Prioris XL 6000 Series Server
System Reference

Digital Equipment Corporation

January 1997

FCC ID: B6XW

The FCC wants you to know...

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

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

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

- Reorient or relocate the receiving antenna

- Increase the separation between the equipment and receiver

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

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

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

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

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

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

Read the instructions for correct handling.

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

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

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

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Introduction

This System Reference describes how to operate, upgrade, configure, and troubleshoot your Prioris XL 6000 Series server. This System Reference will also help to familiarize you with all aspects of the server and provide a reference tool for questions you might have in the future.

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

The *Server Installation Guide* identifies all the components that were shipped from the factory as well as how to connect the mouse, keyboard, monitor, and ac power. The *Server Installation Guide* also shows how to turn your server on for the first time.

Audience

This System Reference is written specifically for anyone responsible for operating, configuring, and expanding the Prioris XL 6000 Series server.

Support Information

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

If you want to...	Refer to the...
Set up your server	*Server Installation Guide* to unpack, install internal components, connect external devices and power.
Load the supplied ServerWORKS software (ServerWORKS Manager is an option on the Prioris XLe 6000 Series server)	*ServerWORKS Quick Launch Reference Guide*. README information contained on the ServerWORKS Quick Launch CD-ROM disk.
Locate the major internal components of your Prioris XL 6000 Series server	*Side Panel Label* on your server's side panel.
Upgrade and configure your server after installing optional components (for example, CPU, memory, IDE or SCSI mass storage devices, etc.)	Information supplied in this System Reference. Supplied IDE, SCSI, and other options documentation. These are supplied as either manuals or as files on the Quick Launch CD-ROM
Run diagnostics	*ServerWORKS Quick Launch Reference Guide* and the Quick Launch program on the supplied CD-ROM disk. Supplied diagnostics documentation which is on the Quick Launch CD-ROM.

Organization

This System Reference contains the following:

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

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

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

- Chapter 4: *Server Management* — This chapter describes how to manage your server using a network manager, specifically Digital's ServerWORKS Manager (option on the Prioris XLe 6000 Series Server). It also provides a list and description of error messages that might display and error codes that might sound if a failure occurs.

- Chapter 5 *Installing Additional Memory*— This chapter describes how to install additional memory on the main logic board.

- Chapter 6 *Installing Disk and Tape Drives*— This chapter describes how to install optional disk drives, tape drives, and an external storage box.

- Chapter 7 *Installing Expansion Boards*— This chapter describes how to install ISA and PCI expansion boards.

- Chapter 8 *Connecting Disk/Tape Drives*— This chapter describes how to connect mass storage devices to the onboard SCSI controller.

- Chapter 9 *Security Features*— This chapter describes the various security features that are available to prevent server or data theft.

- Chapter 10 *Troubleshooting*— This chapter describes initial and advanced troubleshooting solutions.

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

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

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

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

Conventions

Convention Example	Description
Installation Guide	Italics are typically used for titles, comments, and references to other sections of this document or other documents.
`c:\windows>`	Monospaced text indicates information that your server or software displays. For example, a directory path or error message.
`SCU.BAT`	Monospaced text can also indicate a command that you need to enter to run an application or utility.
[Enter]	Square brackets surrounding text represents a keyboard key.
[Ctrl]+[Alt]+[Del]	A plus sign indicates that the keys shown should be pressed at the same time.

Abbreviations

Abbreviation	Meaning
BIOS	Basic input/output system
CPU	Central processing unit
DIMM	Dual in-line memory module
DMA	Direct memory access
DRAM	Dynamic random access memory
ECC	Error correction code
ECP	Extended capabilities port
EPP	Enhanced parallel port
FRU	Field replaceable unit
h	An h suffix to a numerical value denotes hexadecimal numbers. For example, 0F8h equals 0F8 hexadecimal.
IDE	Integrated drive electronics
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
VGA	Video graphics array
Windows NT	Microsoft Windows NT operating system software
ZIF	Zero insertion force

Special Notices

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

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

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

NOTES: Used to provide additional information.
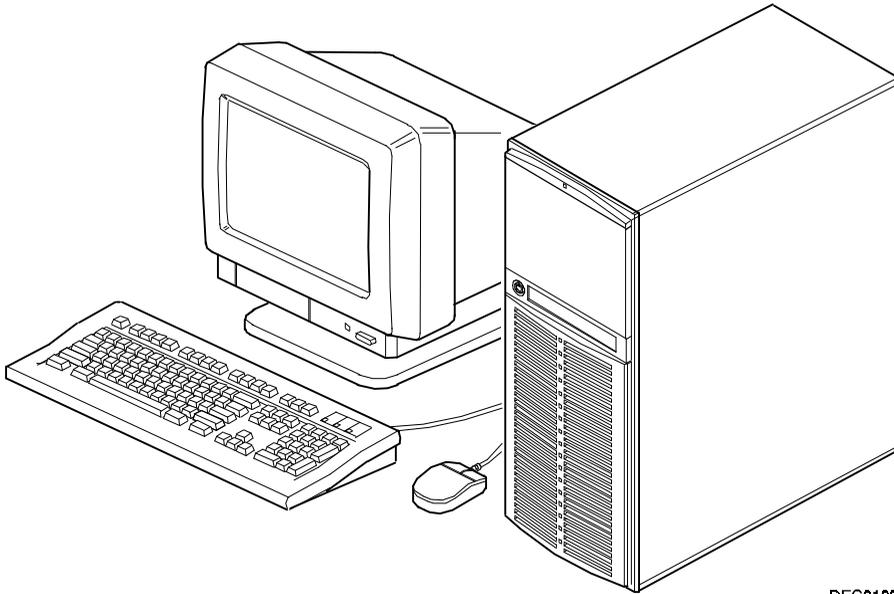
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Typical Prioris XL 6000 Series Server

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

Introduction *1*

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

The Prioris XL 6000 Series server provides the following features:

Reliability/Availability

CPU	Single (1P) Pentium Pro processor mode. The CPU operates using a 64-bit memory interface and an internal L2 cache.
Error Correction Code (ECC) Protested Memory	Recovery from single-bit cache and memory errors.
Power Supply	Shipped with a 300 watt power supply for normal operation.
Variable Fan Speed	Automatically adjusts fan speed according to ambient temperature.
Internal Sensors	Monitors internal server temperatures, fan operation, and power supply temperatures and voltages.

Server Expansion

Flexible Memory Architecture	ECC memory support. Server memory can be upgraded from 16 MB to 512 MB on the main logic board.
Two ISA Expansion Slots and Three PCI Expansion Slots	Accommodates industry-standard expansion boards such as network, Small Computer System Interface (SCSI), and modems.
Integrated SVGA Video Controller	Supports management and configuration applications locally (on the main logic board) without use of an expansion slot.
Single Channel SCSI Controller	Supports narrow and fast wide external and internal SCSI devices.
Capacity for Eight Internal Storage Devices	Accommodates one CD-ROM drive (option on some Prioris XLe 6000 Series configurations), a 3 1/2 inch floppy, and four 3½-inch, 1.5-inch high or six 3½-inch, 1-inch high hard disk drives.
External I/O Ports	Two serial ports and one parallel port to support external options such as a printer, modem, or local terminal.
External network port	One 10/100Base-T (10/100 Mb/s) port to support an external network connection.
Integrated Network Controller	Provided by an Intel PCI LAN controller on the main logic board.

Server Management and Security

Server Diagnostics	Allows local and remote diagnosis of server problems.
Hardware Configuration	Allows local and remote server configuration.
RAM-Based Error Log	Records startup error messages.
Firmware Upgrade Utility	Upgrades firmware versions.
Key Lock	Limits access to server components.

Server Software and Documentation

The following software and documentation are supplied with your server:

- ServerWORKS Manageability Suite — contains ServerWORKS Quick Launch, ServerWORKS Manager (option on Prioris XLe 6000 Series), and licenses.

  - ServerWORKS Quick Launch consists of a bootable CD-ROM disk and reference guide. The Quick Launch program steps you through the initial server setup and operating system installation process. (The CD-ROM drive is an option on some Prioris XLe 6000 Series configurations.)

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

  - ServerWORKS Manager consists of two CD-ROMs, several floppy diskettes, User Guide, and supporting documentation (optional on the Prioris XLe 6000 Series).

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

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

Diagnostic Software

Diagnostic software is shipped with your server on the Quick Launch CD-ROM. This software contains an advanced set of diagnostic utilities that can be used to identify and correct problems you might encounter when installing, configuring, or using your server. There are two ways to access the supplied diagnostic software:

1. During your server installation process, the diagnostic software will be automatically copied to a subdirectory on the MS-DOS partition (only if you selected the option to create an MS-DOS partition). This allows you to run the diagnostic software anytime from the MS-DOS partition you created.

> **NOTE:** The CD-ROM drive is an option on some Prioris XLe 6000 Series configurations. If your server is not equipped with a CD-ROM drive, you will need to use another personal computer that has a CD-ROM drive in order to create diagnostic diskettes. Refer to the *Quick Launch. Users Guide* for more information on how to create server utility and device driver diskettes.

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

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

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

Server Utilities and Technical Support

Current server utilities and technical support information is available on the Quick Launch CD-ROM disk and the Digital Bulletin Board Service (BBS). For access to the Digital BBS in the USA, dial (508) 495-8800 or on the world wide web at:

```
http://www.digital.com
```

or

```
http://www.digital.com/info/service.html.
```

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

Important Ergonomic Information

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

- Be comfortable in your work space.

- Change your posture frequently.

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

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

continued

Adjust	So . . .
Head	Avoid neck strain. Your head should incline downward, but no more than 15 to 20 degrees.
Monitor	No higher than the level of your eyes and at the correct distance for your vision.
	Avoid eye fatigue, which can be caused by glare, image quality, uncomfortable furniture, eye height, and uncorrected vision. If you cannot focus to read at different distances, you may need special glasses. Relax your eyes periodically by looking at distant objects.
Work breaks	Take periodic work breaks. Morning, lunch, and afternoon breaks during the 7-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.
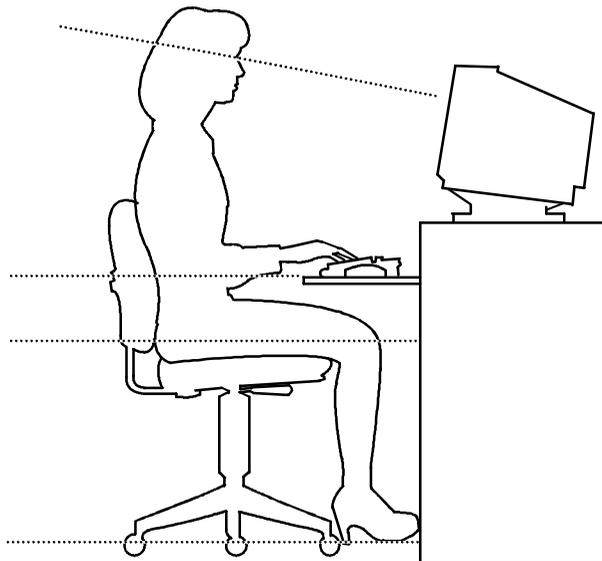
DEC00454

Figure 1-1. Providing a Comfortable Working Environment

Server Software and Utilities *2*

Introduction

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

- ServerWORKS Quick Launch⎯ This software is used to install a network operating system onto the server[1]. The CD-ROM also contains various drivers and on-line documentation.

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

- Flash Memory Update ⎯ This utility enables you to update or restore your server's BIOS and ISA/PCI configuration information.

- SCSI*Select* Utility ⎯ This utility allows you to configure and view settings of the installed Adaptec SCSI controller and SCSI devices.

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

_____

[1] Full Quick Launch functionality is only available to systems that have a bootable CD-ROM drive installed. However, the Quick Launch media can be accessed on any other personal computer that has a CD-ROM drive. The information, documentation, device drivers, and individual server utilities can be downloaded onto diskettes, enabling you to use the information on the CD-ROM disc without an actual CD-ROM drive being installed in your Prioris XLe 6000 Series server.

ServerWORKS Quick Launch

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

System Configuration Utility (SCU)

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

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

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

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

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

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

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

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

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

Starting the SCU

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

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

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

   SCU.BAT

2. Creating a bootable SCU diskette by using the Quick Launch CD-ROM and selecting the *Installations & Utilities* button and then the *Utilities* page. On the *Utilities* page, select the appropriate BIOS level for the server that the SCU is being created for (if this is being done on the server, the default BIOS that is highlighted is the BIOS of that server).

   NOTE: If your server is not equipped with a CD-ROM drive, take the CD-ROM disc to another personal computer that has a CD-ROM drive to create a bootable SCU diskette.

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

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

> **NOTE:** If 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.

Using the SCU

To use the SCU:

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

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

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

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

For more information, please refer to Appendix C: SCU Features

Flash Memory Update Program

All servers have BIOS software in a ROM. This BIOS initializes hardware and boots the operating system when the server is turned on. The BIOS also provides access to other services such as keyboard and disk drives.

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

The flash utility and BIOS updates are available on the Digital's BBS at (508) 495-8800 or on the world wide web at:

```
http://www.digital.com
```

or

```
http://www.digital.com/info/service.html.
```

SCSI*Select* Utility

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

Use SCSI*Select* to:

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

To start the SCSI*Select* configuration utility:

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

Diagnostics

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

Server Components *3*

Introduction

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

Disconnecting External Devices and Power

Before removing the side panel, perform the following:

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

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

3. Turn the server off.

4. Unplug the power cord from the wall outlet.

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

Removing and Installing the Side Panel

To remove the side panel, perform the following:

1. Unlock the side panel.

2. Slide the panel to the rear of the server.
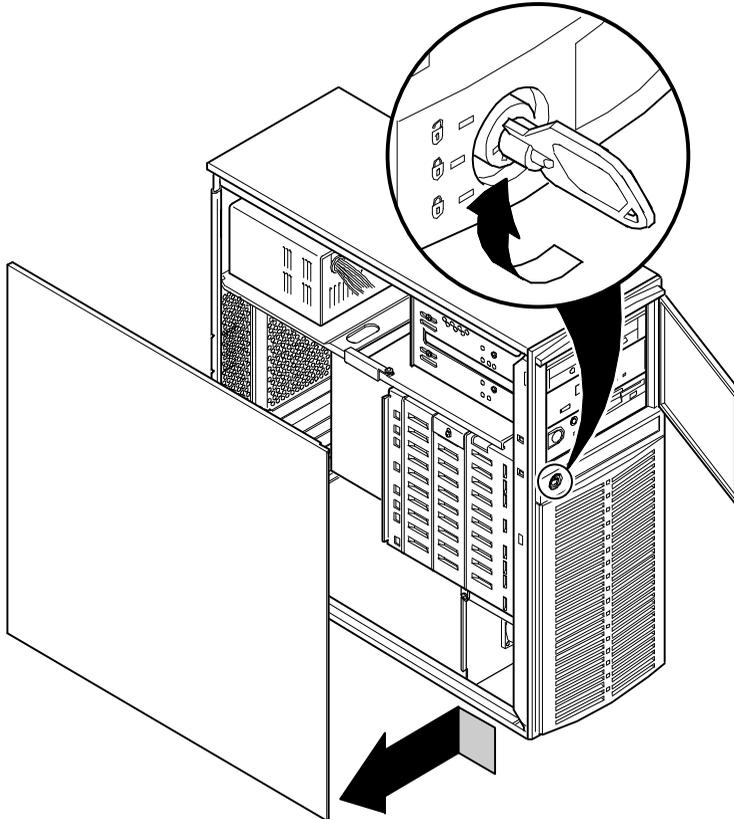
DEC01084-2

Figure 3-1. Unlocking and Removing the Side Panel

To install the side panel.

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

2. Lock the side panel.
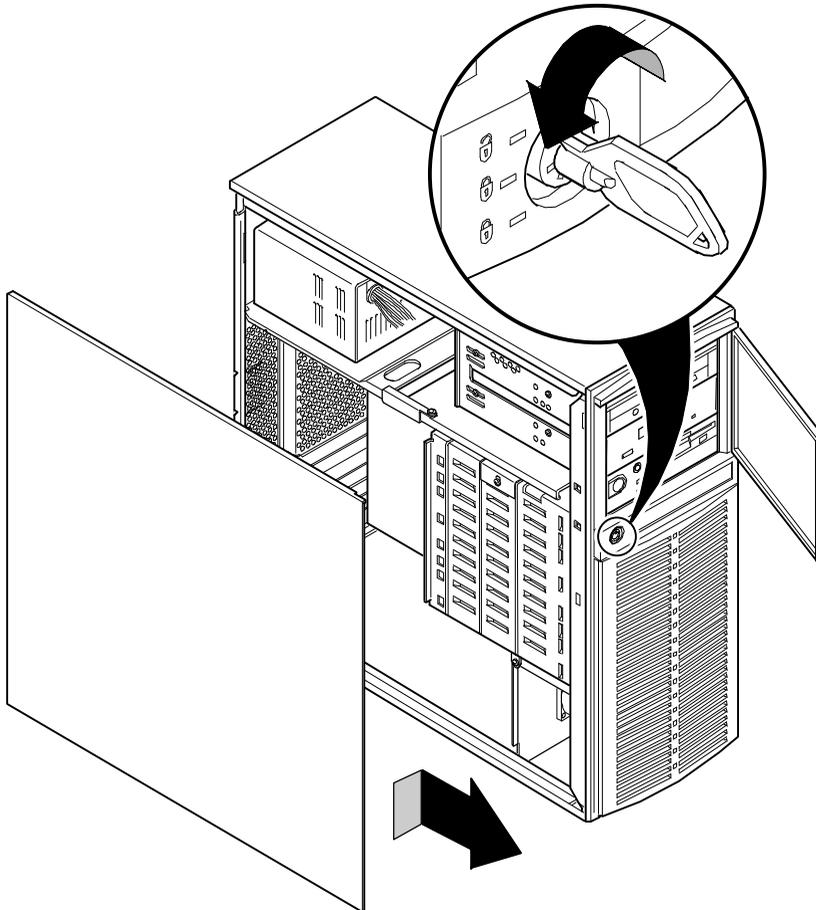
DEC01084-3

Figure 3-2. Installing the Side Panel

Server Front View

Figure Legend	Component
A	Security door lock/chassis lock
B	Hard disk drive indicator
C	Power indicator
D	Reset button
E	Power on/off button
F	CD-ROM drive (option on some Prioris XLe 6000 Series servers)
G	3½-inch diskette drive
H	Diskette eject button
I	Nameplate showing server model name
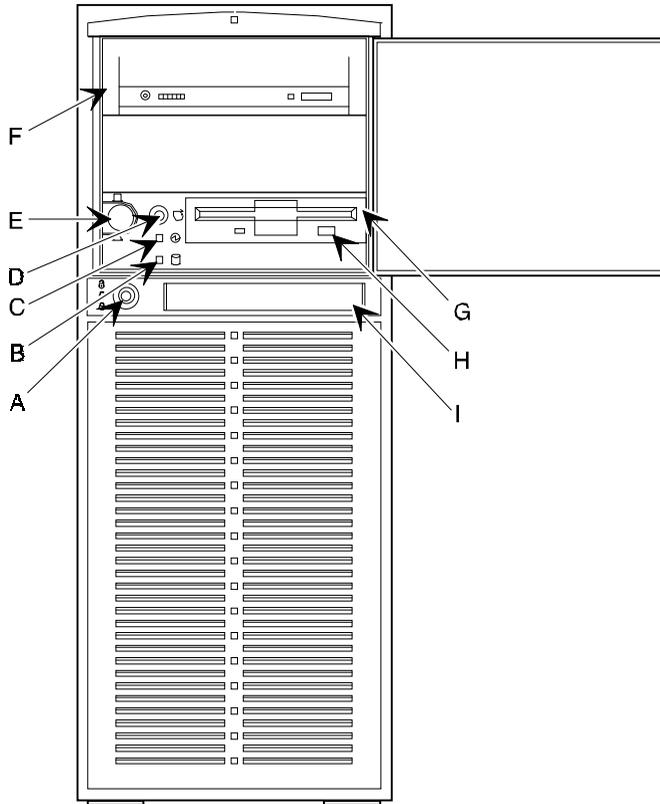
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Figure 3-3. Server Front View

Server Left Side View

Figure Legend	Component
A	Power supply
B	Location of main logic board
C	Rear panel expansion board slots
D	Two ISA expansion slots and three PCI expansion slots
E	Internal 3½-inch drive bays
F	Upper fan assembly
G	Lower fan assembly
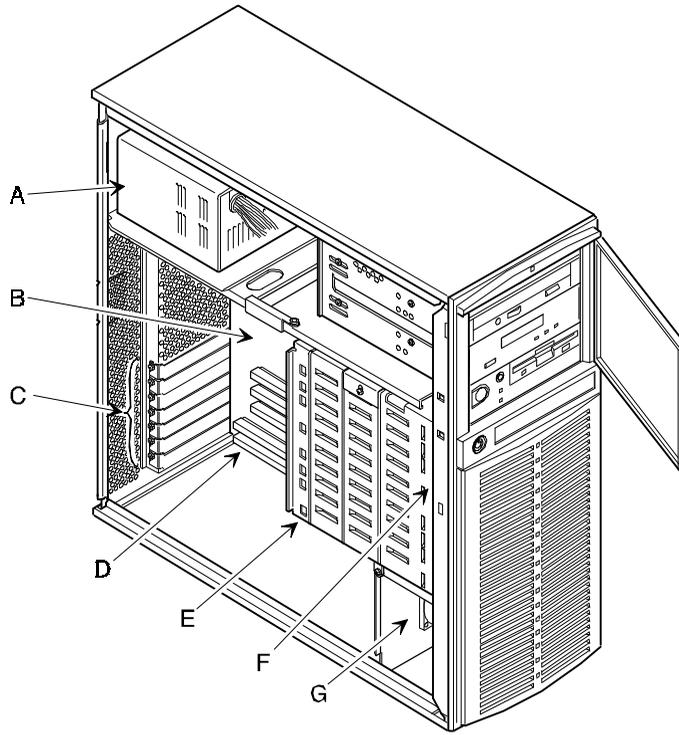
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Figure 3-4. Server Left Side View

Server Rear View

Figure Legend	Component
A	10Base-T/100Base-T port connector (RJ45)
B	Serial port B, COM 2
C	Video port
D	Parallel port
E	Serial port A, COM 1
F	Keyboard port
G	Mouse port
H	Voltage select switch
I	ac line connector
J	SCSI knockout
K	External SCSI port
L	Expansion board slot covers
M	Padlock ring
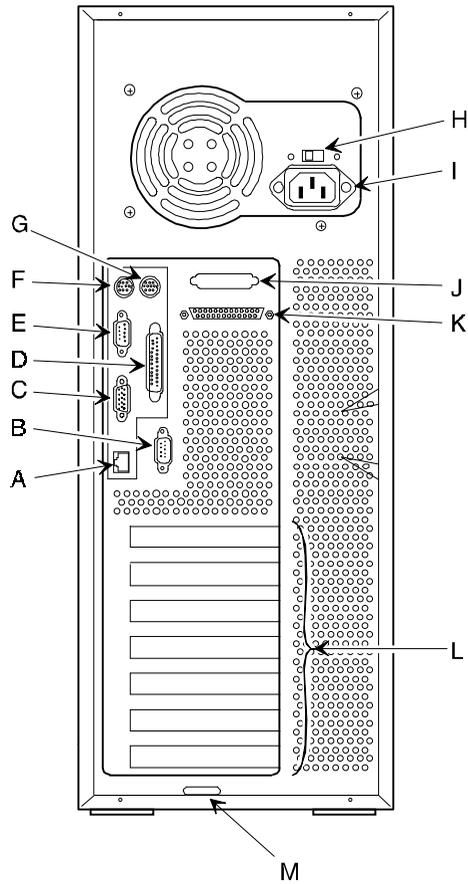
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Figure 3-5. Server Rear View

Main Logic Board Components and Connectors

Figure Legend	Component/Connector
A	Processor ZIF socket
B	Serial port B (COM2)
C	Front panel connector
D	ATX power connector
E	Auxiliary power connector
F	Power connector
G	Wide SCSI connector
H	Fan 0 connector
I	ATX interface connector
J	Diskette drive connector
K	Fan 1 connector
L	Configuration jumper blocks (CMOS & Pasword resets)
M	Server battery/RTC
N	Server Monitor Module (SMM) connector
O	Hard disk drive LED connector
P	Optional video memory (DRAM) socket
Q	ISA expansion slots (1 and 2)
R	PCI expansion slots (1 through 3)
S	Four DIMM memory sockets
T	10Base-T/100Base-T network connector
U	Video port
V	Parallel port
W	Serial port A (COM1)
X	Keyboard and mouse ports
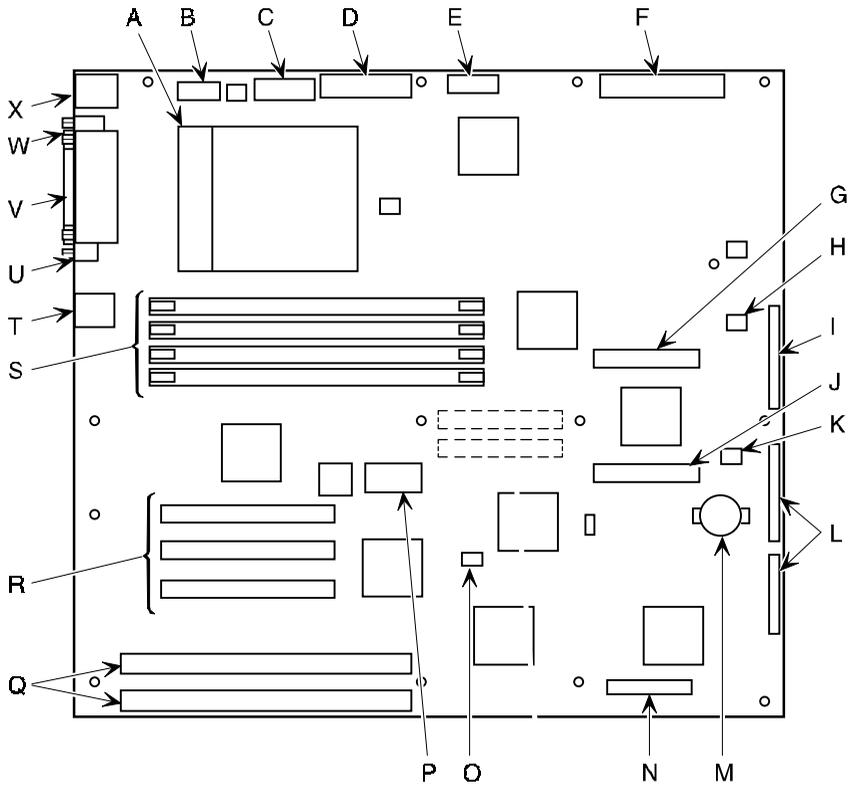
DEC01088-2

Figure 3-6. Main Logic Board Components and Connectors

Tools Needed

Prior to installing an option, have the following available:

- A Phillips screwdriver
- An antistatic wrist strap

Static Electricity

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

- Before touching any circuit board or component, put on a properly-grounded, anti-static wrist strap.
- Keep circuit boards and components away from non-conductors.
- Keep clothing away from circuit boards and components.
- Keep circuit boards in anti-static bags.

Replacing the Lithium Battery

Your server comes with a Lithium 3 V dc wafer-style battery. If your server ever fails to retain the correct date, time, or configuration settings when it is turned on, you need to replace the battery.

To replace the Lithium battery, perform the following:

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

2. Turn off your server.

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

4. Unlock and remove the side panel.

5. Insert the tip of a small flat-bladed screw driver, or equivalent, under the plastic tab on the snap-on plastic retainer.

   Gently lift up and pull back on the retainer to remove it from the Lithium battery socket.

6. Remove the old battery from its socket.

   ⚠ **WARNING:** There is a danger of battery explosion if a lithium battery is incorrectly replaced. To prevent damage to your computer, be sure the + side faces up when installing a new battery. Also, be sure you replace the battery with either a Digital (P/N 12-41474-05), Toshiba (P/N CR2032), or equivalent 3 V dc lithium battery.

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

6. Install the new battery.

   When installing the new battery, make sure the "+" side faces up.

7. Replace and lock the side panel.

8. Connect external devices and restore power.

9. Reboot and run the SCU:

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

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

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

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

Refer to Chapter 2, "Server Software and Utilities."
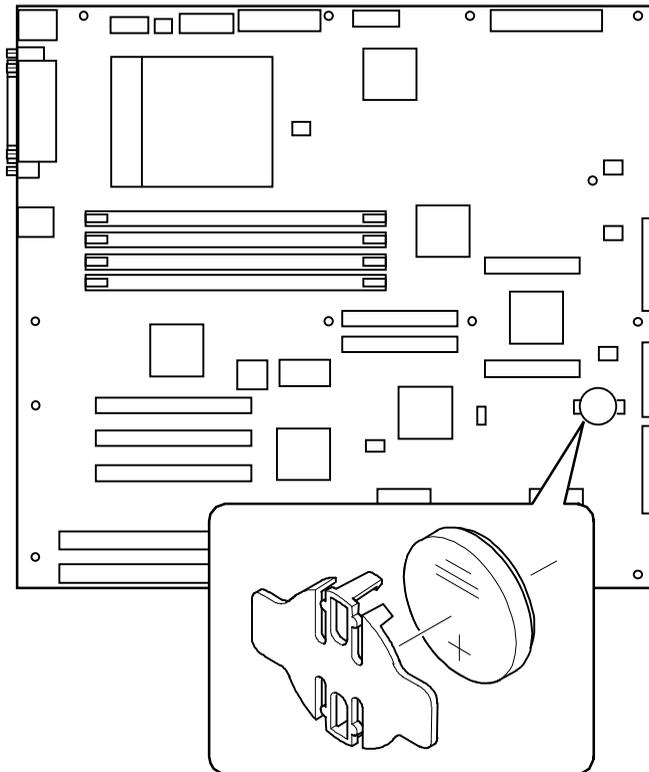
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Figure 3-7. Replacing the Battery

Server Management 4

Introduction

This chapter describes how to manage your server using a network manager, specifically Digital's ServerWORKS Manager[2]. This chapter also provides a list and description of error messages that might display and beep codes that might sound if a failure occurs.

NOTE: Digital's ServerWORKS Manager is an option with Prioris XLe 6000 Series servers. Contact your Digital Equipment Corporation reseller or Customer Support Representative if you are interested in using this server management software.

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[2] ServerWORKS Manager is standard with the Prioris XL 6000 and is an option with the Prioris XLe 6000 configuration.

Obtaining Information Using Server Management Software

Your Prioris XL 6000 Series server is shipped with ServerWORKS™ Manager[3] software. ServerWORKS Manager is a workgroup and server management product for Digital's family of servers. ServerWORKS Manager utilizes the Simple Network Management Protocol (SNMP) environment to assist the Network or Server administrator by constantly monitoring the network for problems.

ServerWORKS Manager is based on an open architecture that enables seamless integration and interoperability with popular enterprise management software packages such as Digital's POLYCENTER Manager/NetView, Hewlett-Packard's OpenView UX for Windows, and IBM's Netview/6000 AIX. Also included with ServerWORKS Manager are Network Operating System (NOS) Agents for Windows NT V3.51 and 4.0, Novell NetWare™ V3.12 and V4.x, and SCO UNIX V5.0. The OS/2 NOS includes its own agent and can also be managed from ServerWORKS Manager.

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

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

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

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

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

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

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[3] ServerWORKS Manager is standard with the Prioris XL 6000 and is an option with the Prioris XLe 6000 configuration.

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

    Refer to the ServerWORKS Manager[4] Administrator User's Guide for more information on how to use ServerWORKS Manager to view and be notified of events on the server.

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

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

Displaying Server Status Using the Hardware

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

- Normal status messages

- Error messages

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

Refer to the following tables for a list of Status Messages, Error Messages and Beep Codes.

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[4] ServerWORKS Manager is standard with the Prioris XL 6000 and is an option with the Prioris XLe 6000 configuration.

Server Status

Component	Possible Failures	Result
Main logic board voltages: +12, +5, +3.3, and -12V	The voltages are outside of the power good range.	An error message displays and a warning beep sounds.
	The voltage exceeds the upper limit.	The server will shutdown after 5 minutes.
	The voltage falls below the lower limit.	A warning message displays and a warning beep sounds.
Fans 1 and 2	The fans fail.	The server will shutdown after 5 minutes.
CPU failure	A CPU failure:	
	• Internal	An error message displays and a warning beep sounds.
	• Over temperature	Usually caused by a fan failure and the result is that the server shuts down.
CPU temperature sensing	The temperature exceeds 82 °C (179.6 °F).	The backup fans will activate without any warning.
		If the temperature drops below 80 °C (176 °F), the backup fans will be turned off.
	The temperature exceeds the warning level (>85 degrees C; >185 °F).	A warning message displays and a warning beep sounds. If the temperature exceeds the warning level for more than five minutes, the server will shut down.
	The temperature exceed the upper limit (>90 °C; >194 °F).	The server will shut down.
Power supply failure	The temperature exceeds the upper limit or the voltages are out of range.	Power supply shuts down, an error message displays, and a beep sounds.

POST Beep Codes

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

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

POST Codes and Countdown Codes

The BIOS indicates the current testing phase during POST after the video controller has been successfully initialized by outputting a 2-digit hex code to I/O location 80h. There are two different sets of codes:

- Codes displayed during the normal BIOS POST process
- Codes displayed during the recovery boot process

Normal Port-80 Codes and Countdown Codes

Port 80 Codes	Countdown Codes	Description
D0h		Early MP initialization, enter real mode
D1h		Power on initialization
D2h		Disable NMI
D3h		Reset video controller
D4h		Enter real mode
D5h		Checksum the 8 KB loader BIOS
D6h		Loader BIOS checksum good
D7h	900	Check if keyboard controller (KBC) buffers are free
D8h		Issue BAT (basic assurance test) command to KBC
D9h		Read BAT results
DAh		Check if KBC passed BAT
DBh	820	Keyboard initialization passed
DDh		Disable keyboard and auxiliary devices
DFh		Disable both DMA controllers
E0h	780	Preliminary initialization of PICs
E1h		Enter real big mode and initialize chipset, size memory
E2h		Initialize timer 2 for speaker
E3h	760	Initialize timer channel 0 for system timer

continued

Port 80 Codes	Countdown Codes	Description
E4h		Clear any pending parity errors
E6h	740	Test RAM from 0 - 640 KB
E7h		Test and initialize first 1 MB of memory
E8h		RAM failure, remap memory partitions and test again
E9h		RAM test complete, passed; clear parity errors
EAh	730	Set up stack at 30:100, enable cache, and shadow BIOS
EBh		Initialize code dispatcher
ECh		Make F000h DRAM R/W enabled
EDh		Dispatch POST
23h	700	Initializations before setting up vector table
24h		Setup interrupt vector table
0Dh		Check CMOS clear jumper
0Eh	690	Check validity of CMOS
0Fh		Force CMOS defaults if required
10h		CMOS initialization complete
25h		Nothing
28h		Set monochrome mode
29h		Set color display
2Ah		Clear parity status if any, initialize warm reset flag
2Bh		Video auto-configuration and initialization
F0h		ISA slot initialization
2Ch	580	Conventional video option ROM search
2Dh		Scan user binary
2Eh	570	Initialize monochrome display if no other video present
2Fh	560	Test buffer memory for monochrome

continued

Port 80 Codes	Countdown Codes	Description
30h		Check vertical and horizontal retrace
31h		Test for color display memory if no external video BIOS found
32h		Check vertical retrace
34h		Sign on message
36h		Initialize messaging services and clear screen
37h	500	Custom sign on display
80h	370	Keyboard/mouse port check
81h		KBC initialization and testing
83h		Check if keyboard is locked
F5h	330	Initialize mouse
39h		Keyboard, mouse, and other sign-ons
3Bh		Prepare for memory test
43h	290	Decide memory size from chipset
4Fh		Disable cache, test memory, and display memory size on screen
52h		Initialize for the other processors in MP system, reset DMA controller
61h	250	DMA register tests
62h		DMA test OK
65h		Initialize 8237 DMA controller
66h		Clear DMA write request register and mask set/reset register
67h	220	8259 interrupt controller test
F4h		Enable extended NMI sources
8Ch	140	Initialize remaining Plug and Play devices (i.e., other than video), initialize IPL, initialize IDE controller
8Fh	130	Floppy initialization
92h		Set printer, RS-232 timeout

continued

Port 80 Codes	Countdown Codes	Description
96h		Option ROM scan and initialization above C800h
97h	080	Scan user binary and conventional option ROM scan
98h		Scan user binary area
9Ah		Clear soft reset flag, complete MP Table
9Dh	070	Timer data area initialization
A0h		Printer setup
A1h		RS-232 setup
A2h		Check for stuck key
ABh		Before NPX (numeric processor instructions) test and initialization
ACh	060	NPX test and initialization
ADh		Update co-processor information in CMOS and recalculate checksum
AEh		Set typematic rate
AFh	050	Keyboard READ ID command
B0h		Wait for READ ID response
A3h		Display POST errors
A6h		Before Setup
A7h	030	Call Setup if required, prompt for password if enabled
B1h		Enable cache for boot
B3h		Setup display mode set
B4H		Jump to pre-OS code
BBh	020	Initialize SMI code, prepare for boot
00h	000	Execute BOOT

Recovery Port-80 Codes and Countdown Codes

These codes are displayed during a recovery boot process. During this process, a diskette in drive A is booted and a BIOS image is automatically installed.

Port 80 Codes	Countdown Codes	Description
02h		Disable internal cache
08h		Disable DMA controller #1 and #2, disable interrupt controller #1 and #2, and reset video display
13h		Initialize all chipset registers
15h	900	Initialize system timer
1Bh	800	Real mode base 64 KB memory test
20h	700	16 KB base RAM test
23h	650	Setup interrupt vectors
40h	600	Test memory in virtual mode
65h	500	Initialize 8237 DMA controller
67h	400	8259 interrupt controller test
80h	300	Unmask diskette, keyboard, and timer interrupts
88h	200	Floppy unit initialization
A0h	100	Cache enable
00h	000	Boot OS

Installing Additional Memory **5**

Introduction

Installing additional server memory and video memory increases the capabilities of your server. This chapter describes the memory configuration guidelines that must be followed prior to installing server memory and video memory. Detailed installation instructions are also provided.

Installing Additional Server Memory

By adding more server memory, you can run larger and more complicated software on your server. Your Prioris XL 6000 Series server supports up to 512 MB of ECC protected memory (using single-banked DIMMs).

This section provides the server memory configuration guidelines that must be followed prior to installing additional DIMMs on the main logic board.

Server DIMMs Requirements

Supported DIMMs	72-bit DIMMs, single-banked, ECC protected memory
Supported densities	16, 32, 64, and 128 MB of ECC protected memory
Minimum server memory supported	32 MB (16 MB in Prioris XLe 6000 Series servers)
Maximum server memory supported	512 MB (ECC protected memory)

Memory Configuration Guidelines

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

- Install memory starting at Bank 0.

- Minimum memory supported is 32 MB (16 MB in Prioris XLe 6000 configurations).

- Maximum memory supported is 512 MB (ECC protected memory).
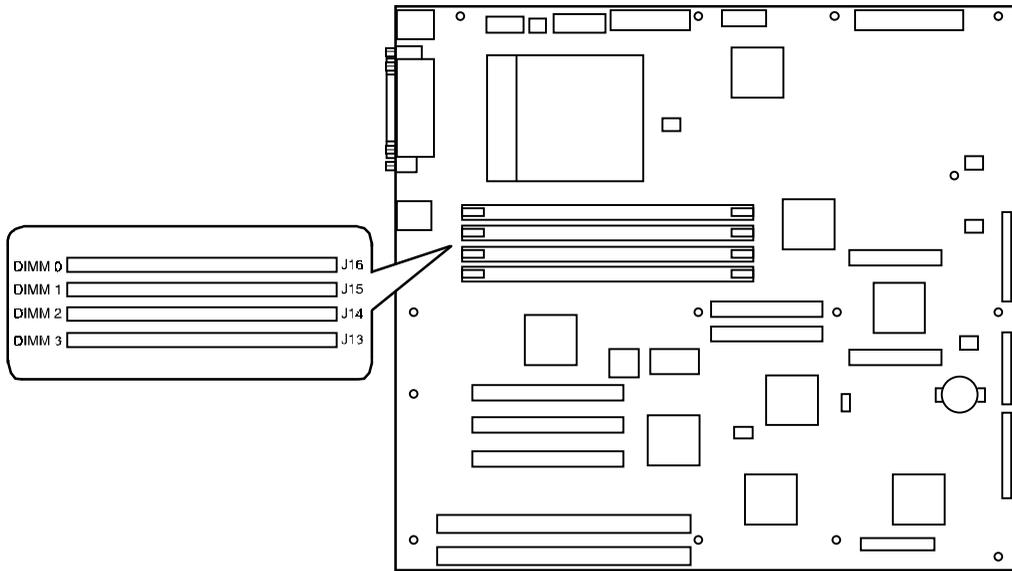
DEC01088-5

Figure 5-1. DIMM Bank Locations

Upgrading Memory

You can upgrade memory on your Prioris XL 6000 Series server by adding DIMMs on the main logic board. When expanding server memory, always start with the DIMM Bank closest to Bank 0.

Installing DIMMs

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

To install DIMMs, perform the following:

1. Power down your server.

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

3. Unlock and remove the side panel.

4. Orient the DIMM so that the two notches in the bottom edge of the DIMM align with the keyed socket (Figure 5-2).

5. Insert the bottom edge of the DIMM into the socket and then press down firmly on the DIMM until it seats correctly. The plastic ejector levers on the socket ends automatically snap to the upright position (Figure 5-2).

6. Repeat the previous steps to install each DIMM.

7. Replace and lock the left side panel.

8. Connect all external devices and restore power.

9. Run the SCU to configure your server for the additional memory.

   Refer to Chapter 2, "Server Software and Utilities."
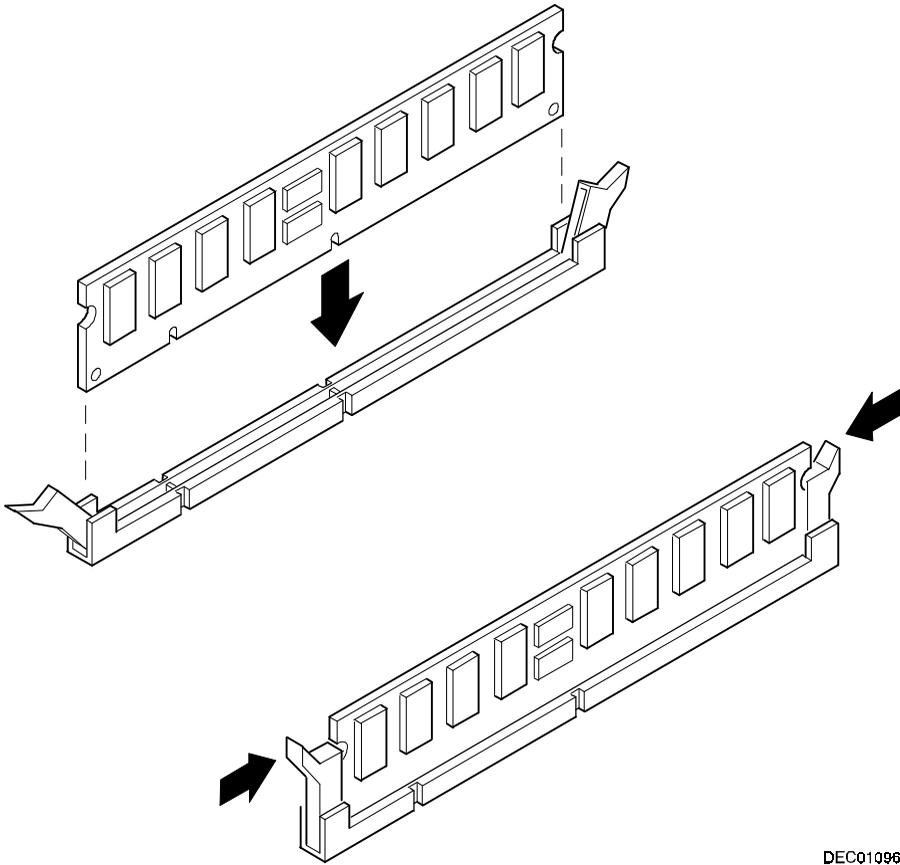
DEC01096

Figure 5-2. Installing a DIMM

Memory Troubleshooting

The Prioris XL 6000 Series server POST can detect memory errors when it boots. The error can be isolated to one of the DIMMs installed on the main logic board.

The memory error message format is as follows:

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

Where:

<Type of Error>	Correctable error	
	Uncorrectable error	
<Location>	Main logic board	DIMM 0
	Main logic board	DIMM 1
	Main logic board	DIMM 2
	Main logic board	DIMM 3

Example:

Uncorrectable Error : Main Logic Board DIMM 0

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

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

To isolate to the failing DIMM, replace one of the DIMMs which was indicated in the POST error message with a similar DIMM and then rerun POST. If the same error message occurs, replace the DIMM.

Installing Additional Video Memory

Your server comes standard with 512 KB of video memory. You can increase this amount to 1 MB by installing a 512 KB video memory DRAM chip in the designated socket on the main logic board.

To install the video memory upgrade chip, perform the following:

1. Power down your server.

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

3. Unlock and remove the side panel.

4. Align the detent of the new video memory chip with the beveled end of the socket on the main logic board (A, Figure 5-3).

5. Press down firmly on the video memory chip until it fully seats in the socket.

6. Replace and lock the left side panel.

7. Connect all external devices and restore power.
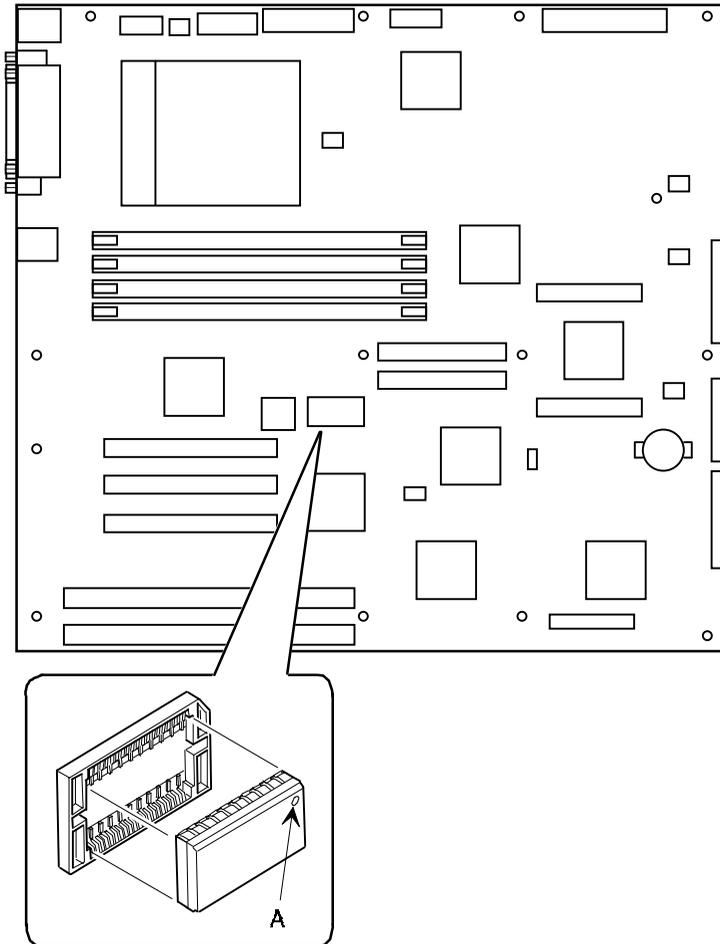
DEC01088-6

Figure 5-3. Installing a Video Memory Expansion Chip

Installing Disk and Tape Drives 6

Introduction

This chapter describes the configuration guidelines that must be followed prior to installing optional disks, a tape drive, and an external storage box. Detailed installation procedures are also included.

Disk and Tape Drive Configuration Guidelines

- A tape drive should be installed in the front access 5¼-inch drive bay.

- A maximum of four 3½-inch, 1.5-inch high hard disk drives can be installed in the internal drive bay.

  or

- A maximum of six 3½-inch, 1-inch high hard disk drives can be installed in the internal drive bay.

CD-ROM Drive Configuration Guidelines

- The factory installed SCSI CD-ROM drive has its SCSI ID set to 5. (The CD-ROM drive is an option on some Prioris XLe 6000 Series configurations.)

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

SCSI Configuration Guidelines

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

SCSI ID and Termination

- Your server supports up to 4 or 6 internal SCSI devices, including six hard disk drives, or four hard disk drives, one CD-ROM drive, and one half-height device (such as a tape drive).

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

Setting IDs and Termination

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

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

- Both ends of the SCSI bus must be terminated. In most cases, one side of the termination will be a soft switch setting on the main logic board, set in the configuration utility. The other termination can be found at the other end of the SCSI bus in the form of an in-line SCSI terminator.

- If a device such as a CD-ROM drive has a terminator jumper installed and the CD-ROM drive is plugged into the second connector on the cable from the SCSI controller, no other devices will be seen beyond the second connector. Determine that all devices have the terminator removed and that the in-line bus terminator is in place.

Boot Device

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

External Channel

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

- Determine that the external SCSI bus is terminated properly.

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

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

* According to Digital specifications

Drive ID

- The SCSI ID addressing is independent of the single bus arrangement. Determine that you select unique SCSI IDs for all SCSI devices on the SCSI bus.

- The onboard controller is a wide SCSI controller to set SCSI IDs greater than seven.

- All SCSI device IDs must be set manually via jumpers on the device. Refer to your manufacturer's documentation for information on setting drive IDs. If a factory installed CD-ROM drive has been installed in your server, the SCSI ID factory setting for that device is 5.

- Narrow (7-bit) devices on a wide cable count as two SCSI IDs. For example, the narrow CD-ROM drive SCSI ID is 5 so SCSI ID 13 is no longer available. The 7-bit CD-ROM device counts as two devices on a 15-bit wide data path. Determine that a unique SCSI ID is selected for each SCSI device located on each SCSI bus.

Cables

The server is shipped with a wide SCSI cable with ten connectors connected to the wide Adaptec 7880 SCSI controller on the main logic board to the CD-ROM (option on some Prioris XLe 6000 Series configurations) and then to the two 5.25-inch drive bays and an active termination.

Installing Optional Drives

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

- Front access drive bay area — This area has one 5¼-inch SCSI CD-ROM drive (option on some Prioris XLe 6000 Series configurations) and one diskette drive, and room for one narrow (50-pin) 5¼-inch half-height SCSI device. Devices can include a CD-ROM drive or a tape drive.

- Internal drive bay area — This area has room for four 3½-inch, 1.5-inch high or six 3½-inch, 1-inch high wide SCSI-2 devices.

Installing a 5¼-Inch Device into the Front Access Drive Bay

To install a 5¼-inch device into the front access drive bay slot, perform the following:

1. Turn off your server.

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

3. Unlock and remove the side panel.

4. Open the door.

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

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

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

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

9. If applicable, replace the plastic filler panel.
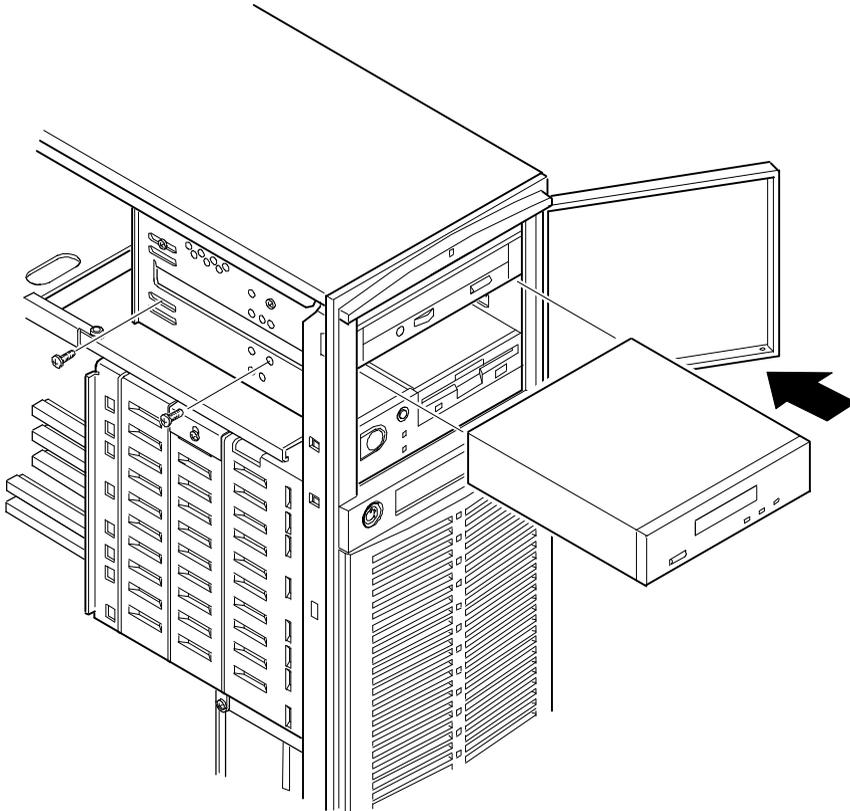
DEC01090

Figure 6-1. Installing a 5¼-Inch Device into the Front Access Drive Bay

Expansion Brackets

You can install a 3½-inch half-height device in the front access drive bay. If you plan to install a 3½-inch device in a 5¼-inch drive bay slot, you must first install the 3½-inch expansion brackets onto the device and then install the 5¼-inch brackets as shown in Figure 6-2. 3½-inch expansion brackets (74-44336-01) are either supplied with the device or can be purchased from Digital. Contact your local Digital sales representative for additional information. Afterwards, install the 3½-inch device following the procedures described in "Installing a 5¼-Inch Device into the Front Access Drive Bay."
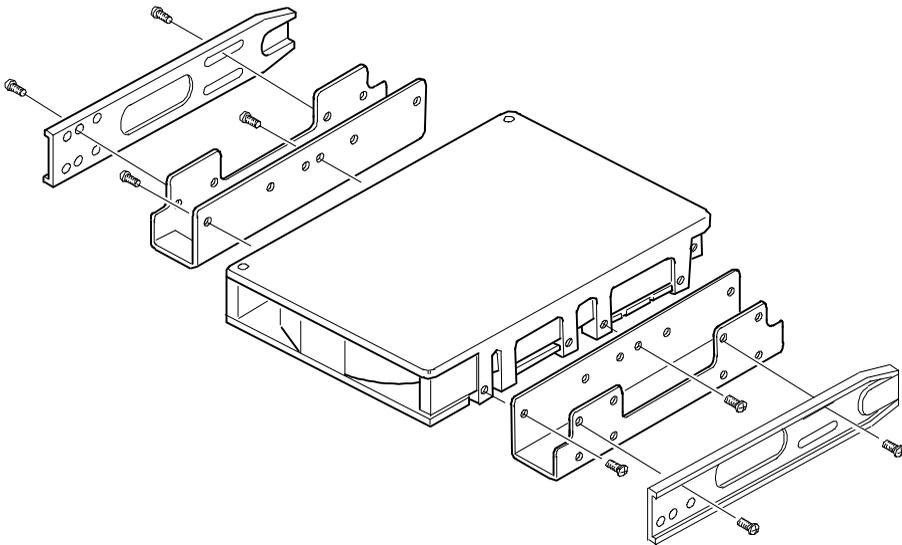
DEC00723

Figure 6-2. Installing Expansion Brackets

Installing a 3½-Inch Device into the Internal Drive Bay

To install a 3½-inch device into one of the internal drive bay slots, perform the following:

1. Turn off your server.

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

3. Unlock and remove the side panel.

4. Install the supplied expansion brackets.
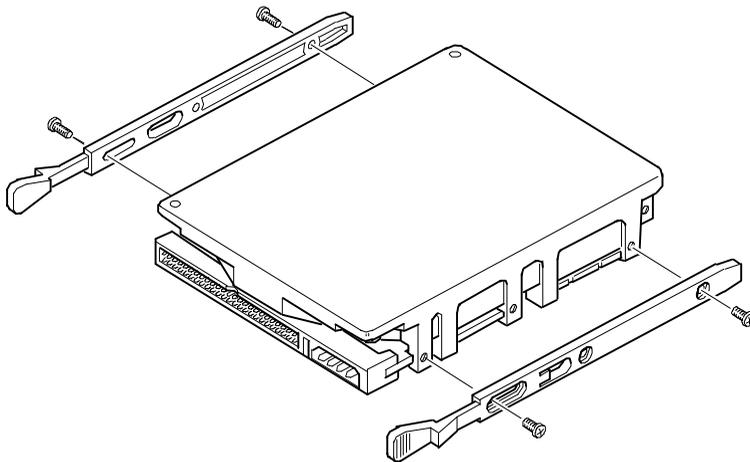
DEC00245

Figure 6-3. Installing Expansion Brackets (Internal Drive Bay)

5. Pivot the internal drive bay out to about a 45-deg. angle from the chassis.

6. Pivot out the retaining arm and insert it in the bracket to stabilize the drive bay.

7. Insert the device into the drive bay slot.

8. Secure the device to the slot using the supplied mounting screws.
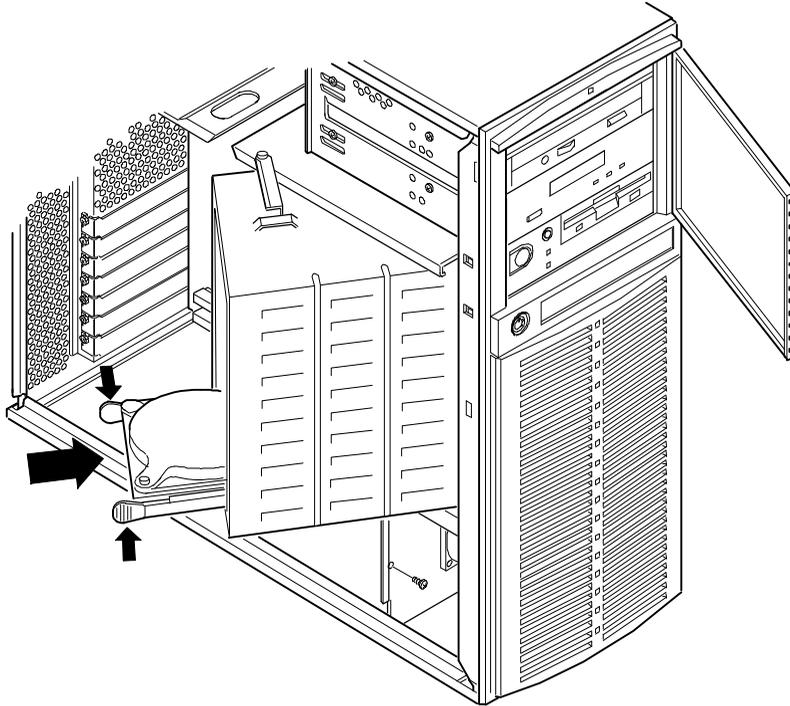
DEC01091

Figure 6-4. Installing a 3½-Inch Device Into the Internal Drive Bay

Connecting an External SCSI Storage Box

SCSI termination is provided by a 'soft switch' setting in "SCSI Select." Select the adapter setting on one end and terminate the other end at the bulkhead.

To connect an external SCSI storage box:

1. Power down the Prioris XL 6000 Series server.

2. Remove the terminator from the external wide SCSI connector at the rear of the server.

3. Connect the external SCSI storage box cable to the external wide SCSI connector at the rear of the server.

4. Determine that the external storage box is properly terminated.
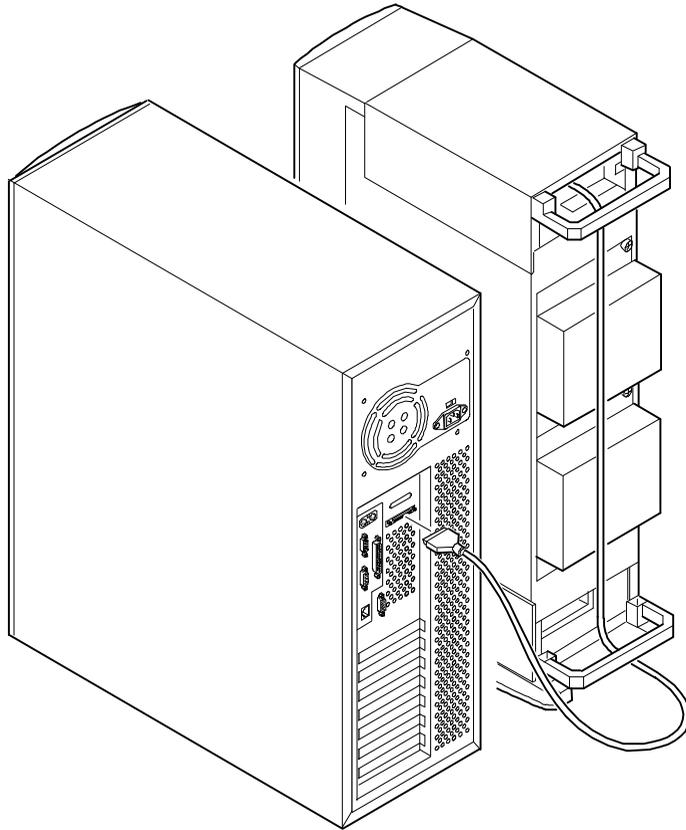
DEC01094

Figure 6-5. Connecting an External SCSI Storage Box

Installing Expansion Boards 7

Introduction

This chapter contains the configuration guidelines that must be followed prior to installing ISA or PCI expansion boards as well as detailed installation procedures. Note that PCI expansion boards can be SCSI.

ISA Expansion Board Configuration Guidelines

- ISA slots one and two support industry-standard 16-bit ISA boards.

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

- You must run the SCU before installing any ISA expansion board to view assigned IRQs and addresses for other options.
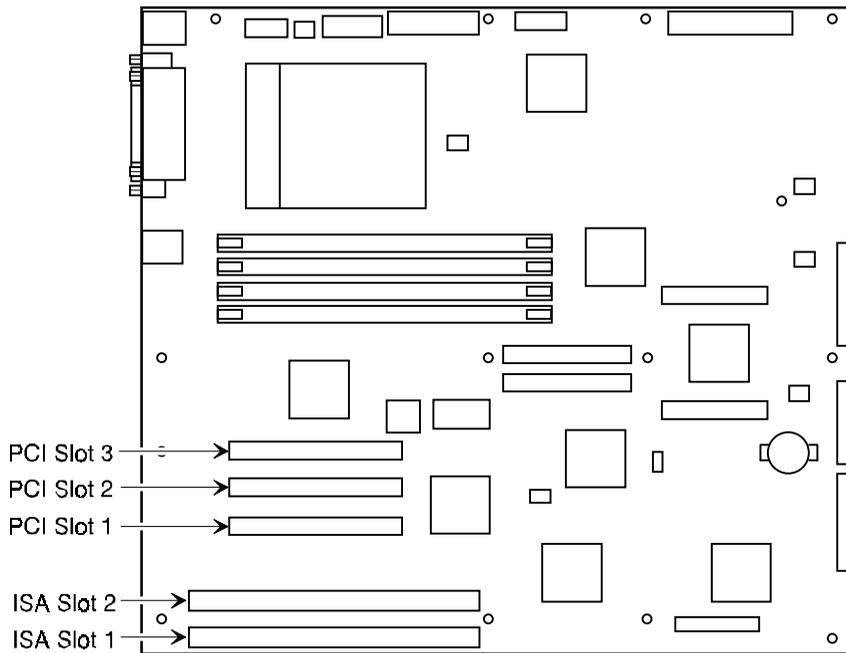
DEC01088-7

Figure 7-1. Expansion Board Slot Locations

PCI Expansion Board Configuration Guidelines

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

- PCI boards should be installed starting in PCI slot one.

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

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

Configuring Your PCI Expansion Boards Using the SCU

When installing PCI expansion boards in your server, the SCU must be run to configure these boards. For PCI expansion boards, the SCU will autodetect the boards and assign IRQs to the boards. The ROM addresses for these PCI expansion boards will be assigned based on the PCI scan order and address availability.

Boot Devices

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

- Embedded SCSI controller
- PCI expansion slot

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

Server Boot Sequence

The server boot sequence is as follows:

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

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

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

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

   Drive C can be attached to the embedded SCSI controller or a PCI expansion board.

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

Server Scan Sequence

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

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

2. PCI slots are scanned in ascending order starting with slot 1.

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

    For each device found, the server scans to see if there are any additional PCI busses on that controller. As PCI busses are detected, they are assigned the next available PCI bus number in sequence. A controller such as the Adaptec 2940W has no additional PCI busses onboard. They would represent a single device on PCI bus 0 if installed in PCI slots 1 - 3.

    The slot priorities are summarized as:

| Priority	Slot #
1	Slot 1 (Bus 0, Device 0Dh)
2	Slot 2 (Bus 0, Device 0Eh)
3	Slot 3 (Bus 0, Device 0Fh)
4	Embedded SCSI controller

Boot Device Assignment Example

In this example, the assumption is that "PCI slots" is the selected boot sequence preference in the SCU.

PCI Scan Order Example

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

In this example, the scanning begins with PCI slot 1 (PCI bus 0) and the two channel SCSI controller. The two channel SCSI controller has an internal PCI bus, which is now seen as PCI bus 1. Channel 1 and Channel 2 of this controller are detected in that order, as Channel 1 has a lower PCI device number. Finally the 2940W is detected in PCI slot 3. The first device found during the scan that is bootable will be the boot device. So, if all the drives in this example were bootable, the boot device would be the drive attached to Channel 1 on PCI Bus 1 of the two channel SCSI controller (see figure 7-2).
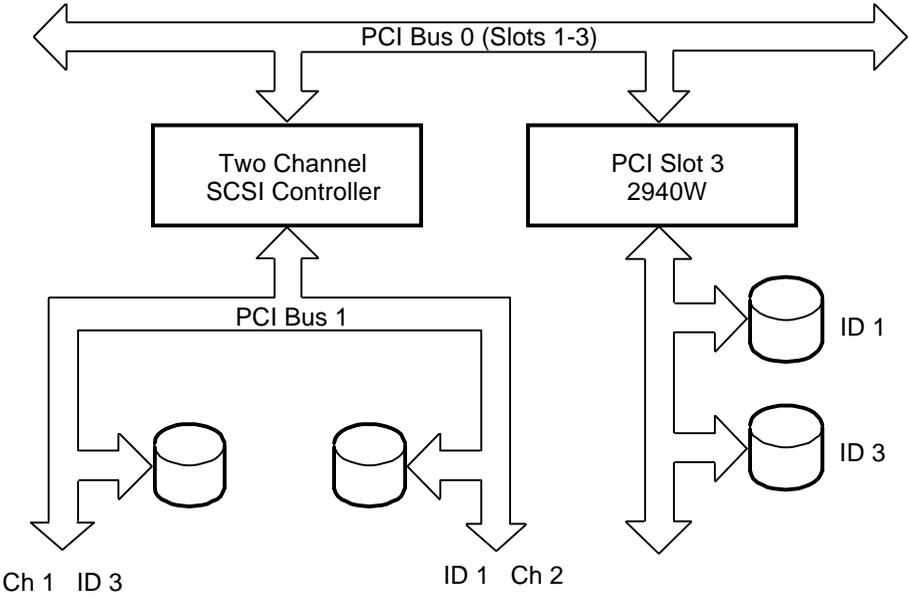
DEC01035

Figure 7-2. PCI Scan Order

Identifying PCI Devices in the SCU

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

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

- PCI 1   PCI SCSI Device   IRQ15

- PCI 1   PCI SCSI Device   IRQ14

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

- PCI 3   PCI SCSI Device   IRQ10

- PCI SCSI Device

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

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

- VGA

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

- PCI 1   PCI Memory Controller   IRQ14
- PCI 2   PCI SCSI Controller   IRQ10
- PCI SCSI Controller
- PCI SCSI Controller
- PCI SCSI Controller (7880)
- PCI Ethernet Controller
- PCI VGA

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

Installing Expansion Boards

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

Adding ISA Expansion Boards

Perform the following steps before installing ISA expansion boards:

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

2. Select "Step 2: Add and Remove 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 3: Change Configuration Settings," to view or change the configuration settings for any ISA expansion board you are going to install in your server.

4. Select "Step 4: Save Configuration," to save your configuration settings to CMOS and to a backup file (.CMS file).

5. Select "Step 5: View Switch/Jumper Settings," to view manufacturer's instructions about setting switches and jumpers and to run the necessary utilities to ensure the correct configuration of each expansion board.

6. Select "Step 6: Exit," to exit the SCU.

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

   Refer to "Installing ISA Expansion Boards."

Installing ISA Expansion Boards

To install an ISA expansion board:

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

1. Run the SCU.

2. Turn off your server.

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

4. Unlock and remove the side panel.

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

DEC01092-2

Figure 7-3. Removing a Metal Filler Plate

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

DEC01093-2

Figure 7-4. Installing an ISA Expansion Board

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

8. Replace and lock the side panel.
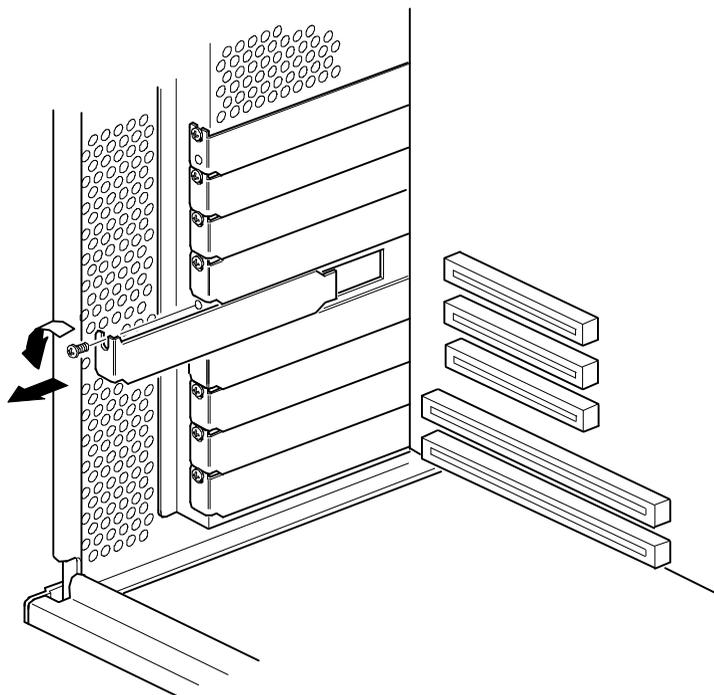
9. Connect all external devices and restore power.

Installing PCI Expansion Boards

To install a PCI expansion board:

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

1. Turn off your server.

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

3. Unlock and remove the side panel.

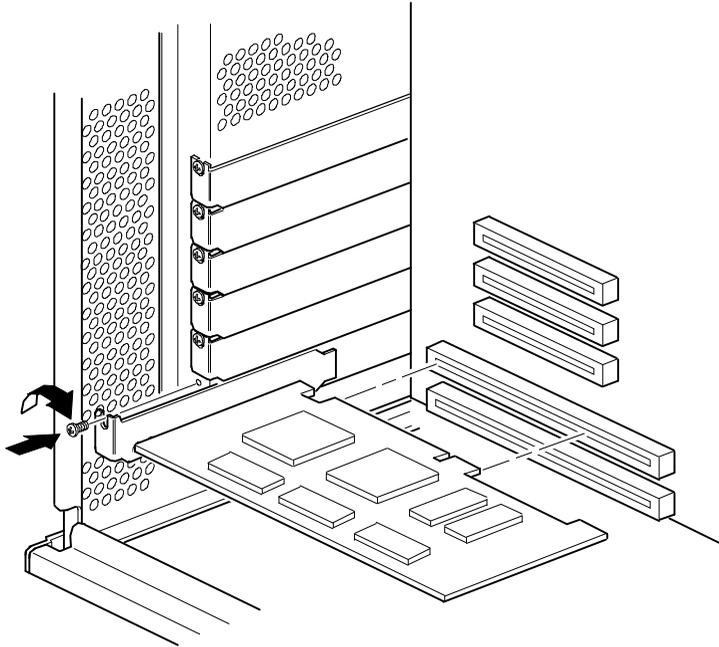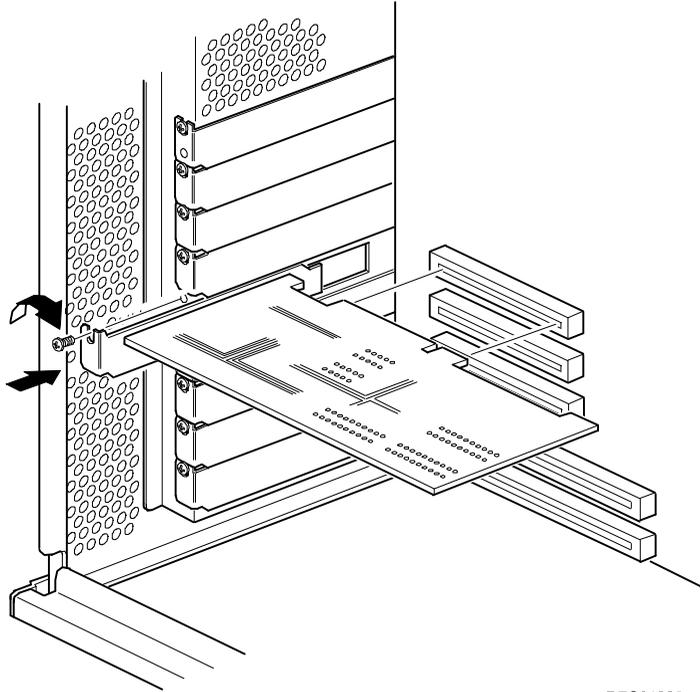4. Unscrew and remove the metal filler plate from the selected PCI expansion slot.

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

DEC01092-3

Figure 7-5. Installing a PCI Expansion Board

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

7. Replace and lock the side panel.

8. Connect all external devices and restore power.

9. Run the SCU.

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

Adding PCI Expansion Boards

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

Perform the following steps after installing PCI expansion boards:

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

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

   Refer to the documentation that shipped with your PCI device.

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

3. Select "Step 4: Save Configuration," to save your configuration.

4. Select "Step 6: Exit," to exit the SCU.

Relocating Expansion Boards

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

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

2. Select "Step 2: Add and Remove Boards."

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

4. Select "Step 4: Save Configuration," to save your configuration.

5. Select "Step 6: Exit," to 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. (Prioris XLe 6000 Series configurations cannot run the SCU from the ServerWORKS Quick Launch CD-ROM disc without an optional bootable CD-ROM drive installed.)

Connecting SCSI Adapters 8

Introduction

This chapter contains the configuration guidelines that must be followed when connecting the SCSI controller to optional disk and tape drives.

SCSI Configuration Guidelines

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

- Run the SCSI configuration utility to change controller settings to fit your specific configuration.

  Refer to Chapter 8 for additional SCSI configuration guidelines.

SCSI Controller Cable Configuration

The following section describes the SCSI controller cable configuration for your Prioris XL 6000 Series server.
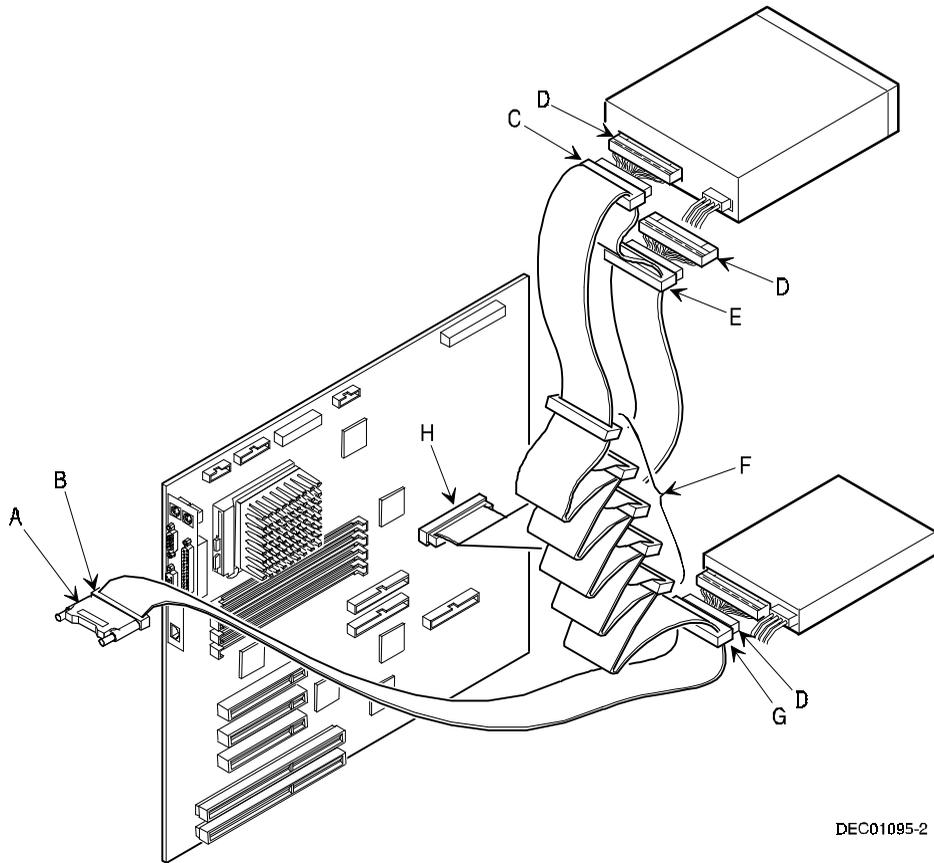
Single Channel SCSI Configuration

To connect SCSI devices, perform the following:

1. Power down the server.

2. Disconnect all peripheral devices from the server.

3. Unlock and remove the side panel.

4. Connect the cables as shown in Figure 8-1.

5. Replace and lock the side panel.

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

7. Run the SCU utilities to configure your server.

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

Figure 8-1 Legend	Component
A	External wide SCSI 67-pin terminator
B	External wide SCSI 67-pin connector
C	Wide SCSI 67-pin connector to CD-ROM drive (option on XLe configuration)
D	67-pin to 50-pin SCSI adapter
E	Wide SCSI 67-pin connector to tape drive
F	Wide SCSI 67-pin connectors (for internal SCSI devices)
G	Wide SCSI 67-pin connector to SCSI hard disk drive
H	Adaptec 7880 wide SCSI 67-pin connector to main logic board

DEC01095-2

Figure 8-1. Single Channel SCSI Configuration

Server Security Features *9*

Introduction

Server security is important to prevent theft or accidental loss of software and hardware. The Prioris XL 6000 Series server provides the following levels of protection:

- Security door and side panel chasis lock—located at the front of your server.

- Padlock ring—located at the rear of your server

- Supervisor password

- Additional security features

Security Door and Side Panel Chassis Lock

Your server has a three-way keylock used to prevent unauthorized access to the front panel security door and left side panel. To open the security door, insert the key into the keylock at lock position number 2 and then turn the key clockwise to lock position number 1. To open the side panel, continue to turn the key clockwise to the unlock position.

CAUTION: Be careful not to lose your server keys. Losing these keys prevents you from opening the front panel security door and gaining access to the inside of the server. Contact your authorized service provider or authorized dealer for information on replacing lost keys.
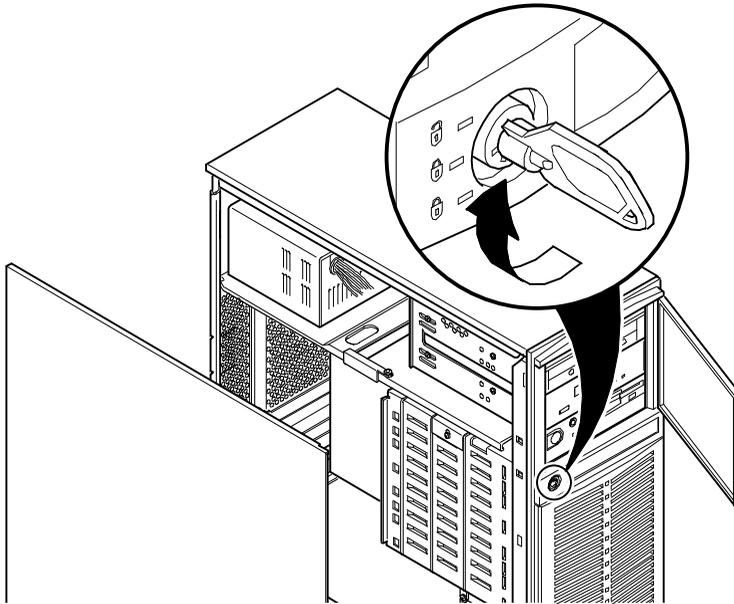
Figure 9-1. Security Door and Side Panel Chassis Lock

Padlock Ring

Your server has a padlock ring located at the bottom of the rear panel. This ring allows you to secure the server with your own padlock to prevent theft.

Administrative and User Password

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

After memory check (post boot), press [F1} to access the CMOS Menu.

1. Access the Security Subsystems Group menu and then select the Administrative Password Option.

2. Type in an administrative password in the Enter Password field and then press [Enter].

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

4. If desired, set a user password.

5. Highlight the Set User Password Option field and then follow the method described in step 2.

6. Exit the SCU and then reboot your server.

7. Your server runs the POST and then prompts you for the password you just 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 side panel.

2. Change jumper J36B to password clear (place a jumper over pins 2 and 3).

   Refer to Figure 9-2 for the jumper locations.
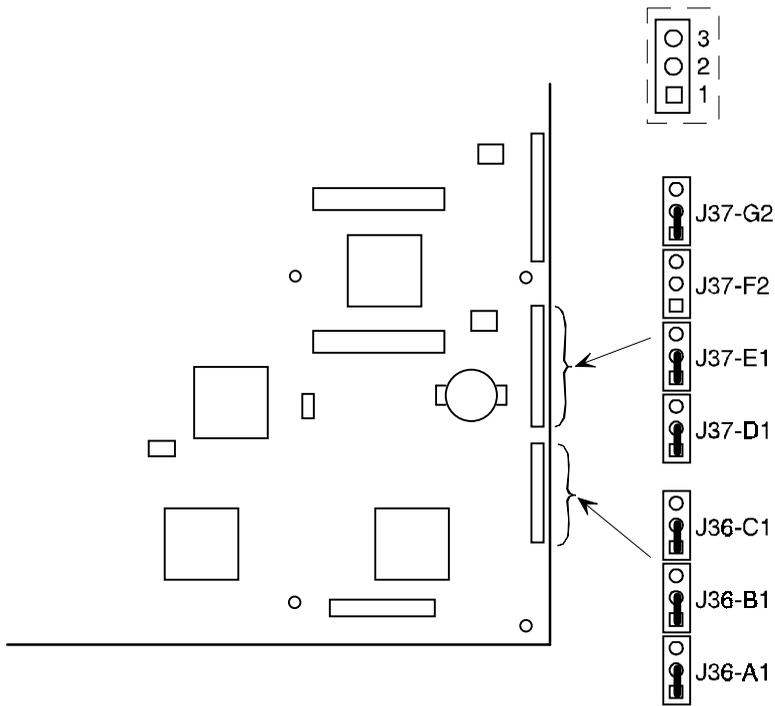
DEC01189

Figure 9-2. Configuration Jumper Blocs

3. Reconnect your server and turn it on.

    Booting your server with the a jumper installed over J36B pins 2 and 3 erases the existing password(s).

4. Turn off your server.

5. Change jumper J36B to protect (place a jumper over pins 1 and 2).

6. Replace the side panel.

7   Reconnect your server and turn it on.

8. Assign a new password.

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

Additional Security Features

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

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

- Floppy Writes — Setting this option to `Disabled` prevents unauthorized personnel from writing data to a diskette.

- Video Blanking — Setting this option to `Enabled` requires a password to reactivate the monitor after a set period of keyboard inactivity.

Troubleshooting *10*

Introduction

This chapter provides initial troubleshooting procedures. The tables that follow list specific problems, probable causes, and recommended actions to take if your server fails. Tables include:

- Server Troubleshooting

- Disk Drive Troubleshooting

- Tape Drive Troubleshooting

- Monitor Troubleshooting

- CD-ROM Troubleshooting

- Diskette Drive Troubleshooting

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

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

Initial Troubleshooting

Follow these general procedures to troubleshoot your Prioris XL 6000 Series server.

- Record all configuration information and have it readily available.

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

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

- Ensure that all cables and connections are secure.

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

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

- Try to duplicate the problem.

- Run the diagnostic software. Refer to the next section "Running the Diagnostics."

- Run the SCU.

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

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

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

- Contact Digital Services for software or hardware related problems.

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

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

Running the Diagnostics

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

The diagnostics are available from:

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

> **NOTE:** If your server is not equipped with a CD-ROM drive, take the CD-ROM disc to another personal computer that has a CD-ROM drive to create a bootable diagnostic diskette.

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

`c:\diag\diagnose.bat`

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

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

Once the diagnostics are started, the main screen appears.

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

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

Diagnostics Utility Keys

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

Server Troubleshooting

Problem	Possible Cause	Action
No response when the server is turned on.	Server is not plugged in.	Turn off the server, plug it in, and then turn it back on again.
	No power at the wall outlet.	Use another wall outlet.
	Main logic board failed.	Contact your authorized service provider.
	Main logic board jumpers incorrectly set.	Set all appropriate jumpers.
	CPU has failed.	Contact your authorized service provider.
	Power supply failed.	Contact your authorized service provider.

continued

Problem	Possible Cause	Action
Power is on, but there is no screen display.	Brightness and contrast controls are not correctly set.	Adjust the brightness and contrast controls.
	Monitor is off.	Turn on the monitor.
	Monitor cable is incorrectly installed.	Check all monitor connections.
	Incorrect video drivers installed.	Install the correct video drivers.
	Video controller has failed.	Contact your authorized service provider.
	Monitor has failed.	Replace monitor or contact your authorized service provider.
Server does not boot from CD-ROM drive.	CD-ROM drive is not connected to the Adaptec controller.	Connect the CD-ROM to the Adaptec controller. Refer to Chapter 9.
	CD-ROM drive not configured as a bootable device.	Change the CD-ROM setting to "bootable" using SCSI*Select*.
	CD-ROM disk is not bootable.	Contact your Digital representative for the latest BIOS.
Server operates incorrectly after installing a new CPU.	CPU installed incorrectly.	Reinstall CPU.

continued

Problem	Possible Cause	Action
Server operates incorrectly after installing optional expansion board.	Expansion board installed incorrectly.	Remove expansion board and reinstall.
	Did not run SCU to configure expansion board after installation.	Run the SCU to properly configure expansion board. Refer to Chapter 8.
	Did not install CFG file for expansion board.	Run SCU and add CFG file (if necessary).
	Expansion board has failed.	Remove expansion board and reboot. If server boots without errors, replace expansion board.
Server operates incorrectly after installing optional memory (DIMMs).	Memory configured incorrectly.	Check that the memory configuration is according to the memory guidelines explained Chapter 6, "Installing Additional Memory."
	DIMMs installed incorrectly.	Remove DIMMs and reinstall.
	DIMMs have failed.	Replace DIMMs.

continued

Problem	Possible Cause	Action
No response to keyboard commands.	Keyboard might be password protected by a local or remote control program.	Enter the keyboard password.
	Keyboard is not connected.	Power down the server and connect the keyboard.
	Keyboard failed.	Replace keyboard or contact your authorized service provider.
No response to mouse commands.	Mouse might be password protected by a local or remote control program.	Enter the keyboard and mouse password.
	Mouse is not connected.	Power down the server and connect the mouse.
	Mouse driver not installed.	Install the appropriate mouse driver.
	Mouse trackball dirty.	Clean trackball.
	Mouse failed.	Replace mouse or contact your authorized service provider.
Server operates correctly but application software does not.	Application software installed incorrectly.	Refer to your application software documentation.
	Having external cache enabled causes conflict with application software.	Run the SCU and disable external cache. Refer to Chapter 3 and Appendix C.

Disk Drive Troubleshooting

Problem	Possible Cause	Action
Server does not recognize an internal SCSI device.	SCSI device jumpers incorrectly set.	Refer to the supplied kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied kit installation instructions.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	SCSI host adapter has failed.	Contact your authorized service provider.
	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI host adapter and SCSI device.	Refer to Chapter 9 for cabling information.
	External SCSI terminator not installed.	Install the external SCSI terminator at the rear of the server. Refer to Chapter 9.
	SCSI device has failed.	Replace SCSI device.

Problem	Possible Cause	Action
Server does not recognize an external SCSI device.	SCSI device jumpers incorrectly set.	Refer to the supplied kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied kit installation instructions.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	SCSI controller has failed.	Contact your authorized service provider.
	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI controller and rear panel connector or external SCSI device and rear panel connector.	Refer to Chapter 9 for cabling information.
	SCSI device has failed.	Replace SCSI device.

continued

Problem	Possible Cause	Action
Server does not boot from an internal SCSI hard disk drive.	SCSI boot hard disk drive not formatted.	Format the SCSI hard disk drive.
		CAUTION: Formatting the SCSI hard disk drive will destroy all the data on the drive.
	SCSI device drivers not installed or incorrectly installed on SCSI boot hard disk drive.	Properly install all required SCSI device drivers. Refer to Chapter 2.
	Operating system software is not installed on the SCSI boot hard disk drive.	Install the appropriate operating system.
	Requested partition does not exist.	Partition the SCSI hard disk drive and then reload the operating software.
	SCSI boot hard disk drive at wrong SCSI address.	Set SCSI boot hard disk drive to lowest "primary" SCSI address.
	SCSI device has failed.	Replace SCSI device.
SCSI hard disk drive cannot read or write information.	Incorrect disk drive jumper settings.	Refer to the supplied kit installation instructions.
	Loose or incorrectly installed cables.	Make sure all cables are correctly installed.
	SCSI hard disk drive is not correctly formatted or partitioned.	Format and partition as required using the supplied operating system.
	SCSI hard disk drive failed.	Replace SCSI hard disk drive.

Tape Drive Troubleshooting

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

Monitor Troubleshooting

Problem	Possible Cause	Action
Monitor power indicator is not on.	Monitor is turned off.	Turn on the monitor.
	Power cord is not connected.	Connect the power cord to the server.
	No power at wall outlet.	Use another outlet.
	Power indicator is defective.	Contact your authorized service provider.
No screen display.	Configuration error.	Run the SCU to configure the server for video operation.
	Monitor brightness and contrast controls are incorrectly set.	Adjust the monitor brightness and contrast controls.
	Monitor has failed.	Replace monitor, or contact your authorized service provider.
Distorted, rolling, or flickering screen display, or wrong/uneven color.	Monitor incorrectly adjusted.	Adjust accordingly.
	Monitor signal cable incorrectly installed.	Straighten any bent connector pins and then reconnect.
Color monitor displaying monochrome.	Server was turned on before the monitor was turned on.	Turn off the server, turn on the monitor, then turn the server back on.
Monitor fails to switch to high-resolution mode.	Appropriate high-resolution video drivers are not installed or incorrectly installed.	Correctly install all appropriate high-resolution video drivers. Refer to the documentation supplied with your monitor.

CD-ROM Troubleshooting

Problem	Possible Cause	Action
Cannot access the CD-ROM drive. Error message reading drive x.	Device drivers not installed.	Install correct device drivers.
	No disk in the CD-ROM drive.	Insert a disk.
	Incorrect SCSI ID assigned.	Make sure correct SCSI ID is assigned. Refer to Chapter 7.
	Tray open.	Close the tray.
Power is on but indicator shows no activity.	No disc or tray is open.	Insert a disk and close the tray.
	Check cable connections.	Make sure cables are correctly connected.
Disk is spinning but drive is idle.	Application software not running.	Run application software.

Diskette Drive Troubleshooting

Problem	Possible Cause	Action
Target diskette drive cannot read or write information.	Diskette is not formatted.	Format the diskette.
	Diskette is worn or damaged.	Try another diskette.
	Diskette is write-protected.	Slide the write-protect switch so the hole is not visible.
	Diskette drive is empty.	Insert a diskette.
	Diskette write protection enabled.	Run the SCU and set the Diskette Write Protection option to "Disabled."
	Disabled in SCU.	Run the SCU and enable the diskette drive.
Server does not boot from a target diskette drive.	Drive ID incorrectly set.	Make sure the drive ID is correctly set. Refer to the documentation that came with the diskette drive.
	Diskette drive not enabled.	Run the SCU and enable the diskette drive.
	Diskette boot option disabled.	Run the SCU and set boot option A then C.
	Diskette does not contain start-up files.	Insert a diskette with the correct start-up files.
	Diskette drive is empty.	Insert a diskette that contains an operating system.
	Diskette is worn or damaged.	Try another diskette.
	Loose cables.	Secure all cable connections.
Cannot write to target diskette drive.	Diskette drive write protected.	Run the SCU and disable the diskette write protection option.

Technical Specifications A
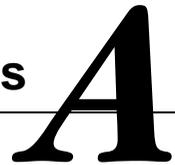
Introduction

This appendix provides the following technical characteristics for your server:

- Server specifications
- ISA expansion slots
- PCI expansion slots
- Power supply input power requirements
- Power supply output specifications
- Power cord requirements
- Main logic board jumper settings
- Server CPU voltage and temperature ranges

Server Specifications

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

Performance Specifications

Attributes	Specification

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

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

Memory	72-bit DIMMs, single-banked, ECC memory 72-bit DIMMs, double-banked, EDO memory 32 MB minimum (16 MB minimum, Prioris XLe 6000 Series configuration) 512 MB (ECC protected memory) maximum
System flash ROM BIOS	128 KB
VGA flash ROM BIOS	128 KB

Server Dimensions

Dimension	Specification
Width	190.5 mm (7.5 in.)
Length	469.9 mm (18.5 in.)
Height	487.6 mm (19.2 in.)
Weight	18 kg (39.6 lb.)

Environmental Specifications

Attributes	Specification
Operating temperature	10°C to 35°C (50°F to 95°F)
Storage temperature	−20°C to 65°C (−4°F to 149°F)
Operating humidity (noncondensing)	20% to 80% relative humidity, maximum wet bulb 35°C (95°F)
Storage humidity (noncondensing)	10% to 90% relative humidity, maximum wet bulb 65°C (149°F)
Altitude	
Operating	2,438 m (8,000 ft) maximum
Nonoperating	4,876 m (16,000 ft) maximum
Shipping vibration	IAW Federal Standard 101, method 5019
Nonoperating shock	30 G, 25 ms halfsine

ISA Expansion Slots

The main logic board contains two ISA 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 Input Power Requirements

The 300 W power supply provides five dc voltages: +12 V dc, −12 V dc, +5 V dc, −5 V dc, and 3.3 V dc. These voltages are used by the various components within the server. The following lists the input power requirements.

Rated Voltage Range	Maximum Range	Rated Input Current[1]	Operating Frequency Range
100 V ac - 120 V ac	88 V ac - 132 V ac	7 A	47 Hz - 63 Hz
220 V ac - 240 V ac	176 V ac - 264 V ac	3.5 A	47 Hz - 63 Hz

[1] Includes outlet current

Power Supply Output Specifications

Your server family power supply provides the following output ratings:

- +5 V dc   0 A min, 38 A max.

- +3.3 V dc   0 A min, 35 A max.

- +12 V dc   0 A min, 7 A max.

- −12 V dc   0 A min, 0.5 A max.

- −5 V dc   0 A min, 0.5 A max.

Power Cord Requirements

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

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

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

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

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

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

Environmental Features

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

Ozone Depleting Substances (ODS)	This product and its shipping package do not contain nor are they manufactured with Class I ODS, as defined in Title VI, section 611 of the clean air act amendments of 1990.
Use of asbestos	Digital Equipment Corporation does not use asbestos in any form in the manufacturing of its products.
Recycled paper in documentation	User documentation is printed on paper with a post-consumer recycled content of between 10 and 60%.
Use of PVC in enclosure pieces	Polyvinylchloride (PVC) is not used in plastic enclosure pieces.
Design for disassembly/re-cycling	This product has been designed for ease of disassembly so that materials can be easily separated for recycling at the end of the product's useful life. One type of fastener is generally used to minimize tools required to disassemble. Plastic components have been marked with standard identification symbols to facilitate separation for recycling. Snap fit fastening techniques have been used, where possible, to reduce disassembly effort. Fastening of dissimilar materials can be disconnected, allowing materials to be separated for recycling.
Environmental packaging features	The outer container on this product is made from unbleached, natural Kraft corrugated fiberboard which can be readily recycled in most areas. Protective cushioning pieces are made from expandable polypropylene which is more efficient than other foams and requires less material to provide equivalent protection, thereby reducing packaging waste. The cushioning pieces are marked with the Society of the Plastics Industry (SPI) material identification symbol for polypropylene to facilitate recycling.

Main Logic Board Jumper Settings

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

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

Feature	Function	Setting	Description
CMOS clear	Protect[1]	J36A, pins 1 and 2[1]	Preserves the contents of NVRAM.
	Erase	J36A, pins 2 and 3	Replaces the contents of NVRAM with the manufacturing default settings.
Password clear	Protect[1]	J36B, pins 1 and 2[1]	Maintains the current server password.
	Erase	J36B, pins 2 and 3	Clears the password.
Flash program	Protect[1]	J36C, pins 1 and 2[1]	Prevents writing to the BIOS boot block.
	Erase/Program	J36C, pins 2 and 3	Permits boot block erasing and programming.
Intrusion detection disable	Enable[1]	J37D, pins 1 and 2[1]	Activates intrusion alarm switch on the chassis. The switch then detects and signals when the chassis side panel is removed.
	Disable	J37D, pins 2 and 3	Deactivates the intrusion alarm switch.
Recovery boot	Normal boot[1]	J37E, pins 1 and 2[1]	Enables the server to boot from the normal BIOS.
	Recovery boot	J37E, pins 2 and 3	Enables the server to boot from the recovery BIOS if the normal BIOS gets corrupted and you are unable to reload a fresh copy of the BIOS from diskette.
Processor core clock	166 MHz	J37F, pins 1 and 2	Selects the processor core frequency, which in turn determines the operating frequencies of processor and PCI busses.
	180 MHz	J37F, pins 2 and 3	
	200 MHz	J37G, pins 1 and 2[1]	

(1) Factory default setting

DEC01088-8
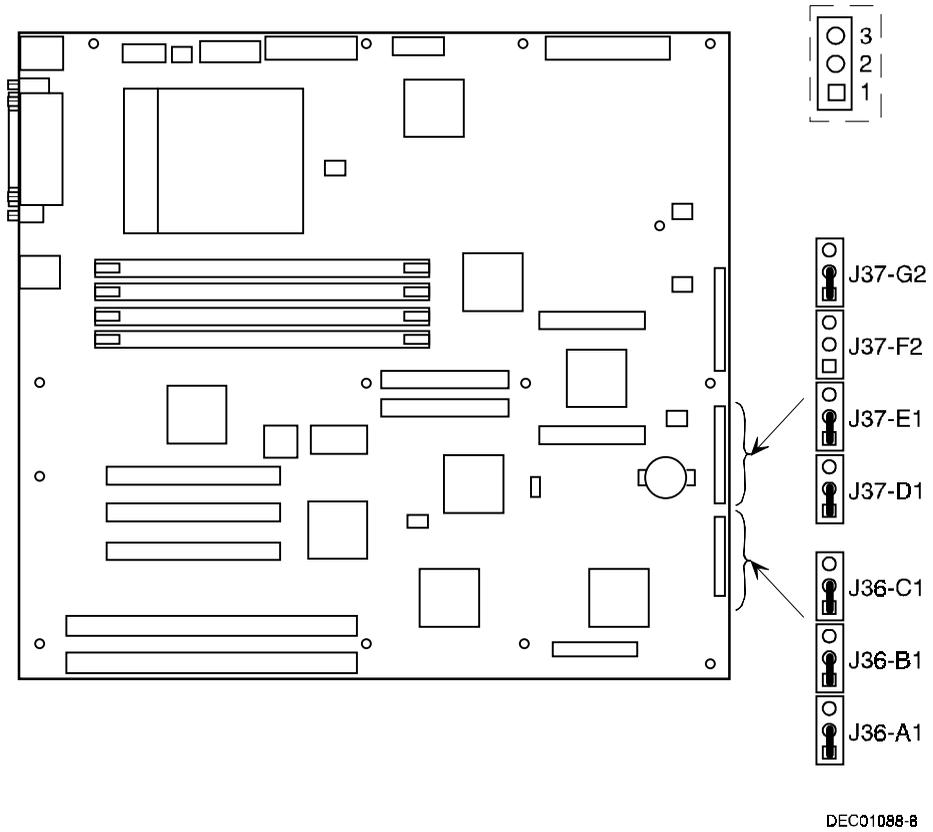
Figure A-1. Main Logic Board Jumper Locations

Server CPU Voltage and Temperature Ranges

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

CPU Voltage Range

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

VRM Voltage Range

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

Device Mapping B

Introduction

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

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

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

CPU Memory Address Map

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

I/O Address Map

Range (hexadecimal)	Function
060 to 064	Keyboard/mouse controller
0F8 to 0FF	Math co-processor
1F0 to 1F7	IDE controller (if enabled)
378 to 37F	LPT2 (if enabled)
2E8	COM4 (if enabled)
2F8	COM2 (if enabled)
3BC to 3BF	LPT1 (if enabled)
278 to 27F	LPT3 (if enabled)
3E8	COM3 (if enabled)
3F0 to 3F5	Diskette controller (if enabled)
3F8	COM1 (if enabled)

Server Interrupt Levels

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

PCI Configuration Space Address Map

PCI Bus No.	Device No.	Device
0	00h	Host bridge
0	07h	ISA bridge
0	08h	PCI slot 1
0	09h	PCI slot 2
0	0Ah	PCI slot 3
0	0Ch	AIC7880 ultra SCSI
0	0Dh	Ethernet controller
0	12h	Video controller

SCU Features C
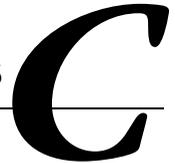
Introduction

After entering the SCU, you can edit a variety of resources and configure your server for the most optimized condition. The six steps or menu items of the SCU, listed as menu pages below, provide the necessary options to configure your server.

```
SYSTEM CONFIGURATION UTILITY, Release x.xx, © 1995
1996 American Megatrends Inc.

Step 1: About System Configuration

Step 2: Add and Remove Boards

Step 3: Change Configuration Settings

Step 4: Save Configuration

Step 5: View Switch/Jumper Settings

Step 6: Exit
```

Step 1:   `About System Configuration`
Use this step to learn more about configuring your system and to obtain information about the AMI SCU..

Step 2:   `Add and Remove Boards`
Use this step if you want to manually add or delete ISA boards or to move boards from one slot to another, use this step.

Step 3:   `Change Configuration Settings`

System Board	**System Board**
PCI Ethernet Device	Bus 0 Dev A
PCI VGA Device	Bus 0 Dev 14
PCI SCSI Device	Bus 0 Dev D
PCI Multifunction Device	Bus 0 Dev 12

This step is optional, you may skip it by pressing [Esc] and all configuration settings will remain unchanged.
Press [Enter] to view or change a board's configuration settings.
Press [ESC] when you are satisfied with the current settings

After all the desired settings have been made, use the next three steps to complete the `Change Configuration` process and exit the SCU.

Step 4:   `Save Configuration`
Saves the configuration settings to nonvolatile RAM and into a backup file (the CMS File).

Step 5:   `View Switch/Jumper Settings`
Displays graphically what the DIP switches and jumpers are set at on any board that has jumpers or switches.

Step 6:   `Exit`
Once changes have been made this step exits to the DOS prompt.

The following tables list the options that are available in the SCU.

Systems Group

Menu Fields	Settings	Comments
System identification string	Not user selectable	Displays the system identification screen.
Config and overlay version	Not user selectable	Displays the SCU configuration and overlay version number.
BIOS version string	Not user selectable	Displays the BIOS version, X.XX.XX.DMO.
System processor	Not user selectable	Displays Pentium Pro processor at XXX MHz.
System performance power-on speed option	Fast[1] Slow	Sets the processor speed at power up.

[1] Factory default setting

Memory Subsystem Group

Menu Fields	Settings	Comments
Base memory options	640 KB base memory[1] 512 KB base memory	Sets the server's base memory size.
Shadowing ISA ROMs options	Press Enter	Press Enter to modify the shadowing options.
Extended memory options (cache, 1 MB ISA hole)	15 MB extended memory 256 KB cache	Sets the extended memory or cache size options.

(1)   Factory default setting

Onboard Disk Controllers

Menu Fields	Settings	Comments
Onboard floppy controller	Enable[1] Disable	Enables or disables the onboard diskette controller. The onboard diskette controller must be disabled if an external diskette controller performs the interfacing to the diskette drives.
Primary onboard IDE controller	Enable[1] Disable	Enables or disables the primary onboard IDE controller.
Secondary onboard IDE controller	Enable[1] Disable	Enables or disables the secondary onboard IDE controller.

(1)   Factory default setting

Onboard Communication Devices

Menu Fields	Settings	Comments
Serial port 1 configuraion	Port: 3F8h (IRQ4)[1] Port: 2F8h (IRQ3) Port: 3E8h (IRQ4) Port: 2E8h (IRQ3) Port 1 disable	Enables or disables onboard serial port 1 at the specified address and IRQ.
Serial port 2 configuration	Port: 2F8h (IRQ3) [1] Port: 3F8h (IRQ4) Port: 2E8h (IRQ3) Port: 3E8h (IRQ4) Port 2 disable	Enables or disables onboard serial port 2 at the specified address and IRQ.
Parallel port configuration	Port: 378h (IRQ7) [1] Port: 278h (IRQ5) Port: 3BCh (IRQ7) Port: 2E8h (IRQ3) Parallel port disable	Enables or disables the onboard parallel port at the specified address and IRQ.
Parallel port mode	ISA compatible[1]	Selects the standard printer connection.
	PS2 mode	Selects the PS/2 compatible mode to receive data.
	Extended mode	Selecting EPP 1.7 or EPP 1.9 is based on what EPP version your printer supports. If you are not sure what version your printer supports, use the default setting.
	ECP mode	Sets the Extended Capabilities Port (ECP) mode.

[1] Factory default setting

Floppy Drive Subsystems Group

Menu Fields	Settings	Comments
Floppy drive A options	3.5" 1.44 MB drive[1] 5.25" 360 KB drive 5.25" 1.2 MB drive 3.5" 720 KB drive 3.5" 2.88 MB drive Disable or not installed	Sets the size and density of diskette drives.
Floppy drive B options	Disable or not installed[1] 3.5" 1.44 MB drive 5.25" 360 KB drive 5.25" 1.2 MB drive 3.5" 720 KB drive 3.5" 2.88 MB drive	Sets the size and density of diskette drives.

[1] Factory default setting

BIOS Language Support Group

Menu Fields	Settings	Comments
Current BIOS language	English (US)[1] Español (SP) Italiano (IT) Français (FR) Deutsch (GR)	Enables you to select a desired language.

[1] Factory default setting

Keyboard (KB) and Mouse Subsystem Group

Menu Fields	Settings	Comments
Numlock	Off at boot[1] On at boot	Selects the keyboard Numlock option.
Typematic speed	Auto[1] 6 char/sec 8 char/sec 10 char/sec 12 char/sec 15 char/sec 20 char/sec 24 char/sec 30 char/sec	Sets the number of times a second to repeat a keystroke while you hold the key down.
Mouse control option	Mouse auto detected	This option auto detects whether or not a mouse is connected to the server.

[1] Factory default setting

Console Redirection

Menu Fields	Settings	Comments
COM port for redirection	Disable[1] Redirection on COM1 @ E4000 Redirection on COM2 @ E4000	Enables you to redirect your server's COM1 or COM 2 serial ports.
Serial port baud rate	2400 baud 9600 baud 19.2K baud 115.2K baud[1]	Enables you to set a specific baud rate for modem data transfers.
Hardware flow control	None CTS/RTS[1] CTS/RTS & Xoff/Xon	Enables you to set hardware flow control options for modem data transfers.
Select terminal type	ANSI	Enables you to select the ANSI terminal type for modem data transfers.

[1] Factory default setting

Security Subsystems Group

Menu Fields	Settings	Comments
Administrative password option	Disable[1] Enable	Press [Enter] to display the Password Menu. After entering a new password, <Tab> down to verify the password.
	Enter password	Type your administrative password in the enter password field.
	Verify password	Verify your administrative password by typing it in the verify password field.
User password option	Disable[1] Enable	Press [Enter] to display the Password Menu. After entering a new password, [Tab] down to verify the password.
	Enter password	Type your user password in the enter password field.
	Verify password	Verify your user password by typing it in the verify password field.
Hot key option	Disable[1]/ [Ctrl-Alt-?]	Press [Enter] to display the menu.
	Disable Enable	[Tab] down to Enable, and then [Tab] to Enter New Hot Key. Type one character, either a letter or number.
Lock out timer	Disable[1]/ [1-127 minutes]	Press [Enter] to display the menu.
		Enter the number of minutes of keyboard inactivity to lock your server's keyboard. Once locked, an administrative or user pasword is required to unlock the keyboard.
Secure boot mode	Enable Disable[1]	Enables or disables your server's secure boot mode option.
Video blanking	Enable Disable[1]	Enables or disables your server's video blanking option.
Floppy writes	Enable[1] Disable	Enabling this option keeps unauthorized personnel from copying server data onto diskettes.

[1] Factory default setting

Boot Subsystem Group

Menu Fields	Settings	Comments
First boot device	Boot floppy[1] Boot hard disk Boot IDE CD-ROM Boot network	Each time your server boots, it will load your operating system from the sequence selected.
Second boot device	Boot disabled Boot floppy Boot hard disk[1] Boot network	Each time your server boots, it will load your operating system from the sequence selected.
Third boot device	Boot disabled[1] Boot floppy Boot hard disk Boot network	Each time your server boots, it will load your operating system from the sequence selected.
Fourth boot device	Boot disabled[1] Boot floppy Boot hard disk Boot network	Each time your server boots, it will load your operating system from the sequence selected.
Display <F1> for setup message during POST	Enable[1] Disable	Enables or disables the <F1> setup prompt each time your server boots.
Require user interaction on POST errors	Enable[1] Disable	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.

[1] Factory default setting

SCSI ROM BIOS Options Group

Menu Fields	Settings	Comments
SCSI-A ROM BIOS scan	Enable[1] Disable	Enables or disables your server's SCSI-A ROM BIOS scan option.
SCSI-B ROM BIOS scan	Enable[1] Disable	Enables or disables your server's SCSI-B ROM BIOS scan option.

[1] Factory default setting

Management Subsystem Group

Menu Fields	Settings	Comments
System sensor control	Press [Enter]	Press [Enter] to modify the server's temperature and voltage sensors for proper operation.
Speaker options	Enable[1] Disable	Enables or disables your server's speaker.
Scan user flash area	Disable[1] Enable	Enabling this option causes the server to scan the flash memory area for binaries that extend or alter critical event logging.

[1] Factory default setting

System Management Options

Menu Fields	Settings	Comments
System management mode	Disable[1] Enable	Enabling this option loads the embedded server management firmware.
Event logging	Disable[1] Enable	Enabling this option causes the BIOS to log critical and informational events to non-volatile flash memory.
PCI system error detection	Disable[1] Enable	When enabled, if a PCI bus error (SERR#) is detected, a critical event is placed in the server event log and an NMI is generated.

[1] Factory default setting

Caring For Your Server *D*

Introduction

This appendix describes how to:

- Clean the outside of the server

- Clean the monitor screen

- Clean the mouse

- Pack and move the server

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

Cleaning the Server

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

Cleaning the Screen

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

Cleaning the Mouse

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

Perform the following steps to clean a mouse ball:

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

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

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

4. Replace the ball and mouse ball cover.

Moving the Server

Perform the following steps before shipping or moving the server:

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

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

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

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

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

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

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

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

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

Packing the Server

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

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

Installing the Server at a New Location

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

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