Digital AlphaStation™ 255 Family

User Information

Order Number: EK-VLLXA-UI. B01

Digital Equipment Corporation
Maynard, Massachusetts

FCC Information - Class B

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

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

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

- Reorient or relocate the receiving antenna

- Increase the separation between the equipment and receiver

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

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

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

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

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

Contents

Contents

3 Configuring Your System

4 Installing System Options

5 Troubleshooting

Contents

A System Care

B Technical Specifications

C Device Mapping

D Updating System Firmware

E Starting an Operating System Installation

F Equipment Log

Index

FIGURES

TABLES

Contents

Preface

Welcome to the Digital AlphaStation 255 Family

This guide introduces the family of Digital AlphaStation 255 systems, the latest in the Value-Line Engineering series of AlphaStation products.

Use this information to start, use, update, troubleshoot, and configure your Digital AlphaStation 255 system. You can also find general system information such as console commands and system care here.

These systems include a new power-management feature, which ensures that the system uses significantly less power when it is idle. (Details on power-management hardware capabilities of the family of 255 systems are available in the *Digital Alphastation 255 Family Technical Information*.)

Audience

If you are operating, configuring, or adding options to the Digital AlphaStation 255 system, the information included here is helpful to you.

Organization of the Information

This guide includes information on AlphaStation 255 systems. The following topics (see the Table of Contents for a detailed listing) are covered:

- Chapter 1, *Getting Started*. Installing, starting, restarting, and turning off the system

- Chapter 2, *System Overview*. Energy-efficiency features, motherboard, keyboard, system controls, indicators, ports, and connections

- Chapter 3, *Configuring Your System.* Using AlphaBIOS firmware and SRM firmware.

- Chapter 4, *Installing System Options*. Installing hard disk, compact disc, and tape drives; memory; option cards; printer cable; and external SCSI cable

- Chapter 5, *Troubleshooting*. Possible causes and actions to solve problems.

- Appendix A, *System Care*. Cleaning your system, monitor, and mouse.

- Appendix B, *Technical Specifications.*

- Appendix C, *Device Mapping*. I/O addresses and interrupts.

- Appendix D, *Updating System Firmware.*

- Appendix E, *Starting an Operating System Installation.*

- Appendix F, *Equipment Log.*

Conventions

This guide uses the following conventions:

Example	Description
`c:\windows`	Monospaced text indicates file names, path names, directories, or screen text. Each operating system has its own specific syntax.
[Enter]	Square brackets surrounding text represent a key on the keyboard.
[Ctrl]+[R]	A plus sign indicates that you press both the keys shown at the same time.
auto_action	Italic text indicates environment variables. Italic is also occasionally used for emphasis.
☞	A pointing hand indicates a reference to additional information.

Abbreviations

This guide uses the following abbreviations:

Abbreviation	Meaning
CD	Compact disc.
CD-ROM	Compact disc read-only memory.
CPU	Central processing unit.
DMA	Direct memory access.
DRAM	Dynamic random access memory.
DROM	Diagnostic read only memory.
FDC	Floppy disk controller.
flashROM	Electrically erasable, rewriteable, nonvolatile memory.
GB	A GB suffix to a numerical value indicates size in *gigabytes* (for example, 1 GB). A gigabyte equals 1,073,741,824 bytes.
IRQ	Interrupt request.
ISA	Industry-standard architecture.
Kb	A Kb suffix to a numerical value indicates size in *kilobits* (for example, 512 Kb). A kilobit equals 1024 bits.
KB	A KB suffix to a numerical value indicates size in *kilobytes* (for example, 640 KB). A kilobyte equals 1024 bytes.

Preface

Abbreviation	Meaning
LED	Light-emitting diode.
Mb	An Mb suffix to a numerical value indicates size in *megabits* (for example, 10 Mb). A megabit equals 1,048,576 bits.
MB	A MB suffix to a numerical value indicates size in megabytes (for example, 550 MB). A megabyte equals 1,048,576 bytes.
MHz	Megahertz.
MAU	Media adapter unit.
ns	Nanoseconds.
NVRAM	Nonvolatile random access memory.
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	Digital UNIX and OpenVMS console firmware.
SROM	Serial read only memory.

Special Notices

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

_____ **WARNING** _____

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

_____ **CAUTION**_____

A CAUTION indicates the presence of a hazard that can damage hardware or corrupt software.
_____

_____**NOTE** _____

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

_____ **HINT**_____

A HINT includes suggestions to make your computing tasks easier.
_____

Additional Information Resources

You may wish to consult the following information resources on your Digital AlphaStation 255 system:

- *Digital AlphaStation™ 255 Family Installation Information* (order number EK-VLLXA-II) presents a graphical overview of the Digital AlphaStation 255 system installation.

- *Digital AlphaStation™ 255 Family Technical Information* (order number EK-VLLXA-TI). This optional manual contains detailed technical information for value-added resellers (VARs) and independent software vendors.

Preface

Users whose systems have the Windows NT operating system may wish to consult the *Digital AlphaBIOS User's Guide*, available on the World Wide Web (http://www.windowsnt.digital.com/support/alphabios/), for further technical details on AlphaBIOS firmware. This online guide introduces the AlphaBIOS firmware and gives directions on configuring, starting, updating, and troubleshooting Alpha systems.

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

1
Getting Started

Introduction

Your Digital AlphaStation 255 system 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 start, install, restart, and turn off your system. You can also find information here about preloaded software as well as guidelines for system security. Figure 1–1 shows a typical Digital AlphaStation 255 system.
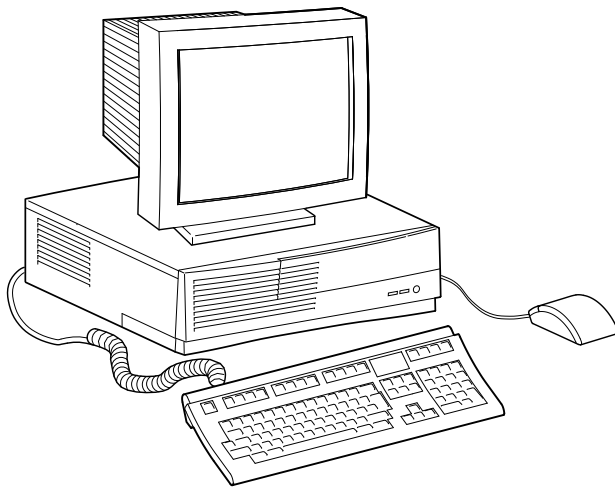
Figure 1–1: AlphaStation 255 System

Before Starting Your System

Before you start your system, perform the following steps:

1. Review the information supplied with your system.

2. Select a well-ventilated site for your system near a grounded power outlet and away from sources of excessive heat. The site also should be isolated from electric noise (for example, 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.

_____ **NOTES** _____

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

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

_____

_____ **WARNING** _____

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.

_____

Posture and Work Habits

If you exercise poor posture while you work or if your equipment is poorly set up, certain recent scientific articles suggest that personal injury may result. Other articles suggest that there is no cause and effect. Because the safety of our users is a great concern to Digital Equipment Corporation, we strongly urge that you read and follow the precautions outlined in Figure 1–1 and Table 1–1. In addition, be sure to adjust your work space so that you are comfortable, and change your position frequently.
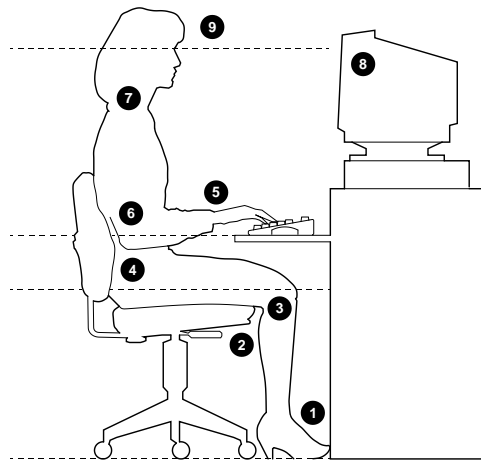
Figure 1–2: Recommendations for Posture and Work Habits

Table 1–1: Recommendations for Posture and Work Habits

Adjust	To allow the following conditions
Chair	1. Feet are flat on the floor.
	2. Legs are vertical and form a right angle to the floor.
	3. Your thighs are horizontal, and they are not bearing weight. Keep the backs of your knees away from the seat so you do not compress the area behind them, which could restrict the blood flow.
	4. Your upper body is erect and your lower back is supported with a backrest.
Keyboard and Mouse	5. 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.
	6. Upper arms are straight down at your sides, and elbows are close to your sides and support your arm weight. Forearms are at a 70- to 90-degree angle.

Table 1–1: Recommendations for Posture and Work Habits *(continued)*

Head	7. Avoid neck strain. Your head should incline downward, but no more than 15 to 20 degrees.
Monitor	8. No higher than the level of your eyes and at the correct distance for your vision.
	9. 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.
Lighting	Avoid direct lighting or sunlight on the screen, which causes glare and reflections. Place lighting behind or to the side of your work area, and distribute the lighting evenly on your work area.
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	20 – 23 degrees C (68 - 74 degrees F)
Humidity	30% – 70%
Ventilation	Provide adequate air ventilation to operate the equipment and avoid fatigue.
Work Space	> 70 cm (28 inches) center to center, preferably between > 152 cm (60 inches).

_____**WARNING**_____

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.

_____

Identifying the Correct AC Power Cord

Your Digital AlphaStation 255 system came with the customer-selected AC power cord. Because there are country-specific variations, and systems may be moved, please inspect your power cord to ensure 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 before you use it.

_____ **WARNING** _____

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

_____

Power cords supplied with the Digital AlphaStation 255 system meet the following criteria:

- UL and CSA Certified cord rated for use at 250 Volts AC with a current rating that is at least 125% of the current rating of the Digital AlphaStation 255 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-type CEE-22 female connector.

- The cord length does not exceed 4.5 meters (14.5 feet).

Installing Your System

The Digital *AlphaStation 255 Family Installation Information* you received with your system graphically outlines the steps to follow in installing your system.

_____ **CAUTIONS** _____

1. To ensure proper cooling, verify that air can flow freely into the system front and out the system rear and left side.

2. The system is designed to be installed horizontally on a desktop. Do not use a stand or rack that would hold the system on its side unless it is a Digital stand that is approved for your system.

_____

Check to make sure that you received all your system components. (See Appendix F, Equipment Log, to list your equipment.) If something is missing, please contact your distributor or Digital representative.

Position your system so that air can flow freely to and from the vents, as Figure 1–3 shows. Take care not to block any of the vents.
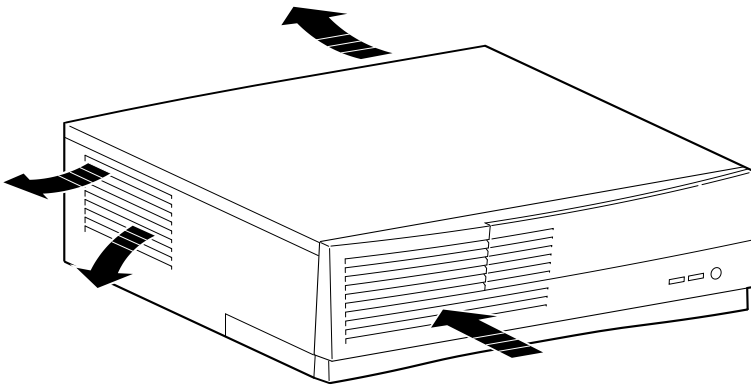
Figure 1–3: System Airflow

Connecting System Parts

To connect the components of your Digital AlphaStation 255 system, perform the following steps:

1. Confirm that the voltage selector switch matches your local voltage (either 115 Volts or 230 Volts), as Figure 1–4 shows.
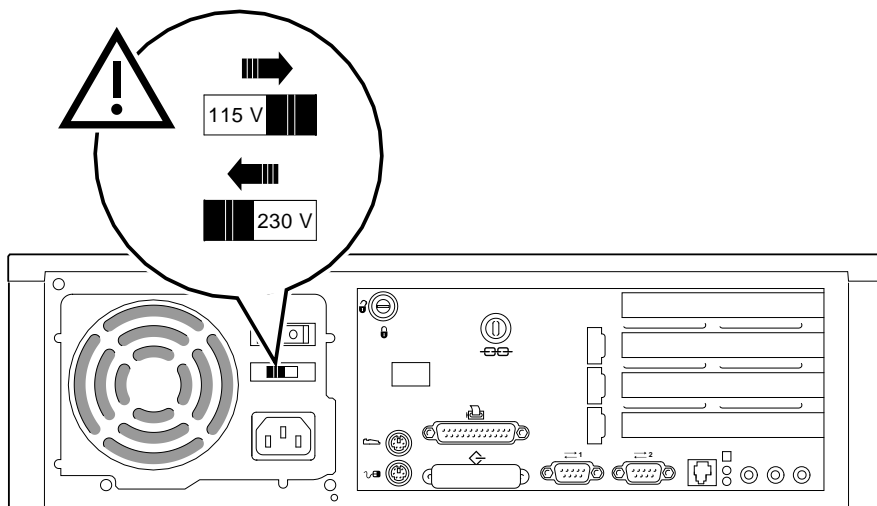
Figure 1–4: Voltage Selector Switch

_____ **CAUTION**_____

Improper voltage selection can damage the system's power supply!
_____

2. Ensure that the power switch is in the off (O side pushed in) position.

3. Connect the mouse, keyboard, video cable, microphone, headphone, and power cords to the system components, as Figure 1–5 shows.
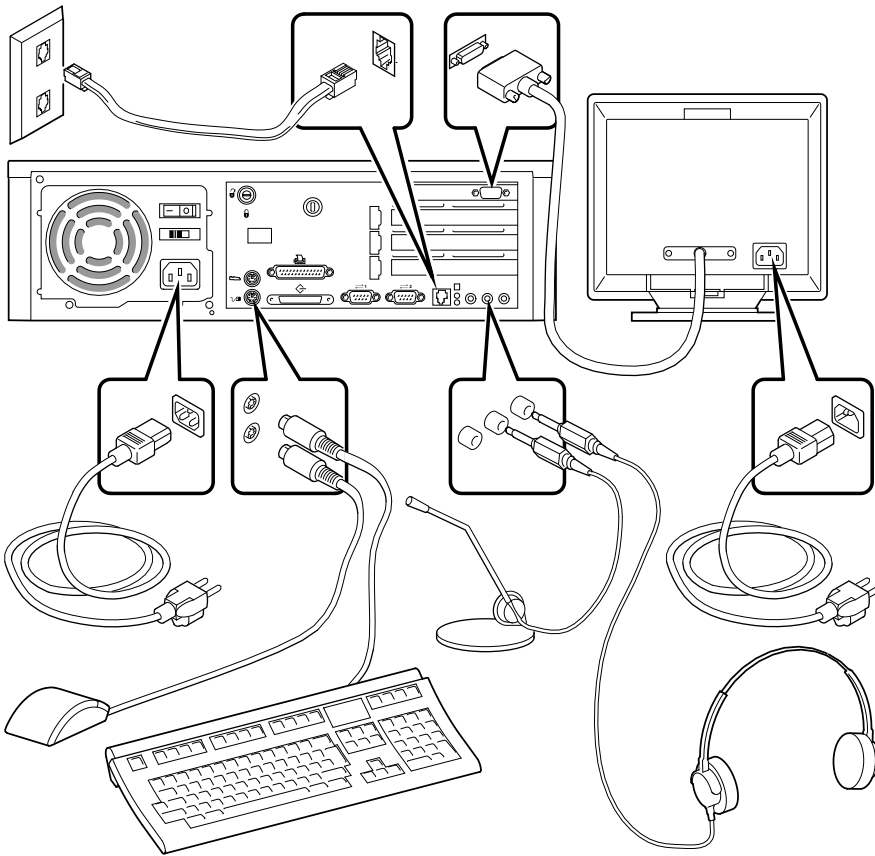
Figure 1–5: Connecting Cables and Power Cords

4. If you have an external SCSI (small computer system interface) device or SCSI storage box, connect the SCSI cable to the SCSI port on the rear of the system. See the SCSI Termination section in Chapter 5, Troubleshooting.

Network Connection

The AlphaStation 255 system has an embedded Ethernet controller with a twisted-pair connector (RJ45) located on the rear of the system. You can order an optional media adapter unit (MAU) (part number PBXDC-DA) if your system needs a ThinWire connection.

Connect your system to the network using the appropriate port. If you are using the Digital UNIX or OpenVMS operating systems, the ThinWire port is selected by default. You can change port types by using the following SRM console commands:

>>>set ewa0_mode twisted	(for the twisted pair [10Base-T] port)
>>>set ewa0_mode AUI	(for the ThinWire port)

After changing the port, type >>>init or power cycle the machine.

Starting Your System

Perform the following steps, in order, to start (boot) your Digital AlphaStation 255 system:

1. Turn on the system unit power, monitor power, and any external devices. Figure 1–6 shows the location of the system unit power button.
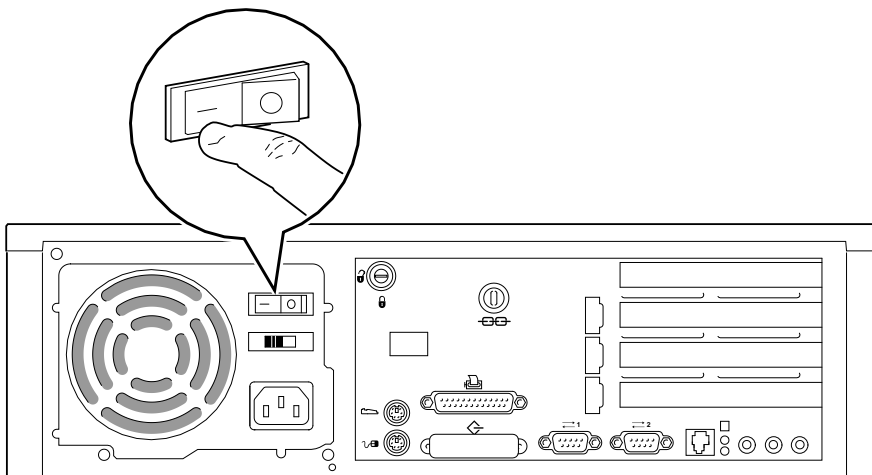
Figure 1–6: Starting Your System

2. After waiting for the monitor to warm up, if necessary, adjust the contrast and brightness to obtain a readable screen display. (Refer to the information supplied with your monitor for adjustment instructions.)

3. Allow your system to complete any power-on self tests and device initialization messages. (This takes approximately 1 minute.) If you are using the OpenVMS or Digital UNIX operating systems, and the *auto_action* environment variable is set to "boot," the system starts as soon as the self tests have completed. If you are using the Microsoft Windows NT Workstation operating system and autoboot is enabled, the system starts after a countdown expires (default is 30 seconds).

Preloaded Operating System Software

If you ordered a Digital UNIX or OpenVMS version of the AlphaStation 255 system, your operating system came preloaded. If you ordered a Microsoft Windows NT Workstation version, the operating system is not preloaded. Disk 0 on the first SCSI bus, however, is partitioned and formatted so that you can immediately install the operating system.

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

☞ For more information on environment variables, see Chapter 3, Configuring Your System.

Microsoft Windows NT Workstation

If you ordered a system with the Microsoft Windows NT Workstation operating system, you will see the following display after system power-on and initialization:

```
AlphaBIOS Version 5.10

Please select the operating system to start:
    Windows NT Workstation 3.51
    Windows NT Workstation 3.51 (test)


Use ↑ and ↓ to move the highlight to your choice.
Press Enter to choose.



  digital™

                              Press <F2> to enter SETUP
```

If autoboot is enabled, a countdown timer [default 10 seconds] is displayed on the boot screen. Booting occurs when the timer expires.

Digital UNIX

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

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

OpenVMS Alpha

If you are using the OpenVMS Alpha (hereafter called OpenVMS) operating system, you see either a >>> prompt (if *auto_action* is set to Halt) *or* the system proceeds to boot OpenVMS (if *auto_action* is set to Boot) when you power on your system.

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

Switching Console Firmware

AlphaStation 255 console firmware resides in flashROM. The flashROM is loaded with SRM firmware for OpenVMS and Digital UNIX systems *or* AlphaBIOS firmware for Windows NT systems. You can change from SRM to AlphaBIOS or from AlphaBIOS to SRM by using the Firmware Update Utility. (Refer to Appendix D, Updating System Firmware.) You do not need to modify your system hardware. The operation simply re-programs the firmware flashROM.

If No Operating System Is Installed

☞ If an operating system was not *preloaded* on your system, refer to your operating system documentation for information on loading. (See also Appendix E, Starting an Operating System Installation.)

Turning Off Your System

Before turning off your system, save and close all open files. If you turn the system off without saving and closing files, you might lose some or all of your work.

Perform the following steps, in order, to turn off your system:

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 1–2 below:

Table 1–2: Operating System Shutdown

Operating System	Action
Microsoft Windows NT Workstation	From the Program Manager File Menu, choose Shutdown *or* press [Ctrl]+[Alt]+[Del]. Choose the OK button to confirm.
Digital UNIX	Type the following from a superuser account: `shutdown -h now`
OpenVMS	Type the following from a privileged account: `@sys$system:shutdown`

3. Wait for the operating system to complete the shutdown process. For OpenVMS and Digital UNIX, the SRM console prompt (>>>) is displayed. Microsoft Windows NT Workstation 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 has completed.

Computer Security

Your Digital AlphaStation 255 system includes several security-related features. See your operation system documentation for more information on the use of these options.

Optional Lock

To provide system security, you may wish to purchase an optional Kensington lock (order number PCP3H-AG) for your Digital AlphaStation 255 system.

Passwords

For additional security, most screen saver and pause screen displays can have password protection enabled. Also, see the discussion of AlphaBIOS and SRM console security in Chapter 5, Troubleshooting, of this text.

2
System Overview

Introduction

This chapter provides an overview of the Digital AlphaStation 255 system. Topics covered include the system's new energy-management feature as well as hardware components, including the motherboard, PCI (peripheral component interconnect) architecture, front panel, rear panel, system unit components, and keyboard.

Energy Management

Digital AlphaStation 255 systems include a new power-management feature. This feature ensures that, when the system is idle, it uses significantly less power. (Details on power-management hardware capabilities of the family of 255 systems are available in the *Digital Alphastation 255 Family Technical Information*.)

System Features

Your Digital AlphaStation 255 system uses a high-performance DECchip 21064A CPU (central processing unit). System features include:

- Memory (DRAM): Up to 1 GB (gigabyte) DRAM

- Primary cache: 16-KB instruction cache and 16-KB data cache on chip.

- Secondary cache: 1 MB.

- Data path: a 132-bit-wide (128 bits of data plus 4 bits of parity) data bus.

- PCI bus adapter with a 32-bit wide multiplexed address/data bus.

- Floppy disk controller.

- Two front-accessible I/O bays: one for 3.5 by 1-inch floppy and one for 5.25 by 1.6-inch CD-ROM/tape drive.

- Bays for one or two internal hard drives: two 3.5 by 1-inch hard disk drives *or* one 3.5 by 1.6-inch hard disk drive and one 3.5 by 1-inch hard disk drive.

- SCSI-2 controller connects directly to the on-board PCI bus and supports up to seven 8-bit, single-ended SCSI devices (such as hard disk drives and CD-ROM drives) running at up to ten million transfers per second (fast SCSI).

- Four I/O slots (PCI, ISA, and PCI/ISA combination) are distributed as follows: two PCI, one combination PCI/ISA, and one ISA.

- Keyboard and mouse ports.

- Two serial ports.

- Ethernet twisted-pair connector.

- One enhanced bidirectional parallel port.

- High-performance graphics adapter.

☞ Refer to Appendix B, Technical Specifications, for additional information.

PCI Architecture

Your system's PCI architecture represents the latest advances in local bus technology. The Digital AlphaStation 255 system's PCI architecture delivers maximum performance by providing a wider data path, greater speed, and improved expandability. PCI removes various types of peripheral controllers from the slower ISA bus and connects them directly to a wider, faster data path. The result is faster data transfers for devices such as SCSI controllers and high-end video adapters—a critical advantage when you are running graphic- and I/O-intensive software.

The PCI bridge chip (in the chipset) can be the PCI bus master, generating cycles on the PCI bus, or it can act as a bridge between the PCI bus and memory. It can generate all types of PCI cycles and responds to cycles initiated by devices requiring access to memory. It performs translation of addresses supplied by other PCI devices acting as bus masters.

The PCI interface clock speed is fixed at 33.33 Mhz, for a 30.0 ns cycle time. The theoretical maximum instantaneous burst data rate is 132 MB/s.

The PCI includes PCI-to-ISA bridge capability that allows you to use commonly available ISA options.

SCSI Controller

The Digital AlphaStation 255 system has a fast SCSI-2 controller that controls up to seven SCSI peripherals such as hard disk drives, CD-ROM (compact disc read only memory) drives, and tape drives.

System Front View

Figure 2–1 is a front view of the system showing the location of the controls and indicators. Table 2–1 describes these items.
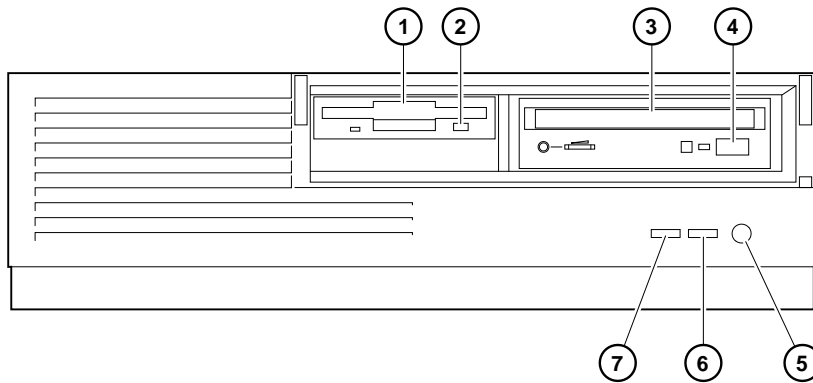
Figure 2–1: Front View of System

Table 2–1: Front Components

Figure Legend	Control or Indicator	Function
1	Floppy drive (optional)	Location of 3.5-inch drive bay.
2	Floppy eject button	Ejects floppy diskette when pushed.
3	CD-ROM drive	5.25-inch half-height front-accessible drive bay.
4	CD-ROM eject button	Opens the CD loading drawer.
5	Reset button	This button resets the system and causes the self-test to run.
6	Power indicator	Lights when the system is on.
7	Disk activity indicator	Lights when a hard disk drive on the embedded SCSI controller bus is in use.

System Rear View

Figure 2–2 shows the rear connectors and lock. Table 2–2 lists the rear connectors and lock and describes their functions.
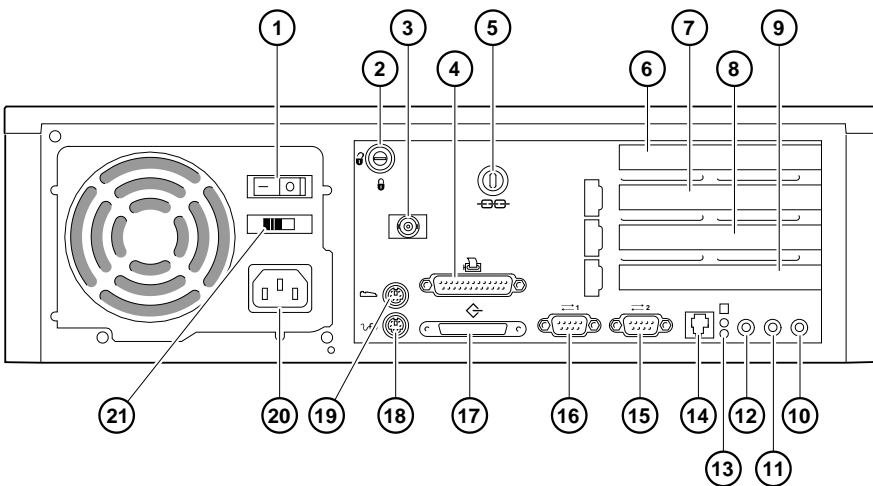
Figure 2–2: Rear Connectors

Table 2–2: Rear Connectors

Figure Legend	Connector	Function
1	Power on/off switch	Turns AC power on or off.
2	Key lock	Locking mechanism for system cover.
3	MAU	Media adapter unit (optional).
4	Enhanced bidirectional parallel port	Connects an industry-standard parallel printer or other parallel device.

Table 2–2. Rear Connectors *(continued)*

Figure Legend	Connector	Function
5	Kensington lock (optional)	Point for attaching the system to another point for security.
6	Expansion slot	PCI slot.
7	Expansion slot	PCI slot.
8	Expansion slot	Combination slot (PCI or ISA, 1/2 sized).*
9	Expansion slot	Used for ISA expansion options.
10	Headphone jack	Connector for the headphones or customer-supplied external speakers.
11	Microphone jack	Connector for the microphone.
12	Line-in connector	Brings audio signals into the system.
13	Network LEDs	Green indicates that the system is linked to the network. Yellow indicates network activity.
14	Twisted pair connector	Connector to the embedded Ethernet controller.
15	COM port 2	Connector for communications port 2.
16	COM port 1	Connector for communications port 1.
17	SCSI port	Provides the interface between the system unit and external SCSI devices. This connector must have a terminator if no SCSI devices are present.
18	Mouse connector	Connects a PS/2-compatible mouse.
19	Keyboard connector	Use to connect a 101- or 102-key keyboard.
20	AC power connector	Connects the system to AC power.
21	Voltage selector switch	Allows you to set your system to work with 115 or 230 Volts AC power.

* The PCI/ISA combination slot cannot be used by OpenVMS users.

System Unit Components

Figure 2–3 shows the location of the Digital AlphaStation 255 system unit components. Table 2–3 lists the system unit components.
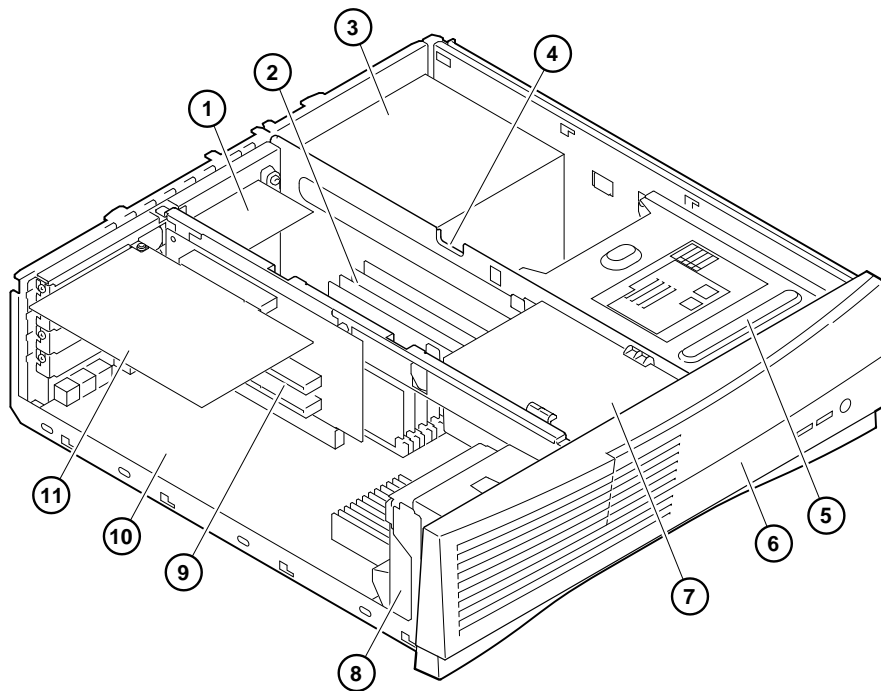
Figure 2–3: System Unit Components

Table 2–3: System Unit Components

Figure Legend	Component
1	Media adapter unit (MAU) (optional). Provides ThinWire Ethernet connections.
2	Memory SIMMs (up to two banks of 4 SIMMs each).
3	Power supply with internal fan.
4	Cable routing areas.
5	CD-ROM drive. Located below the CD-ROM drive is storage for one 1.6-inch-high 3.5-inch hard drive or two 1-inch-high 3.5-inch hard drives.
6	Speaker.
7	3.5-inch, 1.44-MB floppy disk drive (optional).
8	Cooling fan.
9	Riser card for ISA and PCI option cards.
10	Motherboard.
11	Typical PCI option card (size varies with option).

Motherboard

Figure 2–4 shows the locations of the motherboard components. Table 2–4 lists the motherboard components.
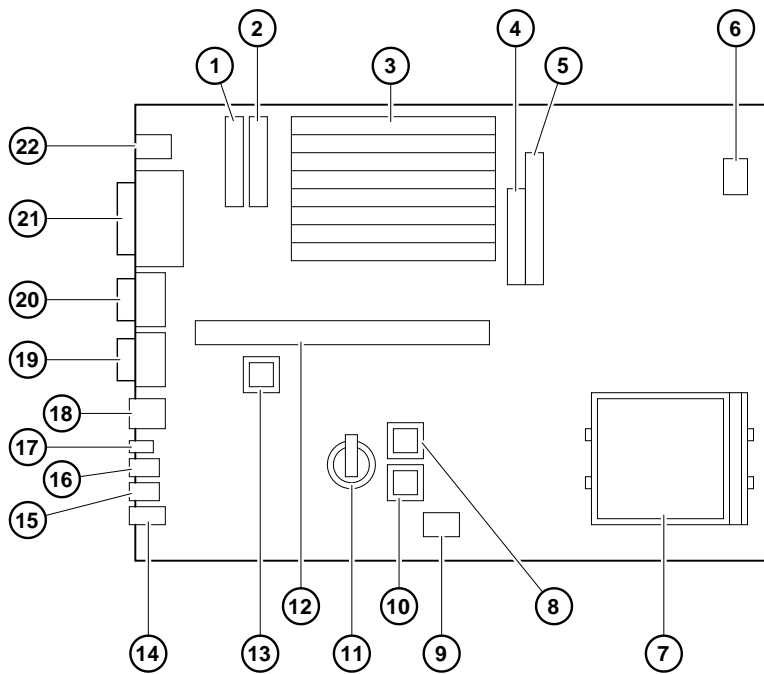
Figure 2–4: Motherboard Components

Table 2–4: Motherboard Components

Figure Legend	Components
1	Power (+/- 12, +/-5 VDC) connector.
2	Power (+3.3 VDC) connector.
3	Memory banks (up to two banks of four SIMMs each).
4	Floppy disk controller (FDC) connector.
5	Internal SCSI connector.
6	Front-panel connector.
7	DECchip 21064A CPU (socketed).
8	Interrupt PAL.
9	Factory diagnostic port.
10	Factory serial ROM (if present).
11	Battery.
12	Riser card connector.
13	Ethernet ID ROM.
14	Headphone jack.
15	Microphone jack.
16	Audio line in jack.
17	Network LEDs.
18	Twisted-pair Ethernet connector.
19	COM 2 port.
20	COM 1 port.
21	External SCSI port and parallel port.
22	Mouse and keyboard connectors.

Keyboard

Your system is equipped with a customer-selected 101-key enhanced keyboard (similar to the one shown in Figure 2–5) that allows you to communicate with your system by entering data or commands. (Depending upon which operating system you ordered, your particular keyboard may vary from the one shown here.) Notice that some European language keyboards have 102 keys. You can adjust the keyboard angle for your comfort. The underside of the keyboard has feet that swing down and lock into place. Refer to Table 2–5 for information on keyboard key groups and functions.

☞   Refer to your operating system or application software documentation for software-specific key functions.
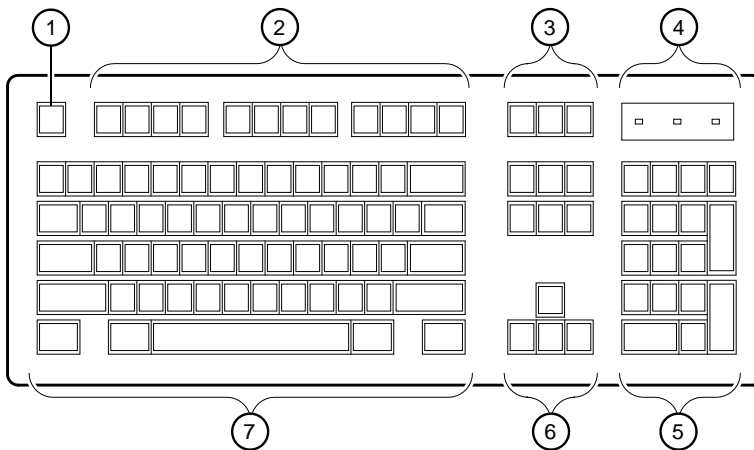
Figure 2–5: Keyboard

Table 2–5: Key Groups and Functions

Figure Legend	Key, Key Group	Function
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.

Table 2–5: Key Groups and Functions *(continued)*

Figure Legend	Key, Key Group	Function
4	Indicator lights	Indicates whether the 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	The keys are typewriter-specific.

3
Configuring Your System

Introduction

This chapter shows you how to configure your AlphaStation 255 system. The firmware used to configure your system depends the operating system being used. Systems running the Microsoft Windows NT Workstation operating system use the AlphaBIOS firmware. Systems running the OpenVMS or Digital UNIX operating systems use the SRM firmware.

Configuring with AlphaBIOS Firmware

AlphaBIOS firmware supports the Microsoft Windows NT Workstation operating system. You can use AlphaBIOS firmware to perform various configuration tasks, such as:

- Selecting a copy of the Windows NT system to boot.

- Displaying system configuration information.

- Setting up the hard disk.

- Setting the date and time.

- Enabling and setting the delay for auto start.

- Setting or changing the AlphaBIOS password.

Starting AlphaBIOS

When the system is powered on, and the power-on self-tests (POST) sucessfully completes, the AlphaBIOS firmware is loaded and started. AlphaBIOS performs several initialization tasks. Among them are, initialize the keyboard and video devices, test memory, and detect and initialize SCSI disk controllers. After the video device is initialized, subsequent steps are displayed on the monitor in an initialization window.

When the SCSI initialization is complete, AlphaBIOS leaves the initialization window and displays the boot screen.

Booting the System

The system is booted from the boot screen (Figure 3–1). The boot screen lists each of the different copies of the Windows NT operating system that have been installed on your system. Choose the operating systems to boot and press [Enter]. Enter the AlphaBIOS Setup program by pressing [F2].

```
AlphaBIOS Version 5.10

Please select the operating system to start:

    Windows NT Workstation 3.51
    Windows NT Workstation 4.00 (Beta)

Use ↑ and ↓ to move the highlight to your choice.
Press Enter to choose.




digital Alpha

                              Press <F2> to enter SETUP
```
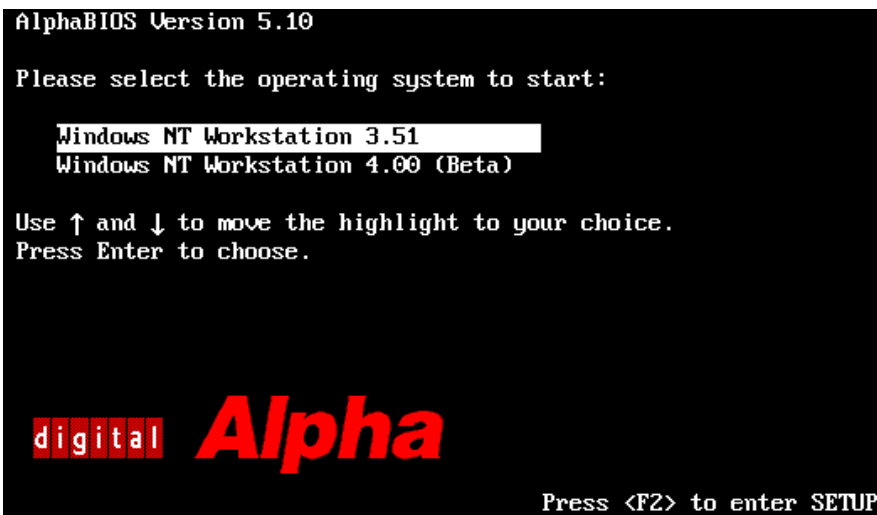
Figure 3–1: AlphaBIOS Boot Screen

AlphaBIOS Setup

Start the AlphaBIOS Setup program by pressing [F2] while the boot screen is displayed. Figure 3–2 shows the AlphaBIOS Setup screen. Use the setup screen to select the desired task. Press [Escape] to return to the boot screen.

```
AlphaBIOS Setup                               F1=Help

  Display System Configuration...
  Upgrade AlphaBIOS
  Hard Disk Setup...
  CMOS Setup...
  Install Windows NT
  Utilities                        ►
  About AlphaBIOS...



  Press ENTER to partition or format hard disks.



ESC=Exit
```
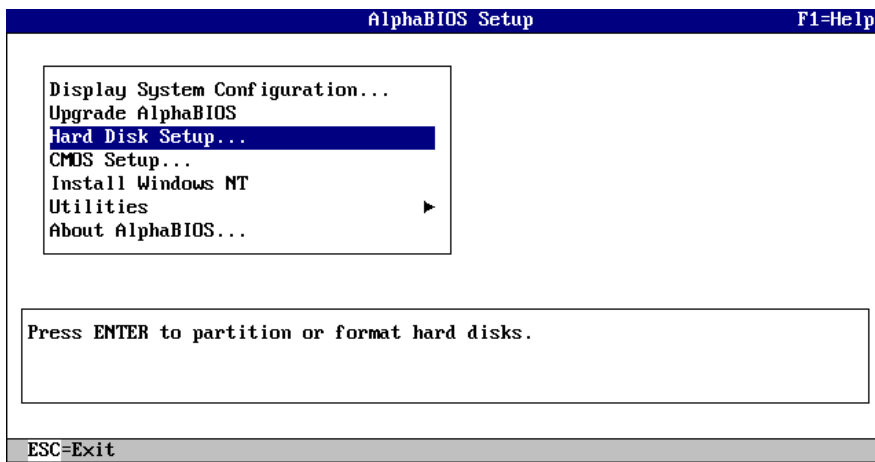
Figure 3–2: AlphaBIOS Setup Screen

Displaying Your Configuration

AlphaBIOS provides clear, easy-to-read display of the system configuration. The display is organized by systemboard, memory, hard disk, PCI, SCSI, and integrated devices. From the AlphaBIOS Setup screen, select Display System Configuration and press [Enter]. From the Display System Configuration screen, use the arrow keys to select the configuration category you wish to view. Figure 3–3 shows the Systemboard Configuration category.

```
        Display System Configuration                    F1=Help


    ┌─────────────────────────────────┐
    │ Systemboard Configuration       │
    │ Memory Configuration            │
    │ Hard Disk Configuration         │
    │ PCI Configuration               │
    │ SCSI Configuration              │
    │ Integrated Peripherals          │
    └─────────────────────────────────┘


    ┌──────────────────────────────────────────────────────┐
    │                                                      │
    │     System Type:  Digital Alpha XL Family            │
    │                                                      │
    │  Processor:  Digital Alpha 21164                     │
    │      Speed:   300 MHz                                │
    │      Cache:     2 MB                                 │
    │     Memory:    32 MB                                 │
    │                                                      │
    │  Floppy Drive A:  3.5" 1.44 MB                       │
    │  Floppy Drive B:  None                               │
    │        Keyboard:  U.S. 101-key keyboard             │
    │                                                      │
    │  AlphaBIOS Version:  5.10 (P4Beta)  951218.1416      │
    │                                                      │
    └──────────────────────────────────────────────────────┘

 ESC=Exit
```

Figure 3–3: Display System Configuration Screen

Memory Configuration

The memory configuration display shows bank size, the starting address of each bank, and the capacity of the SIMMs in the bank.

Hard Disk Configuration

The hard disk configuration screen displays information about recognized disk drives. The display includes the drive type and capacity as well as partition sizes and formats. The lowest-numbered drive is displayed as drive 0, even though its SCSI ID may be 1 or higher.

PCI Configuration

The PCI configuration screen displays both the embedded and the slot-mounted PCI devices. The device names and types, along with their respective revision levels, are displayed.

SCSI Configuration

The SCSI configuration screen displays SCSI device information. The SCSI IDs, device types (and sizes, if applicable), and a description of the devices are displayed.

Integrated Peripherals

The integrated peripherals screen display shows the addresses and IRQs of the serial and parallel ports.

Setting Up the Hard Disks

AlphaBIOS makes it easy to format and partition hard disks on the system. Typically, you partition and format drive 0. Using the Windows NT Disk Administrator, you can quickly partition and format the other drives. Select Hard Disk Setup from the AlphaBIOS Setup screen. Figure 3–4 shows the Hard Disk Setup screen.

```
                         Hard Disk Setup                      F1=Help

   Disk  0    NCRC810 #0, SCSI ID 0            1001 MB
              Partition 1                       995 MB        FAT
              Partition 2                         6 MB        FAT

   Disk  1    NCRC810 #0, SCSI ID 3             510 MB
              Partition 1                       200 MB        FAT
              Unused                            310 MB


    INSERT=New   DEL=Delete   F6=Format   F7=Express   ESC=Exit
```

Figure 3–4: Hard Disk Setup Screen

Press [F7] to perform an express disk setup. The express setup command partitions and formats the selected disk in the recommended manner (6 MB FAT system partition)

_____**NOTE** _____

AlphaBIOS refers to the SCSI disk with the lowest ID as Disk 0.

_____

CMOS Setup Tasks

Use the CMOS setup program to configure system parameters such as the date and time, floppy drive types and capacities, keyboard country and style, and auto start enabling and delay. There also is an advanced CMOS setup mode used to control PCI parity checking, memory testing, AlphaBIOS password, and SCSI termination.

To enter the CMOS Setup, select CMOS Setup from the AlphaBIOS Setup screen. Use [Tab] to move among the fields.

```
                            CMOS Setup                          F1=Help

    Date:  Tuesday,    December ↓ 19  1995
    Time:  13:22:27


    Floppy Drive A: 3.5" 1.44 MB
    Floppy Drive B: None
    Keyboard:  U.S. 101-key keyboard


    Auto Start: Enabled
    Auto Start Count:  30 Seconds


   ┌──────────────────────────────────────────────────────────────────┐
   │ Press ↑ or ↓ to modify date fields.  Date modifications will take effect │
   │ immediately.                                                       │
   │                                                                    │
   └──────────────────────────────────────────────────────────────────┘


  F3=Color  F6=Advanced  F7=Defaults  ESC=Discard Changes  F10=Save Changes
```
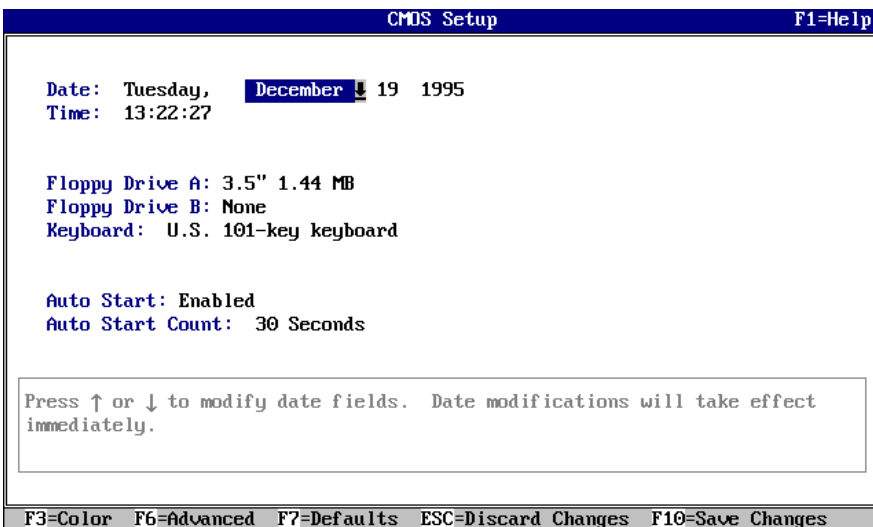
Figure 3–5: CMOS Setup Screen

Date and Time

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

Floppy Drive
AlphaBIOS supports the following drive types:

- 5.25-inch, 1.2-MB

- 3.5-inch, 1.44-MB

- 3.5-inch, 2.88-MB

Keyboard
The keyboard setting allows the use of nearly any language keyboard available. To ensure correct character mappings, make sure that the language of your keyboard, Microsoft Windows NT Workstation, and the keyboard-language selection in CMOS setup all match.

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 screen 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.

CMOS Setup Options
- **Color.** Pressing [F3] repeatedly cycles through the available AlphaBIOS color schemes.

- **Advanced.** Pressing [F6] displays the Advanced CMOS Setup screen.

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

- **Discard Changes.** Pressing [Escape] restores the settings that were 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.

Advanced CMOS Setup

Enter the advanced CMOS setup screen by pressing [F6] in the CMOS Setup screen.

```
                            CMOS Setup                          F1=Help

                        Advanced CMOS Setup                     F1=Help


    PCI Parity Checking:   Disabled ↓

    Power-up Memory Test:  Enabled

    AlphaBIOS Password Option:  Disabled

    SCSI Termination:  External


   Press ↑ or ↓ to enable or disable detection of PCI bus parity errors.
   Some non-compliant PCI option boards do not work properly with PCI parity
   checking enabled.


 ESC=Discard Changes   F10=Save Changes
```
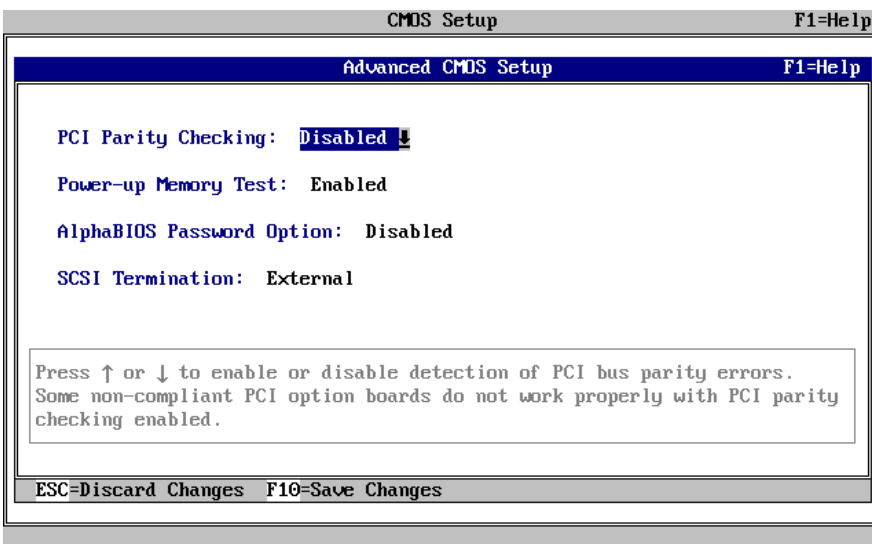
Figure 3–6: Advanced CMOS Setup Screen

PCI Parity Checking
This setting controls PCI parity checking at the PCI bridge chip. Parity checking is
performed if enabled and ignored if disabled. The default is disabled. Certain PCI
adapters have been known to generate bad parity on the PCI under certain loading
conditions, which results in system errors. Ensure that your specific PCI configuration will
operate correctly prior to turning on parity checking.

Extended Memory Test
Extended memory test can be enabled or disabled. When enabled, the memory test writes
and then reads several patterns of data to main memory. This testing verifies the integrity
of the memory.

Password Setup
To help maintain system security, AlphaBIOS provides two levels of password protection:
system setup and system startup. When system setup protection is enabled, you need a
password to enter the AlphaBIOS setup program. When system startup protection is
enabled, you must enter a password before system initialization will take place. Startup
password protection provides more comprehensive protection than setup password
protection because the system cannot be used until you enter the correct password.

_____**NOTE** _____

To change the password, simply set up your password again.

_____

SCSI Termination
The SCSI termination feature is not necessary on the AlphaStation 255 system. External devices are automatically detected, and termination is set appropriately.

Advanced CMOS Setup Options
- **Discard changes.** Pressing [Escape] restores the settings in effect when you entered advanced CMOS setup. This does not discard changes made to standard CMOS setup.

- **Save changes.** Pressing [F10] saves changes you have made in advanced CMOS setup. When exiting CMOS setup, you also must save your changes at the CMOS setup screen for the changes to be stored permanently.

Utilities

Two utilities, operating system selection and run a maintenance program, are available from the utilities menu.

OS Selection Setup

Each operating system selection is a set of information that describes the disk and partition containing OSLOADER.EXE.

```
            Operating System Selection Setup              F1=Help


Windows NT Workstation 3.51              Primary Operating System
Windows NT Workstation 4.00 (Beta)



  Boot Name:  Windows NT Workstation 3.51
  Boot File:  Disk 1, Partition 2    \os\winnt351\osloader.exe
  OS Path:    Disk 1, Partition 1    \WINNT351
  OS Options:



 INSERT=New     F6=Edit     F8=Primary    ESC=Discard Changes
 DEL=Delete     F7=Copy     F9=Validate   F10=Save Changes
```
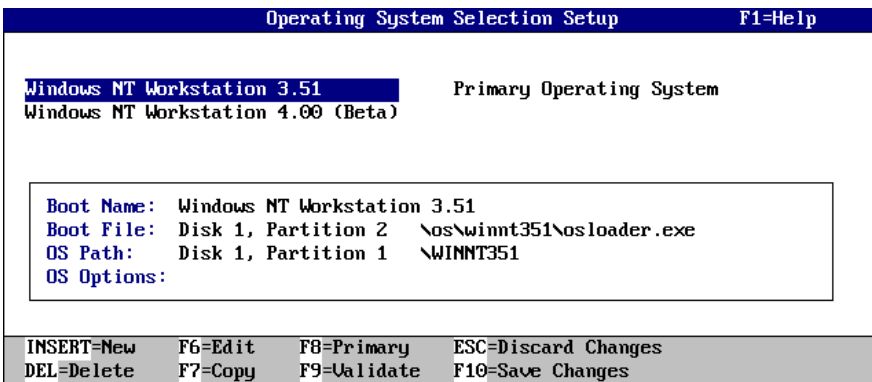
Figure 3–7: Operating System Selection

Running a Maintenance Program

A maintenance program, such as a RAID configuration utility, is run directly from the AlphaBIOS utility menu.

To run a maintenance program, follow this procedure:

1. Start AlphaBIOS setup, select Utilities, select Run Maintenance Program from the submenu, and press [Enter].

2. In the Current Partition field, select the hard-disk partition, floppy disk, or CD-ROM drive from which to run the program. Type the program name into the Program Name field.

Configuring with SRM Firmware

Introduction

Systems running the OpenVMS or Digital UNIX operating systems, use the SRM firmware. You can use the SRM firmware to perform various configuration tasks, such as:

- Booting the system.

- Setting environment variables.

- Displaying the system configuration.

- Adding ISA bus devices.

Conventions

Table 3–1 shows the conventions used in SRM firmware.

Table 3–1: SRM Conventions

Item	Convention
Console 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 that registers such as R0-R31 are shown in decimal notation.)

Table 3–2 shows the special characters used in SRM firmware.

Table 3–2: SRM Special Characters

Character/Key(s)	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, Resume 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.

Booting the System

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>]
```

The boot command options are described in Table 3–3.

Table 3–3: SRM Boot Command

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 set boot_file 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, root number and boot flags are specified here. For Digital UNIX systems, the following symbolic values may be used: i = interactive boot s = boot to single user a = autoboot to multiuser Use the set boot_osflags 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 set mop or set bootp.
-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 set bootdef_dev command to set an environment variable that specifies a default boot device.

Boot Command Examples

Table 3–4 shows boot command examples and their descriptions.

Table 3–4: Boot Command Examples

Command	Description
>>>boot	Boots the system from the default boot device.
>>>boot ewa0	Boots the system from Ethernet port ewa0. If you are booting over a network, set *ewa0_protocols* and *ewa0_inet_init* to BOOTP.
>>>boot -file dec2.sys ewa0	Boots the file named dec2.sys from Ethernet port ewa0.
>>>boot -protocol bootp ewa0	Boots using TCP/IP BOOTP protocol from Ethernet port ewa0.
>>>boot -flags 0,1	Boots the system from the default boot device using flag settings 0,1.
>>>boot -halt dka0	Loads the image from disk dka0, but remains in console mode.

Setting and Showing Environment Variables

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

Table 3–5 describes the SRM set command options.

Table 3–5: SRM Set Command

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

Set Command Examples

Table 3–6 shows set command examples and their descriptions.

Table 3–6: SRM Set Command Examples

Command	Description
>>>set bootdef_dev ewa0	The default boot device is set to ewa0.
>>>set auto_action boot	The console attempts to boot following an error, halt, or power-up.
>>>set boot_osflags 0,1	The default boot flags are set to 0,1.
>>>set foobar 5	An environment variable called foobar is created and given a value of 5.

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>...}]
```

The show command options are described in Table 3–7.

Table 3–7: SRM Show Command

Command Option	Description
config	Displays the current memory configuration, PCI logical slots, and ISA logical slots (based on ISACFG utility input to the configuration database).
device [device name]	Displays the devices and controllers in the system. Specifying a device name returns information on that device only.
<envar>	Displays the value of the environment variable specified.
error	Displays error log information.
map	Displays the system virtual memory map.
memory	Displays the memory module configuration.
pal	Displays the version of OpenVMS and OSF PALcode.
version	Displays the version of the console firmware.

Show Command Examples

Table 3–8 lists show command examples and their descriptions.

Table 3–8: SRM Show Command Examples

Command	Description
>>>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	Lists device information, such as system designation, drive model, or Ethernet address.

>>>show memory
64 Meg of System Memory
Bank 0=32 MB (8 MB per Simm)
       Starting at 0x2000000
Bank 1=32 MB (8 MB per Simm)
       Starting at 0x0
Bank 2=No Memory Detected
	Lists system RAM, bank sizes, and starting addresses.
	
	Bank 2 is always unused in the AlphaStation 255 system.

>>>show * (See the environment variable section.)	Lists all variables and their settings.
>>>show boot* (See the environment variable section.)	Lists all variables beginning with boot.

Environment Variables

Table 3-9 shows selected environment variables and their descriptions (for a complete list, type show * at the SRM prompt).

Table 3-9: SRM Environment Variables

Variable	Description
auto_action	Sets/shows the console action following an error, halt, or power-up. The action can be **halt**, **boot**, or **restart**. Halt is the default.
boot_file	Sets/shows the file name to be used when a bootstrap requires a filename. The default setting is null.

boot_osflags	Sets/shows additional parameters to be passed to system software. When using OpenVMS software, these parameters are the system root number and boot flags. The default setting is **0,0**.
	
	When using Digital UNIX software, the following parameters are valid:
	        i = interactive boot
	        s = boot to single user
	        a = autoboot to multiuser

bootdef_dev	Sets/shows the default device or device list from which the system will attempt to boot. If the system software is pre-loaded, the variable is preset to point to the device containing the pre-loaded software. Otherwise, the default value is null.
bus_probe_algorithm	Selects which method the firmware uses to probe the PCI bus for PCI devices during initialization. Possible values are **new** and **old.** The default is new.
console	Sets the console output to either **serial** port or the **graphics** controller.
control_scsi_term	Unused in the Digital AlphaStation 255 system.
ewa0_inet_init	Allows network booting operations. (In this case, possible values are **BOOTP** or **MOP.**)
ewa0_mode	Selects which Ethernet port to use: **AUI** (ThinWire); **twisted-pair; Full Duplex, twisted-pair; BNC; Fast** (for Fast Ethernet controllers); or **FastFD** (for Fast Ethernet controllers that support Full Duplex). AUI is the default. (Auto-sensing is not supported.)

Table 3–9: SRM Environment Variables *(continued)*

Variable	Description
ewa0_protocols	Determines the Ethernet protocol , which can be either **MOP** or **BOOTP**. MOP is the default.
kbd_hardware_type	Selects the type of keyboard on your system. Possible values are **LK411** or **PCXAL**. PCXAL is the default.
language	The language environment variable associates language *n* to the system (where *n* is the number of the language shown below). You can have the system prompt you for the language using the following command: >>>set language 0 and then >>>init. Select the desired language. Type >>>init again, then power cycle the system.
os_type	Identifies the operating system being used on the system. Values of **OpenVMS**, **OSF**, **UNIX,** or **VMS** cause the SRM console to load.
pka0_fast	A value of **0** sets the SCSI mode to slow (5 MB/sec); a value of **1** sets the SCSI mode to fast (10 MB/sec). *Digital UNIX operating system users* also must edit the configuration file and rebuild the kernel.
pci_parity	This variable 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 if **sniff**. Default is off. Certain PCI adapters have been known to generate bad parity on the PCI under certain loading conditions, which results in system errors. Ensure that your specific PCI configuration will operate correctly prior to turning on parity checking.
tga_sync_green	This variable is used to control the composite video signal for monitors on the ZLXp controller that cannot detect the presence of composite video or v/h signals. The possible values are: **1** – composite video for first ZLXp. **2** – composite video for the second ZLXp. **3** – composite video for the first and second ZLXp.

Adding ISA Bus Devices

ISA Configuration Utility

ISA devices cannot be probed for configuration information by the Digital UNIX or OpenVMS operating system. Therefore, you must enter ISA option information manually using the ISA configuration utility. Run this utility before installing a new ISA option

module on a Digital AlphaStation 255 system running either the Digital UNIX or OpenVMS operating system.

Two methods are available to perform ISA configuration tasks: a forms-based interface (ICONFIG) and a command line interface (ISACFG).

ICONFIG Utility

The ICONFIG utility is a subset of the ISACFG utility. Only one type of each field (or option) can be set (for example, one IRQ or one I/O address) in ICONFIG. Future versions will include more functionality.

Start ICONFIG at the SRM prompt by typing >>>**iconfig**[Return]. The following screen is displayed:

```
ISA CONFIGURATION UTILITY

Name            I/O  IRQ  DMA  Mem      Length    Enabled


MOUSE           60   12                           Y
KBD             60   1                            Y
COM1            3f8  4                            Y
COM2            2f8  3                            Y
LPT1            3bc  7                            Y
FLOPPY          3f0  6    2                       Y


HELP: Enter up to 15 char device name
KEY HELP: Arrows/TAB to move, RET once to submit entry,
         RET 2nd time to exit
```

To add an ISA option, first enter the device's name, then move to the next field and enter its I/O address, and so forth. For example, to add a DE205 Ethernet controller to the database, follow these steps in response to the HELP: prompts at the bottom of the display:

1. Enter up to 15 char device name **DE200-LE [Tab]**

2. Enter i/o address in hex   **300 [Tab]**

3. Enter IRQ channel in decimal   **5 [Tab]**

4. Enter dma channel in decimal   **[Tab]**

5. Enter memory address in hex   **d0000 [Tab]**

6. Enter length of memory in hex   **10000 [Tab]**

7. Enter N to disable, Y to enable **Y [Return]**

When you press [Return], the entry is submitted and checked for conflicts. If conflicts exist, a message is displayed. For example, if you entered an IRQ value of 8 instead of 5, the following message is displayed:

```
ISACFG MESSAGE: ERROR: IRQ conflict with reserved IRQ values
(0,2,8,11 or 13)
```

If you entered a DMA value of 2 rather than nothing, the following message is displayed:

```
ISACFG MESSAGE: ERROR: DMA conflict with slot 0 dev 5
```

You can delete an entire entry by using the [Backspace] key.

ISACFG Utility Command Format

The syntax of the ISACFG command is:

```
isacfg [-slot <slot#>] [-dev <device#>]
[-all|-rm|-mk|-mod] [-<field> <value>] . . .
```

The ISACFG command options are described in Table 3–10.

Table 3–10: SRM ISACFG Command

Command Option	Description
-all	Shows the entire configuration table. Overrides all other commands.
-dev <dev#>	Optional; defaults to 0 if not entered. On a multifunction or multiport adapter, this specifies the device on the adapter.
-dmachan{0-3} <#>	Allows you to specify up to four DMA (direct memory access) channels for the device.
-enadev <#>	Allows you to specify whether an entry is enabled or disabled. Disabled devices are not used in resource allocation calculations. The possible values are: 0 - No (disabled) 1 - Yes (enabled)
-etyp <#>	Defines an entry type for this entry. The # sign can be: 0 - Causes the entry to be deleted 1 - Single option 2 - Embedded multiport device 3 - Multiport option device
-handle <string>	Binds a name to the driver (up to 15 characters).
-init	Initializes the configuration table to the default settings.
-iobase{0-5} <#>	Specifies up to six I/O base registers (in hexadecimal) for a particular device entry.
-irq{0-3} <#>	Allows you to assign up to four IRQ (interrupt request) channels to the device (use decimal IRQ levels).
-membase{0-2} <#>	Specifies up to three R/W ISA memory regions (in hexadecimal).
-memlen{0-2} <#>	Specifies the length corresponding to membase{0-2} (in hexadecimal).
-mk	Adds an entry into the table.
-mod	Modifies an entry in the table.
-rm	Deletes an entry from the table.
-rombase <#>	Specifies an address for ISA BIOS ext. ROM (in hexadecimal).
-romlen <#>	Specifies length of ROM (in hexadecimal).
-slot <slot#>	Allows you to enter a unique slot number for each ISA adapter. You may assign the numbers in any order. The slot number does not relate to a physical ISA adapter position. Slot 0 is reserved for the motherboard devices.
-totdev <#>	Placeholder for you to keep track of the total number of devices, specified by the # sign, at this slot. Modify this for your own use.

Adding ISA Options to OpenVMS and Digital UNIX Systems

When you add a supported ISA option to an AlphaStation 255 system running the OpenVMS or Digital UNIX operating system, perform the procedure shown in Table 3–11.

Table 3–11: Adding ISA Bus Options with the SRM Firmware

Step	Action	Result or Next Step
1	Perform operating system configuration tasks, if any. Refer to your operating system installation guide and release notes.	The operating system is prepared for the ISA option.
2	Shut down the system.	The system is at the console prompt (>>>).
3	>>>isacfg *options*	Adds the new ISA option to the SRM console configuration table using the appropriate command options.
4	>>>init	Typing init allows the changes to be used.
5	Configure the ISA option.	Use the manual that came with your ISA option to set the proper configuration.
6	Turn off the system and install the ISA option.	Refer to Chapter 3, Configuring Your System.
7	Turn on the system and boot.	The operating system boots and sees the new ISA option.

ISACFG Command Examples

This section shows examples of ISACFG commands you use to enter the DE205, audio subsystem, and the FAX/MODEM options into the configuration database. Examples to display, modify, and remove table entries are included as well. In some cases, there are scripts available to issue the proper ISACFG command. Script commands are preceded by an "add_" prefix. To continue long commands onto the next line, type a backslash (\) at the end of the line.

Always type an init command after doing ISACFG commands.

Adding the DE205 option:

```
>>>add_de205
```

-or-

```
>>>isacfg -slot 1 -dev 0 -mk -handle DE200-LE -irq0 5 \
_> -iobase0 300 -membase0 d0000 -memlen0 10000 -etyp 1 -enadev 1
```

Enabling the audio subsystem

```
>>>add_sound
```

-or-

```
>>>isacfg -slot 2 -etyp 1 -mk -iobase0 530 -iobase1 388 \
_>-irq0 9 -dmachan0 0 -dmachan1 1 -handle PCXBJ -enadev 1
```

Disabling the audio subsystem

```
>>>isacfg -slot 2 -rm
```

Adding the FAX/MODEM option:

```
>>>add_fax
```

-or-

the following two commands:

```
>>>isacfg -mod -slot 0 -dev 3 -enadev 0
>>>isacfg -slot 4 -dev 0 -ml -handle COM4 -irq0 3 \
_> -iobase0 2e8 -etyp 1 -enadev 1
```

Displaying the configuration database:

```
>>>isacfg -all
```

Modifying the IRQ0 entry of an option:

```
>>>isacfg -mod -slot 1 -irq0 14
```

Removing an entry:

```
>>>isacfg -rm -slot 1 -dev 0
```

4
Installing System Options

Introduction

This chapter covers the following topics related to installing system options on your Digital AlphaStation 255 system:

- Opening and closing the system cover

- Removing the front door

- Installing additional system memory

- Installing expansion boards/PCI bus options

- Installing internal drives

- Connecting external devices

- Replacing the battery

Removing the Top Cover and Side Panel

_____ **CAUTION** _____

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

_____

To remove the top cover and side panel, refer to Figure 4–1 and perform the following
steps:

1. Shut down your system and all peripheral devices.

2. Unplug the power cord and remove the video cable.

3. Wait at least 15 seconds, to allow time for the power supply capacitors to discharge
   safely.

4. Facing the rear of the unit, unlock the chassis lock ①.

5. Locate and loosen the thumb screw ② that fastens the top cover to the rear panel.
   Place your thumbs on the upper corners of the rear panel, pull back on the cover, and
   lift the cover ③ up and away from the enclosure.

6. You can gain further access by removing the left side panel (nearest to the PCI
   options). Press in the left-side tab ④ to release the side panel. Slide the panel ⑤
   toward the rear of the system unit and remove it.

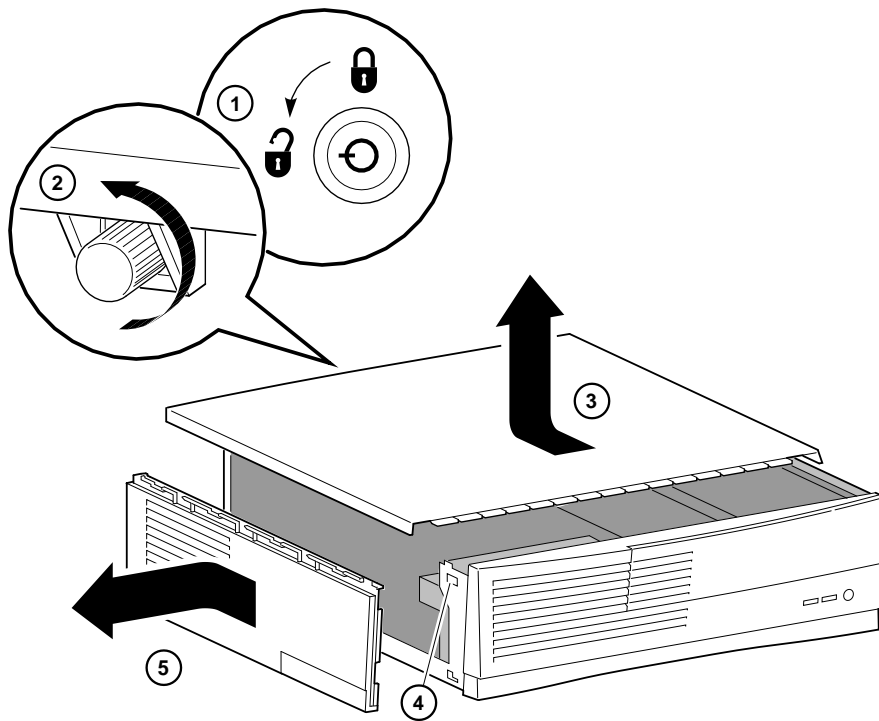**Figure 4–1: Unlocking and Removing Top Cover and Side Panel**

Removing Front Door

Some users may wish to remove the system front door. This is a matter of personal preference and does not affect the use of front-accessible devices.

To remove the front door, refer to Figure 4–2 and perform the following steps:

1. Remove the system top cover (see the previous section on Removing Top Cover and Side Panel).

2. Rotate the door upward to the open position ①. (This position allows access to the front-accessible devices.)

3. Unhook the right tab ② (attached to the rear bracket) on the inside of the door.

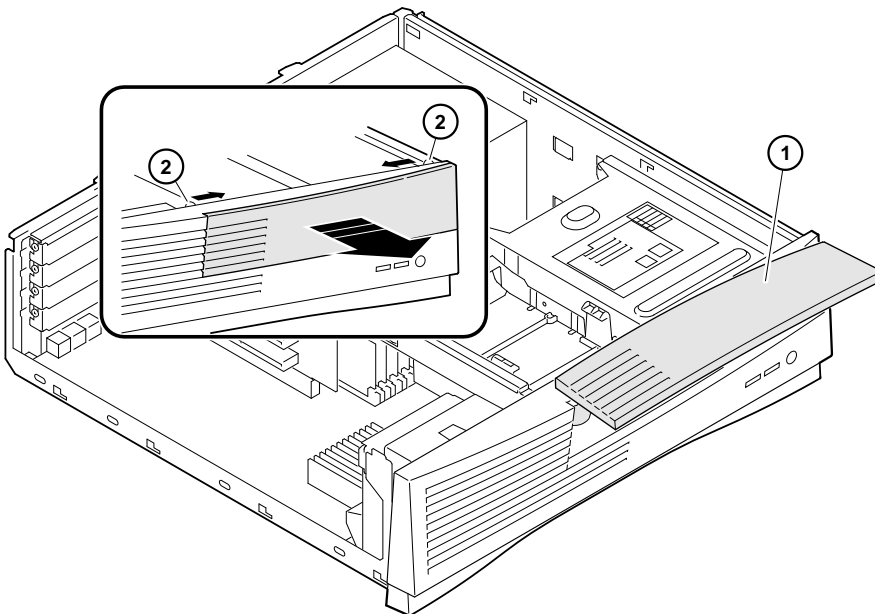4. Unhook the left tab ② by squeezing in the plastic tab located near the floppy drive tray.

Figure 4–2: Front Door Removal

Adding Memory Modules

The procedures for adding SIMMs to the AlphaStation 255 system are outlined below.

There are two memory banks in the system; each bank consists of four SIMMs. Four SIMMs are required because the memory bus width is 132-bits (128 bits of data and 4 bits of parity). Each SIMM in a bank supplies 33 bits of the 132-bit bus width. All SIMMs in a bank must be identical.

To add memory modules (SIMMs), refer to Figure 4–3 as you perform the following steps:

1. Install the SIMM into the socket at an angle ①. Ensure that the notch ③ is aligned with the protrusion in the bottom of the connector. Rock the SIMM gently until it is seated evenly into the bottom of the socket. Tip the SIMM upright ② until both the retaining clips ④ at the socket ends engage.
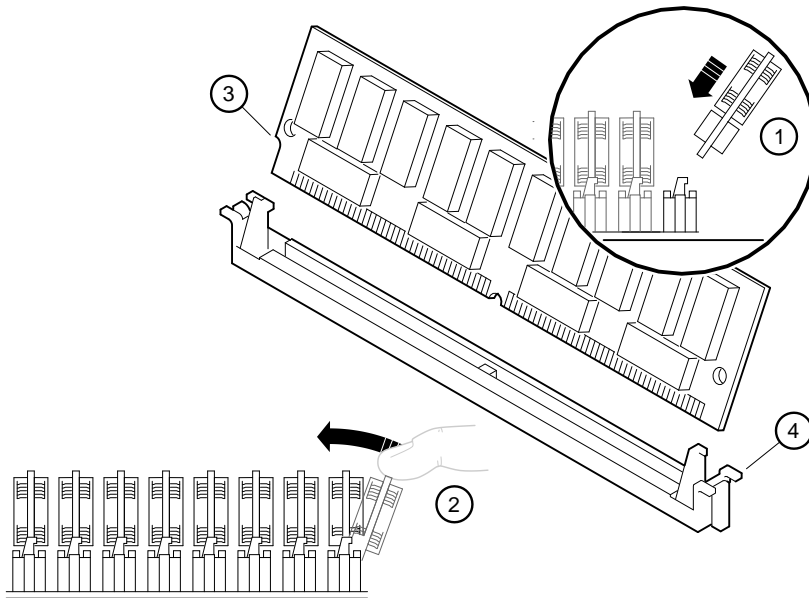
2. Repeat steps 1 and 2 for the remaining three modules.

Figure 4–3: Memory Installation

Removing the Floppy Drive Tray Assembly

If you need further access to the memory SIMMs, you can temporarily remove the floppy drive tray assembly. To remove the floppy drive tray assembly from the system unit, see Figure 4–4 and follow this procedure:

1. Turn off your system and unplug the power cord from the wall outlet.

2. Unlock and remove the top cover panel, as described earlier in this chapter.

3. Squeeze the tabs ① on both sides of the rear of the floppy drive tray to release it from the enclosure. Slide the drive assembly toward the rear of the system unit and lift and remove it.

4. Remove the data and power cables from the floppy drive assembly. Note the position of the cables so that you can reconnect them later.
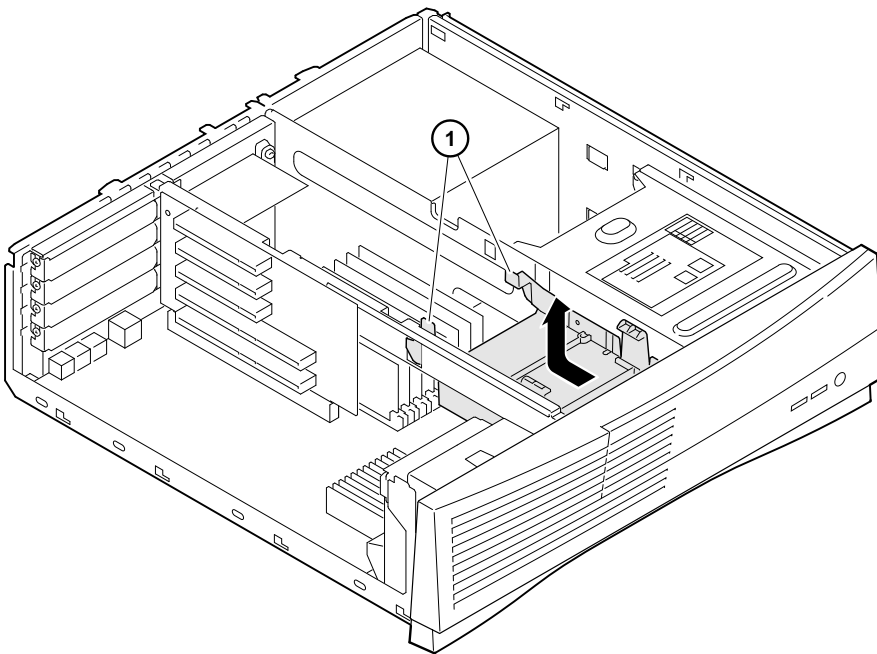

Figure 4–4: Removing Floppy Drive Tray Assembly

Installing Expansion Boards

The AlphaStation 255 system has four slots: two PCI, one combination, and one ISA. The combination slot can contain either a PCI or an ISA option.

_____**NOTE** _____

The lowest PCI slot (the combination slot) shares its interrupts with the embedded Ethernet controller. To use a PCI option in this slot, you must be using an operating system that supports shared interrupts (that is, Windows NT or Digital UNIX*). The OpenVMS operating system does not support shared interrupts.

_____

☞   Refer to your option module documentation for instructions on configuring a PCI or an ISA option module.

To install an expansion board, refer to Figure 4–5 as you perform the following steps:

1.   Unlock and remove the top cover and side panel.

2.   Pick an available slot ① (for PCI options) or ② (for ISA options) for your board.

_____

* Some Digital UNIX drivers do not have shared interrupt support,
as the following table shows:

Driver	Option
scsi	KZPAA-AA
jv	AV301-AA and AV321-AA
pvp	ZLXp-L-1, -2
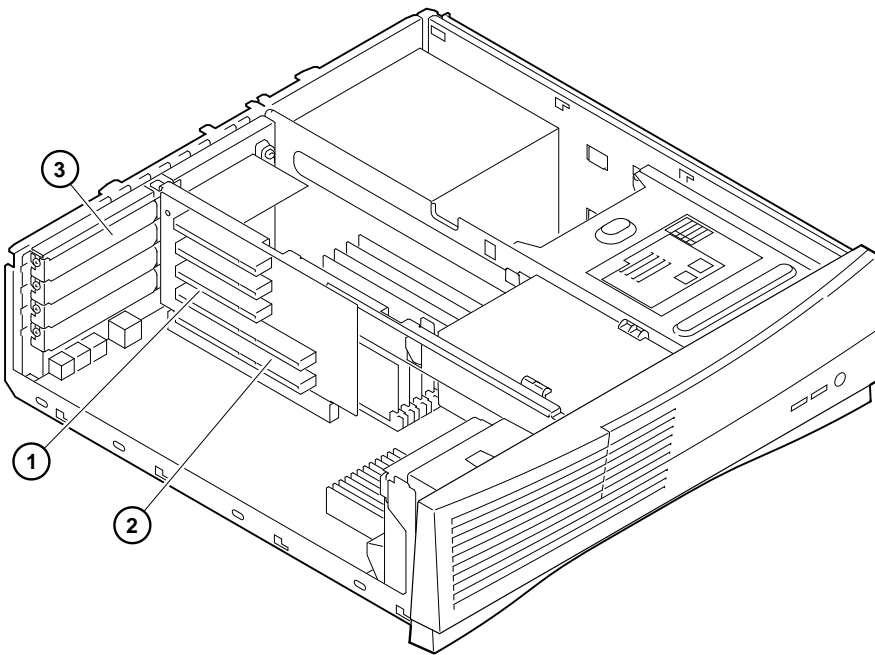
Figure 4–5: Installing an Expansion Board

_____ **NOTE** _____

The bottom ISA slot accepts only half-size ISA cards.
_____

3. Unscrew and remove the metal filler plate ③ for the slot you have chosen.

4. Insert the new expansion card into the riser board slot. (See Figure 4–6.) Push the
    board firmly into the socket.
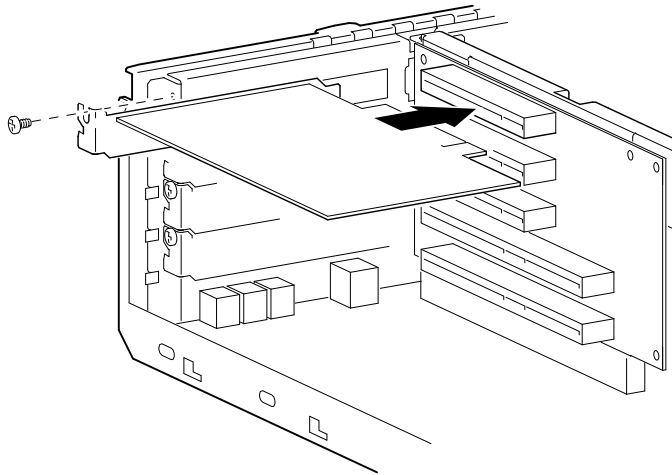
Figure 4–6: Inserting an Expansion Board into the Riser Slot

5. Replace the screw to secure the module at the rear panel.

_____**NOTE** _____

When adding ISA options to Digital UNIX or OpenVMS systems, run the ISA configuration utility (type ICONFIG at the SRM console prompt, >>>) to configure the option. See Chapter 3, Configuring Your System, for more information on this utility.

_____

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

Installing Storage Devices

This section covers general drive-installation information, including internal and external SCSI drives, and cable layouts.

The Digital AlphaStation 255 system supports a maximum of four storage devices internally. The system comes equipped with one accessible device: a 5.25-inch half-height removable media device (CD-ROM drive). In addition, you may have up to two nonaccessible, optional hard drives (two 3.5-inch by 1-inch SCSI disks *or* one 3.5-inch by 1.6-inch and one 1-inch SCSI disk) within the internal storage bays and a floppy diskette drive.

Preparing for SCSI Device Installation

To properly prepare for doing a SCSI device installation, you must be familiar with the available SCSI addresses, SCSI bus length limits, and SCSI termination.

_____ **CAUTION** _____

Failure to properly set up the SCSI termination may result in loss of data or damage to the file system.

_____

SCSI Addresses (SCSI IDs)

Before installing a SCSI drive, you must set the drive's SCSI address (SCSI ID). The SCSI controller chip is normally assigned SCSI ID 7. Digital recommends that you use the information in Table 4–1 as a guide for selecting an address for your SCSI drive.

Table 4–1: Selecting a SCSI Address

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

SCSI Bus Length

The total SCSI bus length includes the length of the internal cables, wiring on the motherboard, external cables, and the cables inside the external storage enclosures. The total length must not exceed:

- 3 meters (9.8 feet) for fast SCSI (10 MB/second) operation.

- 4 meters (13.1 feet) for "slow" SCSI (5 MB/second) operation.

The Digital AlphaStation 255 system's internal SCSI length is 1.1 meters (3.6 feet). This leaves 1.9 meters (6.2 feet) available externally for fast SCSI use. If slow SCSI is used, then an external length of 2.9 meters (9.5 feet) is available.

SCSI Termination

The Digital AlphaStation 255 system contains an embedded SCSI controller. The bus is used to connect the controller to both the internal and external drives. Both ends (and *only* at the ends) of the SCSI bus *must be* terminated correctly.

External

Like the internal SCSI bus, the external end of the SCSI bus also must be terminated. When no SCSI devices are present on the external SCSI bus, the bus is automatically terminated on the motherboard.[*] When, however, an external SCSI cable is present, the automatic external termination is disabled, and the last external SCSI device must be properly terminated.

☞   For information on disabling the automatic termination sensing feature, see Appendix B, Technical Specifications.

Internal

The internal SCSI cable used for the Digital AlphaStation 255 system is a flat ribbon cable. A terminator is plugged into the last connector on the cable. Therefore, *no* internal storage devices should have termination enabled.

---

[*] Initial shipments included motherboards without automatic termination. In these cases, an external terminator was provided in the accessories kit shipped with the system.

Installing Optional Internal SCSI Storage Devices

The SCSI hard disk drives, CD-ROM, and floppy drives all are located on removable drive tray brackets. The hard drive brackets are under the CD-ROM drive and the lower section of the floppy drive tray. This section tells you how to install a hard drive into the removable drive tray bracket. You can install a *maximum of two* SCSI hard disk drives in the internal storage bays.

Installing SCSI Disk Drives

The lower-right-side drive bay (below the CD-ROM drive) contains a drive tray that accommodates up to two 3.5-inch by 1.0-inch hard disks *or* one 3.5-inch by 1.6-inch hard disk. The lower-section floppy drive bay can accommodate one 1.0-inch hard disk. The maximum total capacity is two drives.

To install an internal SCSI device, follow this procedure:

1. Turn off your system and unplug the power cord from the wall outlet.

2. Unlock and remove the top cover, as described earlier in this chapter.

3. To access the lower-right-side drive bay, remove the CD-ROM drive bracket.
    Referring to Figure 4–7, remove the locking pin and push in the button tab ① on the enclosure wall. This releases the CD-ROM drive assembly.

4. Slide the CD-ROM ② back (toward the power supply).
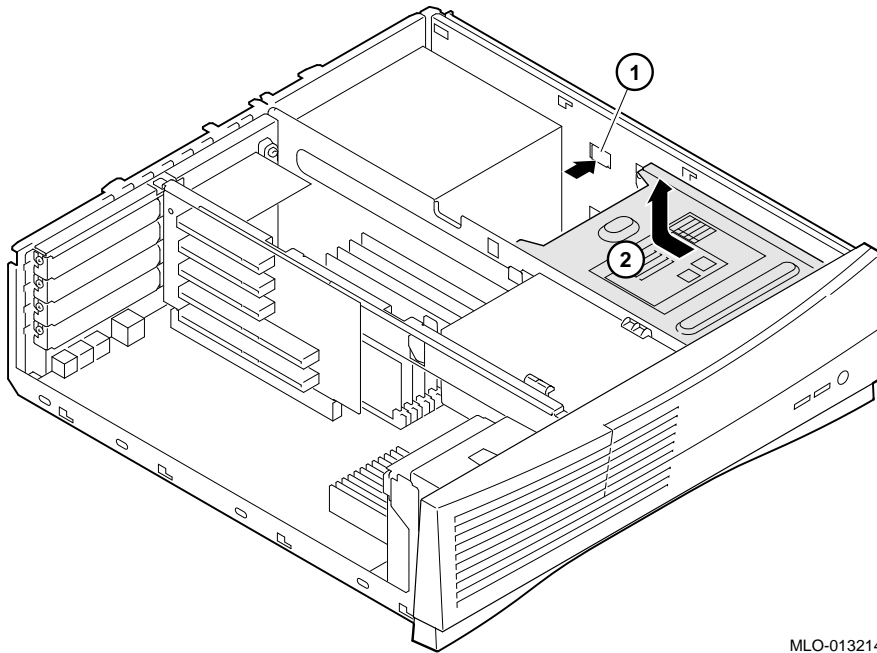
MLO-013214

Figure 4–7: Removing the CD-ROM Drive Bracket

5. Lift the CD-ROM assembly up and out of the system unit as Figure 4–7 shows. The CD-ROM drive is secured within the bracket by two screws. It is not necessary to remove the cables from the CD-ROM. For convenience, you can rest the CD-ROM assembly on the power supply.

6. Referring to Figure 4–8, remove the locking pin and push in the button latch ① on the right side of the enclosure to release the drive tray.

7. Slide the drive tray back ② and lift it up and out of the enclosure.
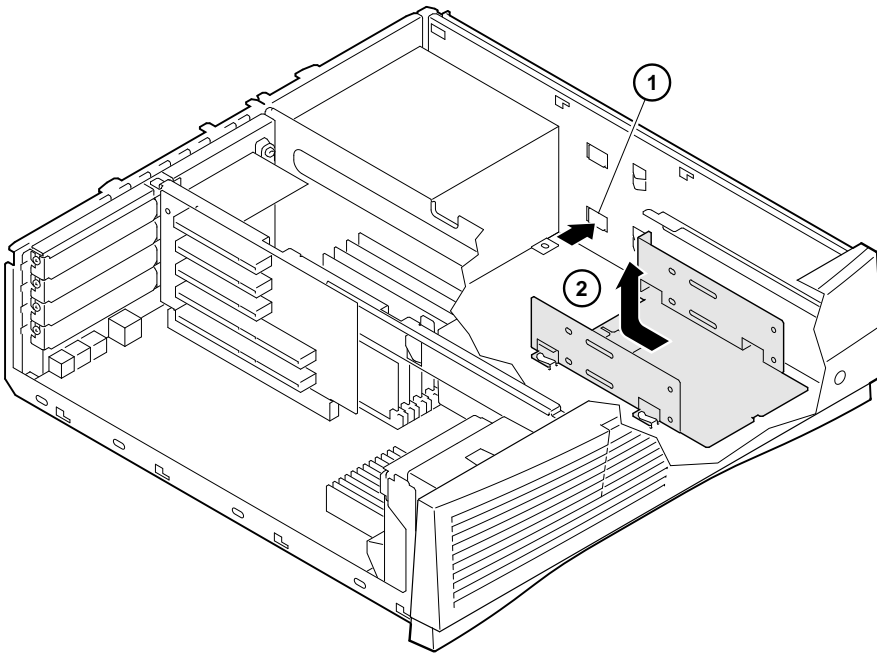
Figure 4–8: Removing the Drive Tray

Installing Drives in the Lower-Right-Side Bracket

Before you begin, refer to the documentation that came with your drive to determine how to configure the drive. To install drives in the lower-right-side bracket, refer to Figure 4–9 and the next procedure.
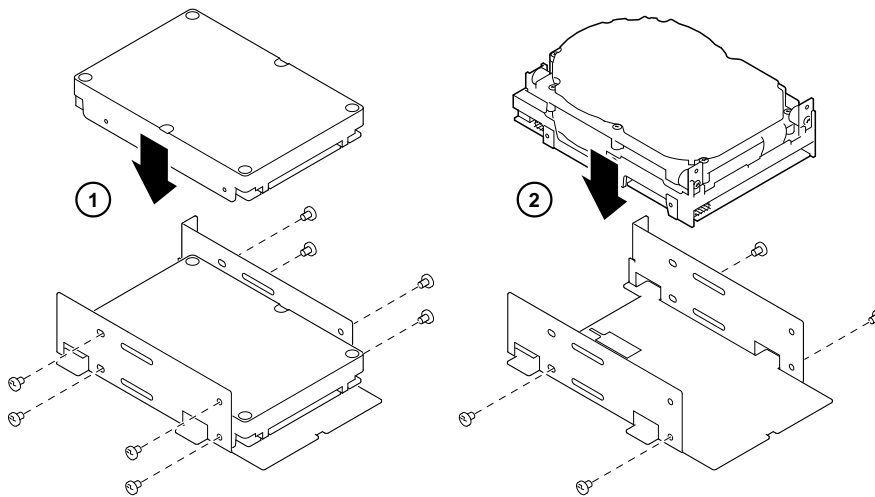
Figure 4–9: Installing Drives in the Right-Side Bracket

1. Select a SCSI address and make sure SCSI termination is disabled. Terminator power should be enabled. (Record the SCSI address in Appendix F, Equipment Log.)

2. Orient the bracket, as Figure 4–9 shows. The left side ① of Figure 4–9 shows two 1.0-inch drives; the right side ② shows one 1.6-inch drive. Position the drives so that the cable connections face the rear of the system. Select the bracket mounting holes that match the threaded holes in the drives. Mount the drives in the tray bracket, securing them with the four screws provided with each drive (two on each side).

3. Connect the power and SCSI cables to the drives before fully inserting and securing the drive tray. Verify that the cables are 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 is 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.

4. Replace the drive tray into the lower-right-side storage bay. Slide the bracket forward until it locks into place and replace the locking pin.

5. Replace the CD-ROM drive-bracket assembly. Slide it forward until it locks into place, and replace the locking pin.

6. Replace the cover.

7. Connect the power cord and plug it into the wall outlet.

Installing a Drive in the Floppy Bracket

Before you begin, refer to the documentation that came with your drive to determine how to configure the drive. To install a drive in the lower position of the floppy bracket, refer to Figure 4–10 and the procedure that follows.
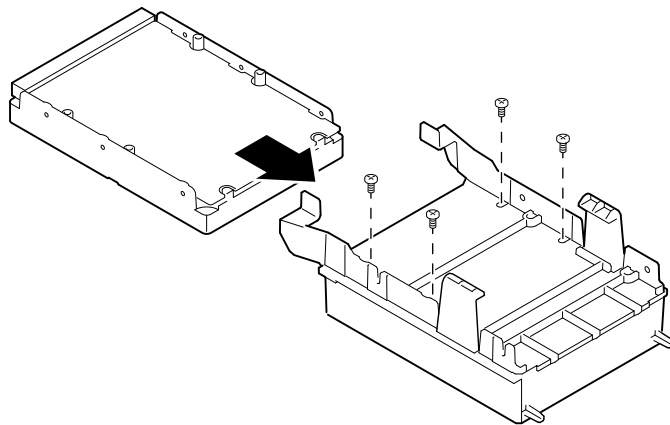

Figure 4–10: Installing a Drive in the Floppy Bracket

1. Select a SCSI address and make sure SCSI termination is disabled. Terminator power should be enabled. (Record the SCSI address you use in Appendix F, Equipment Log.)

2. Orient the bracket, as Figure 4–10 shows. Position the drive so that the cable connections face the rear of the system. Select the bracket mounting holes that match the threaded holes in the drive. Mount the drive in the floppy bracket, securing it with the four screws provided with the drive (two on each side).

3. Connect the power and SCSI cables to the drive before fully inserting and securing the floppy bracket.

   Verify that the cables are 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 is 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.

4. Replace the floppy drive bracket assembly. Slide it forward until it locks in place.

5. Replace the cover.

6. Connect the power cord and plug it into the wall outlet.

Installing External Options

Just as you can add many options inside your system unit, you can also place several outside your system, connected by cables. This section outlines how to connect a printer or SCSI device to the rear ports.

_____**NOTE** _____

Be sure to read the instructions that come with your new equipment as well as the appropriate instructions in this section.

_____

Cabling for a Printer or Other Parallel Device

Connect the cable to the parallel port, as Figure 4–11 shows. Be sure that you are using the correct type of printer cable. If your cable has the incorrect type of connector, you need an adapter or a different cable.
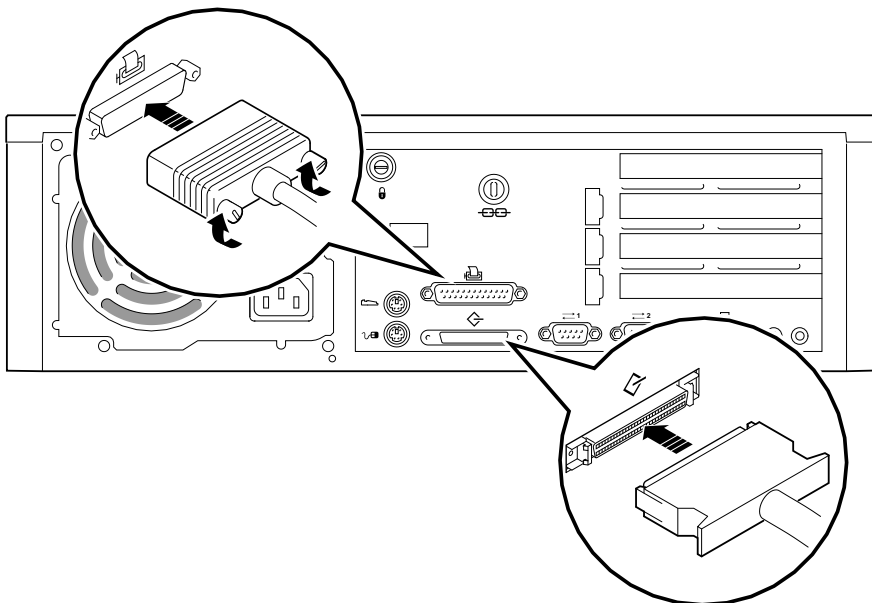
Figure 4–11: Cabling for Printer or Other Parallel Device

External SCSI Options

You might wish to connect an external SCSI device, or a SCSI expansion box. To add external SCSI devices, follow these steps:

Installing System Options

1. Set the drive jumpers or switches for the desired SCSI ID.

2. Remove the terminator plug and connect the option's SCSI cable to the external SCSI port. Use a cable with a 50-pin high-density type SCSI connector to connect to the system.

3. Terminate the *new* end of the bus at the last external SCSI device, using the appropriate terminator. Make sure that any other external SCSI devices have their terminators removed or disabled.

_____ **NOTE** _____

If you remove an external SCSI cable from the rear-panel SCSI connector, the external port must be properly terminated.
_____

Internal Cable Layout

Figure 4–12 through Figure 4–15 show system-box cabling; Table 4–2 through Table 4–5 list components.
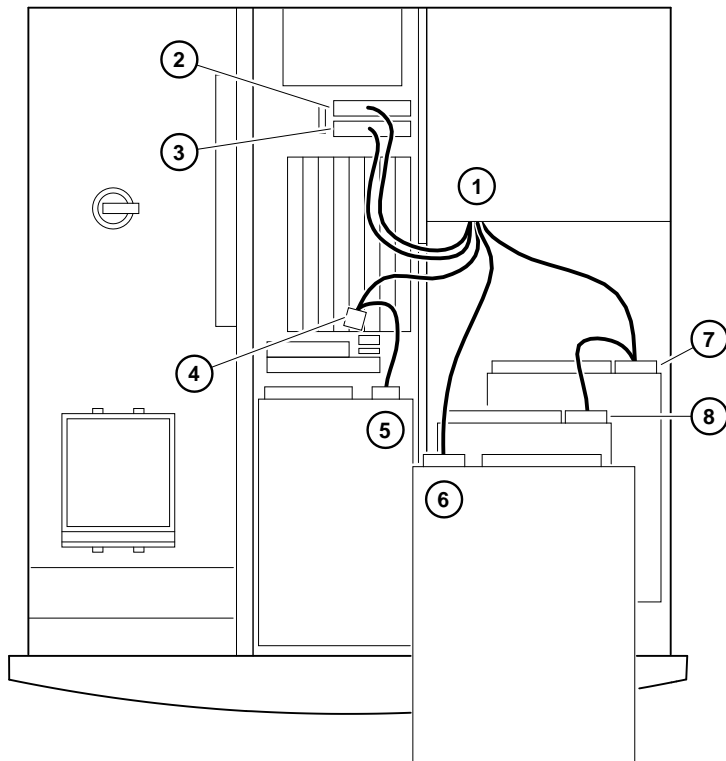
Figure 4–12: Power Supply Cable Configuration

Table 4–2: Power Supply Cable Configuration

Legend	Component
1	Power supply.
2	+/- 12, +/-5 VDC to motherboard.
3	+3.3 VDC to motherboard.
4	Power connector for optional hard drive.
5	Floppy drive or tape drive (optional).
6	CD-ROM drive.
7	Hard drive.
8	Hard drive (optional).

Figure 4–13: SCSI Cable Configuration

Table 4–3: SCSI Cable Configuration

Legend	Component
1	Motherboard internal SCSI bus connector (J4).
2	Tape drive (optional).
3	Hard drive.
4	Hard drive (optional).
5	CD-ROM drive.
6	Internal SCSI bus terminator.
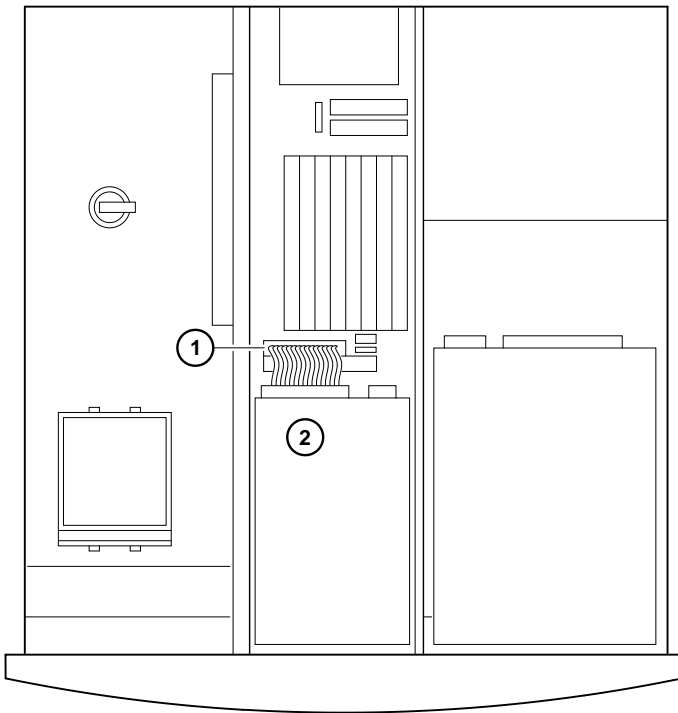
Figure 4–14: FDC Cable Configuration

Table 4–4: FDC Cable Configuration

Legend	Component
1	FDC (floppy drive controller) connector on motherboard (J6).
2	Floppy drive (optional).

Installing System Options
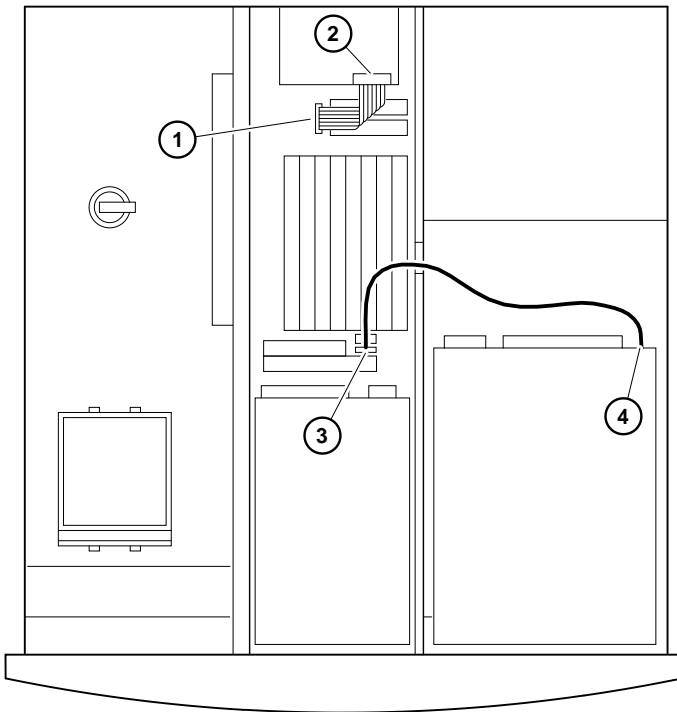
Figure 4–15: MAU and Audio Cable Layout

Table 4–5: MAU and Audio Cable Layout

Legend	Component
1	MAU cable (connects to system board connector[J19]) (optional).
2	MAU card (cable connects to MAU card connector [J2]) (optional).
3	Audio connector on motherboard (J5).
4	Audio connector at CD-ROM drive.

Replacing the Battery

The battery supplies power to the real time clock while the system is off. If necessary, replace the lithium battery with a Panasonic BR2032, CR2032, or equivalent battery. After replacing the battery, you must verify the system configuration and setup data.

_____ **CAUTION**_____

If the battery is incorrectly replaced, there is danger of explosion. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.

_____

_____ **CAUTION**_____

Take care not to bend the spring that holds down the battery. A bent spring could result in poor battery contact and intermittent system problems.

_____

1. Gently press down on the battery and push it out sideways, as Figure 4–16 shows.

2. Insert the new battery, positive side up, into the holder.

Installing System Options
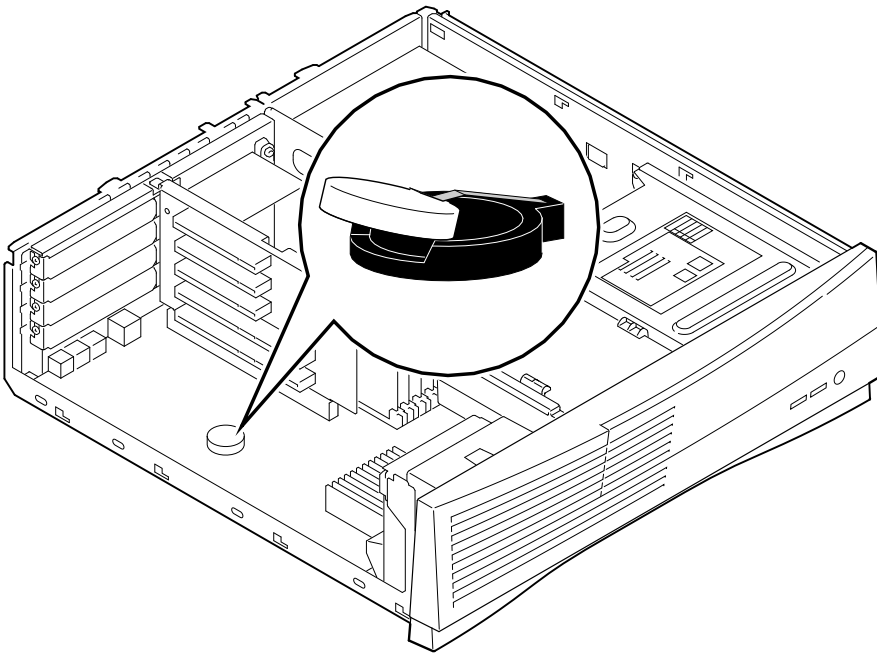
Figure 4–16: Replacing the Battery

Replacing the Left-Side Panel and Top Cover

To replace the left-side panel and top cover, see Figure 4–17 and follow the next procedure.
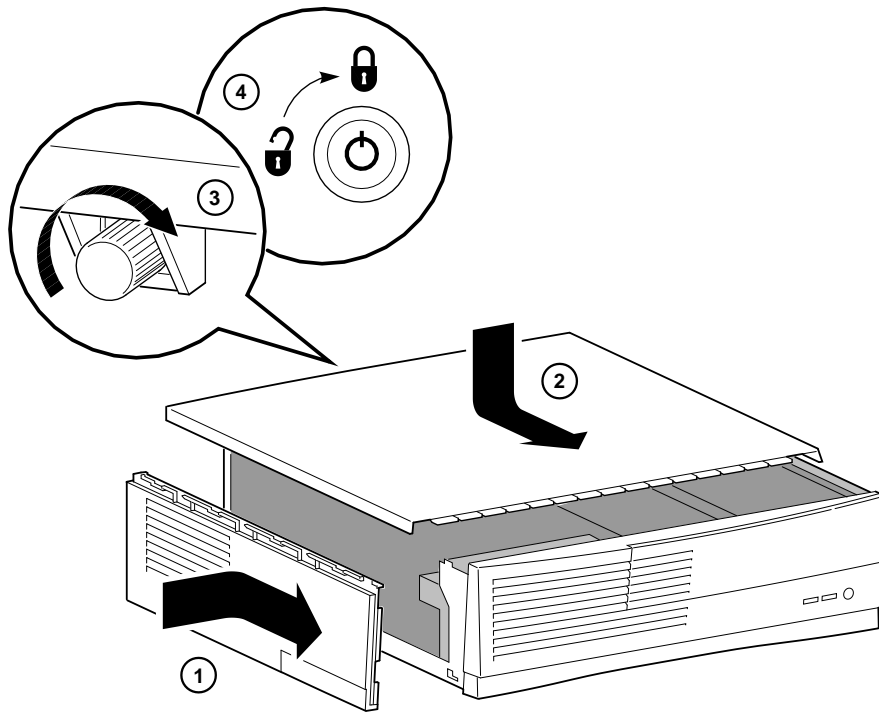
Figure 4–17: Replacing the Left-Side Panel and Top Cover

1. Line up the four locating pins on the bottom of the side panel ① with the slots in the enclosure, push in, and slide forward to lock the left-side panel into place.

2. Slide the top cover ② forward to lock it into place. Fasten the top cover with the thumbscrew ③. Use the chassis lock ④ to secure the top cover.

Installing System Options

3. *Optional.* If you have a Kensington lock (order number PCP3H-AG), refer to Figure 4–18 and secure the lock onto your system as shown.

4. Connect the power cord and plug it into the wall outlet.

5. Turn on the system.

☞ For more information on operating system-specific options, refer to your operating system and option documentation.
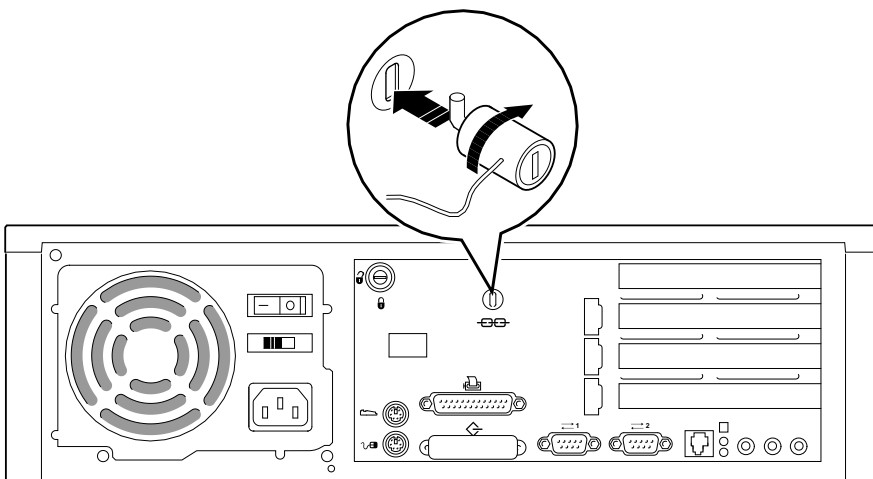
Figure 4–18: Using the Optional Kensington Lock

5
Troubleshooting

Introduction

This chapter describes initial and system troubleshooting.

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

Initial Troubleshooting

Follow these general procedures to initially troubleshoot your Digital AlphaStation 255 system:

1. Check that the power indicator is on and that the fan is running.

2. Check the power indicator on the monitor. Also, check the monitor, keyboard, and mouse cables to ensure that they are connected and seated properly.

3. Press the Reset button. Try rebooting your system.

4. Make sure that all cables and connections are secure.

5. Contact Digital Services or your service provider for software- or hardware-related problems.

_____**NOTE**_____

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

Equipment Log

For your convenience, Appendix F, Equipment Log, includes a form on which you can record all model numbers and serial numbers of your hardware components (system unit, monitor, keyboard, and mouse) and system hardware configuration information (CPU, memory size, drive size, ports, and so on).

General Troubleshooting

Table 5–1 lists how to identify and solve problems that could occur with your system, disk drive, audio, and monitor.

Table 5–1: System Troubleshooting

Problem	Possible Cause	Action
Power indicator not on.	System is not plugged in.	Turn off the system, plug it in, and then turn it back on again.
	No power at the wall outlet.	Use another wall outlet.
	Internal power supply cables not reconnected after installing options.	Reconnect cables.
	Power supply failure.	Contact your service representative.
	Correct voltage not set.	Turn off the system, set correct voltage on system back,, and turn system back on.

Table 5–1: System Troubleshooting *(continued)*

Problem	Possible Cause	Action
Power is on, but there is no screen display.	Brightness and contrast controls are not correctly set.	Adjust the brightness and contrast controls.
	Monitor is off.	Turn on the monitor.
	Monitor cable or power cord is incorrectly installed.	Check all monitor connections.
	Configuration error.	Refer to the video module documentation for more information.
	Monitor is defective.	Try another monitor.
	Defective video controller module.	Replace the video module.
	Console environment variable is set to *serial*.	From the SRM prompt, change the variable to *graphics*. `>>>set console graphics` `>>>init.`
	Keyboard or video controller missing or malfunctioning.	AlphaBIOS tests for keyboard and video before displaying information. Check connections.

Troubleshooting

Table 5–1: 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.	Check the system configuration for correct device parameters. *Digital UNIX and OpenVMS:* Use the SRM show config and show device commands. (See Chapter 3, Configuring Your System.) Use gathered information to identify target devices for boot command and verify that the system sees all installed devices.
		Windows NT: Use the AlphaBIOS firmware to display system configuration. Look at the hard disk configuration to determine what hard disk is available. Verify the operating system selection information.
	Environment variables incorrectly set.	Check and set the environment variables, if necessary. *Digital UNIX and OpenVMS*: Use the SRM console show and set commands to check and set the values assigned to boot-related variables such as *auto_action, bootdef_dev,* and *boot_osflags*. (See Chapter 3, Configuring Your System.)
		If you are attempting to use BOOTP, you must set *ewa0_protocols* and *ewa0_inet_init* to BOOTP.

Table 5–1: System Troubleshooting *(continued)*

Problem	Possible Cause	Action
System does not boot. (continued)	Environment variables incorrectly set. (continued)	*Windows NT:* From the Boot screen, press [F2] to go to setup. From there, go to the desired location to correctly set the environment variables.
	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.
System boots automatically when you don't want it to.	System is set to autoboot. *Auto_action* is set to BOOT.	*Digital UNIX and OpenVMS:* Press [ctrl]+[C]s during self test or before the windowing system starts.
		Once you are at the console prompt >>>, type *set auto_action halt* to prevent autobooting.
		Windows NT: When AlphaBIOS starts, press a [down arrow] to stop the autostart countdown.
Target boot device not listed in show device, show config (SRM), or in the AlphaBIOS display system configuration.	Loose cables.	Secure all signal and power cable connections.
	SCSI drive jumpers incorrectly set.	Check all SCSI devices for incorrect or conflicting IDs. Refer to the device documentation.
	SCSI (small computer system interface) bus termination incorrectly set.	Check that SCSI bus is properly terminated. (See the General Information on Installing Drives section in Chapter 4, Installing System Options.)

Table 5–1: System Troubleshooting *(continued)*

Problem	Possible Cause	Action
No response to keyboard commands.	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.
	Keyboard is connected to the mouse port.	Connect the keyboard to the keyboard port.
No response to mouse commands.	Mouse is not connected.	Connect the mouse and restart the operating system.
	Mouse is connected to the keyboard port.	Connect the mouse to the mouse port and restart the operating system.
	Mouse driver not installed.	Install the appropriate mouse driver; refer to your supplied application software documentation.
	Mouse ball sticking.	Refer to the section on cleaning the mouse.
System forgets some environment variables or the time-of-day while powered off.	Dead battery.	Replace the lithium battery. Use a Panasonic BR2032, CR2032, or equivalent. (See Chapter 4, Installing System Options.)
	No contact between battery holder and battery.	Carefully adjust metal tab on battery holder to allow contact with battery.

Table 5–I: System Troubleshooting *(continued)*

Problem	Possible Cause	Action
Security mode is enabled. Password does not work.	User does not have correct password.	*Before proceeding*, make note of your system's environmental variables and ISA configuration setup information in the Equipment Log for later reference. You will need to reset environmental variables after invoking the procedure below. Perform the following steps: 1. Power off the system. 2. Open the system box. 3. Set the configuration DIP switches to erase NVRAM. 4. Power on the system and wait for the console to start. 5. Power the system off. 6. Reset the configuration DIP switches to original settings. 7. Reassemble system. 8. Power on the system. Get necessary configuration data from the Equipment Log, where you recorded it before initiating the procedure above.

Table 5–2: Disk Drive Troubleshooting

Problem	Possible Cause	Action
Hard disk drive cannot read or write information.	Incorrect SCSI drive ID settings.	Set the SCSI ID. Refer to the disk drive installation instructions.
	Loose or incorrectly installed cables.	Make sure all cables are correctly installed.
	Disk drive is not correctly formatted or partitioned.	Format and partition as required using the supplied operating system.
	External drive not powered up.	Turn on the external drive.
Floppy drive cannot read or write information.	Floppy diskette is not formatted.	Format the floppy diskette.
	Floppy diskette is wrong density.	Use a floppy diskette of the proper density for your drive.
	Floppy diskette is worn or damaged.	Try another floppy diskette.
	Floppy diskette is write protected.	Slide the write-protect switch so the hole is not visible.
	Floppy drive is empty.	Insert a floppy diskette.

Table 5–3: Audio Troubleshooting

Problem	Possible Cause	Action
No sound.	Cables not plugged in.	Plug in the cables.
	Driver not installed.	Install the driver.
	Volume control set low.	Use an on-screen volume control (if available) to increase the volume.
Cannot record.	Cables not plugged in.	Plug in the cables.
	Record level set low.	Use the appropriate control to increase the record level.
Distorted sound.	Volume level set high.	Reduce the volume level. (Use amplified speakers.)

Table 5–4: Monitor Troubleshooting

Problem	Possible Cause	Action
Monitor power indicator is not on.	Monitor is turned off.	Turn on the monitor.
	Power cord is not connected.	Connect the power cord to the system or a wall receptacle.
	No power at wall receptacle.	Use another receptacle.
	Monitor is defective.	Try another monitor.
Distorted, rolling, or flickering screen display, or wrong/uneven color.	Adjustments incorrect.	Adjust accordingly.
	Wrong type of monitor.	Try another monitor.
	Defective monitor.	Try another monitor.
	Monitor signal cable loose or damaged.	Inspect connector pins. Replace cable if damaged.
	Monitor out of sync.	If you have a three-wire monitor, try setting sync to the green signal. with the SRM firmware. For the first ZLXp controller, set *tga_sync_green* to 1; for the second ZLXp controller, set *tga_sync_green* to 2. If your system has two controllers, set *tga_sync_green* to 3. To set the variable, temporarily connect a five-wire monitor or hook a terminal to the COM1 port and use the serial console.

	Console environment variable is set to *serial*.	From the SRM prompt, change the variable to *graphics.*
		`>>>set console graphics`
		`>>>init.`

Error Beep Codes

Table 5–5 shows error beep codes you may encounter while using the Digital AlphaStation 255 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 5–5: Error Beep Codes

Beep Code	Meaning
1-1-4	(1) The SROM code could not read the DROM (diagnostic read only memory) or flashROM headers, or (2) there was a checksum failure.
1-2-1	(1) The DROM code detected a realtime clock failure, or (2) the realtime clock interrupt did not occur.
1-2-4	The SROM code detected a memory-test failure.
1-3-3	The SROM code could not find at least 2 MB of good memory.
3-2-1	The DROM code was unable to read the header of the flashROM, or the flashROM checksum failed. Therefore, the DROM code attempted to boot from the floppy diskette. The attempt failed because there was no boot block on the floppy diskette.
3-2-3	The DROM code was directed to load the floppy diskette, but there was no boot block on the floppy diskette.
3-2-4	The DROM code detected a failure with the keyboard or mouse controller.
3-3-1	The DROM code detected a hard failure.

Diagnostic LED

Your system contains one diagnostic LED indicator on the rear of the motherboard. When you turn on the system, the LED illuminates; if the startup is successful, the LED goes off. If the LED on your system, stays lighted, contact your Digital service representative.

A
System Care

Introduction

This appendix describes how to:

- Clean your system, including the outside enclosure, monitor screen, 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 cloth lightly dampened with a mild detergent solution. Do not use solvents or abrasive cleaners.

_____**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 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 Figure A–1 shows:

1. Turn the mouse over and remove the plate on the bottom.

2. Remove the locking ring and rubber ball ①.

3. Clean the ball and rollers ② with a cotton swab that has been lightly dampened with a mild detergent.

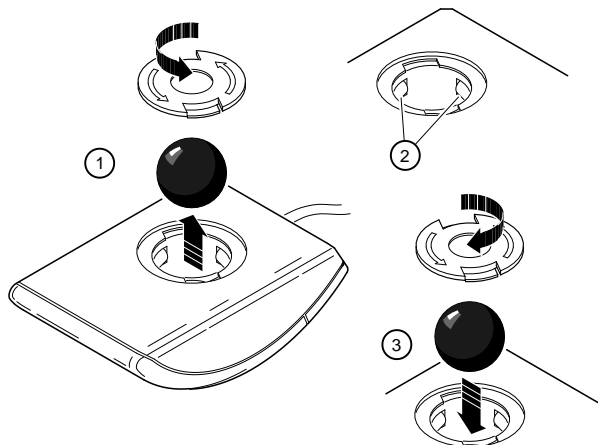4. Replace the ball and plate ③.

Figure A–1: Cleaning Your Mouse

Cleaning Your Keyboard

From time to time, your keyboard keys might get dirty with use. Wipe the keys with a clean cloth that has been lightly dampened with a mild detergent solution.

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. Package the system as the next section, Packing Your System, describes.

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. If you are shipping the system or moving it by vehicle, though, pack it to avoid damage.

Pack the system 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, follow the installation instructions on the installation information to unpack and install it.

B
Technical Specifications

Introduction

This appendix describes the following technical characteristics of the Digital AlphaStation 255 system:

- System specifications

- External system connectors

- Expansion slot current limitations

- System current requirements

- Motherboard switches and jumpers

System Specifications

Table B–1 lists the Digital AlphaStation 255 system processor features, performance, dimensions, environmental, and acoustics specifications.

Table B–1: Processor Features

Feature	Digital AlphaStation 255 System Specifics
Processor type	DECchip 21064A
Core logic	DECchip 21071-AA chipset
Secondary cache	Write-back, 1 MB (megabyte)

Table B–2: System Specifications

Attributes	Specification
PCI clock	33.33 Mhz, 30.0 ns cycle time
Slots	Two PCI, one PCI/ISA combination, and one ISA-only
Memory	Expandable up to 1 GB
Total SCSI bus length	3 meters (9.8 feet) for fast SCSI operation 4 meters (13.1 feet) for slow SCSI operation

* Memory is expandable up to 1 GB when 128-MB SIMMs are available.

Table B–3: System Dimensions

Dimension	Specification
Width	44.6 cm (17.56 inches)
Length	46 cm (19.6 inches)
Height	13 cm (5.12 inches)
Weight	15.9kg (35 lb)

Table B–4: System Environmental Specifications

Attributes	Specification
Operating temperature	10°C to 40°C (50°F to 104°F)
Storage temperature	−40°C to 65°C (−4°F to 149°F)
Operating humidity (noncondensing)	10% to 90% relative humidity, maximum wet bulb 28°C (82°F)
Storage humidity (noncondensing)	10% to 90% relative humidity, maximum wet bulb 46°C (114°F)

Altitude
  Operating
  Nonoperating
	
	 3,048 m (10,000 ft) maximum
	12,190 m (40,000 ft) maximum

Table B–5: Acoustics: Preliminary Declared Values per ISO 9296 and ISO 7779

Product	Sound Power Level L_{WAd}, B		Sound Pressure Level L_{pAm}, dBA (operator position)	
	Idle	Operate	Idle	Operate
AlphaStation 255 with 1-GB disk	4.8	5.1	40	42

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

External System Connectors

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

- Bidirectional enhanced parallel port connector, 25-pin D-submini female

- Serial connectors, 9-pin D-submini male

- Keyboard and mouse connectors, 6-pin mini-DIN

- SCSI port, high-density, shielded

Bidirectional Enhanced Parallel Port Connector

The bidirectional connector provides an interface to a printer or other parallel devices. Table B–6 lists pin assignments. An asterisk (*) after a signal name indicates an active low signal.

Table B–6: Bidirectional 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-subminiature connectors. Table B–7 lists their pin assignments.

The baud rates supported by the system's serial ports are 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 4800, 7200, 9600, 19200, 38400, 57600, and 115,200. The serial ports have signals for full MODEM control. Refer to your operating system information to confirm which of the baud rates from the preceding list your operating system supports.

Table B–7: 9-Pin Serial 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

Table B–8 shows the port mapping used by the OpenVMS operating system.

Table B–8: OpenVMS Port Mapping

Device	Console Variable Value	
	Graphics	**Serial**
Graphics head monitor	OPA0	N/A
COM1	OPA1	OPA0
COM2	TTA0	TTA0

Keyboard and Mouse Connectors

The keyboard and mouse connectors consist of two 6-pin mini-DIN connectors. Table B–9 lists their pin assignments.

Table B–9: Keyboard and Mouse Connector Pinouts

Pin	Keyboard Signals	Mouse Signals
1	KB Data	MS Data
2	Reserved	Reserved
3	Ground	Ground
4	+5 Volts dc	+5 Volts dc
5	KB Clock	MS Clock
6	Reserved	Reserved

SCSI Port Connector

The external SCSI connector is a 50-pin high-density connector. Table B–10 lists the pin assignments.

Table B–10: SCSI Port Pinouts

Pin	Signal	Pin	Signal
1	gnd	26	–DB (0)
2	gnd	27	–DB (1)
3	gnd	28	–DB (2)
4	gnd	29	–DB (3)
5	gnd	30	–DB (4)
6	gnd	31	–DB (5)
7	gnd	32	–DB (6)
8	gnd	33	–DB (7)
9	gnd	34	–DB (P)
10	gnd	35	gnd
11	gnd	36	gnd
12	reserved	37	reserved
13	open	38	TERMPWR
14	reserved	39	reserved
15	gnd	40	gnd
16	gnd	41	–ATN
17	gnd	42	gnd
18	gnd	43	–BSY
19	gnd	44	–ACK
20	gnd	45	–RST
21	gnd	46	–MSG
22	gnd	47	–SEL
23	gnd	48	–CD
24	gnd	49	–REQ
25	gnd	50	–I/O

Power Supply and Input Power Requirements

The 200-watt power supply provides five dc voltages: ±12 Volts, 12 Volts, ±5 Volts, and +3.3 Volts DC. These voltages are used by the various components within the system. (The input power at the rated output is 323 watts.) Table B–11 lists the input power requirements. Table B–12 shows the output voltage specifications.

Table B–11: System Input Power Requirements

Rated Voltage Range	Rated Input Current	Operating Frequency Range
100 Volts AC – 120 Volts AC	5.5 A	47 Hz – 63 Hz
220 Volts AC – 240 Volts AC	3 A	47 Hz – 63 Hz

Table B–12: System Output Power Specifications

Voltage	Output Range	Output Current (Amps)
+3.3	3.17 – 3.465	0.0 – 20
+5.0	4.80 – 5.25	1.5 – 20
+12.0	11.40 – 12.60	0.2 – 8.0
-5.0	-4.60 – -5.50	0.0 – 0.3
-12.0	-10.80 – -13.20	0.1 – 0.5

Motherboard Switches and Jumpers

Switches and jumpers allow you to set specific system parameters.

Figure B–1 shows the locations of the switchpack and jumpers (J29 and J30) on the motherboard with a CPU speed set for 233 Mhz. Table B–13 lists the switch settings.

Technical Specifications

Table B–14 lists the jumper settings.

_____ **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 permanently damage electronic
components.

_____
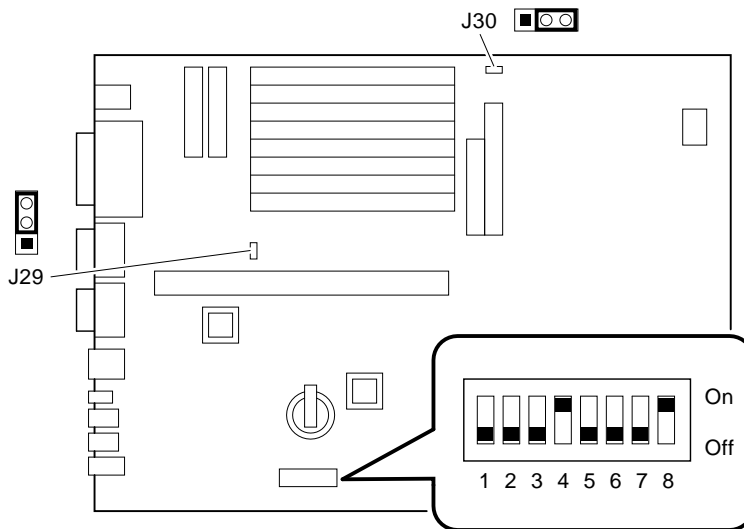
Figure B–1: Motherboard Switch and Jumper Locations

Table B–13: Motherboard Switch Settings

Configuration Switches		Function	Description
1	**2**		
Off	Off	Normal (Default)	The positions of switches 1 and 2 determine whether the SROM code goes to the SROM mini-console (for manufacturing use) or passes control to the next stage of initialization, the DROM code. The DROM code uses switch 2 to determine whether an image from a floppy disk or the flashROM containing the console firmware should be loaded into memory and started.
On	Off	Stop at SROM prompt	
Off	On	Boot from floppy	
On	On	Reset RTC and NVRAM	
			If switches 1 and 2 are both in the On position at power-up, the RTC and NVRAM are cleared. Return to normal operation by powering off the system, placing switches 1 and 2 back to the Off position, and powering on the system again. (See Chapter 5, Troubleshooting, for details.)
FlashROM Protect Switch		**Function**	**Description**
3			
Off		Writes enabled (Default)	Switch 3 can be used to prevent writes to the flashROMs. *However, writes must be enabled for proper system operation.*
On		Writes disabled	
Reset Button		**Function**	**Description**
4			
Off		Halt request	Switch 4 determines the function of the front-panel reset push button.
On		Reset (Default)	

Technical Specifications

Table B–13: Motherboard Switch Settings *(continued)*

Timer/Counter (TC) Audio Disable 5	Function	Description
Off	Enables TC sound (Default)	Switch 5 controls the use of timer/counter (TC) generated sound. The default position (Off) is used when no sound driver is installed. There is no volume control for TC sound.
On	Disables TC sound	

CPU Speed Switches			CPU Clock Rate (MHz)	Description
6	**7**	**8**		
On	On	On	133	These switches set the CPU clock speed. In order to run your system at a higher speed, you must install the appropriate CPU upgrade kit.
Off	On	On	166	
On	Off	On	200	
Off	Off	On	233	
On	On	Off	266	
Off	On	Off	300	
On	Off	Off	333	
Off	Off	Off	366	

Table B–14: Motherboard Jumper Settings *

Jumper	Setting	Function	Description
J29	1 to 2	Disables sensing for presence of external cable.	J29 controls the automatic SCSI bus terminator. Disable sensing when attaching devices that modify the definition of the SCSI pin used for sensing: for example, Digital StorageWorks devices using the high-availability storage subsystem fault bus. When sensing is disabled, an external terminator is always required, even if no external SCSI device is present.
	2 to 3 (D)	Enables sensing for the presence of an external SCSI cable.	If an external SCSI device is attached to the SCSI connector, the automatic SCSI terminator turns off. The SCSI bus must be terminated at the end of the external bus.
J30	1 to 2	For service use only.	This jumper is used for service only. Do not change the setting.
	2 to 3 (D)		

_____

* J29 and J30 were not included on earlier shipments of the AlphaStation 255 systems.

C
Device Mapping

Introduction

This appendix lists system device mapping information, including:

- I/O address map

- Interrupt map

- DMA (direct memory access) channel assignments

- SCSI (small computer system interface) ID assignments

I/O Address Map

Table C–1 presents information on the I/O address map.

Table C–1: I/O Address Map

ISA I/O Addresses	Devices
0060-0064	Keyboard and mouse
0070-0071	Time-of-year clock
02F8-02FF	Serial port 2
0378-037F	Parallel port
03F0-03F7	Floppy disk
03F8-03FF	Serial port 1
0530-0533	Audio subsystem base address

Interrupt Map

The IRQ (interrupt request) assignments for the Digital AlphaStation 255 system are shown in Table C–2 .This information is useful when adding or reconfiguring options on your system. Avoid conflicts when assigning IRQs by associating one IRQ to one source. PCI interrupt levels are set either by the operating system (as in the Windows NT operating system) or by the SRM console (as in the OpenVMS and Digital UNIX operating systems).

The Windows NT operating system preassigns the PCI devices specific IRQs, as shown in Table C–2. If a PCI device is not installed in a PCI slot, the IRQ associated with that slot remains unavailable for ISA devices. For example, if PCI slot 2 is empty, IRQ9 is not available for any other device.

Table C–2: Default System Interrupt Assignments

IRQ#	Source	Windows NT-Specific Preassignments
0	Timer/counter.	
1	Keyboard.	
2	Internal cascade of IRQ8-15.	
3	Serial port 2 or ISA slot.	
4	Serial port 1 or ISA slot.	
5	Parallel port, PCI interrupt, or ISA slot.	
6	Floppy controller or ISA slot.	
7	Parallel port or ISA slot.	
8	Reserved.	
9	PCI interrupt or ISA slot.	PCI slot 2 (top slot).
10	PCI interrupt or ISA slot.	Embedded Ethernet controller and PCI slot 0. Shared IRQ.
11	SCSI controller or ISA slot.	PCI SCSI controller.
12	Mouse or ISA slot.	
13	Reserved.	
14	ISA slot.	
15	PCI interrupt or ISA slot.	PCI slot 1.

_____**NOTE** _____

The Ethernet controller and PCI slot 0 (the lowest PCI slot) share the same IRQ.
Shared interrupt support is unavailable in the OpenVMS operating system.
Therefore, do not install an interrupting device in PCI slot 0 on OpenVMS
operating systems. Devices that rely on polled I/O should work if the device is
supported.

_____

DMA Channel Assignments

The DMA channel assignments for ISA options are shown in Table C–3. This information
is useful when adding ISA options to your system. Avoid DMA channel conflicts by not
assigning multiple devices to the same channel.

Table C–3: DMA Channel Assignments

Channel	Device
0	Audio (or 87303 ECP parallel port).
1	Audio (or 87303 ECP parallel port).
2	Floppy disk controller (ISA option slot).
3	Audio (ISA option slot).
4	Unavailable. (Channels 0-3 are cascaded to this channel.)
5	Available to ISA slots.
6	Available to ISA slots.
7	Available to ISA slots.

SCSI ID Assignments

Table C–4 presents information on the default SCSI ID assignments.

Table C–4: SCSI ID Assignments

ID	Device
7	Host adapter.
6	Available.
5	Tape drive (if present).
4	CD-ROM drive.
3	Available.
2	Available.
1	Second hard disk (if present).
0	First hard disk (typically, the system disk).

D
Updating System Firmware

Introduction

This appendix explains how to use the firmware update utility to install firmware upgrades and change from SRM firmware to AlphaBIOS firmware or vice versa.

_____**NOTE** _____

The user is responsible for performing system firmware upgrades. Consult your upgrade documentation for more information.
_____

System Firmware

The Digital AlphaStation 255 system contains 512 KB of flashROM for the console firmware. The flashROM contains either the AlphaBIOS firmware (for the Windows NT operating system) or the SRM console firmware (for the Digital UNIX and OpenVMS operating systems).

Update Utility

Use the update utility to update your AlphaBIOS and SRM firmware or change from SRM to AlphaBIOS firmware or vice versa. The update utility contains three images: the update utility itself, the SRM image, and the AlphaBIOS image.

Flash Enable Switch

The flashROM write enable switch (3) is located on the motherboard and should always be set to the write enable position. If you have any problems updating firmware, check the switch to ensure that it is set properly. See Appendix B for the location of the switch.

Using the Flash Update Utility from the SRM Console

To update the firmware from the SRM console, do the following:

1. Insert the Firmware Update CD-ROM into the CD-ROM drive.

2. Type the show device command to determine the device ID of the CD-ROM drive.

   ```
   >>>show device

   dka0.0.0.6.0      DKA0      RZ26L                 440C
   dka400.4.0.6.0    DKA400    TOSHIBA CD-ROM        0064
   dva0.0.0.0.1      DVA0
   ena0.0.0.1.1      ENA0      08-00-2B-38-67-6B
   pka0.7.0.6.0      PKA0      SCSI Bus ID 7
   ```

3. Boot the Firmware Update Utility CD-ROM using the device ID display in step 2.
   ```
   >>>b -fl 0,a0 dka400
   Bootfile: [alpha255]as255_vx_x.exe
   ```
   (where x_x is the appropriate version)

   You should see a display similar to the following, while the update utility is loading and executing:

   ```
   bootstrap code read in
   base = 11e000, image_start = 0, image_bytes = ea800
   initializing HWRPB at 2000
   initializing page table at 110000
   initializing machine state
   setting affinity to the primary CPU
   jumping to bootstrap code
   ff.fe.fd.fc.fb.fa.f9.f8.f7.f6.f5.
   ef.df.ee.ed.ec.f4.eb.....ea.e9.e8.e7.e5
   X3.7-10895, built on Sep 13 1994 at 11:29:42
   >>>Execute Update Sequence
   Update Script Complete
   (boot pmem:180000 -flags 0,0)
   bootstrap code read in
   base = 180000, image_start = 0, image_bytes = 800000
   initializing HWRPB at 2000
   initializing page table at 710000
   initializing machine state
   setting affinity to the primary CPU
   jumping to bootstrap code

   apu-version 959328854 *** Firmware Update Utility V2.9 ***
   *** System Type: Alpha Workstation 255/233 ***
   Update
   ```

```
Verify
List
Show
Dump
Verbose
Nverbose
Debug
Ndebug
?

Apu->
```

4. To update the firmware, type `update` and either `SRM` or `ARC`. (Typing `update ARC` will load AlphaBIOS into the flashROM.) The following information will be displayed as the firmware is being updated. The actual information may change between versions.

```
Apu-> update SRM
APU-I *** ROM 0,1 Contents will be destroyed ***
APU-I Are you ready to Program Device? (y/n)y
APU-I Programming device
APU-I Programming device completed
APU-I Programming device
APU-I Programming device completed
Apu->
```

5. Use the verify command to verify the integrity of the SRM or AlphaBIOS firmware. First enable verbose mode by typing `verbose`; then type `verify and either SRM or ARC` (for AlphaBIOS).

```
Apu-> verbose
```

```
Apu-> verify SRM
```

6. To exit the update utility, cycle the power. Leave the power off for at least 20 seconds.

_____**NOTE**_____

Commands such as `Dump, List, Show,` and `Verify` must have verbose mode enabled for their output to be displayed. Type the `Verbose` command at the `Apu->` prompt to enable verbose mode.

_____

Using the Flash Update Utility from AlphaBIOS

To update the firmware from AlphaBIOS, do the following:

1. Insert the Firmware Update CD-ROM into the CD drive.

2. From the AlphaBIOS Boot screen, press F2 to enter AlphaBIOS setup.

3. From the AlphaBIOS setup screen, select Upgrade AlphaBIOS.

Switching Console Firmware

SRM to AlphaBIOS

To switch from SRM firmware to AlphaBIOS firmware, follow these steps:

1. At the SRM prompt, type

```
>>> set os_type nt
```

2. Load and start the firmware update utility as shown previously in this section.

3. At the Apu-> prompt, type update arc. Specifying arc causes the AlphaBIOS firmware to load. (Make sure you have the latest version available firmware version before updating.) The following example shows the AlphaBIOS firmware being loaded. The actual information may change between versions.

```
Apu-> update arc
APU-I *** ROM 0,1 Contents will be destroyed ***
APU-I Are you ready to Program Device? (y/n)y
APU-I Programming device
APU-I Programming device completed
APU-I Programming device
APU-I Programming device completed
Apu->
```

4. Power-cycle the machine.

5. At the SRM prompt, type

```
>>> set os_type vms
-or-
>>>set os_type unix.
```

AlphaBIOS to SRM

To switch from AlphaBIOS firmware to SRM firmware, follow these steps:

1. From the AlphaBIOS Boot screen, press F2 to enter AlphaBIOS setup.

2. From the AlphaBIOS setup screen, select Upgrade AlphaBIOS.

3. At the Apu-> prompt, type `update srm`. Specifying `srm` causes the SRM firmware to load. (Make sure you have the latest version available firmware version before updating.) The following example shows the SRM firmware being loaded. The actual information may change between versions.

```
Apu-> update srm
APU-I *** ROM 0,1 Contents will be destroyed ***
APU-I Are you ready to Program Device? (y/n)y
APU-I Programming device
APU-I Programming device completed
APU-I Programming device
APU-I Programming device completed
Apu->
```

4. Power-cycle the machine.

5. At the SRM prompt, type

```
>>> set os_type vms
-or-
>>>set os_type unix.
```

E

Starting an Operating System Installation

Introduction

This information provides what you need to begin an operating system installation. Once you have started an installation, follow the on-screen instructions and refer to the appropriate operating system documentation.

Using the table below, first locate the operating system you want to install and refer to the appropriate table number:

If you want to:	Go to Table:
Install Windows NT Workstation on a properly partitioned and formatted disk	E-1
Set up partitions for a Windows NT Workstation installation	E-2
Install Digital UNIX	E-3
Install OpenVMS	E-4

_____ **CAUTION** _____

If you boot from a Digital UNIX or OpenVMS disk and also occasionally boot
Microsoft Windows NT Workstation from another disk, use caution when you
run the Windows NT Disk Administrator. When the Disk Administrator detects
additional disks, it updates the system configuration. The Disk Administrator
prompts you for permission to write a signature to the additional disks. Writing
the signature to a Digital UNIX or OpenVMS disk *destroys* the boot block on
that disk and makes the operating system on that disk no longer bootable. Select
NO when you are asked if you want to write a signature to your Digital UNIX or
OpenVMS disks.

_____

Starting a Windows NT Workstation Installation

Digital partitions and formats disk 0 on the first SCSI controller in non-RAID Windows
NT Workstation systems. The partitions are set up as follows:

- Partition 1 (typically, the "C" drive) is the size of the disk less 6 MB and formatted
  FAT. Normally, you select "convert to NTFS" during the Windows NT installation.

- Partition 2 (typically, the "D" drive) is 6 MB, formatted FAT, and identified as the
  system partition.

Refer to Table E–1 for the steps to start installing Windows NT Workstation on a properly
partitioned and formatted disk.

_____ **NOTE** _____

The AlphaBIOS console must be installed and running in order to perform a
Windows NT installation. If the SRM console is running, refer to Appendix E,
Updating System Firmware, for the instructions to load the AlphaBIOS
firmware.

_____

Table E–1: Starting a Windows NT Workstation Installation

Step	Action	Result or Displayed Text
1	Insert the Microsoft Windows NT Workstation CD-ROM into the CD drive.	CD-ROM drive is ready.
2	From the AlphaBIOS boot screen, press [F2].	AlphaBIOS setup screen displays.
3	Select `Install Windows NT.`	Windows NT setup procedure starts. "Welcome to Setup" screen is displayed.
4	If your system type is *not* listed, select `Other.` Press [Enter]. *-or-* If your system type is listed, select system. Press [Enter]. Skip to step 7.	"Insert the manufacturer-supplied hardware support disk" message is displayed.
5	Insert the hardware manufacturer-supplied hardware support disk. Press [Enter] when ready.	You have chosen to change your computer type to one supported by a disk provided by a hardware manufacturer. "Please insert manufacturer-supplied hardware support disk."
6	Select appropriate system type. Press [Enter].	A list of systems is displayed.
7	Press [Enter].	You may now continue the installation process.
8	Select `Custom Setup` by pressing C.	Setup has recognized the following mass storage devices in your computer: NCR PCI (53c810)

Table E–1: Starting a Windows NT Workstation Installation *(continued)*

Step	Action	Result or Displayed Text
9	Press [Enter] to continue.	Setup has determined that your computer contains the following hardware and software components: Computer: Digital... Display: Digital ZLXp-E Keyboard: XT, AT, or Enhanced (83-102 keys) Keyboard Layout: US Pointing Device: MousePort Mouse No Changes: The above list matches my computer.
10	Select Display: (to load a video driver). Press [Enter].	You have asked to change the type of display to be installed.
11	Insert the provided display driver diskette. Press [Enter].	You have chosen to change your computer's display type to one supported by a hardware manufacturer-supplied disk.
12	Select the appropriate display driver. Press [Enter].	You can choose your graphics card type from the list displayed.
13	Select "The above list matches my computer." Press [Enter].	"The list below shows existing partitions and spaces available for creating new partitions."
14	Select the desired disk. Press [Enter].	Follow the on-screen instructions and continue the installation. For more information, refer to the *Microsoft Windows NT Workstation System Guide*.

If you are installing the operating system on a disk that has not been partitioned and formatted, refer to Table E–2.

Table E–2: Setting Up Partitions for a Windows NT Installation

Step	Action	Result
1	From the AlphaBIOS boot screen, press [F2].	AlphaBIOS setup screen displays.
2	Select Hard Disk Setup...	If disk 0 is not partitioned, a message asking if you would like to proceed with default disk partitioning displays.
3	Press [F10] to continue.	Express Setup Complete screen displays.
4	Press [Enter].	A list of disks, including partitions, displays.
5	Press [Escape].	AlphaBIOS setup screen displays. Refer to Table E–1 to re-attempt a Windows NT installation.

Starting a Digital UNIX Installation

To start a Digital UNIX installation, follow the steps in Table E–3.

_____ **NOTE** _____

The SRM console must be installed and running in order to perform a Digital
UNIX installation. If the AlphaBIOS console is running, refer to Chapter 3,
Configuring Your System, for instructions on loading the SRM firmware.

_____

Table E–3: Starting a Digital UNIX Installation

Step	Action	Result
1	At the SRM prompt, type: `>>>set boot_osflags ""`	Clear the *boot_osflags* variable.

2	At the SRM prompt, type:
	`>>>`
	`set auto_action halt`
		Halts the system at the console prompt each time the system is turned on, crashes, or when the reset button is pushed.

3	Insert the *Digital UNIX for AXP™ Systems* CD-ROM into the CD drive.	CD-ROM drive is ready.

4	At the SRM prompt, type:
	`>>>show dev`
		List of devices displays:
		`dka0.0.0.6.0   DKA0   RZ26L 441A`
		`dka400.4.0.6.0 DKA400 RRD43 3213`
		`dva0.0.0.0.1   DVA0`

5	From the SRM console, boot the Digital UNIX CD-ROM. `>>>boot dka400`	Installation information is displayed and you are prompted to select an option. For more information, refer to the *Digital UNIX Installation Guide*.

Starting an OpenVMS Installation

To start an OpenVMS installation, follow the steps in Table E–4.

_____**NOTE** _____

The SRM console must be installed and running in order to perform an
OpenVMS installation. If the AlphaBIOS console is running, refer to Chapter 3,
Configuring Your System, for instructions on loading the SRM firmware.

_____

Table E–4: Starting an OpenVMS Installation

Step	Action	Result
1	Insert the OpenVMS CD-ROM into the CD drive.	CD-ROM drawer closes.
2	At the SRM prompt, type: `>>>show dev`	List of devices displays: `dka0.0.0.6.0   DKA0   RZ26L 441A` `dka400.4.0.6.0 DKA400 RRD43 3213` `dva0.0.0.0.1   DVA0`
3	From the SRM console, boot the OpenVMS CD-ROM. `>>>boot -flags 0,0 dka400`	Installation information is displayed and you are prompted to select an option. For more information, refer to the *OpenVMS Installation Guide*.

F
Equipment Log

Introduction

You can use the Equipment Log to gather information that you may need if problems occur with your system and you need to call your service representative or Digital Equipment Corporation 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 six tables, which you can use to record the following information:

- Your system's hardware components (Table F–1).

- Your system's ISA equipment configuration (Table F–2).

- Your SCSI (small computer system interface) device address settings (Table F–3).

- Your system's hardware configuration (Table F–4).

- The operating system or application software installed on your Digital AlphaStation 255 system (Table F–5).

- Additional components (Table F–6).

Equipment Log

Table F–1: Hardware Components

Component	Vendor/ Type/Size	Model Number/ Speed	Serial Number	Date Installed
System unit	AlphaStation 255			
System unit key number				
Monitor				
Keyboard				
Mouse				
Optional drive				
Additional storage device 1				
Additional storage device 2				
Additional storage device 3				
Additional storage device 4				

Use Table F–2 to keep track of your AlphaStation 255 system's expansion options. The upper portion of the table shows the standard devices. You can use the lower portion of the table to record the parameters of ISA or PCI devices you add to the riser card. The columns refer to information the SRM console used on Digital UNIX and OpenVMS systems needs.

Table F–2: ISA Equipment Configuration

Device	Handle	Slot	IOBASE	Membase and Memlen	DMAmode and chan	IRQ 0-3
Keyboard	KBD	0	60			1
Mouse	MOUSE	0	60			12
Serial Line 1	COM1	0	3F8			4
Serial Line 2	COM2	0	2F8			3
Parallel Port	LPT1	0	3BC		3, if used	7
FDC	FLOPPY	0	3F0		2, if used	6
Riser Card ISA Expansion Slots						

Table F–3: SCSI Addresses

Address	Device
0	
1	
2	
3	
4	CD-ROM drive
5	
6	
7	SCSI controller

Equipment Log

Table F–4: Hardware Configuration

Component	Digital AlphaStation 255 System Specifics
CPU (central processing unit) speed and model	
Firmware version: SROM, DROM, AlphaBIOS, SRM	

Memory size:
   Bank 0
   Bank 1	

Video module	

Table F–5: Installed Software

Operating System or Application Software	Version Number	License Number	Date Installed	Which Disk?

Table F–6: Additional Component Information

Component	Vendor	Model Number	Serial Number	Date Installed

Index

Index

Index