

# AlphaStation 600A Series

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## User Information

Part Number: EK-AL655-UI. A01

**January 1997**

This book introduces the AlphaStation 600A Series system. Use the information in this book to configure, start, use, update, and troubleshoot your system. You will also find general system information, such as console commands and system care, in this book.

**Digital Equipment Corporation  
Maynard, Massachusetts**

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**January 1997**

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S3417

### **Information - Class B**

This device complies with Part 15 of the FCC rules. Operation is subject to the following conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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 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 the receiver.

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

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

The keyboard and video ports should be connected only with shielded data cables with an external ferrite bead over the cable. When either of these ports is connected with cables without such a ferrite bead, the additional ferrite beads shall be clamped over these cables next to the cable connector.



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# Table of Contents

## 1 Getting Started

Introduction .....	1-1
Before Starting Your System .....	1-2
Posture and Work Habits .....	1-3
Identifying the Correct AC Power Cord .....	1-7
Installing Your System .....	1-8
Connecting System Components .....	1-9
Network Connection .....	1-12
Starting Your System.....	1-12
Preloaded Operating System Software .....	1-13
Switching Console Firmware .....	1-14
If No Operating System Is Installed .....	1-15
Booting the Operating System .....	1-15
Turning Off Your System .....	1-18
Computer Security.....	1-19
Security Lock .....	1-19
Passwords .....	1-19
SRM Console Security.....	1-20

## 2 System Overview

Introduction .....	2-1
System Unit.....	2-1
PCI Architecture.....	2-2
System Board .....	2-2
The Keyboard.....	2-3
System Front Panel.....	2-4
System Rear Panel.....	2-6

## Table of Contents

### 3 Installing System Options

Introduction.....	3-1
System Unit Components .....	3-2
Left Side Panel.....	3-3
Removing the Left Side Panel .....	3-4
Replacing the Left Side Panel.....	3-6
System Board .....	3-7
System Memory .....	3-9
Installing Memory Modules.....	3-10
Removing Memory Modules .....	3-11
External Drive Bay Devices .....	3-12
SCSI Addresses .....	3-12
Installing External Drive Bay Devices .....	3-13
Internal Drive Bay Devices.....	3-18
Removing the Drive Assembly from the System Unit.....	3-18
Removing a Device from the Drive Assembly .....	3-20
Replacing the Drive Assembly in the System Unit.....	3-21
EISA and PCI Expansion Options.....	3-21
EISA Bus.....	3-22
PCI Bus .....	3-22
Installing Expansion Modules.....	3-23
The Operator Control Panel.....	3-24
Rotating the OCP.....	3-24

### 4 Troubleshooting

Introduction.....	4-1
General Troubleshooting .....	4-2
Initial Troubleshooting .....	4-2
Interpreting Error Beep Codes .....	4-7
Reading the Console Event Log.....	4-8
The test Command.....	4-8
The sys_exer Command.....	4-10
The show_status Command .....	4-11
Power Problems.....	4-13
Console Problems.....	4-14
Boot Problems.....	4-15
Problems Detected by the Operating System .....	4-16
Storage Problems.....	4-16
Option Card Problems .....	4-20
Network Problems .....	4-20
EISA Bus Problems .....	4-21

## Table of Contents

PCI Bus Problems .....	4-21
Monitor and Terminal Problems .....	4-22
Keyboard and Mouse Problems.....	4-23
Printer Problems .....	4-24
Overheating Problems.....	4-24
RAID Device Problems .....	4-25
Using the Fail-Safe Loader .....	4-26
Status and Error Codes .....	4-27
Equipment Log.....	4-28

## 5 Console Subsystems

Introduction .....	5-1
Using the AlphaBIOS Console.....	5-2
Using a Serial Line .....	5-2
Windows NT System Start-up.....	5-3
The Firmware Menus.....	5-4
Help in Navigating AlphaBIOS .....	5-5
Primary Operating System and the Auto Start Option .....	5-6
Manually Setting Up the Hard Disk .....	5-8
System Setup Tasks .....	5-10
Displaying Your System Configuration.....	5-10
Running a Configuration Utility .....	5-12
Using the EISA Configuration Utility .....	5-13
Before You Run the ECU .....	5-14
Configuring EISA Options.....	5-14
Setting Up Password Protection .....	5-16
Index to the AlphaBIOS Menu Functions.....	5-18
Hard Disk Setup Menu.....	5-19
Operating System Selection Setup Menu.....	5-21
Display System Configuration Menu.....	5-24
Run Maintenance Program Menu .....	5-34
CMOS Setup Menu .....	5-35
Using the SRM Console.....	5-39
Basic Commands .....	5-39
Comprehensive Commands.....	5-41
Getting Help on the SRM Console .....	5-41
SRM Console Conventions .....	5-43
SRM Console Shortcut Keys.....	5-44
Boot Command.....	5-45
ECU Command.....	5-47
Set Command .....	5-47

## Table of Contents

Environment Variables .....	5-53
SRM Console Security Features.....	5-54

## 6 Care of the System

Introduction.....	6-1
Cleaning Your System Unit.....	6-1
Cleaning Your Monitor.....	6-1
Cleaning Your Keyboard.....	6-2
Cleaning Your Mouse.....	6-2
Moving Your System.....	6-3
Packing Your System .....	6-4
Installing Your System at a New Location.....	6-4

## 7 Technical Specifications

Introduction.....	7-1
System Specifications.....	7-1
External System Connectors .....	7-3
Parallel Port Connector.....	7-4
Serial Port Connectors .....	7-4
Keyboard and Mouse Connectors.....	7-5
Expansion Slots .....	7-6
Power Supply and Input Power Requirements.....	7-6
System Board Jumper Locations.....	7-7
System Board and CPU Card Jumper Settings .....	7-8

## 8 Updating System Firmware

Introduction.....	8-1
System Firmware.....	8-1
Updating Firmware Using the CDROM Drive .....	8-2
Updating Firmware Using the Network.....	8-5
Updating Firmware Using the Diskette Drive .....	8-5
Flash Enable Jumper.....	8-6

## 9 Starting an Operating System Installation

Preparing to Install Windows NT.....	9-1
Preparing the System .....	9-1
Installing Microsoft Windows NT.....	9-6
Preparing to Install Digital UNIX .....	9-7



## Table of Contents

Installation Preparation .....	9-7
Installing Digital UNIX .....	9-8
Preparing to Install OpenVMS Alpha.....	9-8
Preparing the System .....	9-8
Installing OpenVMS Alpha.....	9-10

## 10 Equipment Log

Introduction .....	10-1
Equipment Log.....	10-1

## List of Figures

Figure 1-1. AlphaStation 600A Series System.....	1-2
Figure 1-2. Recommendations for Posture and Work Habits .....	1-4
Figure 1-3. System Airflow (Side View, Cover Removed).....	1-9
Figure 1-4. Connecting Cables and the Power Cord .....	1-11
Figure 1-5. Starting Your System.....	1-13
Figure 2-1. Typical Keyboard Layout .....	2-3
Figure 2-2. Indicators, and Drive Bay Locations .....	2-5
Figure 2-3. Rear Connectors (Rear View) .....	2-6
Figure 3-1. System Unit Components .....	3-2
Figure 3-2. Unlocking and Removing the Left Side Panel.....	3-5
Figure 3-3. Replacing the Left Side Panel.....	3-6
Figure 3-4. System Board Components .....	3-7
Figure 3-5. Memory Banks and Connectors .....	3-9
Figure 3-6. Installing a Memory Module.....	3-10
Figure 3-7. Removing a Memory Module .....	3-11
Figure 3-8. Removing a Plastic Filler Panel .....	3-13
Figure 3-9. Attaching the Securing Bracket and Installing the Device.....	3-15
Figure 3-10. SCSI and Removable Device Connector Cable Configuration .....	3-16
Figure 3-11. Power Cable Configuration.....	3-17
Figure 3-12. Removing the Drive Assembly .....	3-19
Figure 3-13. Removing a Device from the Drive Assembly .....	3-20
Figure 3-14. EISA and PCI Expansion Module Contacts.....	3-21
Figure 3-15. PCI/EISA Slot Numbering .....	3-22
Figure 3-16. Installing an Expansion Module.....	3-23
Figure 3-17. Removing the Front Bezel .....	3-25
Figure 3-18. Rotating the OCP.....	3-26
Figure 5-1. The Boot Menu.....	5-3

## Table of Contents

### List of Figures (continued)

Figure 5-2. The AlphaBIOS Setup Menu .....	5-4
Figure 5-3. First Level Help Display.....	5-5
Figure 5-4. Second Level Help Display .....	5-6
Figure 5-5. Primary Operating System Selection .....	5-7
Figure 5-6. Auto Start Option Enabled.....	5-7
Figure 5-7. Operating System Selection Menu.....	5-8
Figure 5-8. Hard Disk Setup Menu .....	5-8
Figure 5-9. Display System Configuration Menu .....	5-11
Figure 5-10. Select Run Maintenance Program.....	5-12
Figure 5-11. Execute Run Maintenance Program.....	5-13
Figure 5-12. Advanced CMOS Setup Menu .....	5-17
Figure 5-13. Hard Disk Setup Menu .....	5-19
Figure 5-14. Operating System Selection Setup Menu .....	5-21
Figure 5-15. Display System Configuration Menu .....	5-24
Figure 5-16. Hard Disk Configuration Menu.....	5-26
Figure 5-17. PCI Configuration Menu .....	5-27
Figure 5-18. Advanced PCI Information Menu .....	5-28
Figure 5-19. EISA Configuration Menu.....	5-29
Figure 5-20. SCSI Configuration Menu .....	5-30
Figure 5-21. Memory Configuration Menu .....	5-32
Figure 5-22. Integrated Peripherals Menu .....	5-33
Figure 5-23. Run Maintenance Program Menu .....	5-34
Figure 5-24. Standard CMOS Setup Menu.....	5-35
Figure 5-25. Advanced CMOS Setup Menu .....	5-37
Figure 6-1. Cleaning the Mouse.....	6-3
Figure 7-1. System Board Jumper Locations.....	7-9
Figure 7-2. CPU Card J1 Jumper Settings.....	7-10
Figure 9-1. Express Hard Disk Setup .....	9-5

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# Preface

## Welcome to the AlphaStation 600A Series System

This book introduces the AlphaStation 600A Series system.

Use the information in this book to configure, start, use, update, and troubleshoot your AlphaStation 600A Series system. You can also find general system information such as console commands and system care in this book.

## Audience

If you will be operating, configuring, or adding options to the AlphaStation 600A Series system, the information included in this book will be helpful to you.

## Organization of the Information

This information for users covers the following topics:

Chapter 1, Getting Started, describes installing, starting, restarting, and turning off the system.

Chapter 2, System Overview, describes the hardware components, including the peripheral component interconnect (PCI) architecture, the controller, the keyboard, the system unit front panel, and the system unit rear panel.

Chapter 3, Installing System Options, describes the system unit components and gives instructions and illustrations to help you remove and replace them.

Chapter 4, Troubleshooting, describes system troubleshooting as well as the error beep codes.

Chapter 5, Console Subsystems, contains a basic description of the AlphaBIOS console commands and the system reference manual (SRM) console commands.

Chapter 6, Care of the System, describes how to clean your system, monitor, mouse, and keyboard. It also contains instructions for moving and reinstalling your system.

## Preface

Chapter 7, Technical Specifications, describes the technical characteristics of the system.


Chapter 8, Updating System Firmware, explains how to use the firmware update utility.

Chapter 9, Starting an Operating System Installation, provides the information you need to begin an operating system installation.

Chapter 10, Equipment Log, contains tables that you can use to record information about your system hardware and software components.

## Conventions

This guide uses the following conventions:

Convention Example	Description
<code>c:\windowsc:\windows&gt;</code>	Monospaced, bold text indicates file names, path names, directories, or screen text.
[Enter]	Square brackets surrounding text represent a key on the keyboard.
[Ctrl]+[R]	A plus sign between keyboard keys indicates that the keys shown should be pressed at the same time.
<i>auto_action</i>	Italic text indicates environment variables. Titles of information sources are in italic, and occasionally italic is used for emphasis in the text.
	A pointing hand indicates a reference to additional information.

## Abbreviations

This guide uses the following abbreviations:

Abbreviation	Meaning
AC	alternating current
amp	ampere
C	Celsius
CD	compact disc
CD-ROM	compact disc read-only memory
CEE	International Commission for Conformity Certification of Electrical Equipment
CFG	configuration file
cm	centimeters
CPU	central processing unit
CSA	Canadian Standards Association
DC	direct current
DMA	direct memory access
DRAM	dynamic random-access memory
DROM	diagnostic read-only memory
ECU	EISA configuration utility
EISA	extended industry-standard architecture
flashROM	electrically erasable, rewriteable, nonvolatile memory
ft	feet
GB	gigabyte
Hz	hertz
IEC	International Electrotechnical Commission
I/O	input/output
IRQ	interrupt request
ISO	International Organization for Standardization

## Preface

### Abbreviations (continued)

Abbreviation	Meaning
Kb	kilobit
KB	kilobyte
kg	kilogram
lb	pound
LED	light-emitting diode
m	meter
MAU	media adapter unit
Mb	megabit
MB	megabyte
MHz	megahertz.
mm	millimeter
ns	nanoseconds
NVRAM	nonvolatile random-access memory
OSF	DEC Open Software Foundation/1 UNIX operating system
PCI	peripheral component interconnect
RISC	reduced instruction set computing
ROM	read-only memory
SCSI	small computer system interface
SIMM	single in-line memory modules
SRM	system reference manual (the Digital UNIX and OpenVMS Alpha consoles)
SROM	serial read-only memory
UL	Underwriters Laboratories
VAR	value-added reseller
V AC	volts alternating current
VMS	Virtual Memory System
W	watt

## Special Notices

This guide uses three kinds of notices to emphasize specific information.

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### WARNING

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A **WARNING** indicates the presence of a hazard that can cause injury.

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### CAUTION

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A **CAUTION** indicates the presence of a hazard that can cause damage to hardware or that might corrupt software.

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### NOTE

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A **NOTE** gives general information, such as compatibility with other products or pointers to other information.

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## Additional Information Resources

For additional information about your AlphaStation 600A Series system, consult the *AlphaStation 600 Series Installation Information* (order number EK-AS800-IN), which presents a graphical overview of the AlphaStation 600A Series system installation. The information in this installation guide applies to both AlphaStation 600 and AlphaStation 600A systems.

Contact your distributor or Digital representative for other available product-related information.





# 1

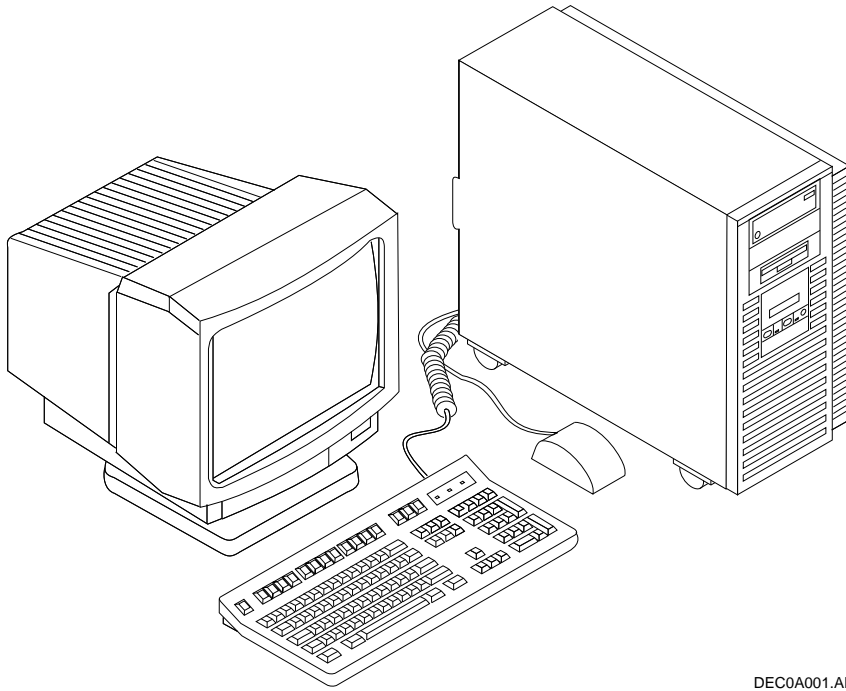
## Getting Started

### Introduction

Your AlphaStation 600A Series is a high-performance system that uses the latest microprocessor technology. The system can stand alone or function as a client in an office network environment.

This chapter describes how to install, start, restart, and turn off your AlphaStation 600A Series system. You can also find information here about preloaded software as well as guidelines for system security. Figure 1-1 shows a typical AlphaStation 600A Series system.

## Getting Started



DEC0A001.AI

**Figure 1-1. AlphaStation 600A Series System**

## Before Starting Your System

Before you start your system, follow this procedure:

1. Read and understand the information supplied with your system.
2. Select a well-ventilated site near a grounded power outlet and away from sources of excessive heat. Also, use an appropriate power strip to isolate the site from electric noise (for example,

## Getting Started

spikes, sags, and surges) produced by devices such as air conditioners, large fans, radios, and televisions.

3. Save all shipping containers and packing material for repackaging or moving the system later.

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### NOTES

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Do not install optional hardware or application software until you have started your system and verified that the base system is working correctly.

On systems that have preloaded software, a label attached to the system unit informs you that there is licensed software installed. Carefully review the software license agreement shipped with your system.

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### WARNING

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**When unpacking and moving system components, be aware that some components (such as the system unit or monitor) may be too heavy for you to safely lift alone. If you are doubtful about whether you can lift these items alone, please get assistance.**

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## Posture and Work Habits

Some studies suggest that if you use poor posture while you work or if your equipment is poorly positioned, injury may result. Although other studies refute this cause and effect, we recommend that you read and follow the precautions outlined in Figure 1-2 and Table 1-1 and adjust your work area so that you are comfortable. and adjust your work area so that you are comfortable.

Getting Started

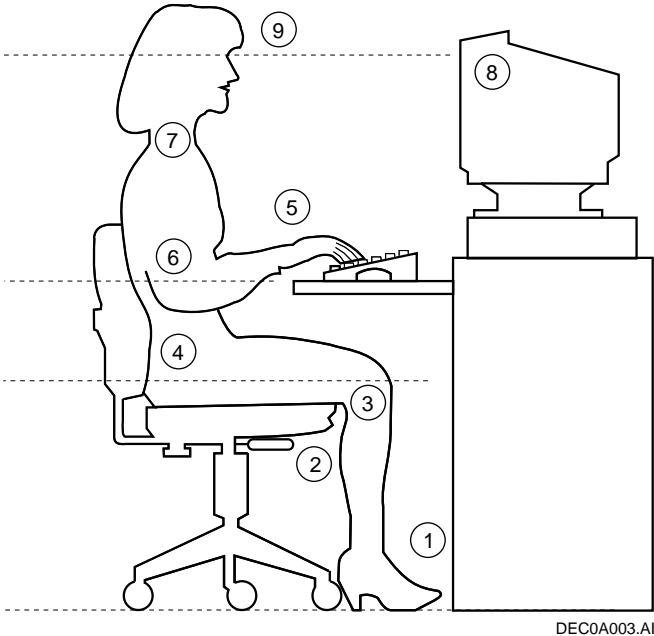


Figure 1-2. Recommendations for Posture and Work Habits

## Getting Started

**Table 1-1 Recommendations for Posture and Work Habits**

Adjust	Figure Callout	To allow the following conditions:
Chair	<p>1</p> <p>2</p> <p>3</p> <p>4</p>	<p>Your feet are flat on the floor.</p> <p>Your legs are vertical and form a right angle to the floor.</p> <p>Your thighs are horizontal, and they are not bearing weight. To prevent restriction of the blood flow, keep the backs of your knees away from the seat so you do not compress the area behind them.</p> <p>Your upper body is erect and your lower back is supported with a backrest.</p>
Keyboard and Mouse	<p>5</p> <p>6</p>	<p>Your wrists are straight and do not flex more than 15 degrees. They are supported and do not rest on sharp edges. 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> <p>Your upper arms are straight down at your sides, and your elbows are close to your sides and support your arm weight. Forearms are at a 70- to 90-degree angle.</p>
Head	<p>7</p>	<p>Avoid neck strain. Your head should incline downward, but no more than 15 to 20 degrees.</p>
Monitor	<p>8</p> <p>9</p>	<p>The monitor should be no higher than the level of your eyes and at the correct distance for your vision.</p> <p>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 focusing on distant objects.</p>
Lighting		<p>Direct lighting or sunlight on the screen causes glare and reflections. Place lighting behind or to the side of your work area, and distribute the lighting evenly on your work area.</p>

## Getting Started

**Table 1-1 Recommendations for Posture and Work Habits (cont.)**

<b>Adjust</b>	<b>Figure Callout</b>	<b>To allow the following conditions:</b>
Noise		Keep background noise at a minimum. Background noise above 65 dBa is tiring. Sound-absorbing materials (for example, curtains, carpeting, and acoustic tile) can help reduce background noise.
Temperature		The temperature should be between 20° and 23°C (68° and 74° F).
Humidity		The humidity should be between 30% and 70%.
Ventilation		Provide adequate air ventilation to operate the equipment and avoid fatigue.
Work Area		Your work area should be greater than 70 cm (28 inches) center to center, preferably 152 cm (60 inches).

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### **WARNING**

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**If you experience pain or discomfort while using your system, rest and review the instructions for posture and work habits. If the pain or discomfort continues after resuming work, discontinue use and report the condition to your job supervisor or physician.**

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### Identifying the Correct AC Power Cord

The proper AC power cord accompanies your AlphaStation 600A Series system. Because variations exist from one country to another, and systems may be moved, inspect your power cord to ensure that it is the correct one for your country or region. If you are not sure that the supplied AC power cord is correct, contact your authorized Digital service representative or distributor before you use it.

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#### **WARNING**

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**Do not attempt to modify or use an external 115V AC power cord for 230V AC input power. Modifying the power cord can cause personal injury and severe equipment damage.**

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Power cords supplied with the AlphaStation 600A Series system meet the following criteria:

- The cords are UL-listed and CSA-certified, rated for use at 250V AC with a current rating that is at least 125% of the current rating of the AlphaStation 600A Series system. In Europe, the cordage carries 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 computer end must be an IEC<sup>1</sup>-type CEE<sup>2</sup>-22 female connector.
- The cord length does not exceed 4.5 m (14.5 ft).

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<sup>1</sup> International Electrotechnical Commission.

<sup>2</sup> International Commission for Conformity Certification of Electrical Equipment.

## Getting Started

### Installing Your System

The *AlphaStation 600A Series Installation Information* you received with your system graphically outlines the steps to follow to install your system.

1. Make sure you received all of your system components. Use Appendix G, Equipment Log, to list your equipment. If something is missing, please contact your distributor or Digital representative.
2. If you are using rack-mount installation, remove the glide pads (enclosure feet).
3. Position your system so that air can flow freely to and from the vents, as shown in Figure 1-3.

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#### CAUTIONS

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To ensure that your system is properly cooled:

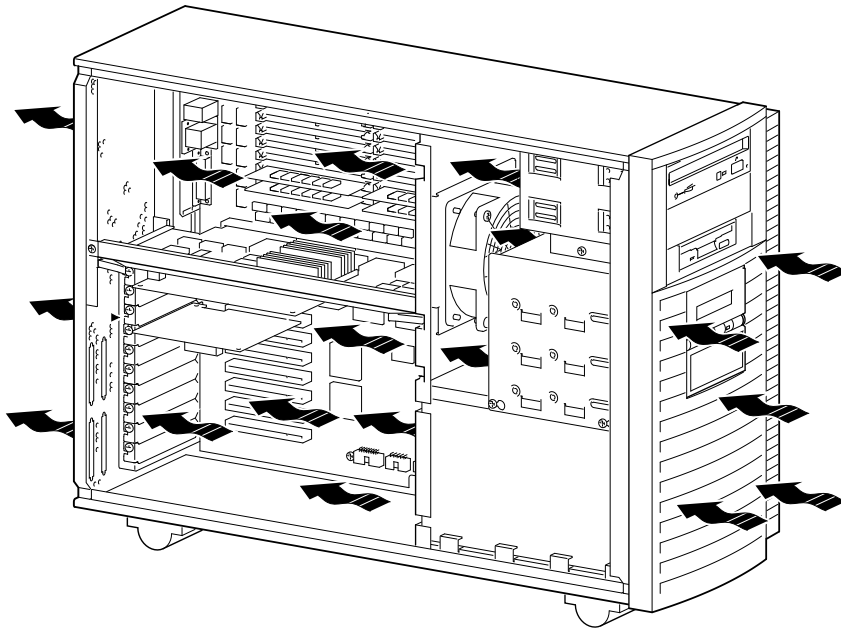
Make sure that air can freely flow into the front ② and out of the rear ① of the system unit.

Do not remove a filler plate until you are ready to add a new system component.

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## Getting Started



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- ① Rear of system unit
- ② Front of system unit

**Figure 1-3. System Airflow (Side View, Cover Removed)**

### Connecting System Components

To connect the components of your AlphaStation 600A Series system, follow this procedure:

## Getting Started

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**NOTE**

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The AlphaStation 600A Series system runs on 88V–268V AC and 48–62 Hz. The system uses an autosensing power supply.

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1. Ensure that the On/Off switch is in the Off (flush) position. See Figure 1-5 for a view of the switch positions.
2. Connect the mouse, keyboard, video cable, and power cords to the system components, as shown in Figure 1-4.

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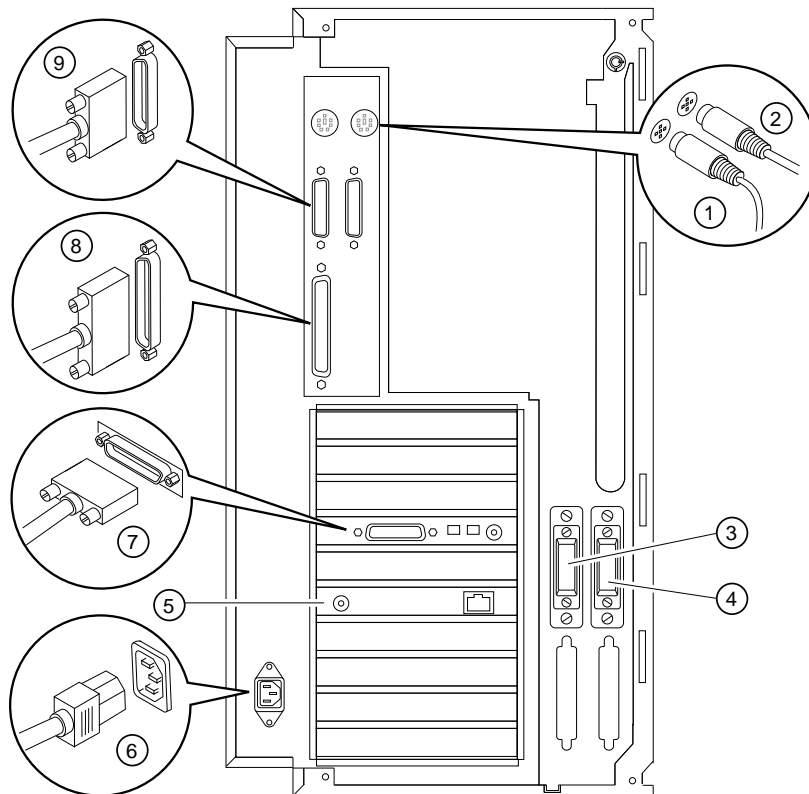
**NOTE**

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If you disconnect the mouse or keyboard during operation, data will be lost and you will have to power-cycle the entire system.

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## Getting Started



ML013755

- ① Mouse connector
- ② Keyboard connector
- ③ Optional SCSI connector
- ④ Optional SCSI connector
- ⑤ Network connectors
- ⑥ Power connector
- ⑦ Video port
- ⑧ Parallel port
- ⑨ Serial ports

**Figure 1-4. Connecting Cables and the Power Cord**

## Getting Started

3. If you have an external small computer system interface (SCSI) interface or SCSI storage box, connect the SCSI cable to the appropriate SCSI port on the rear of the system. See the section on SCSI Termination in Chapter 3 for additional information.

## Network Connection

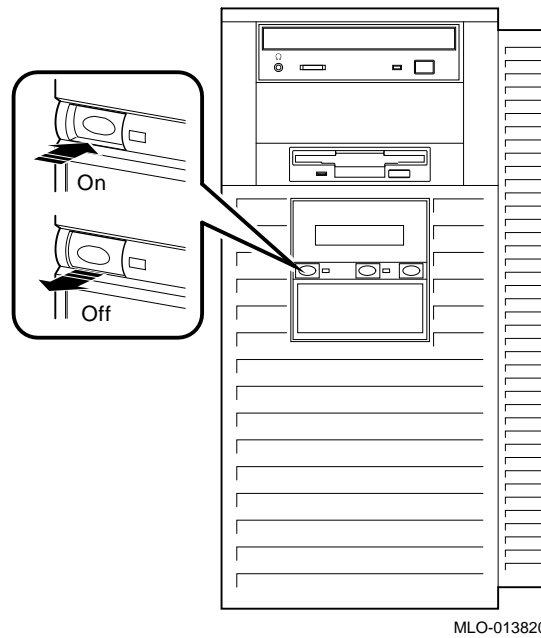
The AlphaStation 600A Series system has 10BASE-T (twisted-pair) connectors for connecting to a network. Use the appropriate connector for your application.

## Starting Your System

Perform the following steps to start your AlphaStation 600A Series system:

1. Turn on the system unit, monitor power, and any external devices. Figure 1-5 shows the location of the system unit On/Off button.
2. If necessary, adjust the monitor contrast and brightness to obtain a readable screen display. Refer to the information supplied with your monitor for further instructions.
3. Allow your system to complete any power-on self-tests and device initialization messages. This will take approximately 1 minute. If you are using the Digital UNIX on OpenVMS Alpha operating systems, and the *auto\_action* environment variable is set to `BOOT`, the system starts as soon as the self tests have completed (less than 2 minutes). If you are using Microsoft Windows NT, the operating system starts after countdown expires (default is 10 seconds).

## Getting Started



**Figure 1-5. Starting Your System**

### **Preloaded Operating System Software**

Your AlphaStation 600A Series system comes with one of the following operating systems preloaded:

- Digital UNIX
- OpenVMS Alpha

## Getting Started

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### NOTE

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Microsoft Windows NT is available but is not preloaded on your AlphaStation 600A Series system.

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Depending on how the environment variables are set, your system shows one of the operating system-specific displays described next, after the self tests complete successfully.

#### Digital UNIX

If you are using the Digital UNIX operating system, when you turn on your system, you see a >>> prompt (if *auto\_action* is set to Halt) or the system proceeds to boot Digital UNIX (if *auto\_action* is set to Boot).

☞ For more information, refer to your operating system documentation.

#### OpenVMS Alpha

If you are using the OpenVMS Alpha operating system, when you turn on your system, you see a >>> prompt (if *auto\_action* is set to Halt) or the system proceeds to boot OpenVMS Alpha (if *auto\_action* is set to Boot).

☞ For more information, refer to your operating system documentation.

#### Switching Console Firmware

To switch from the AlphaBIOS console (used with the Microsoft Windows NT Workstation operating system) to the SRM console (used with the Digital UNIX and OpenVMS Alpha operating systems), from the Boot menu, select your operating system (Digital UNIX or OpenVMS Alpha).

To switch from the SRM console to the AlphaBIOS console, at the SRM prompt (>>>), type: `arc`.

### If No Operating System Is Installed

- ☞ If an operating system was not preloaded on your system, refer to Chapter 9 and to your operating system documentation for information on how to load it.

### Booting the Operating System

You may need to perform some of these tasks before booting your operating system:

Run the EISA Configuration Utility (ECU)

Check required environment variable settings.

Change the way your system powers up or boots.

Verify your system configuration

### Running the EISA Configuration Utility

If you have added, removed, or moved an EISA card, you must run the EISA Configuration Utility before booting the operating system. Refer to "Using the EISA Configuration Utility" in Chapter 5 for more information.

### Checking Required Environment Variable Settings

If you are running the Digital UNIX or OpenVMS Alpha operating system, verify the value of the `set bus_probe_algorithm` environment variable. It should be set to "new."

## Getting Started

You may also want to check that settings for the following variables match your configuration. The SRM console command to reset each variable is shown in parenthesis. To see a complete list of environment variables, type `show *` at the SRM console prompt.

Operating system (`set os_type`)

Ethernet device type (`set ew*0_mode`)

Speed for Fast SCSI devices (`set pk*0_fast`)

Boot device (`set bootdef_dev`)

Boot flags (`set boot_osflags`)

Device names (`set bus_probe_algorithm`)

Network protocols (`set ew*0_protocols`)

### Changing Startup and Boot Defaults

You can change the way the system starts up or boots the operating system. For example, you can set the system to autoboot or you can change the default boot device. To make these kinds of changes you need to change default values for your system's environment variables.

- To change default values for Windows NT systems, which boot automatically, select the CMOS Setup menu from the Boot menu. (See "Using the AlphaBIOS Console" in Chapter 5.
- To change default values for Digital UNIX or OpenVMS Alpha systems, see "set" in Table 5-5. Basic SRM Console Commands.

#### Startup and Boot Environment Variables

The following environment variables affect the way the system starts up or boots:

- `auto_action`
- `autoload`
  - `countdown`
  - `os_type`



## Getting Started

Table 1-2 lists the boot environment variables and their values, and briefly describes their effects. Environment variables marked with an asterisk\* in Table 1-2 require that you use the `init` command to initialize the firmware whenever you reset that particular variable.

```
Example: >>> set os_type NT
>>> init
```

**Table 1-2. Startup and Boot Environmental Variables**

Operating System	Environment Variable	Value	Description
Digital UNIX OpenVMS Alpha	auto_action	Boot Halt Restart	*Specifies the system default startup action. Applies only to the Digital UNIX and OpenVMS Alpha operating systems.
Digital UNIX OpenVMS Alpha	bus_probe_algorithm	New	*Improves bus sizing and configuration on systems running the Digital UNIX and OpenVMS operating systems. Failure to set this environment variable could result in errors.
Windows NT	autoload	Yes or No	Specifies whether the Windows NT operating system should boot. Does not affect the OpenVMS Alpha or Digital UNIX operating systems. If the value is YES, the Windows NT firmware boots the system after the COUNTDOWN time-limit expires. If the value is NO, the system halts at the Windows NT firmware Boot menu.

## Getting Started

**Table 1-3. Startup and Boot Environmental Variables**

Operating System	Environment Variable	Value	Description
Windows NT	countdown	10 seconds (default value)	Specifies the time limit within which you can stop the Windows NT operating system from booting if AUTOLOAD is set to YES. The time limit is specified in seconds. When you turn on the system or reinitialize the firmware, the system displays the seconds remaining before the operating system boots automatically. To stop the system from booting automatically, you must choose another menu item from the Boot menu.
Windows NT Digital UNIX OpenVMS Alpha	os_type	NT UNIX VMS	*Specifies the system default operating system setting. Depending on the value, the system either boots or restarts the specified operating system, or halts in the specified console. You can modify the value from either the Windows NT (ARC) console or Digital UNIX and OpenVMS (SRM) console.

## Turning Off Your System

Before turning off your system, make sure to save and close all open files. If you turn the system off without saving and closing files, you could corrupt some or all of your data.

To turn off your system, follow this procedure:

1. Close any application data files you have open as well as any applications you have running. Most application programs prompt you to save the information before closing.
2. Shut down the operating system with the appropriate command from Table 1-4:

**Table 1-4. System Shutdown Commands**

Operating System	Action
Windows NT	From the Program Manager File menu, choose Shutdown.  Choose the OK button to confirm.
Digital UNIX	Type the following from a superuser account:  <code>shutdown -h now</code>
OpenVMS Alpha	Type the following from a privileged account:  <code>@sys\$system:shutdown</code>

3. Wait for the operating system to complete the shutdown process. For Digital UNIX or OpenVMS Alpha, the SRM console prompt (>>>) is displayed. Microsoft Windows NT displays a window indicating it is safe to turn off or restart the system.
4. Do not turn off power to your system and peripherals until the shutdown sequence completes.

## Computer Security

Use the security lock and passwords to protect your AlphaStation 600A Series system.

### Security Lock

To avoid theft of internal components, your AlphaStation 600A Series system comes with a security key lock, which is located on the back of your system unit. When this lock is in the locked position, no one else can open the system box. Store the key in a safe place.

### Passwords

You can set your system for screen saver and pause screen passwords. See your operating system documentation for more information on the availability and use of these options.

## Getting Started

### **SRM Console Security**

For information on console security features that restrict access to certain SRM console commands, see “SRM Console Security Features” in Chapter 5.

# 2

## System Overview

### Introduction

This chapter describes the AlphaStation 600A Series system hardware components, including the peripheral component interconnect (PCI) architecture, the keyboard, the system unit front panel, and the system unit rear panel.

### System Unit

Your AlphaStation 600A Series system uses a high-performance Alpha architecture CPU.

The system unit includes:

- Two external storage bays for 5.25-inch or 3.5-inch devices
- Three internal storage bays for 3.5-inch devices
- Diskette controller that supports one or two diskette drives
- One 3.5-inch external diskette drive
- Small Computer System Interface (SCSI3) controller with both internal and external buses that support up to 16 SCSI devices, and twisted-pair Ethernet ports.
- Seven slots for 32-bit PCI options; two slots for EISA plug-in options.
- Keyboard and mouse ports
- Two serial ports and one parallel port

 Refer to Chapter 7, “Technical Specifications,” for additional information.

## System Overview

### PCI Architecture

Your system's PCI architecture represents the latest advances in local bus technology. The PCI architecture of your AlphaStation 600A Series system delivers maximum performance by providing a wider data path, greater speed, and improved expandability.

PCI local bus features include:

- Highest performance in the workstation market today
- Best expandability for high-performance peripheral devices
- Support for multiple bus masters
- 32-bit data transfer
- PCI-to-EISA bridge capability that allows you to use commonly available EISA options

### System Board

The system board provides a standard set of I/O functions :

- A Fast Wide SCSI controller chip that supports up to 7 fast wide SCSI drives
- The firmware console subsystem on 1 MB of Flash ROM
- A diskette drive controller
- Two serial ports with full modem control and the parallel port
- Keyboard and mouse interface
- Speaker interface
- PCI-to-PCI bridge chip set
- PCI-to-EISA bridge chip set
- EISA system component chip
- Time-of-year (TOY) clock
- Connectors:
  - - EISA bus connectors (Slots 1 and 2)
  - - PCI bus connectors (Slots 11, 12, and 13, before the bridge)
  - - PCI bus connectors (Slots 1, 2, 3, and 4, behind the bridge)
- Memory module connectors (16 SIMM connectors)
- CPU module connector

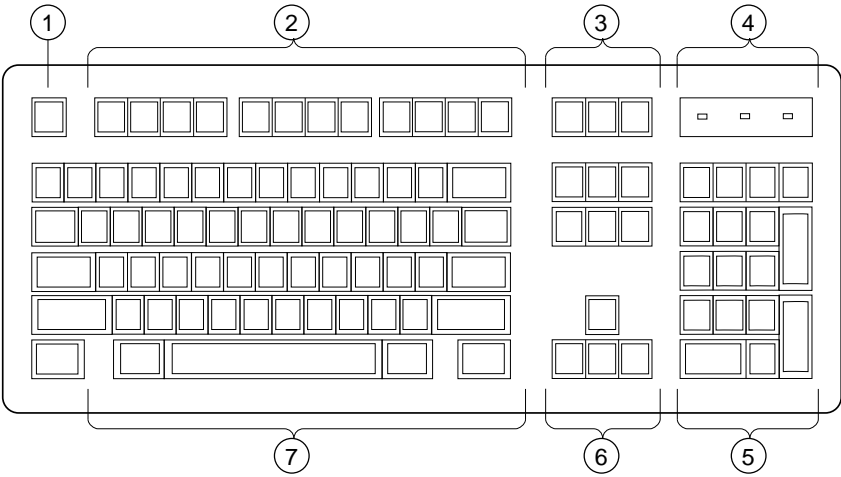
### The Keyboard

Your system comes equipped with a 101-key enhanced keyboard (shown in Figure 2-1) that allows you to enter data or commands to your system. Note: Some European keyboards have 108 keys. Refer to Table 2-1 for information on key groups and functions.

☞ Refer to your operating system or application software documentation for software-specific key functions.

**NOTE**

Adjust the angle of the keyboard for your comfort. The underside of the keyboard has feet that swing down and lock into place.



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**Figure 2-1. Typical Keyboard Layout**

## System Overview

**Table 2-1. Key Groups and Functions**

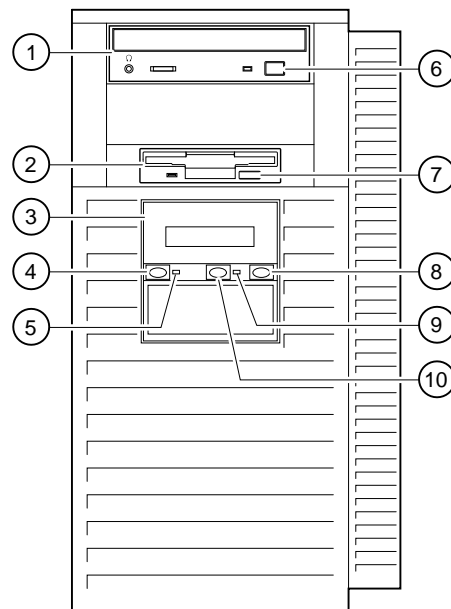
<b>Figure Legend</b>	<b>Key, Key Group</b>	<b>Function</b>
1	[Escape] key	This key is program-specific. Its function is determined by the installed application software.
2	Function key group	These keys are program-specific. Their functions are determined by the installed application software.
3	Edit key group	These keys are program-specific. Their functions are determined by the installed application software.
4	Indicator lights	These lights indicate whether [NumLock], [CapsLock], or [ScrollLock] has been activated.
5	Numeric keypad	These keys perform numeric functions and software-defined functions, including cursor control. The [NumLock] key allows you to toggle between the numeric functions and software-defined functions.
6	Cursor control key group	These keys control the movement of the highlighted cursor on the monitor screen.
7	Alphanumeric key group	These typewriter-specific keys feature automatic-repeat capability. If you press and hold down any of these keys, the keystroke repeats automatically until released.

## System Front Panel

Figure 2-2 shows a front view of the system with pointers to the controls and indicators. Table 2-2 describes these items.



## System Overview



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**Figure 2-2. Indicators, and Drive Bay Locations**

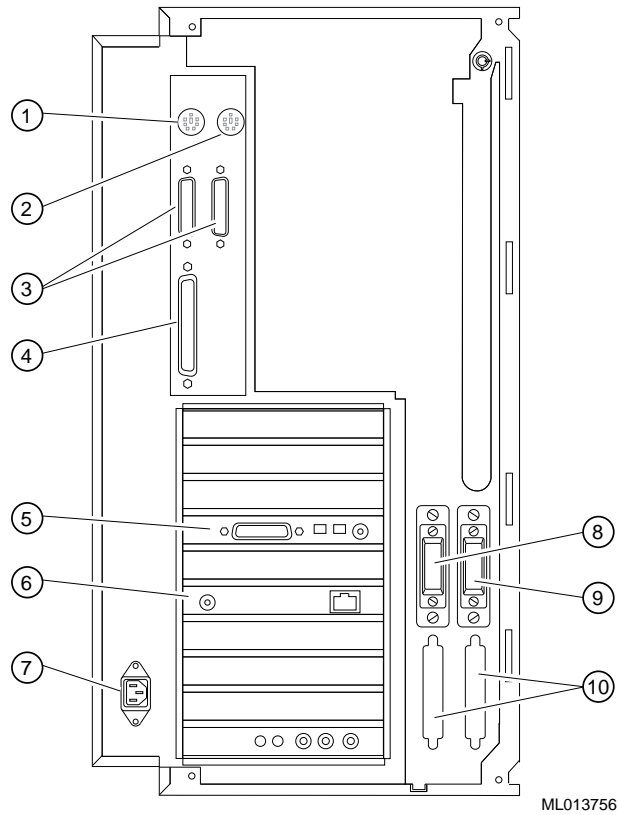
**Table 2-2. Front Controls, Indicators, and Drive Bay Locations**

Figure Legend	Control or Indicator	Function
1	RRD45 CD-ROM drive	Location of 3.5-inch CD-ROM drive.
2	Diskette drive	Location of 3.5-inch diskette drive.
3	Operator control panel	Displays system messages
4	On/Off button	Turns DC power on and off.
5	Halt indicator	Lights when system is in the Halt state.
6	CD-ROM eject button	Releases a CD-ROM from the CD-ROM drive
7	Diskette eject button	Releases a diskette from the diskette drive.
8	Halt button	When pressed, the system halts immediately (the halt button is a momentary contact switch).
9	On/off indicator	DC On, lights when the system is on.
10	Reset button	When pressed, resets the system and causes the self-test to run.

## System Overview

### System Rear Panel

Figure 2-3 shows the rear connectors. Table 2-3 lists the rear connectors and describes their functions.



**Figure 2-3. Rear Connectors (Rear View)**

## System Overview

**Table 2-3. Rear Connectors**

<b>Figure Legend</b>	<b>Connector</b>	<b>Function</b>
1	Mouse connector	Connects a PS/2-compatible mouse.
2	Keyboard connector	Connects a keyboard.
3	Serial port connectors	Connect serial devices.
4	Parallel port connector	Connects an industry-standard parallel printer.
5	Video port (on option module)	Provides the interface between the video/graphics expansion module (option) and the supported monitor.
6	Network connectors	Provide twisted-pair network connections..
7	AC power connector	Connects the system to AC power.
8	Location for optional SCSI connector	Provides the interface between the system unit and external SCSI devices.
9	Location for optional SCSI connector	Provides the interface between the system unit and external SCSI devices.
10	SCSI slots	Provide the interface between the system unit and external SCSI devices when optional SCSI modules are added to the system.



# 3

## Installing System Options

### Introduction

This chapter describes the AlphaStation 600A Series system unit components and gives instructions and illustrations to help you install them. The following components are described:

- External and internal drive bay devices
- Single in-line memory modules (SIMMs)
- EISA and PCI bus options
- Operator control panel (OCP)

---

#### CAUTION

---

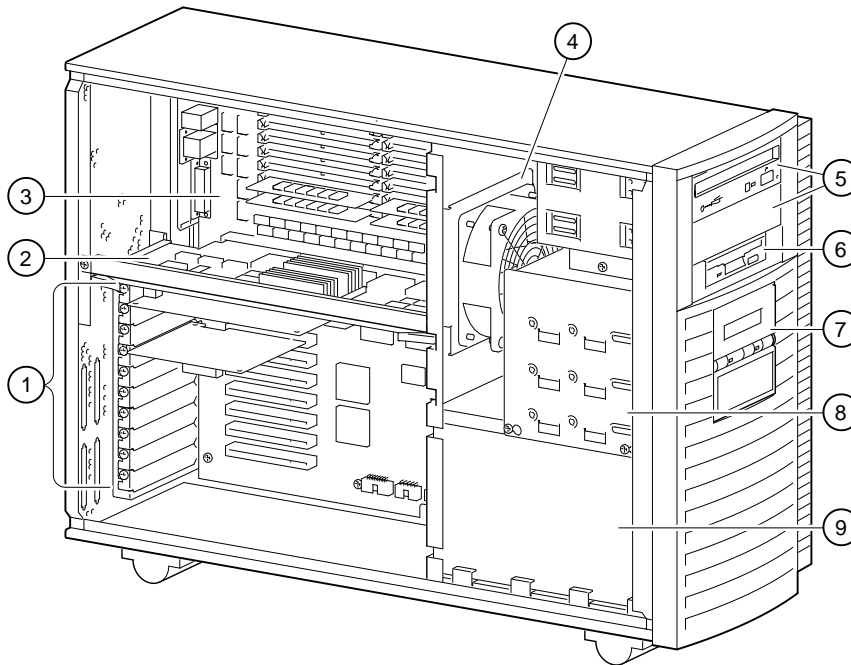
When working on the internals of the system unit (for example, replacing an option), you must wear a grounded wrist strap.

---

## Installing System Options

### System Unit Components

Figure 3-1 shows the location of the AlphaStation 600A Series system unit components. Table 3-1 lists the system unit components.



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**Figure 3-1. System Unit Components**

**Table 3-1. System Unit Components**

Figure Legend	Component
1	Seven 32-bit PCI expansion slots, and two EISA expansion slots
2	CPU module
3	Memory modules
4	Fan
5	External drive bays for 5.25-inch or 3.5-inch devices
6	3.5-inch diskette drive
7	Operator control panel
8	Internal drive assembly for 3.5-inch devices
9	Power supply

## Left Side Panel

To gain access to the inside of the AlphaStation 600A Series system unit, remove the left side panel. The system has a safety interlock on the side panel. Removal of this panel turns off the system if you have not already done so.

---

### NOTE

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If you are using a rack mount, the side panel is the top of the system unit.

---

## Installing System Options

### Removing the Left Side Panel

To remove the left side panel, follow this procedure:

1. Turn off your system and all peripheral devices.
2. Unplug the power cord from the wall outlet.
3. Wait at least 15 seconds, to allow time for the power supply capacitors to discharge safely.
4. Unlock the left side panel by turning the key counterclockwise to a vertical position, as shown in Figure 3-2.

---

#### **CAUTION**

---

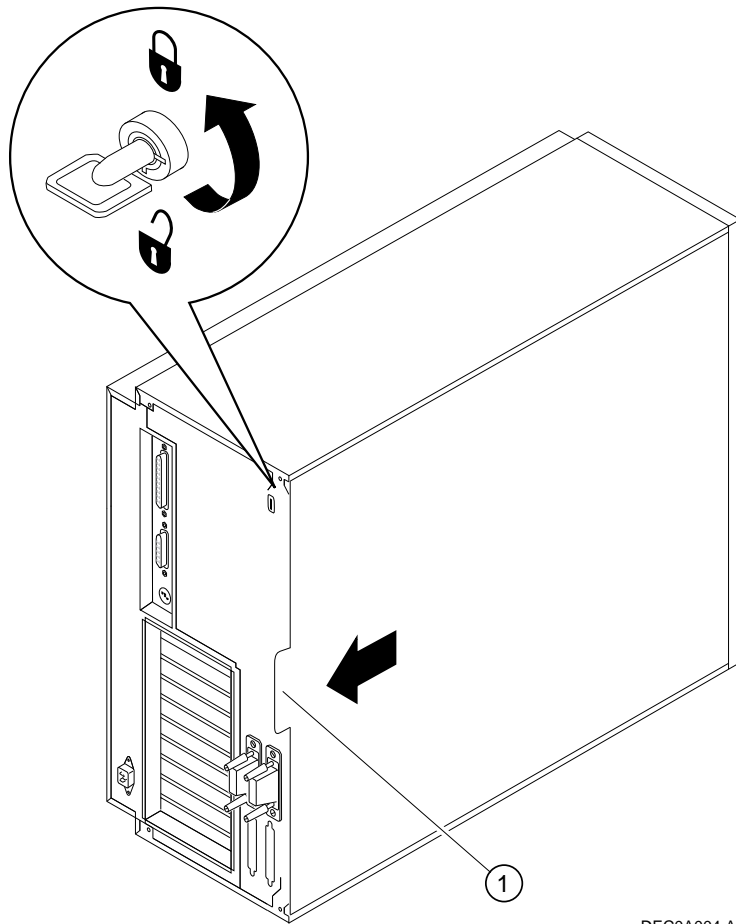
To avoid system damage from static discharge, wear a grounded wrist strap before you touch anything inside the system.

---

5. Slide the panel toward the rear of the system unit (as shown in Figure 3-3) and remove it.



## Installing System Options



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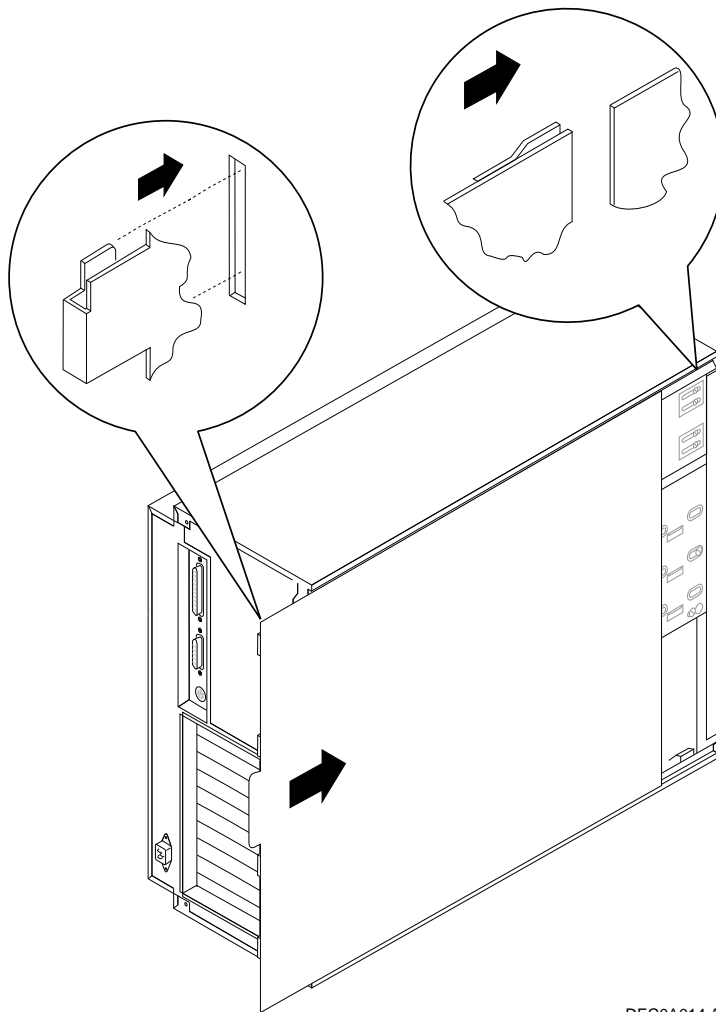
① Finger grip

**Figure 3-2. Unlocking and Removing the Left Side Panel**

## Installing System Options

### Replacing the Left Side Panel

Replace the left side panel, as shown in Figure 3-3, and lock it.

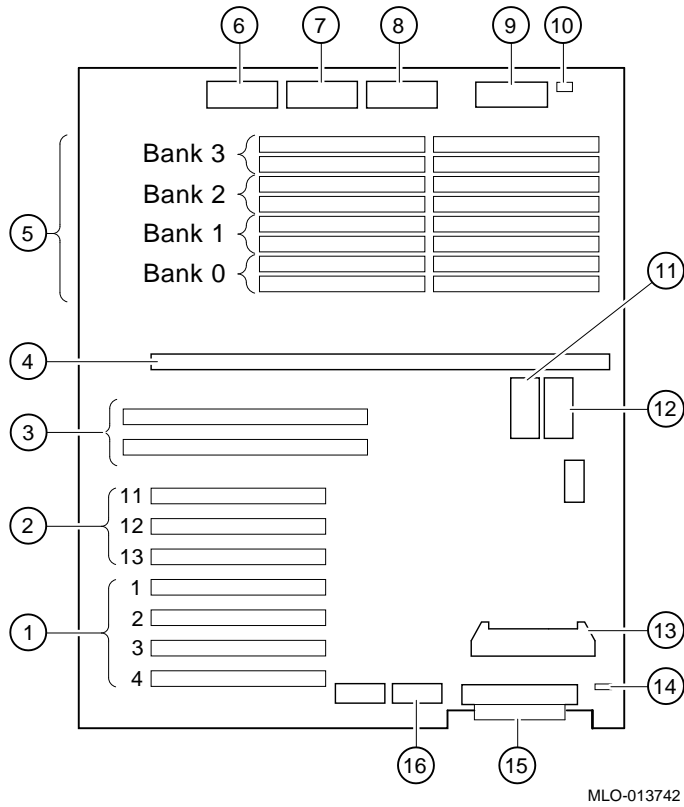


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**Figure 3-3. Replacing the Left Side Panel**

## System Board

Figure 3-4 shows the location of the AlphaStation 600A Series system board components. Table 3-2 describes these components.



**Figure 3-4. System Board Components**

## Installing System Options

**Table 3-2. System Board Components**

<b>Figure Legend</b>	<b>Components</b>
1	PCI slots: primary
2	PCI slots: secondary
3	EISA slots
4	CPU module
5	Memory module connectors
6	Power connector (+5V sense, -5V, +12V, -12V, 3.3V sense)
7	Power connector (+5V)
8	Power connector (+3.3V)
9	Diskette drive connector
10	Fan connector
11	TOY/NVRAM chip (E78)
12	NVRAM chip (E14)
13	Speaker connector
14	OCP connector
15	Internal SCSI bus connector
16	Not used

## System Memory

The AlphaStation 600A Series system memory supports 16 single in-line memory module (SIMM) connectors on the system board. The SIMM connectors are grouped in four memory banks consisting of four memory modules. Figure 3-5 shows the four memory banks and their memory module connectors.

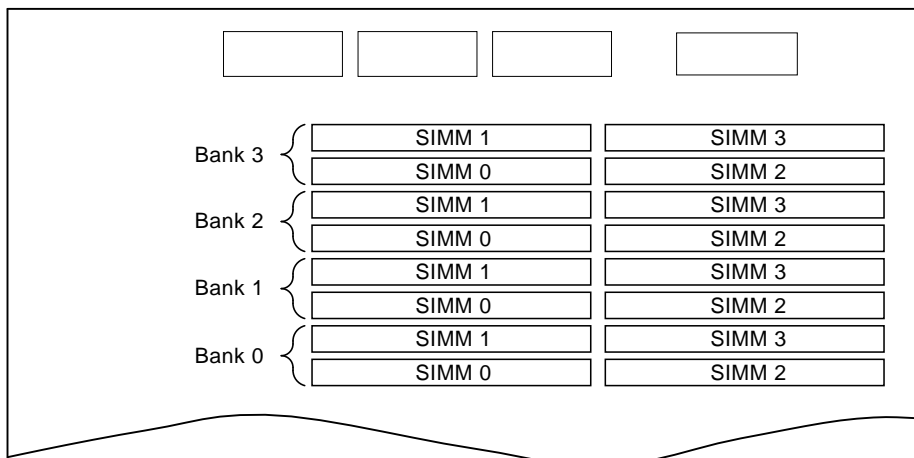
Keep in mind the following rules when installing memory modules:

A memory option consists of four memory modules.

One bank must contain a memory option.

All memory modules within a bank must be of the same capacity.

The system unit supports five sizes of memory options: 16, 32, 64, 128, and 256 megabytes. Using combinations of these five memory options, the system supports from 16 megabytes to one gigabyte of memory.



MLO-013740

**Figure 3-5. Memory Banks and Connectors**

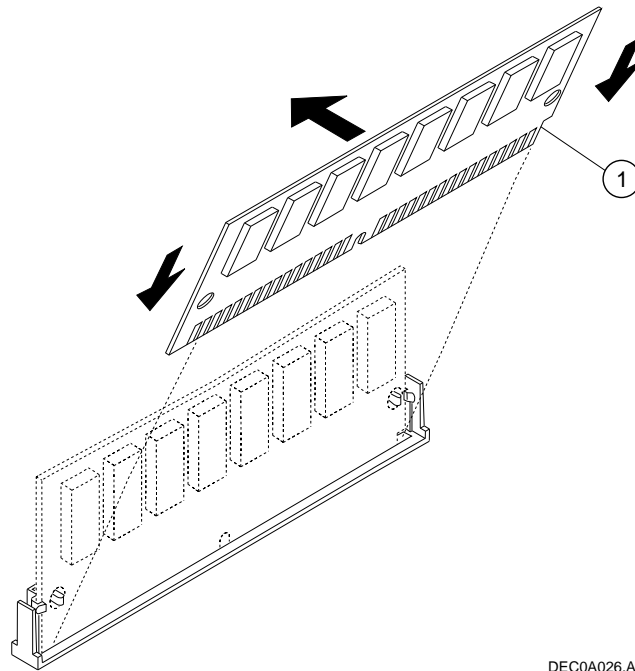
## Installing System Options

### Installing Memory Modules

You need to install a new memory module to replace a faulty module or when upgrading a memory bank. You may need to remove memory modules in order to access the memory slots for any new modules (see the next section). To install a memory module, refer to Figure 3-6 and follow these steps:

1. Install the module in the socket at a 45-degree angle. Be sure that the notch ① is oriented as shown. Rock the module gently until it is seated evenly, and press gently so it slips over the two posts located at each end of the slot. Tip the module upright until both retaining clips at the ends of the socket engage.
2. Reinstall any memory modules you may have removed for access purposes.
3. Replace the system covers.
4. Test the memory configuration using the following commands:  

```
>>> show memory  
>>> memory
```



DEC0A026.AI

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

## Removing Memory Modules

You may need to remove memory modules to either remove or install another memory module. Note the position of any memory modules that you remove.

---

### CAUTION

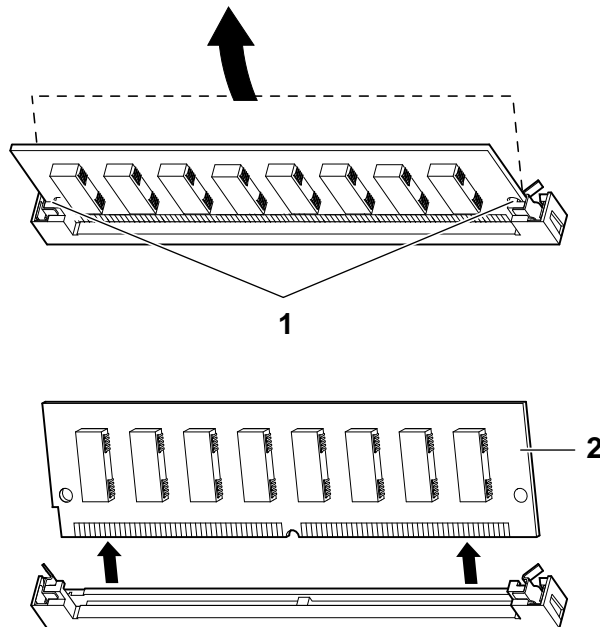
---

To avoid electrostatic damage to components, wear a grounded wrist strap before you touch anything inside the system.

---

Figure 3-7 shows the removal procedure for a memory module. To remove a memory module:

1. Remove the appropriate memory modules by pressing the metal clips ① on both sides of the memory module connector to the side.
2. Tilt the memory module and lift it ② out of its connector.



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

## Installing System Options

### External Drive Bay Devices

The AlphaStation 600A Series system supports three external drive bay devices: a slimline 3.5-inch diskette drive and two 5.25-inch half-height removable media devices (intended for tape and CD-ROM use.)

### SCSI Addresses

Before installing a SCSI drive, you must either set or verify the setting of the drive's SCSI address (SCSI ID). Digital recommends that you use Table 3-3 as a guide for the selection of an address for your SCSI drive. Although Table 3-3 shows eight SCSI addresses, wide-bus SCSI can support up to 15 addresses.

**Table 3-3. SCSI Address Recommendations**

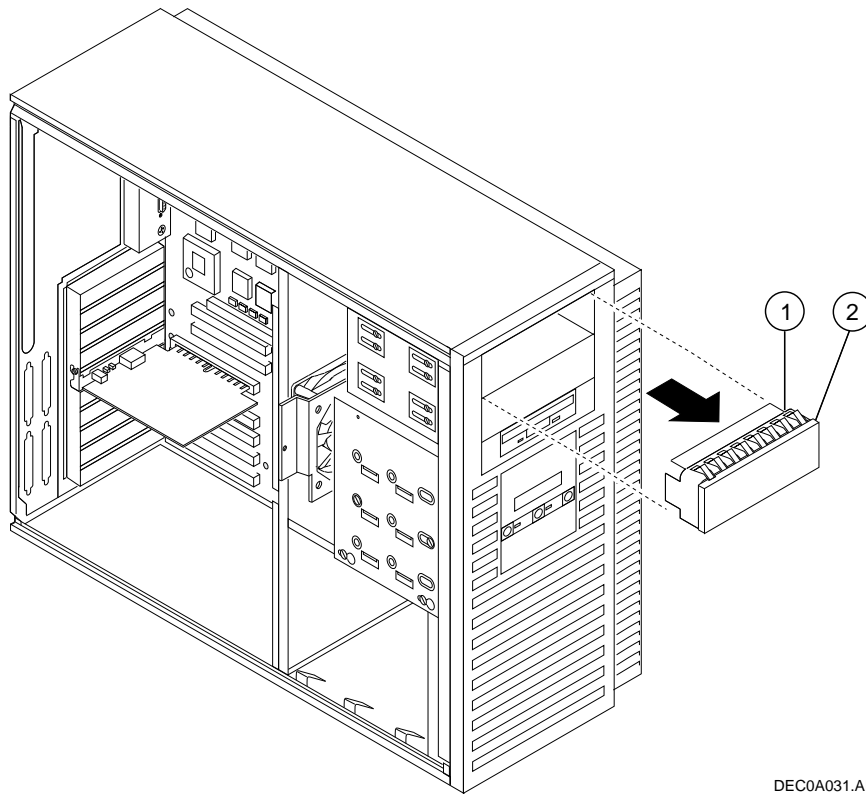
SCSI Address (ID)	Device (Drive) Recommended
0	System disk (where your operating system resides)
1	Expansion/hard drive
2	Expansion/hard drive
3	Expansion/hard drive
4	Expansion/hard drive
5	CD-ROM drive
6	Expansion
7	Host adapter (SCSI controller)



## Installing External Drive Bay Devices

To install an external drive bay device, follow this procedure: .

1. Turn off your system and unplug the power cord from the wall outlet.
2. Unlock and remove the left side panel, as described earlier in this chapter.
3. Carefully remove the plastic filler panel ②, pushing it out from the inside using a Phillips screwdriver inserted through one of the screw holes in the side of the drive bay.



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- ① Shield
- ② Filler panel

**Figure 3-8. Removing a Plastic Filler Panel**

## Installing System Options

4. Refer to your drive documentation to configure the drive. If the drive is a SCSI drive, you must select a SCSI address and make sure SCSI termination is disabled. Terminator power should be enabled. Record the SCSI address you use in Appendix G.
5. Attach the securing bracket by aligning the holes and inserting the screws, as shown in Figure 3-9.
6. Connect the power and SCSI cables to the drive before fully inserting and securing the device. Figure 3-10 shows a SCSI cabling configuration using one diskette drive and three SCSI drives. If you have a SCSI tape drive, it connects to the SCSI cable. Figure 3-11 shows the cables from the power supply.

---

### NOTES

---

The CD-ROM must always go in the top slot.

The CD-ROM drive and optional tape drive are narrow SCSI devices. You must use the wide-to-narrow SCSI adapters with them, as shown in Figure 3-10. Two adapters (part number 17-04009-01) are supplied with the system.

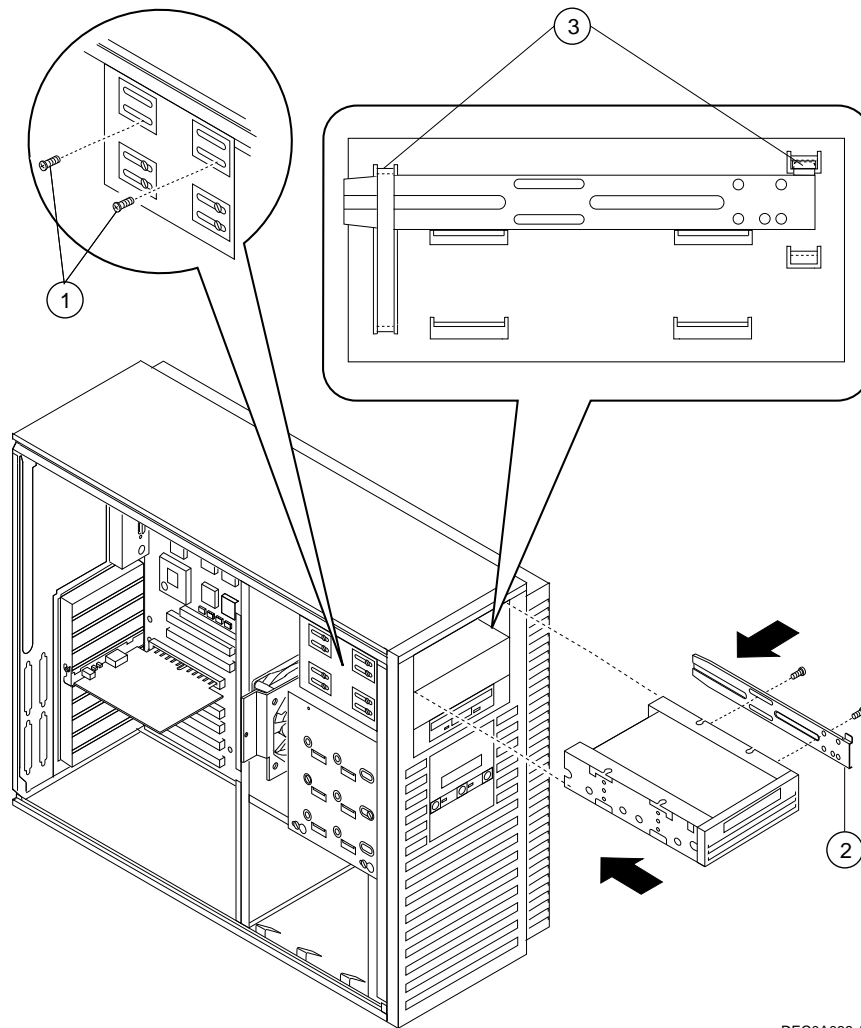
If you are using SCSI2 “wide” drives, you do not need the adapter.

---

Verify that the cable is connected in the correct orientation. All cables and most connectors are keyed so that you cannot connect them incorrectly. If your drive is not keyed, you must connect pin 1 of the cable to pin 1 of the connector.

Pin 1 of the cable is on the edge with the colored stripe or pattern. Pin 1 of the connector should be marked with a small number "1" at one end of the connector or with a small number "1" or "2" printed on the circuit board near one end of the connector.

## Installing System Options

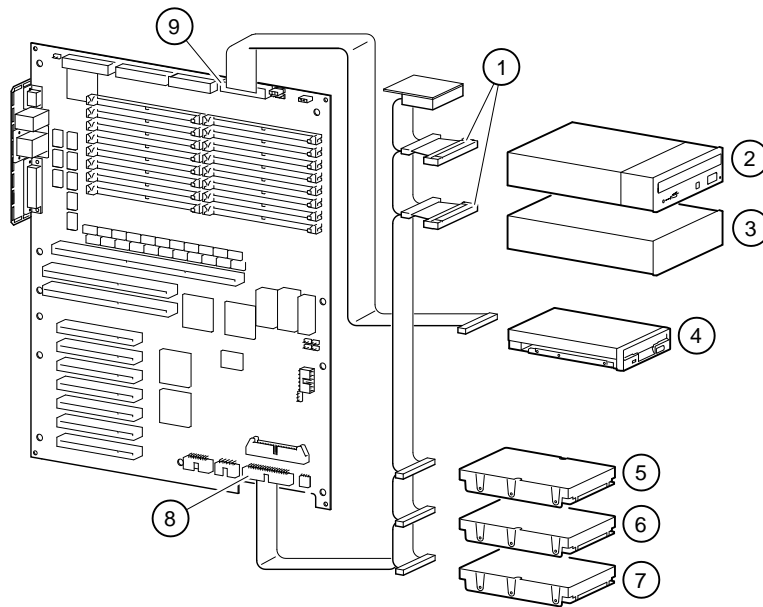


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- ① Two mounting screws for each device
- ② Securing bracket, with two mounting screws
- ③ Bracket shown in place

**Figure 3-9. Attaching the Securing Bracket and Installing the Device**

## Installing System Options

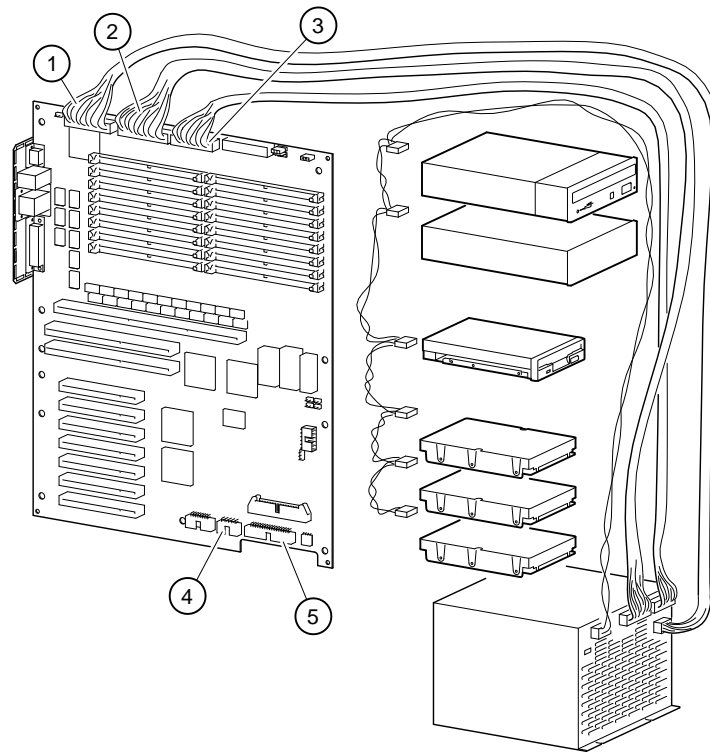


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- ① Wide-to-narrow SCSI adapter
- ② CD-ROM
- ③ Tape drive or disk drive
- ④ Diskette drive
- ⑤ ⑥ ⑦ Disk drives
- ⑧ Internal SCSI connector
- ⑨ Diskette drive connector

**Figure 3-10. SCSI and Removable Device Connector Cable Configuration**

## Installing System Options



MLO-013825

- ① J21 - power connector (+5V sense, -5V, +12V, -12V, and +3.3V sense)
- ② J19 - power connector (+5V)
- ③ J20 - power connector (+3.3V)
- ④ J22 - OCP connector
- ⑤ J3 - internal SCSI connector

**Figure 3-11. Power Cable Configuration**

## Installing System Options

7. Slide the drive in and secure it with two mounting screws, as shown in Figure 3-9.

---

### NOTE

---

If you are mounting a 3.5-inch drive in a 5.25-inch drive bay, you need 3.5-to-5.25-inch exchange brackets on the 3.5-inch drive.

---

8. Replace and lock the left side panel, as described earlier in this chapter.
9. Connect the power cord and plug it into the wall outlet.

## Internal Drive Bay Devices

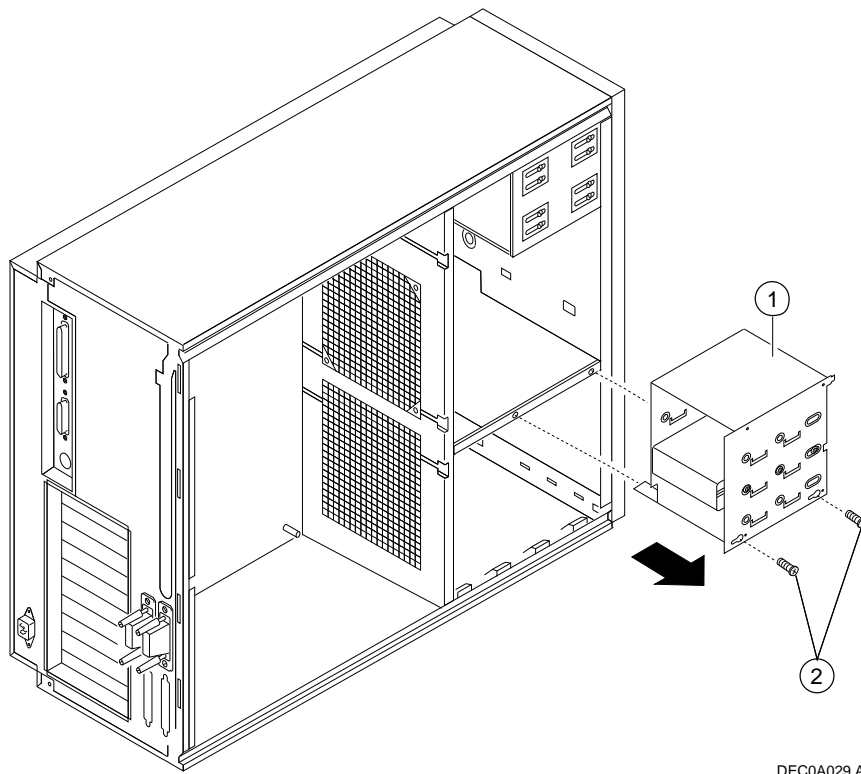
The AlphaStation 600A Series system supports three 3.5-inch devices in a drive assembly. To add or replace these devices, you must remove the entire drive assembly from your system unit, remove the devices from the assembly, and install the new devices.

### Removing the Drive Assembly from the System Unit

To remove the drive assembly from the system unit, see Figure 3-12 and follow this procedure:

1. Turn off your system and unplug the power cord from the wall outlet.
2. Unlock and remove the left side panel, as described earlier in this chapter.
3. Remove the SCSI and power cables from the devices in the drive assembly. Note the position of the cables so that you can reconnect them to the correct devices later.
4. Loosen the two mounting screws ② just above the power supply in the keyhole slots.
5. Slide the drive assembly ① toward the rear of the system unit and remove it.

## Installing System Options



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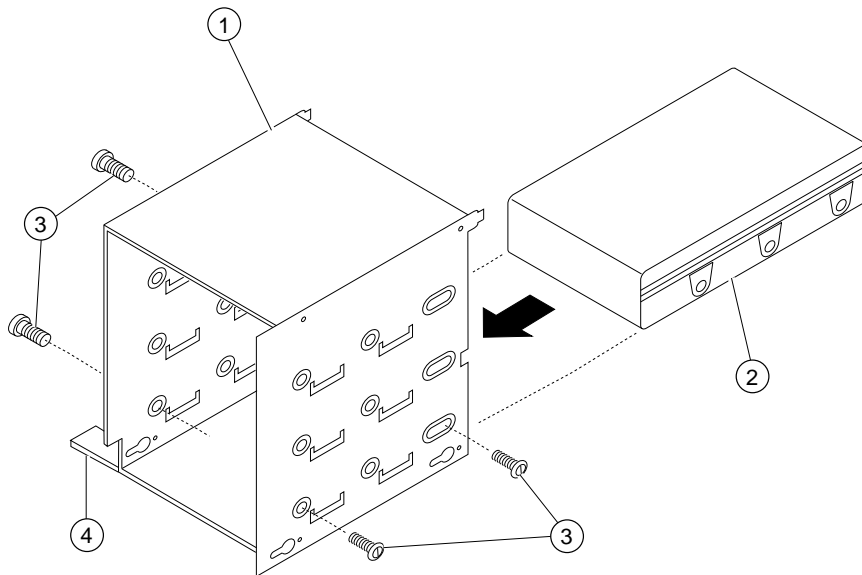
**Figure 3-12. Removing the Drive Assembly**

## Installing System Options

### Removing a Device from the Drive Assembly

To remove a device from the drive assembly, see Figure 3-13 and follow this procedure:

1. Remove a device by removing the screws ③ on both sides and sliding the device ② out of the assembly ①.



DEC0A028.AI

**Figure 3-13. Removing a Device from the Drive Assembly**

2. Slide the drive into the drive assembly and secure it with screws.

---

#### **CAUTION**

---

Be sure to use the short screws that came with the drive. Other screws may be too long and could damage the internal mechanism of the drive.

---



## Replacing the Drive Assembly in the System Unit

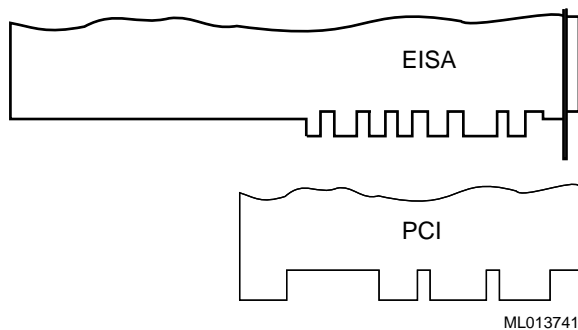
To replace the drive assembly in the system unit, follow this procedure:

1. Reconnect the SCSI and power cables to the drives.
2. Replace the drive assembly in the system unit by sliding it forward until it is properly positioned. Ensure that the two mounting tabs ④ on the drive assembly engage the mounting finger and slot in the system unit.
3. Tighten the two mounting screws.
4. Replace and lock the left side panel, as described earlier in this chapter.
5. Connect the power cord and plug it into the wall outlet.

## EISA and PCI Expansion Options

You can determine whether an option is an extended industry-standard architecture (EISA) option, or a peripheral component interconnect (PCI) option by examining the contacts on the module (shown in Figure 3-14):

The AlphaStation 600A Series system features seven 32-bit PCI slots and two EISA slots. Figure 3-15 shows the location of the EISA slots ① and PCI slots: secondary ② and primary ③.



**Figure 3-14. EISA and PCI Expansion Module Contacts**

## Installing System Options

### EISA Bus

The EISA bus is a 32-bit I/O bus. EISA is a superset of the well-established 16-bit ISA bus. EISA was designed to accept newer 32-bit components, while remaining compatible with older 8-bit and 16-bit cards.

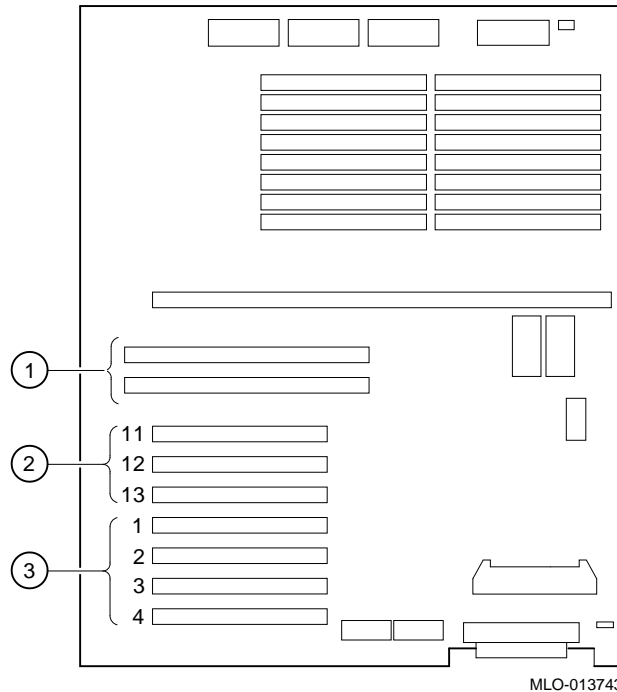
EISA offers performance of up to 33 MB/second for bus masters. Slots are bus master slots and can be filled in any sequence.

- ☞ Refer to your option module documentation for instructions on configuring an EISA option module.

### PCI Bus

The PCI bus is an industry-standard I/O bus that is the preferred bus for high-performance I/O options. The system supports 32-bit PCI option modules.

- ☞ PCI option modules require no additional configuration procedures; the system automatically recognizes the modules and assigns the appropriate system resources. Refer to your option module documentation for additional information.



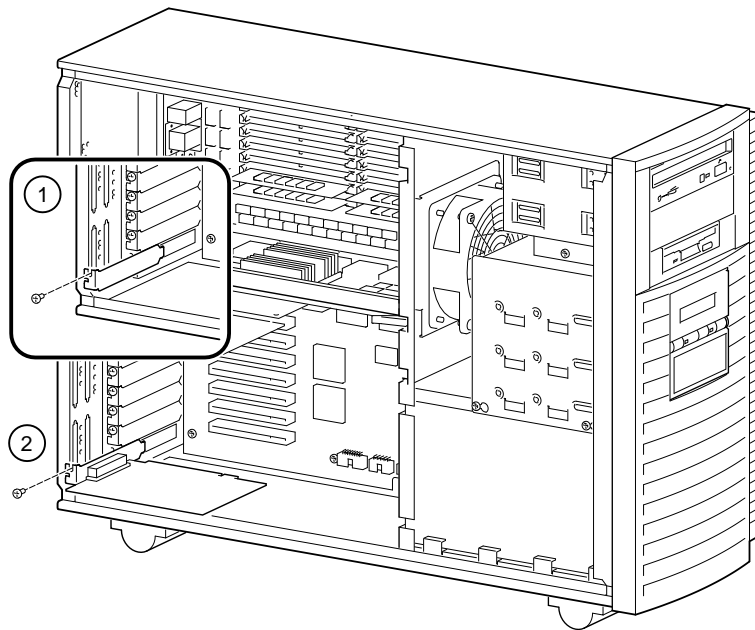
**Figure 3-15. PCI/EISA Slot Numbering**

### Installing Expansion Modules

To install an expansion module, see Figure 3-16 and follow this procedure:

1. Turn off your system and unplug the power cord.
2. Unlock and remove the left side panel, as described earlier in this chapter.
3. Unscrew and remove the metal slot cover ①.
4. Insert the new expansion module into the socket in the system board ②. Push the module firmly into the socket.
5. Replace the screw that formerly held the slot cover to secure the module ②.
6. Replace and lock the left side panel, as described earlier in this chapter.
7. Connect the power cord and plug it into the wall outlet and turn on the system.

☞ For more information on operating system-specific options, refer to your operating system and option documentation.



MLO-013753

**Figure 3-16. Installing an Expansion Module**

## Installing System Options

### The Operator Control Panel

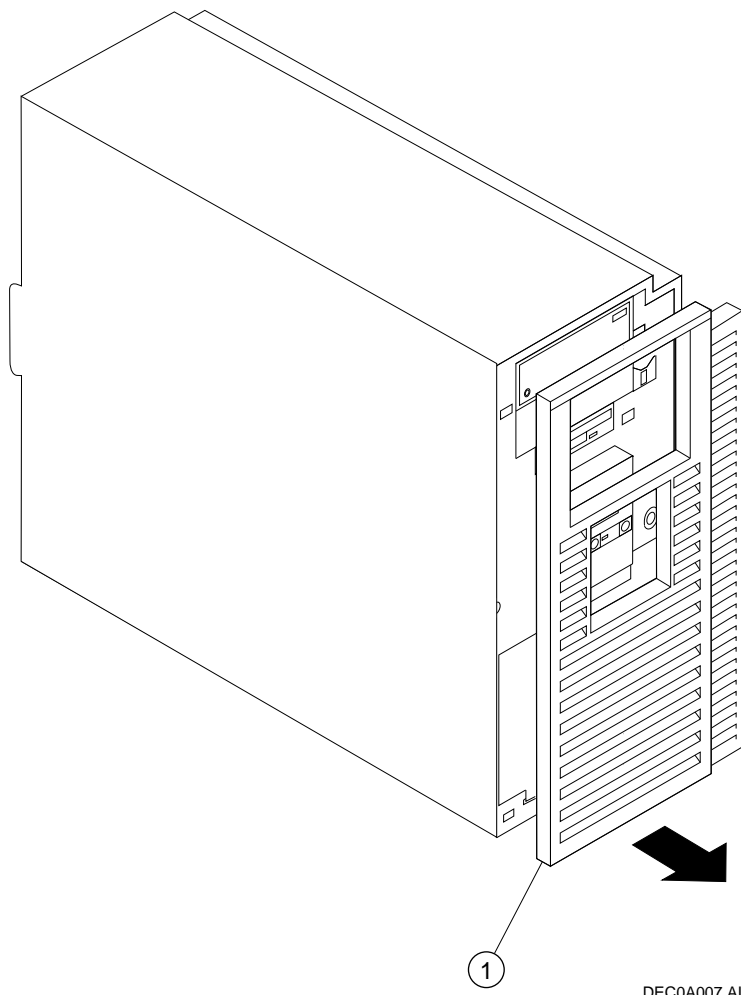
If you are either using a rack mount for the AlphaStation 600A Series system unit or positioning the system horizontally on a desk top, you may want to rotate the operator control panel (OCP) 90 degrees.

#### Rotating the OCP

To rotate the OCP, follow this procedure:

1. Turn off your system and unplug the power cord from the wall outlet.
2. Remove the front bezel ①, as shown in Figure 3-17.

## Installing System Options

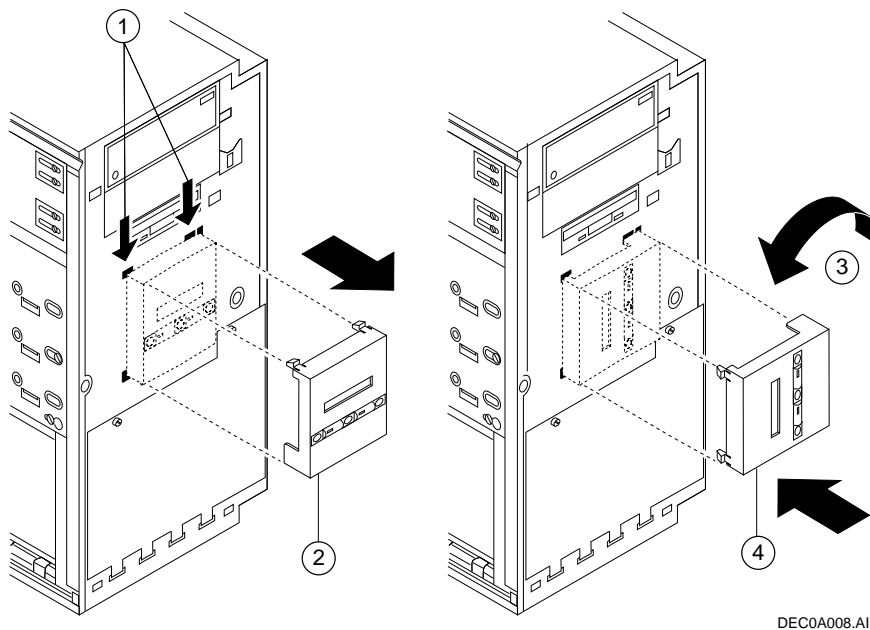


DEC0A007.AI

**Figure 3-17. Removing the Front Bezel**

3. Remove the OCP ② by pressing down ①, as shown in Figure 3-18; rotate the OCP ③ to the left 90 degrees ④.

## Installing System Options



DEC0A008.AI

**Figure 3-18. Rotating the OCP**


4. Reinsert the OCP.
5. Replace the front bezel.
6. Connect the power cord and plug it into the wall.

# 4

## Troubleshooting

### Introduction

This chapter describes initial and general troubleshooting as well as the error beep codes.

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

---

#### NOTE

---

If you need to return a failed component, pack it in its original container and return it to Digital Equipment Corporation or to your service provider.

---

## Troubleshooting

### General Troubleshooting

Before you begin troubleshooting your system, consult your service agreement to determine how much troubleshooting and repair you should undertake yourself.

- If you plan to maintain the system yourself, use the information in this guide to help identify and resolve the problem.
- If you have a service agreement with a service provider, contact your representative for assistance.

### Initial Troubleshooting

To troubleshoot your AlphaStation 600A Series system initially, follow this procedure:

1. Check that the power indicator is on.
2. Check the power indicator on the monitor.
3. Make sure that all cables and connections are secure.
4. Press the Halt/Reset button. If your system fails to boot, turn it off, wait 20 seconds, and turn it back on.
5. Contact your Digital service representative or service provider for software- or hardware-related problems by calling 1-800-DIGITAL.

Table 4-1 lists possible problems and the relevant sections in this chapter.



## Troubleshooting

**Table 4-1 Determining Where to Look**

<b>Task or Problem</b>	<b>Relevant Section</b>
To confirm that EISA cards or memory modules are properly configured.	Option Card Problems
To run a diagnostic test of the whole system, show its status, or terminate the testing.	System Diagnostics
No startup display appears when you turn on the system.	System Diagnostics (Error Beep Codes) System Troubleshooting Power Problems Console Problems Problems Detected by the Operating System
Startup tests do not complete.	Console Problems
The system cannot boot the operating system.	Boot Problems System Diagnostics System Troubleshooting
The operating system reports errors, is hung, or crashes.	Problems Detected by the Operating System
The system cannot access a mass storage device. Storage devices are missing from the <code>show device</code> display.	Storage Problems
The system indicates network problems, an EISA card is not configured, or a PCI card is unseen by the system.	Option Card Problems
The monitor or the terminal are not working.	Monitor and Terminal Problems
The keyboard and mouse are not working.	Keyboard and Mouse Problems
The system repeatedly shuts down after 10 seconds.	Overheating Problems
System does not see or cannot access RAID drives.	RAID Device Problems
The FlashROM is corrupted, and the system cannot access console mode.	Using the Fail-Safe Loader

## Troubleshooting

Table 4-2 lists how to identify and solve general problems that could occur with your system.

**Table 4-2. System Troubleshooting**

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Power indicator not on.	System is not plugged in.  No power at the wall outlet.  Power supply failure.  Internal power supply cables not reconnected after installing options.  Removable side panel not installed properly.	Turn off the system, plug it in, and then turn it back on again.  Use another wall outlet.  Contact your service representative.  Reconnect cables.  Reinstall removable side panel.
Power is on, but there is no screen display.	Brightness and contrast controls are not correctly set.  Monitor is off.  Monitor cable or power cord is incorrectly installed.  Configuration error. SRM console may be set incorrectly to "Serial."  Monitor is defective.  Defective video controller module.	Adjust the brightness and contrast controls.  Turn on the monitor.  Check all monitor connections.  Set the SRM console to "Graphics." Refer to the video module documentation for more information.  Try another monitor.  Replace the video module.

## Troubleshooting

**Table 4-2. System Troubleshooting (continued)**

Problem	Possible Cause	Action
System does not boot	Operating system software is not installed on the hard disk drive.	Install the appropriate operating system.
	System cannot find the boot device.	<p>Check the system configuration for correct device parameters.</p> <p><b>Digital UNIX and OpenVMS Alpha:</b> Use the SRM <b>show config</b> and <b>show device</b> commands. (Refer to Chapter 5, “Console Subsystems.”) Use gathered information to identify target devices for the <b>boot</b> command and verify that the system acknowledges all installed devices.</p> <p><b>Windows NT:</b> Use the AlphaBIOS console to display the available boot devices. First, from the Boot menu select <b>AlphaBIOS Setup menu...</b>; then select <b>Display System Configuration</b>. Verify that the target boot device is listed.</p>
	Environment variables incorrectly set.	<p>Check and set the environment variables, if necessary.</p> <p><b>Digital UNIX and OpenVMS Alpha:</b> Use the SRM console <b>show envar</b> and <b>set envar</b> commands to check and set the values assigned to boot-related variables such as <i>auto_action</i>, <i>bootdef_dev</i>, and <i>boot_osflag</i>. (Refer to Chapter 5, “Console Subsystems.”)</p>

## Troubleshooting

**Table 4-2. System Troubleshooting (continued)**

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
System does not boot. (continued)	Hard disk drive is not correctly formatted, or the requested partition does not exist.	Format the hard disk drive or correctly partition the hard disk drive using the supplied software.
	There is no software on the requested partition.	Install software on the requested partition.
Target boot device not listed in <b>show device</b> , <b>show config</b> (SRM), or <b>Display System Configuration</b> (AlphaBIOS)	Loose cables.	Secure all cable connections.
	SCSI drive jumpers incorrectly set.	Check all SCSI devices for incorrect or conflicting IDs. Refer to the hard disk drive documentation.
No response to keyboard commands	SCSI bus termination incorrectly set.	Check that the SCSI bus is properly terminated. Refer to Chapter 3 for more information.
	Keyboard is password-protected.	Enter the keyboard password, if supported by your operating system.
	Keyboard is not connected.	Connect the keyboard to the keyboard port. <sup>3</sup>
	Keyboard is connected to the mouse port.	Connect the keyboard to the keyboard port. <sup>1</sup>

---

<sup>3</sup>Turn the system off before connecting the keyboard.

**Table 4-2. System Troubleshooting (continued)**

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
No response to mouse commands	Mouse is not connected.	Connect the mouse. <sup>4</sup>
	Mouse is connected to the keyboard port.	Connect the mouse to the mouse port. <sup>2</sup>
	Mouse driver not installed.	Install the appropriate mouse driver. Refer to your application software documentation.
	Mouse ball sticking.	Clean the mouse. Refer to Appendix B, System Care, for information on cleaning the mouse.

### Interpreting Error Beep Codes

Table 4-3 describes error beep codes that you may encounter while using your system. For example, if the SROM (serial read only memory) code could not find any good memory, you would hear a 1-3-3 beep code (one beep, a pause, a burst of three beeps, a pause, and another burst of three beeps).

**Table 4-3. Error Beep Codes**

<b>Beep Code</b>	<b>Meaning</b>	<b>Action</b>
1 at system start-up	System start-up is successful.	None.
1-2-4	Backup cache error	Call your service representative
1-1-2	A ROM data path error was detected while loading AlphaBIOS/SRM console code.	Refer to the section, "Using the Fail-Safe Loader."
1-1-4	The SROM code could not read the flashROM headers, or there was a checksum failure.	Refer to the section, "Using the Fail-Safe Loader."
1-2-1	TOY NVRAM failure.	Call your service representative.

---

<sup>4</sup>Turn the system off before connecting the mouse.

## Troubleshooting

**Table 4-3 Error Beep Codes (continued)**

Beep Code	Meaning	Action
1-3-3	The SROM code could not find at least 16 MB of good memory, or there was no memory available.	Verify that the memory modules are properly seated. Replace faulty memory modules. If replacement does not solve the problem, call your service representative.
3-1-2	The J1 jumper on the CPU card was set incorrectly or the on-board SCSI controller failed.	Check that the J1 jumper is set at bank 1. (See Figure 9-7.) If the jumper is not the problem, call your service representative.
3-3-1	Generic system failure.	Call your service representative.
3-3-2	The J1 jumper on the CPU card was set incorrectly or the PCI-to-PCI controller failed.	Check that the J1 jumper is set at bank 1. (See Figure 9-7.) If the jumper is not the problem, call your service representative.
3-3-3	Internal Qlogic controller failure.	Call your service representative.

### Reading the Console Event Log

The system maintains a console event log consisting of status messages received during startup testing. If problems occur during startup, standard error messages may be embedded in the console event log. To display the console event log, use the `cat e1` command. Or, to display the log screen by screen, use the `more e1` command.

### The test Command

The `test` command runs firmware diagnostics for the entire core system. The command runs one pass of the tests, and fatal errors are reported to the console terminal. To run tests concurrently and indefinitely, use the `sys_exer` command.

The `cat e1` command should be used in conjunction with the `test` command to examine test/error information reported to the console event log.

## Troubleshooting

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### NOTE

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By default, no write tests are performed on disk and tape drives. Media must be installed to test the floppy drive and tape drives. A loopback connector is required for the COM2 port (9-pin loopback connector, 12-27351-01).

The `test` command does not test the DNSES, TGA card, reflective memory option, nor third-party options. When using the `test` command after shutting down an operating system, you must initialize the system to a quiescent state.

Enter the following commands at the SRM console:

```
>>> set auto_action halt
>>> init
...
>>> test
```

After testing is complete, set the `auto_action` environment variable to its previous value (usually, `boot`) and use the Reset button reset the system.

---

The test script is made up of several exercisers that test devices in the following order:

1. Console loopback tests if the `lb` argument is specified: COM2 serial port and parallel port.

---

### NOTE

---

A serial loopback connector (12-27351-01) must be installed on the COM2 serial port if the `lb` argument is specified.

---

2. Network external loopback tests for E\*A0. This test requires that the Ethernet port be terminated or connected to a live network; otherwise, the test will fail.
3. Memory tests (one pass).
4. Read-only tests: DK\* disks, DR\* disks, DU\* disks, kMK\* tapes, DV\* diskettes.
5. VGA console tests. These tests are run only if the console environment variable is set to "serial." The VGA console test displays rows of the word "digital."

*Synopsis:*

```
test [lb]
```

*Argument:*

- [ lb ]     The loopback option includes console loopback tests for the COM2 serial port and the parallel port during the test sequence.

## Troubleshooting

In Example 4-1, the system tests complete successfully after one pass of the diagnostics.

### Example 4-1 The test Command

```
>>> test
Testing the Memory
Testing the DK* Disks (read only)
No DU* Disks available for testing
No DR* Disks available for testing
No MK* Tapes available for testing
No MU* Tapes available for testing
Testing the DV* Floppy Disks (read only)
Testing the VGA (Alphanumeric Mode only)
Test the EWA0 Network
Testing the EWB0 Network
>>>
```

### The sys\_exer Command

The `sys_exer` command runs firmware diagnostics for the entire core system. This command runs the same tests that are run by the `test` command, but `sys_exer` runs them concurrently and in the background. Nothing is displayed unless an error occurs. Example 4-2 shows a sample of the `sys_exer` display.

---

#### NOTE

---

The diagnostics started by the `sys_exer` command require extra memory resources. The `init` command must be used to reconfigure memory before booting and operating the system.

---

Because the `sys_exer` tests are run concurrently and indefinitely (until you stop them with the `init` command), they are useful in diagnosing intermittent hardware problems.

---

#### NOTE

---

By default, no write tests are performed on disk and tape drives. Media must be installed to test the diskette drive and tape drives. Certain memory errors reported by the OCP may not be reported by the ROM-based diagnostics. Always check the power-up diagnostic display before running diagnostic commands.

---



## Troubleshooting

### *Synopsis:*

sys\_exer [lb]

### *Arguments:*

[lb]           The loopback option includes console loopback tests for the COM2 serial port and the parallel port during the test sequence.

>>>

### **Example 4-2. The sys\_exer Command**

```
>>> sys_exer
Default zone extended at the expense of memzone.
Use INIT before booting
Exercising the Memory
Exercising the DK* Disks {read only}
Exercising the Floppy (read only)
Testing the VGA (Alphanumeric Node only)
Exercising the EWA0 Network
Exercising the EWBO Network

Type "init" in order to boot the operating system
Type "show_status" to display testing progress
Type "cat el" to redisplay recent errors
```

### **The show\_status Command**

The show\_status command reports one line of information per executing diagnostic. Many of the diagnostic tests are run in the background and provide information only if an error occurs. Use the show\_status command to display the progress of the diagnostics. The show\_status display is shown in Example 4-3.

## Troubleshooting

### Example 4-3. The show\_status Command

```
>>> show_status
```

ID	Program	Device	Pass	Hard/Soft	Bytes Written	Bytes Read
00000001	idle	system	0	0 0	0	0
0000550b	memtest	memory	193	0 0	7243563008	7243563008
00005514	memtest	memory	192	0 0	7222591488	7222591488
0000551d	exer_kid	dka100.1.0.2	0	0 0	0	2461184
0000551e	exer_kid	dka400.4.0.2	0	0 0	0	2460672
00005533	exer_kid	dva0.0.0.100	0	0 0	0	2311168
00005608	nettest	ewa0.0.0.200	1131	0 2	12160512	12159632
00005746	nettest	ewb0.0.0.13	1127	0 2	12116624	12115280

```
>>> init
ff.fe.fd.fc.fb.fa.f9.f8.f7.f6.f5.ef.df.ee.f4.
.
.
.
>>>
```

## Power Problems

Table 4-4 describes how to troubleshoot the system when there is no power at the system enclosure.

**Table 4-4. Troubleshooting Power Problems**

Symptom	Action
No AC power	<p>Check the power source and power cord.</p> <p>Check that the system cover is properly secured. An interlocking sensor switch shuts off power to the system if the cover is removed.</p> <p>If there are two power supplies, make sure that both power supplies are plugged in.</p>
AC power is present, but system does not power on.	<p>Check the On/Off switch on the operator control panel.</p> <p>Check that the ambient room temperature is within environmental specifications (10–40°C, 50–140°F).</p> <p>Check that cable connectors on the system board are properly connected.</p> <p>Check that the internal power supply cables are plugged in at the right place on both the power supply and system backplane.</p>
Power supply shuts down after approximately 10 seconds (fan failure).	<p>Using a flashlight, look through the front to determine if the fan is spinning at startup. If it does not spin, check the power supply.</p>

## Troubleshooting

### Console Problems

Table 4-5 describes how to troubleshoot the system when, at startup, the console terminal does not display the startup screen, or the startup screen displays error messages.

**Table 4-5. Troubleshooting Console Problems**

Symptom	Action
Startup screen is not displayed.	<p>Refer to the table "Error Beep Codes" to interpret the startup beep codes.</p> <p>Check that keyboard and monitor are connected and functioning properly. Check that power is on.</p> <p>If the startup screen is not displayed, yet the system enters console mode when you press the Return key, check that the <code>console</code> environment variable is set correctly. If you are using a VGA console terminal, the variable should be set to "graphics." If you are using a serial terminal, the variable should be set to "serial."</p> <p>Try connecting a console terminal to the COM1 serial communication port. If necessary use a 9-pin connector. Check baud rate setting for console terminal and system. The system baud rate setting is 9600. When using the COM1 serial port, set the <code>console</code> environment variable to "serial."</p> <p>If you have verified that there are no monitor, terminal or keyboard problems, the problem may be with the firmware. Refer to the section, "Using the Fail-Safe Loader."</p>
Startup screen displays error messages.	<p>If startup screens or the console event log indicate problems with mass storage devices, or if storage devices are missing from the <code>show config</code> display, use the troubleshooting tables in the section, "Storage Problems" to determine the problem.</p> <p>If startup screens or the console event log indicate problems with EISA or PCI devices, or if EISA or PCI devices are missing from the <code>show config</code> display, use the troubleshooting table in the section, "Option Card Problems" to determine the problem.</p>

## Boot Problems

Table 4-6 describes how to troubleshoot problems that occur while the system is booting operating system software.

**Table 4-6. Troubleshooting Boot Problems**

Symptom	Action
The system cannot find the boot device.	<p>Verify that your system recognizes the boot device, using the <code>show device</code> command.</p> <p>Check that the boot device environment variable correctly identifies the boot device:</p> <p>Digital UNIX and OpenVMS Alpha: use the <code>show bootdef_dev</code> command to display the boot device.</p> <p>Windows NT: Check system configuration for the correct environment variable settings:</p> <p>For Digital UNIX and OpenVMS, examine the <code>auto_action</code>, <code>bootdef_dev</code>, <code>boot_osflags</code>, and <code>os_type</code> environment variables. Make sure that the <code>bus_probe_algorithm</code> environment variable is set to "new."</p> <p>For problems booting over a network, check the <code>ew*0_protocols</code> or <code>er*0_protocols</code> environment variable settings: Systems booting from a Digital UNIX server should be set to <code>bootp</code>; systems booting from an Open VMS server should be set to <code>mop</code>.</p> <p>For Windows NT, examine the <code>FWSEARCHPATH</code>, <code>AUTOLOAD</code>, and <code>COUNTDOWN</code> environment variables.</p>
System does not boot.	<p>Check that the Halt switch is set to the "off" position.</p> <p>Verify that you have not installed an unsupported graphics module or another type of unsupported adapter.</p> <p>For problems booting over a network, check the <code>ew*0_protocols</code> or <code>er*0_protocols</code> environment variable settings: Systems booting from a Digital UNIX server should be set to <code>bootp</code>; systems booting from an OpenVMS Alpha server should be set to <code>mop</code>.</p> <p>Run the <code>test</code> command to check that the boot device is operating. See the table in the section, "Console Problems."</p>
There is a software problem or the operating system is not installed correctly.	<p>Refer to your operating system software information.</p> <p>Verify that you have the correct firmware revision for your system</p>

## Troubleshooting

### Problems Detected by the Operating System

Table 4-7 describes possible operating system problems and their solutions.

**Table 4-7. Troubleshooting Problems Detected by the Operating System**

Symptom	Action
System is hung or has crashed.	Examine the crash dump file. Refer to the <i>OpenVMS Alpha System Dump Analyzer Utility Manual</i> (AA-PV6UB-TE) for information on how to interpret OpenVMS Alpha crash dump files. Refer to the <i>Guide to Kernel Debugging</i> (AA-PS2TD-TE) for information on using the Digital UNIX Crash Utility.
No startup display.	The console environment is set to "serial;" thus, the startup screen is routed to the COM1 serial communication port and cannot be viewed from the VGA monitor. If you are using a VGA monitor, set the console environment variable to "graphics." (Use the <code>set console graphics</code> command). See "Troubleshooting Console Problems."
Errors have been logged, and the operating system is up.	Have your service provider examine the operating system error log files to isolate the problem. If the problem occurs intermittently, have your service provider run an operating system exerciser, such as DEC VET, to stress the system. Refer to the <i>DEC Verifier and Exerciser Tool User's Guide</i> (AA-PTTMD-TE) for instructions on running DEC VET.

### Storage Problems

Mass storage device problems at startup are usually indicated by read fail messages or by the omission of storage devices from the `show config` display. Table 4-8, Table 4-9, and Table 4-12 list troubleshooting suggestions.

## Troubleshooting

**Table 4-8. Troubleshooting Fixed-Media Problems**

Symptom	Problem	Action
Fault indicator light for drive is on (amber).	Drive has failed.	Replace drive.
Drives are missing from the <code>show config</code> display.  Drives appear intermittently in <code>show config</code> display.	Duplicate SCSI IDs (when removable-media bus is extended to StorageWorks shelf).  SCSI bus length limit exceeded.	Correct removable-media SCSI device IDs. May need to reconfigure internal StorageWorks backplane.  Check cabling.
Valid drives are missing from the <code>show config</code> display.  One drive may appear seven times on the configuration screen display.	SCSI ID is set to 7 (reserved for host ID).  Duplicate host IDs on a shared bus.	Correct SCSI IDs.  Change host ID through the <code>pk*0_host_id</code> environment variable (set <code>pk*0_host_id</code> ).  For systems using Windows NT, choose "Set default configuration" from the Setup menu to select the host ID.
You cannot access the software or data on the drive. (Hard disk drive cannot read or write information.)	The SCSI ID of the drive is not unique or the SCSI drive cables are connected incorrectly.  Incorrect disk drive jumper settings.  SCSI hard disk drive is not correctly formatted or partitioned  The SCSI drive is faulty.	If the device is not listed in the <code>show config</code> display, check the SCSI cabling and the drive's SCSI ID.  Refer to the disk drive installation instructions.  Format and partition as required using the supplied operating system.  Contact your service representative.
Activity indicators do not come on.	Missing or loose cables.	Remove device and inspect cable connections.
Drive is missing from the <code>show config</code> display.	Drive is not properly seated.	Reseat drive.

## Troubleshooting

Table 4-9 describes symptoms of hard disk problems, with possible causes and solutions.

**Table 4-9. Troubleshooting Hard Disk Error Messages**

<b>Error message</b>	<b>Possible Cause</b>	<b>Action</b>
“Internal error occurred”	Incompatible or failed disk cables.	Try another cable known to be good.
	Disk controller not configured.	Check your hard-disk controller documentation to see if you have to run a configuration utility to set up your hard-disk.
	Disk controller malfunction.	Test controller functioning using the controller’s diagnostic utility. If an error is found, contact your service representative for a replacement.
	Improper SCSI termination.	Check to see that terminating resistor packs are removed from all drives except the controller itself and the last drive connected to it.
“No hard drives were found connected to your computer”	No hard disk installed.	Install hard disk.
	Cable not connected to either the disk or controller.	Check the cable connections to ensure that cable connectors are fully seated.
	No power to drive.	Check cable connections. If problem persists, try connecting the drive to a different power connector.
	Disk drive malfunction.	Replace the drive with one known to be good. If problem persists, hard drive is defective. Contact your service representative.



## Troubleshooting

### Troubleshooting Hard disk Error Messages (cont.)

Error message	Possible Cause	Action
“Perform an express disk setup?”	Hard disk 0 does not have any partitions defined.	Perform an express disk setup to automatically create default disk partition arrangement on hard disk 0.

**Table 4-10 Troubleshooting Removable-Media Problems**

Symptom	Problem	Action
Diskette drive cannot read or write information	Diskette is not formatted.	Format the diskette.
	Diskette is of wrong density.	Use diskette of proper density for your drive.
	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.
Drive fault indicator is on.	Drive failure.	Try the drive in a different slot to eliminate slot failure as the cause. If drive is faulty, replace the drive. If faulty slot is suspected, try a working drive in that slot. If it fails, check for conflicting SCSI IDs. If none, call service representative.
Valid drives are missing from the <code>show config</code> display.	Duplicate SCSI IDs.	Correct removable-media SCSI IDs.
Valid drives are missing from the <code>show config</code> display. One drive may appear seven times on the configuration display.	SCSI ID is set to 7 (reserved for host ID).	Correct SCSI IDs.

## Troubleshooting

**Table 4-11 Troubleshooting Removable-Media Problems (cont.)**

Symptom	Problem	Action
Valid drives are missing from the <code>show config</code> display. One drive may appear seven times on the configuration display.	Duplicate host IDs on a shared bus.	Change host ID using the <code>set pk*0_host_id</code> command.
Activity indicators do not come on. Drive missing from the <code>show config</code> display.	Faulty cable termination. Missing or loose cables.	Check cable termination. Remove device and inspect cable connections.
Activity indicators do not come on.	Cable length.	Check cable length: bus length must not exceed 3 meters.
Drive missing from the <code>show config</code> or <code>show device</code> display. Read/write errors in the console event log; storage adapter port failure.	Missing terminator.	Attach terminators as needed: internal SCSI terminator or external SCSI terminator.
Devices produce errors or device IDs are dropped.	Extra terminator.	Check that SCSI bus is terminated only at beginning and end. Remove unnecessary terminators.

## Option Card Problems

Option card problems can include problems related to network options, EISA bus options, and PCI options.

### Network Problems

Network problems can vary depending on the type of network option card that you have installed. See the option card documentation for information on troubleshooting network problems. Make sure you have correctly set the network type for the network interface card. See Chapter 6, "Configuring" for more information.

## EISA Bus Problems

EISA bus problems at startup are usually indicated by the following display during startup. Run the EISA Configuration Utility (ECU) if this message is displayed.

EISA Configuration Error. Run the EISA Configuration Utility.

Table 4-12 describes the steps for troubleshooting EISA problems.

**Table 4-12. Troubleshooting EISA Bus Problems**

Step	Action
1	Confirm that the option is supported, and confirm firmware and software versions.
2	Check that the EISA card and any cabling are properly seated.
3	Run the ECU to: <ul style="list-style-type: none"> <li>• Confirm that the system has been configured with the most recently installed controller.</li> <li>• Check the software setting for each EISA controller.</li> <li>• See if the ECU deactivated (&lt; &gt;) any controllers to prevent conflict.</li> <li>• See if any controllers are locked, which limits the ECU's ability to change resource assignments.</li> <li>• Ensure that IRQs are set correctly.</li> </ul>
4	Check for a bad slot by moving the last installed controller to a different slot.
5	Call the option manufacturer or your service representative for help.

## PCI Bus Problems

PCI bus problems at startup are usually indicated by the inability of the system to detect the PCI device. Use Table 4-13 to diagnose the likely cause of the problem.

### PCI Parity

Some PCI devices do not implement PCI parity, and some have a parity-generating scheme that may not comply with the PCI Specification. In such cases, the device functions properly as long as parity is not checked. The `pci_parity` environment variable for the SRM console has a default setting of OFF, so that false PCI parity errors do not result in machine check errors. The AlphaBIOS environment variable, `ENABLEPCIPARITYCHECKING`, also has a default setting of FALSE, so that parity is not checked unless you change the value to TRUE. When PCI parity is disabled, no parity checking is implemented for any PCI device, even those that produce correct, compliant parity.

## Troubleshooting

**Table 4-13. Troubleshooting PCI Bus Problems**

Step	Action
1	Confirm that the option is supported, and confirm firmware and software versions.
2	Confirm that the PCI module and any cabling are properly seated.
3	Check for a bad slot by moving the last installed controller to a different slot.
4	Call the option manufacturer or your service representative for help.

## Monitor and Terminal Problems

If the system starts up but has no startup display when you turn on the system, refer to Table 4-14.

**Table 4-14. Troubleshooting Monitor and Terminal Problems**

Possible Cause	Action
The monitor or terminal is not turned on.	Check that the monitor or terminal is turned on. Make sure that all cables are connected at both ends. Make sure there is power at the outlet.
The monitor or terminal brightness and contrast controls are incorrectly set.	Adjust the monitor or terminal contrast and brightness controls.
The monitor or terminal cable is not connected to the correct serial port.	Check the serial port to which the terminal cable is connected. Make sure that it is connected to the left-hand serial port (COM1). Straighten any bent connector pins and reconnect cable.
If you are using a console terminal, check the baud rate setting for the terminal and system. The system default baud rate setting is 9600.	Connect the console terminal to the COM1 serial communication port and set the console environment variable to serial ( <code>set console serial</code> command).
The power cord is not connected. The power cord may be faulty. The power cord socket may not be working.	Make sure that all the power cords are connected correctly at both ends. Try a power cord that works or test the power socket with an appliance that works.
Monitor may be defective or the wrong type.	Try another monitor.

## Troubleshooting

**Table 4-15. Troubleshooting Monitor and Terminal Problems**

Possible Cause	Action
The terminal or monitor fuse may have blown.	Replace the blown terminal or monitor fuse. Refer to the terminal or monitor documentation.
The port to which the terminal or monitor connects may not be the correct one.  The port to which the terminal or monitor connects may be faulty.	Ensure that your monitor cable is plugged into the correct graphics port if you have an optional graphics card installed. You should plug the cable into the connector of your option card, not the connector on the system board.  Try connecting the terminal or monitor to another system using the same terminal or monitor cable. If the terminal or monitor works, the port to which the terminal or monitor was connected is faulty. Contact your service representative.

## Keyboard and Mouse Problems

Table 4-16 lists problems that may occur with the keyboard or mouse.

**Table 4-16. Troubleshooting Keyboard and Mouse Problems**

Symptom	Possible Cause	Action
The monitor does not display the character that you type.	The keyboard cable is not connected correctly.  The keyboard has failed.	Make sure that the keyboard cable is connected correctly in the keyboard connector.  Replace the keyboard. If the problem persists, contact your Digital service representative.
The monitor displays a message indicating a keyboard error.	The keyboard is not connected correctly.	Make sure that the keyboard is connected to the keyboard port.
The mouse pointer is displayed on the monitor, but does not move correctly.	The mouse is connected incorrectly.  The mouse ball is dirty.	Make sure that the mouse cable is connected correctly in the mouse connector.  Remove the ball from the mouse and clean it in a lukewarm, mild-soap solution. Dry the ball and replace it in the mouse.

## Troubleshooting

**Table 4-17. Troubleshooting Keyboard and Mouse Problems (cont.)**

Symptom	Possible Cause	Action
The mouse pointer does not show on the monitor.	The mouse is connected incorrectly or the mouse cable is loose.	Make sure that the mouse cable is connected correctly in the mouse connector.
	The system is in console mode.	The mouse pointer is displayed only when the operating system is running. Boot the operating system.
	The mouse is faulty.	Replace the mouse.

## Printer Problems

Verify that the printer is correctly cabled to the system (see Figure 2-3 to verify the connection) and refer to the printer's documentation if necessary.

## Overheating Problems

Internal sensors monitor system and power supply temperature and shut down the system if maximum limits are exceeded. If the system shuts down unexpectedly:

- Ensure that the side panel is properly in place. Refer to "Left Side Panel" in Chapter 3 for information on removing and replacing the panel.
- Verify that the ambient temperature does not exceed the limits specified in Table 7-3, "System Environmental Specifications."
- Refer to Table 4-4, "Power Problems" to troubleshoot power supply problems and fan failure.

## RAID Device Problems

For systems that have the StorageWorks RAID Array 200 Subsystem installed, Table 4-18 describes symptoms of RAID device problems and offers solutions.

**Table 4-18 Troubleshooting RAID Device Problems**

Symptom	Action
Some RAID devices do not appear on the show device display.	Valid configured RAID logical drives will appear as DRA0-DRA <i>n</i> , not as DK <i>n</i> . Configure the drives by running the RCU, following the instructions in the <i>StorageWorks RAID Array 200 Subsystem Family Installation and Configuration Guide</i> , EK-SWRA2-IG. Several physical disks can be grouped as a single logical DRA <i>n</i> device. External SCSI terminators used with the SWXCR controller must be of type 12-41667-02 (narrow) or 12-41667-04 (wide).
Drives on the RAID subsystem start up with the amber fault indicator light on.	Whenever you move drives on or off the RAID controller, run the RCU to set up the drives and logical units. Follow the instructions in the installation and configuration guide.
Cannot access disks connected to the RAID subsystem on Microsoft Windows NT systems.	On Microsoft Windows NT systems, while running the ECU, verify that the controller is set to spin up two disks every six seconds. This is the default setting if you are using the default configuration files for the controller.

## Troubleshooting

### Using the Fail-Safe Loader

The fail-safe loader (FSL) allows you to boot an Update Utility diskette in an attempt to repair corrupted console files that reside within the FlashROMs on the system board. Use the FSL only when a failure at startup prevents you from accessing the console mode and you have checked the operator control panel for progress messages.

#### **Using the Update Utility**

To activate the fail-safe loader:

1. Turn off the system
2. Install the update utility diskette in the diskette drive.
3. Remove the left side panel (See "System Unit Components" in Chapter 3.)
4. Enable the fail-safe loader by moving the J1 jumper on the CPU card from the normal position (0) to the position nearest the system board (7). (See Chapter 7.)
5. Replace the left side panel.
6. Turn on the system, and check the operator control panel for progress messages. Respond "yes" to the update prompt.
7. After the update utility has completed, turn off the system.
8. Remove the side panel.
9. Disable the fail-safe loader and set the J1 jumper to the normal operating position.
10. Replace the side panel, and turn the system back on.
11. Check to make sure that the appropriate console prompt appears.



## Status and Error Codes

Table 4-19 shows SROM status and error codes you may encounter while using the AlphaStation 600A Series system.

**Table 4-19. SROM Status and Error Codes**

Status Code	Meaning
<b>Fatal Error Codes</b>	
FF	No s-cache bits set in sc_ctl register
FD	Floppy load error
FA	No usable memory detected
F9	System init failure
F8	PCI data path error
F7	CIA/PCEB I/O register init failure
F6	Bad CIA memory csr was detected
F4	Bcache data path error
F3	Bcache address line error
F1	Flash ROM data path read error
<b>Nonfatal Error Codes</b>	
EB	CPU speed error detected
EA	PCI-to-PCI data path error
E9	No real-time clock (TOY)
E6	EISA configuration NVRAM
E5	Main memory data path error
E4	Q-logic SCSI data path error
E3	Main memory address lines error
E2	Super I/O error
E1	Main memory cell test error
E0	Flash ROM checksum error

## Troubleshooting

**Table 4-16. SROM Status and Error Codes (continued)**

<b>Nonfatal Error Code</b>	<b>Meaning</b>
DF	SROM program beginning to initialize the EV5 CPU
DE	Initialize CPU and system interface
DD	Sizing CPU speed
DC	Sizing S-cache
DB	Initializing and testing the PCI bus
DA	Sizing B-cache
D9	Sizing memory
D8	Configuring memory
D7	Initializing B-cache
D6	Testing memory
D5	Testing B-cache bits
D4	Testing memory bits
D3	Testing B-cache address
D2	Testing memory address
D1	Testing B-cache cells
D0	Testing memory cells
CF	Initializing memory
CD	Loading Flash ROM code
CC	Re-initializing CPU and system interface
CB	SROM execution completed

## Equipment Log

For your convenience, Chapter 10 includes a form on which you may record all model numbers and serial numbers for your hardware components (system unit, monitor, keyboard, and mouse) and system hardware configuration information (CPU, memory size, drive size, ports, and so on).

# 5

## Console Subsystems

### Introduction

The AlphaStation 600A Series system contains two console subsystems:

The AlphaBIOS console supports the Microsoft Windows NT operating system.

The SRM (system reference manual) console supports the Digital UNIX and OpenVMS Alpha operating systems.

Each console subsystem contains special software, called firmware, that interacts directly with the hardware components and facilitates interaction between the system hardware and the operating system. The console firmware is used to initialize and set up the I/O system of the computer, which includes the PCI bus and connected devices such as SCSI disk controllers, the video display, the diskette drive, and the keyboard. The firmware resides in 1MB of flashROM on the system board and can be updated without removing and installing chips.

Users of the Windows NT operating system can use the information on the AlphaBIOS console to configure, start, update, and troubleshoot your Alpha system. Users of the OpenVMS Alpha and Digital UNIX operating systems need to use the AlphaBIOS interface only to run the EISA Configuration Utility (ECU), RAID Configuration Utility (RCU), or other option-specific configuration utilities. To switch from the SRM console to the AlphaBIOS console, type either of the following commands at the SRM prompt: `arc` or `ecu`. Either command accesses the AlphaBIOS Boot menu.

## Console Subsystems

### Using the AlphaBIOS Console

AlphaBIOS firmware provides a menu-based interface to the console subsystem that supports Windows NT running on hardware based on the Alpha processor. When an AlphaStation 600A Series system with Windows NT is turned on, a menu similar to the following displays after initialization:

### Using a Serial Line

AlphaBIOS can be run from the graphics console or from a serial line. If you use the serial line, refer to Table 5-1 for serial line equivalents to graphics line keyboard commands.

**Table 5-1. Serial Line Keyboard Commands**

Graphics Line Commands	Serial Line Commands
F1	CTRL +A
F2	CTRL +B
F3	CTRL +C
F4	CTRL +D
F5	CTRL +E
F6	CTRL +F
F7	CTRL +P
F8	CTRL +R
F9	CTRL +T
F10	CTRL +U
Insert	CTRL +V
Delete	CTRL +W
Backspace	CTRL +H
ESC	CTRL +[

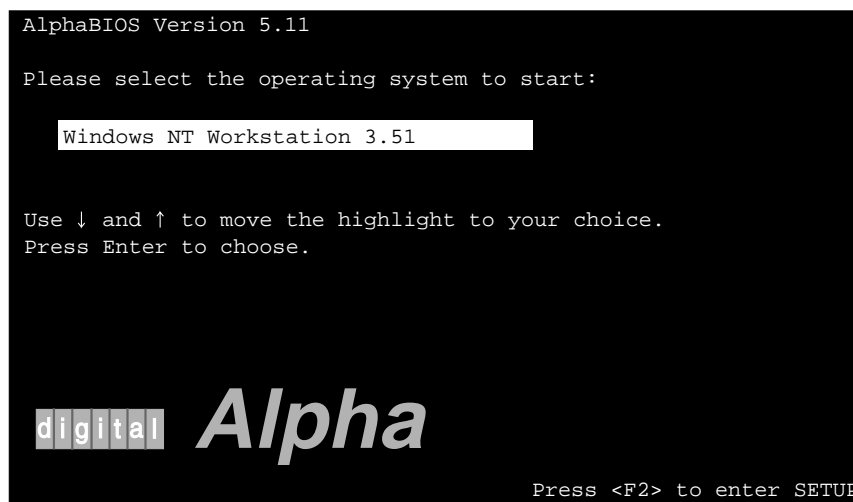
### Windows NT System Start-up

For systems using the Windows NT operating system, AlphaBIOS initializes the video and keyboard devices first. Thus, if AlphaBIOS does not start when you turn on your computer, check first to see that the keyboard is plugged in and working and that the video card and monitor are properly connected and working. After the video and keyboard are initialized, AlphaBIOS displays a windowed, graphical-style user interface (UI), where progress is displayed as initialization continues.

Next, a memory test verifies that the memory is fully functioning. While the memory test runs, it shows each megabyte (MB) of memory tested. If you do not want to test memory during initialization, you can disable the test while it is running by pressing the space bar, or use the CMOS Setup menu to disable it.

After memory is tested, AlphaBIOS detects and initializes SCSI disk controllers connected to the computer. As each controller is detected, AlphaBIOS probes its SCSI bus and reports each of the SCSI devices detected.

Finally, after the SCSI initialization is complete, AlphaBIOS leaves the initialization window and displays the Boot menu, shown in Figure 5-1. Whenever you turn on or reset your system, the Boot menu is displayed.



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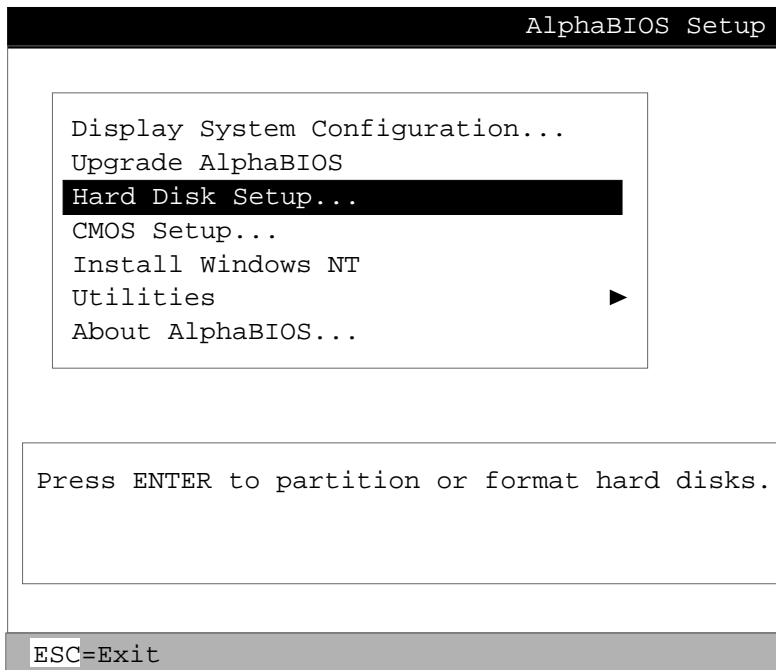
**Figure 5-1. The Boot Menu**

The Boot menu lists each of the operating systems that have been set up on your computer. From the boot menu, you can choose which of the operating systems you want to boot, or you can enter the AlphaBIOS Setup menu.

## Console Subsystems

### The Firmware Menus

By pressing F2 in the Boot menu, you can access the AlphaBIOS Setup menu, shown in Figure 5-2. From the Setup menu you can access other menus to perform the tasks listed in Table 5-2.



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**Figure 5-2. The AlphaBIOS Setup Menu**

**Table 5-2. Choosing the Right Menu**

Task	Menu
Enable the Auto Start option	CMOS Setup (Standard)
Set date and time	CMOS Setup (Standard)
Configure the diskette drive and keyboard	CMOS Setup (Standard)
Test memory at system start-up	CMOS Setup (Advanced)
Set PCI parity	CMOS Setup (Advanced)
Set password protection	CMOS Setup (Advanced)

**Table 5-3. Choosing the Right Menu (cont.)**

Select a console (AlphaBIOS or SRM)	CMOS Setup (Advanced)
Run a configuration utility	Utilities
Set up the hard disk	Hard Disk Setup
Display the system configuration	Display System Configuration
Upgrade the AlphaBIOS firmware	Upgrade AlphaBIOS
Verify and change operating system selections	Utilities

## Help in Navigating AlphaBIOS

Two levels of keyboard help are available for AlphaBIOS. To reach the first level, press F1 once from the CMOS Setup menu. This Help display, shown in Figure 5-3, provides explanations of the keystrokes available for the part of the AlphaBIOS interface currently displayed.

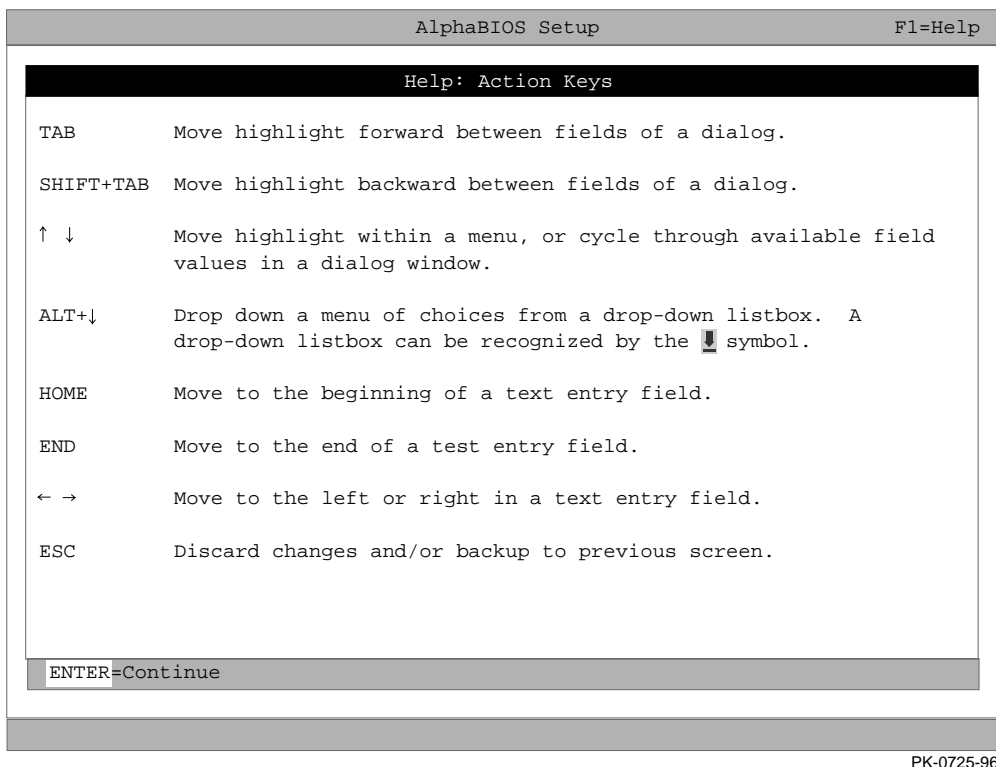
Help: CMOS Setup		F1=Key Help
F3	Change color scheme.	
F6	Enter Advanced CMOS Setup.	
F7	Set factory default CMOS settings.	
ESC	Exit CMOS Setup and discard any changes.	
F10	Exit CMOS Setup and save changes, including changes from Advanced CMOS Setup.	
ENTER=Continue		

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**Figure 5-3. First Level Help Display**

The second level of keyboard help, reached by pressing F1 twice from the CMOS Setup menu, shows explanations of the keystrokes available for navigating the interface throughout the AlphaBIOS firmware interface. Figure 5-4 shows an example of the second Help display.

## Console Subsystems



**Figure 5-4. Second Level Help Display**

## Primary Operating System and the Auto Start Option

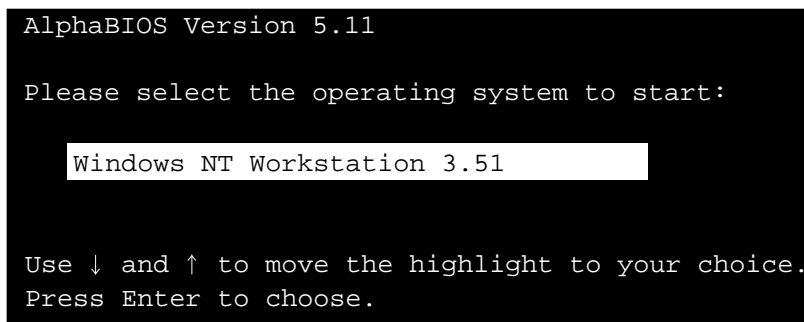
Alpha systems can have multiple versions of Windows NT installed at the same time. This feature is useful, for example, when testing application compatibility across different versions of Windows NT.

Each time you install a separate version of Windows NT, a new operating system selection is created. Although you can start any of the installed versions of Windows NT, one of the installed versions must be the primary operating system. The version you select as the primary operating system is the one that automatically starts if the Auto Start option is enabled in AlphaBIOS.

Figure 5-5 shows an example of a primary operating system selection as it appears in the Boot menu. Notice that the primary operating system is listed first on the boot display.



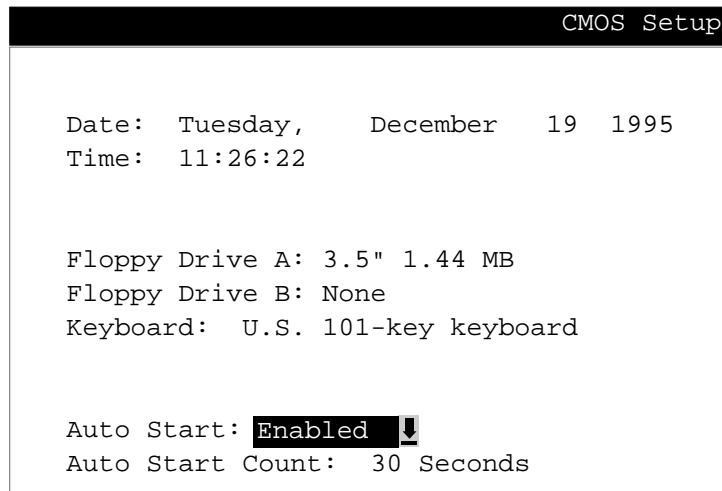
## Console Subsystems



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**Figure 5-5. Primary Operating System Selection**

The primary operating system starts automatically if the Auto Start option is enabled in the CMOS Setup menu, shown in Figure 5-6.

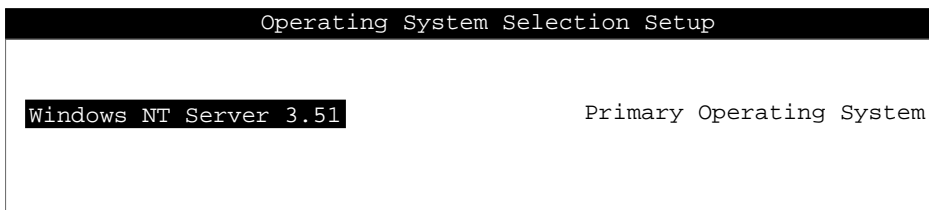


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**Figure 5-6. Auto Start Option Enabled**

## Console Subsystems

The primary operating system can be selected in the Operating System Selection Setup menu, shown in Figure 5-7. For information on preparing to install the operating system, see Chapter 9.



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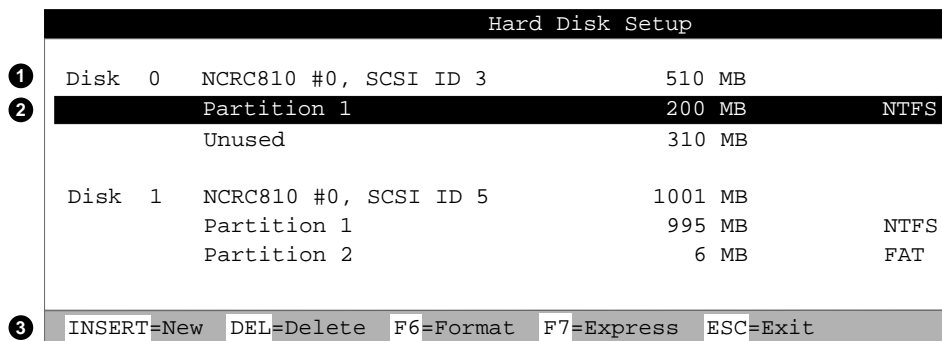
**Figure 5-7. Operating System Selection Menu**

## Manually Setting Up the Hard Disk

The Hard Disk Setup Menu allows you to set up the hard disk manually.

### CAUTION

Unlike other parts of AlphaBIOS setup, hard disk setup makes changes to your disk configuration as you enter them. Use care when changing your hard-disk arrangement, because unintended data loss can occur.



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**Figure 5-8. Hard Disk Setup Menu**

### 1. Disk ①

The Disk line describes the physical characteristics of the hard disk. This information is presented for informational purposes and is not selectable or editable.

## Console Subsystems

For detailed information on the fields presented on the Disk line, see the section “Hard Disk Configuration Menu,” later in this chapter.

### 2. Partitions ②

The Partition line(s) describes how space on the drive is allocated to logical drives.

Fields on the partition line include:

**Partition number.** Within a single drive, partition numbers are assigned in sequential order: 1, 2, 3, and so on. The partitions populate the drive from the innermost cylinders to the outermost cylinders. If you have a large hard disk (over 800 MB) and plan to use the FAT file system, it is a good idea to break the disk into several smaller partitions because the FAT file system uses disk space more efficiently at smaller partition sizes. This is not a concern for the NTFS file system, however, as it uses disk space very efficiently at all partition sizes.

**Partition size.** The partition size is the raw (unformatted) storage capacity of the partition. Actual storage space will differ based on the file system with which the partition is formatted.

**Partition format.** The file system (if any) used on a partition. This field will display FAT, NTFS, or unknown (if the partition is unformatted).

### 3. Disk Setup Options ③

**Insert partition.** Use this option to create new partitions. Before creating a new partition, be sure to select an unpartitioned space. Pressing the Insert key while an already-partitioned space is selected causes an informational error to be displayed.

**Delete partition.** Use this option to delete existing partitions. Before deleting a partition, make sure any data that you wish to save on the partition has been backed up. Deleting a partition deletes all data on the partition being deleted, but leaves the rest of the disk unaffected. Pressing the Delete key while an unpartitioned space is selected causes an informational error to be displayed.

**Format partition.** By pressing F6, you can use this option to format a partitioned space with the FAT file system.

**Express setup.** By pressing F7, you can use this option to create the default recommended partition arrangement for Windows NT on your system.

**Exit.** Press the Escape key to return to the AlphaBIOS Setup menu.

## Console Subsystems

### System Setup Tasks

The CMOS Setup menu is used for a variety of system settings and is divided into two modes, standard and advanced. Table 5-4 lists the tasks that can be performed in the two CMOS Setup modes:

**Table 5-4. CMOS Setup Tasks**

<b>Standard Mode</b>	<b>Advanced Mode</b>
Auto Start	Memory test at start-up
Date and time	PCI parity
Diskette configuration	Password protection
Keyboard configuration	Console selection

To enter standard CMOS setup mode:

1. From the AlphaBIOS Setup menu, select “CMOS Setup,” and press Enter.

To enter advanced CMOS setup mode:

1. From the AlphaBIOS Setup menu, select “CMOS Setup,” and press Enter.
2. In the CMOS Setup menu, press f6.

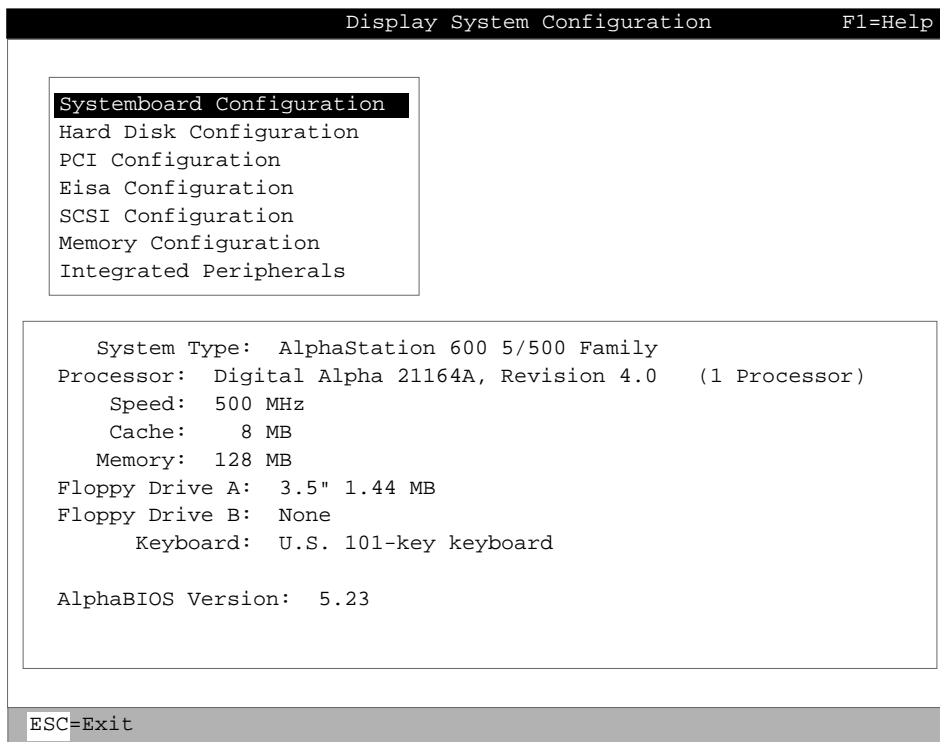
### Displaying Your System Configuration

You can use AlphaBIOS to display your system configuration in an easy-to-read format organized by category: system board, memory, hard disk, PCI options, SCSI devices, and peripherals.

To display your system configuration, follow these steps and refer to Figure 5-9.

1. From the AlphaBIOS Setup menu, select “Display System Configuration,” and press Enter.
2. In the Display System Configuration menu, use the arrow or Tab keys to select the configuration category you want to see.

## Console Subsystems



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**Figure 5-9. Display System Configuration Menu**

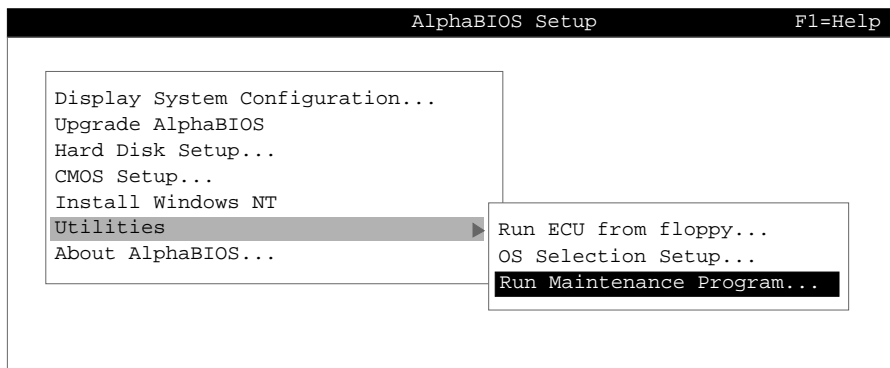
## Running a Configuration Utility

If you change your system configuration—for example, by adding a new EISA adapter or another RAID drive, you will have to run an EISA or RAID configuration utility. As you modify your system, you might be required to run other types of configuration utilities as well. Configuration utilities (also called maintenance programs) are run directly from the AlphaBIOS Utility menu.

**Users of OpenVMS Alpha or Digital UNIX:** Users of the OpenVMS Alpha and Digital UNIX operating systems need to switch from the SRM console to the AlphaBIOS console to run a configuration utility. To switch, type either of the following commands at the SRM console prompt: `arc` or `ecu`. This command will access the AlphaBIOS Boot menu. To access the Setup menu from the Boot menu, press F2.

► To run a configuration utility:

1. From the AlphaBIOS Setup menu, select “Utilities.” From the submenu that appears, select “Run Maintenance Program,” and press Enter. See Figure 5-10.

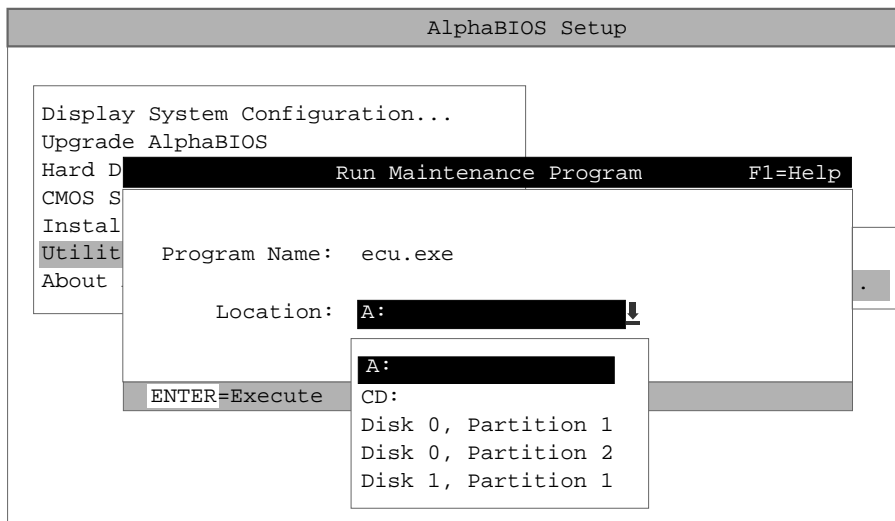


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**Figure 5-10. Select Run Maintenance Program**

2. In the Run Maintenance Program dialog box, type the name of the program to be run in the Program Name field. Then tab to the Location list box, and select the hard-disk partition, diskette, or CD-ROM drive from which to run the program.
3. Press Enter to execute the program. See Figure 5-11.

## Console Subsystems



PK-0730-96

**Figure 5-11. Execute Run Maintenance Program**

### NOTE

If you are running a utility from a diskette, you can simply type the utility's name into the Program Name field, and press Enter. The diskette drive is the default selection in the Location field. Use Alt+Down arrow when a list box is selected, to open the list..

## Using the EISA Configuration Utility

Whenever you add, remove, or move an EISA module in your AlphaStation 600A Series system, you need to run the EISA configuration utility (ECU). The ECU is a menu-based utility, run from the AlphaBIOS menu interface, that provides on-line help to guide you through the configuration process.

Each EISA module has a corresponding configuration file (CFG), which describes the characteristics and the system resources required for that option. The ECU uses the CFG to create a conflict-free configuration.

The ECU is supplied on a diskette that is shipped with your system. Make a copy of the ECU diskette, and keep the original in a safe place. Use the backup copy when you are configuring the system. The ECU diskette must have the volume label SYSTEMCFG.

## Console Subsystems

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### NOTE

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The CFG files supplied with the option you want to install may not work if the option is not supported on this system. Before you install an option, check that your system supports the option.

---

## Before You Run the ECU

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### CAUTION

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Make sure the system is turned off before you install options.

---

Before you run the ECU:

- 1 Refer to the documentation that comes with your option module to determine if it is an EISA option.
- 2 Install EISA options.
  -  For information about installing a specific option, refer to the documentation for that option.
- 3 Familiarize yourself with the utility.

You can find more information about the ECU by reading the ECU on-line help. To read the on-line help, start the ECU. On-line help for the ECU is located under Step 1, Important EISA Configuration Information.
- 4 Familiarize yourself with the configuration procedure for your system:
  - If you are installing, moving, or removing an EISA option, refer to the section on Configuring EISA Options in this appendix.
- 5 The ECU diskette is shipped in the accessories kit that accompanies your system. Make a copy of the diskette and keep the original in a safe place. Use the backup copy for configuring options.

## Configuring EISA Options

EISA options are recognized and configured automatically. To configure an EISA bus, follow these steps:



## Console Subsystems

1. Install, move, or remove the EISA option module.

Use the instructions provided with the EISA option.

2. Insert either the ECU diskette for Windows NT into the diskette drive, or the diskette for Digital UNIX or OpenVMS.
3. Refer to the section “Running a Configuration Utility,” earlier in this chapter.

The message loading AlphaBIOS firmware displays. There may be a 10- to 20-second delay in system activity while the system recognizes the ECU. When the firmware has finished loading, the ECU program is initialized.

If the ECU locates the required CFG configuration files, it displays the main menu. The CFG for the option may reside on a configuration diskette packaged with the option or may be included on the system configuration diskette.

---

### NOTE

---

It is not necessary to run Step 2 of the ECU, “Add or remove boards.” EISA modules are recognized and configured automatically.

---

4. Change settings or resources (*optional*).

This step is not required when you are using the board’s default settings.

The View or Edit Details ECU option is used to change user-selectable settings or to change the resources allocated for these functions (for example, IRQs, DMA channels, and I/O ports).

5. Save your configuration.

The Save and Exit ECU option saves your configuration information to the system’s nonvolatile memory.

6. Remove the ECU diskette from the drive, and restart the operating system.

## Setting Up Password Protection

Password protection provides two levels of security for your system: setup protection and startup protection. When system setup protection is enabled, a password is required to start AlphaBIOS Setup. When startup password protection is enabled, a password is required before the system initializes.

---

### CAUTION

---

Take care to remember your password. To clear the password requires replacement of a system board component.

---

Startup password protection provides more comprehensive protection than setup password protection because the system cannot be used at all until the correct password is entered.

**To enable password protection:**

1. From the AlphaBIOS Setup menu, select “CMOS Setup,” and press Enter.
2. In the CMOS Setup menu, press F6 to enter advanced CMOS setup mode.
3. In the Advanced CMOS Setup menu, shown in Figure 5-12, select “AlphaBIOS Password Option.”

## Console Subsystems



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**Figure 5-12. Advanced CMOS Setup Menu**

Use the arrow keys to select the type of protection you want. An explanatory dialog box appears. Read the dialog box and press Enter to continue.

4. Enter your password in the “Enter New Password” dialog box, then press Enter.
5. Enter your password in the “Confirm New Password” dialog box, then press Enter.
6. Press f10 to save your changes.

---

### CAUTION

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If you want to change your password, simply set up your password again.

---

## Console Subsystems

### **Index to the AlphaBIOS Menu Functions**

This section presents detailed explanations of the elements found in each of the AlphaBIOS menus. The following topics are covered:

- Hard Disk Setup Menu
- Operating System Selection Setup Menu
- Display System Configuration Menu
- Hard Disk Configuration Menu
- PCI Configuration Menu
- EISA Configuration Menu
- SCSI Configuration Menu
- Memory Configuration Menu
- Integrated Peripherals Menu
- Run Maintenance Program Menu
- CMOS Setup Menu
- Standard CMOS Setup Menu
- Advanced CMOS Setup Menu

## Hard Disk Setup Menu

This section details all of the information presented on the AlphaBIOS Hard Disk Setup menu. An example is shown in Figure 5-13.

Hard Disk Setup			
①	Disk 0	NCRC810 #0, SCSI ID 3	510 MB
②		Partition 1	200 MB NTFS
		Unused	310 MB
	Disk 1	NCRC810 #0, SCSI ID 5	1001 MB
		Partition 1	995 MB NTFS
		Partition 2	6 MB FAT
③	INSERT=New DEL=Delete F6=Format F7=Express ESC=Exit		

PK-0732-96

**Figure 5-13. Hard Disk Setup Menu**

### 1. Disk ①

The Disk line describes the physical characteristics of the hard disk. This information is presented for informational purposes and is not selectable or editable.

For detailed information on the fields presented on the Disk line, see the section “Hard Disk Configuration Menu,” later in this chapter.

### 2. Partitions ②

The Partition line(s) describes how space on the drive is allocated to logical drives.

Fields on the partition line include:

**Partition number.** Within a single drive, partition numbers are assigned in sequential order: 1, 2, 3, and so on. The partitions populate the drive from the innermost cylinders to the outermost cylinders. If you have a large hard disk (over 800 MB) and plan to use the FAT file system, it is a good idea to break the disk into several smaller partitions because the FAT file system uses disk space more efficiently at smaller partition sizes. This is not a concern for the NTFS file system, however, as it uses disk space very efficiently at all partition sizes.

## Console Subsystems

**Partition size.** The partition size is the raw (unformatted) storage capacity of the partition. Actual storage space will differ based on the file system with which the partition is formatted.

**Partition format.** The file system (if any) used on a partition. This field will display FAT, NTFS, or unknown (if the partition is unformatted).

### 3. Disk Setup Options

**Insert partition.** Use this option to create new partitions. Before creating a new partition, be sure to select an unpartitioned space. Pressing the Insert key while an already-partitioned space is selected causes an informational error to be displayed.

**Delete partition.** Use this option to delete existing partitions. Before deleting a partition, make sure any data that you wish to save on the partition has been backed up. Deleting a partition deletes all data on the partition being deleted, but leaves the rest of the disk unaffected. Pressing the Delete key while an unpartitioned space is selected causes an informational error to be displayed.

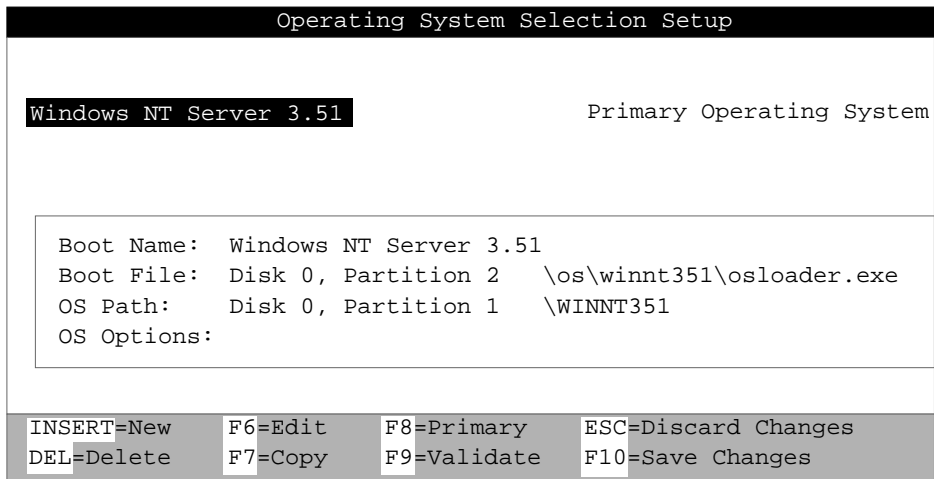
**Format partition.** By pressing F6, you can use this option to format a partitioned space with the FAT file system.

**Express setup.** By pressing F7, you can use this option to create the default recommended partition arrangement for Windows NT on your system. For more information on the recommended partition arrangement, see “Setting Up Your Hard Disk”.

**Exit.** Press the Escape key to return to the AlphaBIOS Setup menu.

## Operating System Selection Setup Menu

This section details the information presented on the AlphaBIOS Operation System Selection Setup Menu. An example is shown in Figure 5-2. The process of setting up your operating system selections is somewhat like using an editor. You can make all the changes you want to your operating system selections, and then either save your changes or exit without saving your changes.



PK-0737-96

**Figure 5-14. Operating System Selection Setup Menu**

### 1. Boot Name

Each boot name is associated with an operating system selection. Windows NT Setup automatically creates a boot name each time you install the operating system. Because the boot name is only a name, you can modify the boot name at any time without affecting the rest of the operating system selection. Note that the boot name must have at least one character.

### 2. Primary Operating System

The primary operating system is the OS that appears first on the AlphaBIOS boot menu. It is also the version of the OS that automatically starts if Auto Start is selected. You can make any of the operating system selections the primary operating system.

### 3. Boot File

The Boot File line describes the disk, partition, path, and name of the file that AlphaBIOS passes control to during the process of starting the operating system. This setting is created

## Console Subsystems

along with the operating system selection during Windows NT Setup, and it is usually not modified by the user. However, this setting can be modified if necessary. For example, a developer testing different versions of OSLOADER.EXE can store the different versions in different locations and modify this line to start the operating system with the different versions as needed.

During Operating System Selection Setup, the disk and partition for the location of the boot file can be selected from a list of choices presented in a list box. To open a list of values for the field, press the Alt and down arrow keys together. When you select a boot file location and name, AlphaBIOS searches for the specified program on the specified partition. If the search fails, a warning appears, saying that the file does not exist. You are given the choice to continue with the changes anyway or to cancel the operation and fix the problem.

Note that because the boot file must be located in a FAT partition, only FAT partitions are available as the boot partition within the list box.

### 4. OS Path

The OS Path line describes the disk, partition, and path to the operating system root directory for an operating system selection.

During Operating System Selection Setup, the disk and partition for the location of the boot file can be selected from a list of choices presented in a list box. To open a list of possible values for the field, press the Alt and down arrow keys at the same time. When you select or enter an OS path, AlphaBIOS searches for the directory. If the search fails, a warning appears, saying that the directory does not exist. You are given the choice to continue with the changes anyway or to cancel the operation and fix the problem.

### 5. OS Options

The OS Options line lists the startup parameters passed to the operating system for an operating system selection. One example of a startup parameter is whether to start the operating system in debug mode. By default, Windows NT does not add any entries to this field. This field can be modified.

### 6. OS Selection Setup Options

You can use the options listed at the bottom of the menu to edit operating system selections. When you edit an OS selection, the fields of the OS Selection are validated when you exit the OS selection setup menu. Depending on the option you choose, one of the following dialog boxes will appear.

**New OS Selection.** Pressing the Insert key displays the Insert New Operating System Selection dialog box, with default values for the new OS selection already filled in. You can change these values as necessary.



## Console Subsystems

**Delete OS Selection.** Pressing the Delete key tags the currently selected OS selection for deletion. Although the OS selection is removed from the menu, it is not actually deleted until you save your changes.

You can also delete all of your OS selections at once by pressing the Control and Delete keys at the same time while in the Operating System Selection Setup menu.

**Note:** If you delete all of your OS selections, a dialog box appears informing you that no OS selections exist and offering three options. You can create a new OS selection, exit without saving changes, or exit and save changes.

**Edit OS Selection.** You can edit all of the values of an OS selection by selecting the OS selection to edit and pressing F6. A dialog box appears with current information. You can then edit all of the OS selection fields.

**Copy OS Selection.** You can make it easy to create a new OS selection by using an existing OS selection as a template. To do this, select the OS selection you want to make a copy of and press F7 to make a copy of it. A dialog box appears with the values of the OS selection you selected. You can then edit all of the OS selection fields. Note that if you do not make any changes, a duplicate copy of the OS selection you copied is made.

**Validate OS Selection.** Pressing F9 in the Operating System Selection Setup menu allows you to validate the fields in the currently selected OS selection. The validation routine checks that the OS loader file and OS directory fields contain valid paths, and that the OSLOADER.EXE file exists in the directory specified. At the end of the validation, a dialog box appears describing the results of the validation. If there is an error in an OS selection, the validation routine displays a dialog box describing the component of the OS selection that is in error. At this point you can choose to edit the OS selection to correct the error, or delete the OS selection altogether.

You can also validate all of the OS selections at once by pressing the Control and F9 keys at the same time. All OS selections are validated in the order they are listed on menu.

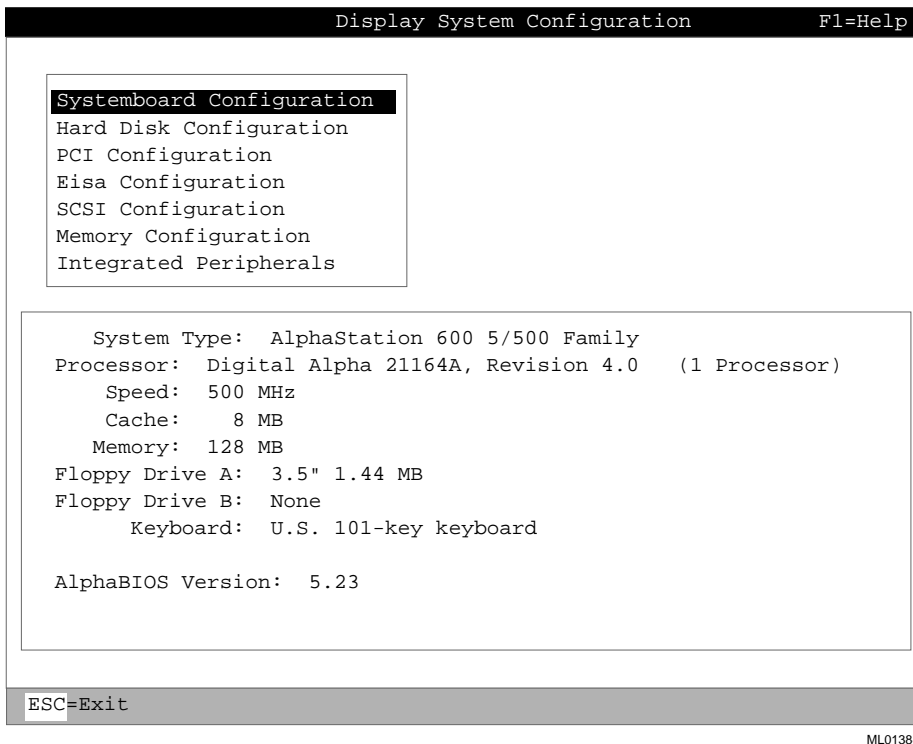
**Primary Operating System.** You can set any of the OS selections to be the primary operating system by selecting the OS selection and pressing F8. When you make an OS selection primary, it is displayed first on the Operating System Selection Setup menu and the text “Primary Operating System” appears next to the OS selection. In addition, the primary operating system is displayed first on the AlphaBIOS boot menu and is automatically started if Auto Start is enabled.

**Exit.** Pressing the Escape key returns you to the AlphaBIOS Setup menu.

## Console Subsystems

### Display System Configuration Menu

Information about the system board configuration is presented when you select “Systemboard Configuration” and press Enter. An example is shown in Figure 5-15.



**Figure 5-15. Display System Configuration Menu**

#### 1. System Type

The System Type field shows the system family to which the system board in your system belongs. Alpha system families are defined by the basic architecture of the system board. Individual system models within the family can have different processors, run at different speeds, have different options, etc.

#### 2. Processor

The Processor field shows the model and revision of processor installed on your system board—for example, 21064. Revision level information can be useful in troubleshooting problems with technical support personnel.

## Console Subsystems

### **3. Speed**

The Speed field shows the speed at which the processor runs internally.

### **4. Cache**

The Cache field shows the amount, in kilobytes, of static RAM cache memory installed. Cache memory is used to speed system performance by acting as an intermediary between the processor and the system's main memory, which uses slower dynamic RAM.

### **5. Memory**

The Memory field shows the amount, in megabytes, of main memory installed.

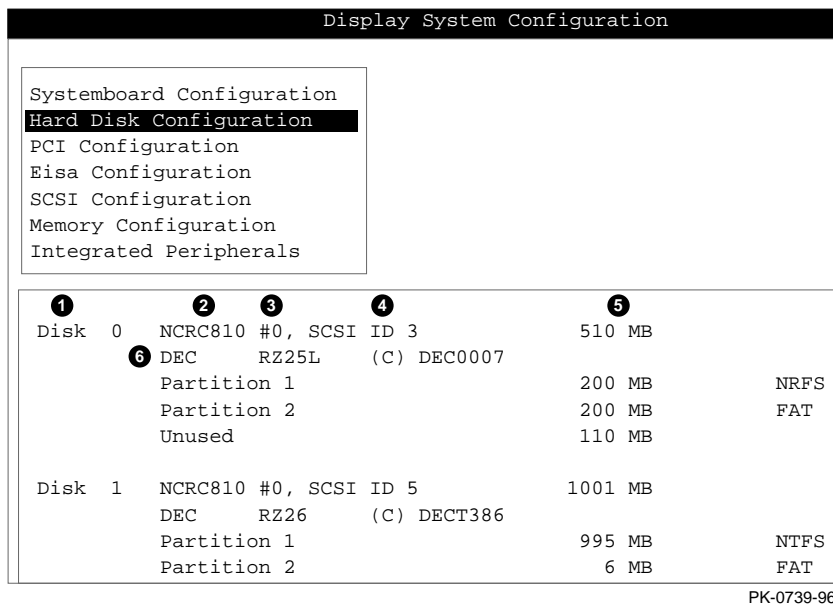
### **6. AlphaBIOS Version**

The AlphaBIOS Version field shows the version of AlphaBIOS currently running on your system. The AlphaBIOS Version field has three parts: the major version number, minor version number, and build date. The major version number signifies the overall level of the BIOS; that is, it represents major functionality. The minor version number signifies minor enhancements that have been made since the last major revision. The build date is the date and time the BIOS was compiled.

### **Hard Disk Configuration Menu**

Information about the hard disk configuration is presented when you select Hard Disk Configuration and press Enter. An example is shown in Figure 5-16.

## Console Subsystems



**Figure 5-16. Hard Disk Configuration Menu**

Fields in the hard disk configuration menu include:

❶ **Physical disk ID.** The physical disk ID is based on the SCSI ID. The disk with the lowest SCSI ID is disk 0; the disk with the next lowest SCSI ID is disk 1, and so on.

❷ **Controller.** The controller is the brand and model of SCSI chip used on the SCSI controller.

❸ **Controller number.** The controller number is based on how many SCSI controllers of a particular type are installed in the system. The first controller of a type is always numbered 0. For example, if two NCR 810 controllers and one QLogic controller existed in a system, they would be numbered as follows:

First NCR 810 = NCR810 #0, Second NCR 810 = NCR 810 #1, QLogic = QLogic #0

❹ **SCSI ID number.** The SCSI ID number is a unique number you assign to each SCSI device installed in the system. This is usually done via jumpers or a thumb wheel attached to the drive housing or by jumpers supplied on the StorageWorks backplane.

❺ **Size.** This is the raw capacity of the drive. Formatting the drive with different file systems—for example, FAT and NTFS—may result in different usable sizes because of the differences in how storage is managed under those file systems.

## Console Subsystems

⑥ **Drive manufacturer ID.** This line identifies the type of drive and the manufacturer, as well as the firmware revision of the drive.

### PCI Configuration Menu

Information about all the PCI devices in your system is presented when you select “PCI Configuration” and press Enter. An example is shown in Figure 5-17.

Device Name	Device Type	Revision	Physical Slot
Intel 82375 PCEB	EISA bridge	5	PCI0-Embedded
Digital 21040	Ethernet	35	PCI0-2
S3, DevID=8811	VGA	0	PCI0-4
NCRC810	SCSI	2	PCI0-5
NCRC810	SCSI	17	PCI1-Embedded

ENTER=Select    ESC=Exit

PK-0740-96

**Figure 5-17. PCI Configuration Menu**

#### 1. Device Name

This is the name and model of the device as recorded in the device’s firmware.

#### 2. Device Type

The device type lists the function of the device in the system.

#### 3. Physical Slot

The physical slot lists the actual PCI slot number to which the device is attached. Refer to your system manual for the physical location of PCI slots on your particular system board.

#### 4. Revision

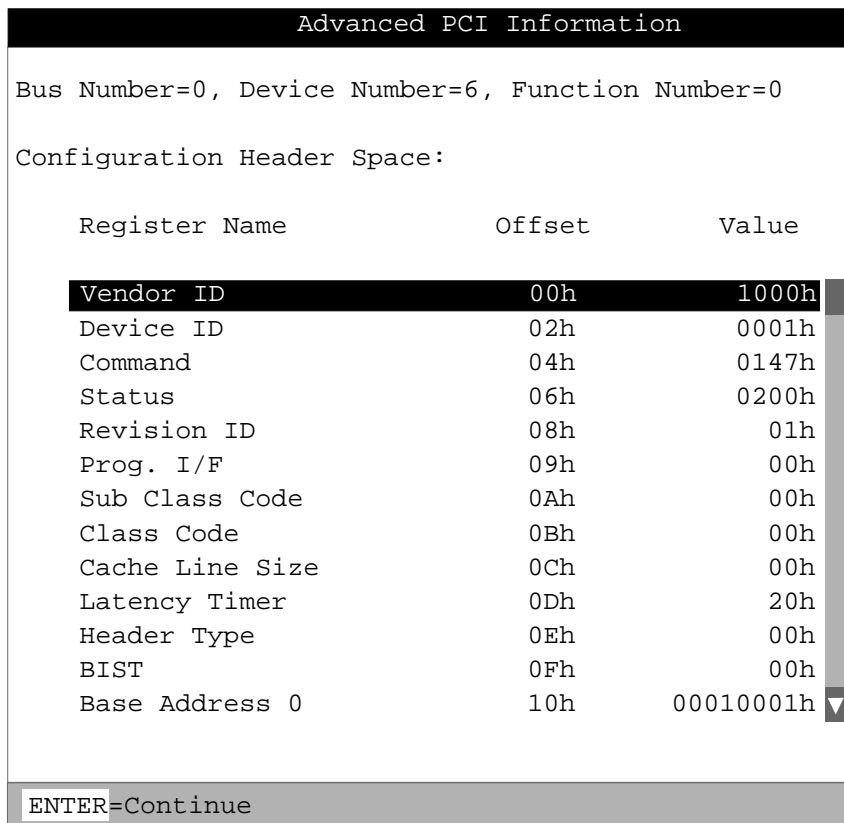
The revision level of the device signifies the number of times it has been updated by the manufacturer.

## Console Subsystems

### PCI Device Detail

You can also get additional detail about any of the PCI devices listed by following this procedure:

- ▶ To get additional detail about a PCI device
  1. Press Enter to allow selection in the device list.
  2. Select the device about which you want additional detail.
  3. Press Enter, and the detail is displayed, as shown in Figure 5-18.
  4. Press Escape to return to the table of PCI devices.



The screenshot shows a terminal window titled "Advanced PCI Information". It displays the following text:

```
Bus Number=0, Device Number=6, Function Number=0  
Configuration Header Space:
```

Register Name	Offset	Value
Vendor ID	00h	1000h
Device ID	02h	0001h
Command	04h	0147h
Status	06h	0200h
Revision ID	08h	01h
Prog. I/F	09h	00h
Sub Class Code	0Ah	00h
Class Code	0Bh	00h
Cache Line Size	0Ch	00h
Latency Timer	0Dh	20h
Header Type	0Eh	00h
BIST	0Fh	00h
Base Address 0	10h	00010001h

At the bottom of the screen, it says "ENTER=Continue".

PK-0741-96

**Figure 5-18. Advanced PCI Information Menu**

## Console Subsystems

### 1. Bus Number

The bus number is the virtual PCI bus number.

### 2. Function Number

The function number represents the number assigned to a particular function on a multifunction device. For example, a combination Ethernet/SCSI controller would be listed twice, with the first function listed as function 0 and the other function listed as function 1.

### 3. Device Number

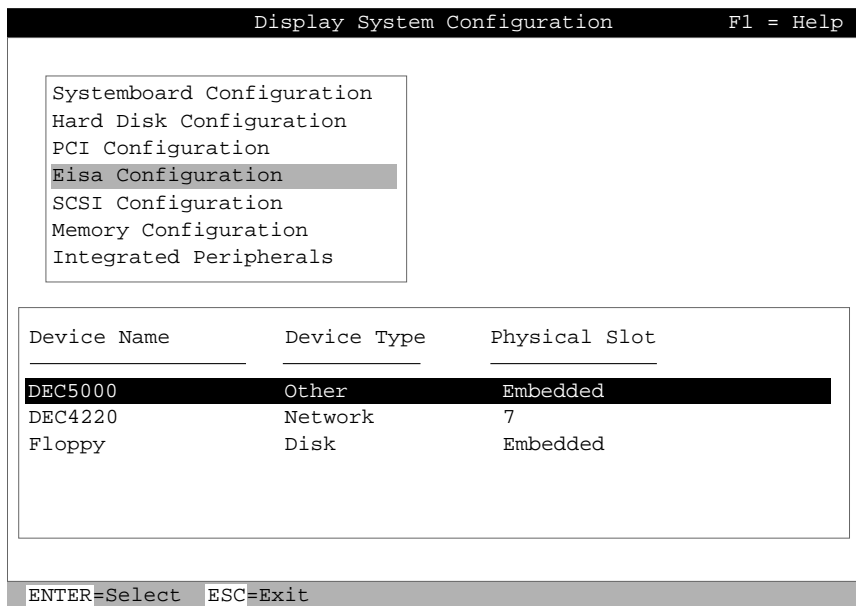
The device number is the PCI bus device number.

### 4. Configuration Header Space

The configuration header space displays the PCI configuration space information for the selected device. This information is supplied for system engineers.

### EISA Configuration Menu

Information about all the EISA devices in your system is presented when you select “Eisa Configuration” and press Enter. An example is shown in Figure 5-19.



The screenshot shows a terminal window titled "Display System Configuration" with a "F1 = Help" prompt. A menu box contains the following options: Systemboard Configuration, Hard Disk Configuration, PCI Configuration, Eisa Configuration (highlighted), SCSI Configuration, Memory Configuration, and Integrated Peripherals. Below this is a table of EISA devices:

Device Name	Device Type	Physical Slot
DEC5000	Other	Embedded
DEC4220	Network	7
Floppy	Disk	Embedded

At the bottom of the window, it says "ENTER=Select" and "ESC=Exit".

PK-0751-96

Figure 5-19. EISA Configuration Menu

## Console Subsystems

### 1. Device Name

This is the name and model of the device as recorded in the device's firmware.

### 2. Device Type

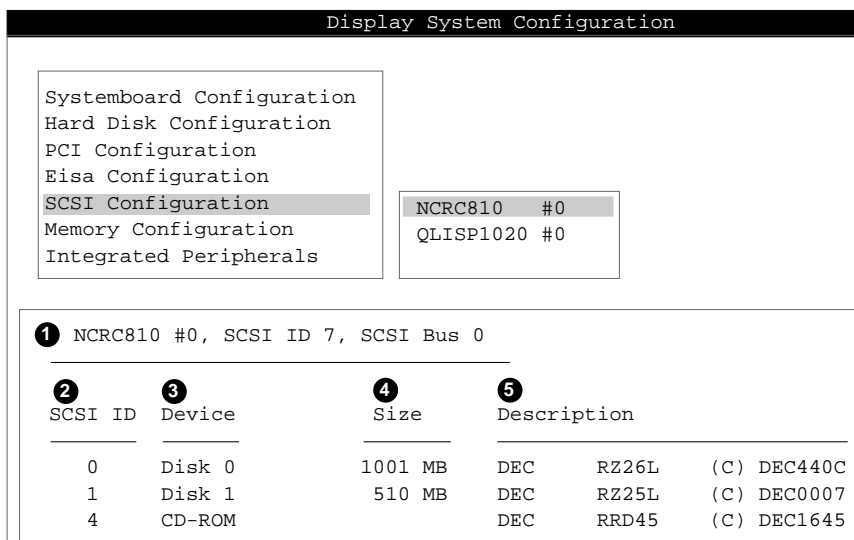
The device type lists the function of the device in the system.

### 3. Physical Slot

The physical slot lists the actual EISA slot number to which the device is attached. Refer to your system manual for the physical location of EISA slots on your particular system board.

## SCSI Configuration Menu

Information about the configuration of your system's SCSI devices is presented when you select "SCSI Configuration" and press Enter. In Figure 5-20, only one controller is installed in the system. If additional controllers were installed, a menu, allowing you to select which controller you wish to display information about, is displayed before detailed information about the controller is displayed.



PK-0743A-96

Figure 5-20. SCSI Configuration Menu

### 1. SCSI Controller Information ①

The SCSI controller information describes the physical characteristics of the selected SCSI controller. Information listed in this field includes:



## Console Subsystems

**Controller.** The controller is the brand and model of SCSI chip used on the SCSI controller.

**Controller number.** The controller number is based on how many SCSI controllers of a particular type are installed in the system. The first controller of a type is always numbered 0.

**SCSI ID number.** The SCSI ID number is a unique number assigned to the SCSI controller. This must be a unique number. The standard controller numbering scheme is for controllers to be SCSI ID 7.

**SCSI bus number.** The SCSI bus number indicates whether the controller is first or second in the system. The first controller is tied to SCSI bus 0, and the second controller is tied to SCSI bus 1.

### 2. SCSI ID ②

The SCSI ID number is a unique number you assign to each SCSI device installed in the system. This is usually done via jumpers on the device or on the StorageWorks backplane.

### 3. Device Type ③

The device type displays whether the device is a hard disk, CD-ROM, scanner, or other type of device.

### 4. Size ④

This is the raw capacity of the drive. Formatting the drive with different file systems—for example, FAT and NTFS—may result in different usable sizes because of the differences in the way storage is managed under those file systems. This information is left blank if it is not applicable to a device, for example, a scanner.

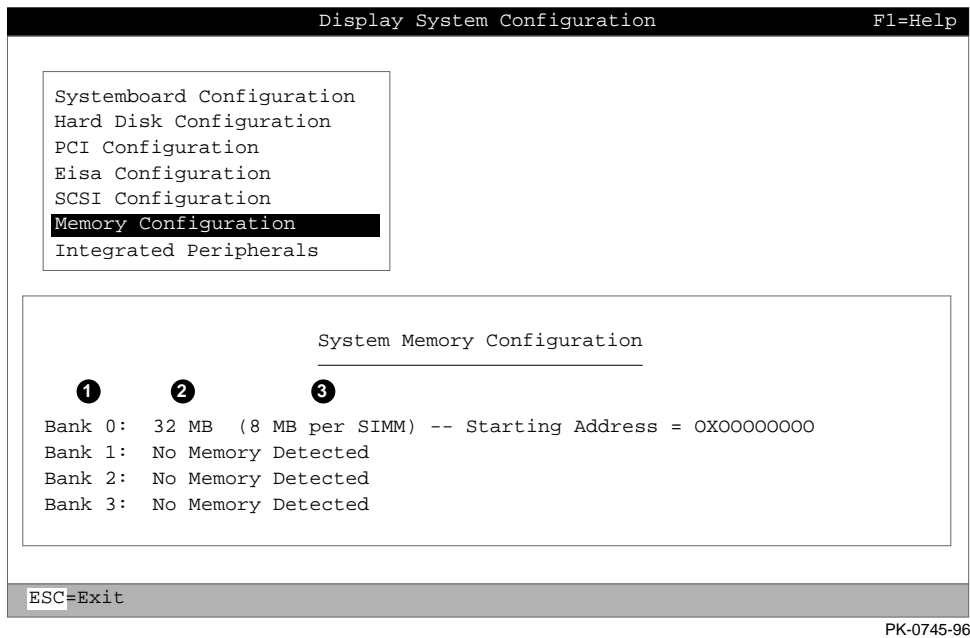
### 5. Description ⑤

This is the name and model of the device as recorded in the device's firmware.

## Memory Configuration Menu

Information about the memory configuration is presented when you select Memory Configuration and press Enter. An example is shown in Figure 5-21.

## Console Subsystems



PK-0745-96

**Figure 5-21. Memory Configuration Menu**

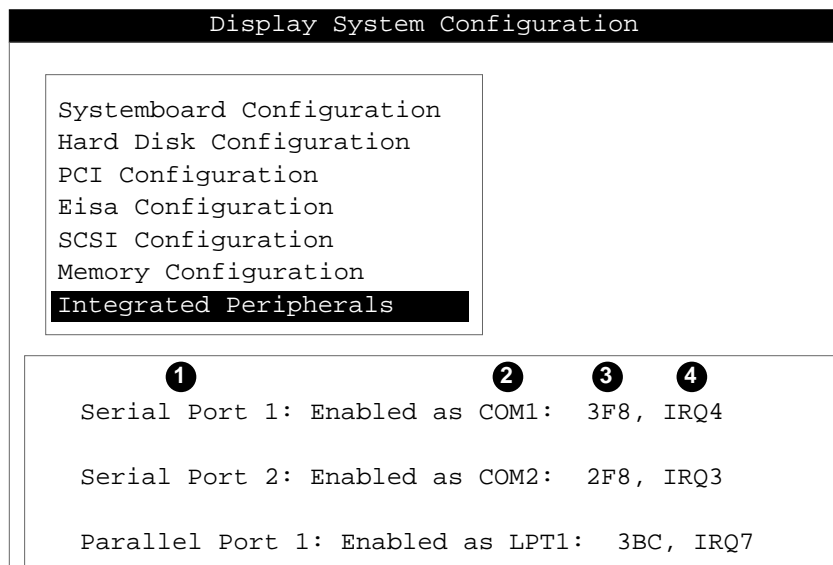
### 1. Installed Memory

The amount of memory, in megabytes, installed in your system.

- ① Memory bank
- ② Installed memory
- ③ Memory per SIMM

### Integrated Peripherals Menu

The integrated peripherals, such as parallel and serial ports, installed in your system are detailed in this menu, shown in Figure 5-22.



PK-0746-96

**Figure 5-22. Integrated Peripherals Menu**

**1. Device type ①**

This is the physical device as it exists on the system board.

**2. MS DOS name ②**

This shows whether the device is enabled, and if it is enabled, the addressable MS-DOS name for the device.

**3. Port address ③**

The port address is the physical memory location from and to which data travels as it is received into the device, and sent from the device, respectively.

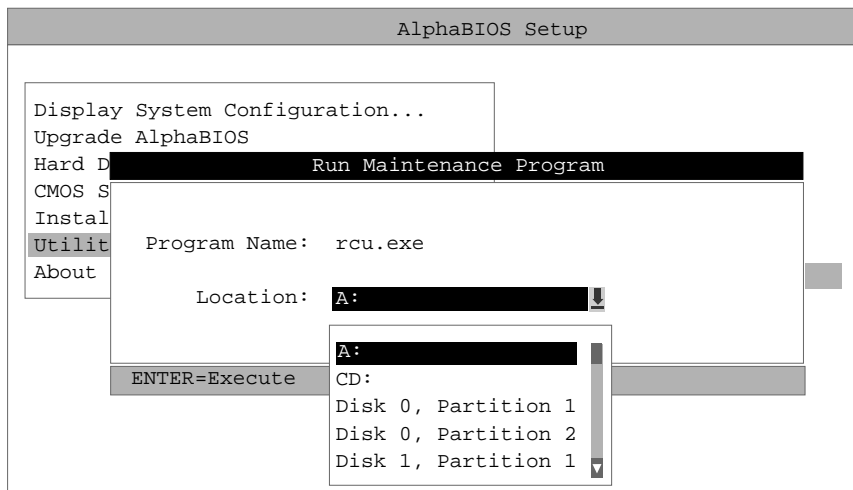
**4. Interrupt ④**

This is the interrupt request line (IRQ) used by the device to get the CPU's attention.

## Console Subsystems

### Run Maintenance Program Menu

This section details the information presented on the AlphaBIOS Run Maintenance Program Menu. An example is shown in Figure 5-23.



PK-0747-96

**Figure 5-23. Run Maintenance Program Menu**

#### Location

The location is the location from which the program in the Program Name field will be run if no path is entered along with the program name. To display a list of all available disks and partitions, press the Tab key, then use the down arrow keys. Once the list is displayed, use the up arrow key to cycle through the selections. To highlight a location, press the Tab key and the arrow key.

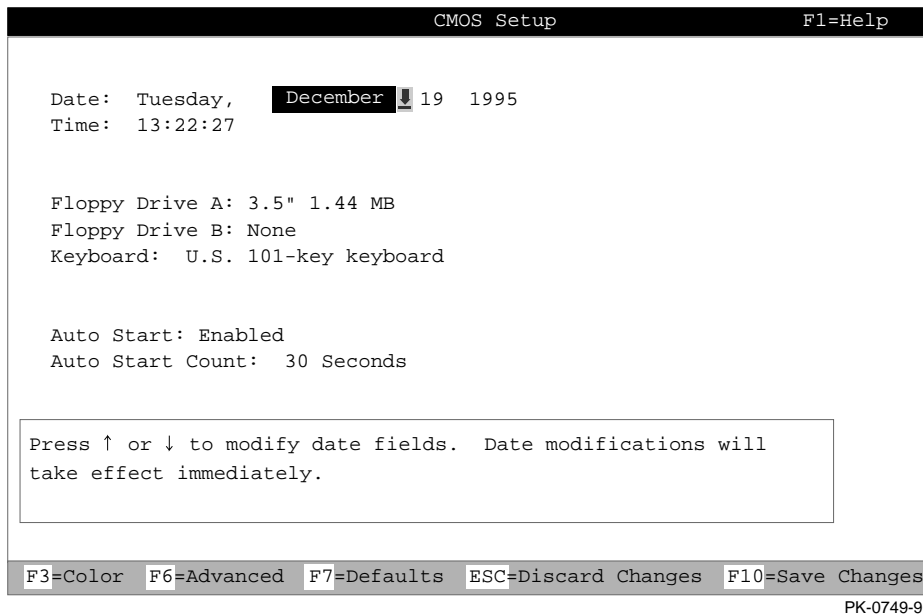
#### Program Name

The program name is the program to be run. It must be an executable program with a .EXE filename extension. However, when entering the program name, it is not necessary to type the extension.

Programs written to be run from AlphaBIOS must be written as ARC compatible images.

## CMOS Setup Menu

CMOS Setup is used to configure several basic system parameters. There are two modes for CMOS Setup, standard and advanced. Standard CMOS setup, shown in Figure 5-24 is used to configure basic system parameters. Advanced CMOS setup, shown in Figure 5-25, is used for system-specific parameters and password protection. To move through the fields, use the Tab key.



**Figure 5-24. Standard CMOS Setup Menu**

### 1. Date and Time

When setting the time, use the 24-hour format; for example, 10:00 p.m. is 22:00:00.

### 2. Floppy Drive

AlphaBIOS supports the following types of diskette drives:

- 5.25 inch, 1.2 MB
- 3.5 inch, 1.44 MB
- 3.5 inch, 2.88 MB

## Console Subsystems

### 3. Keyboard

The keyboard setting makes it possible to use just about any language keyboard available. To ensure correct character mappings, the language of your keyboard, Windows NT, and the keyboard language selection in CMOS setup should all match.

### 4. Auto Start and Auto Start Count

The Auto Start setting determines whether the primary operating system is automatically started after the system is reset or power-cycled. The Auto Start Count setting is the amount of time the boot menu is displayed before the default system is automatically started. This delay gives you the opportunity, after resetting or power-cycling the system, to select another operating system to start or to enter AlphaBIOS Setup.

### 5. Standard CMOS Setup Options

**Color.** Pressing F3 repeatedly cycles through the available AlphaBIOS color schemes.

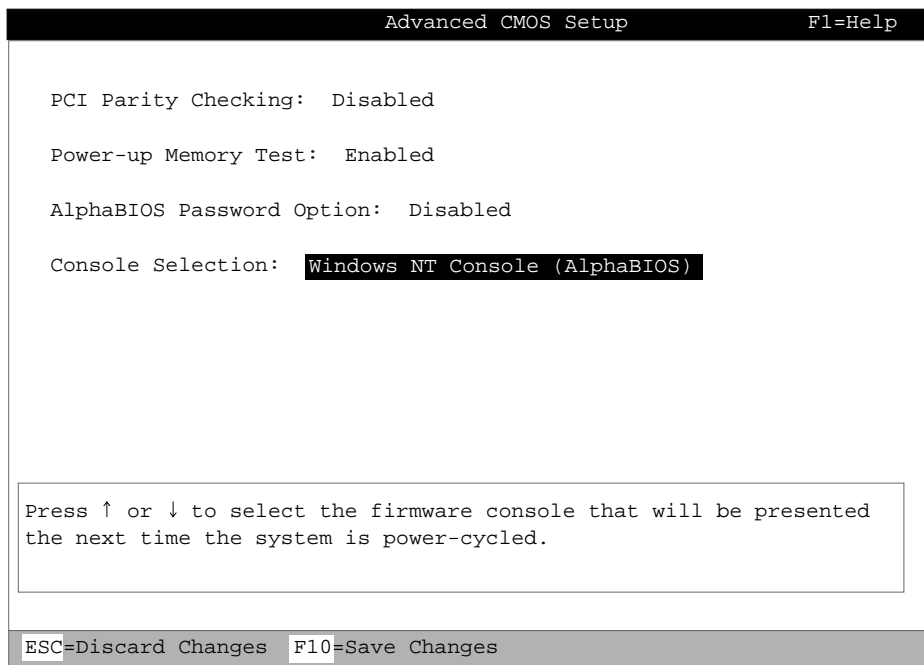
**Advanced.** Pressing F6 displays the Advanced CMOS Setup menu.

**Defaults.** Pressing F7 restores the default standard CMOS setup values without affecting the advanced CMOS setup values.

**Discard Changes.** Pressing Escape restores the settings in effect when you started CMOS Setup. This option also discards changes made in advanced CMOS setup.

**Save Changes.** Pressing F10 saves changes made in both the standard and advanced modes of CMOS Setup.

## Console Subsystems



PK-0750-96

**Figure 5-25. Advanced CMOS Setup Menu**

### 1. PCI Parity Error Checking

Possible settings for PCI parity checking are enabled and disabled by using this setting. Parity checking is a method for ensuring data integrity across the PCI bus. AlphaBIOS supports PCI option cards that generate parity as well as those that do not. Unfortunately, many older, and even some newer, PCI option cards do not fully comply with the PCI specification. One of the results of this non-compliance can be incorrect generation of PCI parity.

To accommodate cards that do not correctly generate PCI parity, Alpha systems with PCI expansion slots leave PCI parity checking disabled by default. If you are certain that all of your PCI option cards correctly implement PCI parity generation, you can turn parity checking on. If PCI parity checking results in unstable system behavior, such as lockups, you can turn PCI parity checking off again.

If you discover that a card in your system does not correctly generate PCI parity, you can check with the card manufacturer about getting an updated version of the card with PCI parity generation correctly implemented.

## Console Subsystems

### 2. Power-up Memory Test

Possible settings for the power-up memory test are enabled and disabled. When enabled, the memory test writes and then reads patterns of data to main system memory. This testing verifies the integrity of main system memory.

### 3. Password Setup

Possible settings for password setup are “disabled,” “setup password protection,” and “startup password protection.” For more information on password protection, see “Setting Up Password Protection” in Chapter 2.

### 4. Console Selection

Select the firmware console to be presented the next time the system is reset or started up. Selections are Digital UNIX (SRM), OpenVMS Alpha (SRM), or Windows NT (AlphaBIOS).

### 5. Advanced CMOS Setup Options

**Discard changes.** Pressing Escape restores the settings in effect when you started advanced CMOS setup. This does not discard changes made to standard CMOS setup.

**Save Changes.** Pressing F10 saves changes made in advanced CMOS setup. Note that, when exiting CMOS Setup, you must also save your changes at the Standard CMOS Setup menu for the changes to be stored permanently.



## Using the SRM Console

The SRM console supports the Digital UNIX and OpenVMS Alpha operating systems. For a complete list of SRM commands, type `help` at the SRM prompt (`>>>`).

There are two levels of Digital UNIX and OpenVMS Alpha (SRM) console commands:

- Basic
- Comprehensive

### Basic Commands

Use basic commands to perform common tasks described in this guide. Table 5-5 lists each console task and provides the corresponding command and its syntax.

---

**NOTE**

---

To limit the screen display to 23 lines at a time, use:

```
>>> more [filename]. Example: >>> more e1. Or, use  
>>> [command] | more Example: >>> show config | more.
```

---

## Console Subsystems

**Table 5-5. Basic SRM Console Commands**

Task	Command	Syntax
Boot the Windows NT (AlphaBIOS) console firmware.	arc or alphabios	arc or alphabios
Boot the operating system.	boot	boot [-flags [longword,]longword [-halt] [-filename] [boot_device]
Display error logs.	cat el	cat el or more el
Resume program execution.	continue	continue
Invoke the EISA Configuration Utility.	ecu	ecu
Display online help on using console commands.	help	help [command . . .]
Initialize the system.	init	init
Halt system tests invoked by test command.	kill_diags	kill_diags
Display online help on using console commands.	man	man [command . . .]
Display status of all system processes.	ps	ps
Set an environment variable.	set	set [-default] envar val
Display the value of an environment variable or display configuration information.	show	show [envar] [{config,device,memory, pal,version}]
Test the system and display results.	test	test

---

**NOTE**

---

Environment variables must be entered exactly as shown, not abbreviated. The system will not recognize an abbreviated form.

---

### Comprehensive Commands

Additional commands are available for system diagnosis and other complex tasks. Use of these commands requires detailed knowledge of your system. Do not use these commands without fully understanding the effect they can have on your system. To see a list of additional commands, enter `help` or `man` at the SRM console prompt.

### Getting Help on the SRM Console

To get online help, enter `help` at the SRM console prompt. Example 5-1 shows the `help` command and the resulting display.

#### Example 5-1 The help Command

```
>>> help
```

*Function:*

Display information about console commands.

*Synopsis:*

```
help [<command>...]
```

Command conventions:

<item> Implies a placeholder for user specified item.

<item>... Implies an item or list of items.

[] Implies optional keyword or item.

{a,b,c} Implies any one of a, b, c.

{a|b|c} Implies any combination of a, b, c.

## Console Subsystems

The following help topics are available:

alloc	boot	bpt	break	cat
check	chmod	clear	continue	crash
create	date	deposit	dynamic	echo
edit	eval	examine	exer	exit
false	find_field	fr_cmd	free	fw_cmd
grep	halt	hd	help	init
isp1020_edit	kill	kill_diags line	ls	
man	memtest	mem_more	net	nettest
ps	rm	sa	semaphore	set
set host	shell	show	show cluster	show config
show hwrpb	show iobq	show map	show memory	show_status
sleep	sp	start	stop	true
wc	x			

## SRM Console Conventions

Table 5-6 lists SRM console conventions.

**Table 5-6. SRM Console Conventions**

Item	Convention
Console prompt	>>>
Continuation line prompt	_>
Maximum command length	255 characters.
Multiple contiguous spaces or tabs	Treated as a single space.
Command abbreviations	Allowed, if not ambiguous.
Command qualifiers or options	Prefix with a space and a dash (-).
Numbers	Hexadecimal, unless otherwise specified. (Note: Registers such as R0–R31 are shown in decimal notation.)

## Console Subsystems

### SRM Console Shortcut Keys

Table 5-7 lists SRM console shortcut keys and their functions.

**Table 5-7. SRM Console Shortcut Keys**

Shortcut Key	Function
Return	Terminates command line input.
← Backspace	Deletes the previously typed character.
[Ctrl]+[A]	Toggles insert/overstrike mode. (Overstrike is the default.)
[Ctrl]+[B], ↑, or ↓	Recalls previous commands. (The last 16 commands are stored.)
[Ctrl]+[C]	Terminates the foreground process.
[Ctrl]+[D] or ←	Moves the cursor left one position.
[Ctrl]+[E]	Moves the cursor to the end of the line.
[Ctrl]+[F] or →	Moves the cursor right one position.
[Ctrl]+[H]	Moves the cursor to the beginning of the line.
[Ctrl]+[O]	Suppresses/resumes (toggles) console output.
[Ctrl]+[Q]	XON, resumes the flow of data to the console.
[Ctrl]+[S]	XOFF, stops the flow of data to the console.
[Ctrl]+[U]	Deletes the entire line.
[Ctrl]+[R]	Retypes the current command line.

## Boot Command

The boot command performs the following functions:

- Initializes the processor
- Loads a program image from the specified boot device
- Transfers control to the loaded image

The syntax of the boot command is:

```
boot [-file <filename>] [-flags <longword>[,<longword>]]
[-protocols <enet_protocol>] [-halt] [<boot_device>]
```

where:

Command Option	Description
-file <filename>	Specifies the name of a file to load into the system. For booting from Ethernet, this name is limited to 15 characters. Use the <code>set_boot_file</code> command to set the environment variable that specifies a default boot file.
-flags <longword>[,<longword>]	Specifies additional information for the operating system. For systems with OpenVMS Alpha, root number and boot flags are specified here. For Digital OSF/1 systems, the following flag parameters may be used: i = interactive boot s = boot to single user a = autoboot to multi-user Use the <code>set_boot_osflags</code> command to set an environment variable that specifies a default boot flag value.
-protocols <enet_protocol>	Specifies the Ethernet protocol(s) that will be used for a network boot. Values may be <code>mop</code> or <code>bootp</code> .
-halt	Forces the bootstrap operation to halt and invoke the console program after the image is loaded and the page tables and other data structures are set up.
<boot_device>	Specifies a device path or list of devices that the firmware will attempt to boot. Use the <code>set_bootdef_dev</code> command to set an environment variable that specifies a default boot device.

## Console Subsystems

### Boot Command Examples

Table 5-8 shows `boot` command examples and their descriptions.

**Table 5-8. Boot Command Examples**

Command	Description
<code>&gt;&gt;&gt;boot</code>	Boots the system from the default boot device.
<code>&gt;&gt;&gt;boot ewa0</code>	Boots the system from Ethernet port ewa0.
<code>&gt;&gt;&gt;boot -file dec2.sys mke0</code>	Boots the file named <code>dec2.sys</code> from Ethernet port mke0.
<code>&gt;&gt;&gt;boot -protocol bootp eza0</code>	Boots using TCP/IP BOOTP protocol from Ethernet port eza0.
<code>&gt;&gt;&gt;boot -flags 0,1</code>	Boots the system from the default boot device using flag settings 0,1.
<code>&gt;&gt;&gt;boot -halt dka0</code>	Loads the image from disk dka0, but remains in console mode.



## ECU Command

The `ecu` command transfers execution to the AlphaBIOS console and automatically runs the EISA Configuration utility. Be sure to insert the ECU diskette before you issue this command.

The syntax of the `ecu` command is:

```
ecu
```

Refer to the section “Using the EISA Configuration Utility” later in this chapter for additional information

## Set Command

The `set` command is used to set or modify the value of an environment variable. Environment variables are used to pass configuration information between the console and the operating system.

The syntax of the `set` command is:

```
set [-default] [-integer] [-string] <envar> <value>
```

where:

Command Option	Description
<code>-default</code>	Restores an environment variable to its default value.
<code>-integer</code>	Creates an environment variable as an integer.
<code>-string</code>	Creates an environment variable as a string.
<code>&lt;envar&gt;</code>	The environment variable to be assigned a new value.
<code>&lt;value&gt;</code>	The value that is assigned to the environment variable. It can be either a numeric value or an ASCII string.

---

### NOTE

Whenever you use the `set` command to reset an environment variable, you must initialize the system to put the new setting into effect. You initialize the system by entering the `init` command or pressing the Reset button..

---

## Console Subsystems

### Set Command Examples

Table 5-9 shows `set` command examples and their descriptions.

**Table 5-9. Set Command Examples**

Command	Description
<code>&gt;&gt;&gt;set bootdef_dev ewa0</code>	The default boot device is set to <code>ewa0</code> .
<code>&gt;&gt;&gt;set auto_action boot</code>	The console will attempt to boot following an error, halt, or power cycle.
<code>&gt;&gt;&gt;set boot_osflags 0,1</code>	The default boot flags are set to 0,1.
<code>&gt;&gt;&gt;set os_type NT</code>	Sets up the system to start the AlphaBIOS console after the next power cycle.
<code>&gt;&gt;&gt;set com1_baud</code>	Sets the baud rate of the COM1 or COM2 port. Default baud rate is 9600.
<code>&gt;&gt;&gt;set console</code>	Sets the device on which power-up output is displayed. GRAPHICS - displayed at a graphics terminal or device connected to the VGA module. SERIAL-displayed on device connected to the COM1 port.
<code>&gt;&gt;&gt;set ew*0_mode</code>	Sets the Ethernet controller to the default Ethernet device type. For 10Base-T (twisted-pair), use "twisted."
<code>er*0_protocols, ew*0_protocols</code>	Determines which network protocols are enabled for booting and other functions. For OpenVMS, use "mop"; for Digital UNIX, use "bootp".
<code>pci_parity</code>	Disables or enables parity checking on the PCI bus. Some PCI devices do not implement PCI parity checking, or generate parity that may be incorrect or not fully compliant with the PCI specification. The device functions properly as long as parity is not checked. The default value is "off" - PCI parity disabled. <b>Note:</b> No parity checking is implemented for any PCI device, even those in full compliance with the PCI specification.
<code>&gt;&gt;&gt;set bus_probe_algorithm</code>	Should be set to "new." Improves bus sizing and configuration. Not applicable to systems running Windows NT.
<code>&gt;&gt;&gt;set pk*0_fast</code>	Enables fast SCSI devices on a SCSI controller to perform in standard or fast mode. For standard, set to 0; for fast, set to 1.
<code>&gt;&gt;&gt;set pk*0_host_id</code>	Sets the controller host bus node ID to a value between 0 and 7..

## Console Subsystems

**Table 5-10. Set Command Examples (cont.)**

Command	Description
>>>set pk*0_soft_term	Enables or disables SCSI terminators. Applies to systems using the QLogic ISP1020 SCSI controller..

### Show Command

The `show` command displays the current value of a specified environment variable. The `show` command also displays information about the system, according to the arguments entered.

The syntax of the `show` command is:

```
show [{config, device, hwrpb, memory, pal, version, <envar>...}]
```

where:

Command Option	Description
<code>config</code>	Displays the current memory configuration and PCI logical slots (based on CFG utility input to the configuration database).`
<code>device [device name]</code>	Displays the devices and controllers in the system. Specifying a device name returns information on that device only.
<code>&lt;envar&gt;</code>	Displays the value of the environment variable specified.
<code>error</code>	Displays error log information.
<code>memory</code>	Displays the memory module configuration.
<code>pal</code>	Displays the version of OpenVMS Alpha and OSF PALcode.
<code>version</code>	Displays the version of the console firmware.

## Console Subsystems

### Show Command Examples

Table 5-11 lists show command examples and their descriptions.

**Table 5-11. Show Command Examples**

Command	Description
<pre>&gt;&gt;&gt;show device  dka0.0.0.6.0      DKA0 RZ26L 441A dka400.4.0.6.0    DKA400 RRD43 3213 dva0.0.0.0.1      DVA0 ewa0.0.0.12.0     EWA0 08-00-2B-E2-1C-25 pka0.7.0.6.0      PKA0 SCSI Bus ID 7</pre>	Lists device information, such as system designation, drive model, or Ethernet address.
<pre>&gt;&gt;&gt;show memory  48 Meg of system Memory  Bank 0 = 16 Mbytes (4 MB Per Simm) Starting at 0x00000000 Bank 1 = 16 Mbytes (4 MB Per Simm) Starting at 0x01000000 Bank 2 = 16 Mbytes (4 MB Per Simm) Starting at 0x02000000 Bank 3 - No Memory Detected</pre>	Displays information for each bank of memory in the system..
<pre>&gt;&gt;&gt;show * (Refer to the next section.)</pre>	Lists all variables and their settings.
<pre>&gt;&gt;&gt;show boot* (Refer to the next section.)</pre>	Lists all variables beginning with boot.

### Sample show config Command Display

**Firmware:** Version numbers for the firmware code, PALcode, SROM chip, and CPU are displayed.

**Memory:** Size and configuration for each bank of memory are displayed.

**Hose 0, Bus 0, PCI:** All controllers on Hose 0, Bus 0 of the primary PCI bus are displayed. For storage controllers, the associated devices are also displayed.

Slot 7 is assigned to the PCI-to-EISA bridge chip

Slot 8 is assigned to the PCI-to-PCI bridge chip

Slots 11-13 correspond to physical PCI option slots on the primary PCI bus:

Slot 11 = PCI 11

## Console Subsystems

Slot 12 = PCI 12

Slot 13 = PCI 13

---

### NOTE

---

If the system finds PCI devices it does not recognize, the device and vendor ID will appear as 0000 1011 in the `show config` display. This does not mean that the device is not supported, only that it is not in the SRM table of known devices.

---

**Hose 0, Bus 1, EISA:** All controllers on Hose 0, Bus 1 of the EISA bus are displayed. The logical slot numbers in the left column of the display correspond to physical EISA option slots (1 and 2). For storage controllers, the associated devices are also displayed.

**Hose 0, Bus 2, PCI:** All controllers on Hose 0, Bus 2 of the secondary PCI bus are displayed. The logical slot numbers are listed in the left column of the display. For storage controllers, the associated devices are also displayed.

Slot 0 corresponds to the SCSI controller on the system board, along with storage drives on the bus.

Slots 1-4 correspond to physical PCI option slots on the secondary PCI bus:

Slot 1 = PCI 1

Slot 2 = PCI 2

Slot 3 = PCI 3

Slot 4 = PCI 4

**Hose 0, Bus 3, PCI:** If PCI options contain a PCI-to-PCI bridge, such as the DECchip 21050-AA in the secondary PCI bus (slot 4 in Example 2-1), the additional bus is represented in the display. For each option that contains a PCI-to-PCI bridge, the bus number increments by 1, and the logical numbers start anew at 0.

---

### NOTE

---

The onboard SCSI controller (Qlogic 1020A) is always device pka.

---

## Console Subsystems

### Example 2-1 show config Command Display

```
>>> show config

                               Digital Equipment Corporation
                               AlphaStation 600A 5/500

Firmware

SRM Console:  T4.7
  ARC Console:  5.23
  PALcode:     VMS PALcode V1.19-3, OSF PALcode V2.21-5
  Serial Rom:  T1.1

Processor

DECchip (tm) 21164A   500MHz

Memory

  64 Meg of System Memory
  Bank 0 = 64 Mbytes (16 MB per Simm) Starting at 0x00000000
  Bank 1 = No Memory Detected
  Bank 2 = No Memory Detected
  Bank 3 = No Memory Detected

Slot  Option      Hose 0, Bus 0, PCI
  7  Intel 82375EB          Bridge to Bus 1, EISA
  8  DECchip 21050-AA      Bridge to Bus 2, PCI
 11  DECchip 21040-AA   ewb0.0.0.11.0      08-00-2B-E5-CC-B1

Slot  Option      Hose 0, Bus 1, EISA
  1  ISA2000

Slot  Option      Hose 0, Bus 2, PCI
  0  Qlogic ISP1020   pka0.7.0.2000.0   SCSI Bus ID 7
      dka0.0.0.2000.0   RZ26L
      dka400.4.0.2000.0 RRD43
  4  DECchip 21050-AA          Bridge to Bus 3, PCI

Slot  Option      Hose 0, Bus 3, PCI
  0  DECchip 21040-AA   ewa0.0.0.3000.0   08-00-2B-E2-31-68
  2  Qlogic ISP1020   pkb0.7.0.3002.0   SCSI Bus ID 7
  3  Qlogic ISP1020   pkc0.7.0.3003.0   SCSI Bus ID 7

>>>
```

## Console Subsystems

### Environment Variables

Table 5-12 shows selected environment variables and their descriptions. For a complete list, type `show *` at the SRM prompt.

**Table 5-12. Environment Variables**

Variable	Description
<code>auto_action</code>	Sets/shows the console action following an error, halt, or power-cycle. The action can be halt, boot, or restart. Halt is the default.
<code>boot_file</code>	Sets/shows the file name to be used when a bootstrap requires a file name. The default setting is null.
<code>boot_osflags</code>	Sets/shows additional parameters to be passed to system software. When using OpenVMS Alpha software, these parameters are the system root number and boot flags. The default setting is 0,0.
<code>bootdef_dev</code>	Sets/shows the default device or device list from which the system will attempt to boot. If the system software is preloaded, the variable is preset to point to the device containing the preloaded software. Otherwise, the default value is null.
<code>console</code>	Sets the console output to either serial port or the graphics controller.
<code>os_type</code>	Sets/shows the specified operating system (NT, OpenVMS Alpha, or Digital UNIX) that nonvolatile random-access memory (NVRAM) will boot.
<code>pci_parity</code>	Controls PCI parity checking at the PCI bridge chip. Parity checking is performed if on, disabled if off, and dependent on the SCSI controller revision.

## Console Subsystems

### SRM Console Security Features

Console security features, which restrict access to certain console commands, are intended to prevent unauthorized users from modifying system parameters or otherwise tampering with the system from the console. The SRM console supports two modes:

- Secure mode allows access only to specific console commands: `start`, `continue`, `boot` (with stored parameters), and `login`.
- User mode allows access to all SRM console commands

---

#### NOTE

---

The security features work only if access to the system hardware is controlled. Be sure to keep the front panel of the system locked and the key secure.

---

### The `set secure` Command

Use the `set secure` command to enable the security features without restarting the console. If the console password has already been set, access will be limited to the `start`, `continue`, `boot` (using the stored parameters), and `login` commands. For example:

```
>>> set secure
Console is secure
```

If the password has not been set, the console will prompt you to set it. (See "The `set password` Command.")

```
>>> set secure
Secure not set. Please set the password.
```

### The `set password` Command

Use the `set password` command to set or change the console password. If the password has already been set, the console prompts you for the new password and verification, then for the old password.

```
>>> set password
Please enter the password:
Please enter the password again:
Now enter the old password:
>>>
```



## Console Subsystems

---

### NOTE

---

The password length must be between 15 and 30 alphanumeric characters. Any characters after the 30th are not stored.

---

If the validation password does not match the one previously set, the password does not change.

```
>>> set password
Please enter the password:
Please enter the password again:
Validation error
```

If the password has not been set, the console prompts you for the new password and verification.

```
>>> set password
Please enter the password:
Please enter the password again:
>>>
```

### The login Command

Use the `login` command to turn off the security features and gain access to all the SRM console commands during a particular session. If a password has not been set when you enter the `login` command, you will be prompted to set it, but you need not do so unless you wish to.

```
>>> login
Secure not set. Please set the password:
>>>
```

When the console prompt is redisplayed, the console is no longer in secure mode. If a password has been set when you enter the `login` command, you must enter the password at the prompt:

```
>>> login
Please enter the password:
```

If the password you enter matches the current password, the secure mode is turned off and all console commands can be used. You can then return to secure mode by initializing the system or entering the `boot`, `continue`, or `start` command.

If you forget the password, you can use the `login` command and the Halt switch to clear the password:

1. Check that the Halt switch is off.

## Console Subsystems

2. Enter the `login` command.
3. When the `Enter Password:` prompt is displayed, press the Halt switch, then press Return.
4. Press the Halt switch off. The password is now cleared, and secure mode cannot be reinstated until you set a new password.

---

### NOTE

---

If you leave the Halt switch on after you clear the password, the system will not boot.

---

### The clear password Command

The `clear password` command clears the environment variable, *password*, setting it to zero. Use this command when you want access to all the SRM console commands, but the system is in secure mode. To use `clear password`, you must know the current password. If you do not know the password, see "The login Command."

```
>>> clear password
Please enter the password:
Password successfully cleared
```

# 6

## Care of the System

### Introduction

This chapter describes how to:

- Clean your system, including the outside enclosure, monitor, mouse, and keyboard
- Move your system

---

#### WARNING

---

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

---

### Cleaning Your System Unit

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

### Cleaning Your Monitor

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

## Care of the System

---

### WARNING

---

**If you use a prepackaged screen cleaner, make sure that it is *nonflammable*. Never spray the cleaner directly on the screen. Instead, apply the cleaner to a clean cloth, and then clean the screen.**

---

## Cleaning Your Keyboard

Your keyboard keys may get dirty with use. Clean them with a clean cloth that has been lightly dampened with a mild detergent solution.

## Cleaning Your Mouse

If your mouse does not move smoothly or if the pointer jumps across the screen when you are using the mouse, the ball inside the mouse may need cleaning. To clean the ball, perform the following steps, as shown in Figure 6-1:

1. Turn the mouse over and remove the plate ① on the bottom.
2. Remove the rubber ball ②.
3. Clean the ball and rollers ③ with a cotton swab that has been lightly dampened with a mild detergent. Replace the ball and plate.

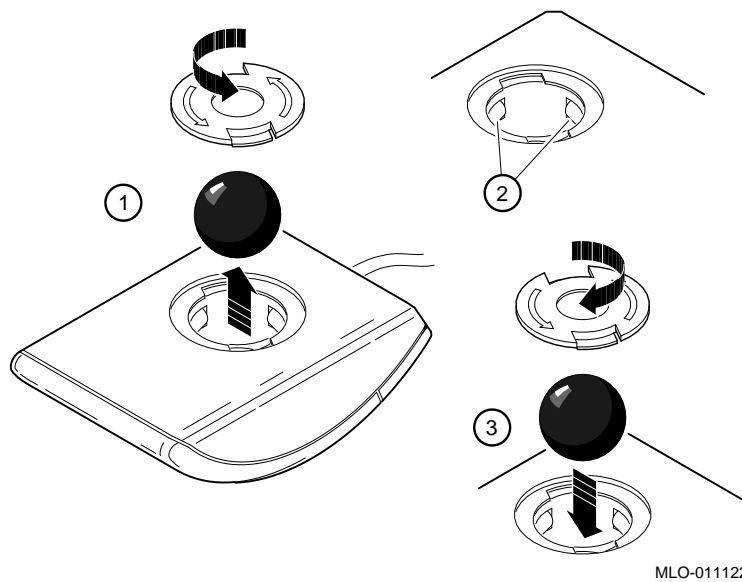


Figure 6-1. Cleaning the Mouse

## Moving Your System

Perform the following steps before shipping or moving the system:

1. Back up all files stored on the hard disk drive.
2. Turn off the external peripherals, the system, and the monitor.
3. Disconnect the power cord from the wall outlet and from the back of the system unit.
4. Disconnect the monitor, keyboard, mouse, and any other cables from the back of the system unit.
5. Replace the cache module hold-down bracket. See Figure 3-6 for additional information.
6. Package the system as described in the section on Packing Your System later in this appendix.

## Care of the System

---

### **WARNING**

---

**When packing and moving system components, be aware that some components (such as the system unit or monitor) may be too heavy for you to safely lift alone. If you are doubtful about whether you can lift these items alone, please get assistance.**

---

## **Packing Your System**

If you are moving the system a short distance (for example, from one room to another in the same building), you do not have to pack it. However, if you are shipping the system or moving it by vehicle, pack it in the original packing material and containers. If you did not save the boxes and packing material, use a sturdy carton and cushion the computer well to avoid damage.

## **Installing Your System at a New Location**

After moving the system to a new location, unpack and install it following the installation instructions in Chapter 1.

# 7

## Technical Specifications

### Introduction

This chapter describes the following technical characteristics of the AlphaStation 600A Series system:

- System specifications
- External system connectors
- Expansion slot current limitations
- System current requirements
- System board jumpers
- I/O subsystem module

### System Specifications

Tables 7-1 through 7-4 list the AlphaStation 600A Series system processor features, dimensions, environmental specifications, and acoustics specifications.

**Table 7-1. System Specifications**

<b>Attributes</b>	<b>Specification</b>
PCI clock	33 MHz
Data I/O	32-bit PCI

## Technical Specifications

System board RAM	Expandable up to 1.0 GB
------------------	-------------------------

**Table 7-2. System Dimensions**

Dimension	Specification
Width	238.8 mm (9.4 inches)
Length	645.2 mm (25.4 inches)
Height	442 mm (17.4 inches)
Weight	32+ kg (70+ lb)

**Table 7-3. System Environmental Specifications**

Attributes	Specification
Operating temperature	10°C to 40°C (50°F to 104°F) (without removable media)
Storage temperature	-40°C to 66°C (-40F to 151°F)
Operating humidity (noncondensing)	10% to 90% relative humidity, (without removable media) 20% to 80% relative humidity (with removable media) maximum wet bulb 2°C (36°F)
Storage humidity (noncondensing)	10% to 90% relative humidity, maximum wet bulb 65°C (149°F)
Altitude Operating Nonoperating	2,438 m (8,000 ft) maximum 4,876 m (16,000 ft) maximum
Shipping vibration	IAW Federal Standard 101, method 5019
Nonoperating shock	30 G, 25 ms halfsine



**Table 7-4. Acoustics-Declared Values According to ISO 9296 and ISO 7779**

Product	Sound Power Level $L_{WA_d}$ , B		Sound Pressure Level $L_{pAm}$ , dBA	
	Idle	Operate	(Operator Position) Idle Operate	
PB650-A9	5.1	5.2	33	34

**NOTE**

Current values for specific configurations are available from Digital representatives. 1B=10 dBa.

## External System Connectors

This section lists the pin assignments for your system's external connectors.

- Parallel connector: 25-pin D-submini female
- Serial connectors: 9-pin D-submini male
- Keyboard and mouse connectors: 6-pin mini-DIN

## Technical Specifications

### Parallel Port Connector

The parallel port connector provides an interface to a printer or other parallel devices. Table 7-5 lists pin assignments. An asterisk (\*) after a signal name indicates an active low signal.

**Table 7-5. Parallel Port Pinouts**

DB25 Pin	Signal	Function
1	STB-R*	Strobe
2	PRTD0	Printer data bit 0
3	PRTD1	Printer data bit 1
4	PRTD2	Printer data bit 2
5	PRTD3	Printer data bit 3
6	PRTD4	Printer data bit 4
7	PRTD5	Printer data bit 5
8	PRTD6	Printer data bit 6
9	PRTD7	Printer data bit 7
10	ACK*	Acknowledge
11	BUSY	Busy
12	PE	Paper end
13	SLCT	Select
14	AUTOFDXT*	Autofeed
15	ERR*	Error
16	INIT*	Initialize printer
17	SLCTIN*	Select input
18 to 25	GND	Ground

### Serial Port Connectors

The serial port connectors consist of two 9-pin D-submini connectors. Table 7-6 lists their pin assignments.

## Technical Specifications

The baud rates supported by the system's serial ports are 300, 1200, 2400, 4800, 9600, 19200, and 38400.

**Table 7-6. 9-Pin Port Pinouts**

DB9 Pin	Signal	Function
1	DCD	Data carrier detect
2	RXD	Receive data
3	TXD	Transmit data
4	DTR	Data terminal ready
5	GND	Ground
6	DSR	Data set ready
7	RTS	Request to send
8	CTS	Clear to send
9	RI	Ring indicator

## Keyboard and Mouse Connectors

The keyboard and mouse connectors consist of two 6-pin mini-DIN connectors. Table 7-7 lists their pin assignments.

**Table 7-7. Keyboard and Mouse Connector Pinouts**

Pin	Signal
1	Data
2	Reserved
3	Ground
4	+5V DC (fused)
5	Clock
6	Reserved

## Technical Specifications

### Expansion Slots

The system board contains seven 32-bit PCI and two EISA expansion slots. The maximum available +5V DC allowable to any expansion slot depends on the following parameters:

- Power supply capacity
- The +5V DC requirements of the system board
- The +5V DC requirements of the peripherals
- The power demands of all other slots in use and of the system board

### Power Supply and Input Power Requirements

The 400-watt power supply provides five DC voltages: +12V, -12V, +5V, -5V, and +3.43V DC. These voltages are used by the various components within the system and are listed in Table 7-8.

**Table 7-8. Output Power Requirements**

DC Outputs	Maximum Load	Maximum Power
+3.4V	36.4 amps	120.0 W
+5.0V	52.0 amps	265.0 W
-5.0V (aux)	0.6 amps	1.0 W
+12.0V	11.0 amps	132.0 W
-12.0V	0.2 amps	2.4 W
<b>Maximum Watts</b>		<b>400 W</b>

## Technical Specifications

---

### HINT

---

The maximum power from any combination of +3.3V and +5.0V does not exceed 335 W.

---

The AlphaStation 600A Series system has the rated voltage range described in Table 7-9.

**Table 7-9. Input Power Requirements**

Rated Voltage Range	Rated Input Current	Operating Frequency Range
88V AC–264V AC	8–4 amps	47 Hz–63 Hz

## System Board Jumper Locations

Jumper pins allow you to set specific system parameters. Set them by changing the pin location of jumper blocks. A jumper block is a small plastic-encased conductor (shorting plug) that slips over the pins. To change a jumper setting, remove the jumper from its current location with your fingers or small needlenose pliers. Place the jumper over the two pins designated for the desired setting. Press the jumper evenly onto the pins. Be careful not to bend the pins.

Figure 7-1 shows the locations of the system board jumper pins. Table 7-10 lists the system board jumpers and factory-default settings. Pin 1 is always oriented toward the top of the board.

---

### 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 system unit chassis. A static discharge from your fingers can result in permanent damage to electronic components

---

## Technical Specifications

### System Board and CPU Card Jumper Settings

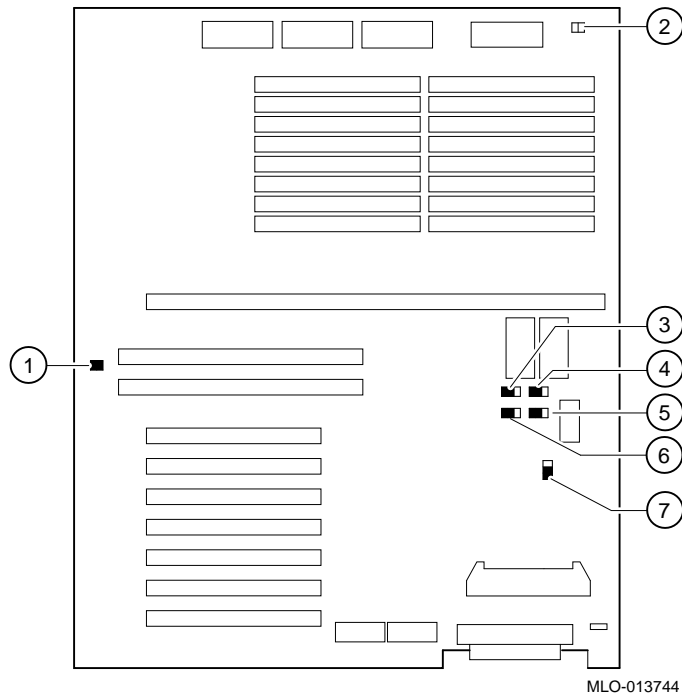
Table 7-10 lists the default jumper settings for the system board. The jumper settings are shown in Figure 7-1.

**Table 7-10. System Board Default Jumper Settings**

Number	Name	Description and Default
J50 ①	FROM VPP enable	Permits the 12 volts needed to update the Flash ROMs. Enabled.
J16 ②	Fan	Allows the large fan to be disabled. Enabled.
J53 ③	Fan shutdown	Allows the software to shut down the system in the event of a fan failure. Enabled.
J52 ④	Temperature shutdown	Allows the temperature chips to shut down the system in an orderly sequence. Enabled.
J56 ⑤	Fan fault	Allows hardware to detect a fan fault and shut down the system in an orderly sequence. Enabled. Set to disable if testing the system board or CPU card outside of the enclosure.
J51 ⑥	SCSI terminator	Enables the on-board SCSI terminators. The system specification requires that the SCSI bus be terminated at both ends. Enabled.

## Technical Specifications

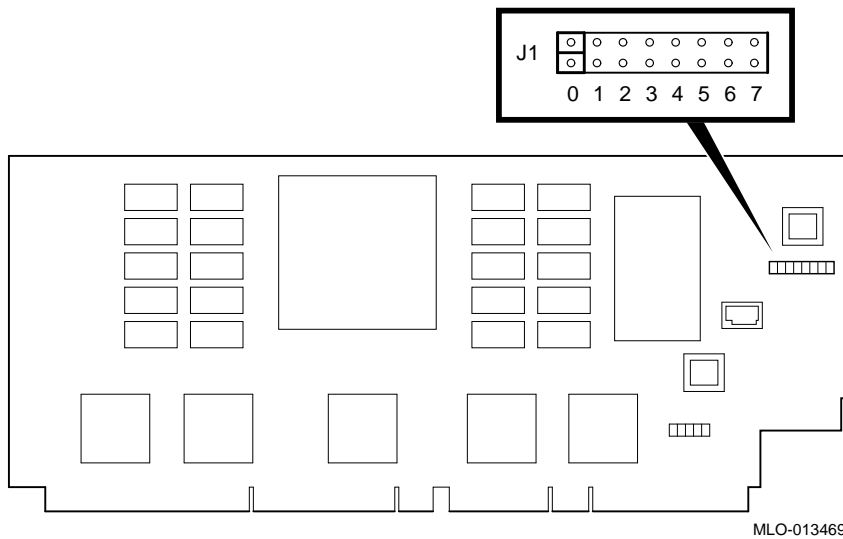
Figure 7-1 shows the system board jumper settings for normal operation.



**Figure 7-1. System Board Jumper Locations**

## Technical Specifications

A jumper on the CPU card activates the SRAM tests and the fail-safe loader. This jumper is labeled J1. Figure 7-2 shows the J1 jumper and its default setting. Table 7-11 shows the other jumper setting functions.



MLO-013469

**Figure 7-2. CPU Card J1 Jumper Settings**

**Table 7-11. Jumper Setting Functions**

Bank	Jumper Setting Function
0	Standard boot setting
1	Standard boot setting
2	Mini console setting (Internal use only)
3	Mini console setting (Internal use only)
4	Startup with no backup cache (Internal use only)
5	Mini console setting (Internal use only)
6	Mini console setting (Internal use only)
7	Fail-safe loader setting: selects fail-safe loader firmware



# 8

## Updating System Firmware

### Introduction

This chapter explains how to use the firmware update utility. It is the user's responsibility to update the system firmware.

### System Firmware

The AlphaStation 600A Series system contains a flashROM with AlphaBIOS console firmware (for the Windows NT operating system) and a flashROM with SRM console firmware (for the Digital UNIX and OpenVMS Alpha operating systems). You may want to update your system firmware as later versions become available. You may also need to recopy firmware onto the system if the flashROM should ever become corrupted. To do this, use a special procedure (see "Using the Fail-Safe Loader" in Chapter 4.)

You can load firmware into the flashROM from any of the following sources:

- CDROM
- Network
- Diskette

## Updating System Firmware

### Updating Firmware Using the CDROM Drive

#### To update an OpenVMS Alpha or Digital UNIX system:

1. At the console prompt (>>>), enter the `show device` command:

```
>>> show device
dka0.0.0.6.0      DKA0              RZ26L             440C
dka400.4.0.6.0   DKA400           TOSHIBA CD-ROM XM-4101TA 0064
dva0.0.0.0.1     DVA0
ewa0.0.0.2004.0  EWA0             08-00-2B-E5-6A-41
ewb0.0.0.11.0   EWB0             08-00-2B-E1-03-19
pka0.7.0.2001.0  PKA0             SCSI Bus ID 7   2.10
```

In the above example, the CDROM drive has a device ID of `dka400`.

2. Load the Firmware Update compact disc into the drive.
3. Boot the system from the update utility disc, using the device ID determined in step 1 (in this case, `dka400`). For example:

```
>>> boot -f1 0,A0 dka400
```

## Updating System Firmware

Use the `list` command to show a list of memory-loaded images and a list of currently supported flashROMs. In the following example, only three devices can be firmware-updated.

```
UPD> list
```

Device	Current Revision	Filename	Update Revision
ARC	4.46	arc_fw	4.47
SRM	t4.5-55	srm_fw	t4.5-55
fwb0	2.46	dfpaa_fw	2.46
		dfeaa_fw	1.3
		dfeab_fw	2.46
		kzpsa_fw	A10

Use the `update` command to update adapter firmware, as shown in the following example:

```
UPD> update
Confirm update on:
ARC SRM
[Y/(N)]y
WARNING: updates may take several minutes to complete for
each device.

                DO NOT ABORT!

SRM   Updating to V4.7...  Verifying V4.7...  PASSED.
ARC   Updating to V5.26... Verifying V5.26... PASSED.

UPD>
```

## Updating System Firmware

### To update a Windows NT system:

---

**NOTE**

---

The latest version of the firmware is available on the World Wide Web:  
<http://www.windowsnt.digital.com>

---

As new versions of Windows NT are released, it might be necessary to upgrade AlphaBIOS to the latest version. As improvements are made to AlphaBIOS, you may want to upgrade to take advantage of new AlphaBIOS features.

#### **From the AlphaBIOS console:**

To upgrade from an earlier version of AlphaBIOS, follow these steps from the AlphaBIOS console:

1. Insert the diskette or CD-ROM containing the AlphaBIOS upgrade.
2. If you are not already running AlphaBIOS Setup, access the AlphaBIOS Setup menu by restarting your system and pressing f2 when the Boot menu is displayed.
3. From the AlphaBIOS Setup menu, select "Upgrade AlphaBIOS" and press Enter. When you choose this option, the existing AlphaBIOS searches for an executable AlphaBIOS update file, first on CD-ROM, and then on diskette. Once the update file has been found, it executes it, and the AlphaBIOS is upgraded.
4. After the upgrade is complete, the system either resets automatically or prompts you to reset the system.

## Updating System Firmware

### Updating Firmware Using the Network

To update firmware using the network, see the Read Me instructions on the Web Server.

### Updating Firmware Using the Diskette Drive

To update the firmware using the diskette drive:

1. Insert the diskette with the new firmware version in the diskette drive.
2. Enter the following command at the SRM console prompt:  

```
>>> boot dva0
```
3. Use the list command to show a list of memory-loaded images and a list of currently supported flashROMs. In the following example, only three devices can be firmware-updated.

```
UPD> list
Device      Current Revision  Filename      Update Revision
ARC         4.46             arc_fw        4.47
SRM         t4.5-55          srm_fw        t4.5-55
fwb0       2.46             dfpaa_fw      2.46
                        dfeaa_fw      1.3
                        dfeab_fw      2.46
                        kzpsa_fw      A10
```

Use the update command to update adapter firmware, as shown in the following example:

```
UPD> update
Confirm update on:
ARC SRM
[Y/(N)]y
WARNING: updates may take several minutes to complete for
each device.

                DO NOT ABORT!

SRM      Updating to V4.7...  Verifying V4.7...  PASSED.
ARC      Updating to V5.26... Verifying V5.26... PASSED.
UPD>
```

## Updating System Firmware

---

**NOTE**

---

To update your system using the SRM console, use a diskette formatted with the Alpha boot block. To update using the AlphaBIOS console, use an FAT formatted diskette.

---

### Flash Enable Jumper

Before you can update your system firmware, the flashROM enable jumper (J50) must be in the write-enabled position. Refer to the section on system board jumpers in Chapter 7.

# 9

## Starting an Operating System Installation

### Preparing to Install Windows NT

#### Preparing the System

1. Before you install the Windows NT operating system, make sure that you have the following items:
  - Microsoft Windows NT AlphaBIOS firmware, Version 4.44 or later. The AlphaBIOS firmware is a menu-driven utility to configure your system, and Version 4.44 is required to run Windows NT 3.51 or later.
  - Microsoft Windows NT Workstation 4.0 or later.
  - The EISA Configuration Utility (ECU) diskette for Microsoft Windows NT, Version 1.9 or later.
  - A partitioned and formatted hard disk drive installed in your system. If your drive has not yet been prepared, follow the instructions in "Preparing the Hard Disk" later in this section.
2. If a Microsoft Windows NT product announcement was included with your system, read the announcement, which contains important READ FIRST information.

## Starting an Operating System Installation

3. Contact the administrator of your local area network to obtain the network information you will need. This information will vary depending on the type of network hardware and software installed at your location.

### Setting the Operating System Type

1. Turn the system on by pressing the On/Off switch on the front of the system. After a short wait, the operator control panel on the front of the system displays the message "Model 5/500," and the screen displays initialization and testing information. Internal errors are indicated by audible "beep" codes. (See Chapter 4, "Troubleshooting.")
2. Press the Enter key. If your screen displays the AlphaBIOS console Boot menu, your system has already been prepared for use with Microsoft Windows NT and you can proceed to the section "CMOS Setup."

---

#### NOTE

---

**Systems with Pre-installed Windows NT Software:** If you have a system with Windows NT installed at the factory, Windows NT setup will start automatically the first time you turn on your system. If your system does not have Windows NT pre-installed, you must have a CD-ROM drive attached to your system to install Windows NT. Refer to your operating system documentation to install your operating system.

---

If your screen displays a triple arrow (>>>) prompt instead of the AlphaBIOS console Boot menu, your system has booted the SRM console. Proceed to step 3.

3. Type the following two commands at the SRM console prompt and press the Enter key after each command:

```
set console graphics
```

```
set os_type nt
```

4. Turn off the power to your system by pressing the On/Off switch on the front of your system. Wait at least 10 seconds, then turn the power back on.



## Starting an Operating System Installation

5. The system performs several diagnostics. If you see an ECU error message, you can ignore it, because the remainder of the configuration procedure will correct any configuration errors that are displayed on the screen.

### CMOS Setup

---

#### NOTE

---

Steps 1 and 2 in the following procedure are needed only when you first set up your system. On subsequent installations and upgrades, begin at step 3.

---

1. From the AlphaBIOS Setup menu, select the CMOS Setup menu and press Enter. Set the system date and time.
2. Return to the main AlphaBIOS Setup menu, select "Hard Disk Setup," and press Enter.

It is recommended that you partition and format your system's hard disk before installing Windows NT software, even if already partitioned and formatted. Repartitioning and reformatting reduce the likelihood of operational problems due to conflicting versions of the operating system or disk-related problems.

You can easily set up the first hard disk in your system (disk 0) with the recommended default partition arrangement by performing an express setup. Note, however, that express setup does not format the large partition with NTFS. You will have the opportunity to do this during the Windows NT installation.

## Starting an Operating System Installation

---

### NOTE

---

The hard disk with the lowest SCSI ID number is seen as disk 0 by AlphaBIOS.

---

---

### CAUTION

---

If you have any needed information on your disk, be sure to back up your disk before using express setup.

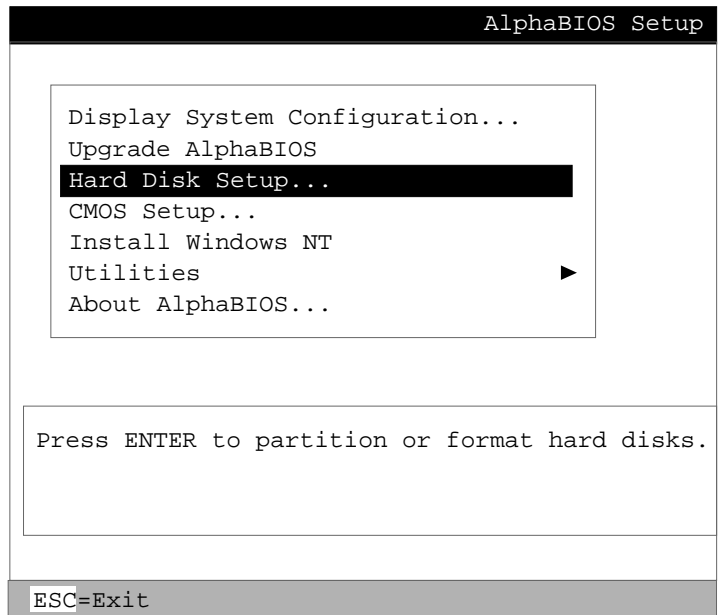
---

To perform an express hard-disk setup, follow these steps and refer to Figure 9-1.

- a. From the AlphaBIOS Setup menu, select “Hard Disk Setup,” and press Enter.
  - b. Press F7 to enter express setup.
  - c. Press F10 to continue with the setup.
3. Put the Windows NT CD into the CD-ROM drive.
  4. Start AlphaBIOS Setup, select “Install Windows NT,” and press Enter.

To complete the installation, refer to your operating system documentation.

## Starting an Operating System Installation



PK-0726-96

**Figure 9-1. Express Hard Disk Setup**

## Starting an Operating System Installation

### Setting the EISA Configuration

1. From the AlphaBIOS Setup menu, select "Utilities."

If any of the EISA option cards in your computer have not yet been identified, a Caution dialog box is displayed. You can ignore this dialog box because your option cards will be identified in the following steps.

2. From the submenu, select "Run Maintenance Program." Insert the EISA Configuration Utility (ECU) diskette for Microsoft Windows NT into the diskette drive, and select "Run ECU from floppy."

---

#### NOTE

---

It is not necessary to run Step 2 of the ECU, "Add or remove boards." (EISA cards are recognized and configured automatically.)

The "View or Edit Details" ECU option is used to change user-selectable settings or to change the resources allocated for these functions (IRQs, I/O ports, and so on). When using default settings, this step is not required.

- 
3. Select "Step 5: Save and Exit" and press the Enter key. At the confirmation prompt, select "Save the configuration" and press the Enter key. When a dialog box appears, indicating that the configuration has been saved, press the Enter key. Your system will restart with the updated information.

### Installing Microsoft Windows NT

To install the Microsoft Windows NT operating system, refer to your Windows NT documentation.

---

#### NOTE

---

During installation, you are prompted for the location of the files for Microsoft Windows NT. Install the files into the larger of the two partitions you create, and when prompted, format that partition with the NTFS file system.

---

## Starting an Operating System Installation

### Preparing to Install Digital UNIX

#### Installation Preparation

Before installing Digital UNIX on your system, make sure that you have the following items:

- Digital UNIX Version 4.0A, or later
- SRM console firmware, Version 4.7 or later
- EISA Configuration Utility (ECU) diskette, Version 1.9 or later, for Digital UNIX and OpenVMS Alpha.

Before starting installation, be sure to review the Digital UNIX release notes ("General Installation") and the Digital UNIX installation guide for your version of the operating system.

#### Setting the Operating System Type

1. Turn the system on. After a short wait, the operator control panel on the front of the system displays the message "Model 5/500" and the screen displays initialization and testing information.
2. Press the Enter key. If the screen displays a triple arrow prompt (>>>) you have booted the SRM console. Verify the value of the `set bus_probe_algorithm` environment variable. It should be set to "new." (See "Booting the Operating System" in Chapter 1 and "Set Command Examples" in Chapter 5.) Then, proceed to the next section, "Installing Digital UNIX."

If the computer booted directly into the AlphaBIOS Boot menu, and you did not see the >>> prompt, you must proceed to step 3 to switch to the SRM console.

3. From the AlphaBIOS Boot menu, select the Digital UNIX operating system.

These steps initiate loading of the firmware. Once the Digital UNIX and OpenVMS Alpha firmware is loaded and the system is initialized, the system displays the SRM console prompt (>>>).

## Starting an Operating System Installation

4. Verify the value of the `set bus_probe_algorithm` environment variable. It should be set to "new." (See "Set Command Examples" in Chapter 5.

## Installing Digital UNIX

To install the Digital UNIX operating system from a CD-ROM or to do a remote installation over a local network using Remote Installation Service (RIS), refer to your operating system documentation.

## Preparing to Install OpenVMS Alpha

### Preparing the System

Before you install the OpenVMS Alpha operating system on your system, make sure that you have the following:

- OpenVMS Alpha operating system, Version 6.2-1H3 or later
- SRM console firmware, Version 4.7 or later
- EISA Configuration Utility (ECU) diskette for Digital UNIX (DEC OSF/1) and OpenVMS Alpha, Version 1.9.

Before beginning the installation or upgrade, prepare the required hardware and software components, as described in this section. After preparation is complete, refer to the *OpenVMS Alpha Version 6.2 Upgrade and Installation Manual* to install the operating system.

### Preparing Hardware Components

To prepare the hardware components, follow these steps:

1. Be sure the hardware has been installed and checked for proper operation.
2. Be sure you know how to turn on and operate your system components, including the system unit, console, monitor or terminal, drives, and printer. Refer to Chapter 1 if necessary.
3. Set up your system to record the installation procedure on either a hardcopy terminal or a printer attached to the console terminal. If you do not do this, the screen messages will be lost.

## Starting an Operating System Installation

You may want to record a transcript of screen messages to refer to during installation.

### Preparing Software Components

To prepare the software components, follow these steps:

1. Be sure you have all the items listed on the bill of materials in the software distribution kit. If your distribution kit is incomplete, notify your service representative and request priority shipment of any missing items.
2. Review all cover letters and release notes.

### Setting the Operating System Type

To set the operating system type, follow steps 1 through 7.

1. Turn the system on. After a short wait, the operator control panel on the front of the system displays the message "Model 5/500" and the screen displays initialization and testing information.
2. Press the Enter key. If the screen displays a triple arrow prompt (>>>), you have booted the SRM console. Verify that the `bus_probe_algorithm` environment variable is set to "new." (See "Booting the Operating System" in Chapter 1. Then, proceed to "Installing OpenVMS Alpha.")

If the computer booted directly into the AlphaBIOS Boot menu, and you did not see the >>> prompt, you must proceed to step 3 to switch to the SRM console.

3. From the AlphaBIOS Boot menu, select the OpenVMS Alpha operating system.

This step initiates loading of the firmware. Once the SRM firmware is loaded and the system is initialized, the system displays the SRM console prompt (>>>).

4. Verify the value of the `set bus_probe_algorithm` environment variable. It should be set to "new." (See "Set Command Examples" in Chapter 5.)

## Starting an Operating System Installation

### Required PALcode

If your computer console does not have a specific minimum version of the privileged architecture library code (PALcode), you may not be able to boot your system during the installation or upgrade procedure. To ensure the correct version, follow these steps before performing an installation or upgrade:

1. At the SRM console prompt (>>>) on your running system, enter the `show configuration` or `show pal` command. The system display will indicate the PALcode version your system is using.
2. To determine whether your system is running the required or recommended version of PALcode, refer to the most recent OpenVMS Alpha operating system cover letter or release notes to check for new information that supplements the PALcode information in the *OpenVMS Alpha Version 6.2 Upgrade and Installation Manual*. You can also contact your service representative.
3. If the PALcode version is below the required or recommended minimum, upgrade your firmware either by following the directions in Chapter 8, or by contacting your service representative.

### Installing OpenVMS Alpha

Use the OpenVMS Alpha CDROM to install or upgrade the operating system, or to perform operations such as backing up the system disk. For installation information, refer to your operating system documentation.



# 10

## Equipment Log

### Introduction

With the equipment log, you can gather information that you may need if problems occur with your system and you need to call Digital for assistance.

Use the equipment log to record information about your system hardware and software components. Update the equipment log when you add options.

### Equipment Log

The log consists of five tables, which you can use to record the following information:

- Your system's hardware components (Table 10-1)
- Your SCSI device address settings (Table 10-2)
- Your system's system hardware configuration (Table 10-3)
- The operating system or application software installed on your AlphaStation 600A A Series system (Table 10-4)
- Additional components (Table 10-5)

## Equipment Log

**Table 10-1. Hardware Components**

<b>Component</b>	<b>Vendor/ Type/Size</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Date Installed</b>
System unit	AlphaStation	600A Series		
System unit key number				
Monitor				
Keyboard				
Mouse				
Installed diskette drive				
Additional storage device 1				
Additional storage device 2				
Additional storage device 3				
Additional storage device 4				
Additional storage device 5				

**NOTE**

See the regulatory label on the rear bulkhead for such information as the serial number.

Equipment Log

**Table 10-2. SCSI Addresses**

Device	Address	Device	Address

**Table 10-3. Hardware Configuration**

Component	AlphaStation 600A Series System Specifics
CPU speed and model	
Firmware version	
Memory size	
Video module	

**Table 10-4. Installed Software**

Operating System or Application Software	Version Number	License Number	Date Installed

Equipment Log

**Table 10-5. Additional Component Information**

<b>Component</b>	<b>Vendor</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Date Installed</b>

---

# Index

## A

---

- abbreviations used in this guide, xiii
- AC power cord
  - criteria met, 1-7
  - identifying, 1-7
- acoustics specifications, 7-3
- additional information resources, xv
- airflow, 1-8
- ALPHABIOS console, 5-2
- AlphaStation 600A Series system
  - before you start the system, 1-2
  - connecting cables and the power cord, 1-11
  - connecting system components, 1-9
  - cooling, 1-8
  - description, 1-1
  - identifying the correct AC power cord, 1-7
  - installing, 1-8
  - preloaded operating system software (described), 1-14
  - preloaded operating system software (listed), 1-13
  - security, 1-19
  - starting, 1-12
  - switching console firmware, 1-14
  - turning off, 1-18

## B

---

- Beep codes
  - interpreting, 4-7
- Boot defaults
  - changing, 1-16
- Boot problems
  - troubleshooting, 4-15

## C

---

- cables
  - connecting, 1-11
- cleaning
  - keyboard, 6-2
  - monitor, 6-1
  - mouse, 6-2
  - system unit, 6-1
- Commands
  - basic, 5-39
  - comprehensive, 5-41
  - console, 5-39
  - limiting display, 5-41
- connecting cables and the power cord, 1-11
- connecting system components, 1-9
- connectors
  - rear panel, 2-6
- Console commands, 5-39
- Console event log, 4-8

## Index

- console firmware
  - switching, 1-14
- Console problems
  - troubleshooting, 4-14
- Console security, 5-54
- console subsystems, 5-1
- Consoles
  - and online help, 5-41
- controls and indicators, 2-4
- conventions used in this guide, xii
- cooling the system, 1-8

## D

---

- Digital UNIX
  - installing, 9-8
  - preparing to install, 9-7
- Drive problems
  - troubleshooting, 4-16

## E

---

- ECU. *See* EISA Configuration Utility
- EISA bus problems
  - troubleshooting, 4-20
- EISA configuration utility
  - before you run, 5-14
  - configuring EISA options, 5-14
  - description, 5-13
  - diskette, 5-13
  - on-line help, 5-14
  - volume label requirement, 5-13
- EISA Configuration Utility (ECU)
  - error messages, 4-20
  - using with Windows NT, 9-6
  - when to use, 1-15
- EISA slot numbering, 3-22
- Environment variables
  - boot, 1-16
  - changing default, 1-16
  - setting, 1-15

- environmental specifications (system unit), 7-2
- equipment log
  - additional components, 10-4
  - description, 10-1
  - hardware components, 10-2
  - hardware configuration, 10-3
  - SCSI device address settings, 10-3
  - software installed, 10-3
- Error beep codes, 4-7
- error codes, 4-27, 4-28
- Error messages
  - EISA Configuration Utility (ECU), 4-20
  - startup, 4-14
- expansion module contacts, 3-21
- expansion options
  - EISA bus, 3-22
  - installing a module
    - illustration, 3-23
    - procedure, 3-23
  - PCI bus, 3-22
  - PCI/EISA slot numbering, 3-22
- expansion slot current limitations, 7-6
- external drive bay devices
  - attaching the securing bracket and installing, 3-15
  - CD-ROM restrictions, 3-14
  - connecting the power and SCSI cables, 3-14
  - description, 3-12
  - installing, 3-13
  - power cable configuration, 3-17
  - SCSI addresses, 3-12
  - SCSI and device connector cable configuration, 3-16
- external system connector pin assignments
  - keyboard and mouse, 7-5
  - parallel port, 7-4
  - serial ports, 7-4

## F

---

- Fail-safe loader

- using, 4-26
- Fan problems
  - troubleshooting, 4-13
- flash enable jumper, 8-6
- front bezel
  - removing, 3-25

## G

- 
- Graphics options
    - environment variable, 4-14

## H

- 
- Hard disk
    - preparing for Windows NT, 9-3
  - hardware components
    - front panel controls, indicators, and drive bay locations, 2-4
    - keyboard, 2-3
    - PCI architecture, 2-2
    - rear panel connectors, 2-6
    - system unit, 2-1
  - Help
    - SRM console, 5-41
  - help command, 5-41

## I

- 
- installing system options
    - adding memory modules, 3-9
    - EISA and PCI expansion options, 3-21
    - external drive bay devices, 3-13
    - installing a SIMM, 3-10
    - internal drive bay devices, 3-18
    - operator control panel, 3-24
    - removing the left side panel, 3-3
    - replacing the left side panel, 3-6
    - system board components, 3-7
    - system memory, 3-9
    - system unit components, 3-2
    - wearing a grounded wrist strap, 3-1

- installing the system, 1-8
- internal drive bay devices
  - removing a device from the drive assembly
    - illustration, 3-20
    - procedure, 3-20
  - removing the drive assembly
    - illustration, 3-19
    - procedure, 3-18
  - replacing the drive assembly in the system unit, 3-21

## J

- 
- Jumper settings
    - system board, 7-8
  - jumpers
    - system board, 7-7

## K

- 
- keyboard
    - adjusting the angle, 2-3
    - cleaning, 6-2
    - key groups and functions, 2-4
    - layout, 2-3
    - no response to commands, 4-6
  - keyboard connector pinouts, 7-5
  - Keyboard problems
    - troubleshooting, 4-23

## L

- 
- left side panel
    - removing, 3-3
    - replacing, 3-6

## M

- 
- memory
    - installing, removing, 3-9
  - memory modules, 3-9
    - installing, 3-10
    - removing, 3-11

## Index

memory options  
  sizes, 3-9

Monitor. *See also* SVGA, VGA monitor  
  cleaning, 6-1

Monitor problems  
  troubleshooting, 4-22

mouse  
  cleaning, 6-2  
  no response to commands, 4-7

mouse connector pinouts, 7-5

Mouse problems  
  troubleshooting, 4-23

moving the system, 6-3

## N

---

network connection, 1-12

Network problems  
  troubleshooting, 4-20

## O

---

OCP. *See* operator control panel

OpenVMS  
  installing, 9-10  
  preparing to install, 9-8  
  verifying version, 9-8

Operating system defaults  
  changing, 1-16

Operating system problems  
  troubleshooting, 4-16

Operating system type  
  setting for Digital UNIX, 9-7  
  setting for Windows NT, 9-2

operator control panel  
  rotating  
    illustration, 3-26  
    procedure, 3-24

Option card problems  
  troubleshooting, 4-20

organization of this guide, xi

Overheating problems  
  troubleshooting, 4-24

## P

---

PALcode, 9-10

parallel port connector pinouts, 7-4

PCI architecture, 2-2

PCI bus problems  
  troubleshooting, 4-21

PCI slot numbering, 3-22

plastic filler panel  
  caution relative to overheating, 1-8  
  removing, 3-13

posture and work habits  
  precautions, 1-3  
  recommendations, 1-5  
  warning, 1-6

power cord  
  connecting, 1-11

power requirements  
  input, 7-7  
  output, 7-6

Power supply problems  
  troubleshooting, 4-13

preloaded operating system software  
  described, 1-14  
  listed, 1-13

Printer problems  
  troubleshooting, 4-24

processor features, 7-2

## R

---

RAID Configuration Utility (RCU), 4-24

RAID device problems  
  troubleshooting, 4-24

removing a plastic filler panel, 3-13

removing the front bezel, 3-25



**S**


---

SCSI adapters, 3-14

security

lock, 1-19

passwords, 1-19

serial port connector pinouts, 7-4

set console graphics command, 9-3

set password command, 5-54

set secure command, 5-54

show\_status command, 4-11

shutdown commands, 1-19

SIMM

installing, 3-10

special notices used in this guide, xv

SRM console

commands, 5-39

conventions, 5-43

description, 5-39

help, 5-41

shortcut keys, 5-44

SRM console commands

boot

examples, 5-46

syntax, 5-45

ecu

syntax, 5-47

environment variables

auto\_action, 5-53

boot\_file, 5-53

boot\_osflags, 5-53

bootdef\_dev, 5-53

console, 5-53

os\_type, 5-53

pci\_parity, 5-53

set

examples, 5-48

syntax, 5-47

show

examples, 5-50

syntax, 5-49

starting the system, 1-12

Startup screen display problems

troubleshooting, 4-14

status codes, 4-27

Storage drive problems

troubleshooting, 4-16

switching console firmware, 1-14

system

starting, 1-12, 1-13

turning off, 1-18

system board jumpers

description, 7-7

location, 7-9

settings, 7-9

system care

cleaning the keyboard, 6-2

cleaning the monitor, 6-1

cleaning the mouse, 6-2

cleaning the system unit, 6-1

installing the system at a new location, 6-4

moving the system, 6-3

packing the system, 6-4

system components

connecting, 1-9

system cooling, 1-8

system firmware

description, 8-1

flash enable jumper, 8-6

system shutdown commands, 1-19

system unit

components, 3-2

description, 2-1

dimensions, 7-2

SYSTEMCFG (volume label), 5-13

**T**


---

technical specifications

expansion slot current limitations, 7-6

## Index

- external system connectors
  - keyboard and mouse, 7-5
  - parallel port, 7-4
  - serial port, 7-4
- system board jumpers
  - description, 7-7
  - location, 7-9
- system current requirements, 7-6
- system specifications
  - acoustics specifications, 7-3
  - dimensions, 7-2
  - environmental specifications, 7-2
  - processor features, 7-2
- Temperature sensor, 4-24
- Terminal problems
  - troubleshooting, 4-22
- test command, 4-8
- troubleshooting
  - diskette drive cannot read or write, 4-19
  - equipment log, 4-28
  - error codes, 4-27

- initial, 4-2
- no response to keyboard commands, 4-6
- no response to mouse commands, 4-7
- no screen display, 4-4
- overview, 4-2
- power indicator not on, 4-4
- status codes, 4-27
- system does not boot, 4-5
- target boot device not listed, 4-6

turning off the system, 1-18

## U

---

Utility update diskette

- using, 4-26

## W

---

wide-to-narrow SCSI adapters, 3-14

Windows NT

- preparing to install, 9-1
- verifying version, 9-1