackball.
	Mouse failed	Replace mouse or contact your Digital service representative.
	Server operation halted.	Reboot server.

Disk Drive Troubleshooting

Problem	Possible Cause	Action
IDE/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.
	IDE/SCSI hard disk drive is not correctly formatted or partitioned.	Format or partition as required using the supplied operating system.
		CAUTION: Formatting the IDE/SCSI hard disk drive will destroy all the data on the drive.
	IDE drive type incorrect.	Run the SCU to identify the correct drive type.
	Onboard IDE or SCSI interface disabled.	Run the SCU and set the applicable controller option to "Enabled."
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 (3½-inch diskette) or uncover the write-protect notch (5¼-inch diskette).
	Diskette drive is empty.	Insert a diskette.
	Onboard diskette controller disabled.	Run the SCU and set the diskette controller option to "Enabled."
	Diskette write protection is enabled	Run the SCU and set the diskette write protection to "Disabled."

Monitor Troubleshooting

Problem	Possible Cause	Action
Monitor power indicator is not on.	Monitor is turned off.	Turn on the monitor.
	Power cord is not connected.	Connect the power cord to the server.
	No power at wall outlet.	Use another outlet.
	Power indicator is defective.	Contact your Digital service representative.
No screen display.	Configuration error.	Run the SCU to configure the server for video operation.
	Monitor brightness and contrast controls are incorrectly set.	Adjust the monitor brightness and contrast controls.
	Video controller failed.	Contact your Digital service representative.
No monitor display while loading Windows video drivers.	Monitor type incorrectly set.	Set the correct monitor type using the appropriate utility. Refer to Chapter 2.
	Wrong Windows driver loaded.	Load the correct video driver.

continued

Problem	Possible Cause	Action
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.
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. Refer to your Windows documentation and the documentation supplied with your monitor.

CD-ROM Troubleshooting

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

5
Server Security Features

Introduction

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

- Chassis key lock—the chassis key lock, located at the rear of your server, locks the left and right side panels.

- Chassis lockdown—located at the lower-rear of your server

- Supervisor password

- Additional security features

Chassis Key Lock

Your server's chassis key lock is located at the rear of your server. When locked, it prevents others from opening the server's side panels.

1. Insert key as shown and turn to right (clockwise) to release the left and right side panels.

2. Insert key as shown and turn to left (counter clockwise) to lock the left and right side panels.

> **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.
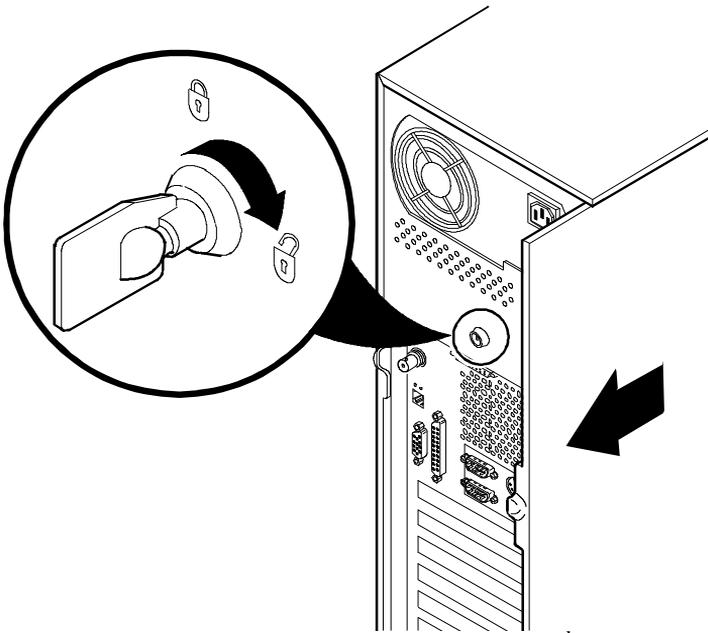
Figure 5-1. Chassis Key Lock

Chassis Lockdown

You can physically anchor your Prioris LX server to a fixed location using the locking tab at the lower-rear of the chassis. To anchor your server, pull the tab out of its slot and attach a Kensington lock (or equivalent).
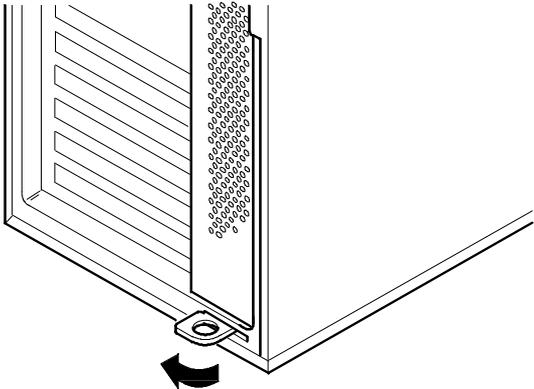
DEC00589

Figure 5-2. Chassis Lockdown

Supervisor Password

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

Perform the following steps to set a supervisor password:

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

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

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

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

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

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

6. Select `Installed`.

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

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

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

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

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

If You Forget Your Password

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

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

2. Place J22/SW3 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 set to On erases the existing password(s).

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

5. Place J22/SW3 to the Off position.

6. Reconnect your server and turn it on.

7. Using the SCU, assign a new password.

    Refer to Chapter 2, "Configuring Your Server," for more information.

Additional Security Features

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

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

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

  If you select Disable, the server does not inform you when to press <F2> to enter Setup. You can still enter Setup by pressing <F2> before POST completes.

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

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

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

Your main logic board's Flash upgrade switch (J22, SW1 and SW2) should be set to the OFF position to prevent unauthorized personnel from loading a new server BIOS. Loading a new server BIOS might allow someone to override other server security features or introduce a virus into your server.

A
Technical Specifications

Introduction

This appendix provides the following information about the technical characteristics of the Prioris LX servers.

- Server specifications

- CPU specifications

- EISA expansion slots

- PCI local bus expansion slots

- Power supply and input power

- Nominal current requirements

- Identifying the correct ac power cord

- Main logic board switches/jumpers

- i486 CPU module switch settings

- Pentium CPU module switch settings

CPU Specifications

CPU specifications vary depending on the type of CPU module installed in your server. Refer to the on-line Pentium CPU Module booklet for Pentium CPU module jumper information.

Server Performance Specifications

Attributes	Specification
Bus clock	
EISA	7.5/8.33 MHz
PCI	25/30/33 MHz
Data I/O	
EISA	8, 16, and 32 bit
PCI	32-bit
CPU module DRAM	At least 16 MB up to 128 MB (i486 CPU module installed) up to 192 MB (Pentium CPU module installed)
ROM BIOS size	128 KB flash memory (expandable to 256 KB)
VGA BIOS	256 KB flash memory

Server Dimensions

Dimension	Specification
Width	177.8 mm (7.0 in)
Length	431.8 mm (17.0 in)
Height	431.8 mm (17.0 in)
Weight	12.875 kg (28.4 lb.)

Server Environmental Specifications

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

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

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

EISA Expansion Slots

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

PCI Local Bus Expansion Slots

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

- +5 V dc only PCI expansion boards

- Bus mastering

Power Supply Requirements

Your server's power supply provides five dc voltages: +12 V dc, −12 V dc, +5 V dc, −5 V dc, and +5 V dc standby. These voltages are used by the various components within the server.

Server System Input Power Requirements (with 250 W Power Supply)

Rated Voltage Range	Maximum Range	Rated Input Current[1]	Operating Frequency Range
100 V ac-120 V ac	88 V ac-132 V ac	6 A	47 Hz - 63 Hz
220 V ac-240 V ac	176 V ac-264 V ac	3 A	47 Hz - 63 Hz

(1) Includes outlet current

Server System Input Power Requirements (with 300 W Power Supply)

Rated Voltage Range	Maximum Range	Rated Input Current[1]	Operating Frequency Range
100 V ac-120 V ac	88 V ac- 132 V ac	A	47 Hz - 63 Hz
220 V ac-240 V ac	176 V ac-264 V ac	A	47 Hz - 63 Hz

(1) Includes outlet current

Current Requirements (with 250 W Power Supply)

Prioris LX servers' power supplies provide the following maximum current requirements:

- +5 V dc,   35 A
- +12 V dc,   12 A
- -5 V dc,   0.3 A
- −12 V dc,   0.5 A
- +5 V dc standby,   0.05 A

For +5 V dc and +12 V dc, total power = 295 Watts maximum

Current Requirements (with 300 W Power Supply)

Prioris LX servers' power supplies provide the following maximum current requirements:

- +5 V dc,   A
- +12 V dc,   A
- -5 V dc,   A
- −12 V dc,   A
- +5 V dc standby,   A

For +5 V dc and +12 V dc, total power = Watts maximum

Identifying the Correct ac Power Cord

> ⚠️ **WARNING:** Do not attempt to modify or use an external 100 V ac (Japan only) or 115 V ac power cord for 220-240 V ac input power. Modifying either power cord can cause personal injury and severe equipment damage.

An ac power cord is supplied with your server. Carefully inspect it and make sure it is the correct one for your country or region based on the criteria listed below. If you feel the supplied ac power cord is incorrect, contact your authorized Digital service representative.

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

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

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

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

- The maximum cord 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 Jumper Settings

Feature	Description	Setting	Description
Flash upgrade	Enable[1] Disable	J22/SW1, On[1] J22/SW1, Off	Your main logic board's flash upgrade switch must be set to disable to prevent unauthorized personnel from loading a new server BIOS. Loading a new server BIOS might allow someone to override other server security features or introduce a virus into your server.
Boot block upgrade	Enable[1] Disable	J22/SW2, On[1][2] J22/SW2, Off	Set this switch to disable (off) to prevent unauthorized personnel from changing the BIOS boot block.
Clear password	Normal[1] Password clear (MFG test)	J22/SW3, Off[1] J22/SW3, On	If you forget your password, set this switch to password clear (on) and then restart your server. Refer to Chapter 5 for more information.
DSM installed	Not installed[1] Installed	J27, jumpered[1] J27, open	If you add Digital's Remote Server Management (RSM) option to your server, you will need to connect the RSM reset cable to connector DSM and change this jumper setting to open (Install).
Onboard VGA	Enabled[1] Disabled	J9, jumpered[1] J9, open	Disable this jumper if you install a video controller expansion board.

[1] Factory default setting
[2] Setting this switch to the OFF position prevents corruption of the BIOS boot block when a boot block update is not required
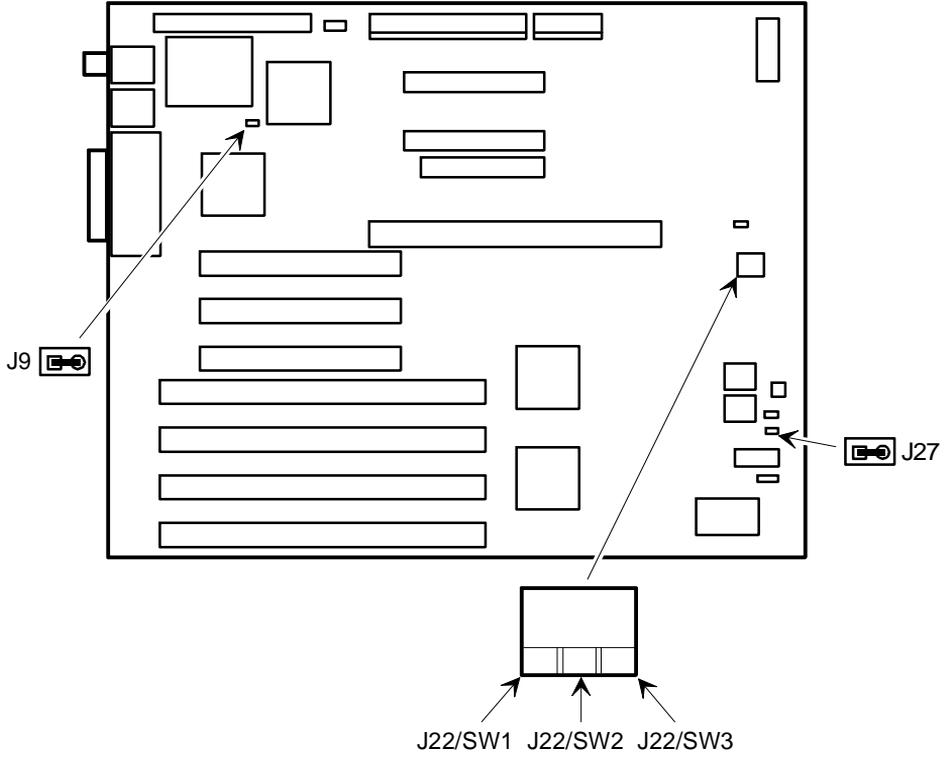
DEC00592-5

**Figure A-1. Main Logic Board Jumper Locations**

i486 CPU Module Switch Settings

The following table lists the i486 CPU module switches/jumpers and factory-default settings. Figure A-2 shows the locations of the i486 CPU module 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.

i486 CPU Module Jumper Settings

Feature	Description	Setting	Description
CPU clock input	25 MHz 33 MHz[1]	J7/SW1, On J7/SW1, Off[1]	Sets the clock speed of the installed CPU.
Reserved	Reserved	J7/SW2, On J7/SW2, Off	
Reserved	Reserved	J7/SW3, On J7/SW3, Off	

[1] Factory default setting

NOTE: Digital recommends that you do not change the factory default settings.

J7/SW1   J7/SW2   J7/SW3
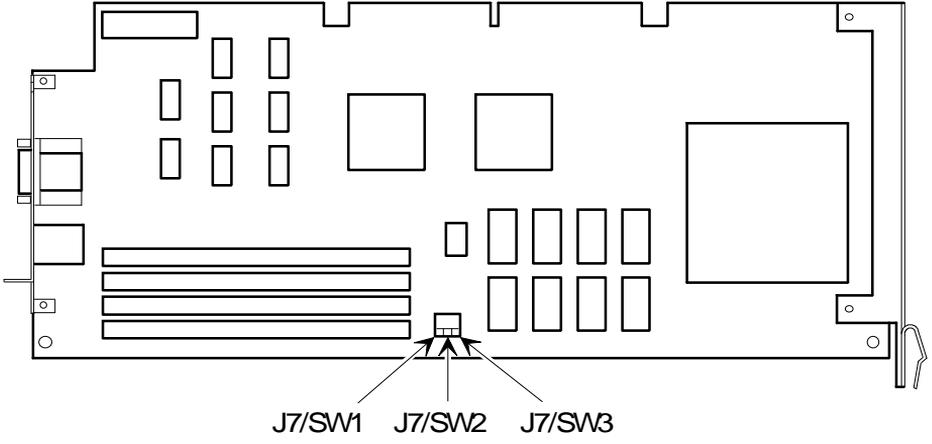
DEC00607-3

Figure A-2. i486 CPU Module Jumper Locations

Pentium CPU Module Switch Settings

The following table lists the Pentium CPU module switches/jumpers and factory-default settings. Figure A-3 shows the locations of the Pentium CPU module 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.

Pentium CPU Module Jumper Settings

Feature	Description	Setting	Description
Bus/core ratio	2/3	J3/SW1, Off J3/SW2, Off	Sets the bus and CPU frequency ratio. For example, if a
	1/2	J3/SW1, On J3/SW2, Off	100 MHz Pentium CPU is installed and you select a 1/2 ratio, then the bus speed will
	1/3	J3/SW1, Off J3/SW2, On	be 50 MHz and the CPU speed will be 100 MHz.
	2/5	J3/SW1, On J3/SW2, On	
CPU clock input	50 MHz	J3/SW2, Off J4/SW3, Off	Sets the clock speed of the installed CPU.
	66.6 MHz	J3/SW2, On J4/SW3, Off	
	60 MHz	J3/SW2, On J4/SW3, On	
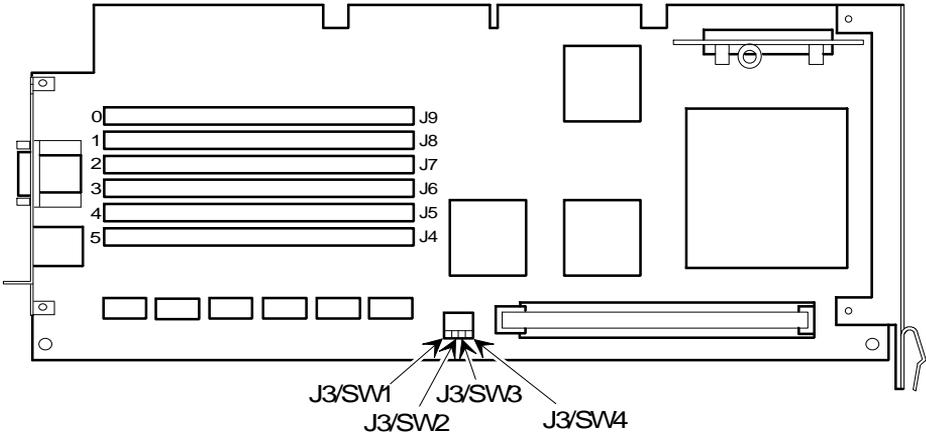
DEC00602-3

Figure A-3. Pentium CPU Module Jumper Locations

B

Server Messages

Introduction

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

- Power-On Self Test (POST) and boot server messages
- POST execution messages
- Beep codes

POST Messages

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

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

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

POST and Boot Messages

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

Message	Description/Solution
Invalid NVRAM media type	NVRAM access failed.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.
Keyboard controller error Keyboard error Keyboard locked - Unlock key switch	Check the keyboard connection. If the connection is secure, the keyboard or keyboard controller might have failed. If the problem persists, contact your Digital service representative.
Monitor type does not match CMOS - Run SETUP	Run the SCU and set the correct monitor type.
Operating system not found	The operating system cannot be found on drive A or drive C.
	Run the SCU and correctly identify drive A or drive C.
	Correctly install the operating system. Refer to the supplied operating system documentation.
Parity check 1 *nnnn* Parity check 2 *nnnn*	Parity error found in the server bus. The BIOS attempts to locate the address and display it on your monitor screen.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.

continued

B-3

Message	Description/Solution
`Press <F1> to resume, <F2> to Setup`	This message appears after any recoverable error message.
	Press <F1> to reboot or <F2> to enter the BIOS Setup utility to make any necessary changes.
`Real time clock error`	Real-time clock failed BIOS test.
	Replace real-time clock (battery)and then run the SCU to restore previous configuration information.
`Shadow RAM Failed at offset: nnnn`	Shadow RAM failed.
	Run the SCU and disable failed shadow memory region.
`nnnn Shadow RAM passed`	Where *nnnn* is the amount of shadow RAM (in kilobytes) that tested successfully.
`System battery is dead - Replace and run SETUP`	Replace the battery and then run the SCU to restore previous configuration information.
`System BIOS shadowed`	This indicates that your server's BIOS was successfully copied to shadow RAM.
`System cache error - Cache disabled`	RAM cache failed.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.

Message	Description/Solution
System CMOS checksum bad - run SETUP	Correct the address conflict using the SCU. If the problem persists, contact your Digital service representative.
System RAM failed at offset: *nnnn*	System RAM failed.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.
nnnn System RAM passed	Where *nnnn* is the amount of system RAM (in kilobytes) that tested successfully.
System timer error	Your server's timer test failed.
	Run the SCU and restore all settings to original values.
	If the problem persists, contact your Digital service representative.
UMB upper limit segment address: nnnn	Displays the address of the upper limit of UMB. This indicates the released segments of the BIOS that can be reclaimed by a virtual memory manager.
Video BIOS shadowed	This indicates that your server's video BIOS was successfully copied to shadow RAM.

POST Execution Messages

The following messages appear at the bottom of the screen during POST execution.

Message Number	Description
230	Unexpected interrupts test
220	Shadow ROMs
210	Test RAM between 512K and 640K
200	Extended memory test
190	Set cache registers
180	Cache configuration
170	Real -time clock test
160	Keyboard test
150	Initial hardware interrupt
140	Co-processor test
130	Serial ports test
120	Parallel ports test
110	Initiate onboard SIO
100	Mouse test
90	Testing diskette drives
80	Testing hard disk drives
30	Setup power management
20	Enable IRQs
10	Setting time of day

Beep Codes

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

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

Beep Code	Error	Port 80h
2-2-3	BIOS ROM checksum	16h
3-1-1	Test DRAM refresh	20h
3-1-3	Test keyboard controller	22h
3-4-1	Test 512K base address lines	2Ch
3-4-3	Test 512K base memory	2Eh
2-1-2-3	Check ROM copyright notice	46h
2-2-3-1	Test for unexpected interrupts	58h

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's memory and address locations are allocated at the factory to operate within a standard PC 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 network 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 System configuration Utility (SCU).

Refer to Chapter 2, "Configuring Your Server," for additional information.

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

CPU Memory Address Map

Address Range	Function	Size
0000 to 9FFFF	Base memory	640 KB
A0000 to BFFFF	Video RAM	128 KB
C0000 to C7FFF	VGA BIOS	32 KB
C8000 to DFFFF	BIOS extension ROM (AT bus used)	96 KB
E0000 to FFFFF	Server BIOS	128 KB
100000 to 7FFFFFF	Extended memory (i486 CPU modules)	127 MB[1]

[1] For Pentium CPU modules, extended memory is 191 MB (100000 to BFFFFFF)

CPU I/O Address Map

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

I/O Address Map

Range (hexadecimal)	Function
000 to 00F	DMA controller one
020 to 021	Interrupt controller one
040 to 043	Interval timer
060 to 06F	Keyboard/mouse controller
070 to 07F	Real-time clock (RTC) NMI
080 to 08F	DMA page register
0A0 to 0A1	Interrupt controller two
0C0 to 0CF	DMA controller two
0F0	Clear math co-processor busy
0F1	Reset math co-processor
0F8 to 0FF	Math co-processor
170 to 177	Secondary IDE controller
1F0 to 1F7	Primary IDE controller
278 to 27A	LPT2 (if enabled)
2E8 to 2EF	COM4 (if enabled)
2F8 to 2FF	COM2
378 to 37A	LPT1 (if enabled)
3BC to 3BE	LPT3 (if enabled)
3E8 to 3EF	COM3
3F0 to 3F7	Diskette controller (if enabled)
3F6 to 3F7	Primary IDE controller Secondary IDE controller
3F8 to 3FF	COM1 (if enabled)

Server Interrupt Levels

Interrupt Number	Interrupt Source
IRQ0	Timer tick
IRQ1	Keyboard controller
IRQ2	Cascade interrupt
IRQ3	COM2, COM4 (if enabled)
IRQ4	COM1, COM3 (if enabled)
IRQ5	Reserved
IRQ6	Diskette drive (if enabled)
IRQ7	LPT1, LPT3 (if enabled)
IRQ8	Real-time clock (RTC)
IRQ9 to IRQ11	Reserved
IRQ12	Mouse interrupt
IRQ13	Math co-processor
IRQ14	IDE primary (if enabled)
IRQ15	IDE secondary (if enabled)

DMA Channel Assignment

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

PCI Configure Space Address Map

Range (hexadecimal)	Function
C0xx	CPU bridge
C1xx	Onboard PCI SCSI
C2xx	EISA bridge
C6xx	PCI slot 1
C7xx	PCI slot 2
C8xx	PCI slot 3

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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