

Digital Alpha XL Family

User's Guide

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Any changes or modifications to this equipment may void the user's authority to operate this equipment.

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

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

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

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Preface

Welcome to the Digital Alpha XL Family System

This guide introduces the Digital Alpha XL Family system.

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

Terminology

In this guide, the terms *model 4* (XL 233 and 266) and *model 5* (XL 300, 366, and 433) are used to differentiate system motherboards as well as other system-specific characteristics.

Audience

If you are operating, configuring, or adding options to the Digital Alpha XL Family system, the information included here is helpful to you. See the specific comments in the next section, Organization of the Information, for guidelines on where to find material (for example, on configuring your system) that meets your specific needs.

Windows NT Operating System

Not all systems will be shipped with Windows NT. If your system does not have Windows NT, refer to Chapter 1, Getting Started, for instructions on installing it.

Organization of the Information

This information for users covers the following topics (see the Table of Contents for a detailed listing):

- Chapter 1, *Getting Started*. Installing, starting, restarting, and turning off the system.
- Chapter 2, *System Overview*. Motherboard, keyboard, system controls, indicators, ports, and connections.
- Chapter 3, *Configuring Your System*. Using AlphaBIOS firmware to configure your system. This chapter provides configuration information for Alpha XL customers who have the *XL 266* (some *model 4* systems) or *XL 300, 366, or 433* (all *model 5* systems) systems.
- 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 problem.
- Appendix A, *Technical Specifications*.
- Appendix B, *System Care*. Cleaning your system, monitor, and mouse.
- Appendix C, *Device Mapping*. I/O addresses and interrupts.
- Appendix D, *Updating AlphaBIOS Firmware*.
- Appendix E, *Starting an Operating System Installation*.
- Appendix F, *Configuring with the ARC Console*. Using the ARC console to configure boot devices, date and time, environment variables, SCSI termination, and so forth. This appendix provides configuration information for those customers who have a *XL 233* system.
- Appendix G, *Equipment Log*.

Conventions

This guide uses the following conventions:

Convention Example	Description
<code>c:\windows</code>	Monospaced text indicates file names, path names, directories, or screen text.
[Enter]	A key name surrounded by brackets indicates that you press that key.
Ctrl/ <i>x</i>	Ctrl/ <i>x</i> indicates that you hold down the Ctrl key while you press another key or mouse button (indicated here by <i>x</i>).
Apu_> update	Boldface type in examples indicates user input.
SIMMs are <i>always added in bank sets</i> .	Italic type emphasizes important information, indicates variables, and indicates complete titles of manuals.
	A pointing hand indicates a reference to additional information.

Preface

Abbreviations

This guide uses the following abbreviations:

Abbreviation	Meaning
ARC	Advanced RISC Computing.
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.
FAT	File allocation table.
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.

(continued)

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.
ns	Nanoseconds.
NVRAM	Nonvolatile random access memory.
PCI	Peripheral component interconnect.
RAID	Redundant array of inexpensive disks.
RISC	Reduced instruction set computing.
ROM	Read only memory.
SCSI	Small computer system interface.
SIMM	Single in-line memory modules.
SROM	Serial read only memory.

Preface

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 cause damage to hardware or that might 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 Alpha XL Family system:

- *Digital Quick Setup Guide* (order number ER-A03WW-IM) presents a graphical overview of the Digital Alpha XL Family installation.
- *Digital Alpha XL CPU Guide* (order number EK-ALXLA-CG). This guide contains information about the Alpha XL CPU modules.
- On-line documentation is available in the form of customized help screens. Double-click on the appropriate "Getting Started" icon to access these screens.

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

Getting Started

Introduction

Your Digital Alpha XL system is a high-performance computer that uses the latest microprocessor technology. The system can be used as a stand alone computer, or it can function as a client in an office network environment.

This chapter describes how to start, install, restart, and turn off your Digital Alpha XL system. Information about preloaded software as well as guidelines for system security are also included here. Figure 1-1 shows a typical Digital Alpha XL system.

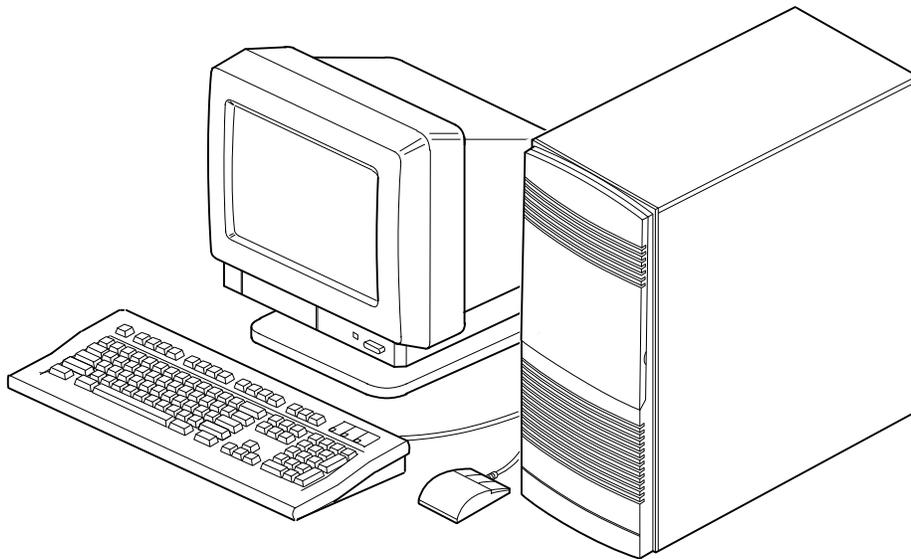


Figure 1-1. Digital Alpha XL System

Before Starting Your System

Before you start your system, perform the following steps:

1. Read and understand the information supplied with your system.
2. Select a well-ventilated site near a grounded power outlet and away from sources of excessive heat. 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 at a later time.

NOTES

- a. Do not install optional hardware or application software until you have started your system and verified that it is working correctly.
- b. On systems that have preloaded software, a label attached to the system unit informs you that 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 1-2 and Table 1-1. In addition, be sure to adjust your work space so that you are comfortable, and change your position frequently.

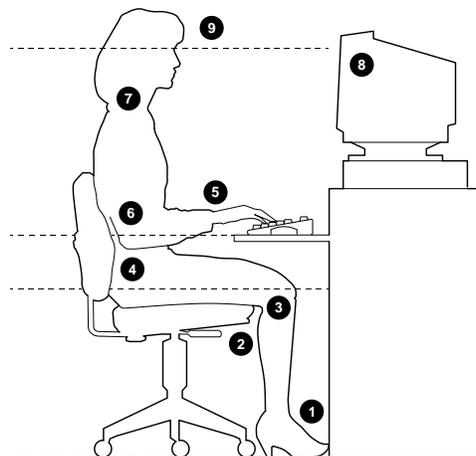


Figure 1-2. Recommendations for Posture and Work Habits

Getting Started

Table 1-1. Recommendations for Posture and Work Habits

Adjust	To allow the following conditions
Chair	<ol style="list-style-type: none">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	<ol style="list-style-type: none">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.
Head	<ol style="list-style-type: none">7. Avoid neck strain. Your head should incline downward, but no more than 15 to 20 degrees.
Monitor	<ol style="list-style-type: none">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.

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

Adjust	To allow the following conditions
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.

Getting Started

Identifying the Correct AC Power Cord

Your Digital Alpha XL system should come with the proper ac power cord. As there are variations from one country to another, 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 V AC power cord for 230 V AC input power. Modifying the power cord can cause personal injury and severe equipment damage.

Power cords supplied with the Digital Alpha XL system meet the following criteria:

- UL and CSA Certified cord rated for use at 250 V ac with a current rating that is at least 125% of the current rating of the Digital Alpha XL 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 in which the system will be used. 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).

Preloaded Operating System Software

If your Digital Alpha XL system came preloaded with the Microsoft Windows NT Workstation operating system, your system shipped with the following software:

- Microsoft Windows NT CD-ROM.
- Software Restore CD-ROM.
- Video Drivers floppy diskette.
- HAL floppy diskette (for *model 5* systems only).

Set these items aside in a safe place. You will use them if you need to restore the operating system to your disk.

Not all systems come with Microsoft Windows NT Workstation operating system preloaded. If your system does not already have Windows NT installed, refer to Appendix E, Starting an Operating System Installation, for instructions.

Installing Your System

The Digital Alpha XL system *Quick Setup* card you received with your system graphically outlines the steps to follow in installing your system.

CAUTIONS

1. To ensure that your system is properly cooled, make sure that air can freely flow into the front and out of the rear of the system unit.
 2. The system is designed to be installed vertically. If you elect to install the system horizontally, place the side nearest the power on-off switch down.
-

Getting Started

Check to make sure that you received all your system components. (See Appendix G, 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 shown in Figure 1-3.

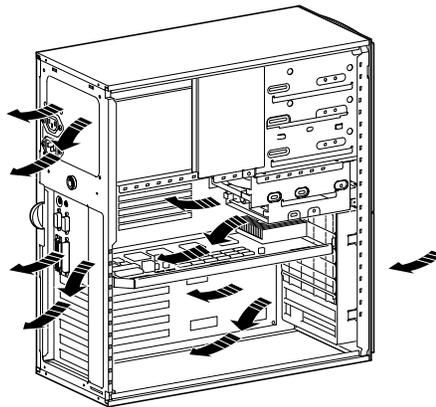


Figure 1-3. System Airflow

Connecting System Parts

To connect the components of your Digital Alpha XL system, perform the following steps:

1. Confirm that the voltage selector switch matches your local voltage (either 115 V or 230 V), as Figure 1-4 shows.

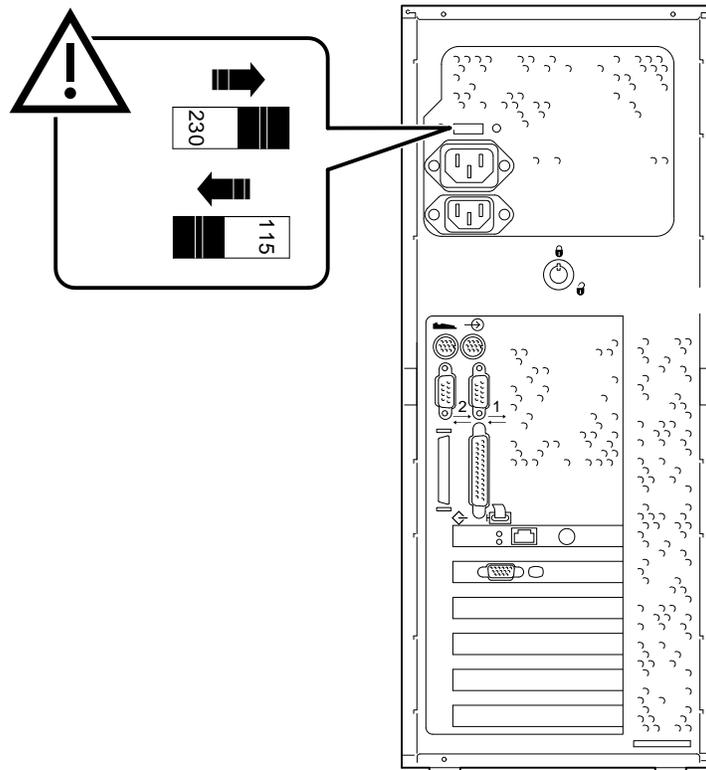


Figure 1-4. Voltage Selector Switch

Getting Started

CAUTION

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

2. Ensure that the power switch is in the off (out) position. Refer to your system's *Quick Setup* card for a view of the positions of this switch.

CAUTION

Do not use the system auxiliary AC outlet. Plug your monitor into a wall receptacle.

3. Connect the mouse, keyboard, video cable, and power cords to the system components, as Figure 1-5 shows.

CAUTION

On early Alpha XL 300 systems, the keyboard and mouse connectors are reversed. A sticker on the rear of the system identifies the appropriate connectors.

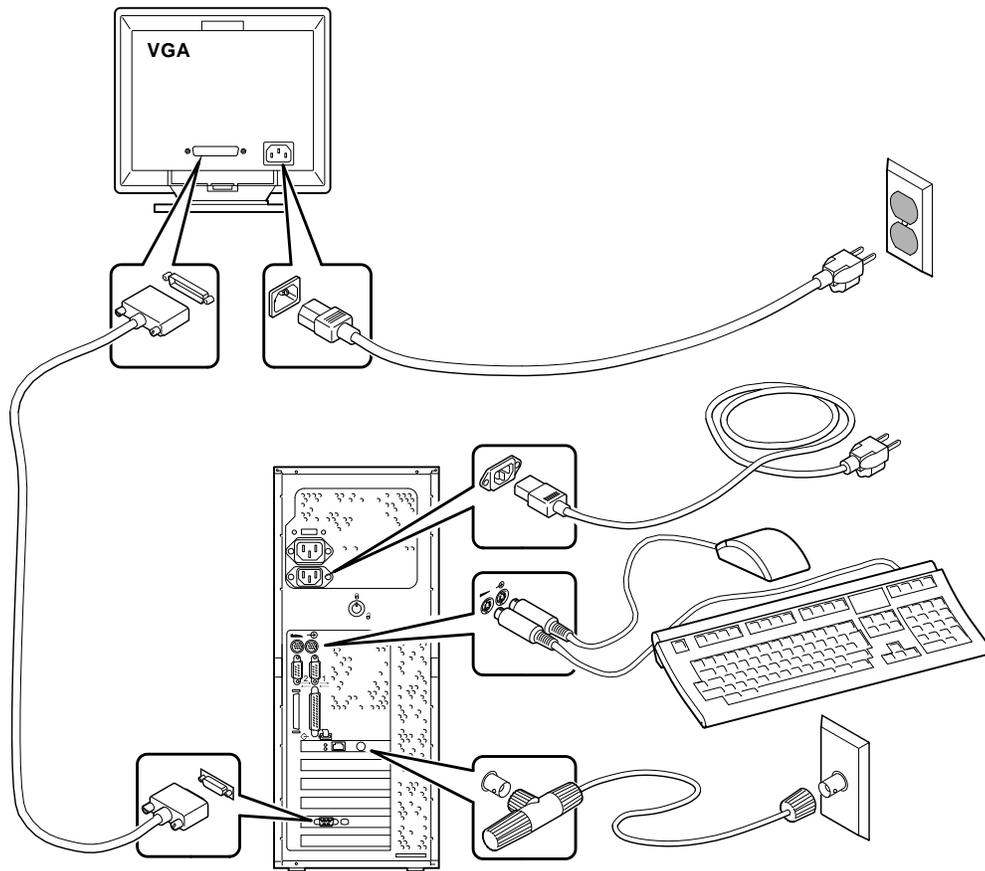


Figure 1-5. Connecting Cables and Power Cords

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 3.

Getting Started

Network Connection

If you ordered a *model 4* system, which has an optional network module, connect your network interface cable to the appropriate port on your network module.

On *model 5* systems, the Ethernet controller is embedded. A media adapter unit (MAU) provides ThinWire and Twisted-Pair connections on the rear of the system.

Starting Your System

Perform the following steps in the order outlined to start (boot) your Digital Alpha XL system:

1. Open the system unit front door and turn on the system unit power. Also, turn on the monitor power, and any external devices. Figure 1-6 shows the location of the system unit power button.

If you wish, you can remove the system door, as Figure 1-6 shows.

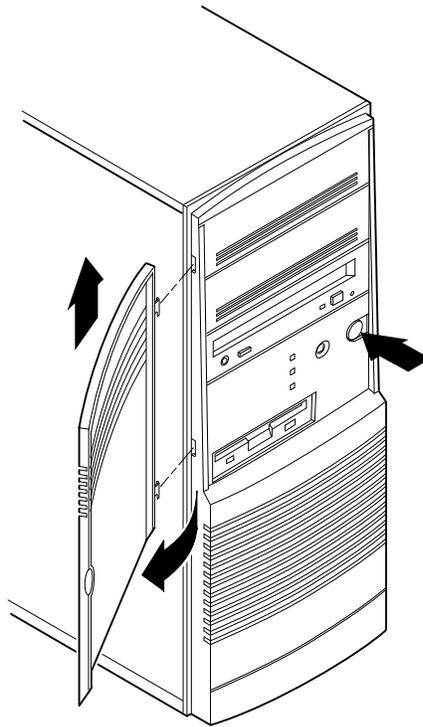


Figure 1-6. Starting Your System

2. If necessary, adjust the monitor contrast and brightness to obtain a readable screen display. (Refer to the information supplied with your monitor for further instructions.)

Getting Started

3. Allow your system to complete any power-on self tests and device initialization messages. This takes approximately 1 minute. If the AlphaBIOS firmware has autostart enabled *and* if Windows NT was preloaded on your system, the Microsoft Windows NT Workstation operating system starts after a countdown expires. The default countdown is 10 seconds. To override the countdown timer, select another Boot menu option before the countdown expires.

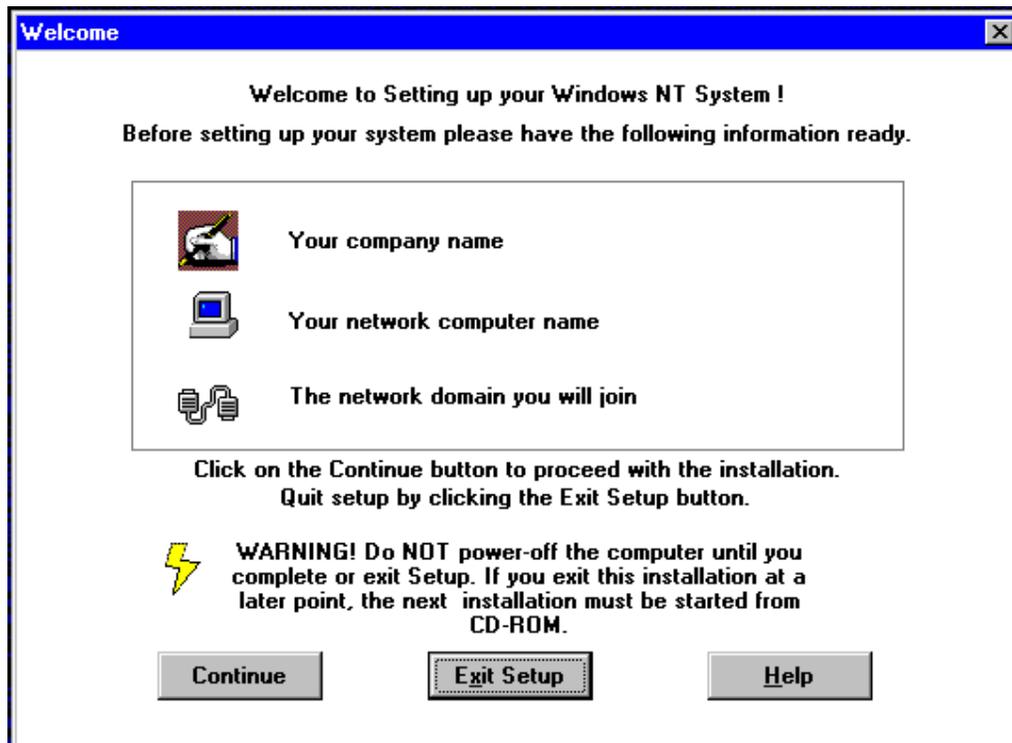
Starting the Windows NT FIS Procedure

If the Microsoft Windows NT Workstation operating system was preloaded on your system, the Windows NT FIS procedure will start when you turn on your system for the first time.

CAUTION

Do not power off the system until you either complete or exit Setup. If the system is powered off during Setup, the FIS will be lost, and you will have to start the installation using the Microsoft Windows NT CD-ROM.

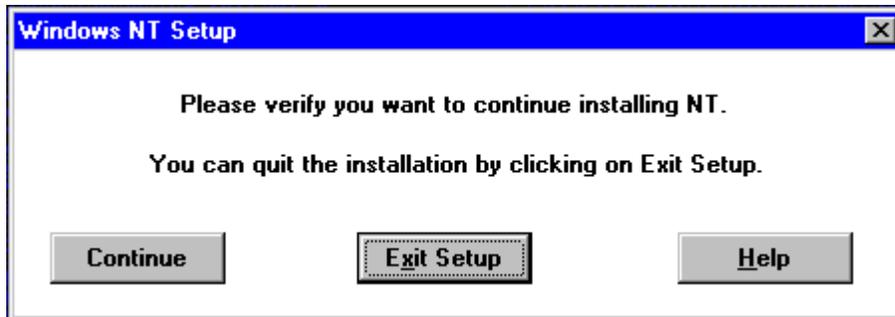
The following screen should display:



If the screen is not displayed when you power on the system for the first time, this may indicate a problem with the system. Write down any messages that display and call your Digital service representative.

Getting Started

Before proceeding, make sure you know the company name, network computer name, and the network domain your system will be joining. Click on Continue to proceed. The following screen is displayed:



After you have clicked on Continue, the Windows NT installation proceeds. When you are prompted, enter your company name, network computer name, and the network domain your system will be joining.

Printers are not set up during the FIS procedure. Once the Windows NT installation is completed, you can log on and customize the system for your printers.

NOTE

If the factory-installed Windows NT operating system does not work *or* if Windows NT operating system was not preloaded on your system, refer to Appendix E, Starting an Operating System Installation.

Turning Off Your System

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

Perform the following steps 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 from the Program Manager File Menu by selecting Shutdown, or by pressing [Ctrl]+[Alt]+[Del].
3. From the Shutdown Computer menu, choose the OK button to confirm.
4. Wait for the Microsoft Windows NT Workstation operating system to complete the shutdown process. Once the shutdown process is completed, Windows NT indicates that it is safe to turn off or restart the system.

CAUTION

Do not turn off power to your system or peripherals until the shutdown sequence has completed.

Getting Started

Computer Security

Your Digital Alpha XL system includes several security features. See your operating system documentation for more information on the availability and use of these options.

Chassis Lock

To avoid theft of internal components, your Digital Alpha XL system comes with a chassis key lock, which is located on the back of your system box. When this lock is in the locked position, no one else can open the system box. Store the key in a safe place.

Security Loop

Your system comes with a built-in security loop, which discourages theft of your system unit.

Passwords

You can set up your system with user-based login, lock workstation, and screen saver passwords.

System Overview

Introduction

This chapter presents an overview of the Digital Alpha XL system. Topics covered include the system's architecture, PCI bus, front and rear views, system unit and motherboard components, and the keyboard.

System Architecture

Your Digital Alpha XL system uses one of many high-performance Alpha architecture CPU modules. The CPU module plugs in to a motherboard containing main memory, expansion slots, SCSI controller, and so forth.

 For information on the available Alpha CPU modules, see the *Digital Alpha XL CPU Guide*.

The system box has the following features:

- Three storage bays for half-height 5.25-inch devices.
- Floppy disk controller that supports two floppy drives or one floppy and one tape drive.
- SCSI-2 controller with both internal and external busses that support up to seven SCSI devices.
- *Model 4 (233 and 266)*: Two slots for PCI options, three slots for ISA options, and one additional combination slot (for either a PCI or ISA option).
- *Model 5 (300, 366, and 433)*: Two slots for PCI options, two slots for ISA options, one combination slot (for either a PCI or ISA option), and one MAU slot.

System Overview

- Keyboard and mouse ports.
- Two serial ports.
- One enhanced bidirectional parallel port.

 Refer to Appendix A, Technical Specifications, for additional information.

PCI Architecture

Your system's PCI architecture represents the latest advances in local bus technology. The Digital Alpha XL system PCI architecture delivers maximum performance by providing a wider data path, greater speed, and improved expandability. Now, you can move ISA bus peripheral controller functionality over to the PCI bus with available PCI peripheral controllers. 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.

PCI local bus features include:

- Highest performance in the market today.
- Best expandability for high-performance peripheral devices.
- Support for multiple bus masters.
- 32-bit data transfer at 132 MB per second (peak).
- PCI-to-ISA bridge capability that allows you to use commonly available ISA options.

SCSI Controller

The Digital Alpha XL system uses a PCI-based embedded fast SCSI-2 controller that controls up to seven SCSI peripherals such as hard disk drives, CD-ROM drives, and tape drives.

Diagnostics

The Digital Alpha XL system uses diagnostic routines that are built in to the CPU module. These diagnostics are executed during power on and initialization, which is why they are referred to as power-on self test (POST).

Getting Started Program

If your system has the Windows NT operating system preinstalled, you also received the custom-designed Getting Started user interface. This program furnishes easy access to applications, as well as information on system use, warranty, and so forth.

CAUTION

Do not attempt to plug a monitor power cord into the AC auxiliary port on the back of the system. Instead, use the additional power cord (shipped with your system) to attach your monitor directly to the wall outlet.

System Overview

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.

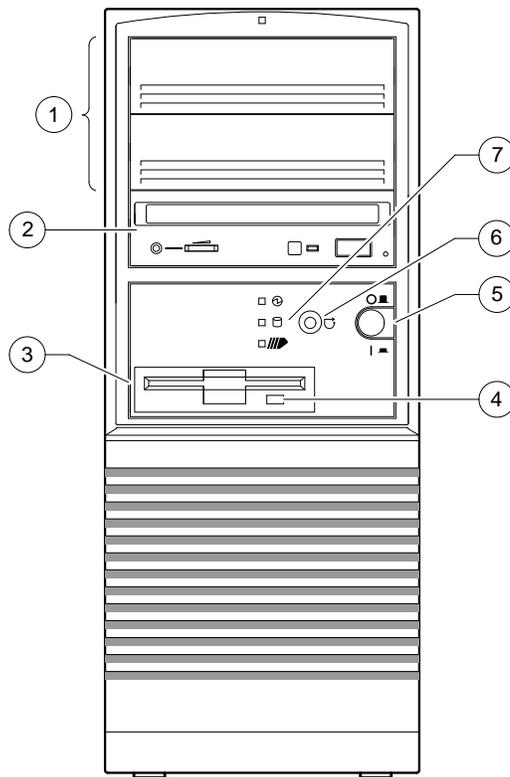


Figure 2-1. Front Controls and Indicators

Table 2-1. Front Controls and Indicators

Figure Legend	Control or Indicator	Function
1	Drive bays	Location of two 5.25-inch drive bays.
2	CD-ROM drive	Location of a 5.25-inch bay. A CD-ROM drive is installed in the bay.
3	Floppy drive	Location of 3.5-inch diskette drive. A hidden 3.5-inch drive bay containing a hard disk is located just above the floppy drive.
4	Floppy eject button	Releases a 3.5-inch diskette from the floppy diskette drive.
5	Power On/Off button	Turns AC power on and off.
6	Reset button	The reset button resets the system and causes the self test to run.
7	Indicators	Indicators from top to bottom are as follows: <ul style="list-style-type: none"> • Power indicator lights when the system is on. • Hard disk drive indicator lights when a hard disk drive is in use. • The lower indicator is not used.

System Overview

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.

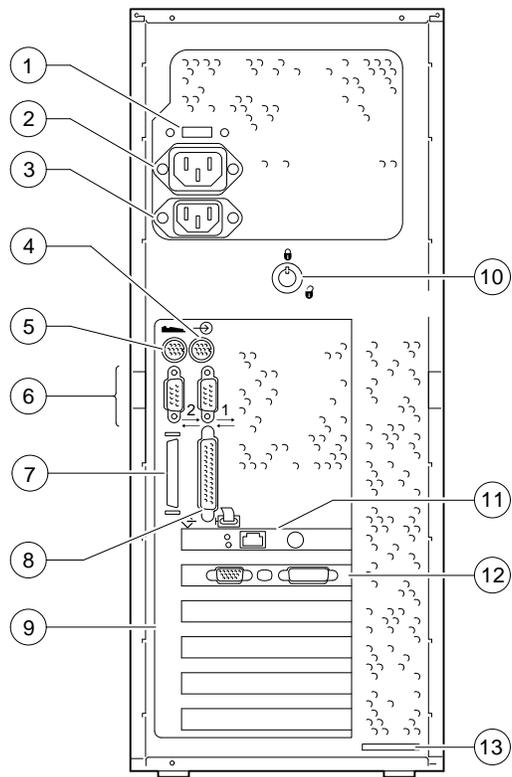


Figure 2-2. Rear Connectors

Table 2-2. Rear Connectors

Figure Legend	Connector	Function
1	Voltage selector switch	Lets you set your system to work with 115 or 230 V AC power.
2	AC connector	<i>Do not use.</i>
3	AC power connector	Connects the system to AC power.
4*	Mouse connector	Connects a PS/2-compatible mouse.
5*	Keyboard connector	Connects a 101- or 102-key keyboard.
6	Serial port connectors	Connects serial devices.
7	SCSI connector	Interfaces system unit and external SCSI devices.
8	Parallel port connector	Connects an industry-standard parallel printer.
9	Expansion board slots	<i>Model 4:</i> Two full-size PCI, three full-size ISA, and one PCI <i>or</i> ISA expansion boards. <i>Model 5:</i> Uppermost slot is used for the MAU. Next two slots are for PCI options. Fourth slot down is a PCI/ISA combination slot. The two lowermost slots are for ISA options.
10	System (chassis) lock	Locks outside panels.
11	MAU	Provides connection to embedded Ethernet.
12	Video port (on option module) Matrox video connector	Interface between video/graphics expansion module (option) and supported monitor. For Matrox manufacturing testing purposes only. <i>Not supported by Digital Equipment Corporation.</i>
13	Security feature	Allows you to cable system box to a table.

* On early shipments of the Alpha XL 300 systems, the keyboard and mouse connectors are reversed.

System Overview

System Unit Components

Component Locations

Figure 2-3 shows the locations of the Digital Alpha XL system unit components. Table 2-3 lists the system unit components.

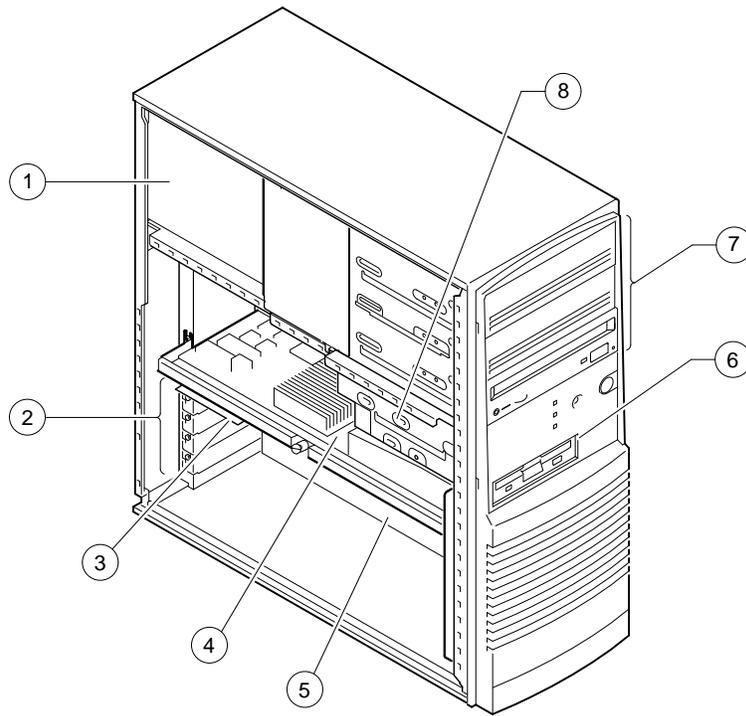


Figure 2-3. System Unit Components

Table 2-3. System Unit Components

Figure Legend	Component
1	Power supply
2	Expansion slots
3	MAU
4	CPU module
5	Motherboard
6	One 3.5-inch diskette drive
7	Three 5.25-inch half-height drive bays
8	Hidden 3.5-inch half-height drive bay

Motherboards

Model 4 (233 and 266)

Figure 2-4 shows the location of the *model 4* motherboard components. Table 2-4 lists the *model 4* motherboard components. Refer to Appendix A for the motherboard jumper locations and descriptions.

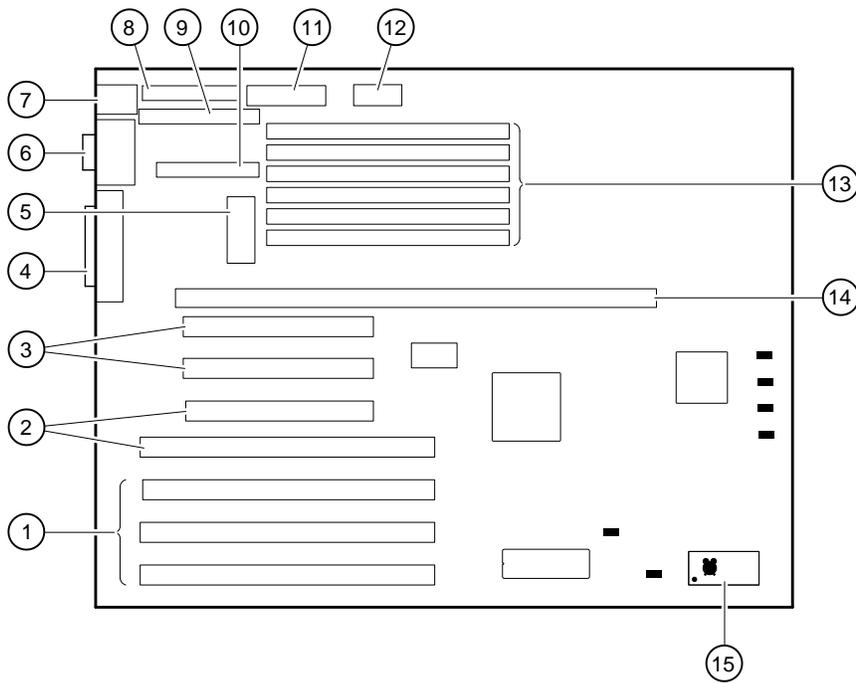


Figure 2-4. *Model 4* Motherboard Components

Table 2-4. Model 4 Motherboard Components

Figure Legend	Components
1	ISA expansion slots
2	Combination PCI and ISA expansion slot
3	PCI expansion slots
4	External SCSI connector and bidirectional parallel port connectors
5	Power connector (+3.3 V)
6	Serial ports (COM1 and COM2)
7	Mouse and keyboard connectors
8	FDC connector
9	Internal SCSI connector
10	Unused
11	Power connector (+5, -5, +12, and -12 V)
12	Power connector (+5 V)
13	SIMM connectors
14	CPU module connector
15	Realtime clock

System Overview

Model 5 (300, 366, and 433)

Figure 2-5 shows the location of the *model 5* motherboard components. Table 2-5 lists the *model 5* motherboard components. Refer to Appendix A for the motherboard jumper locations and descriptions.

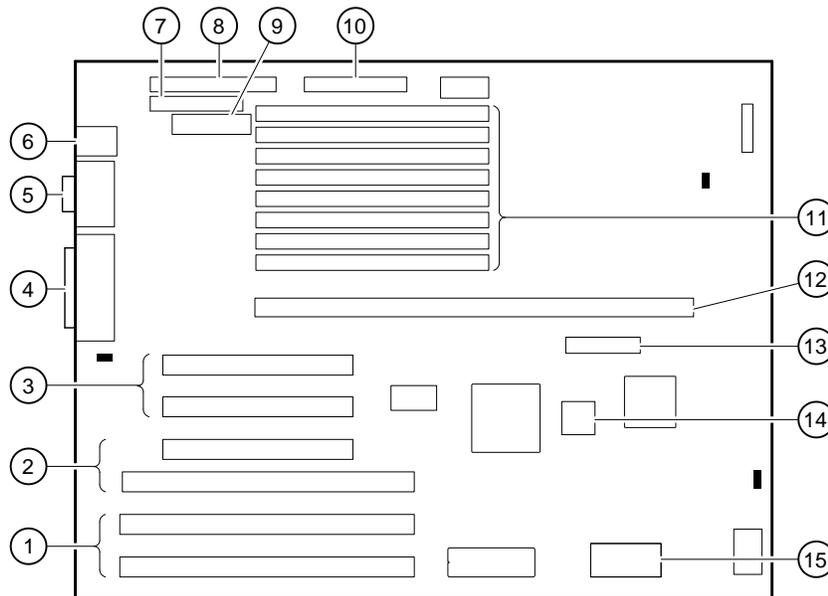


Figure 2-5. Model 5 Motherboard Components

Table 2-5. Model 5 Motherboard Components

Figure Legend	Components
1	ISA expansion slots
2	Combination PCI and ISA expansion slot
3	PCI expansion slots
4	External SCSI connector and bidirectional parallel port connectors
5	Serial ports (COM1 and COM2)
6	Mouse and keyboard connectors
7	FDC connector
8	Internal SCSI connector
9	Power connector (+3.3 V)
10	Power connectors (+5, -5, +12, and -12 V)
11	SIMM connectors
12	CPU module connectors
13	MAU connector
14	Ethernet ID ROM
15	Realtime clock

Keyboard

Your system comes equipped with a 101-key enhanced keyboard that allows you to communicate with your system by entering data or commands. Notice that some European language keyboards have 102 keys. You can adjust the angle of the keyboard for your comfort. The underside of the keyboard has feet that swing down and lock into place. Refer to Figure 2-6 and Table 2-6 for information on keyboard key groups and functions.

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

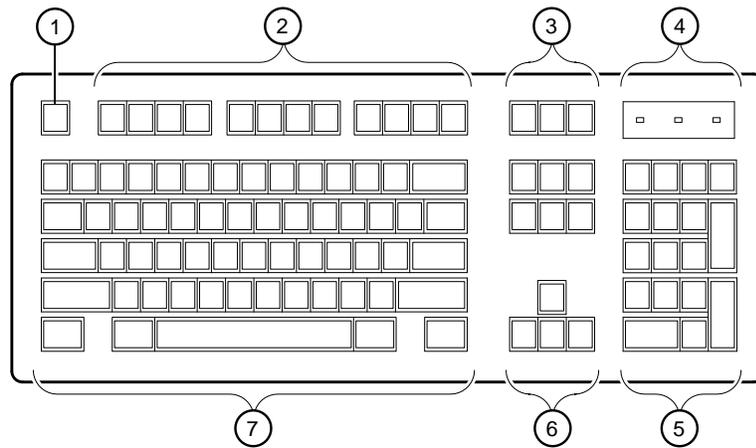


Figure 2-6. Keyboard Layout

Table 2-6. 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.
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	These typewriter-specific keys feature auto-repeat capability. If you press and hold down any of these keys, the keystroke repeats automatically until released.

3

Configuring Your Alpha XL System

Introduction

This chapter shows you how to configure your Digital Alpha XL system 300, 366, and 433 (*model 5 systems*) using the AlphaBIOS firmware.



Customers who are using ARC firmware (*model 4 systems*) should refer to Appendix F, Configuring with the ARC Console.

Configuring with AlphaBIOS Firmware

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

- 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) successfully complete, the AlphaBIOS firmware is loaded and started. AlphaBIOS performs several initialization tasks. Among these are: initializing the keyboard and video devices, testing memory, and detecting and initializing SCSI disk controllers. After the video device is initialized, subsequent steps are displayed on the monitor in an initialization window.

Configuring Your Alpha XL System

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].

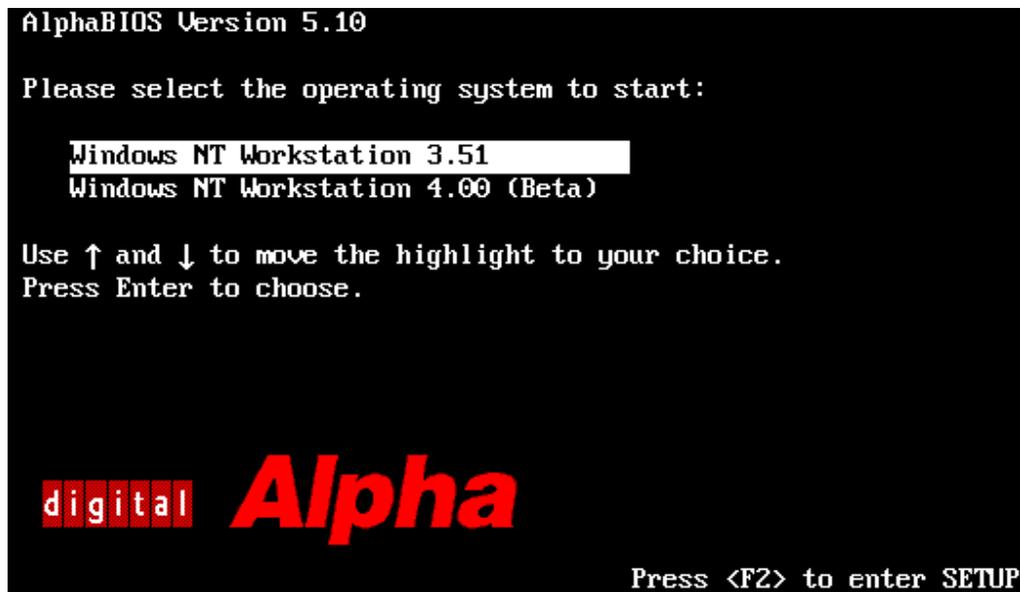


Figure 3-1. AlphaBIOS Boot Screen

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.

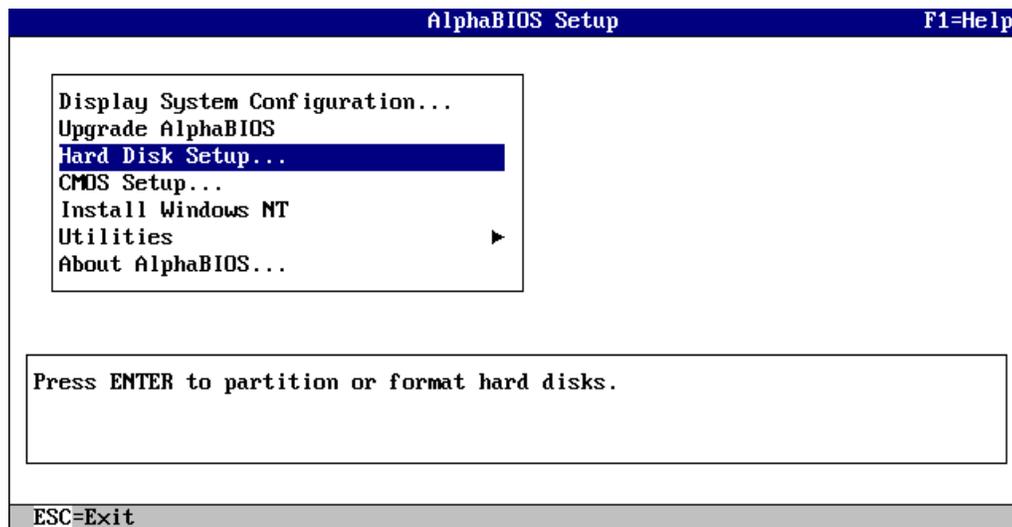


Figure 3-2. AlphaBIOS Setup Screen

Configuring Your Alpha XL System

Displaying Your Configuration

AlphaBIOS provides a clear, easy-to-read display of the system configuration. The display is organized by system board, 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.

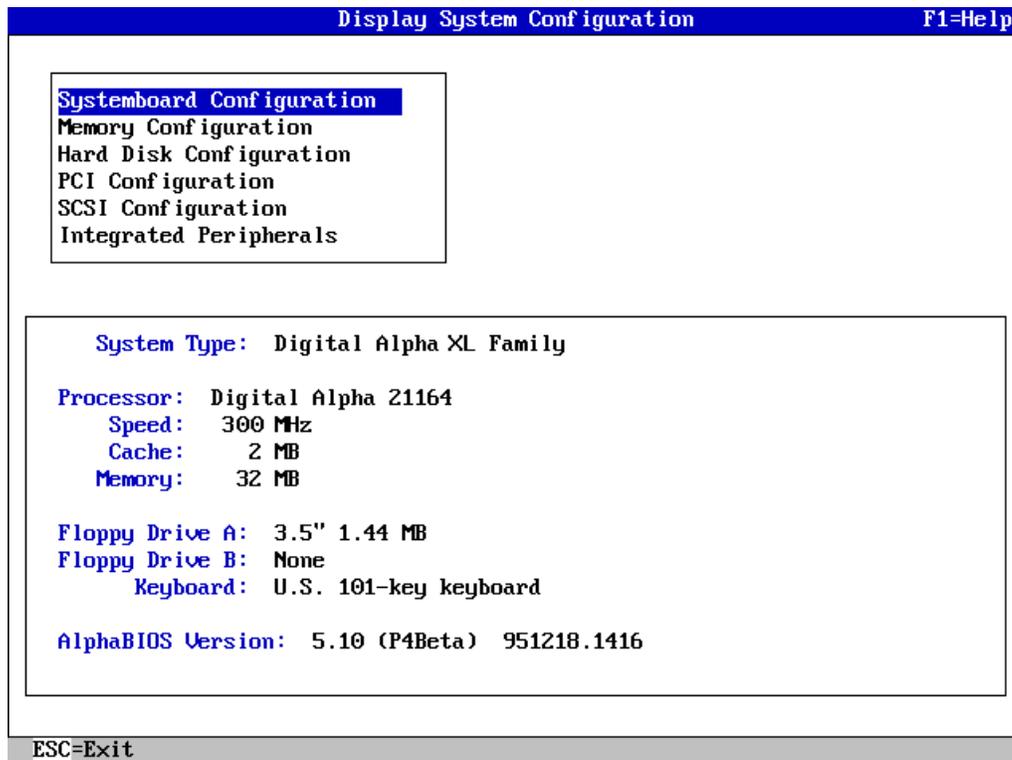


Figure 3-3. Display System Configuration Screen

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 at 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.

Configuring Your Alpha XL System

Setting Up the Hard Disks

AlphaBIOS makes it easy to format and partition hard disks on your 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.

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 to control PCI parity checking, memory testing, AlphaBIOS password, and SCSI termination.

To enter CMOS setup, select CMOS Setup from the AlphaBIOS Setup screen. Figure 3-5 shows the CMOS Setup screen. Use [Tab] to move among the fields.

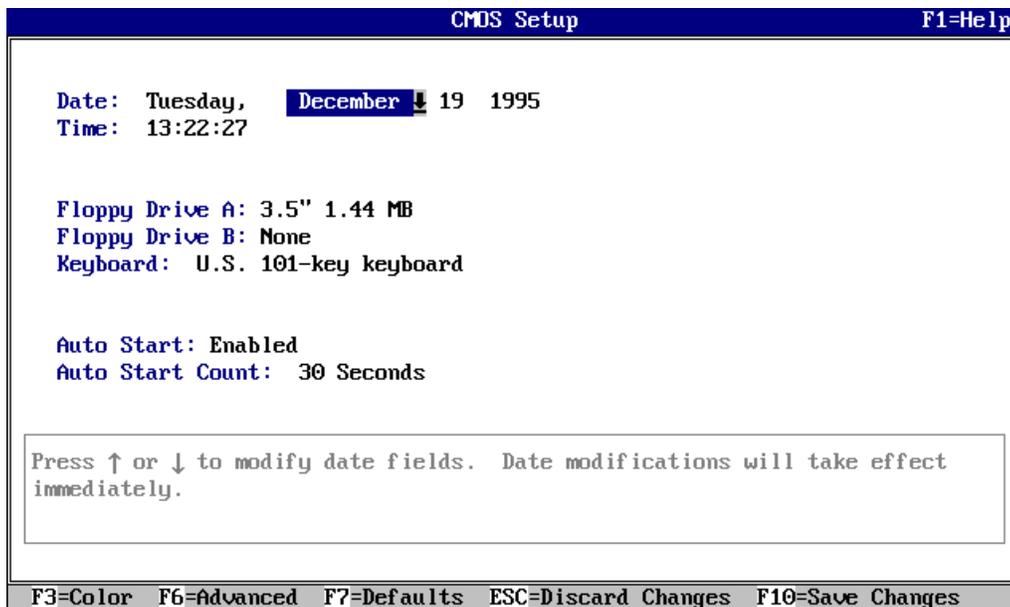


Figure 3-5. CMOS Setup Screen

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.

Configuring Your Alpha XL System

Floppy Drive

AlphaBIOS supports the following drive types: 5.25-inch, 1.2-MB; 3.5-inch, 1.44-MB; and 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 your keyboard language, 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

CMOS setup offers several options, as follows:

- **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 affected 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 (Figure 3-6) by pressing [F6] in the CMOS Setup screen.

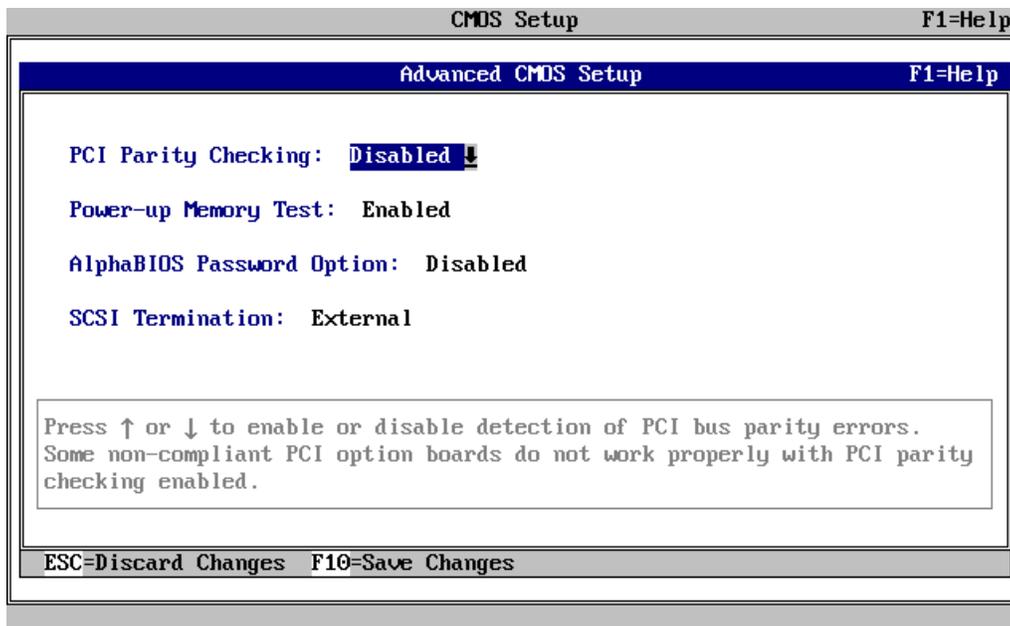


Figure 3-6. Advanced CMOS Setup Screen

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.

Configuring Your Alpha XL System

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 it does not allow the system to be used until you enter the correct password.

NOTE

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

SCSI Termination

SCSI termination is not configured with AlphaBIOS. Instead, SCSI termination is automatically sensed. This sensing can be disabled by moving a motherboard jumper.



Refer to Appendix A, Technical Specifications, for more information on Autosense SCSI termination.

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. Figure 3-7 shows the screen.

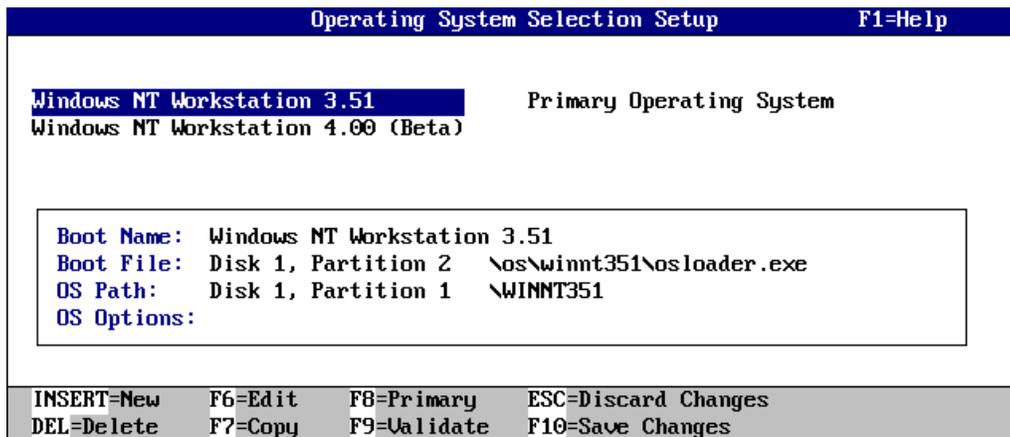


Figure 3-7. Operating System Selection

Configuring Your Alpha XL System

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.

Installing System Options

Introduction

This chapter explains how to install optional memory, expansion boards, and drives inside your Digital Alpha XL system.

Removing the Side Panels

To remove the side panels:

1. Turn off your system and all peripheral devices.
2. Unplug the power cord and remove the monitor power cord (if connected) and video cable.
3. Wait at least 20 seconds, to allow time for the power supply capacitors to safely discharge.
4. Unlock the side panels by turning the key clockwise to a horizontal position (Figure 4-1).

CAUTION

To avoid system damage from static discharge, touch bare (unpainted) metal on the system before you touch anything inside the system.

5. Slide the panels to the rear of the system unit (Figure 4-1), and remove them.

NOTE

If you are installing or removing drives, you must remove both side panels. Otherwise, remove only the left side panel.

Installing System Options

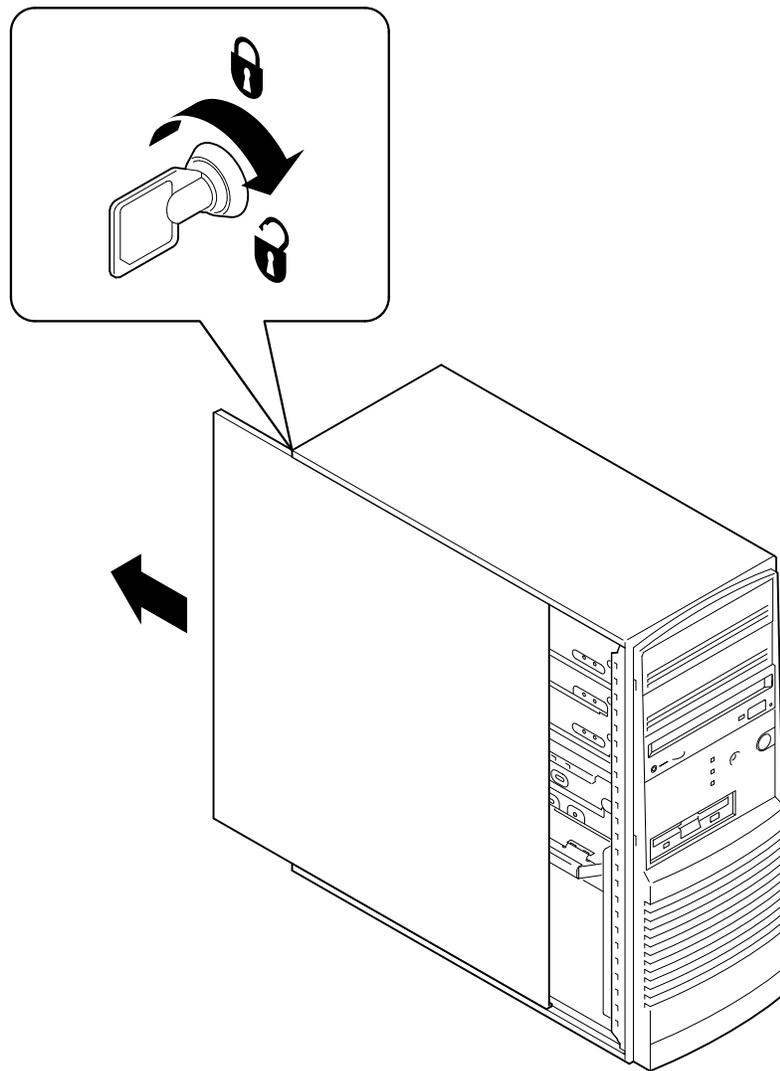


Figure 4-1. Unlocking and Removing Left Side Panel

Installing Additional System Memory

Adding more memory allows your system to run larger, more memory-intensive software more quickly. The amount of memory you can add, and the size of the SIMMs, varies depending upon which system (*model 4* or *model 5*) you have.

Model 4 (233 and 266)

You can increase your *model 4* system's memory up to 384 MB.

You can add 16-MB, 32-MB, or 64-MB memory options. These memory options are pairs of single in-line memory modules (SIMMs): a 16-MB option consisting of two 8-MB SIMMs, a 32-MB option consisting of two 16-MB SIMMs, or a 64-MB option consisting of two 32-MB SIMMs. SIMMs are *always* added as pairs into one of three available memory banks. Each SIMM member of a pair must have the same capacity and access time. The system supports 36-bit SIMMs that have an access time of 70 ns.

Memory Configurations

SIMMs are added in any of three banks, with each bank having two slots (Figure 4-2).

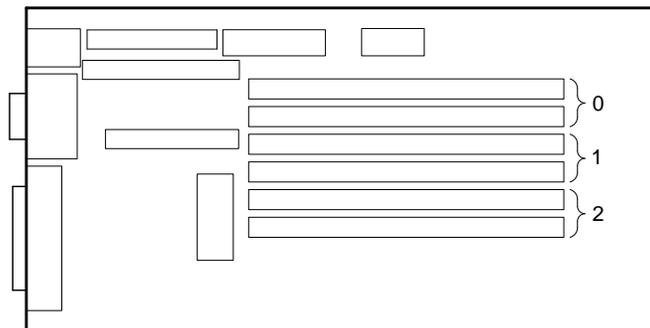


Figure 4-2. Model 4 Memory Banks

Installing System Options

Model 5 (300, 366, and 433)

You can increase your *model 5* system's memory up to 512 MB.

You can add 32-MB, 64-MB, or 128-MB memory options. These memory options are groups of four single in-line memory modules (SIMMs): a 32-MB option consisting of two 16-MB SIMMs, a 64-MB option consisting of two 32-MB SIMMs, or a 128-MB option consisting of four 32-MB SIMMs. SIMMs are *always* added as groups of four into the available memory bank. Each SIMM member of a bank must have the same capacity and access time. The system requires 36-bit SIMMs that have an access time of 70 ns.

Memory Configurations

SIMMs are added in either of two banks, with each bank having four slots (Figure 4-3). When you receive your system, usually only one bank of four SIMMs is open; the other bank of four SIMMs is populated already.

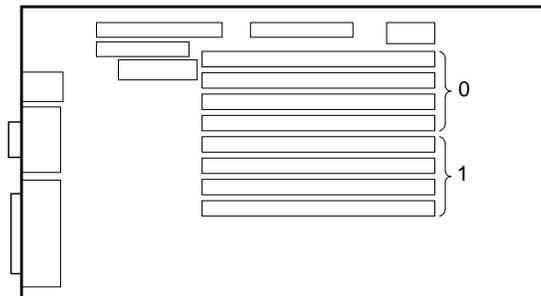


Figure 4-3. Model 5 Memory Banks

Adding Memory Modules

To add memory modules (SIMMs), perform the following steps:

1. Turn off your system. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord from the back of the system unit.
2. Unlock and remove the left side panel.

NOTE

You must remove the CPU card before installing the SIMM.

3. Carefully remove the screw located in the center of the bracket **X** (see Figure 4-4, which shows the bracket that holds the CPU assembly in place.)
4. Gently pull the two ends of the brackets toward you to release the CPU module.
5. Lift out the CPU assembly.

CAUTION

Take care not to bend the CPU assembly when removing it.

Installing System Options

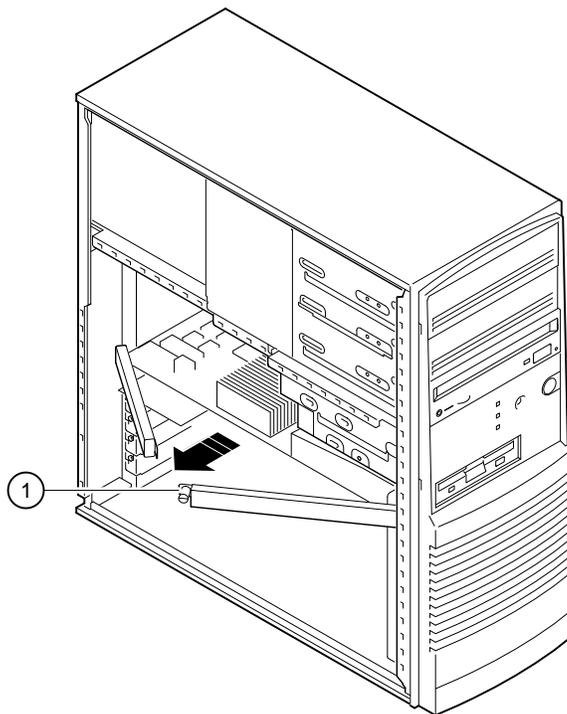


Figure 4-4. Removing CPU Assembly

6. Install the SIMM into the socket at a 45-degree angle (Figure 4-5). Be sure that the notch is oriented as shown. Rock the SIMM gently until it is seated evenly into the bottom of the socket. Using equal pressure near both ends, tip the SIMM upright until both the retaining clips at the ends of the socket engage.
7. Repeat Step 6 for each additional SIMM.

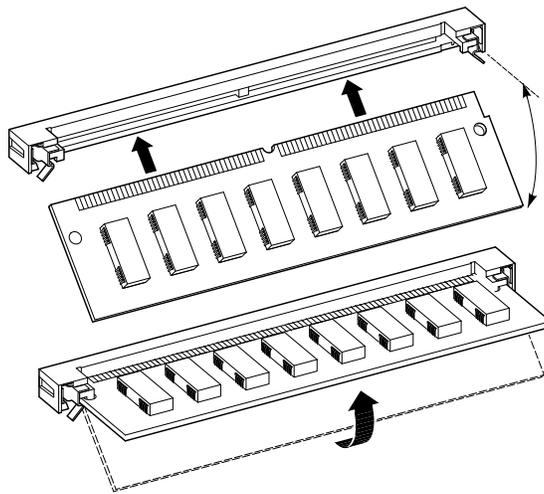


Figure 4-5. Installing a SIMM

CAUTION

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

Installing System Options

NOTE

The CPU module handles are used *only* for removing the module. At all other times, the handles must be fastened together at the center where they meet.

8. To reinsert the CPU module, refer to Figure 4-6 and guide the fan pipe at the front edge of the CPU module into the third slot down on the fan/speaker assembly, while at the same time guiding the rear of the module through the two tabs on the pivot bracket. Ensure that you keep the module even as it slides toward the connector.
9. Before seating the module, make sure the CPU module connector is aligned properly with the motherboard connector. Refer to Figure 4-6 and apply even, firm pressure on both ends of the CPU module until it seats in the motherboard.
10. Replace and lock the left side panel.
11. Connect the power cord to the back of the system unit.
12. Connect any external devices and plug the power cord into the wall outlet.

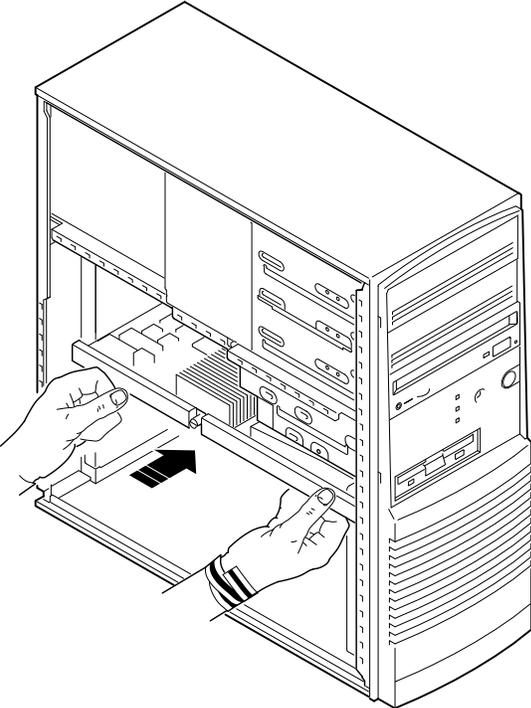


Figure 4-6. Inserting the CPU Module

Installing Expansion Boards

The Digital Alpha XL system has the following expansion slot capabilities: for the *model 4*, two PCI slots, three ISA slots, and one combination PCI and ISA slot; and for the *model 5*, two PCI slots, two ISA slots, and one combination PCI and ISA slot.

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

To install an expansion board, perform the following steps:

1. Turn off your system. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord from the back of the system unit.
2. Unlock and remove the left side panel.
3. Unscrew and remove the appropriate metal slot filler plate.
4. Insert the new expansion board into the appropriate motherboard socket. Push the board firmly into the socket (Figure 4-7).

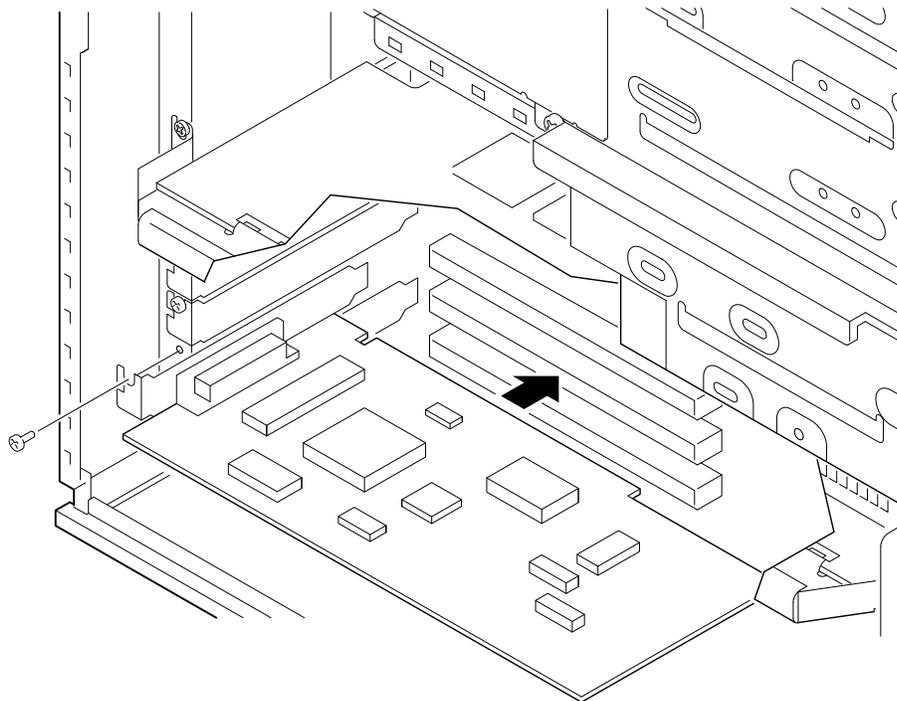


Figure 4-7. Installing an Expansion Board

5. Replace the screw to secure the module.
6. Replace and lock the left side panel.
7. Connect the power cord to the back of the system unit. Connect any external devices and plug the power cord into the wall outlet.

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

Adding Mass Storage Devices

Your system has two drive bay areas: the upper drive bay and the lower drive bay. You can install mass storage devices such as hard disk drives, floppy diskette drives, CD-ROM drives, and tape backup drives in these drive bay areas:

- Upper drive bay area. This area has room for three 5.25-inch half-height devices. (In the Alpha XL system, one of these positions contains a CD-ROM drive.) Each drive bay is equipped with a removable panel to accommodate devices requiring front-panel access.

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

- Lower drive bay area. This area has a drive bay assembly that holds a 3.5-inch floppy diskette drive (standard on all Alpha XL systems) and one hidden (nonaccessible from the front) 3.5-inch half-height device. This hidden bay is typically used for mounting the system's primary hard disk drive.

Expansion Brackets

You can install half-height devices in any of the three positions in the upper drive bay area. To do this, attach drive-expansion brackets to the device.

NOTE

Be sure to use the brackets that came with the system, rather than those that came with the drive.

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 any external storage enclosures. The total length must not exceed 3 meters (9.8 feet) for fast SCSI (10 MB/second) operation or 4 meters (13.1 feet) for "slow" SCSI (5 MB/second) operation.

- *Model 4.* The Alpha XL system internal SCSI length is 1.5 meters (4.9 feet). This leaves 1.5 meters (4.9 feet) available for fast SCSI use. If slow SCSI is used, then an external length of 2.5 meters (8.2 feet) is available.
- *Model 5.* The Alpha XL system internal SCSI length is 1.6 meters (5.2 feet). This leaves 1.4 meters (4.6 feet) for fast SCSI or 2.4 meters (7.9 feet) for slow SCSI.

SCSI Addresses

Before installing a SCSI drive, you must either set or verify the setting of the drive's SCSI address (SCSI ID). Digital recommends that you use Table 4-1 as a guide to the selection of an address for your SCSI drive.

Table 4-1. SCSI Address Recommendations

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

Installing System Options

SCSI Termination

The Digital Alpha XL system has a built-in SCSI bus that can be connected to both internal (inside the system box) and external SCSI peripherals. Termination is required at both the internal and external ends.

Internal Termination

The CD-ROM drive should always be at the end of the SCSI bus. It has its own internal termination. If you add SCSI peripherals inside the system box, make sure that the CD-ROM drive is the last device connected to the cable. Refer to the appropriate drive manual to disable the new peripheral's termination.

External Termination

CAUTION

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

Model 4 (XL 233 and 266)

Terminate the external portion of the SCSI bus by using the ARC firmware machine-specific setup menu. Set the value to Internal if no external devices are present. Set the value to External if external devices are attached. Ensure that the last external device provides termination.



Refer to Appendix F for more information on using ARC firmware.

Model 5 (XL 300, 366, and 433)

The external portion of the SCSI bus is automatically terminated if no cable is plugged into the rear-panel SCSI connector. If external devices are connected, make sure that the last device provides termination.

Installing Devices in the Upper Drive Bay Area

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

1. Turn off your system. Unplug the power cord from the wall outlet. Unplug the power cord from the back of the system unit. Unlock and remove the side panels, as described earlier in this chapter.
2. Carefully remove the plastic filler panel (Figure 4-8). If no drive is present in the slot that is to be used, you can remove the panel by pushing it out from the inside with a Phillips screwdriver inserted through one of the screw holes in the side of the drive bay.
3. Refer to your drive documentation to configure the drive. If the drive is a SCSI drive, select a unique SCSI address for it, and make sure that SCSI termination is disabled. Term power should be enabled. Record the SCSI address of the drive in Appendix G, Equipment Log.

Installing System Options

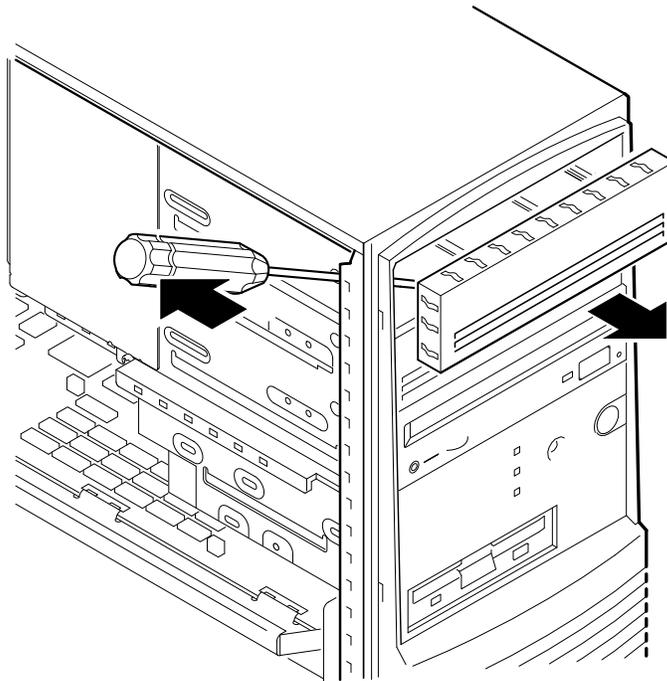


Figure 4-8. Removing Plastic Filler Panel from the Upper Drive Bay

4. Remove the metal plate, as Figure 3-9 shows. The top of the plate is hooked behind a rail, and the bottom of the plate is held by a screw. To improve access, remove the metal plate from the other side of the system as well.

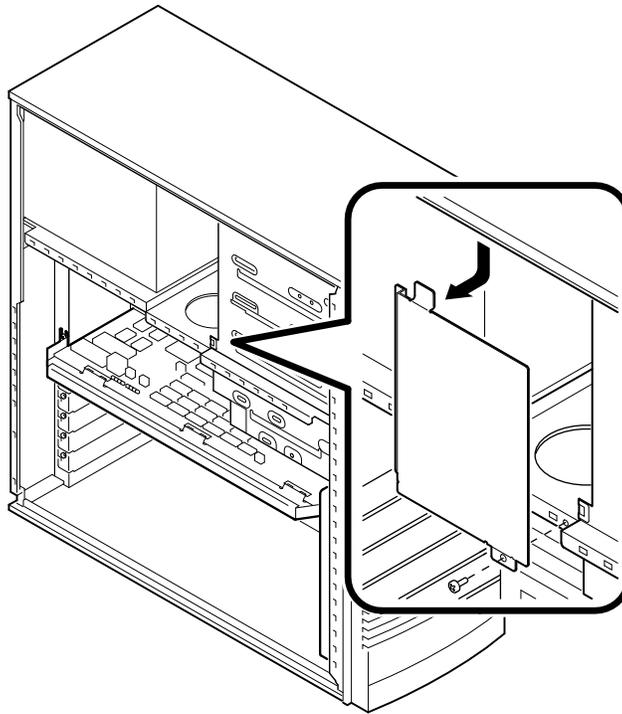


Figure 4-9. Removing the Metal Plate

Installing System Options

5. If you are installing a 3.5-inch device, add the 3.5- to 5.25-inch expansion brackets, as Figure 4-10 shows. Fasten the drive with the screws provided.

CAUTION

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

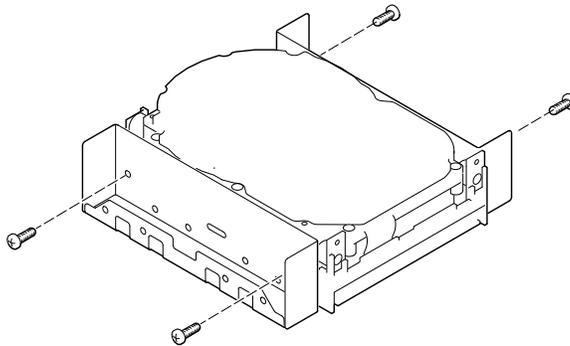


Figure 4-10. Exchange Bracket Mounting

6. Insert the new device into the drive bay from the front (Figure 4-11).

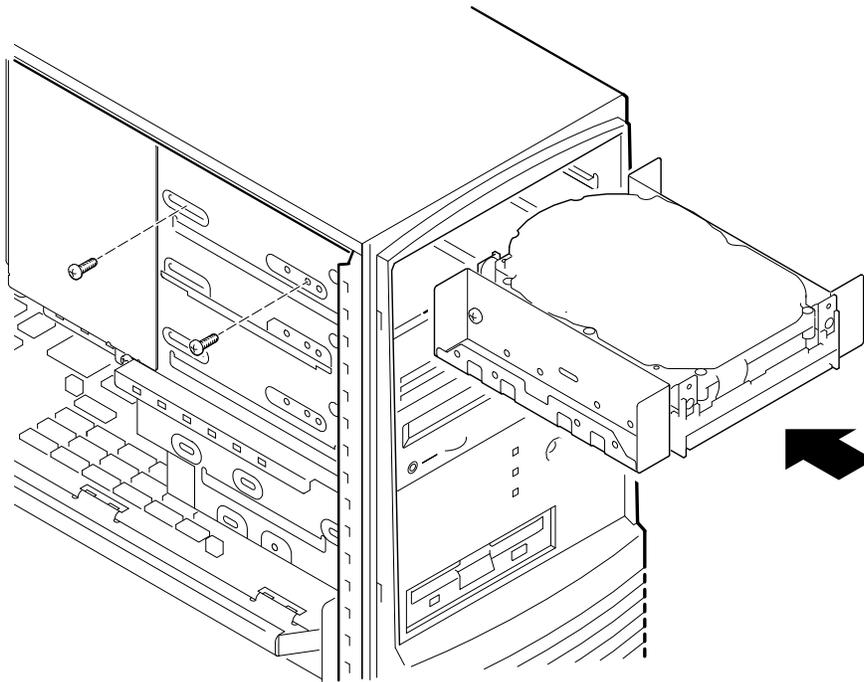


Figure 4-11. Inserting a Device into the Upper Drive Bay

7. Secure the device with two screws on each side. Use the three front mounting holes as follows: H for hard drive; T for tape drive; and F for floppy or CD drive.

Installing System Options

8. Connect the SCSI cable to the device. Figure 4-12 shows a sample cabling configuration using one floppy diskette drive and three SCSI drives. SCSI tape drives connect to the SCSI cable and FDC tape drives connect to the FDC cable (the same cable used by the floppy diskette drive). Ensure that the cable is oriented correctly. 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 socket. Pin 1 of the cable is on the edge with the colored stripe or pattern. Pin 1 of the socket is marked with either a tiny number "1" at one end of the socket or with a tiny number "1" or "2" printed on the circuit board near one end of the socket.

Installing System Options

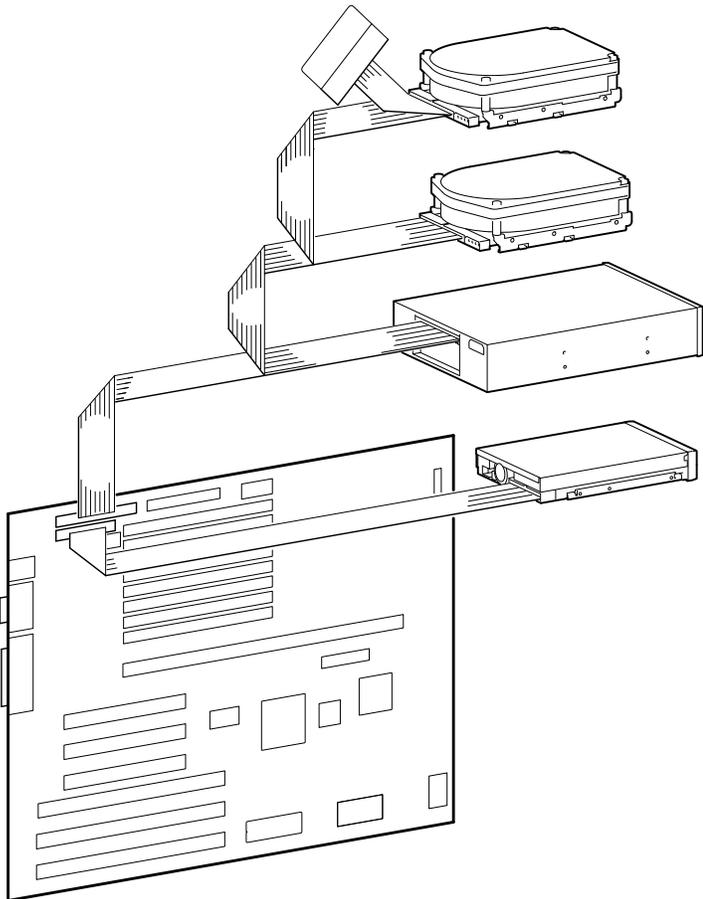


Figure 4-12. Sample SCSI and FDC Cable Configuration

Installing System Options

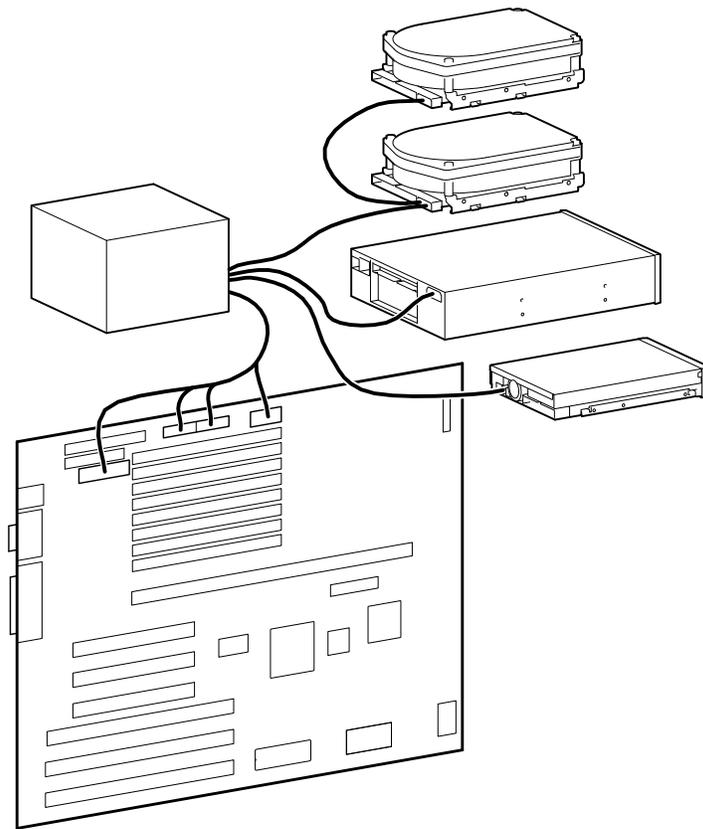


Figure 4-13. Power Cable Configuration

9. Connect a power cable to the device. Figure 4-13 shows the cables from the power supply.
10. Replace the metal plate that you removed in step 4.

11. Replace and lock the side panels.
12. Connect the power cord to the back of the system unit.
13. Connect any external devices and plug the power cord into the wall outlet.

Installing Devices in the Lower Drive Bay Area

The lower drive bay area holds two 3.5-inch devices, a diskette drive, and, typically, a hard disk drive. To upgrade the devices in the lower drive bay area, you must remove the entire drive bay assembly from your system and then remove the devices from the assembly and install the new devices. Perform the following steps:

1. Turn off your system. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord from the back of the system unit.
2. Unlock and remove the left side panel, as described earlier.
3. Remove the cables from the devices in the lower drive bay. Note the position of the cables so that you can reconnect them to the correct devices later.
4. Lift the retaining clip at the rear top of the drive bay assembly and slide the assembly to the rear of the system unit (Figure 4-14).

CAUTION

Be sure to support the drive bay assembly so that it does not fall and damage the circuit boards.

Installing System Options

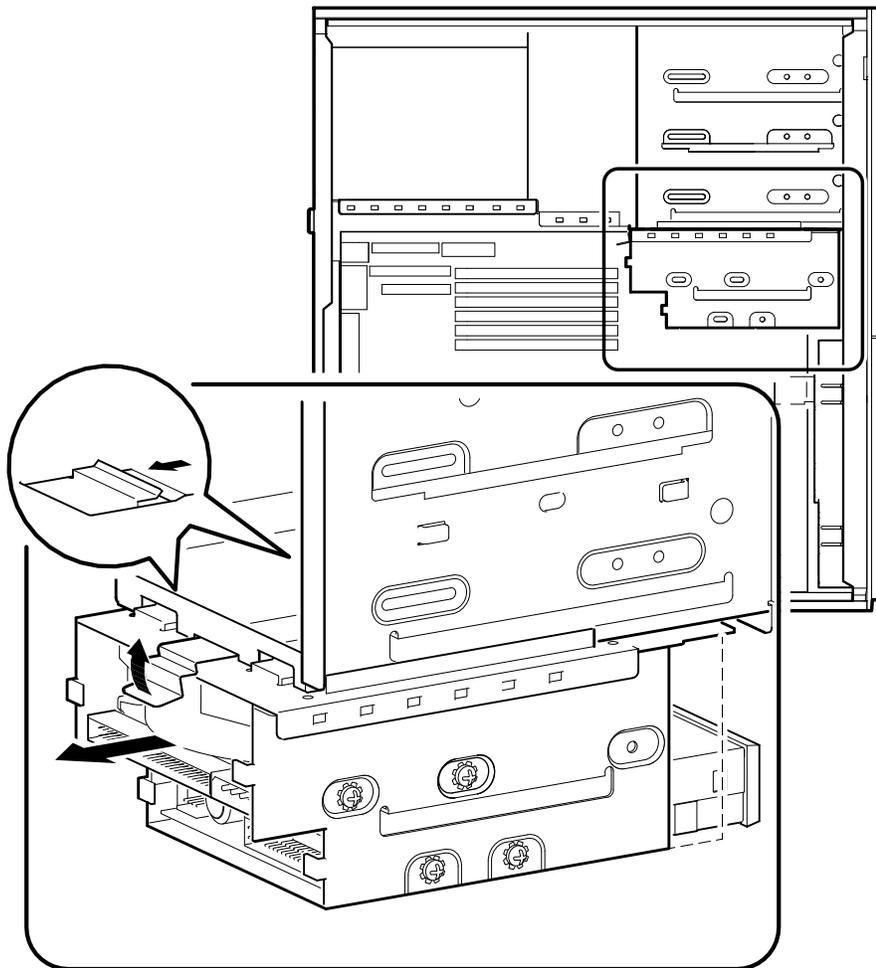


Figure 4-14. Removing the Lower Drive Bay Assembly

5. Remove a device by removing the screws on the side and sliding the device out of the lower bay assembly (Figure 4-15).

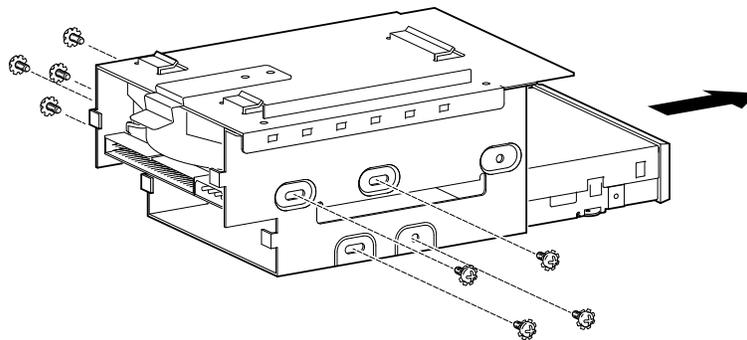


Figure 4-15. Removing the Lower Drive Bay Devices

6. Slide the drive into the drive bay assembly and secure it with screws.

CAUTION

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

Installing System Options

7. Replace the lower drive assembly in the system by sliding it forward until the retaining clip latches.
8. Reconnect the data and power cables to the drives.

CAUTION

Loosely hanging cables can block air flow and cause system overheating. Use the provided cable clips to fasten the cables to the inside top of the processor area.

9. Replace and lock the left and right side panels.
10. Connect the power cord to the back of the system unit.
11. Connect any external devices and plug the power cord into the wall outlet.

5

Troubleshooting

Introduction

This chapter describes initial and system troubleshooting as well as error beep codes and diagnostic LEDs (light emitting diodes). LEDs are used in the *model 4* (XL 233 and 266) systems; there are no LEDs in the *model 5* (XL 300, 366, and 433) system.



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

Initial Troubleshooting

Follow these general procedures to troubleshoot your Digital Alpha XL Series system initially:

1. Check that the power indicators are 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. If your system fails to boot, turn it off, wait 20 seconds, and then turn it back on.
4. Make sure that all cables and connections are secure.
5. If the operating system has not loaded after two minutes, see the diagnostic LEDs section of this chapter.
6. Contact Digital Services or your service provider for software- or hardware-related problems.

Troubleshooting

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 G, 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

Tables 5-1 through 5-3 list how to identify and solve problems that could occur with your system, disk drive, 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 wall outlet.	Use another wall outlet.
	Power supply failure.	Contact your service representative.
	Internal power supply cables not reconnected after installing options.	Reconnect cables.
	Loose fan connection.	Tighten fan connection.

Table 5-1. System Troubleshooting (continued)

Power is on, but there is no screen display.	Brightness and contrast controls not set correctly.	Adjust brightness and contrast controls.
	Monitor is off.	Turn on the monitor.
	Monitor cable or power cord incorrectly installed.	Check all monitor connections.
	Configuration error.	Refer to video module documentation for details.
	Monitor is defective.	Try another monitor.
	Defective video controller module.	Replace the video module.
	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. Use the AlphaBIOS firmware to display system configuration. Look at the hard disk configuration to determine which hard disk is available. Verify the operating system selection information.
	Environment variables incorrectly set.	Check and set the environment variables, if needed. From the Boot screen, press [F2] to go to setup. Then go to the Utilities, Operating System Selection screen to validate the paths. Finally, go to the Advanced CMOS Setup screen to verify assigned values.
	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 AlphaBIOS Hard Disk Setup routines.
	The requested partition has no software.	Install software on the requested partition.

Table 5-1. System Troubleshooting (continued)

Problem	Possible Cause	Action
Target boot device not listed in Display System Configuration.	Loose cables. SCSI drive jumpers incorrectly set. SCSI bus termination incorrectly set.	Secure all cable connections. Check all SCSI devices for incorrect or conflicting IDs. Refer to the hard disk drive documentation. Check that SCSI bus is properly terminated. Refer to Chapters 3 and 4 for more information.
No response to keyboard commands.	Keyboard is password protected. Keyboard is not connected. Keyboard is connected to the mouse port.	Enter the keyboard password, if supported by your operating system. Connect the keyboard to the keyboard port. Connect the keyboard to the keyboard port.
No response to mouse commands.	Mouse is not connected. Mouse is connected to the keyboard port. Mouse driver not installed. Mouse ball sticking.	Connect the mouse. Connect the mouse to the mouse port. Install the appropriate mouse driver; refer to your supplied application software documentation. Refer to the section on cleaning the mouse.

Troubleshooting

Table 5-2. Disk Drive Troubleshooting

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

Table 5-3. Monitor Troubleshooting

Problem	Possible Cause	Action
Monitor power indicator is not on.	<p>Monitor is turned off.</p> <p>Power cord is not connected.</p> <p>No power at wall outlet.</p> <p>Power indicator is defective.</p>	<p>Turn on the monitor.</p> <p>Connect the power cord to the system or a wall outlet.</p> <p>Use another outlet.</p> <p>Contact your service representative or Digital Equipment Corporation.</p>
Distorted, rolling, or flickering screen display, or wrong/uneven color.	<p>Monitor incorrectly adjusted.</p> <p>Wrong type of monitor.</p> <p>Defective monitor.</p> <p>Monitor signal cable incorrectly installed.</p>	<p>Adjust accordingly.</p> <p>Try another monitor.</p> <p>Try another monitor.</p> <p>Straighten any bent connector pins and then reconnect.</p>

Troubleshooting

Error Beep Codes

The following sections show error beep codes that you may encounter while using the Digital Alpha XL system. For example, if the SROM (serial read only memory) code cannot find any good memory, you will hear a 1-3-3 beep code (one beep, a pause, a burst of three beeps, a pause, and another burst of three beeps).

Model 4 (XL 233 and 266)

Table 5-4 shows the error beep codes for the *model 4* (XL 233 and 266) system.

Table 5-4. Model 4 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 hard failure (for example, a Bcache failure).
1-3-3	(1) The SROM code could not find 2 MB of good memory, or (2) there was no memory available.
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. The attempt failed because of either: (1) no floppy in drive, or (2) no Alpha architecture boot block on the floppy.
3-2-3	The DROM code was directed by the position of jumper J5 (on the CPU module) to load the floppy, but there was no floppy in the drive.
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. Refer to the LEDs to find exact location of failure.

Model 5 (XL 300, 366, and 433)

Table 5-5 shows the error beep codes for the *model 5* system.

Table 5-5. Model 5 Error Beep Codes

Beep Code	Meaning
1-1-4	FlashROM data was bad. Header information did not contain the expected manufacturing data patten, or the checksum was bad.
1-2-4	The SROM code detected a Bcache or main memory failure.
1-3-3	The SROM code could not find 2 MB of good memory, or memory was flagged as bad and removed from the memory map and there was no other good bank left.

Diagnostic LEDs

Your *model 4* (XL 233 or 266) system contains eight diagnostic LED indicators located on the CPU module. The LEDs indicate errors that occur during system initialization and POST.

NOTE

Model 5 (XL 300, 366, and 433) systems do not contain diagnostic LEDs.

Refer to the *Digital Alpha XL CPU Guide* for the locations of the LEDs.

Interpreting the LED Indicator Values

Table 4-6 lists the LED indicator values and their meanings. The meanings are valid when the LEDs have stopped sequencing through tests due to an error condition.

Troubleshooting

Table 5-6. Model 4 (XL 233 and 266) LED Codes

Indicator Values ¹ Bit 7 Bit 0	Hex Value	Meaning
● ● ● ● ● ○ ● ○	FA	Memory test 1 failure
● ● ● ● ● ○ ○ ●	F9	Memory test 2 failure
● ● ● ● ● ○ ○ ○	F8	Memory test 3 failure
● ● ● ● ○ ● ● ●	F7	Memory test 4 failure
● ● ● ● ○ ○ ● ○	F2	DROM and flashROM corrupted
● ● ○ ● ● ● ● ○	DE	Memory test failed
● ● ○ ● ● ● ○ ●	DD	FlashROM ID test failed
● ● ○ ● ● ● ○ ○	DC	NVRAM test failed
● ● ○ ● ● ○ ● ●	DB	SCSI controller test failed
● ● ○ ● ● ○ ● ○	DA	PCI/ISA bridge test failed
● ● ○ ● ● ○ ○ ●	D9	Realtime clock test failed
● ● ○ ● ● ○ ○ ○	D8	Keyboard controller test failed
● ● ○ ● ○ ● ● ●	D7	Floppy controller, bidirectional parallel port, or serial ports test failed
● ● ○ ● ○ ● ● ○	D6	Interrupts test failed
● ● ○ ● ○ ○ ○ ○	D0	Power on self test passed, DROM console running
● ● ● ○ ○ ○ ● ○	E2	Floppy load failed
● ● ● ○ ○ ○ ○ ●	E1	Flash load failed
○ ○ ● ○ ○ ○ ○ ○	20	Machine check occurred
● ● ● ● ● ● ○ ○	FC	ARC console initialized (Final display)

¹ The filled-in circle (●) indicates that the LED is on, and the open circle (○) indicates off.

A

Technical Specifications

Introduction

This appendix describes the following technical characteristics of the Digital Alpha XL system:

- System specifications
- External system connectors
- Expansion slot current limitations
- System current requirements
- Motherboard jumpers

System Specifications

Tables A-1 through A-4 list the Digital Alpha XL Family system processor features, dimensions, environmental, and acoustics specifications.

Table A-1. System Specifications

Attributes	Specification
PCI clock	33 MHz
Data I/O	32-bit PCI
Motherboard RAM	<i>Model 4:</i> Expandable up to 384 MB <i>Model 5:</i> Expandable up to 512 MB
Total SCSI bus length	3 meters (9.8 feet) for fast SCSI operation 4 meters (13.1 feet) for slow SCSI operation

Technical Specifications

Table A-2. System Dimensions

Dimension	Specification
Width	177.8 mm (7.0 in)
Length	431.8 mm (17.0 in)
Height	431.8 mm (17.0 in)
Weight	12+ kg (28+ lb)

Table A-3. System Environmental Specifications

Attributes	Specification
Operating temperature	10°C to 40°C (50°F to 104°F)
Storage temperature	-20°C to 65°C (-4°F to 149°F)
Operating humidity (noncondensing)	20% to 80% relative humidity, maximum wet bulb 40°C (104°F)
Storage humidity (noncondensing)	10% to 90% relative humidity, maximum wet bulb 65°C (149°F)
Altitude Operating Nonoperating	2,438 m (8,000 ft) maximum 4,876 m (16,000 ft) maximum
Shipping vibration	IAW Federal Standard 101, method 5019
Nonoperating shock	30 G, 25 ms halfsine

Table A-4. Acoustics – Declared Values per ISO 9296 and ISO 7779

Product	Sound Power Level L _{WA} d, B		Sound Pressure Level L _{pA} m, dBA (operator position)	
	Idle	Operate	Idle	Operate
Alpha XL 300				
with 0 disk	4.9	4.9	34	34
with 1-GB disk	4.9	5.3	35	37

NOTE

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

Technical Specifications

External System Connectors

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

- Bidirectional 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 Parallel Port Connector

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

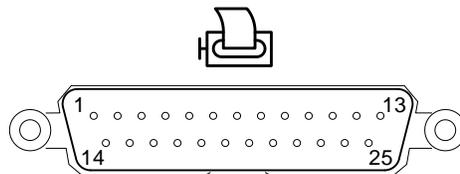


Table A-5. Bidirectional Parallel Port Pinouts

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

Technical Specifications

Serial Port Connectors

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

The baud rates supported by the system's serial ports are 300; 1200; 2400; 4800; 9600; 19,200; and 38,400.

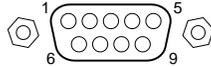


Table A-6. 9-Pin Serial Port Pinouts

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

Keyboard and Mouse Connectors

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

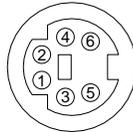


Table A-7. Keyboard and Mouse Connector Pinouts

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

Technical Specifications

SCSI Port Connector

The external SCSI connector is a 50-pin high-density connector. Table A-8 lists the pin assignments.

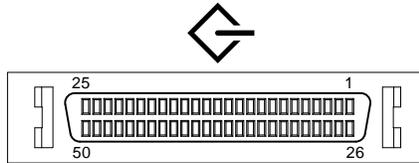


Table A-8. SCSI Port Pinouts

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

Table A-8. SCSI Port Pinouts (*continued*)

Pin	Signal	Pin	Signal
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

Technical Specifications

Expansion Slots

The motherboard contains: for the *model 4*, two PCI slots, three ISA slots, and one combination PCI and ISA expansion slot; and for the *model 5*, two PCI slots, two ISA slots, and one combination PCI and ISA expansion slot. The maximum available +5 V DC current allowable to any expansion slot depends on the following parameters:

- Power supply capacity
- +5 V DC requirements of the motherboard and peripherals
- +5 V DC requirements of the peripherals
- Power demands of all other slots in use

Power Supply and Input Power Requirements

The 300-watt power supply provides five dc voltages: +12 V, -12 V, +5 V, -5 V, and +3.3 V DC. These voltages are used by the various components within the system. Table A-9 lists the input power requirements.

Table A-9. System Input Power Requirements

Rated Voltage Range	Maximum Range	Rated Input Current ¹	Operating Frequency Range
100 V AC – 120 V AC	88 V AC – 132 V AC	8 A	47 Hz - 63 Hz
220 V AC – 240 V AC	176 V AC – 264 V AC	4 A	47 Hz - 63 Hz

¹ Includes outlet current.

Motherboard Jumpers

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

Technical Specifications

Model 4 (233 and 266)

Table A-10 lists the motherboard jumpers and factory-default settings for the *model 4* system. Figure A-1 shows the locations of the *model 4* motherboard jumper pins. Note that the square pin of each jumper block is pin 1.

 For information on the CPU module jumpers, see the *Digital Alpha XL CPU Guide*.

Table A-10. Model 4 Motherboard Jumper Settings

Jumper	Setting	Function	Description
J29	1 to 2	CMOS clear	CMOS clear
	2 only (D)	Normal	
J32	1 to 2	Password clear	Password clear (not used on the Alpha XL system)
	Removed	Normal	
J33	1 to 2	Color	Display type (not used on the Alpha XL system)
	2 only (D)	Mono	
J34	1 to 2	Recovery mode	Recovery mode (not used on the Alpha XL system)
	2 only (D)	Normal	
J35	1 to 2 (D)	Enabled	BIOS upgrade (not used on the Alpha XL system)
	2 only	Disabled	
J40	1 to 2 (D)	Disabled	Reprogram boot block (not used on the Alpha XL system)
	2 to 3	Enabled	

(D) = Default position.

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.

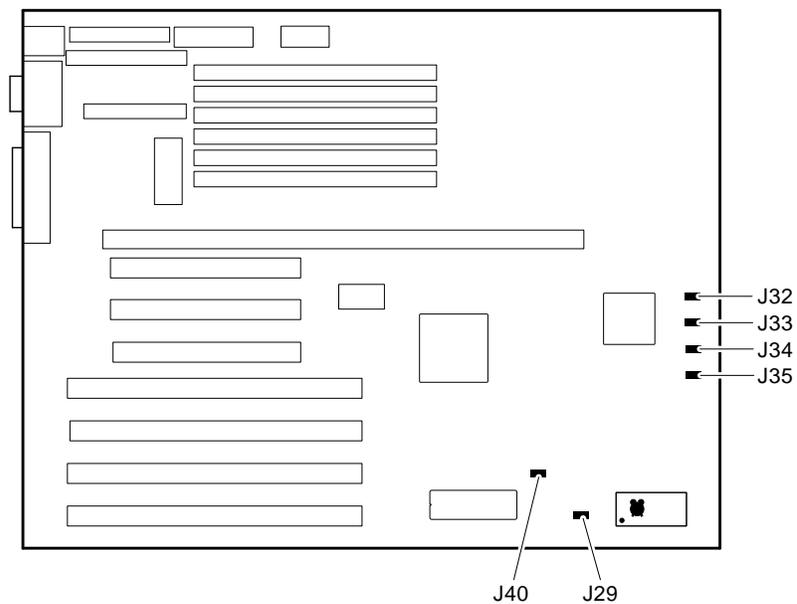


Figure A-1. Model 4 Motherboard Jumper Locations

Model 5 (300, 366, and 433)

Table A-10 lists the motherboard jumpers and factory-default settings for the *model 5*. Figure A-1 shows the locations of the *model 5* motherboard jumper pins. Note that the square pin of each jumper block is pin 1.

 For information on the CPU module jumpers, see the *Digital Alpha XL CPU Guide*.

Table A-11. Model 5 Motherboard Components

Jumper	Setting	Function	Description
J21	1 to 2 (D)	Autosense enabled	J21 controls the automatic SCSI bus terminator.
	2 to 3	Autosense and termination disabled	If an external SCSI cable 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.
J22	1 to 2 (D)	Normal	CMOS clear. When 2 to 3 is set, the memory located in the realtime clock is cleared.
	2 to 3	Clear CMOS	

(D) = Default position.

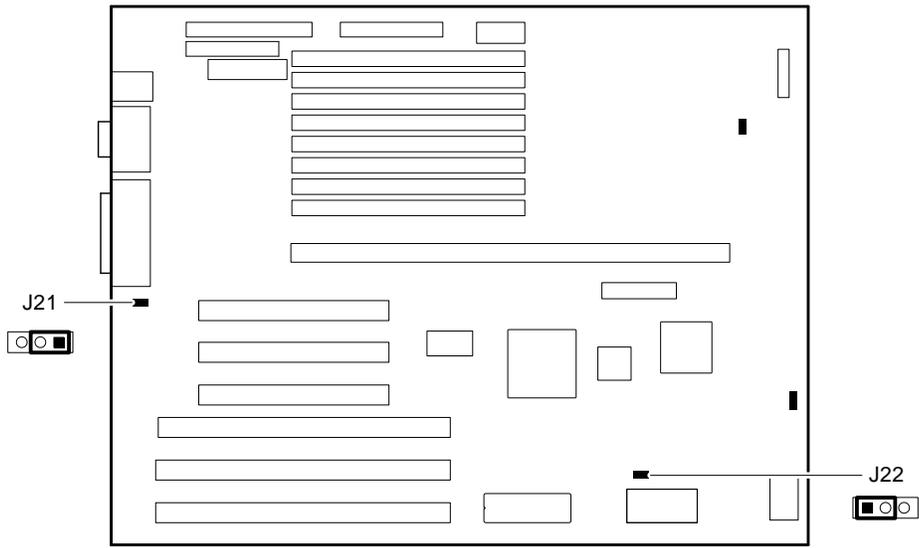


Figure A-2. Model 5 Motherboard Components

B

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.

System Care

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 wipe 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 might need cleaning. To clean the ball, perform the following steps, as Figure B-1 shows:

1. Turn the mouse over and remove the plate on the bottom.
2. Remove the locking ring and the 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.

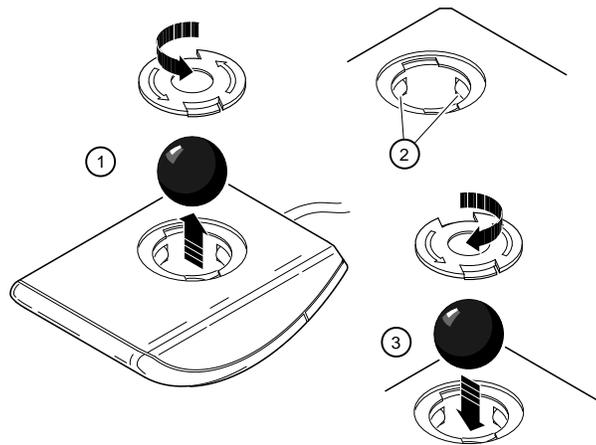


Figure B-1. Cleaning the Mouse

Cleaning Your Keyboard

From time to time, your keyboard keys might get dirty with use. Clean them with a fresh 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.

System Care

4. Disconnect the monitor, keyboard, mouse, and any other cables from the back of the system unit.
5. Package the system as described in the next section, Packing Your System.

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, 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.

C

Device Mapping

Introduction

This appendix lists system device mapping information, including:

- I/O address map
- Interrupt assignments
- DMA channel 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
0000-02F7	Reserved
02F8-02FF	Serial port 2
03BC-03BE	Parallel port
03BF-03EF	Reserved
03F0-03F7	Floppy disk
03F8-03FF	Serial port 1
0400-07FF	Reserved

Device Mapping

Interrupt Map

The IRQ assignments for the Digital Alpha XL 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 by the Windows NT operating system.

Table C-2. System Interrupt Assignments

IRQ#	Source
0	Timer/counter
1	Keyboard
2	Internal cascade of 8259
3	Serial port 2 or ISA slot
4	Serial port 1 or ISA slot
5	Parallel port or ISA slot
6	Floppy controller or ISA slot
7	Parallel port or ISA slot
8	Reserved
9	ISA slot
10	ISA slot
11	ISA slot
12	Mouse or ISA slot
13	Reserved
14	ISA slot
15	ISA slot

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	Available to ISA slots.
1	Available to ISA slots.
2	Floppy disk controller.
3	Parallel port, ISA slots.
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.

D

Updating AlphaBIOS Firmware

Introduction

This appendix contains how to use the firmware update utility to install firmware upgrades.

CAUTION

You are responsible for performing system firmware upgrades. Consult your upgrade documentation for more information.

System Firmware

The Digital Alpha XL system contains 512 KB of flashROM. The flashROM contains the AlphaBIOS firmware.

Flash Enable Jumper

The flashROM write enable jumper is located on the CPU module and should always be jumpered to the write enable position (2 to 3). If you have any problems updating firmware, check the jumper to ensure that it is set properly.

 See the *Alpha XL CPU Guide* for the location of the jumper.

Updating AlphaBIOS Firmware

Using the Flash Update Utility from AlphaBIOS

You may update the firmware by either using the supplied CD *or* by copying the firmware from the Internet onto a floppy diskette.

Updating Firmware from AlphaBIOS

To update the firmware from AlphaBIOS using the firmware CD or floppy diskette, follow these steps:

1. Shut down the Windows NT operating system and restart the system.
2. Insert the Firmware Update CD-ROM or a floppy diskette (prepared as the next section describes) into the appropriate drive.
3. From the AlphaBIOS boot screen, press [F2] to enter AlphaBIOS setup.
4. From the AlphaBIOS setup screen, select Upgrade AlphaBIOS.

HINT

AlphaBIOS verifies the system image and displays the old and new firmware versions.

5. Follow the screen prompts to complete the update.

Preparing a Firmware Floppy Diskette

Copy the firmware over the Internet from the ftp.digital.com/pub/Digital/Alpha/firmware area and follow these steps:

1. Format a blank floppy diskette (FAT).
2. Copy xltab.rom to Drive a:.

E

Starting an Operating System Installation

Introduction

Your Alpha XL system may arrive with the Windows NT Operating system preloaded at the factory. If Windows NT was preloaded, the installation process begins when you apply power to the system.

Under certain circumstances – if the system loses power during the installation process *or* if Windows NT was not preloaded on your system – you must install the software from the CD-ROM drive.

This appendix provides the information you need to prepare the disk (if necessary) and to begin a Windows NT installation from the CD-ROM drive.

Using the information below, identify the task you want to perform 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

Starting an Operating System Installation

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.

Installing Windows NT on a Partitioned Disk

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 on a *Model 5* system.

Table E-1. Starting a Windows NT Workstation Installation

Step	Action	Result
1	Insert the Microsoft® Windows NT™ Workstation (Version 3.51) 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. Press [Enter].	Windows NT Setup displays the message, "Windows NT Setup could not determine what type computer you have."
4	Select Other. Press [Enter].	Insert the Manufacturer-supplied hardware support disk into Drive A:.
5	Insert the 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. A list of systems is displayed.
6	Select the Alpha XL 300/366 Family system type. Press [Enter].	The Windows NT Workstation Setup screen displays.
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).

Starting an Operating System Installation

Table E-1. Starting a Windows NT Workstation Installation (continued)

Step	Action	Result
9	Press [Enter] to continue.	Setup has determined that your computer contains the following hardware and software components: Computer: Alpha XL 300/366 Family. Display: VGA Compatible. Keyboard: XT, AT, or Enhanced (83-102 keys). Keyboard Layout: US. Pointing Device: Mouse Port Mouse. No Changes: The above list matches my computer.
10	Select <code>Display:</code> (to load a display driver). Press [Enter].	You have asked to change the type of display to be installed.
11	If your display controller type is not listed, select <code>Other</code> . Press [Enter].	Please insert the disk labeled Manufacturer-supplied hardware support disk into drive A:.
12	Insert the provided display driver diskette. Press [Enter].	A list of display types appears.
13	Select the appropriate display. Press [Enter].	The list of hardware and software components is displayed.
14	Select <code>The above list matches my computer</code> . Press [Enter].	The list below shows existing partitions and spaces available for creating new partitions.
15	Select the target disk for the Windows NT installation. Press [Enter].	Follow the on-screen instructions and continue the installation. For more information, refer to the <i>Microsoft Windows NT Workstation System Guide</i> .

Starting an Operating System Installation

After the Windows NT operating system is installed, remove the Windows NT CD-ROM and insert the Software Restore CD-ROM into the CD drive. Each subdirectory of the software-restore CD-ROM includes a setup program. Go to each subdirectory that you wish to restore and run the SETUP program. The appropriate files are then moved to your system's hard disk.

Setting Up Partitions for a Windows NT Installation

If you are installing the operating system on a disk that has not been partitioned and formatted, follow the procedure in Table E-2.

Table E-2. Setting Up Partitions for a Windows NT Workstation Installation

Step	Action	Result
1	Power on the system	AlphaBIOS initializes the system and displays the AlphaBIOS boot screen.
2	From the AlphaBIOS boot screen, press [F2].	AlphaBIOS setup screen displays.
3	Select Hard Disk Setup... Press [Enter].	If disk 0 is partitioned, proceed to Step 4.
4	Press [F7].	Express Hard Disk Setup confirmation message displays.
5	Press [F10] to continue.	Express Setup Complete message displays.
6	Press [Enter].	A list of disks, including partitions, displays.
7	Press [Escape].	AlphaBIOS setup screen displays.
8	Press [Escape].	AlphaBIOS boot screen displays.

Configuring with the ARC Console

Introduction

This appendix shows how to use the ARC firmware to configure your *model 4* (XL 233 and 266) Digital Alpha XL system.

NOTE

All *model 5* systems use AlphaBIOS firmware. See Chapter 3, *Configuring Your System*.

The ARC firmware supports the Microsoft Windows NT Workstation operating system and has the following features:

- An easy-to-use menu interface that allows you to:
 - Set the date and time.
 - Set default environment variables.
 - Display system configuration information.
 - Manage boot selections.
 - Control SCSI termination and PCI parity.
 - Update the ARC firmware.
 - Install the Windows NT Workstation operating system.
- Resides in 512KB (kilobytes) of flashROM on the CPU module.
- Can be updated in the field.

Configuring with the ARC Console

ARC Firmware Initialization

When you power on the Digital Alpha XL system, a series of power-on self tests (POST) are performed and the ARC firmware is started. Once the firmware is started, it initializes itself. During initialization, the firmware checks the information stored in the nonvolatile memory. If the information is unreadable or inconsistent, a warning message is displayed. The warning message identifies the areas that must be fixed prior to booting the Microsoft Windows NT Workstation operating system.

Once the ARC firmware has been initialized successfully, a menu similar to the following is displayed:

```
ARC Multiboot Alpha AXP Version 4.38
Copyright (c) 1993-1995 Microsoft Corporation
Copyright (c) 1993-1995 Digital Equipment Corporation

Boot menu:
  Boot Windows NT
  Boot an alternate operating system
  Run a program
  Supplementary menu...

Use the arrow keys to select, then press Enter.
```

The following sections describe configuration-related tasks that you can perform with the ARC firmware.

Displaying Your Alpha XL System Configuration

The `Display hardware configuration` command is located in the `Supplementary` menu. Use this command to display information about:

- Devices that were detected (and are supported) by the ARC firmware
- Processor revision and speed as well as physical memory size
- Video option detected
- PCI slots including vendor, revision, and device type

For example, a typical system hardware configuration may display as follows:

```
Alpha Processor and System Information
Processor ID      21064
Processor Revision 3
System Revision   0x1
Processor Speed   233 Mhz
Physical Memory   32 MB
```

```
Extended Firmware Information:
Version: 4.38 950717.0852
NVRAM Environment Usage: 24%
(748 of 3052 bytes)
```

```
Video Option detected:
```

Configuring with the ARC Console

Devices detected by the firmware:

```
multi(0)video(0)monitor(0)
multi(0)key(0)keyboard(0)
multi(0)disk(0)fdisk(0)    (Removable)
multi(0)serial(0)
multi(0)serial(1)
scsi(0)disk(1)rdisk(0)    (2 Partitions) DEC  RZ28
scsi(0)cdrom(4)fdisk(0)  (Removable)    DEC  RRD43
```

PCI slot information:

Bus	Slot	Function	Vendor	Device	Revision	Device Type
0	6	0	1000	1	1	SCSI
0	7	0	8086	484	3	ISA bridge
0	11	0	1011	4	1	Video card
0	12	0	1011	2	22	Ethernet

Setting the Default Environment Variables

The `Set default environment variables` command is located in the `Setup` menu. Use this command to specify the location of the default system partition. For example, when the partition is on a SCSI hard disk, you are prompted for the SCSI bus number, drive SCSI ID, and the partition number. These values set an environment variable. Windows NT uses the environment variable to determine the correct drive and partition to boot from.

You must know your disk configuration before performing these steps. If you are unsure about your disk configuration, select `Display hardware configuration` from the `Supplementary` menu. (See the previous section.)

1. When the ARC boot menu appears, select `Supplementary` menu, and press [Enter]. Select `Set up the system...` and press [Enter].
2. Select `Set default environment variables` and press [Enter].

Configuring with the ARC Console

3. For the system partition location, select `SCSI Hard Disk` and press [Enter].
4. Enter the SCSI bus number (typically, 0) and the SCSI ID of the disk where the partition resides.

NOTE

If you are unsure about the environment values, accept the default values of 0. If these values are incorrect for your system (if, for example, your hard disk drives are on a SCSI bus 1, through a secondary controller), Windows NT setup will prompt you to run the ARCINST utility. The ARCINST utility provides valid values that you can use to set this environment variable correctly. (Refer to Appendix E for information on running ARCINST.)

5. Enter the system partition number on the disk, which should be 2, and press [Enter].

Setting the Default Configuration

The `Set default configuration` command is located in the `Setup` menu. Use this command to select:

- Monitor resolution (default is 640 x 480).
- Floppy-drive capacity (default is 1.44 MB).
- Keyboard language.
- SCSI controller (Host) ID (default is 7).

For example, when selected, the `Set default configuration` command prompts you to make the following choices:

Configuring with the ARC Console

Select monitor resolution:

- 1280x1024
- 1024x768
- 800x600
- 640x480

Select first floppy drive capacity:

- 5.25" 1.2MB
- 3.5" 1.44MB
- 3.5" 2.88MB
- None

Select second floppy drive capacity:

- 5.25" 1.2MB
- 3.5" 1.44MB
- 3.5" 2.88MB
- None

Select keyboard:

- U.S. 101-key keyboard
- Japanese 106-key keyboard
- French 102-key keyboard
- German 102-key keyboard
- Spanish 102-key keyboard
- Spanish variation
- Canadian French 102-key keyboard
- Swiss 102-key keyboard
- Italian 102-key keyboard
- Finnish/Swedish keyboard
- Norwegian keyboard
- Danish 102-key keyboard
- U.K. 102-key keyboard

Enter SCSI Host ID (0 - 7) for SCSI bus number 0: 7

Setting the Date and Time

The `Set system time` command is located in the `Setup` menu. Use this command to set the system's date and time.

Selecting a Default Language

The first time power is applied after updating the ARC firmware or the firmware is reset to factory defaults, you are prompted to select a default ARC language.

NOTE

You can also change the default language at any other time by selecting `Set up the system`, then selecting `Set system language`, and following the prompts.

1. At the `Set system language` menu, select either `English` or `Other language` as appropriate. If you selected `English`, your Alpha XL system displays the `Boot` menu (or the `Setup` menu if you selected the `Set system language` command from there), and you have completed this task.

If you selected `Other language`, you are prompted for the location of the message and font files. Go to step 2.

2. Insert the diskette or CD-ROM containing the ARC firmware message and font files into a drive. If the files are located on your hard disk, go to step 3.
3. Select either `Floppy disk`, `CD-ROM`, or `Hard Disk` as appropriate, and press `[Enter]`. The languages available are displayed on the screen.
4. At the `Language` menu, select the language of your choice and press `[Enter]`.
5. The screen clears and you are asked if you would like to save the language files to hard disk. Select `Yes` and press `[Enter]`.

Configuring with the ARC Console

6. You are prompted to choose a location on the hard disk for the language files. (A default location is selected.) Press [Enter] to accept the default; otherwise, select `Alternate Hard Disk location` and press [Enter].

Edit the partition and the directory location to indicate where you wish to store the language files, then press [Enter]. The language files are copied to the hard disk, and the `ARC Boot` menu appears in the language you selected.

Managing the Boot Selection Menu

You reach the `Boot selection` menu by selecting `Manage boot selection` menu from the `Setup` menu. Use the boot selection menu to add, change, check, delete, dump (list), and rearrange boot selections.

Initially, select `Add a boot selection`. You are then prompted to:

```
Select a system partition for this boot selection
  SCSI Bus 0 Hard Disk 0 Partition 2
  New System Partition
```

(The partition defined by the `Set default environment variables` command must be one of the available choices.)

Configuring with the ARC Console

Enter the osloader directory and name:
 \os\winnt\osloader.exe

Is the operating system in the same partition as the
osloader:
 Yes
 No

Enter the operating system root directory: \winnt35

Enter a name for this boot selection: Windows NT

Do you want to initialize the debugger at boot time?:
 Yes
 No

After you have added a boot selection, use the `Check boot selections` command to perform verification testing of the selections. If an error is detected, you are prompted to ignore, delete, or change the boot selection.

Along with adding boot selections, the Boot selections menu allows you to:

- Change a boot selection
- Check boot selections
- Delete a boot selection
- Dump boot selections
- Rearrange boot selections

Booting Your Alpha XL System

The `Boot` command is the first selection in the `Boot` menu. Use this command to boot Windows NT using the default boot selection identifier. The default boot selection identifier is the one at the top of the list. You can change the order of the list by selecting the `Rearrange boot selections` command from the `Boot` selection menu.

Configuring with the ARC Console

Booting an Alternate Operating System

The `Boot an alternate operating system` command is located in the `Boot` menu. Use this command to select a boot selection identifier that is different from the default selection. For example, you can have multiple versions of Microsoft Windows NT Workstation installed, each with its own unique boot selection identifier. Use this command to select the version that you want to boot.

Setting SCSI Termination

SCSI termination is controlled from the `Machine Specific Setup` menu. When set to **Internal**, the SCSI bus is internally terminated at both ends. No external devices should be added when the variable is set to this value. This is the default setting.

When set to **External**, the SCSI bus is internally terminated at one end. The other end of the SCSI bus must be terminated externally at the last external device in the SCSI chain.

From the `Machine Specific Setup` menu, select the appropriate line and press [Enter]. The "*" shows which termination mode is selected.

```
(*) SCSI termination set to Internal
( ) SCSI termination set to External
```

Setting PCI Parity

PCI parity is controlled from the `Machine Specific Setup` menu. The setting controls PCI parity checking at the PCI bridge chip. The new value becomes effective after a power cycle.

From the `Machine Specific Setup` menu, select the appropriate line and press [Enter]. The "*" shows which parity mode is selected. PCI parity checking is disabled by default.

```
( ) PCI parity checking enabled
(*) PCI parity checking disabled
```

Configuring with the ARC Console

When you enable parity checking, the following message is displayed:

```
Certain PCI adapters have been known to generate bad
parity on the PCI, resulting in system errors.
```

```
Please ensure that your specific PCI configuration will
operate correctly prior to turning on parity checking.
```

```
Are you sure you want to do this?
```

```
Yes
```

```
No
```

Setting Autoboot

The `Setup autoboot` command is located in the `Setup` menu. Use this command to enable automatic booting of the system. When you enable autoboot, you are also prompted to enter a countdown value (10 seconds is the default). The ARC firmware waits for the duration of the countdown value before booting the system. To override the countdown timer, select another Boot menu option before the countdown expires.

Installing New Firmware

The `Install new firmware` command is located in the `Supplementary` menu. Use this command to install firmware upgrades. When selected, the floppy drive and CD-ROM are checked for the firmware update utility. If the proper media is not present, this command times out. For more detailed information on performing firmware updates, follow the instructions packaged with the update.

Installing Windows NT from CD-ROM

The `Install Windows NT from CD-ROM` command is located in the `Supplementary` menu. You must put the Microsoft Windows NT Workstation CD-ROM into the CD drive before selecting this command.

G

Equipment Log

Introduction

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

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

Equipment Log

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

- Your system's hardware components (Table G-1).
- Your system's ISA equipment configuration (Table G-2).
- Your SCSI device address settings (Table G-3).
- Your system's system hardware configuration (Table G-4).
- The operating system or application software installed on your system (Table G-5).
- Additional components (Table G-6).

Equipment Log

Table G-1. Hardware Components

Component	Vendor/ Type/Size	Model Number	Serial Number	Date Installed
System unit	Digital Alpha XL			
System unit key number				
Monitor				
Keyboard				
Mouse				
Installed diskette drive				
Additional storage device 1				
Additional storage device 2				
Additional storage device 3				
Additional storage device 4				

Use Table G-2 to keep track of your Alpha XL 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 devices you add to the motherboard expansion slots.

Table G-2. ISA Equipment Configuration

Device	Handle	Slot	IOBASE	Memory base	DMA channel	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			7
FDC	FLOPPY	0	3F0		2	6
Motherboard ISA Expansion Slots						

Table G-3. SCSI Addresses

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

Equipment Log

Table G-4. Hardware Configuration

Component	Digital Alpha XL System Specifics
CPU speed and model	
Firmware version	
Memory size	
Video module	

Table G-5. Installed Software

Operating System or Application Software	Version Number	License Number	Date Installed

Table G-6. Additional Components

Component	Vendor	Model Number	Serial Number	Date Installed

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