

# DIGITAL Server 3100/3200 Series

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## System Reference

Part Number: ER-B42WW-UA. A01

**Digital Equipment Corporation**

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**The FCC wants you to know...**

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

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

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

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

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

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

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

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

Read the instructions for correct handling.

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

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

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

This equipment has been tested for radio frequency emissions and has been verified to meet AZ/NZS AS3548 requirements for ITE equipment for Australia and New Zealand.

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# Preface *P*

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## Introduction

This System Reference describes how to operate, upgrade, configure, and troubleshoot your DIGITAL Server 3100/3200. 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 *DIGITAL Server 3100/3200 Series Installation Guide*.

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

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

## Audience

This System Reference is written specifically for anyone responsible for operating, configuring, and expanding the DIGITAL Server 3100/3200.

## Support Information

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

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<b>If you want to...</b>	<b>Refer to the...</b>
Set up your server	<i>Installation Guide</i> to unpack, install internal components, connect external devices and power, and access the ServerWORKS Quick Launch program.
Load the supplied ServerWORKS Quick Launch software	<i>ServerWORKS Quick Launch Getting Started</i> guide.  README information contained on the ServerWORKS Quick Launch CD-ROM disc.
Locate the major internal components of your server	<i>Quick Reference Label</i> on your server's side panel.
Upgrade and configure your server after installing optional components (for example, a Pentium Pro or Pentium II processor module, memory, mass storage devices, SCSI or RAID adapters, etc.)	Information supplied in this System Reference.  Supplied SCSI, RAID, and other options documentation. These are supplied as either printed manuals or as files on the Quick Launch CD-ROM.
Run diagnostics	<i>ServerWORKS Quick Launch Getting Started</i> guide and the Quick Launch program on the supplied CD-ROM disc.  Supplied diagnostics documentation which is on the Quick Launch CD-ROM.

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## Organization

This *System Reference* contains the following:

- Chapter 1: *Introduction* — Provides information about your server such as: features, server software and documentation, diagnostic software, server utilities, and technical support.
- Chapter 2: *Server Software and Utilities* — Describes the server software and utilities that are supplied with your server.
- Chapter 3: *Server Components* — Provides information about the server's components and associated procedures such as removing the top cover.
- Chapter 4: *Server Management* — Describes how to manage your server using a network manager, specifically DIGITAL ServerWORKS Manager.
- Chapter 5: *Pentium Pro Processor Upgrades* — Describes how to upgrade your server with higher-performance Pentium Pro processor modules.
- Chapter 6: *Pentium II Processor Upgrades* — Describes how to upgrade your server with higher-performance Pentium II processor modules.
- Chapter 7: *Installing Additional Memory (SIMMs)* — Describes how to install additional memory on a Pentium Pro processor module.
- Chapter 8: *Installing Additional Memory (DIMMs)* — Describes how to install additional memory on a Pentium II processor module.
- Chapter 9: *Installing Disk and Tape Drives* — Describes how to install optional SCA-2 disk drives, tape drives, and external SCSI or RAID devices.
- Chapter 10: *Installing Expansion Boards* — Describes how to install ISA, EISA, and PCI expansion boards.

- Chapter 11: *Connecting SCSI and RAID Adapters* — Describes how to connect mass storage devices to the onboard SCSI controller or to supported RAID adapters.
- Chapter 12: *Server Security Features* — Describes the various security features that are available to prevent server or data theft.
- Chapter 13: *Troubleshooting* — Describes initial and advanced troubleshooting solutions.
- Appendix A: *Technical Specifications* — Lists server operating specifications. Also included is switch information on the main logic board and processor modules. It also provides a list and description of error messages that might display and error codes that might sound if a failure occurs.
- Appendix B: *Device Mapping* — 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* — Lists the available SCU resource and configuration options.
- Appendix D: *Caring For Your Server* — Provides suggestions for cleaning and moving your server.



## Conventions

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

## Abbreviations

<b>Abbreviation</b>	<b>Meaning</b>
BIOS	Basic input/output system
DIMM	Dual in-line memory module
DMA	Direct memory access
DRAM	Dynamic random access memory
ECC	Error correction code
ECP	Extended capabilities port
EDO	Extended data out
EISA	Extended industry standard architecture
EPP	Enhanced parallel port
FDD	Floppy disk drive
FRU	Field replaceable unit
GB	Gigabyte
h	An h suffix to a numerical value denotes hexadecimal numbers. For example, 0F8h equals 0F8 hexadecimal.
I/O	Input/output
IRQ	Interrupt requests
ISA	Industry standard architecture
KBC	Keyboard controller
MB	Megabyte
MS-DOS™	Microsoft disk operating system
NIC	Network interface card
NOS	Network operating system
PCI	Peripheral component interconnect

*continued*

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<b>Abbreviation</b>	<b>Meaning</b>
POST	Power-on self test
RAID	Redundant array of independent disks
RAM	Random access memory
ROM	Read only memory
RSM	Remote server manager
RTC	Real-time clock
SBB	Storage building block
SCSI	Small computer system interface
SCU	System configuration utility
SIMM	Single in-line memory module
SMP	Symmetrical multi-processor
SVGA	Super-video graphics array
VGA	Video graphics array
Windows NT	Microsoft Windows NT operating system software
ZIF	Zero insertion force

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## Special Notices

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



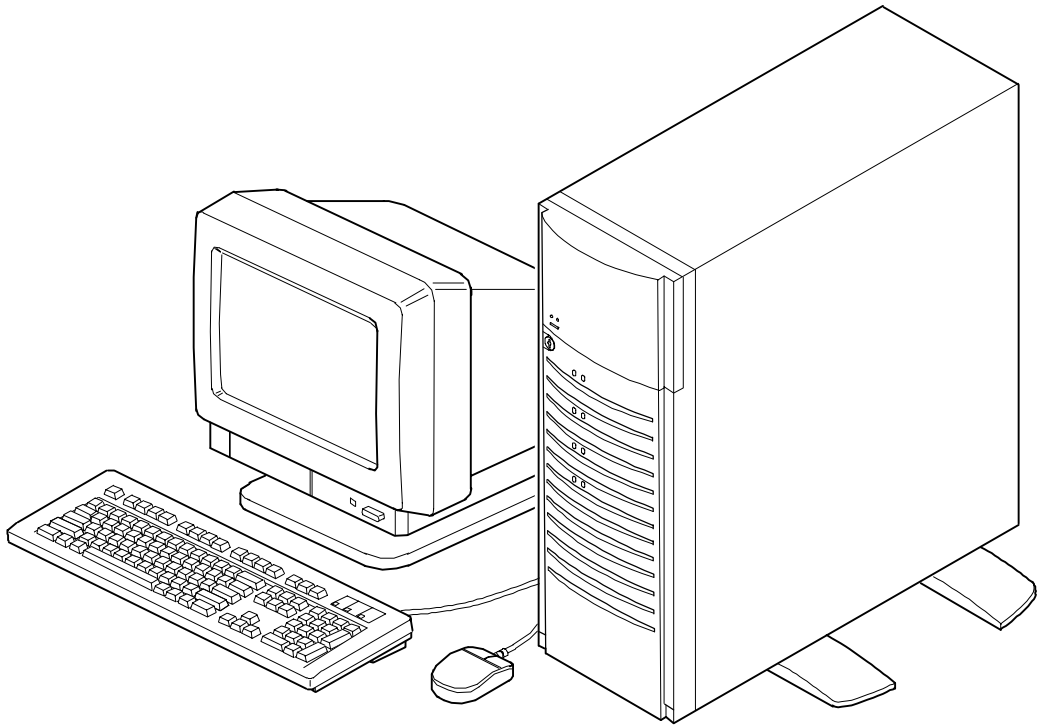
**WARNING:** Indicates the presence of a hazard that can cause personal injury if the hazard is not avoided.



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



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



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### Typical DIGITAL Server 3100/3200



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

# Introduction

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# 1

The DIGITAL Server 3100/3200 is a high-performance, highly-scalable departmental server featuring the latest in modular processor and storage technology.

The DIGITAL Server provides support for the following features:

## Reliability/Availability

*Pentium Pro or Pentium II Processor Module* Pentium Pro processor module. Each Pentium Pro processor requires 36-bit SIMMs with 60 ns access time. It will operate with either EDO or Fast Page memory.

Or

Each Pentium II processor operates using 168-pin, 72-bit DIMMs with 60 ns access time and ECC protected EDO memory.

*Error Correction Code (ECC) Memory* Recovery from most cache and memory errors.

*Variable Fan Speed* Automatically adjusts fan speed according to internal chassis ambient temperature.

*continued*

## Introduction

### *Internal Sensors*

Monitors internal server temperatures, fan operation, and voltages for the main logic board and processor module.

### *Clusters*

Supports DIGITAL Clusters for Windows NT and Microsoft Cluster Server (part of Microsoft Windows NT Server, Enterprise Edition) for database and file services failover.

## Server Expansion

### *Flexible Memory Architecture*

ECC memory supported. Server memory can be upgraded from 32 MB to a maximum of 1 GB using SIMM memory on a Pentium Pro processor module. For Pentium II processor modules, you can upgrade from 32 MB to a maximum of 512 MB using DIMM memory.

### *Four EISA Expansion Slots, Two PCI Expansion Slots, and One Shared PCI/EISA Expansion Slot*

Accommodates industry-standard expansion boards such as network, Small Computer System Interface (SCSI), Redundant Array of Independent Disks (RAID), and modems.

### *Integrated PCI and SVGA Video Controller*

Supports management and configuration applications locally (on main logic board) without use of an expansion slot.

### *Wide Ultra SCSI Controller*

Supports narrow and wide Ultra SCSI internal devices.

*continued*

*Capacity for Seven  
Internal Storage  
Devices*

Accommodates four 3½-inch half-height SBB disk drives, one CD-ROM (standard), a 3½-inch diskette drive (standard), and two narrow (50-pin) half-height, 5¼-inch devices; or one full-height, 5¼-inch device such as a CD-ROM or tape drive.

*Keyboard and Mouse  
External I/O Ports*

Supplied 104-key keyboard and three-button mouse. Two serial ports and one Enhanced Parallel Port (EPP) to support external options such as a printer, modem, or local terminal.

*External Wide Ultra  
SCSI Port*

Allows you to connect external wide Ultra SCSI devices to your server.

*Wide Ultra SCSI and  
RAID Storage  
Backplane*

Supports high-performance drives.

*Disk Hot Swap  
Capability*

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

*External Network  
Ports/Integrated  
Network Controller*

A DIGITAL Ethernet controller on the main logic board. An Ethernet daughter card provides: one 10/100Base-T (10/100 Mb/s) port, one 10Base-2 (10 Mb/s) port, and one 10Base-5 (AUI) port.



## Server Management and Security

<i>Server Diagnostics</i>	Allows local and remote diagnosis of server problems.
<i>Hardware Configuration</i>	Allows local and remote server configuration.
<i>Unique Asset Management</i>	Unique server identifier in non-volatile memory provides easy asset management.
<i>BIOS and Firmware Upgrade Utility</i>	Upgrades the BIOS and firmware versions.
<i>Hard Drive Indicator Lights</i>	Provides immediate status information on SBB hard drive activity or failure.
<i>Server Fault LED Status</i>	Provides immediate status information on server fan, temperature, voltage, and memory failure.
<i>Key Lock</i>	Limits access to server components. A 45° turn clockwise opens the top door. A 90° rotation opens the bezel and allows access to the side panel thumbscrews, SBBs, and other components (refer to Chapter 12).

## Server Software and Documentation

The following software and documentation are supplied with your server:

- ServerWORKS Manageability Suite — contains ServerWORKS Quick Launch, DIGITAL ServerWORKS Manager, and licenses.
  - ServerWORKS Quick Launch consists of a bootable CD-ROM and *Getting Started* guide. The Quick Launch program steps you through the initial server setup and operating system installation process.

*Refer to the ServerWORKS Quick Launch Getting Started guide and the README.TXT file, which is located on the Quick Launch CD-ROM.*

- DIGITAL ServerWORKS Manager consists of two CD-ROMs, an *Overview and Installation Guide*, and supporting documentation.

*Refer to the DIGITAL ServerWORKS software kit for more information.*

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



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

## Diagnostic Software

Diagnostic software is shipped with every DIGITAL Server on the Quick Launch CD-ROM. This software contains an advanced set of diagnostic utilities for identifying and correcting problems with the server. The diagnostic software can be used to verify proper hardware installation and isolate intermittent problems that are not detected by the Power-On Self Test (POST).

The diagnostic program is a stand-alone MS-DOS package that can be run from diskettes or from the DOS partition on the server's hard disk drive.

The diagnostic software includes:

- AMIDiag base diagnostic (processors, memory, and main logic board components tests) from American Megatrends, Inc.
- DIGITAL vendor extended tests (SCSI, network, storage, and RAID)
- Extensive on-line help and the *AMIDiag User's Guide*

*Refer to Chapter 2, "Server Software and Utilities" for information on creating diagnostic diskettes from the Quick Launch CD-ROM.*

*For additional information on "When to Use the Diagnostics" and "Running the Diagnostics", refer to Chapter 13. Also refer to the AMIDiag User's Guide, located under "Additional Documentation" on the Quick Launch CD-ROM and to the README.TXT file on the diagnostics diskettes.*

## Server Utilities and Technical Support

Current server utilities and technical support information is available on the Quick Launch CD-ROM disc and the Internet.

For product information, use the address:

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

For technical support, use the address:

`http://www.windows.digital.com/support/support.asp`

For access directly to the software library for BIOS and driver updates, use the address:

`http://www.windows.digital.com/~ftp/00-index.stm`

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

## Important Ergonomic Information

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

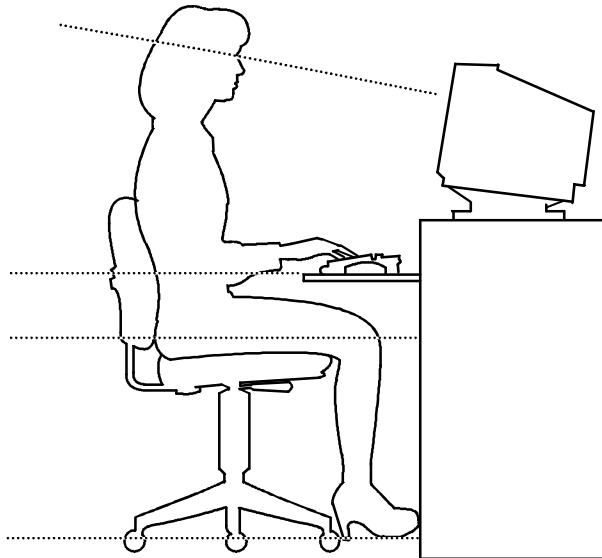
- Be comfortable in your work space.
- Change your posture frequently.
- Proceed according to the recommendations in the following table and figure.

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

*continued*

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

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



DEC00454

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

# 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. The CD-ROM also contains various drivers, utilities, and on-line documentation.
- **System Configuration Utility (SCU)** — This utility allows you to configure your server when relocating, adding, or removing EISA/ISA/PCI expansion boards and when changing your server's factory-defined settings. The SCU is available on the Quick Launch CD-ROM.
- **RAID Configuration Utility** — This utility is available for RAID-ready servers only. This utility allows you to configure your RAID array. The RAID configuration utility is available on the Quick Launch CD-ROM.
- **BIOS Upgrade Utility** — This utility allows you to update or restore your server's BIOS. The BIOS Upgrade Utility is available on the Internet.



- **SCSISelect Utility** — This utility allows you to configure and view settings of the onboard SCSI controller and SCSI devices. The SCSISelect Utility is available each time you boot your server.
- **Diagnostics** — This utility is used to verify server operation. The diagnostics utility is available on the Quick Launch CD-ROM.

## ServerWORKS Quick Launch

ServerWORKS 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 *ServerWORKS Quick Launch Getting Started* guide.

## System Configuration Utility (SCU)

Your server was pre-configured at the factory using the System Configuration Utility (SCU). This means that your server's hardware (Pentium Pro or Pentium II processors, memory, cache, mass storage devices, expansion boards, etc.) has been identified and configured for optimum performance. If you need to make changes to this configuration, DIGITAL recommends that you use the SCU along with the information provided in this section.

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

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

*Refer to the ServerWORKS Quick Launch Getting Started guide and the README.TXT file, which is located on the Quick Launch CD-ROM, for additional information.*

## When to Run the SCU

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

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

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

## Configuring Expansion Boards

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

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

As an added feature, the SCU creates and stores all setup changes in a System Configuration (.SCI) file. This file is automatically generated when you run the SCU. Afterwards, this SCI file can be used on any DIGITAL Server that is identically configured and can serve as a backup to the EISA configuration stored in NVRAM memory.

## Starting the SCU

The SCU is located on your ServerWORKS Quick Launch CD-ROM disc. The SCU options are shown in Figure 2-1. If this is your first time using the SCU, it is recommended that you select “Learn About Configuring your Computer” for detailed information on using the SCU. If this is a subsequent session, refer to the appropriate sections in this chapter to change your server’s configuration.

You can start the SCU in one of three ways:

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

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

```
SCU.BAT
```

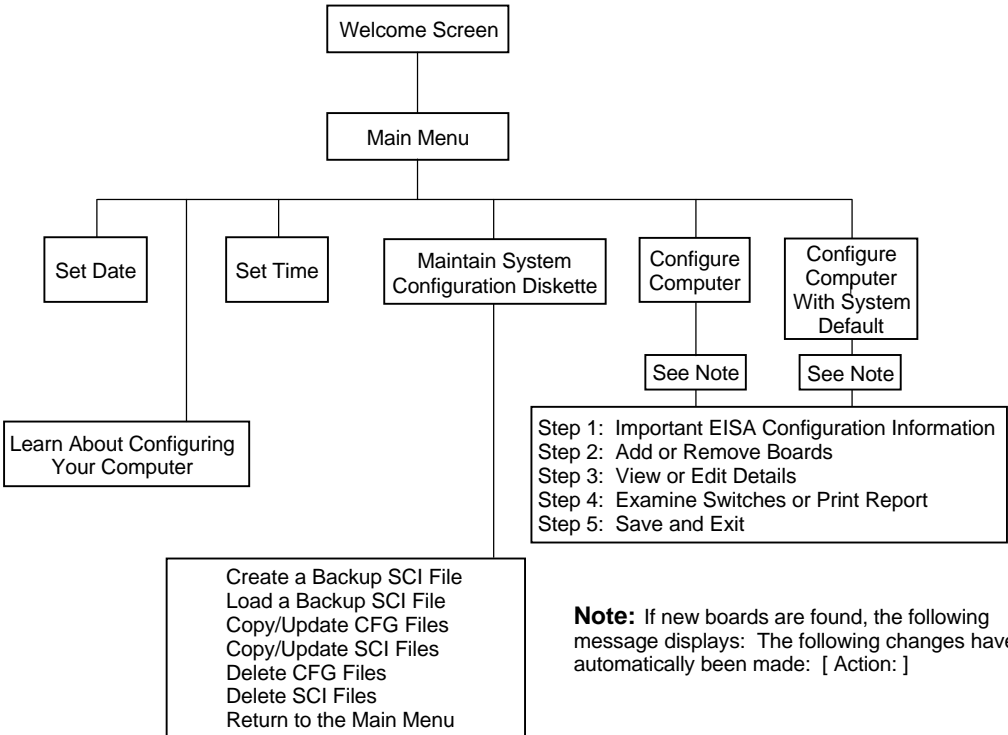
2. Creating a bootable SCU diskette by using the Quick Launch CD-ROM and selecting the *Installations & Utilities* button and then the *Utilities* page. On the *Utilities* page, select the appropriate BIOS level for the server that the SCU is being created for (if this is being done on the server, the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

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

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



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



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Figure 2-1. SCU Main Menu Options

## Using the SCU

To use the SCU:

1. Turn on your server and allow the Power-On Self Test (POST) to complete.

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

2. Start the SCU using one of the three methods described previously.
3. Press [Enter] to display the SCU introductory screen.



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

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

Press [Enter] to display the Main menu.

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

5. Step through the menu items to familiarize yourself with the SCU.

## SCU Keyboard Function Keys

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

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

## Configure Computer

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

Select one of the following menu options:

- “Configure Computer with System Default” — Loads the SCU default settings.
- “Configure Computer” — Instructions are displayed. Complete the instructions if you are performing an initial configuration on your server. If this is a subsequent configuration, refer to the appropriate menu item to update your server’s configuration.

*Refer to Chapter 10, “Installing Expansion Boards,” for board installation information.*

## Setting the Date and Time

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

To access this menu item:

1. Start the SCU using one of the three methods described in “Starting the SCU.”
2. Press [Enter] to display the SCU main menu.
3. Configure your server for the current date and time by selecting the Set Date and Set Time options.

## Maintain System Configuration Diskette

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

To access this menu item:

1. Start the SCU using one of the three methods described in “Starting the SCU.”
2. Press [Enter] to display the SCU main menu.
3. Select the `Maintain System Configuration Diskette` option, and then press [Enter].
4. Select a menu item and complete the displayed instructions for that item.

Afterwards, the following menu options are available:

- Create a backup SCI file
- Load a backup SCI file
- Copy/update CFG files
- Copy/update SCI files
- Delete CFG files
- Delete SCI files
- Return to the Main Menu



## RAID Configuration Utility

RAID-ready DIGITAL Servers include a RAID adapter and RAID configuration utility. The RAID configuration utility appears when you boot your server with the ServerWORKS Quick Launch CD-ROM disc. Use this utility to configure your RAID array.



**NOTE:** Your DIGITAL Server is shipped configured as an Ultra SCSI system. Use the RAID configuration utility to disable support for Ultra SCSI if you are using non-Ultra devices.

*Refer to the RAID User's Manual on the Quick Launch CD-ROM. Select the "User Documentation" button.*

## BIOS Upgrade Utility

All servers have BIOS software in a flash (ROM) chip located on the main logic board. 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 BIOS upgrade utility (PHLASH.EXE) located in the BIOS upgrade kit. The "BIOS upgrade" switch (SW1-1) on the main logic board must be set to ON before you can upgrade the system BIOS.

BIOS upgrades are available on the Internet.

For technical support, use the address:

<http://www.windows.digital.com/support/support.asp>

For access directly to the software library for BIOS and driver updates, use the address:

<http://www.windows.digital.com/~ftp/00-index.stm>



**CAUTION:** A crisis recovery diskette should be created before upgrading the server BIOS

When upgrading the BIOS, you must remove any video option cards and enable the onboard SVGA. In the rare event that you may need to use the crisis recovery diskette, the system will require that the onboard SVGA be used in this mode.

## **SCSI*Select* Utility**

Your DIGITAL Server comes with an onboard Adaptec 7880 SCSI controller and the SCSI*Select* configuration utility. This utility, located within the server BIOS, allows you to change SCSI 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.



**NOTE:** Your DIGITAL Server is shipped configured as an Ultra SCSI system. Use the SCSI *Select* utility to disable support for Ultra SCSI if you are using non-Ultra devices.

*Refer to the Adaptec User's Manual on the Quick Launch CD-ROM. Select the "User Documentation" button.*

## Diagnostics

Diagnostic software is shipped with every DIGITAL Server on the Quick Launch CD-ROM. This software contains an advanced set of diagnostic utilities for identifying and correcting problems with the server. The diagnostic software can be used to verify proper hardware installation and isolate intermittent problems that are not detected by the Power-On Self Test (POST).

The diagnostic program is a stand-alone MS-DOS package that can be run from diskettes or from the DOS partition on the server's hard disk drive.

To access the supplied diagnostic software:

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

- Using the Quick Launch CD-ROM, you can create bootable diagnostic software diskettes. This allows you to run the diagnostic software using the diskettes you created.



**NOTE:** DIGITAL strongly recommends that you copy the diagnostics to diskettes and then use these diskettes to run the diagnostics on your server.

To run the diagnostics from the DOS partition, perform the following:

1. Boot the server and select MS-DOS from the boot menu.
2. At the MS-DOS prompt, type:  
`C:\diag\diagnose.bat`
3. Select MS-DOS again and the diagnostics will load. Once the diagnostics begin, the main menu appears.

*Refer to Chapter 13, "Troubleshooting," for more information.*

To create the diagnostic diskettes from the Quick Launch CD-ROM, perform the following:

1. Insert the Quick Launch CD-ROM into the drive and boot the server or from a PC or workstation, use Windows File Manager or Explorer and run:  
`<cd-rom>:\QLAUNCH.EXE.`
2. From the Quick Launch main menu, select *Installations & Utilities*.
3. Select the *Utilities* tab and then select the server model.
4. Insert a blank MS-DOS formatted diskette into drive A and select *Diagnostics*.
5. Select *Continue*. Afterwards, remove the diskette for safekeeping.
6. Choose the next diagnostic diskette from the list and then select *Continue*. Create all the diskettes labeled "Diagnostics."

*Refer to Chapter 13, "Troubleshooting," for more information.*

# Server Components

---

# 3

## Introduction

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

## Disconnecting External Devices and Power

Before removing the side 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 its ac outlet and the data cable from the server.

## Unlocking the Server to Access the Side Panel

1. Unlock the server's front bezel by depressing and rotating the key 90° clockwise.
2. Afterwards, swing the bezel open. (The bezel is the hinged door running the full height of the server).

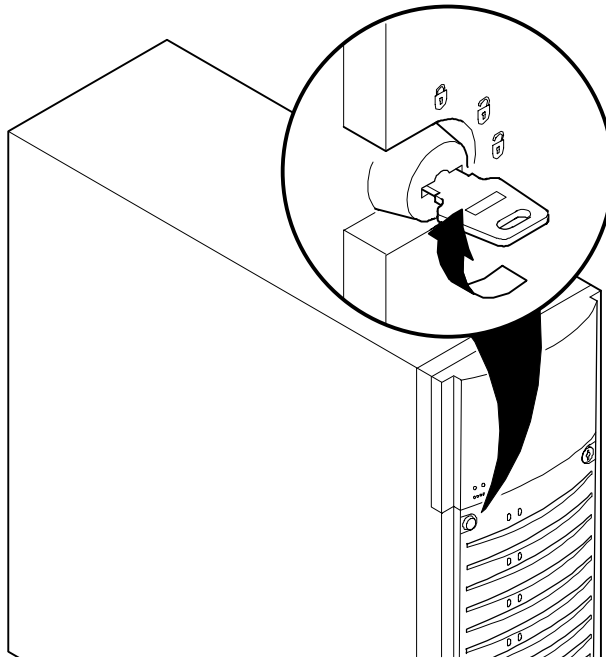
Once opened, the bezel can be removed by lifting it up and out.

## Keylock Function

- Depress and rotate the key 45° for access to the control panel and upper drive bays.
- Depress and rotate the key 90° for access to the side panel thumbscrews and SBBs.



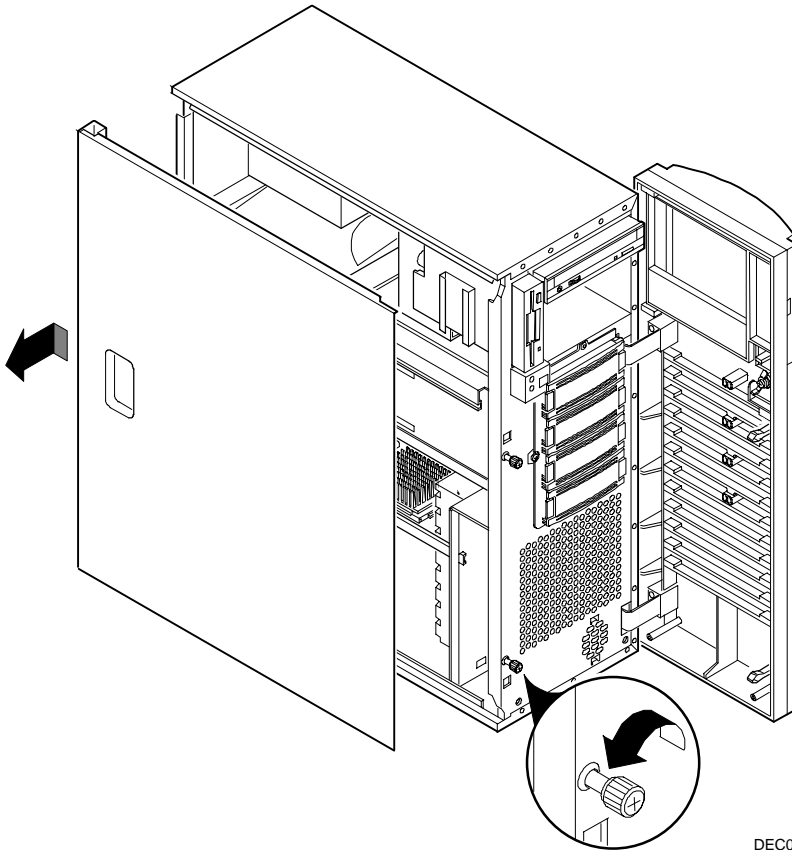
**CAUTION:** Keep your keys in a safe place. They are not easily duplicated or replaced.



**Figure 3-1. Front-Access Security Door and Front Bezel Lock**

## Removing and Installing the Side Panel

1. Loosen the two thumbscrews that secure the side panel to the chassis.
2. Slide the side panel to the rear of the server and then pivot it down to remove it .



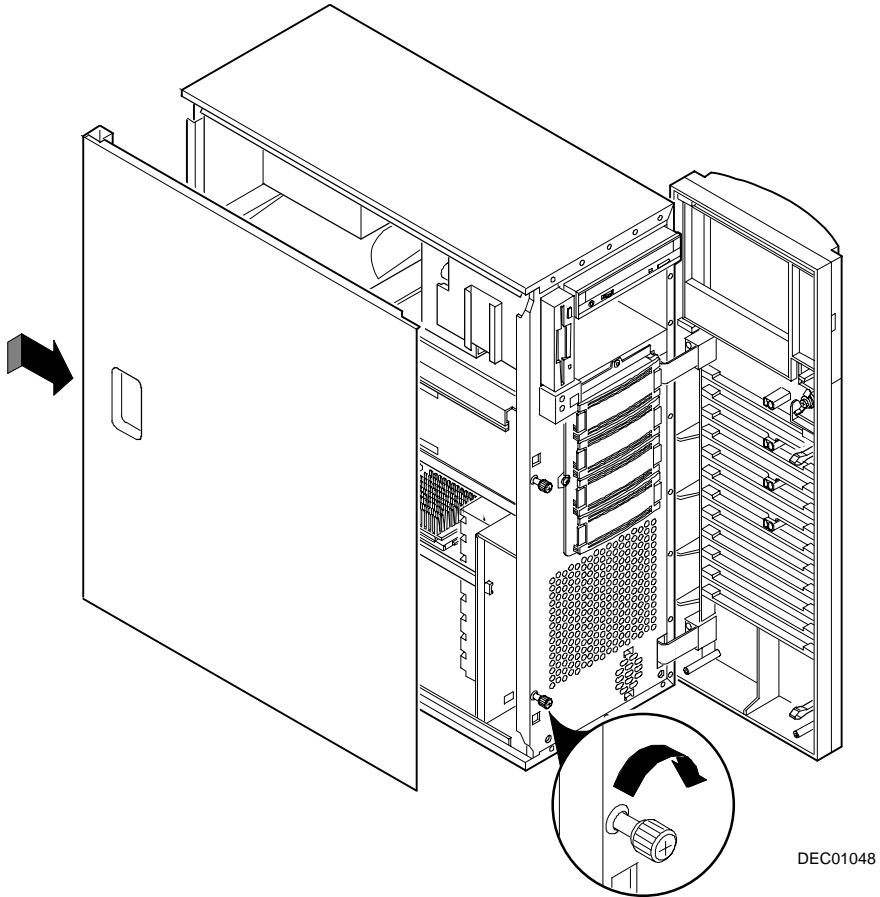
DEC01048

**Figure 3-2. Removing the Side Panel**



To install the side panel.

1. Pivot the side panel up and then slide it to the front of the server.
2. Secure the side panel to the chassis using the two thumbscrews.
3. Close and lock the server's front bezel.



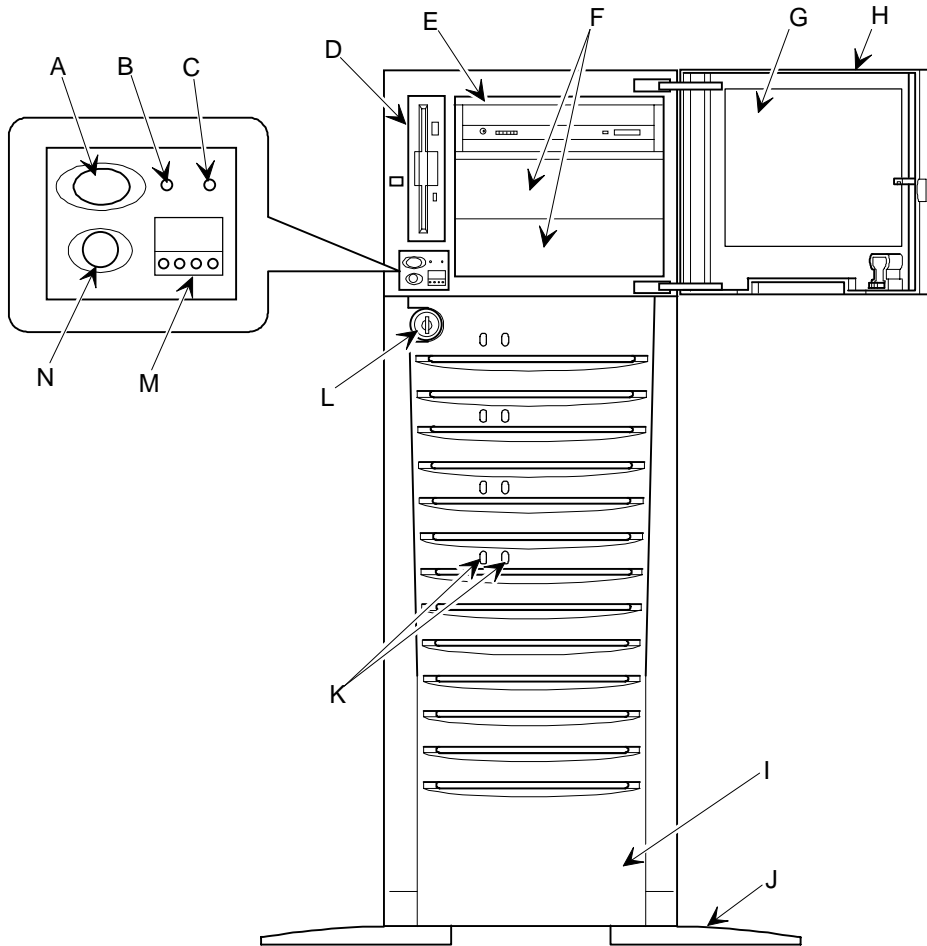
DEC01048

**Figure 3-3. Installing the Side Panel**

## Server Front View

<b>Figure Legend</b>	<b>Component</b>
A	Power button
B <sup>(1)</sup>	Power indicator
C <sup>(1)</sup>	Hard disk drive activity indicator
D	3½-inch diskette drive
E	CD-ROM drive
F	Front access 5¼-inch half-height drive bays
G	Fault status LED label
H	Disk access door
I	Front bezel
J	Stabilizing feet
K	Storage Building Block (SBB) LED status indicators <sup>(1)</sup>
L	Three-way security lock
M <sup>(1)</sup>	Fault status LED indicators
N	Reset button

<sup>(1)</sup> The four internal LED status indicators appear as one indicator with the front door closed. You must open the front door to view a specific LED fault code.

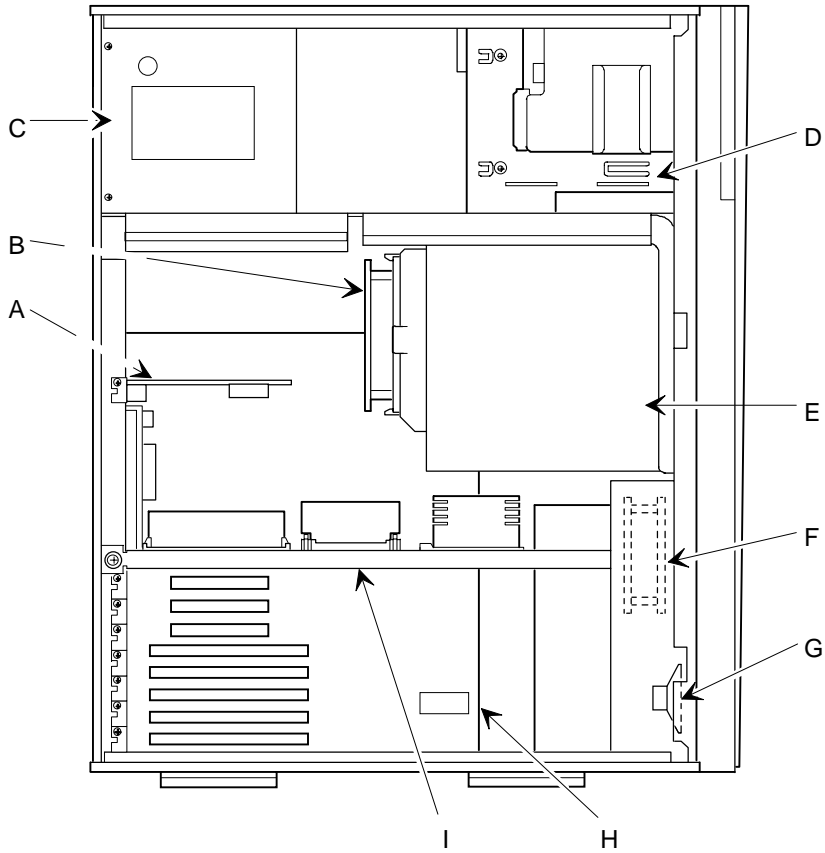


DEC01049-2

Figure 3-4. Server Front View

## Server Left Side View

<b>Figure Legend</b>	<b>Component</b>
A	Ethernet daughter card
B	SBB cooling fan
C	Power supply
D	Upper drive bays
E	SBB storage bay
F	Main logic board cooling fan
G	Speaker
H	Main logic board
I	Pentium Pro or Pentium II processor and memory module with retainer

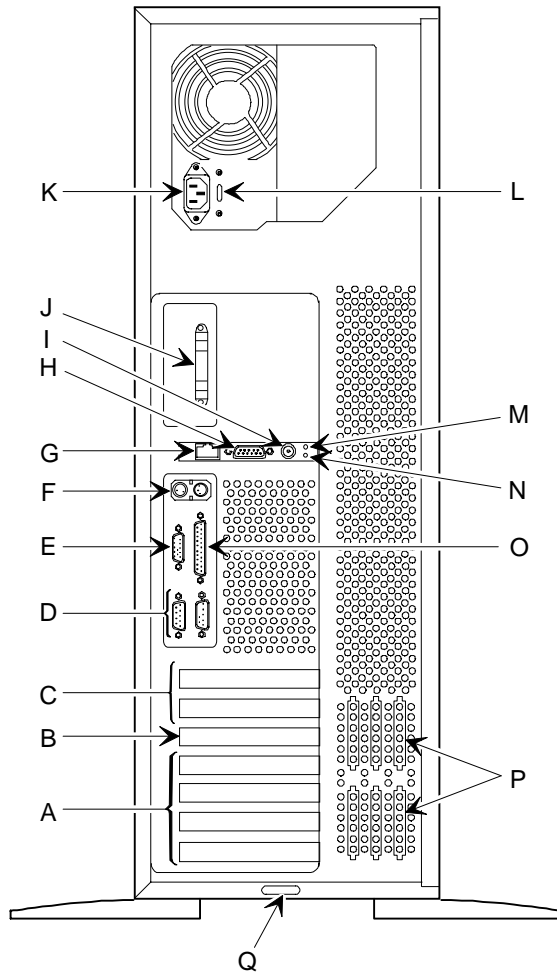


DEC01050-2

Figure 3-5. Server Left Side View

## Server Rear View

<b>Figure Legend</b>	<b>Component</b>
A	Four dedicated EISA expansion slots
B	One shared EISA/PCI expansion slot
C	Two dedicated PCI expansion slots
D	Serial ports
E	SVGA graphics port
F	Keyboard and mouse ports
G	10/100Base-T connector (RJ45)
H	10Base-5 connector (AUI)
I	10Base-2 connector (BNC)
J	External wide SCSI port
K	ac power input plug
L	Voltage select switch
M	Network activity indicator
N	Network power indicator
O	Parallel port
P	SCSI knockouts
Q	Security hold-down bar



DEC01051

Figure 3-6. Server Rear View

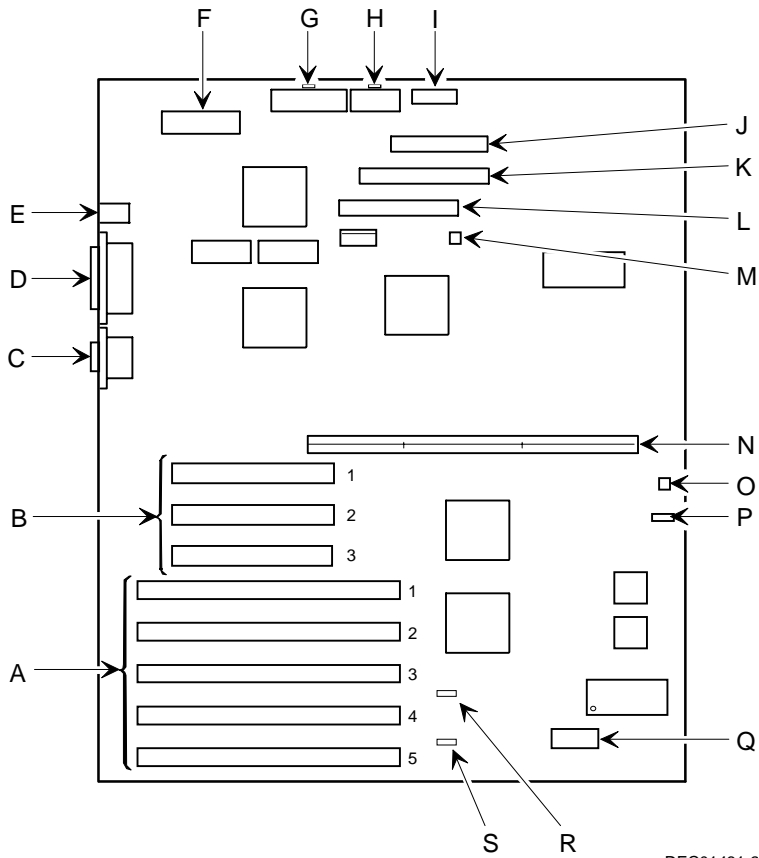
## Main Logic Board Connectors

---

<b>Figure Legend</b>	<b>Connector</b>
A	EISA expansion slots (1 through 5)
B	PCI expansion slots (1 through 3)
C	Serial ports
D	Parallel port and video port
E	Mouse and keyboard ports
F	Ethernet daughter card connector
G	5 V dc power supply in
H	3.3 V dc power in
I	Front panel switch and LED connector
J	Diskette drive connector
K	50-pin narrow SCSI bus connector
L	68-pin wide SCSI bus connector
M	Fan 2 connector
N	Pentium Pro or Pentium II processor and memory module connector
O	Fan 1 connector
P	Speaker connector
Q	Remote Server Management (RSM) connector
R	EISA slot 4 master delay jumper (J30)
S	EISA slot 5 master delay jumper (J31)

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DEC01431-2

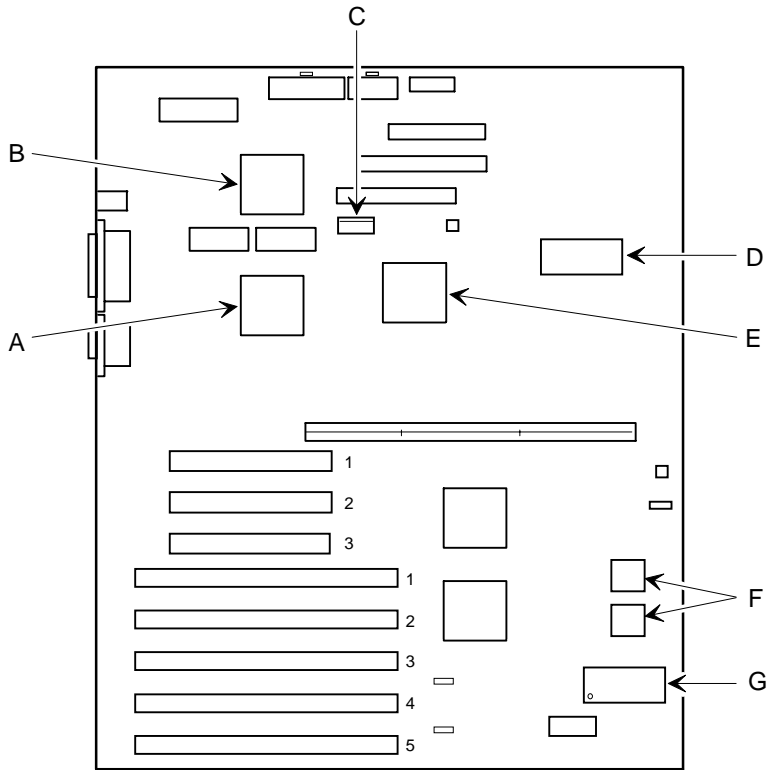
**Figure 3-7. Main Logic Board Connectors**

## Main Logic Board Components

---

<b>Figure Legend</b>	<b>Component</b>
A	Video controller
B	Ethernet controller
C	DIP switch block (SW1)
D	8031 ROM
E	SCSI controller
F	BIOS flash ROM
G	Real-time clock/server battery

---

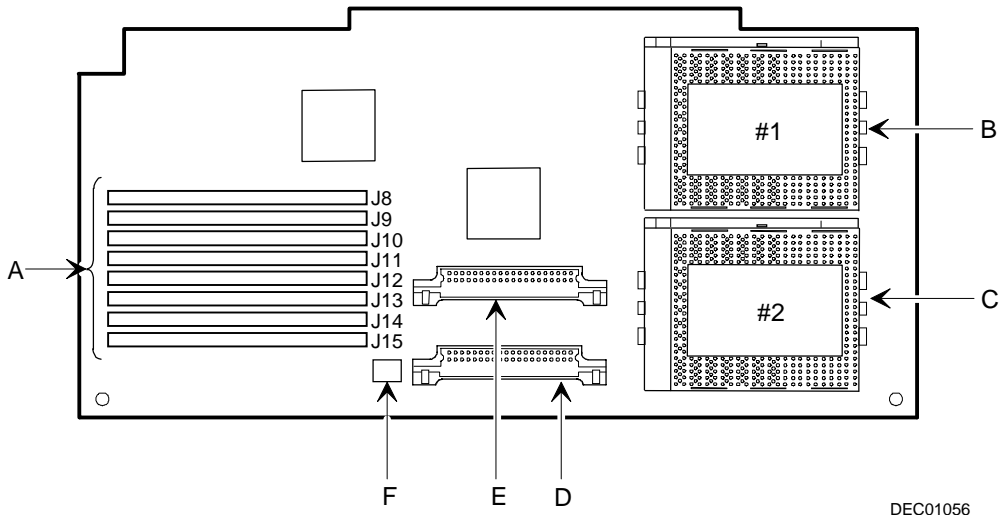


DEC01431-3

**Figure 3-8. Main Logic Board Components**

## Pentium Pro Processor Module Components and Connectors

<b>Figure Legend</b>	<b>Component/Connector</b>
A	Eight memory SIMM sockets
B	Pentium Pro processor #1 ZIF socket
C	Pentium Pro processor #2 ZIF socket
D	Voltage Regulator Module (VRM) slot, processor 2
E	Voltage Regulator Module (VRM) slot, processor 1
F	Frequency ratio DIP switches (SW4)

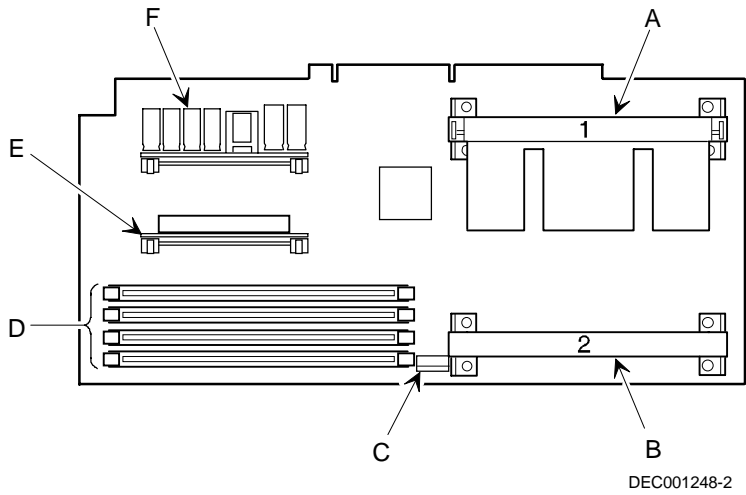


DEC01056

**Figure 3-9. Pentium Pro Processor Module Components and Connectors**

## Pentium II Processor Module Components

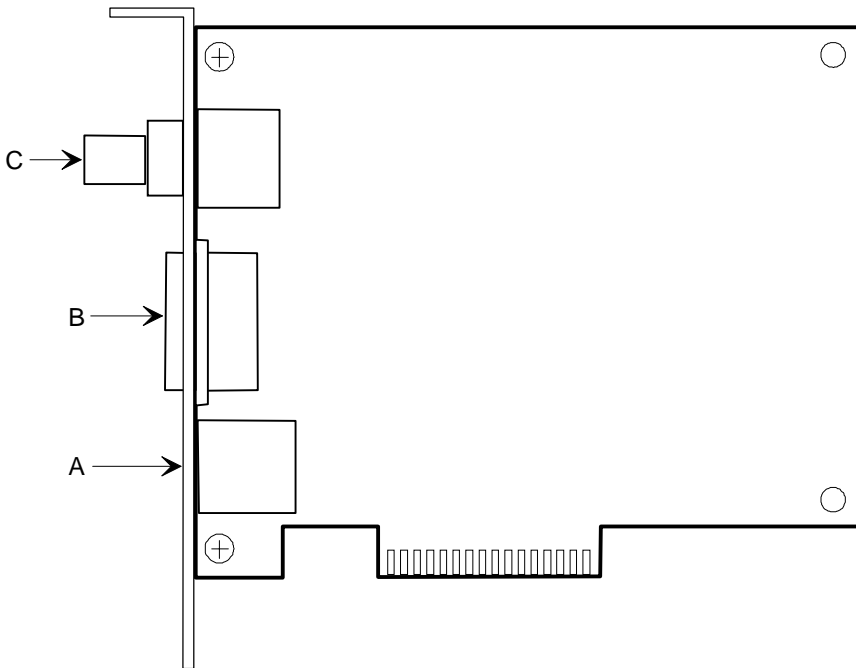
<b>Figure Legend</b>	<b>Component/Connector</b>
A	Pentium II processor #1
B	Pentium II processor #2 slot or terminator card
C	Dip switch for processor settings
D	Four DIMM sockets
E	Voltage Regulator Module (VRM) slot, processor 2
F	Voltage Regulator Module (VRM) slot, processor 1



**Figure 3-10. Pentium II Processor Module Components**

## Ethernet Daughter Card Components and Connectors

Figure Legend	Component/Connector
A	10/100Base-T connector (RJ45)
B	10Base-5 connector (AUI)
C	10Base-2 connector (BNC)



DEC01030-3

Figure 3-11. Ethernet Daughter Card Components and Connectors



## Tools Needed

Prior to installing an option, have the following available:

- A Phillips screwdriver
- An antistatic wrist strap

## Static Electricity

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

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

## Replacing the Server Battery/Real Time Clock (RTC)

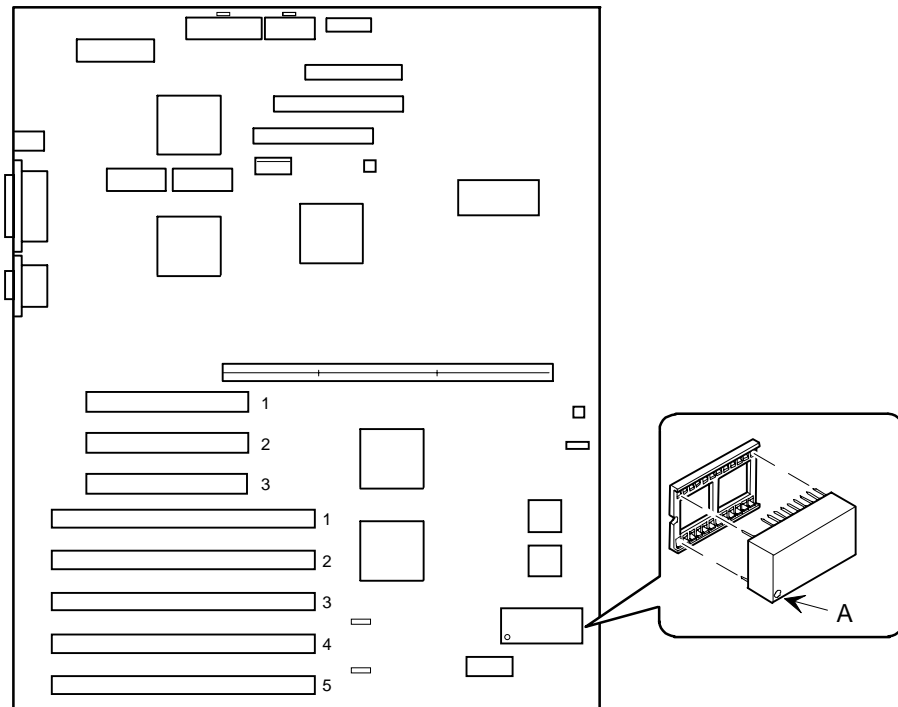
Your server's battery runs the server clock and retains any setup information when it is turned off. If your server ever fails to retain the correct date, time, or configuration settings when it is turned on, you need to replace your server's battery/RTC. The DIGITAL part number for this device is 21-39151-01. This part can be obtained through your DIGITAL service provider.

To replace the battery/RTC, perform the following:

1. If you have not already done so, record server configuration settings using the SCU.
2. Turn off your server.
3. Disconnect external devices, ac power, and monitor power.

## Server Components

4. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.
5. Remove the old battery/RTC (see Figure 3-12).



DEC01431-4

**Figure 3-12. Replacing the Server Battery/RTC**



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

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



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

7. Replace the side panel, tighten the two thumbscrews, and then close and lock the front bezel.
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."*

# Server Management

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## Introduction

The DIGITAL Server is configured with hardware that supports server management, including an 8031 processor with multiple I<sup>2</sup>C busses for server status reporting.

## Managing Your Server

The DIGITAL Server allows you to perform the following server management functions:

- Monitor main logic board voltage and cooling fan status
- Monitor Pentium Pro processor or Pentium II processor module voltage, temperature and status
- Detect and automatically correct single-bit ECC errors

The DIGITAL Server allows you to manage your server and its main components by:

1. Obtaining information about the main logic board and the processor module.
2. Notifying you of any changes to the main logic board or processor module on your server.

Information can be obtained either through the SCU or through system management software such as the DIGITAL ServerWORKS Manager.

## Obtaining Information about Your Server

The DIGITAL Server provides the following system information for the main logic board and the processor module configured on your server:

- Asset number — User definable field for tracking these components
- Part number — DIGITAL part number
- Revision number — Board assembly revision number
- Serial number — Serial number of the board assembly
- Artwork number — Revision of the printed circuit board

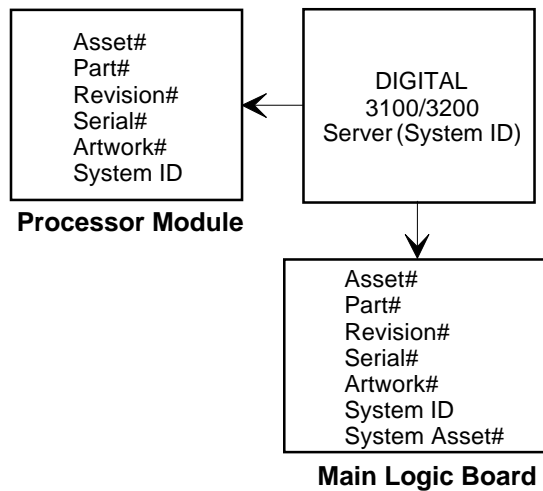
The System ID is also located on the main logic board and processor module. The System ID contains the following information:

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

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

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

You can obtain information about your server's configuration by running the SCU or by using ServerWORKS management software.



DEC01072

**Figure 4-1. DIGITAL Server Component Information**

## Obtaining Information Using the SCU

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

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

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

## Obtaining Information Using Server Management Software

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

DIGITAL ServerWORKS Manager is based on an open architecture that enables seamless integration and interoperability with popular enterprise management software packages such as Computer Associates' Unicenter TNG, Hewlett-Packard's OpenView UX for Windows, and IBM's Netview/6200 AIX. Also included with the DIGITAL 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.

DIGITAL 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 DIGITAL Servers using a Windows-based graphical user interface (GUI) for point and click simplicity.
- Display server component information that provides critical information such as processor and file system utilization and information about the network interface.
- Automatically builds a database of the network by Autodiscovering all SNMP network resources and displays the nodes discovered during Autodiscovery on a color-coded topological map.
- Poll all network devices at intervals defined by the administrator.
- Perform an in-depth network analysis to continuously monitor the status of the network.
- Set alarms and alerts for specified events on all network devices, as well as the network itself, to spot problems early and avoid costly downtime.

*Refer to the DIGITAL ServerWORKS Manager Overview and Installation 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 DIGITAL Server with other SNMP-based managers.

*Refer to the DIGITAL ServerWORKS Manager Overview and Installation Guide for more information.*



## Displaying Server Status Using the Hardware

There are two types of information displayed when your DIGITAL Server is operating:

- Normal status messages
- Error messages

During normal operation, Power On Self Test (POST) and boot messages are displayed on the monitor. Some error messages are also displayed by the server fault status LEDs.

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

*Refer to Appendix A for server fault status LED indications and POST messages.*

# Pentium Pro Processor Upgrades

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# 5

## Introduction

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



**NOTE:** If your DIGITAL Server came with a Pentium II processor module, refer to Chapter 6, “Pentium II Processor Upgrades,” for detailed information on upgrading to a higher-performance Pentium II processor.

## Configuration Guidelines



**NOTE:** Before you begin, create an SCU diskette using Quick Launch. You must run the SCU after installing any processor upgrade. This allows your server to recognize the new processor configuration.

There are two Pentium Pro upgrade types:

- a. A processor upgrade that enables you to upgrade from a single Pentium Pro processor to a dual Pentium Pro processor configuration.
- b. A single Pentium II processor module upgrade that enables you to upgrade from a Pentium Pro processor module configuration to a Pentium II processor module configuration.

Contact your authorized DIGITAL representative for available options. For details regarding the upgrade of your processor, refer to the documentation in the upgrade kit.

- Use only DIGITAL-supplied Pentium Pro processor modules.
- A Pentium Pro processor upgrade can be done by installing a higher-performance Pentium II processor module or a second Pentium Pro processor.

## **Processor Compatibility in a Multiprocessor Environment**

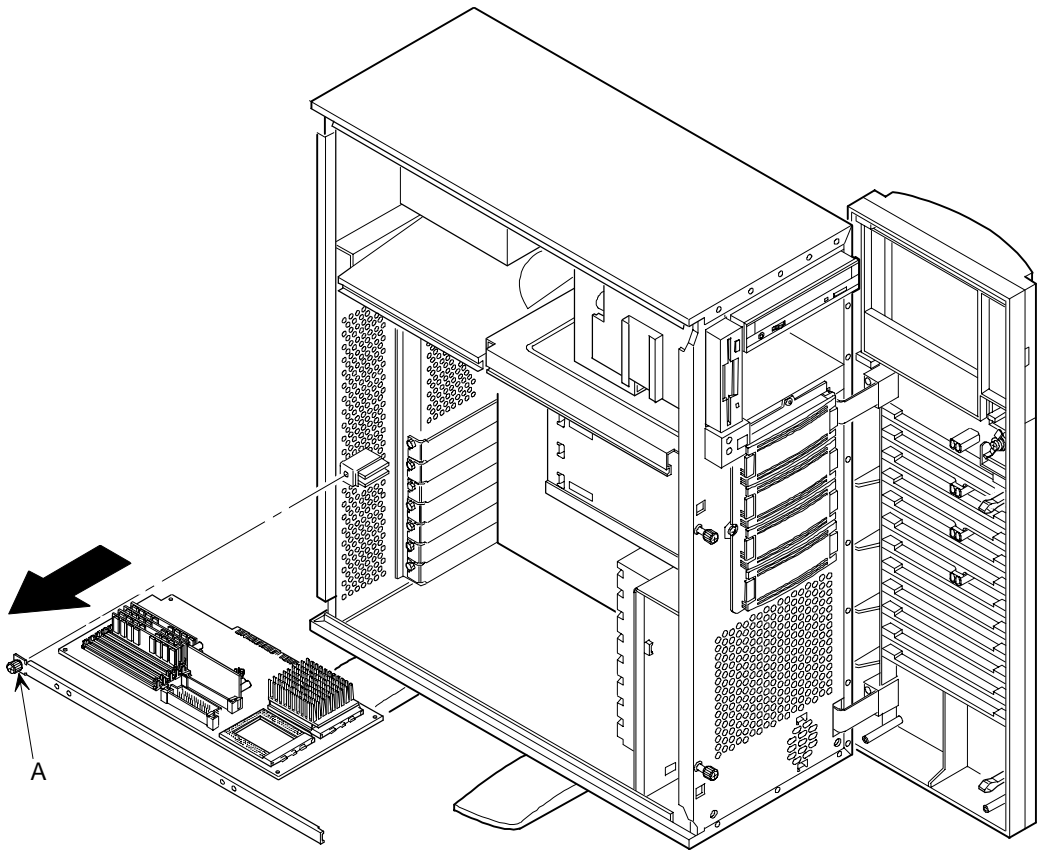
DIGITAL recommends using identical steppings/versions of processors within a multiprocessor server whenever possible, since these configurations have received the greatest amount of validation testing. Since it is not possible to validate every combination of processor steppings, each new stepping of a processor is fully validated only against the latest stepping. At press time, there were no known incompatibility issues when mixing processor steppings in a multiprocessor server. Please refer to the README file on the ServerWORKS Quick Launch CD-ROM to view the latest processor compatibility information. If you have any concerns about processor compatibility within a multiprocessor server, please contact your local authorized DIGITAL reseller for assistance.

## Installing a Processor

The following sections provide detailed instructions on how to perform a processor installation.

### Removing the Pentium Pro Processor Module

1. Shut down the operating system software.
2. Turn off your server.
3. Disconnect all external devices, ac power, and monitor power.
4. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.
5. Place the antistatic wrist strap on your wrist and connect the grounding clip to a non-painted metal surface of the server's chassis.
6. Loosen the thumbscrew and then remove the retainer and Pentium Pro processor module (A, Figure 5-1).
7. Grasping both ends of the processor module, carefully remove it from the main logic board and place it on an antistatic surface.

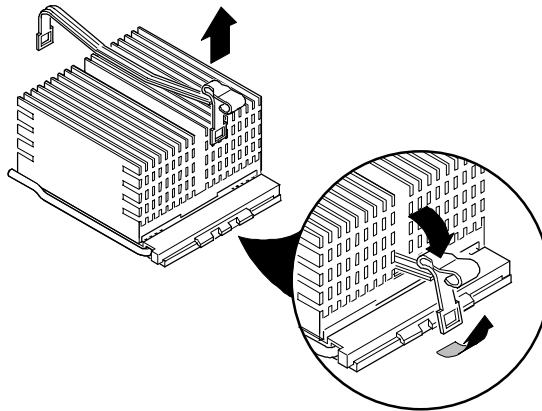


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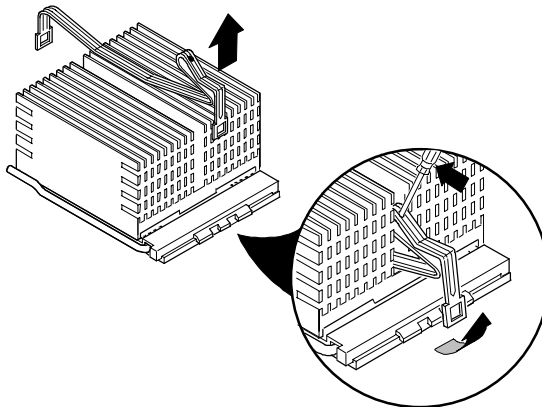
**Figure 5-1. Removing the Processor Module**

## Installing a Pentium Pro Processor and Voltage Regulator Module (VRM)

1. Remove the processor from its shipping holder by removing the retaining clip. To remove the clip, press down firmly on the top of the clip. If needed, press down with a small screwdriver in the hole of the second style clip shown in Figure 5-2.



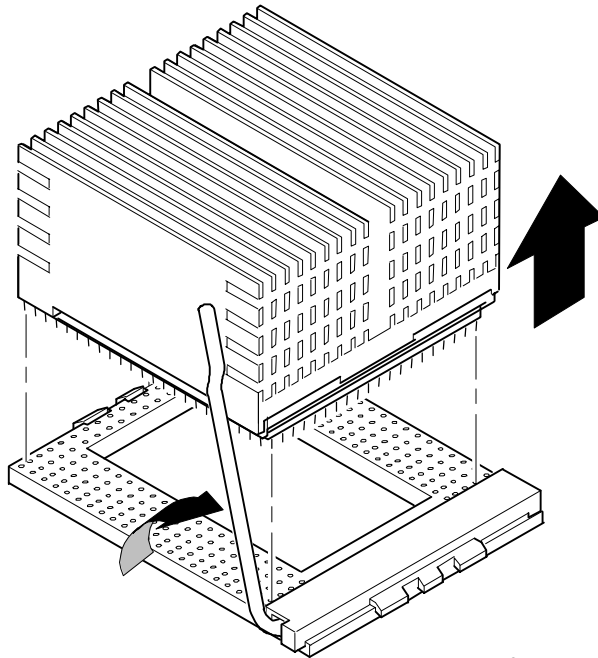
DEC01211-2



DEC01211-3

**Figure 5-2. Removing the Retaining Clip**

2. Remove the processor/heat sink assembly from its shipping holder. Do not pull the heat sink off of the processor. Use care not to bend the pins.

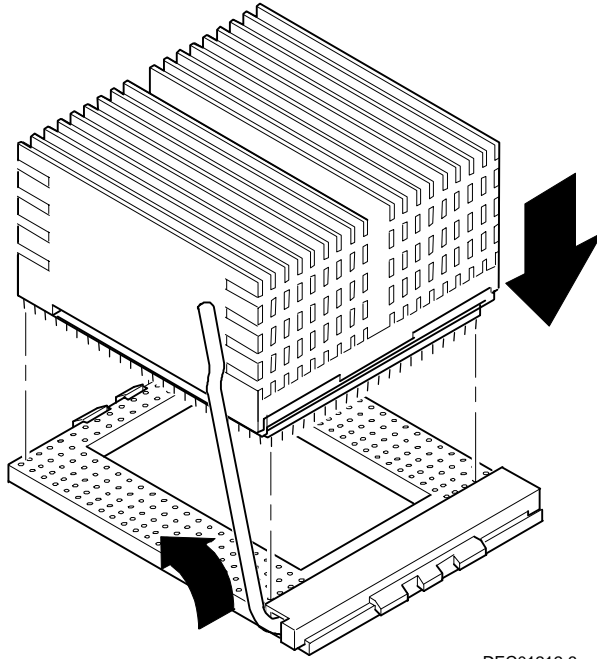


DEC01212-2

**Figure 5-3. Removing the Processor/Heat Sink Assembly**

3. On the processor module, lift up on the lever of the empty processor socket. Position the pins of the new processor in the socket of the processor module. Note that the pins are denser on one side for correct orientation.

4. Lower the lever to engage the pins (Figure 5-4).

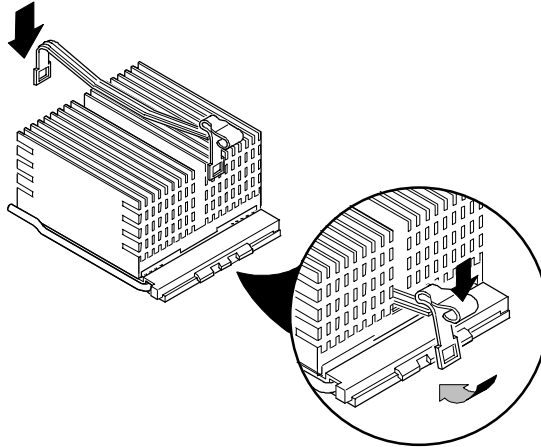


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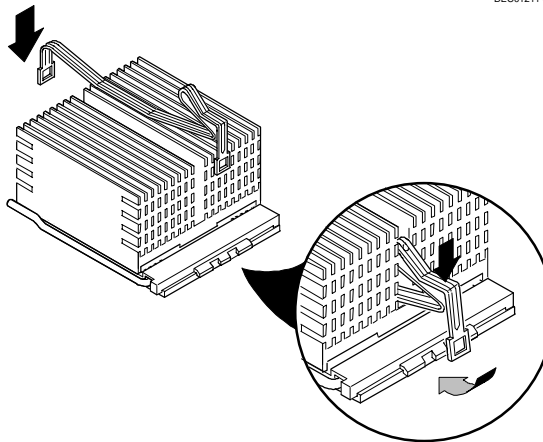
**Figure 5-4. Installing the New Processor**



5. Replace the retaining clip by installing the back side of the clip first, then pressing it into place as shown in Figure 5-5.



DEC01211-4



DEC01211-5

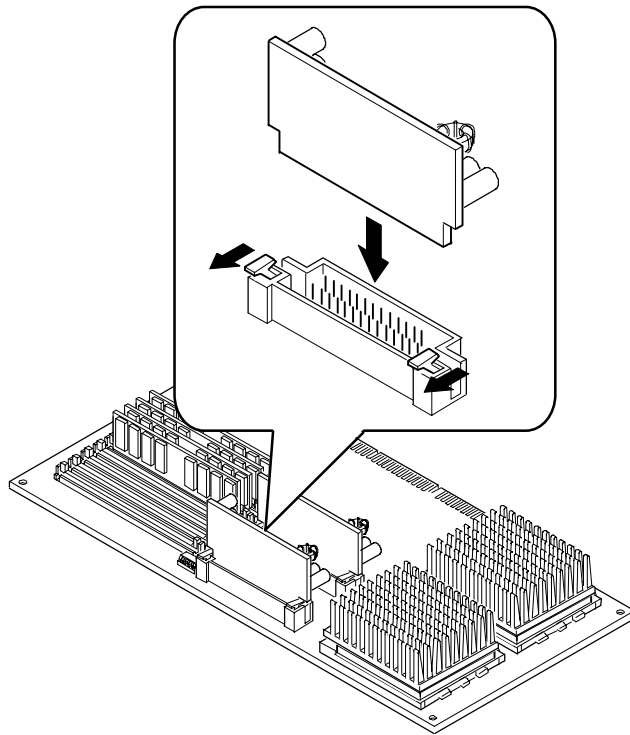
**Figure 5-5. Installing the Retaining Clip**

6. Remove the new VRM from its shipping container.
7. Install the VRM into the empty VRM socket (see Figure 5-6).



**NOTE:** A voltage regulator module must be installed for each processor that is installed in the server.

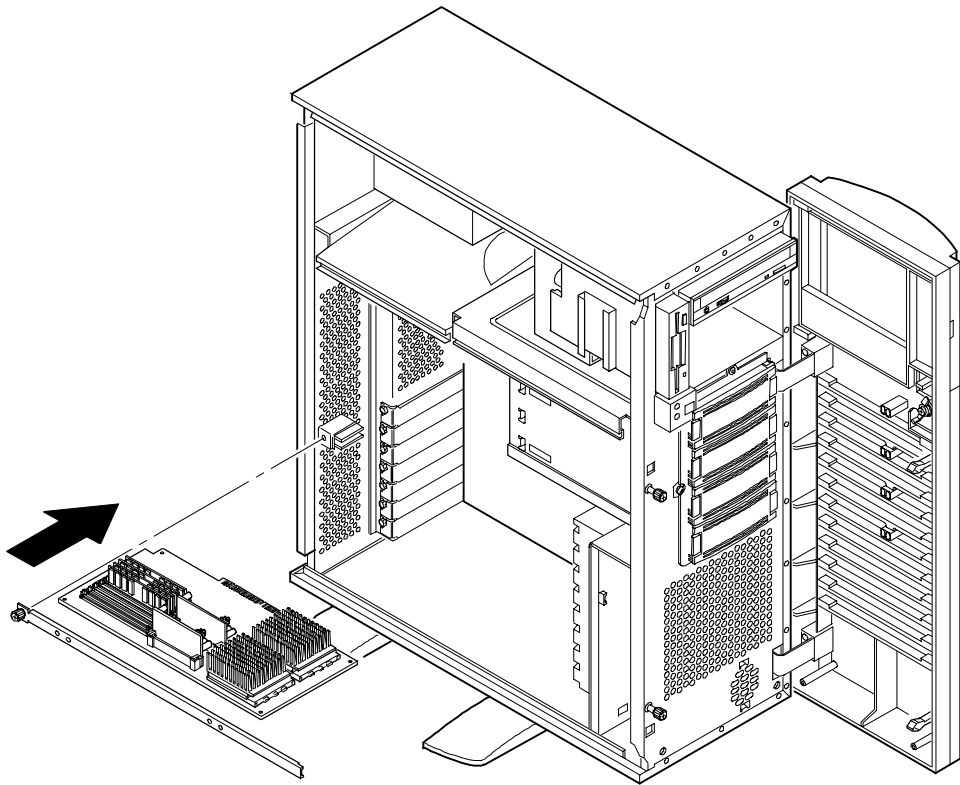
8. Set all appropriate switch settings on the processor module.  
*Refer to Appendix A, "Technical Specifications," for switch locations.*



DEC01032-5

**Figure 5-6. Installing a VRM**

9. Install the processor module into the slot on the main logic board.
10. Secure the processor module to the main logic board using the previously removed retaining bracket.
11. Install the side panel and lock the server.
12. Connect any cables and power cords previously removed from the back of the server.



DEC01054-3

**Figure 5-7. Installing the Processor Module**

## Run the System Configuration Utility (SCU)

Power up and boot your server from the SCU diskette. The SCU enables you to check or change your server's configuration. Run the SCU to configure your server for the new processor or processor module.

To start and run the SCU:

1. Insert the SCU diskette into drive A and turn on your server. The diskette should boot automatically.
2. When the SCU title appears, press any key to continue. Afterwards, follow the instructions on your screen to access the SCU main menu.
3. From the main menu, press the up or down arrow to highlight an item and then press Enter to select it. Press F1 at any time for help about a selection.
4. From the main menu select `Configure Computer` and then `View and Edit Details`.

For example: If you install a video option card, select the *Advanced Control Group* and disable the *Embedded - PCI VGA controller*.

5. Make sure that the boot option is drive "A: then C:"
6. Select `Save and Exit` to configure your server for the processor module.
7. When complete, remove the SCU diskette from drive A.

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

# Pentium II Processor Upgrades

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# 6

## Introduction

Installing a second Pentium II processor increases the capabilities of your server. This chapter describes the configuration guidelines that must be followed prior to upgrading your server as well as detailed procedures on removing and installing a Pentium II processor module.



**NOTE:** If your DIGITAL server came with a Pentium Pro processor module, refer to Chapter 5, “Pentium Pro Processor Upgrades,” for detailed information on upgrading to a higher-performance Pentium Pro processor module.

## Configuration Guidelines



**NOTE:** Before you begin, create an SCU diskette using Quick Launch. You must run the SCU after installing any processor upgrade. This allows your server to recognize the new processor configuration.

There is only one Pentium II processor upgrade. You can upgrade from a single processor configuration to a dual processor configuration.

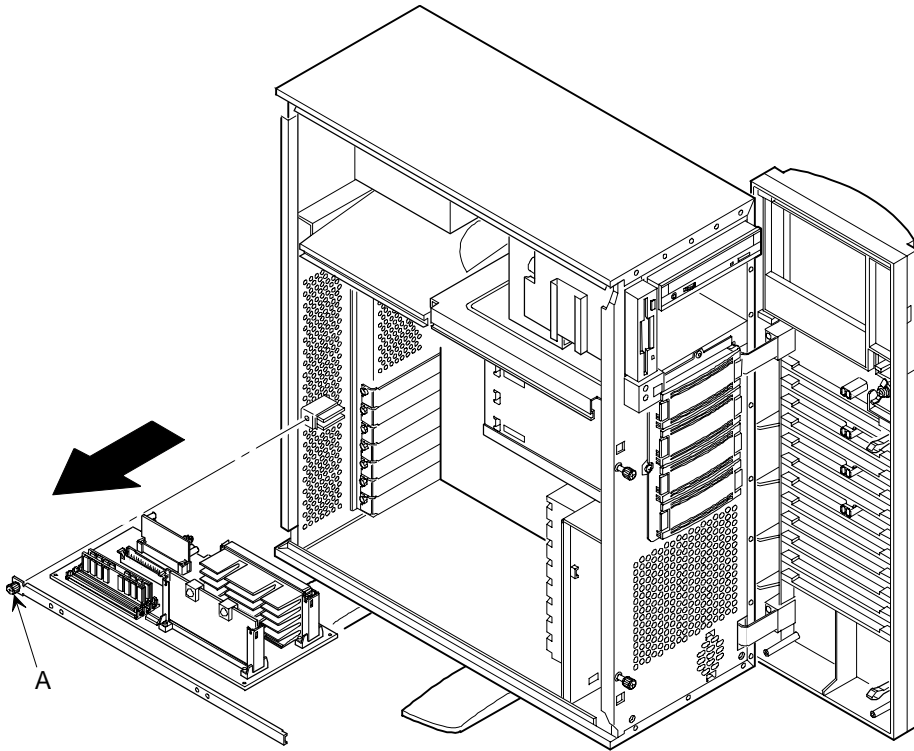
- Single processor modules must be installed in the primary Slot 1 socket (Processor 1) and have a termination card installed in the second Slot 1 socket (Processor 2). The termination card must be removed prior to installing a second processor.
- A Voltage Regulator Module (VRM) must be installed for each processor installed in the processor module.
- DIGITAL recommends that dual processor configurations use processors with identical stepping (manufacturing revision). Processors with different stepping might not function properly. Stepping information appears during the Power On Self Test (POST) for each processor.
- Use only Digital-supplied Pentium II processor modules
- Use only Digital-supplied DIMMs

## Installing a Processor

To upgrade from a single-processor configuration to a dual-processor configuration:

1. Power down the server.
2. Disconnect all external devices, ac power, and monitor power.
3. Remove the side panel.
4. Place the antistatic wrist strap on your wrist and connect the grounding clip to a non-painted metal surface of the server's chassis.
5. Loosen the thumbscrew and then remove the retainer and Pentium II processor module (A, Figure 6-1).

## Pentium II Processor Upgrades

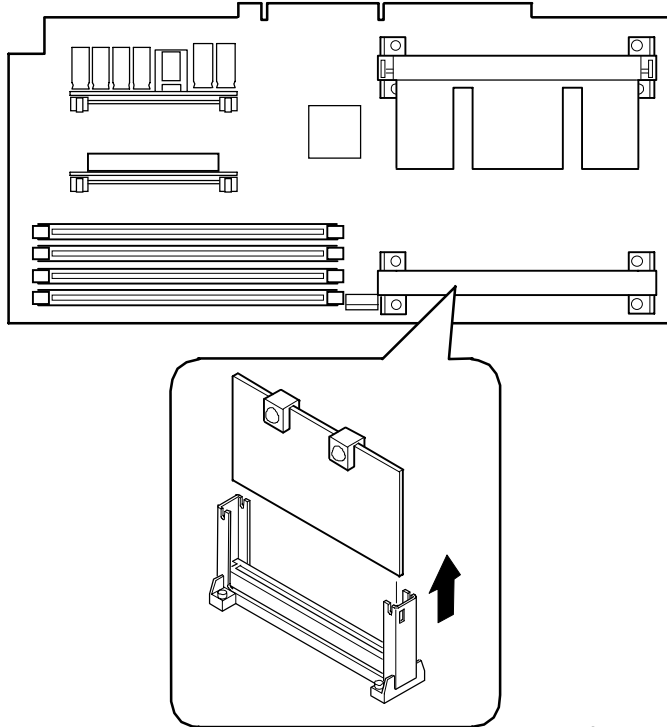


DEC01282-2

**Figure 6-1. Removing the Processor Module**



6. Remove the terminator card from the processor module (see Figure 6-2). Grasp the terminator by each end and pull up.

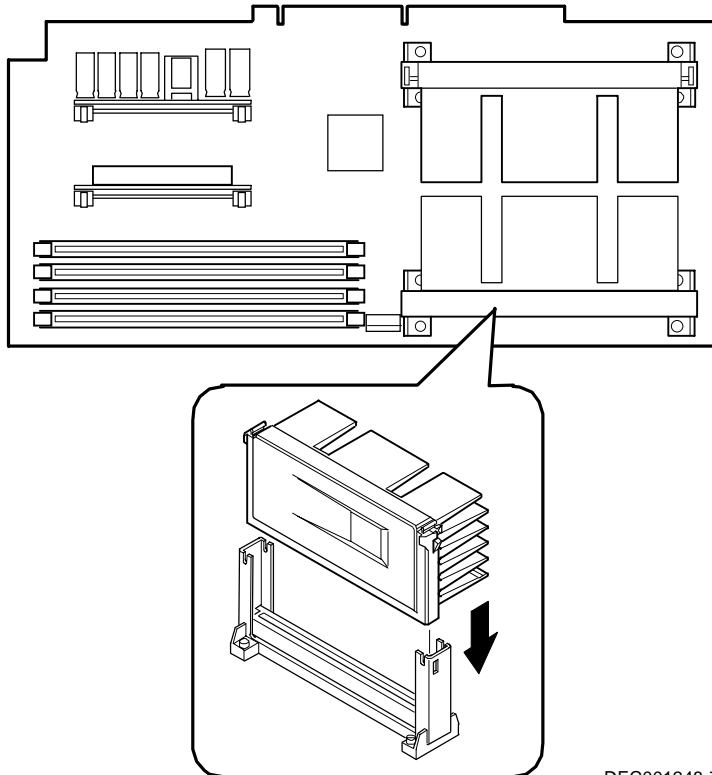


DEC001248-6

**Figure 6-2. Removing the Terminator Module**

## Pentium II Processor Upgrades

7. Remove the new processor from its shipping container.
8. Insert the new processor into this slot (see Figure 6-3).
9. Secure the new processor to its socket by pushing out on the two plastic tabs at each side.



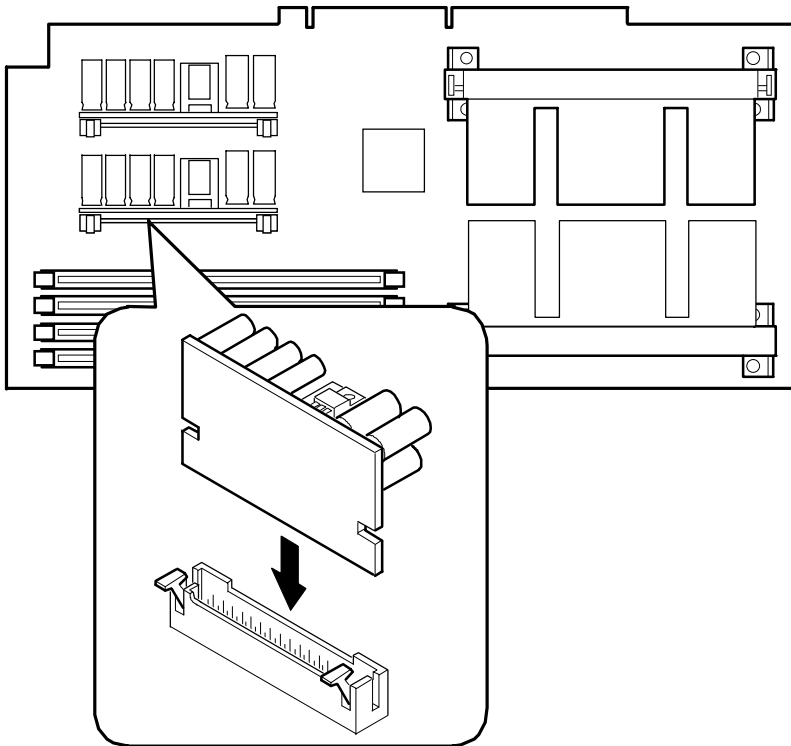
DEC001248-7

**Figure 6-3. Installing the Second Processor**

10. Remove the new VRM from its shipping container.
11. Install the second VRM into the empty VRM socket (see Figure 6-4).



**NOTE:** A VRM must be installed for each processor installed in the processor module.



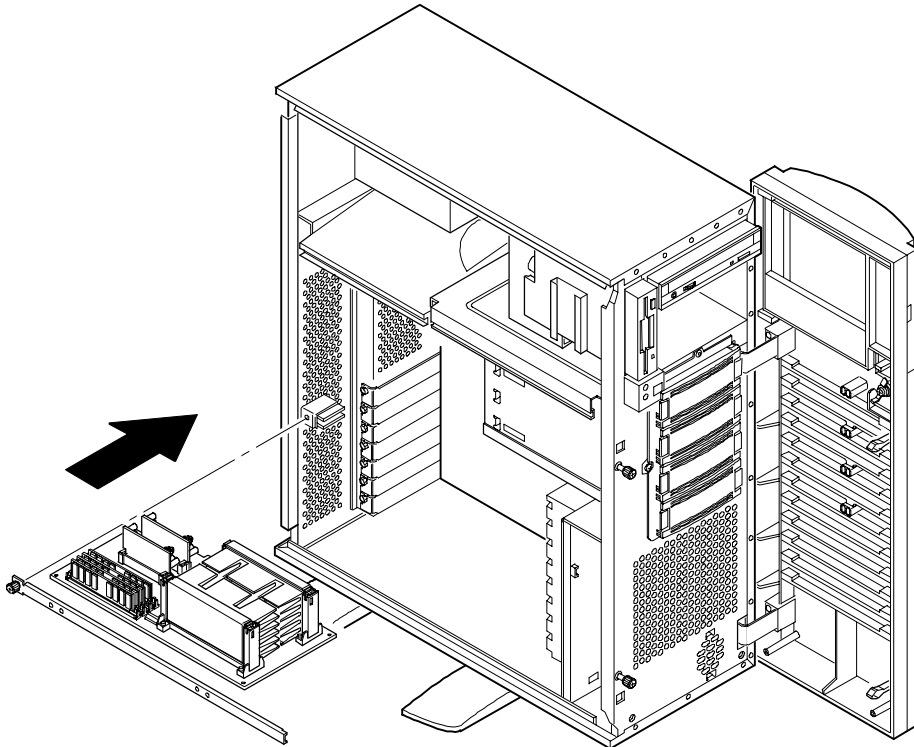
DEC001248-9

**Figure 6-4. Installing a VRM**

12. Set all appropriate switch settings on the processor module.  
*Refer to Appendix A, "Technical Specifications," for switch locations.*

## Pentium II Processor Upgrades

13. If you are installing additional memory as part of this procedure, refer to Chapter 8, "Installing Additional Memory (DIMMs)," for more information.
14. Install the Pentium II processor module.



DEC01282-3

**Figure 6-5. Installing the Processor Module**

15. Replace the side panel.
16. Connect all external devices and restore power.

## Run the System Configuration Utility (SCU)

Power up and boot your server from the SCU diskette. The SCU enables you to check or change your server's configuration. Run the SCU to configure your server for the new processor or processor module.

To start and run the SCU:

1. Insert the SCU diskette into drive A and turn on your server. The diskette should boot automatically.
2. When the SCU title appears, press any key to continue. Afterwards, follow the instructions on your screen to access the SCU main menu.
3. From the main menu, press the up or down arrow to highlight an item and then press Enter to select it. Press F1 at any time for help about a selection.
4. From the main menu select `Configure Computer` and then `View and Edit Details`.

For example: If you install a video option card, select the *Advanced Control Group* and disable the *Embedded - PCI VGA controller*.

5. Make sure that the boot option is drive "A: then C:"
6. Select `Save and Exit` to configure your server for the processor module.
7. When complete, remove the SCU diskette from drive A.

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

# Installing Additional Memory (SIMMs)

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# 7

## Introduction

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

Your DIGITAL Server supports up to 1 GB of EDO memory or Fast-Page memory using single in-line memory modules (SIMMs). Your server's memory can only be increased by adding or replacing SIMMs on the installed processor module.

Your DIGITAL server has a minimum supported memory of 32 MB. Memory is configured in banks, with each bank containing two SIMMs. The processor module contains Banks 0 through 3, with two SIMMs per bank.



**CAUTION:** SIMMs must be ordered separately. Only install SIMMs supported by Digital Equipment Corporation. DIGITAL does not support server performance, product warranty, or service calls resulting from installing non-qualified SIMMs.

## Server SIMMs Requirements

Supported SIMMs	36-bit SIMMs, 60 ns access time, EDO memory or 36-bit SIMMs, 60 ns access time, Fast-Page memory
Supported densities	8, 16, 32, and 64 MB of EDO or 64 and 128 MB of Fast-Page memory (refer to the memory configuration guidelines for additional information)
Minimum server memory supported	32 MB
Maximum server memory supported	1 GB

## Memory Configuration Guidelines

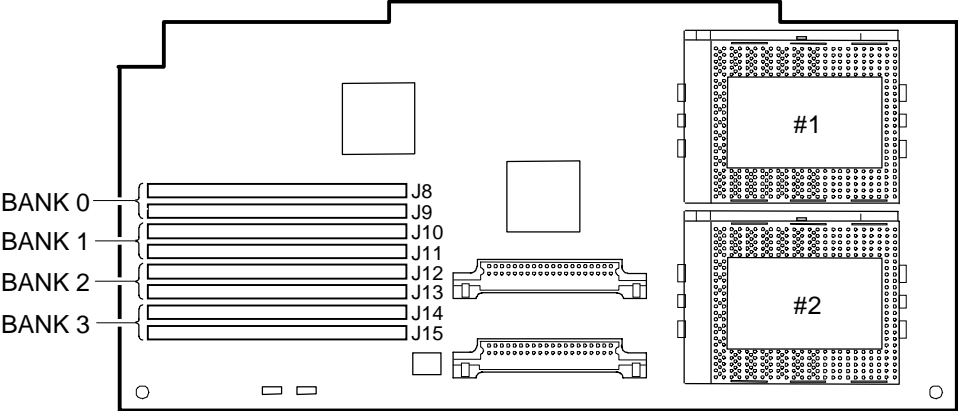


**NOTE:** Before you begin, create a SCU diskette using Quick Launch. You must run the SCU after installing any memory upgrade. This allows your server to recognize the new memory configuration.

The memory configuration guidelines for your DIGITAL Server are as follows:

- Each memory bank on the processor module must contain two SIMMs which must be the same size and type.
- Install memory starting at Bank 0, then Bank 1, then Bank 2, and Bank 3 last.
- Add SIMMs in multiples of two to fill up a bank.
- EDO and Fast-Page memory can be mixed by bank only.

Installing Additional Memory (SIMMs)



DEC01029-3

Figure 7-1. Processor Module SIMM Bank Locations



## Installing Additional Memory (SIMMs)

### Memory Configurations

Bank 0		Bank 1		Bank 2		Bank 3		Total Memory
J8	J9	J10	J11	J12	J13	J14	J15	
32 MB								32 MB
32 MB	32 MB							64 MB
32 MB	32 MB	32 MB	32 MB					128 MB
32 MB	32 MB	32 MB	32 MB	32 MB	32 MB			192 MB
32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	256 MB
64 MB	64 MB							128 MB
64 MB	64 MB	64 MB	64 MB					256 MB
64 MB	64 MB	64 MB	64 MB	64 MB	64 MB			384 MB
64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	64 MB	512 MB
128 MB	128 MB							256 MB
128 MB	128 MB	128 MB	128 MB					512 MB
128 MB	128 MB	128 MB	128 MB	128 MB	128 MB			768 MB
128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB	1024 MB

Table does not list all possible configurations

## Upgrading Memory

You can upgrade memory on your DIGITAL Server by adding and/or replacing SIMMs on the installed processor module. You must add two SIMMs (per bank) when expanding memory starting from Bank 0.

### Installing SIMMs

To install SIMMs, perform the following:

1. Power down your server.
2. Refer to Chapter 5 for instructions on “Removing the Pentium Pro Processor Module.”



**CAUTION:** Never install SIMMs on a processor module without first removing it from the server.

## Installing Additional Memory (SIMMs)

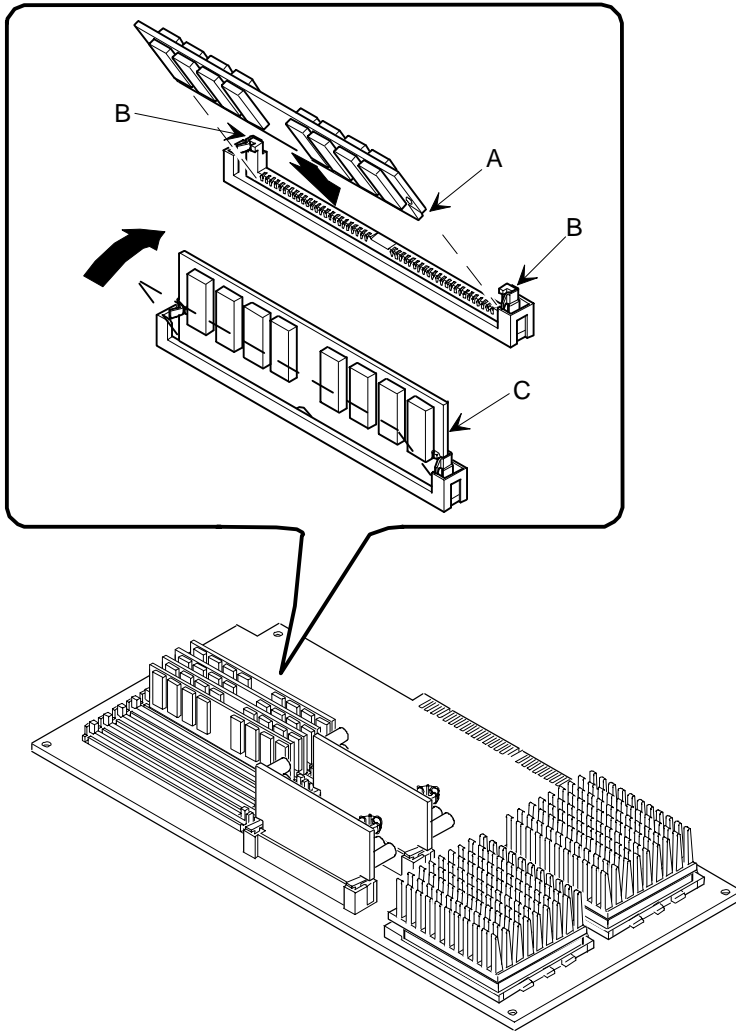
3. Install a SIMM into a socket at a 45 degree angle away from the edge connector.

Make sure the notch is oriented as shown (A, Figure 7-2). Rock the SIMM gently until it completely engages the bottom of the socket. Tip the SIMM upright until both retaining clips engage (B, C, Figure 7-2).

4. Install the remaining SIMMs in complete banks on the processor module.
5. Replace the processor module according to the instructions in Chapter 5.
6. Replace the side panel and then close and lock the front bezel according to the instructions in Chapter 3.
7. Connect all external devices and restore power.
8. Run the SCU. Select `Configure Computer` from the main menu, and then select `Save and Exit` to configure your server for the additional memory.

*For more information, refer to Chapter 2, "Server Software and Utilities."*

## Installing Additional Memory (SIMMs)



DEC01032-2

**Figure 7-2. Installing a SIMM**

## Memory Troubleshooting

Your DIGITAL Server's POST can detect memory size, type, and errors when it boots. The memory size, type, and error can be isolated to a pair of SIMMs on the installed processor module. The memory error message format is:

<Type of Error> <Location> <Size> <Type>

An example for a single bit memory error:

Correctable Error J10/J11 zz MB EDO SIMMs

An example for a multiple bits memory error:

Uncorrectable Error : J14/J15 zz MB EDO SIMMs

Where:

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

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

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

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

*Refer to Figure 7-1 to locate the bank and J designation numbers.*

# Installing Additional Memory (DIMMs)

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# 8

## Introduction

This chapter provides the memory configuration guidelines that must be followed prior to installing additional DIMMs on an installed Pentium II processor module.

Your DIGITAL Server provides an EDO/ECC memory system. The minimum supported memory is 32 MB. The maximum supported memory is 512 MB. When configuring total server memory (DIMM combinations), make sure that you reference the DIMM memory configuration table and follow all DIMM memory configuration guidelines.



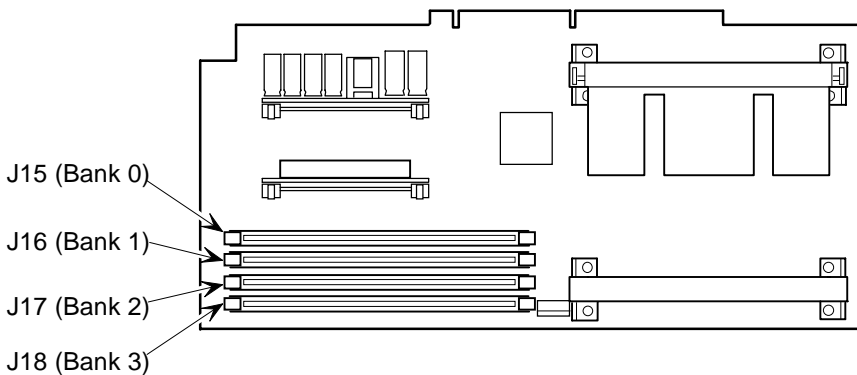
**CAUTION:** DIMMs must be ordered separately. Only install DIMMs supported by Digital Equipment Corporation. DIGITAL does not support server performance, product warranty, or service calls resulting from installing non-qualified DIMMs.

## Memory Configuration Guidelines

- Supported DIMMs: 168 pin, 72-bit 60 ns access time. EDO memory, ECC protected.
- Supported densities: DIMMs are available in 32 MB, 64 MB, and 128 MB.
- Maximum memory: 512 MB.
- Each memory bank on the processor module will accommodate one DIMM.
- Install replacement or additional DIMMs starting with Bank 0 (J15). See Figure 8-1 for DIMM socket locations.
- Different DIMM capacities can be mixed.



**NOTE:** Before you begin, create a SCU diskette using Quick Launch. You must run the SCU after installing any memory upgrade. This allows your server to recognize the new memory configuration.



DEC001248-3

**Figure 8-1. DIMM Socket Locations**

## Memory Configurations

Bank 0 (J15)	Bank 1 (J16)	Bank 2 (J17)	Bank 3 (J18)	Total Memory
32 MB <sup>(1)</sup>				32 MB
32 MB	16 MB			48 MB
32 MB	16 MB	16 MB		64 MB
32 MB	32MB			64 MB
32 MB	16 MB	16 MB	16 MB	80 MB
32 MB	32 MB	32 MB		96 MB
32 MB	32 MB	32 MB	32 MB	128 MB
64 MB				64 MB
64 MB	64 MB			128 MB
64 MB	64 MB	32 MB	32 MB	192 MB
64 MB	64 MB	64 MB		192 MB
64 MB	64 MB	64 MB	32 MB	224 MB
64 MB	64 MB	64 MB	64 MB	256 MB
128 MB				128 MB
128 MB	64 MB			192 MB
128 MB	128 MB			256 MB
128 MB	128 MB	64 MB	32 MB	352 MB
128 MB	128 MB	128 MB		384 MB
128 MB	128 MB	128 MB	64 MB	448 MB
128 MB	128 MB	128 MB	128 MB	512 MB

<sup>(1)</sup> Standard 32 MB offering

Table does not list all possible configurations



## Installing DIMMs on the Processor Module

Use the following procedure to install DIMMs:



**CAUTION:** To avoid possible damage to the components, place the antistatic wrist strap on your wrist and connect the grounding clip to a non-painted metal surface of the server's chassis.

1. Power down your server.
2. Refer to Chapter 6 for instructions on “Removing the Pentium II Processor Module.”

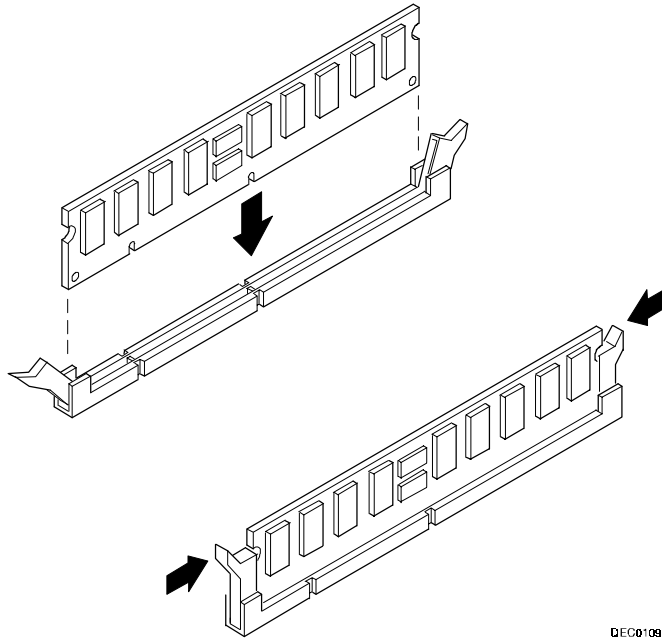


**CAUTION:** Never install DIMMs on a processor module without first removing it from the server.

3. Unpack the DIMMs. Refer to “Memory Configurations” described in earlier in this chapter for information on the supported memory configurations.

## Installing Additional Memory (DIMMs)

4. Install DIMMs starting with Bank 0 on processor module, orient the DIMM so that the two notches at the bottom edge of the DIMM are aligned with the keyed socket (see Figure 8-2).



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**Figure 8-3. Installing a DIMM**

## Installing Additional Memory (DIMMs)

5. Insert the DIMM straight down into its socket. Apply equal pressure to both ends of the DIMM until it fully seats in the socket.

The plastic hold-down/ejector tabs snap into place when the DIMM is inserted correctly.

6. Continue installing DIMMs to complete your memory upgrade.
7. Replace the processor module according to the instructions in Chapter 6.
8. Replace the side panel and then close and lock the front bezel according to the instructions in Chapter 3.
9. Connect all external devices and restore power.
10. Run the SCU. Select `Configure Computer` from the main menu, and then select `Save and Exit` to configure your server for the additional memory.

*For more information, refer to Chapter 2, "Server Software and Utilities."*

## Memory Troubleshooting

Your DIGITAL Server's Power-On Self Test (POST) can detect memory errors when it boots. The error can be isolated to a single DIMM on the processor module.

The memory error message format is:

<Type of error>: <Location>

Where:

<Correctable Error>: <Jxx xxMB EDO DIMM>

If the error is correctable when the server boots, the BIOS displays the following:

Press <F1> to resume

<Uncorrectable Error>: <Jxx xxMB EDO DIMM>

If the error is uncorrectable, the server halts after the memory test.

<Configuration Error>: <Jxx xxMB EDO DIMM>

This indicates that an error occurred while reading the memory configuration. The problem is either the DIMM, the processor module, or the main logic board. In all cases, the server halts when this error occurs.

# Installing Disk and Tape Drives

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## Introduction

Your DIGITAL Server 3100/3200 supports narrow and wide Ultra SCSI devices. The following sections describe the SCSI configuration guidelines that must be adhered to so your server operates correctly after installing and connecting SCSI devices.

## Tape Drive Configuration Guidelines

- Tape drive(s) should be installed in the front access 5¼-inch drive bays.
- A full-height tape drive occupies two half-height 5¼-inch drive bays.

## Hard Disk Drive/SBB Configuration Guidelines

- A maximum of six hard disk drives can be installed and configured in the server:
  - Four Storage Building Block (SBB) drives in the hot swap bay area.
  - Two non-hot swap drives in the upper bay area
- SBBs must only be installed in the hot-swap, lower bay area.

## CD-ROM Drive Configuration Guidelines

- The factory installed SCSI CD-ROM drive has its SCSI ID set to 5.
- The CD-ROM drive should always be connected to the onboard Adaptec SCSI controller to support the bootable ServerWORKS Quick Launch CD-ROM disc.

## 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 seven internal SCSI devices, including four SBBs, one CD-ROM drive, and two half-height devices located in the upper bays above the SBB area.
- The CD-ROM drive and the two half-height devices located in the upper bays are typically only connected to the narrow SCSI bus.
- The four SBB devices can only be connected to the wide SCSI bus.

*Limitations on connecting these devices might also be based on the manufacturer's design.*

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



**CAUTION:** The onboard SCSI connectors provide both wide and narrow access to a single SCSI channel. Care must be taken to avoid conflicting IDs. A one meter SCSI limit applies to the combined length of the narrow and wide SCSI cable.

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



**NOTE:** If the SCSI connector on the main logic board is not used, additional termination settings must be changed using the *SCSISelect* utility.

*Refer to Chapter 11, "Connecting SCSI and RAID adapters," for more information.*

- If a device such as a CD-ROM drive has a terminator jumper installed, remove it. Otherwise no other devices will be seen beyond the CD-ROM drive.

*Refer to Chapter 11, "Connecting SCSI and RAID Adapters," for information on setting onboard SCSI termination.*

## Boot Device

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

- You can add external devices to your server by adding a SCSI or RAID adapter in one of the available PCI/EISA slots.
- Make sure that the SCSI ID you select for the external SCSI devices do not conflict with other devices installed in the server on the same bus.
- Make sure that the external SCSI bus is terminated properly.
- Extending an internal Ultra SCSI bus is not a supported configuration.
- Each device on the SCSI bus must be assigned a unique SCSI ID number.
- For proper operation, the length of the SCSI cable 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.
- Properly terminate both ends of the SCSI cable. In most cases, one side of the termination is provided by the SCSI adapter. The last device on the external SCSI bus must also be terminated.

\* According to DIGITAL specifications



## Storage Backplane

- SBBs must only be installed in the hot-swap bay area.
- A maximum of four SBBs can be installed.
- A SCSI ID for each SBB is assigned by the switch settings on the storage backplane (see Figure 9-1).

*Refer to the SCSI Bus Target ID Settings table in the Drive ID section.*

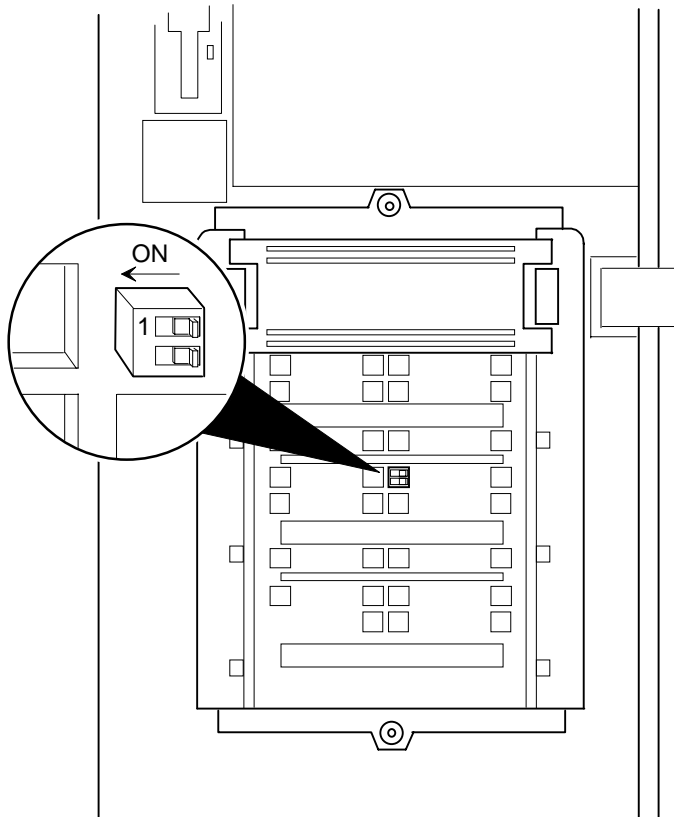
## Drive ID

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

### SCSI Bus Target ID Settings (SW1 Figure 9-1)

Switch Position Setting	SCSI ID			
Top switch, (SW1-1) OFF	0	1	2	3
Top switch, ON	8	9	10	11
Bottom switch (SW1-2)	No connection			

## Installing Disk and Tape Drives



DEC01064

**Figure 9-1. Storage Backplane Switch Location**



**NOTE:** You need to remove the third SBB from the top to gain access to switch SW1 (see Figure 9-5).

## Wide Ultra SCSI Configuration Guidelines

Your server was configured at the factory for wide Ultra SCSI operation. To ensure that your server continues to operate correctly using this mode, follow these guidelines:

- Only use DIGITAL supported wide Ultra SCSI devices.
- Using non-Ultra SCSI hard disk drives in the top drive bay is not a supported wide Ultra SCSI configuration.
- Using non-Ultra SCSI hard disk drives in the hot-swap drive bay is a supported wide Ultra SCSI configuration. However, maximum wide Ultra SCSI bus utilization will not be achieved if the non-Ultra SCSI drives are active.

*Refer to Chapter 11, "Connecting SCSI and RAID Adapters," for information on configuring your server for non-Ultra SCSI mode.*

- Replacing or modifying the factory-installed SCSI cable is not a supported wide Ultra SCSI configuration.

## Cables

- Narrow SCSI cable with four connectors connected to the narrow SCSI connector on the main logic board, to the two 5¼-inch half-height drive bays, and then to the CD-ROM drive.
- Wide SCSI cable with two connectors connected to the wide SCSI connector on the main logic board and to the bottom 68-pin wide SCSI connector on the storage backplane.
- Wide SCSI cable with two connectors connected to the top 68-pin wide SCSI connector on the storage backplane and to the external wide SCSI connector at the rear of the server.
- A narrow SCSI bus terminator connected to the end connector of the narrow SCSI cable.
- A wide SCSI bus terminator connected to the wide SCSI bus connector on the top of the backplane. This terminator must be moved to the end of the external wide SCSI bus connector if installed.

## Installing Optional Drives

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

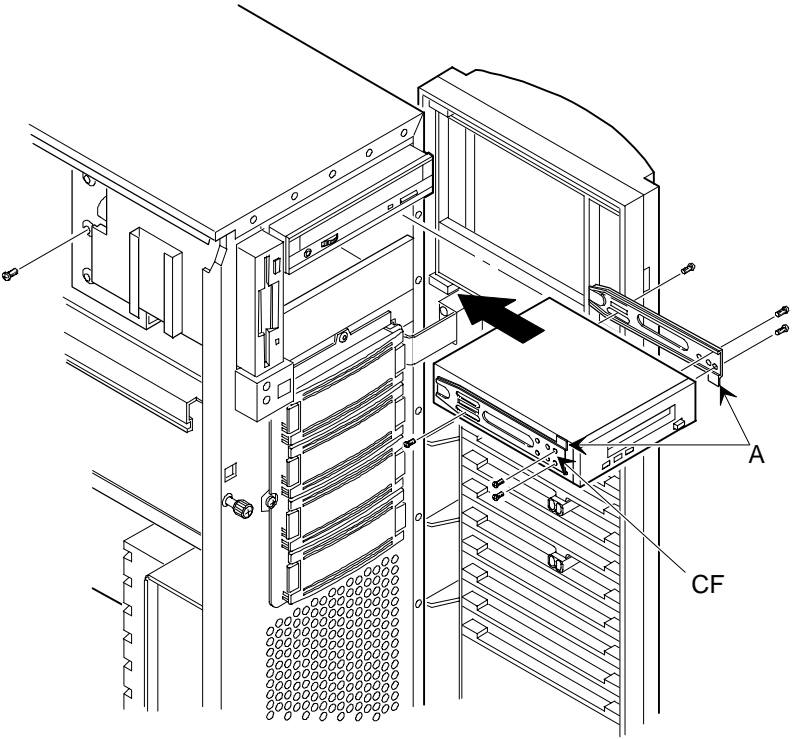
- Top drive bay area—This area has one 5¼-inch SCSI CD-ROM drive, one 3½-inch diskette drive (both standard on the DIGITAL server) and room for two narrow (50-pin) 5¼-inch half-height SCSI devices or one full-height, 5¼-inch device. Devices can include CD-ROM drives or tape drives.
- Hot Swap (lower) drive bay area—This area has room for four 3½-inch wide SCSI SBB devices capable of “hot swapping”, exchanging the device while the system is powered on and not accessing the device.

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

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

1. Turn off your server.
2. Disconnect all external devices, ac power, and monitor power.
3. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.
4. Remove the front plastic filler panel.
5. Attach the supplied drive brackets to the device.
  - a. Ensure that the tab on the left bracket is up (A, Figure 9-2) and the tab on the right bracket is down.
  - b. Install two screws in the front holes (CF) and in one rear slot. (Note that, when installed, the labeling on the right bracket will be upside down.)
6. Insert the device into the drive bay slot from the front.
7. Secure the device to the slot using the supplied pan-head mounting screw.

*Refer to Chapter 11, "Connecting SCSI and RAID Adapters," for power and SCSI cable connections.*



DEC01055-2

**Figure 9-2. Installing a Half-Height 5 1/4-Inch Device Into Top Drive Bay**

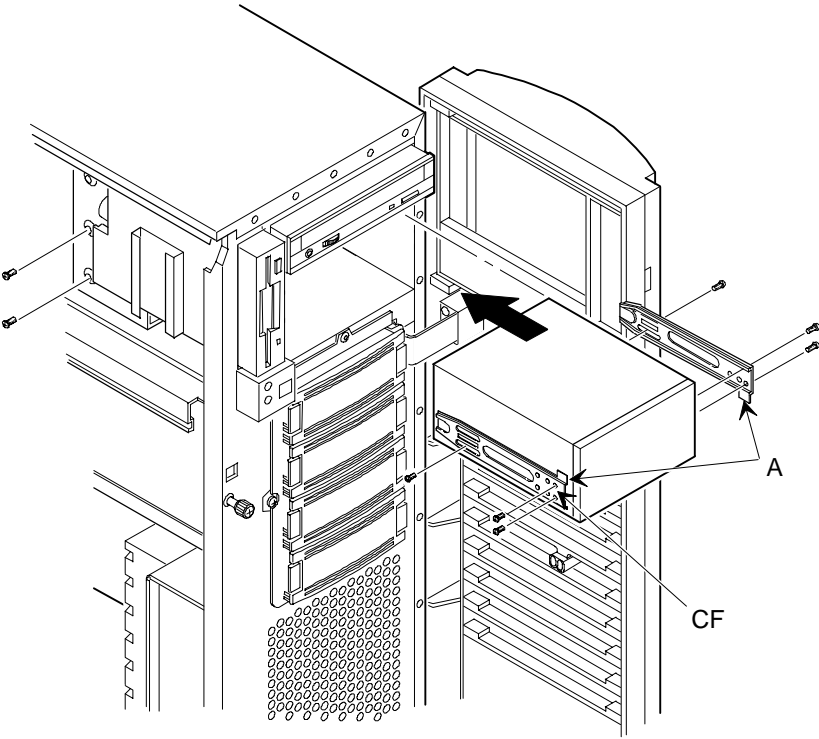
## Installing a Full-Height 5¼-Inch Device into the Top Drive Bay

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

1. Turn off your server.
2. Disconnect all external devices, ac power, and monitor power.
3. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.
4. Remove the front plastic filler panels.
5. Attach the supplied drive brackets to the device.
  - a. Ensure that the tab on the left bracket is up (A, Figure 9-3) and the tab on the right bracket is down.
  - b. Install two screws in the front holes (CF) and in one rear slot. (Note that, when installed, the labeling on the right bracket will be upside down.)
6. Insert the device into the drive bay from the front.
7. Secure the device using the two supplied mounting screws.

*Refer to Chapter 11, "Connecting SCSI and RAID Adapters," for power and SCSI cable connections.*



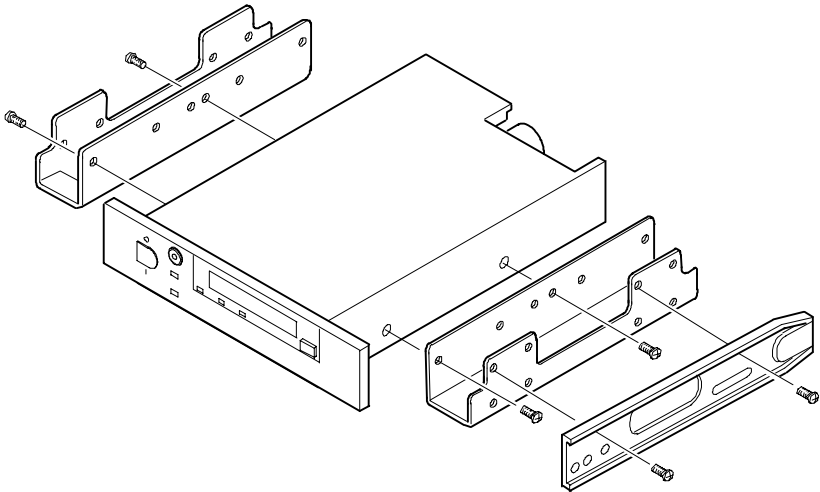


DEC01055-3

**Figure 9-3. Installing a Full-Height 5 1/4-Inch Device Into Top Drive Bay**

## **Expansion Brackets**

You can install 3½-inch half-height devices 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, as shown in Figure 9-4. The expansion brackets 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 Half-Height 5¼-Inch Device into the Top Drive Bay.”



DEC01447

**Figure 9-4. Installing 3 1/2-Inch Expansion Brackets**

## Hot-Swap Drive Bay

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



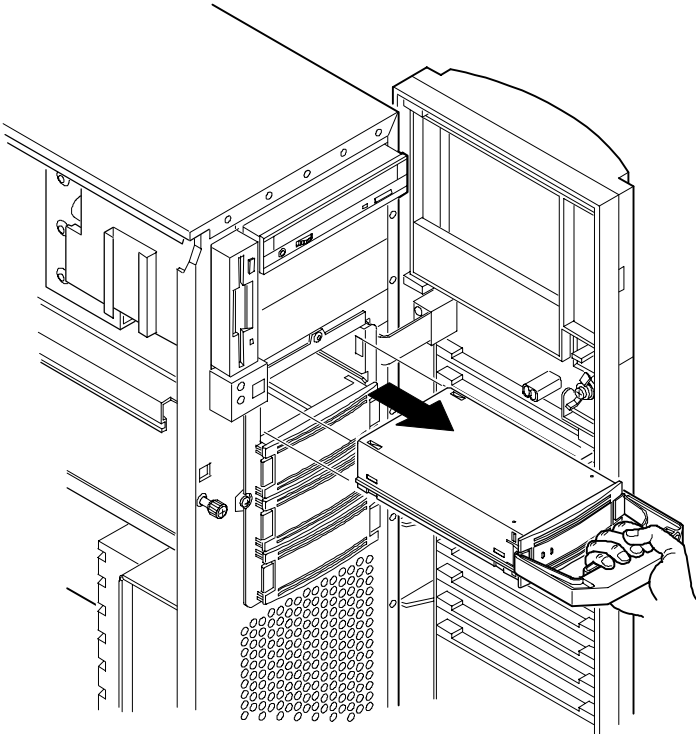
**NOTE:** You might need to reconfigure your server to recognize the devices you installed.



**CAUTION:** To avoid possible damage to components, place an antistatic wrist strap on your wrist and then connect the grounding clip to a non-painted metal surface on your server's chassis.

Use the following procedure to install or replace an SBB:

1. Unlock and open the front bezel.
2. Remove the filler panel or SBB by pressing in and holding the handle in the middle of the extractor tool (see Figure 9-5).
3. Using the extractor tool, pull the SBB out.
4. Insert the new SBB into the guide slots and push it in until it is fully seated and the mounting tabs engage the shelf.
5. Close and lock the front bezel.



DEC01058-3

**Figure 9-5. Removing a Device From the Hot-Swap Drive Bay**

## SBB LED Status Indicators

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

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



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

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

### SBB Status LEDs

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

## Installing the External Wide SCSI Cable Assembly

To connect the external wide SCSI cable assembly:

1. Power down the server.
2. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.
3. Remove the 68-pin terminator from the storage backplane above the fan by unscrewing its thumbscrews.
4. Plug the male end of the external wide SCSI cable assembly into the storage backplane.

*Refer to Chapter 11, "Connecting SCSI and RAID Adapters," for power and SCSI cable connections.*

5. Remove any cover plate from the external wide SCSI port hole at the rear of the chassis.
6. Remove one of the hex-head screws from the end of the external wide SCSI assembly and then loosen the other.
7. Thread the cable through the nylon cable clamps at the top of the chassis divider. Do not block the air flow from the fan.
8. Insert the cable connector through the external wide SCSI port hole and secure it in place with the hex-head screws.
9. Attach the terminator to the external wide SCSI connector at the rear of the server.



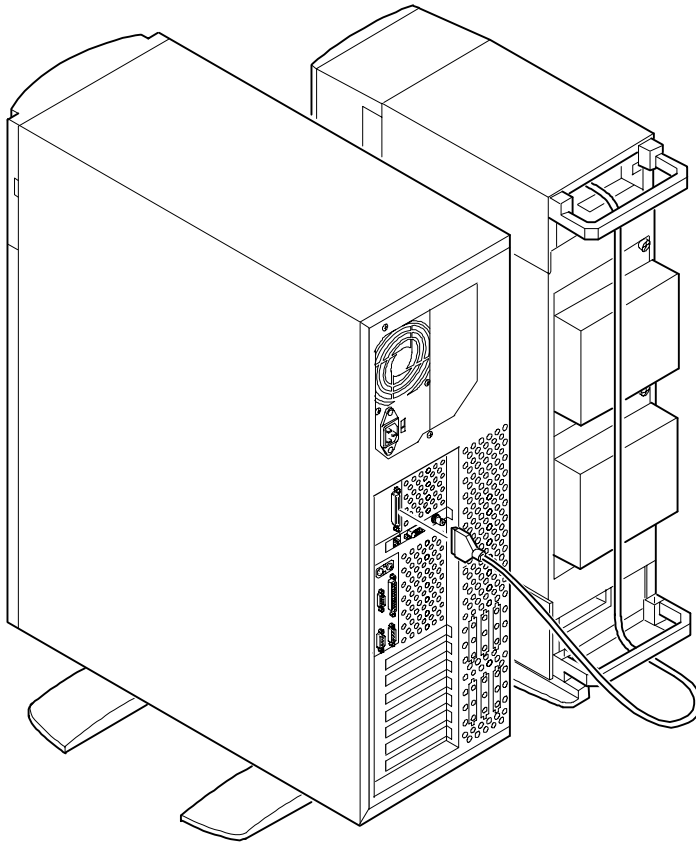
**CAUTION:** Do not ship the server with the terminator installed. Having the terminator installed during shipping might damage the cable connector.

## **Connecting an External SCSI Storage Box**

To connect an external SCSI storage box:

1. Power down the 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 making sure it is properly terminated.





DEC01059

**Figure 9-6. Connecting an External SCSI Storage Box**

# Installing Expansion Boards

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# 10

## Introduction

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

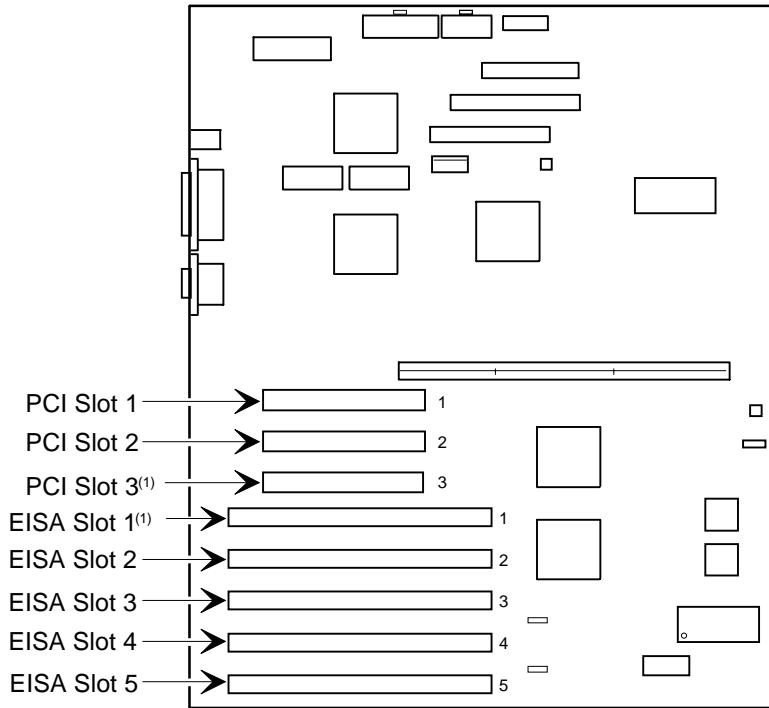


**NOTE:** Before you begin, create a SCU diskette using Quick Launch. You will need this diskette when adding, removing, or relocating PCI, EISA, or ISA expansion boards.

## ISA/EISA Expansion Board Configuration Guidelines

- EISA slots one through five support industry-standard 32-bit EISA expansion or 16-bit ISA boards.
- ISA/EISA boards should be installed starting in EISA slot two. Install a board in the shared EISA slot (slot 1) last.
- You must run the SCU after installing any EISA expansion board.
- You must run the SCU before installing any ISA expansion board to view assigned IRQs and addresses for other options.
- An optional Remote Server Management (RSM) card can be installed in EISA slot 2.

## Installing Expansion Boards



DEC01431-5

<sup>(1)</sup> PCI slot 3 and EISA slot 1 share an expansion slot at the rear of the server

**Figure 10-1. 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. Install a board in the “shared PCI slot” (slot 3) last.
- The SCU automatically scans the PCI bus and will assign an IRQ and I/O port address for any new PCI board installed in the server.

## Configuring Your EISA/PCI Expansion Boards Using the SCU

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

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

For PCI expansion boards, the SCU will autodetect the 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.



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

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

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

## Server Scan Sequence

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

1. The search for a bootable device is started from a low ROM address to a high ROM address (starting at C8000h). The boot device with the lower address gets higher priority to be assigned as drive C then those with higher addresses.
2. The EISA bus is scanned first. If an EISA expansion board is configured to occupy the C8000h address, then it becomes the boot device.
3. The PCI bus is scanned next. If the embedded PCI SCSI controller is enabled using the SCU, then it is the boot device. If "PCI slots" is the selected SCU option, then the boot device is determined by the PCI scan sequence:
  - a. PCI slots are scanned in ascending order starting with slot 0.
  - b. For each bus, the scanning sequence is also in ascending order starting from device 0 to device 1Fh.

For each device found, the server scans to see if there are any additional PCI busses on that controller. As PCI busses are detected, they are assigned the next available PCI bus number in sequence. Controllers such as the Adaptec 2940W and the Mylex RAID controllers (1, 2, or 3 channel) have no additional PCI busses onboard. They would represent a single device on PCI bus 0 if installed in PCI slots 1 - 3.

The slot priorities are summarized as:

Priority	Slot #
1	Slot 1 (Bus 0, Device 08h)
2	Slot 2 (Bus 0, Device 09h)
3	Slot 3 (Bus 0, Device 0Ah)
4	Embedded SCSI controller (0Ch)

## Scan Order Depending on SCU Boot Sequence Preference

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

1. PCI Slots — If “PCI Slots” is selected, slots 1 - 3 are scanned first, then the embedded SCSI controller is scanned.
2. Embedded SCSI controller — If the embedded SCSI controller is selected, it is scanned first, then PCI slots 1 - 3 are scanned.

## Boot Device Assignment Example

In the following example, the assumption is that “PCI Slots” is the selected boot sequence preference in the SCU.

### EISA/PCI Scan Order Example

PCI Slot 1	PCI SCSI controller, such as a 2940W Drive at SCSI ID 0
EISA Slot 4	EISA RAID host adapter, such as a Mylex RAID 3 channel Drive on Channel 1 SCSI ID 0 Drive on Channel 2 SCSI ID 4 Drive on Channel 3 SCSI ID 2

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

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

## 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 Controller IRQ15
- PCI 1 PCI SCSI Controller IRQ14



## Installing Expansion Boards

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 2, the entry in the SCU might look similar to this:

- PCI 2 PCI SCSI Controller IRQ10
- PCI 2 PCI Memory Controller IRQ2 (9)
- Embedded PCI SCSI Controller

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

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

- Embedded SVGA

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 SVGA device). As an example, assume that a server has two controllers installed, one in PCI Slot 1 and the other in PCI Slot 2. The SCU might show the following:

- PCI 1 PCI SCSI Controller IRQ15
- PCI 1 PCI Memory Controller IRQ14
- PCI 2 PCI SCSI Controller IRQ10
- PCI 2 PCI Memory Controller IRQ2(9)

- Embedded PCI SCSI Controller
- Embedded PCI SCSI Controller
- Embedded PCI SCSI Controller (7880)
- Embedded PCI Ethernet Controller
- Embedded PCI SVGA

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

## Advanced Menu in the SCU

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

### Locking of Resources

The SCU allows you to lock resources for any EISA/PCI expansion board installed in the server. This allows you to assign resources to that expansion board (such as an IRQ), and then to keep those resources assigned to that expansion board even if the SCU is rerun. PCI option ROM addresses are assigned by the BIOS and cannot be set or locked using the SCU.

To lock a resource:

1. Enter the `Advanced` menu in the SCU.

The first item in this list is Lock/unlock boards.

2. Press [Enter] to select.

The list of integrated and installed options is shown.

3. Move to the option whose resources you want to lock and press [Enter].

An exclamation point (!) appears to the left of that option indicating that the resources associated with that option have been fixed and will not change when the SCU is run.

## Installing Expansion Boards

To unlock a resource:

1. Press [Enter].  
The exclamation point disappears.
2. Press [F10] to complete this operation.

### **View Additional System Information**

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

To view additional system information:

1. Enter the *Advanced* menu in the SCU.
2. Select *View Additional System Information* menu.
3. Select *Board Specifications* to view slot allocations.
4. Select *System Specifications* to view detailed information for each EISA/PCI device including board ID, length, etc.
5. Select *Used Resources* to view IRQ assignments.
6. Select *Available Resources* to view unassigned IRQs.



**NOTE:** The memory address shown might not be correct.

## Set Verification Mode Menu

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

To set your server's verification mode:

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

## Maintain SCI File Menu

You can save the system configuration information to a file as follows:

1. Enter the `Advanced` menu in the SCU.
2. Select `Maintain SCU Files` menu.
3. Select `Open . . .` to display information from a previously created `.SCI` file. The current configuration information will be lost.
4. Select `Save as . . .` to save the current configuration information to a file.

## Installing Expansion Boards

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

## Adding ISA Expansion Boards

Perform the following steps before installing ISA expansion boards:

1. Start the SCU using one of the three methods described in Chapter 2, “Starting the SCU.”
2. Select step 2 from the `Configure Computer` menu: “Adding and Removing Boards,” and update the list of expansion boards and options to include any ISA expansion boards you are going to install in your server.
3. Select “Step 4: Examine Switches or Print Report,” to check the required switch and jumper settings of the ISA expansion boards.
4. Select “Step 5: Save and Exit,” to save your configuration and exit the SCU.
5. Turn off your server and install the ISA expansion boards, manually setting the necessary switches and jumpers.

*Refer to “Installing ISA Expansion Boards.”*

## Installing ISA Expansion Boards

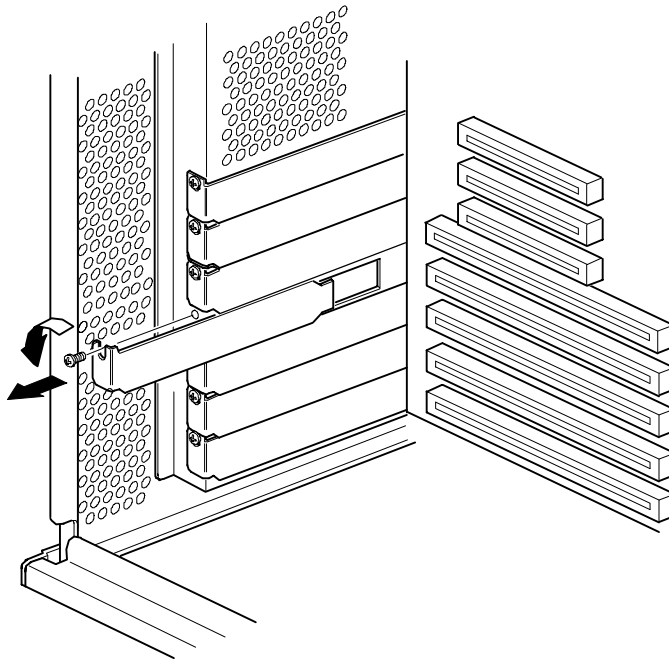
To install an ISA expansion board:



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

1. Run the SCU.
2. Turn off your server.
3. Disconnect the external devices, ac power, and monitor power.

4. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.
5. Unscrew and remove the metal filler plate from the selected ISA expansion slot.

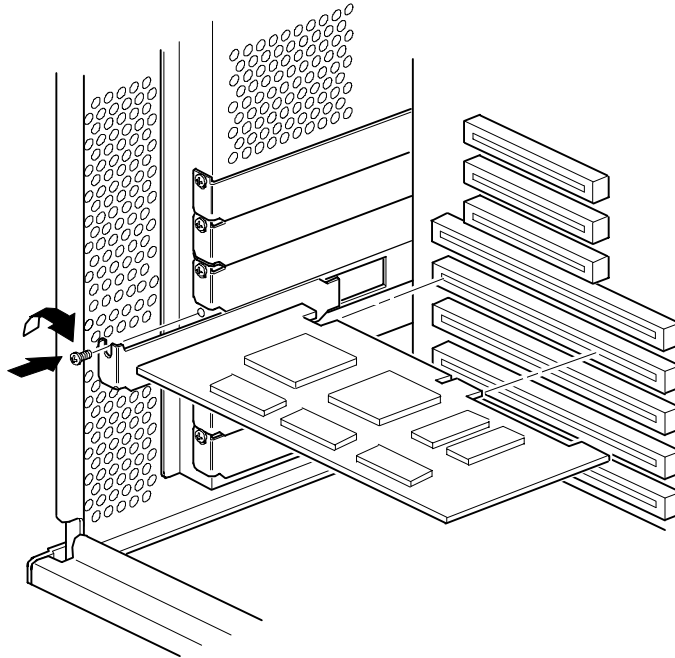


DEC01060-2

**Figure 10-2. Removing a Metal Filler Plate**

## Installing Expansion Boards

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



DEC01060-3

**Figure 10-3. Installing an ISA Expansion Board**

7. Secure the ISA expansion board to the slot with the screw removed in step 5.
8. Replace the side panel, secure the two thumbscrews, and then close and lock the front bezel.
9. Connect all external devices and restore power.

## Installing EISA Expansion Boards

To install an EISA expansion board:

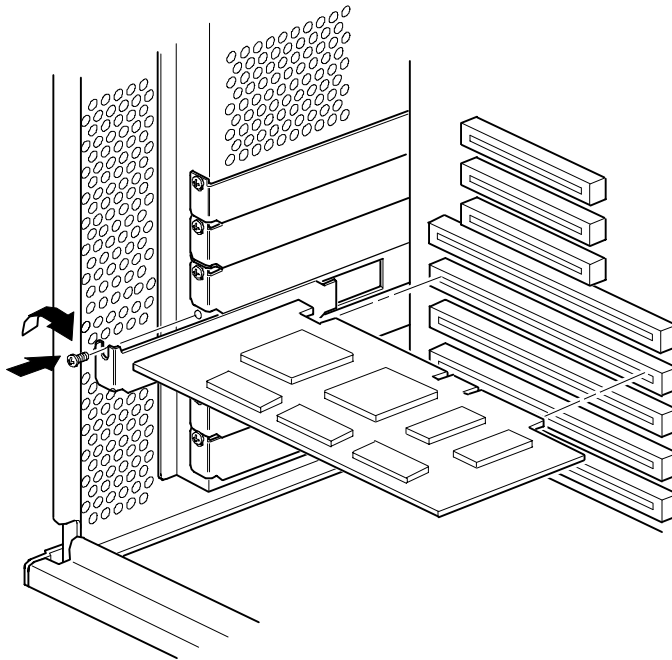


**NOTE:** Read and fully understand your optional expansion board's documentation before installing the expansion board.

1. Turn off your server.
2. Disconnect all external devices, ac power, and monitor power.
3. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.
4. Unscrew and remove the metal filler plate from the selected EISA expansion slot (see Figure 10-3).
5. Insert the new EISA expansion board into the socket and push it firmly into place.
6. Secure the EISA expansion board to the slot with the screw removed in step 4.
7. Replace the side panel, secure the two thumbscrews, and then close and lock the front bezel.
8. Connect all external devices and restore power.
9. Run the SCU.

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





DEC01060-4

**Figure 10-4. Installing an EISA Expansion Board**

## **Adding EISA Expansion Boards**

Perform the following steps after installing EISA expansion boards:

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

After your server boots, the following message appears:

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

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

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

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

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



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

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

## Installing PCI Expansion Boards

To install a PCI expansion board:

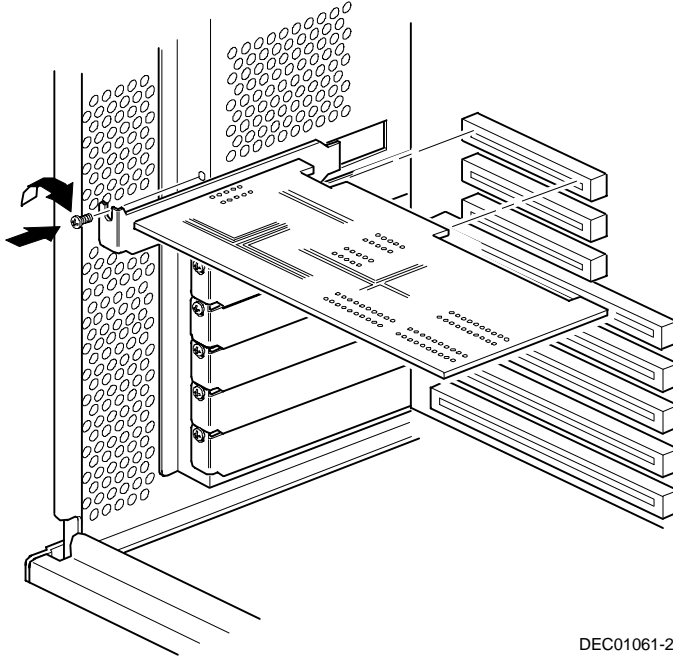


**NOTE:** Read and fully understand your optional expansion board’s documentation before installing the expansion board.

1. Turn off your server.
2. Disconnect all external devices, ac power, and monitor power.
3. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.
4. Unscrew and remove the metal filler plate from the selected PCI expansion slot.

## Installing Expansion Boards

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



DEC01061-2

**Figure 10-5. Installing a PCI Expansion Board**

6. Secure the PCI expansion board to slot with the screw removed in step 4.
7. Replace the side panel, secure the two thumbscrews, and then close and lock the front bezel.
8. Connect all external devices and restore power.
9. Run the SCU.

*Refer to “Adding PCI Expansion Boards” for detailed information on running the SCU.*

## Adding PCI Expansion Boards



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

Perform the following steps after installing PCI expansion boards:

1. Start the SCU using one of the three methods described in Chapter 2, “Starting the SCU.”
2. Press [Enter] to display the SCU welcome screen and then [Enter] again to continue.
3. From the `Configure Computer` menu, select “Step 3: View or Edit Details”.
4. The SCU automatically scans for PCI devices and will assign resources to them. Verify that the resources assigned (e.g., IRQ’s) are supported by the PCI device under the operating system you are loading onto your server.

*Refer to the documentation that shipped with your PCI device.*

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



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

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

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

## Relocating Expansion Boards

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

1. Start the SCU using one of the three methods described in Chapter 2, "Starting the SCU."
2. Press [Enter] to display the SCU main menu and then [Enter] again to continue.
3. Select step 2 from the `Configure Computer` menu: Adding and Removing Boards."
4. Highlight the expansion board you want to relocate, press [Enter], and then follow the instructions displayed on your monitor screen.
5. Select "Step 5: Save and Exit," to save your configuration and exit the SCU.

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



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

# Connecting SCSI and RAID Adapters

---

# 11

## Introduction

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

## SCSI Configuration Guidelines

- Fast and wide SCSI supports up to 16 devices per channel.
- Select the disk drives in the SBB bays for hot-swap support in a RAID server.
- Do not connect wide SCSI devices to the narrow SCSI bus.
- Run the SCSI and/or RAID configuration utility to change controller settings to fit your specific configuration.
- Wide Ultra SCSI supports data transfer rates up to 40 MB per second.
- DIGITAL recommends that you use all wide Ultra SCSI capable devices on a wide Ultra SCSI bus for maximum server performance.

*Refer to Chapter 10 for additional SCSI configuration guidelines.*

## RAID Configuration Guidelines

- Fault management must be supported and enabled by the controller for disk drive hot swapping.
- When adding a RAID adapter to a server that does not have RAID installed, use the RAID software to configure your server for RAID operation.
- Select the disk drives in the SBB bays for hot-swap support in a RAID server.
- Use the same capacity disk drives in a RAID group, otherwise the difference in disk drive capacity will be lost.
- The maximum number of logical disk drives in a RAID group is 32.
- To maximize the I/O performance of your multi-channel RAID subsystem, connect each disk drive in a RAID group on a separate SCSI channel. This enables the RAID adapter concurrent access to all disk drives.
- Supported RAID levels include: 0, 1, 0+1, 5, and RAID 7 (JBOD).

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

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

## Setting Onboard SCSI Termination

The onboard SCSI controller has two types of connectors, wide and narrow. The default has the narrow cable connected to a narrow device, like the CD-ROM drive. Use the following procedure to set the bus termination for the onboard SCSI controller:

1. When the Adaptec BIOS banner appears during the boot process and before the end of the device information, press Ctrl+A.
2. Select the first "Bus: Device" listed.
3. Select "Configure/View Host Adapter Settings."
4. Select "Host Adapter SCSI Termination" and set the low/high switches:

Configuration	Termination	
	Low (lower 8 bits)	High (upper 8 bits)
Wide cable of Channel A not connected to backplane	On <sup>(1)</sup>	On
Wide cable of Channel A connected to backplane	Off <sup>(2)</sup>	On

(1) Use this setting if only one of the two onboard SCSI connectors is being connected to a SCSI device.

(2) Use this setting if both wide and narrow connectors are tied to SCSI devices by means of cables.



## SCSI Controller Cable Configurations

The following sections describe the available SCSI controller cable configurations for your DIGITAL Server.

### Wide and Narrow SCSI Cable Configuration

To connect SCSI devices using wide or narrow SCSI cables, perform the following:

1. Power down the server.
2. Disconnect all peripheral devices from the server.
3. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.
4. Connect the cables as shown in Figure 11-1.

Use the nylon cable clamps and other features to dress the cables properly. Do not block the air flow from the fan.

5. Replace the side panel, secure the two thumbscrews, and then close and lock the front bezel.
6. Connect all external devices and then power on your server.
7. Run the SCU utility or the SCSI configuration utility to configure your server.

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

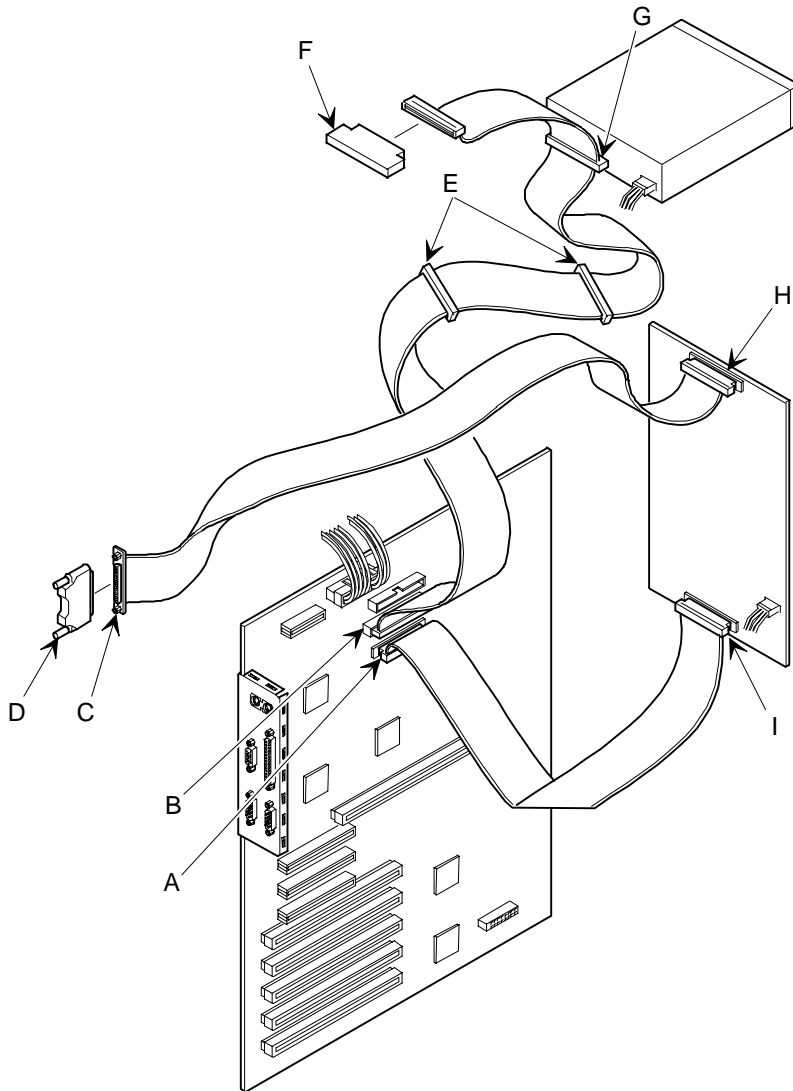


**NOTE:** Onboard SCSI termination must be configured for High = On, Low = Off. Refer to "Setting Onboard SCSI Termination" described earlier in this chapter.

Figure 11-1 Legend	Component
A	Wide SCSI 68-pin SCSI controller connector
B	Narrow SCSI controller connector
C	External wide SCSI connector cable assembly
D	External wide SCSI terminator <sup>(1)</sup>
E	Narrow SCSI 50-pin connectors to top front drive bay
F	Narrow SCSI 50-pin terminator
G	Narrow SCSI 50-pin connector to CD-ROM drive
H	Wide SCSI connector to SBB backplane
I	Wide SCSI 68-pin connector to SBB backplane

<sup>(1)</sup> Terminator (D) is installed at item H when no external wide cable assembly is installed.

## Connecting SCSI and RAID Adapters



DEC01062-2

**Figure 11-1. Wide and Narrow SCSI Cable Configurations**

## Single Channel RAID Configuration

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



**NOTE:** Your DIGITAL Server also supports two-channel and three-channel RAID adapters. Contact your DIGITAL sales representative for more information.

1. Power down the server.
2. Disconnect all peripheral devices from the server.
3. Unlock and open the front bezel, loosen the two thumbscrews, and then remove the side panel.
4. Connect the cables as shown in Figure 11-2.

Use the nylon cable clamps and other features to dress the cables properly. Do not block the air flow from the fan.

5. Replace the side panel, secure the two thumbscrews, and then close and lock the front bezel.
6. Connect all external devices and then power on your server.
7. Run the SCU and/or RAID utilities to configure your server.

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

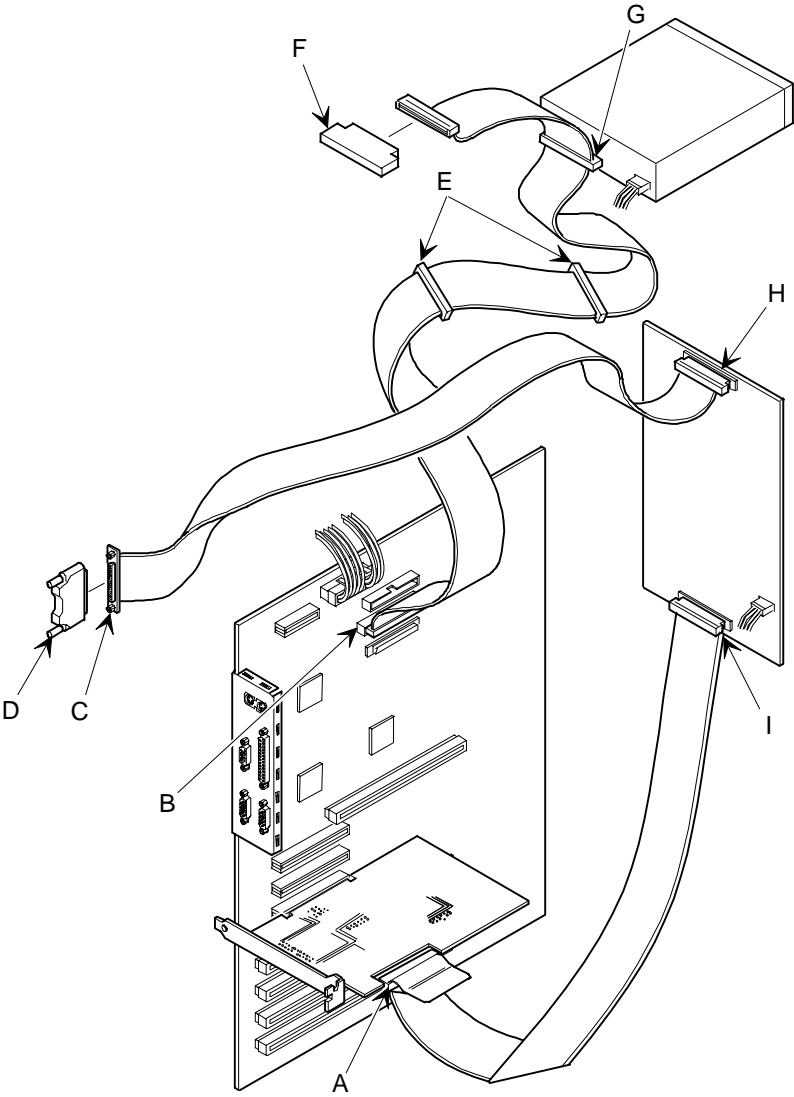


**NOTE:** Onboard SCSI termination must be configured for High = On, Low = Off. Refer to "Setting Onboard SCSI Termination" described earlier in this chapter.

## Connecting SCSI and RAID Adapters

<b>Figure 11-2 Legend</b>	<b>Component</b>
A	Single channel RAID controller connector
B	Narrow SCSI 50-pin connector to main logic board
C	External wide SCSI cable assembly
D	External wide SCSI terminator <sup>(1)</sup>
E	Narrow SCSI 50-pin connectors to top drive bay
F	Narrow SCSI 50-pin terminator
G	Narrow SCSI 50-pin connector to CD-ROM drive
H	Wide SCSI connector to SBB backplane
I	Wide SCSI 68-pin connector to SBB backplane

<sup>(1)</sup> Terminator (D) is installed at item H when no external wide cable assembly is installed.



DEC01067-2

Figure 11-2. Single Channel RAID Configuration

## Enable Ultra SCSI Data Transfers (Adaptec SCSI Channel)

Your server is already configured for Ultra SCSI data transfers. If you are changing your drives from fast, wide SCSI to wide Ultra SCSI, you must use the following procedure to enable wide Ultra SCSI data transfers on a non-RAID Ultra SCSI channel.

1. Boot your server.
2. When the message “Press Ctrl/A for the SCSI Select Utility” appears on your monitor screen, press Ctrl/A.
3. Select “Configure/View Host Adapter Settings.”
4. Select “Advanced Configurations.”
5. In the “Support for Ultra SCSI Speed” option, select “Enabled.”
6. Press the [Esc] key three times.
7. At the “Exit Utility ?” prompt, select “Yes.”
8. Press any key to reboot your server.



**NOTE:** If you want to disable wide Ultra SCSI mode, refer to “Configuring Your Server for Non-Ultra SCSI Mode” described at the end of this chapter.

## Enable Ultra SCSI Data Transfers (RAID Channel)

Your server is already configured for Ultra SCSI data transfers. If you are changing your drives from fast, wide SCSI to wide Ultra SCSI, you must use the following procedure to enable wide Ultra SCSI data transfers on a RAID Ultra SCSI channel.

1. Insert the Mylex DACCF utility in drive A.
2. At the MS-DOS prompt type: CD DACCFG [Enter] then type DACCF [Enter], to invoke the Disk Array Controller utility.
3. Select "SCSI Xfr Parameters."
4. Type the channel number (0, 1, 2) and press Enter, or press Enter to accept the default.
5. Select the "Data Transfer Rate (MHz)", press the Enter key to change the value until "20 MHz" is displayed.
6. Press the [Esc] key two times.
7. Select "Yes" to save the configuration.
8. Reboot your server.



## Configuring your Server for Non-Ultra SCSI Mode

To enable non-Ultra SCSI transfers on a non-RAID SCSI channel, perform the following:

1. Boot your server.
2. When the message “Press Ctrl/A for the SCSI Select Utility” appears on your monitor screen, press Ctrl/A.
3. Select “Configure/View Host Adapter Settings.”
4. Select “Advanced Configurations.”
5. In the “Support for Ultra SCSI Speed” option, select “Disabled.”
6. Press the [Esc] key three times.
7. At the “Exit Utility ?” prompt, select “Yes.”
8. Press any key to reboot your server.

# Server Security Features

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# 12

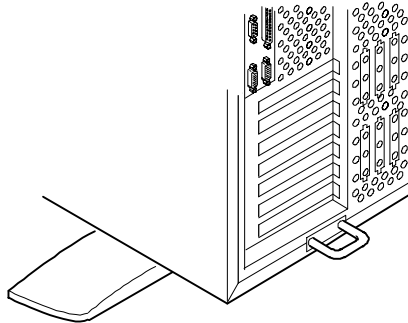
## Introduction

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

- Hold-down bar at the rear of the chassis
- Front-access security door and front bezel lock.
- Supervisor password
- Additional security features

## Hold-Down Bar

At the rear of the chassis on the bottom is a rectangular hold-down bar that pulls out. You can use this bar to secure the server to the floor or to a desk using a locking cable.



DEC01106

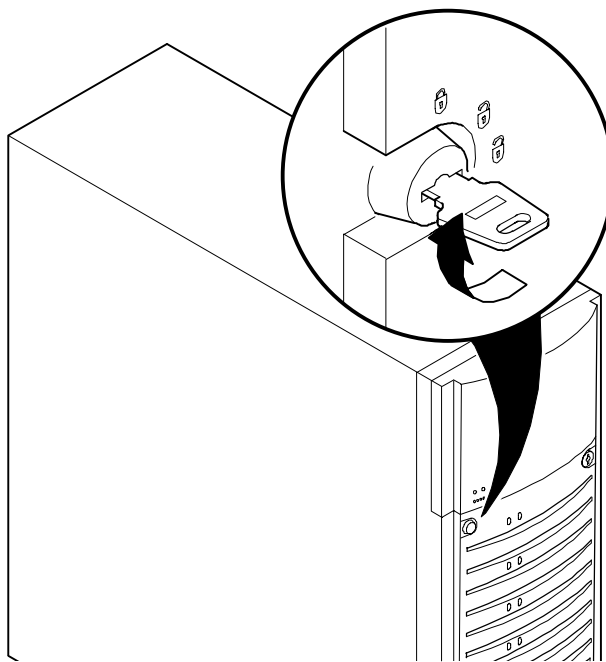
**Figure 12-1. Hold-Down Bar**

## Front-Access Security Door and Front Bezel Lock

Your server has a three-way keylock used to prevent unauthorized access to the front-access security door and front bezel. To open the front-access security door, insert the key into the keylock at the top position, depress and turn the key clockwise to the first unlock position (45°). To open the front bezel, continue to turn the key clockwise to the second unlock position (90°).



**CAUTION:** Be careful not to lose your server keys. Write the key number in your manual and keep the key in a secure place. Losing these keys prevents you from removing the side panel, opening the front-access security door, and opening the front bezel. Contact your authorized service provider or authorized dealer for information on replacing lost keys.



**Figure 12-2. Front-Access Security Door and Front Bezel Lock**

## Supervisor Password

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

Perform the following steps to set a supervisor password:

1. Turn on your server and allow the POST to complete.  
If POST detects an error refer to Appendix A, “Technical Specifications,” and take the appropriate steps to correct the problem. After the problem has been resolved, restart the server.
2. Either start the SCU from the MS-DOS partition or insert the SCU diskette into drive A and soft boot (reset) your server.
3. Press [Enter] to display the Main menu, select the `Configure Computer` option, then select the `View and edit details` option.
4. Highlight the `Security Options Group` and then press [Enter].
5. Highlight the `Supervisor Password` field and then press [Enter].
6. Select `Installed`.
7. Type in a supervisor password and then press [Enter].  
To confirm, type in your supervisor password a second time and then press [Enter].
8. Highlight the `Password On Boot` field and select `Enabled` if desired.
9. Exit the SCU and reboot your server so changes immediately take effect.

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

## If You Forget Your Password

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

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

2. Change switch SW1-4 to ON (password clear position).

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

3. Reconnect your server and turn it on.

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

4. Turn off your server.

5. Change switch SW1-4 to OFF (normal mode position).

6. Replace the side panel

7. Reconnect your server and turn it on.

8. Using the SCU, assign a new password.

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

## Additional Security Features

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

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

- **Diskette Access** — Setting this option to either `Supervisor` or `User` controls who has access to any installed diskette drive.
- **Network Server** — Setting this option to `Enabled` will allow the server to boot without a keyboard connected to the server.
- **Fixed Disk Boot Sector** — Setting this option to `Write Protected` prevents writing to the hard disk drive boot sector.

# Troubleshooting **13**

---

## Introduction

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

- Server Troubleshooting
- Disk Drive Troubleshooting
- SBB Troubleshooting
- Tape Drive Troubleshooting
- Monitor Troubleshooting
- CD-ROM Troubleshooting
- Diskette Drive Troubleshooting
- RAID Troubleshooting

*Refer to Appendix A, "Technical Specifications," 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 DIGITAL 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 Appendix A, “Technical Specifications,” 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 “When to Use 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 the SCSI or RAID configuration if you have problems after connecting devices.

*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 DIGITAL service provider for assistance and recommendations. Refer to the “Service Information” area on the Quick Launch CD-ROM for the phone numbers in your area or to the Warranty and Service Information Booklet supplied with your DIGITAL Server documentation.

## When to Use the Diagnostics

The diagnostic software is a versatile diagnostic tool that can be used to verify proper hardware installation and isolate intermittent problems that are not detected by the Power-On Self Test (POST). You should run the diagnostic software in the following situations:

- The server fails to boot or load the operating system software.
- The server fails to boot or load the operating system software after you add additional hardware such as more memory, additional processors, additional SCSI devices, or expansion boards.
- The operating system hangs repeatedly and no changes have been recently added to the software such as service packs or a new application.
- You suspect a server hardware failure.
- You want to validate server operation.
- An intermittent hardware problem exists.

## Running the Diagnostics

To run the AMIDiag base package (Emergency Mode diskette) from a diskette, follow this procedure:

1. Insert the diskette labeled “For Emergency Use” in drive A and then boot the server.
2. Use the arrow keys to highlight the desired test.
3. Press [Enter].

*For additional troubleshooting information refer to the AMIDiag User's Guide, located under “Additional Documentation” on the Quick Launch CD-ROM.*

## Running Quick Tests or Groups of Tests

Function keys can be used to select and run groups of tests. A list of function keys is available by pressing the F9 key. The following list includes examples of how to run Quick Tests or Groups of Tests.

- To run Quick Test, press F8 to select tests, then F10 to run all the selected tests.
- To run all Memory tests, press F6 to select tests listed on the menu, then press F10 to run all the selected tests.
- To run all tests from all menus, press F7 to select all tests, then press F10 to run all the selected tests.

## Running DIGITAL Vendor Extended Tests

To run DIGITAL Vendor Extended Tests from a diskette:

1. Insert the DIGITAL Vendor Extended Tests diskette for the selected device and then boot the server or type

```
A : \DMENU.
```

2. Select the desired test.

Each diskette has a README.TXT file with a list of devices that can be tested and additional information about each diagnostic.

## Running the Diagnostics Tests from the Server's Hard Disk Drive

To run diagnostic tests from the server's hard disk drive, perform the following:

1. Boot the server and select MS-DOS from the boot menu.
2. At the C:\> prompt, type:

```
\DIAG\DIAGNOSE.BAT
```

This sets up the CONFIG.SYS and AUTOEXEC.BAT files to run the diagnostics and reboots the server. Select MS-DOS again, then the diagnostics will load. Note that the original CONFIG.SYS and AUTOEXEC.BAT are restored before the diagnostics load.

3. Select the test or group of tests using the arrow keys and function keys previously defined. DIGITAL Vendor Extended Tests can also be run from the *User* menu.

## Server Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
No response when the server is turned on.	Server is not plugged in.	Turn off the server, plug it in, and then turn it back on again.
	No power at the wall outlet.	Use another wall outlet.
	Main logic board failed.	Contact your authorized service provider.
	Main logic board switches incorrectly set.	Set all appropriate switches.
	Processor module has failed.	Reseat the processor module.
	Processor module switches incorrectly set.	Make sure all switches are correctly set.
	Power supply failed.	Contact your authorized service provider.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
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.
Server does not boot from CD-ROM drive.	Monitor has failed.	Replace monitor or contact your authorized service provider.
	CD-ROM drive is not connected to the Adaptec controller.	Connect the CD-ROM to the Adaptec controller. Refer to Chapter 11.
	CD-ROM drive not configured as a bootable device.	Change the CD-ROM setting to "bootable" using <i>SCSISelect</i> .
Server operates incorrectly after installing a processor module.	CD-ROM disc is not bootable.	Contact your DIGITAL representative for the latest BIOS.
	Processor module installed incorrectly.	Reinstall processor module.
	SCU indicates an error after installing a processor module.	Remove processor module and reboot. If server boots without errors, replace processor module.

*continued*

## Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
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 10.
	Did not install CFG file for expansion board.	Run SCU and add CFG file (if necessary).
	Expansion board has failed.	Remove expansion board and reboot. If server boots without errors, replace expansion board.
Server operates incorrectly after installing optional memory (SIMMs/DIMMs).	Memory configured incorrectly.	Reboot the server and check for any boot message to identify faulty DIMM(s)/SIMM(s).  Check that the memory configuration is according to the memory guidelines explained in Chapter 6 or 7.
	SIMMs/DIMMs installed incorrectly.	Remove SIMMs/DIMMs and reinstall.
	SIMMs/DIMMs have failed.	Replace SIMMs/DIMMs.
	Processor module installed incorrectly.	Reinstall processor module.
	Processor module failed.	Replace processor module.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
No response to keyboard commands.	Keyboard might be password protected by a local or remote control program.	Enter the keyboard password.
	Keyboard is not connected.	Power down the server and connect the keyboard.
	Keyboard is connected to the mouse port.	Power down the server and connect the keyboard to the keyboard port.
	Keyboard failed.	Replace keyboard or contact your authorized service provider.
No response to mouse commands.	Mouse might be password protected by a local or remote control program.	Enter the keyboard and mouse password.
	Mouse is not connected.	Power down the server and connect the mouse.
	Mouse is connected to the keyboard port.	Power down the server and connect the mouse to the mouse port.
	Mouse driver not installed	Install the appropriate mouse driver.
	Mouse trackball dirty.	Clean trackball.
	Mouse failed.	Replace mouse or contact your authorized service provider.
Server operates correctly but application software does not.	Application software installed incorrectly.	Refer to your application software documentation.
	Having external cache enabled causes conflict with application software.	Run the SCU and disable external cache. Refer to Chapter 2 and Appendix C.



## Disk Drive Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Server does not recognize an internal SCSI device.	SCSI device jumpers incorrectly set.	Refer to the supplied kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied kit installation instructions and to the storage backplane switch configuration in Chapter 9.
	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, SCSI device or backplane.	Refer to Chapter 11 for cabling information.
	SCSI device has failed.	Replace SCSI device.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Server does not recognize an external SCSI device.	SCSI device jumpers incorrectly set.	Refer to the supplied kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied kit installation instructions and to the storage backplane switch configuration in Chapter 9.
	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 storage backplane and rear panel connector or external SCSI device and rear panel connector.	Refer to Chapter 11 for cabling information.
	SCSI device has failed.	Replace SCSI device.

*continued*

## Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Server does not boot from an internal SCSI hard disk drive.	SCSI boot hard disk drive not formatted.	Format the SCSI hard disk drive. <b>CAUTION:</b> Formatting the SCSI hard disk drive will destroy all the data on the drive.
	SCSI device drivers not installed or incorrectly installed on SCSI boot hard disk drive.	Properly install all required SCSI device drivers. Refer to Chapter 2.
	Operating system software is not installed on the SCSI boot hard disk drive.	Install the appropriate operating system.
	Requested partition does not exist.	Partition the SCSI hard disk drive and then reload the operating software.
	SCSI boot hard disk drive at wrong SCSI address.	Set SCSI boot hard disk drive to lowest "primary" SCSI address.
	SCSI device has failed.	Replace SCSI device.
SCSI hard disk drive cannot read or write information.	Incorrect disk drive jumper settings.	Refer to the supplied kit installation instructions.
	Loose or incorrectly installed cables.	Make sure all cables are correctly installed.
	SCSI hard disk drive is not correctly formatted or partitioned.	Format and partition as required using the supplied operating system.
SBB failure.	Check SBB status LEDs for a drive failure indication.	Refer to Chapter 9 for additional information.

## SBB Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
SBB fault LED lit.	Disk drive failed.	Replace disk drive.
SBB activity and fault LEDs lit.	Disk drive hung or has failed.	Replace disk drive.
SBB fault LED flashing.	Disk drive failed and is spinning down.	Replace disk drive.

## Tape Drive Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
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.	<p>Using a small screwdriver, rotate the motor shaft clockwise to bring threading mechanism to the initial loading position.</p> <p>If necessary, press the ratchet mechanism to tighten the tape before ejecting.</p> <p>Continue to turn the motor shaft clockwise until the tape can be lifted out of the drive mechanism and ejected from the drive.</p>

## Monitor Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Monitor power indicator is not on.	Monitor is turned off.	Turn on the monitor.
	Power cord is not connected.	Connect the power cord to the server.
	No power at wall outlet.	Use another outlet.
No screen display.	Power indicator is defective.	Contact your authorized service provider.
	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.
Distorted, rolling, or flickering screen display, or wrong/uneven color.	Monitor has failed.	Replace monitor, or contact your authorized service provider.
	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

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Cannot access the CD-ROM drive. Error message reading drive x.	Device drivers not installed.	Install correct device drivers.
	No disc in the CD-ROM drive.	Insert a disc.
	Incorrect SCSI ID assigned.	Make sure correct SCSI ID is assigned. Refer to Chapter 9.
	Tray open.	Close the tray.
Power is on but indicator shows no activity.	No disc or tray is open.	Insert a disc and close the tray.
	Check cable connections.	Make sure cables are correctly connected.
Disc is spinning but drive is idle.	Application software not running.	Run application software.

## Diskette Drive Troubleshooting

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

## RAID Troubleshooting

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



# Technical Specifications

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## Introduction

This appendix provides the following technical characteristics for your server:

- Server specifications
- EISA expansion slots
- PCI expansion slots
- Power supply input power requirements
- Power supply output specifications
- Power cord requirements
- Main logic board switch and jumper settings
- Pentium Pro processor module switch settings
- Pentium II processor module switch settings
- Server fault status
- Server status: processor temperature sensing
- POST messages
- Processor voltage and temperature ranges

## Server Specifications

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

### Performance Specifications

<b>Attributes</b>	<b>Specification</b>
Bus clock	
EISA	7.5/8.33 MHz
PCI	30/33 MHz
Data I/O	
EISA	8-bit, 16-bit, and 32-bit
PCI	32-bit
Server memory	
SIMMs	32 MB minimum 1 GB maximum
	Supports 36-bit, 60 ns EDO memory and Fast-Page memory
DIMMs	32 MB minimum 512 MB maximum
	Supports 168 pin, 72-bit 60 ns EDO memory, ECC protected.
System flash ROM	128 KB
BIOS	
VGA flash ROM	128 KB
BIOS	

## Server Dimensions

Dimension	Specification
Width	213,4 mm (8.4 in.)
Length (without bezel)	482,6 mm (19 in.)
Length (with bezel)	546,0 mm (21.5 in.)
Height (without pedestal)	615 mm (24.2 in.)
Weight (no expansion boards)	≅25 kg (55 lb.)

## Environmental Specifications

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

## EISA Expansion Slots

The main logic board contains four dedicated EISA expansion slots and one shared EISA expansion slot. These slots support +5 V dc expansion boards.

## PCI Local Bus Expansion Slots

The main logic board contains two dedicated PCI local bus expansion slots and one shared PCI local bus expansion slot. These slots support:

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

## Power Supply Input Power Requirements

The 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 table lists the input power requirements.

<b>Rated Voltage Range</b>	<b>Maximum Range</b>	<b>Rated Input Current</b>	<b>Operating Frequency Range</b>
100 V ac - 123 V ac	88 V ac - 132 V ac	7 A	47 Hz - 63 Hz
200 V ac - 240 V ac	176 V ac - 264 V ac	3.5 A	47 Hz - 63 Hz

## Power Supply Output Specifications

Your server's power supply provides the following output ratings:

- +5 V dc                      2.0 A min, 40 A max.
- +3.3 V dc                    0 A min, 30 A max.
- +12 V dc                    0 A min, 12 A max.
- -12 V dc                    0 A min, 0.5 A max.
- -5 V dc                     0 A min, 0.3 A max.
- +5 VSB                     0 A min, 0.1 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).

## Environmental Features

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

<i>Ozone Depleting Substances (ODS)</i>	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.
<i>Use of asbestos</i>	Digital Equipment Corporation does not use asbestos in any form in the manufacturing of its products.
<i>Recycled paper in documentation</i>	User documentation is printed on paper with a post-consumer recycled content of between 10 and 60%.
<i>Use of PVC in enclosure pieces</i>	Polyvinylchloride (PVC) is not used in plastic enclosure pieces.
<i>Design for disassembly/re-cycling</i>	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.
<i>Environmental packaging features</i>	The outer container on this product is made from unbleached, natural corrugated fiberboard which can be readily recycled in most areas. Protective cushioning pieces are made from expandable polypropylene which is more efficient than other foams and requires less material to provide equivalent protection, thereby reducing packaging waste. The cushioning pieces are marked with the Society of the Plastics Industry (SPI) material identification symbol for polypropylene to facilitate recycling.

## Main Logic Board Switch and Jumper Settings

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



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

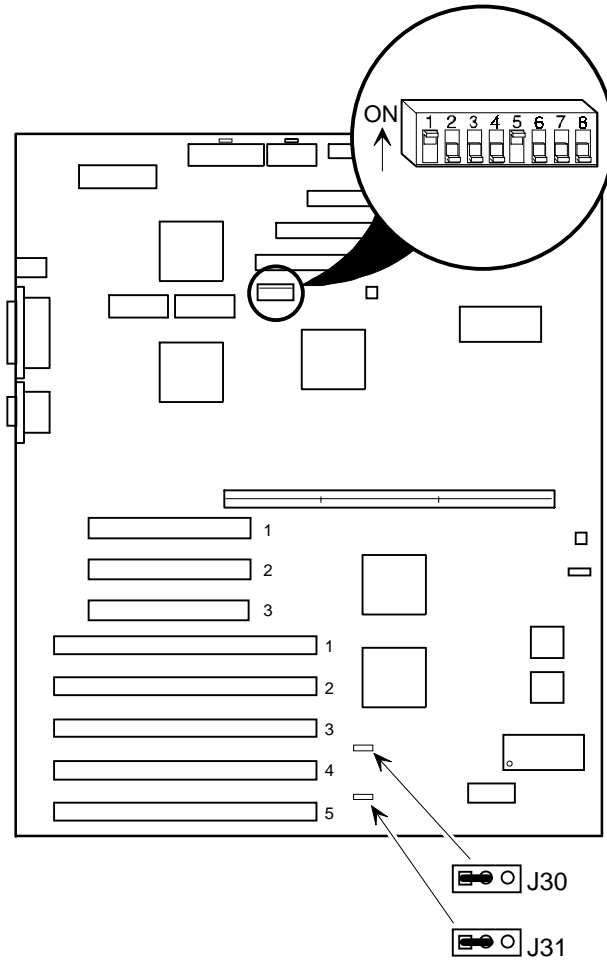
## Technical Specifications

Feature	Function	Setting	Description
BIOS upgrade	Disabled Enabled <sup>(1)</sup>	SW1-1, off SW1-1, on <sup>(1)</sup>	This switch is set to <b>Enabled</b> (on) at the factory in order to load the latest BIOS information from the ServerWORKS Quick Launch CD-ROM.  To prevent unauthorized personnel from loading a new server BIOS, you must set this switch to <b>Disabled</b> (off). Loading a new server BIOS might allow someone to override other server security features or introduce a virus into your server.
Recovery mode	Normal <sup>(1)</sup> Recovery mode	SW1-2, off <sup>(1)</sup> SW1-2, on	If your BIOS upgrade failed, refer to the README.TXT file that came with the BIOS upgrade.
Boot block update	Disabled <sup>(1)</sup> Enabled	SW1-3, off <sup>(1)</sup> SW1-3, on	Set this switch to <b>disabled</b> (OFF) position to prevent unauthorized personnel from changing the BIOS boot block.
Password clear	Normal mode <sup>(1)</sup> Password clear (MFG test)	SW1-4, off <sup>(1)</sup> SW1-4, on	If you forget your password, set this switch to the password clear (ON) position and then restart your server. Refer to Chapter 12 for more information.
RSM installed	Installed Not installed <sup>(1)</sup>	SW1-5, off SW1-5, on <sup>(1)</sup>	If you add DIGITAL's Remote Server Management (RSM) option to your server, you will need to connect the RSM reset cable to RSM connector and change the switch position to the installed (OFF) position.
Clear NVRAM	Normal operation <sup>(1)</sup> Clear	SW1-6, off <sup>(1)</sup> SW1-6, on	Clears contents of NVRAM. Set only in the case when a configuration change using the SCU did not complete successfully (e.g. power failed while configuring), or a configuration was defined which no longer allows the server to boot. The BIOS settings will return to their default values, and the SCU will need to be run again to reconfigure the server.
Reserved	Reserved	SW1-7, off <sup>(1)</sup>	This switch should always be OFF.
Reserved	Reserved	SW1-8, off <sup>(1)</sup>	This switch should always be OFF.
EISA slot 4 master delay	Normal <sup>(1)</sup> Delay one clock cycle	J30, pins 1 and 2 <sup>(1)</sup> J30, pins 2 and 3	If your EISA expansion board contains an Intel BMIC 82355 chip set, you must change the factory-set jumper setting from pins 1 and 2 to pins 2 and 3. Failure to do so might prevent your server from operating correctly.
EISA slot 5 master delay	Normal <sup>(1)</sup> Delay one clock cycle	J31, pins 1 and 2 <sup>(1)</sup> J31, pins 2 and 3	If your EISA expansion board contains an Intel BMIC 82355 chip set, you must change the factory-set jumper setting from pins 1 and 2 to pins 2 and 3. Failure to do so might prevent your server from operating correctly. Determines if EISA master will delay one clock cycle or not in EISA slot 4.

(1) Factory default setting

ON = switch closed; OFF = switch open





DEC01431-6

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

## Pentium Pro Processor Module Switch Settings

The following table lists the Pentium Pro processor module switch settings and factory default settings. Figure A-2 shows the switch and jumper locations.

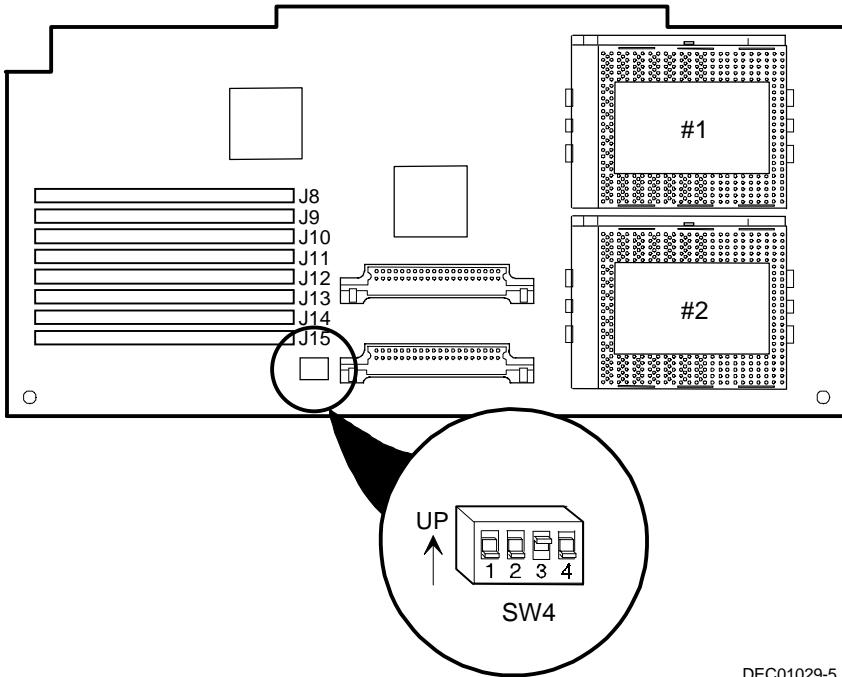


**CAUTION:** Do not touch any electronic component unless you are safely grounded. Wear a grounded wrist strap or touch an exposed metal part of the server chassis. A static discharge from your fingers can result in permanent damage to electronic components.

Speed	Position	Switches	SW 4 Switch Settings
133 MHz	<input type="checkbox"/> UP	1, 2, 3, 4	■ ■ ■ ■
	<input checked="" type="checkbox"/> DOWN		
166 MHz	<input type="checkbox"/> UP	2	■ <input type="checkbox"/> ■ ■
	<input checked="" type="checkbox"/> DOWN	1, 3, 4	
200 MHz <sup>(1)</sup>	<input type="checkbox"/> UP	3	■ ■ <input type="checkbox"/> ■
	<input checked="" type="checkbox"/> DOWN	1, 2, 4,	
233 MHz	<input type="checkbox"/> UP	2, 3,	■ <input type="checkbox"/> <input type="checkbox"/> ■
	<input checked="" type="checkbox"/> DOWN	1, 4	
266 MHz	<input type="checkbox"/> UP	4	■ ■ ■ <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	1, 2, 3	

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

Other speeds are not supported, check with your authorized DIGITAL reseller for future processor products.



DEC01029-5

**Figure A-2. Pentium Pro Processor Module Switch Locations**

## Pentium II Processor Module Switch Settings

The following table lists the Pentium II processor module switch settings and factory default settings. Figure A-3 shows the switch 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.

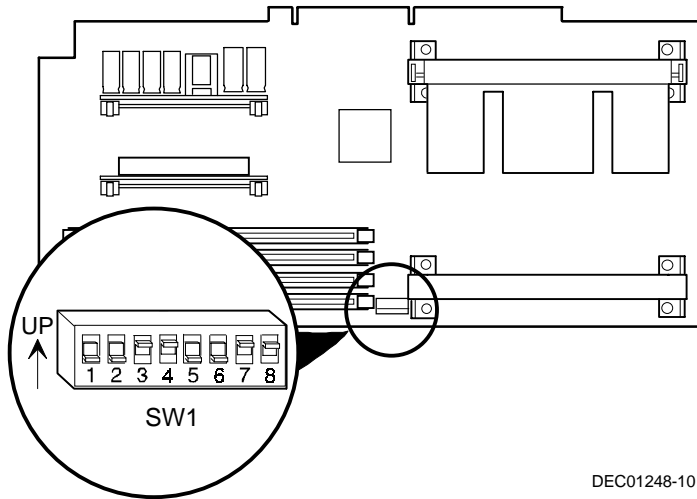
## Processor Clock Speed Switch Settings

The following table provides the switch settings for a number of available Pentium II processors. The switches are set correctly for the processor that came with the Pentium II processor module you purchased.

Speed	Position	Switches	J19 Switch Settings
200 MHz <sup>(1)</sup>	<input type="checkbox"/> UP	2, 5, 6, 7, 8	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	1, 3, 4	
233 MHz <sup>(1)</sup>	<input type="checkbox"/> UP	1, 2, 5, 6, 7, 8	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	3, 4	
266 MHz	<input type="checkbox"/> UP	3, 5, 6, 7, 8	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	1, 2, 4	
300 MHz	<input type="checkbox"/> UP	1, 3, 5, 6, 7, 8	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	2, 4	
333 MHz <sup>(2)</sup>	<input type="checkbox"/> UP	2, 3, 5, 6, 7, 8	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	1, 4	
366 MHz <sup>(2)</sup>	<input type="checkbox"/> UP	1, 2, 3, 5, 6, 7, 8	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	4	
400 MHz <sup>(2)</sup>	<input type="checkbox"/> UP	4, 5, 6, 7, 8	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	1, 2, 3	
433 MHz <sup>(2)</sup>	<input type="checkbox"/> UP	1, 4, 5, 6, 7, 8	<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	2, 3	
466 MHz <sup>(2)</sup>	<input type="checkbox"/> UP	2, 4, 5, 6, 7, 8	<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	1, 3	
500 MHz <sup>(2)</sup>	<input type="checkbox"/> UP	1, 2, 4, 5, 6, 7, 8	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	3,	
533 MHz <sup>(2)</sup>	<input type="checkbox"/> UP	3, 4, 5, 6, 7, 8	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input checked="" type="checkbox"/> DOWN	1, 2	

<sup>(1)</sup> Processor speeds not supported.

<sup>(2)</sup> The processor speeds indicated above are anticipated future processor products. This does not constitute a promise of the availability of such a processor, but should it be made available some time in the future, these are the needed switch settings to support such a processor.



DEC01248-10

**Figure A-3. Pentium II Processor Module Switch Settings**

## Server Fault Status

Description	Server Fault LED Indicators			
	LED4	LED3	LED2	LED1
No power, server ready, power ON default	Off	Off	Off	Off
Shutdown, fan fault	Off	Off	Off	On
Shutdown, over temperature	Off	Off	On	Off
Shutdown, voltage fault	Off	Off	On	On
No terminator 1	Off	On	Off	Off
Wait for system boot	Off	On	Off	On
Wait for processor active	Off	On	On	Off
No terminator 2	Off	On	On	On
Bank 0 fault (J15)	On	Off	Off	Off
Bank 1 fault (J16)	On	Off	Off	On
Bank 2 fault (J17)	On	Off	On	Off
Bank 3 fault (J18)	On	Off	On	On
Reserved	On	On	Off	Off
Reserved	On	On	Off	On
Reserved	On	On	On	Off
Processor module fail	On	On	On	On

## Server Status: Processor Temperature Sensing

Component	Possible Failures	Result	
Processor temperature sensing:			
	For Pentium Pro processor	The temperature exceeds 85 °C (185 °F)	Warning beep. Server shuts down after five minutes.
		The temperature exceeds 90 °C (194 °F)	Server shuts down.
	For Pentium II processor	The temperature exceeds 75 °C (167 °F)	Warning beep. Server shuts down after five minutes.
	The temperature exceeds 80 °C (176 °F)	Server shuts down.	



## POST Messages

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

### POST/Boot Codes

POST Code Descriptions	Count Down Code <sup>(1)</sup>	Beep Codes
BIOS ROM checksum		1-2-2-3
Test 8742 keyboard controller		1-3-1-3
Auto size DRAM		1-3-3-1
RAM failure on address line(s)		1-3-4-1
RAM failure on data line(s)		1-3-4-3
RAM failure on data bits xxxx of high byte of memory bus		1-4-1-1
Shadow system ROM		1-4-3-1
Unexpected interrupts test	230	2-2-3-1
Shadow miscellaneous ROMs	220	
Test refresh 512K to 640K DRAM	210	
Extended memory test	200	
Set cache registers	190	
Cache configuration	180	
Real-time clock test	170	1-4-2-1
Keyboard test	160	
Initial hardware interrupt	150	
Co-processor test	140	
Serial ports test	130	
Parallel ports test	120	

(1) Count down codes are displayed on your server's monitor.

*continued*

POST Code Descriptions	Count Down Code <sup>(1)</sup>	Beep Codes
Initiate onboard super I/O	110	
Mouse test	100	
Testing diskette drives	90	
Testing hard disk drives	80	
Processor search	50	
Searching the other processors		1-2
Option ROM checksum error	20	
Setting time of day	10	
Ready to boot		1

(1) Count down codes are displayed on your server's monitor.

## Processor Voltage and Temperature Ranges

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

### Processor Voltage Range

Nominal	Tolerance	Normal Voltage Range	Server Error Occurs	Server Shutdown Occurs
+12	±10%	+10.8 to +13.2 V	<+9.0 V	>+13.8 V
+5	±5%	+4.75 to +5.25 V	<+4.3 V	>+5.80 V
+3.3	±1%	+3.0 to +3.6 V	<+3.0 V	>+3.81 V
-12	±10%	-13.2 to -10.8 V	>-9.0 V	<-13.8 V
Vcore				

## 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*

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## Introduction

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

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



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

## Processor Memory Address Map

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

## I/O Address Map

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

## Server Interrupt Levels

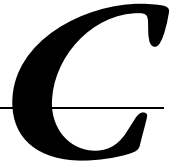
Interrupt Number	Interrupt Source
IRQ1	Keyboard controller
IRQ3	COM2, COM4 (if enabled)
IRQ4	COM1, COM3 (if enabled)
IRQ6	Diskette controller (if enabled)
IRQ7	LPT1, LPT2, LPT3 (if enabled)
IRQ10	COM2, COM4 (if enabled)
IRQ11	COM1, COM3 (if enabled)
IRQ12	Mouse interrupt
IRQ13	Math co-processor

## PCI Configuration Space Address Map

PCI Bus No.	Device No.	Device
0	00h	Host bridge
0	07h	EISA bridge
0	08h	PCI slot 1
0	09h	PCI slot 2
0	0Ah	PCI slot 3
0	0Ch	AIC7880 Ultra SCSI controller
0	0Dh	DC21143 Ethernet controller
0	12h	S3 Trio64 V+ VGA

# SCU Features

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## Introduction

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



## System - DIGITAL Server 3100/3200

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

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

## System Management Group

Menu Fields	Settings	Comments
System information	Asset number	Select [Enter] to display the Asset number of the server and the System ID. The Asset number can be changed by the user.
Main logic board information	Asset number	Select [Enter] to display main logic board information including Asset number, Serial number, Artwork Revision number, Model number, and System ID. The Asset number is the only item that can be changed by the user.
Processor module information	Asset number	Select [Enter] to display processor module information including Asset number, Serial number, Artwork Revision number, Model number, and System ID. The Asset number is the only item that can be changed by the user.

(1) Factory default setting

## Diskette Drive Group

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

(1) Factory default setting

## Boot Options Group

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

## Integrated Peripherals Group

Menu Fields	Settings	Comments
Video type	VGA or EGA <sup>(1)</sup> CGA 80 columns Monochrome	Sets the video controller type.
Monitor type	Color <sup>(1)</sup> Monochrome	Sets the type of monitor connected to your server: Color or Monochrome.

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

*continued*

## SCU Features

<b>Menu Fields</b>	<b>Settings</b>	<b>Comments</b>
Mouse port	Disabled Enabled <sup>(1)</sup>	Enables or disables the onboard PS/2 style mouse port.
Parallel port	Disabled  Compatible mode <sup>(1)</sup>  Bi-Directional Mode  EPP 1.7 mode EPP 1.9 mode  ECP mode	Selects the Enhanced Parallel Port (EPP) mode.  Selects the standard printer connection.  Selects the PS/2 compatible mode to receive data.  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.  Sets the Extended Capabilities Port (ECP) mode.
Serial port 1	Disabled Enable at: 3F8h-3FFh (IRQ4) <sup>(1)</sup> Enable at: 2F8h-2FFh (IRQ3) Enable at: 3E8h-3EFh (IRQ4) Enable at: 2E8h-2EFh (IRQ3) Enable at: 3F8h-3FFh (IRQ11) Enable at: 2F8h-2FFh (IRQ10) Enable at: 3E8h-3EFh (IRQ11) Enable at: 2E8h-2EFh (IRQ10)	Enables or disables onboard serial port 1 at the specified address and IRQ.
Serial port 2	Disabled Enable at: 3F8h-3FFh (IRQ4) Enable at: 2F8h-2FFh (IRQ3) <sup>(1)</sup> Enable at: 3E8h-3EFh (IRQ4) Enable at: 2E8h-2EFh (IRQ3) Enable at: 3F8h-3FFh (IRQ11) Enable at: 2F8h-2FFh (IRQ10) Enable at: 3E8h-3EFh (IRQ11) Enable at: 2E8h-2EFh (IRQ10)	Enables or disables onboard serial port 2 at the specified address and IRQ.

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

*continued*

<b>Menu Fields</b>	<b>Settings</b>	<b>Comments</b>
Embedded PCI SCSI	Installed <sup>(1)</sup> Not installed	When installed, this device will be recognized by the server. When not installed, this device will not be recognized by the server and will be ignored during the PCI scan sequence.
Embedded PCI Ethernet	Installed <sup>(1)</sup> Not installed	When installed, this device will be recognized by the server. When not installed, this device will not be recognized by the server and will be ignored during the PCI scan sequence.

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

## Keyboard Features Group

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

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

## Shadow Options Group

Menu Fields	Settings	Comments
Shadow video BIOS ROM	Enabled <sup>(1)</sup> Disabled	The main logic board reserves an area of DRAM for a copy of video BIOS ROM. This DRAM called “shadow memory” is write-protected and has the same addresses as the video BIOS ROM locations. When you shadow video BIOS ROM, the ROM image is copied into an appropriate area in DRAM. This increases the server’s performance because the video BIOS instructions are in fast DRAM instead of low speed ROM. For PCI VGA devices, video BIOS is always shadowed in C0000h-C7FFFh, regardless of this field’s setting.
Shadow C8000h- CBFFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow CC000h- CFFFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow D0000h- D3FFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow D4000h- D7FFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow D8000h- DBFFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.
Shadow DC000h- DFFFFh	Disabled <sup>(1)</sup> Enabled	Allows you to disable or enable the shadowing request for optional ROM at the corresponding addresses.

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



## Security Options Group

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

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

## Cache Options Group

Menu Fields	Settings	Comments
L1 cache	Not user selectable; Always enabled	Indicates that the processor L1 cache is enabled.
L2 cache	Not user selectable; Always enabled	Indicates that the processor L2 cache is enabled.
Cache system BIOS ROM	Enabled <sup>(1)</sup> Disabled	Enables or disables caching request for server BIOS ROM (F0000h to FFFFFh).
Cache video ROM	Enabled <sup>(1)</sup> Disabled	Enables or disables the server to cache the video BIOS in the C0000 to C7FFFh segment.

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

## Advanced Control Group

Menu Fields	Settings	Comments
Processor to PCI write posting	Enabled Disabled <sup>(1)</sup>	Enables processor writes to PCI to be posted in the OPB.
PCI to DRAM pipeline	Disabled <sup>(1)</sup> Enabled	Enables pipelining of PCI to DRAM write cycles.
APIC & MP table	Disabled MPS 1.1 MPS 1.4 <sup>(1)</sup>	Applicable to single processor configurations only, always enabled for Multi-Processing (MP) operating system configurations. When set to MPS 1.1 or MPS 1.4, the processor's Advanced Programmable Interrupt Controller (APIC) is enabled, and the MP table used by MP operating systems will be created.  <b>Note:</b> This parameter must be disabled for NetWare 3.12 single processor systems.
Error correction code	Enabled <sup>(1)</sup> Disabled	Enables or disables the Error Correction Code (ECC).
PCI parity check	Enabled <sup>(1)</sup> Disabled	Enables or disables the PCI parity checking.

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

## EISA or PCI Devices Group

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

# Caring For Your Server *D*

---

## Introduction

This appendix describes how to:

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



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

## **Cleaning the Server**

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

## **Cleaning the Screen**

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

## **Cleaning the Mouse**

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

Perform the following steps to clean a mouse ball:

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

## Moving the Server

Perform the following steps before shipping or moving the server:

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

## Packing the Server

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

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

Summary Info Title

## **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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