OpenVMS Alpha Version 7.1 Upgrade and Installation Manual

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This document contains step-by-step instructions for installing and upgrading the OpenVMS Alpha operating system on Alpha computers. It also includes information about booting, shutdown, backup, and licensing procedures.

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The OpenVMS documentation set is available on CD–ROM.

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Preface

Intended Audience

This manual is intended for anyone responsible for installing or upgrading the OpenVMS Alpha operating system and for the startup, shutdown, and backup operations required on Alpha computers running this software.

When to Use This Manual

If you received factory-installed software (FIS) with your Alpha computer, refer to that user documentation to start up your system for the first time. Use this manual if you need to install or upgrade the OpenVMS Alpha operating system software yourself or if you need to perform certain startup, shutdown, or backup operations.

Document Structure

This manual is organized as follows:

- Chapter 1 defines key terms and provides information about hardware and software components. Review this chapter before performing any installation or upgrade.
- Chapter 2 provides preliminary information about installing the operating system in an OpenVMS Cluster environment.
- Chapter 3 describes how to install the operating system.
- Chapter 4 describes the tasks you must perform after installing the operating system.
- Chapter 5 describes how to prepare your system for an upgrade.
- Chapter 6 supplements Chapter 5 with additional tasks you must perform before upgrading an OpenVMS Cluster system.
- Chapter 7 describes how to upgrade the operating system.
- Chapter 8 describes the tasks you must perform after upgrading the operating system.
- Appendix A contains instructions for halting the system, booting the operating system CD–ROM and the system disk, using console commands to set system parameters, using the Writeboot utility, and invoking system shutdown procedures.
- Appendix B describes how to back up and restore the system disk.
- Appendix C contains supplementary information about registering licenses.
- Appendix D provides release notes, restrictions, and related information about using the OpenVMS Alpha operating system on specific Alpha computers.

- Appendix E describes how to prepare your OpenVMS system and your PC to run the OpenVMS Management Station server and client software.
- The Glossary defines key terms used in this manual.

Related Documents

Before installing, upgrading, or using the OpenVMS Alpha operating system on your Alpha computer, be sure you have access to the following documents:

- All cover letters included with your kit.
- The *OpenVMS Version 7.1 Release Notes*, which provides important supplementary information about the OpenVMS Alpha operating system.
- *OpenVMS Cluster Systems* and *Guidelines for OpenVMS Cluster Configurations*, if you plan to install your system in an OpenVMS Cluster environment.
- *OpenVMS Version 7.1 New Features Manual*, which describes enhancements and new support included in the OpenVMS Version 7.1 operating system.
- The most recent version of the *DECwindows Motif for OpenVMS Installation Guide* and *Managing DECwindows Motif for OpenVMS Systems* (if you plan to install and customize DECwindows Motif for OpenVMS Alpha software).
- The following DECnet-Plus (Phase V) documents:
  - *DECnet-Plus Release Notes*
  - *DECnet-Plus for OpenVMS Installation and Basic Configuration*
  - *DECnet-Plus for OpenVMS Applications Installation and Advanced Configuration Manual*
- The hardware manuals that are supplied with your Alpha computer. These manuals provide detailed information about your system hardware, including the operation of the system unit, the drives, and the monitor.

During the course of installing, upgrading, or using the OpenVMS Alpha operating system on your Alpha computer, you might need to refer to the following documents as well:

- *OpenVMS License Management Utility Manual*, which contains detailed information about registering your software licenses.
- *OpenVMS System Manager's Manual* and the *OpenVMS System Management Utilities Reference Manual*, which contain information about system management operations and utilities that you might need to use when you install, upgrade, customize, and maintain your OpenVMS Alpha system. The *OpenVMS System Management Utilities Reference Manual: M–Z* provides complete information about using the POLYCENTER Software Installation utility PRODUCT command to add or remove files, install other software, and related operations.
- *DECnet for OpenVMS Guide to Networking*, which contains detailed information about using the DECnet for OpenVMS Alpha (Phase IV) software (if you have chosen to use this DECnet product instead of DECnet-Plus (Phase V) software).
- *Volume Shadowing for OpenVMS*, which you might need if you are installing or upgrading the OpenVMS Alpha operating system on a shadowed system disk.

- *OpenVMS Management Station Overview and Release Notes*, which provides information about getting started, setting up, and using OpenVMS Management Station.

For additional information on the Open Systems Software Group (OSSG) products and services, access the Digital OpenVMS World Wide Web site. Use the following URL:

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

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Conventions

The name of the OpenVMS AXP operating system has been changed to the OpenVMS Alpha operating system. Any references to OpenVMS AXP or AXP are synonymous with OpenVMS Alpha or Alpha.

VMScluster systems are now referred to as OpenVMS Cluster systems. Unless otherwise specified, references in this document to OpenVMS Clusters or clusters are synonymous with VMSclusters.

In this manual, every use of DECwindows and DECwindows Motif refers to DECwindows Motif for OpenVMS software.

The following conventions are also used in this manual:

Ctrl/*x*	A sequence such as Ctrl/*x* indicates that you must hold down the key labeled Ctrl while you press another key or a pointing device button.
Return	In examples, a key name enclosed in a box indicates that you press a key on the keyboard. (In text, a key name is not enclosed in a box.)
. . .	Horizontal ellipsis points in examples indicate one of the following possibilities: • Additional optional arguments in a statement have been omitted. • The preceding item or items can be repeated one or more times. • Additional parameters, values, or other information can be entered.
. . .	Vertical ellipsis points indicate the omission of items from a code example or command format; the items are omitted because they are not important to the topic being discussed.
( )	In command format descriptions, parentheses indicate that, if you choose more than one option, you must enclose the choices in parentheses.
[ ]	In command format descriptions, brackets indicate optional elements. You can choose one, none, or all of the options. (Brackets are not optional, however, in the syntax of a directory name in an OpenVMS file specification or in the syntax of a substring specification in an assignment statement.)
{ }	In command format descriptions, braces indicate a required choice of options; you must choose one of the options listed.
text style	This text style represents the introduction of a new term or the name of an argument, an attribute, or a reason. This style is also used to show user input in Bookreader versions of the manual.
italic text	Italic text indicates important information, complete titles of manuals, or variables. Variables include information that varies in system output (Internal error *number*), in command lines (/PRODUCER=*name*), and in command parameters in text (where *device-name* contains up to five alphanumeric characters).
UPPERCASE TEXT	Uppercase text indicates a command, the name of a routine, the name of a file, or the abbreviation for a system privilege.

`Monospace type`	Monospace type indicates code examples and interactive screen displays. In the C programming language, monospace type in text identifies the following elements: keywords, the names of independently compiled external functions and files, syntax summaries, and references to variables or identifiers introduced in an example.
-	A hyphen at the end of a command format description, command line, or code line indicates that the command or statement continues on the following line.
numbers	All numbers in text are assumed to be decimal unless otherwise noted. Nondecimal radixes—binary, octal, or hexadecimal—are explicitly indicated.

1
Getting Started

This chapter defines key terms and describes preliminary procedures you must perform before an installation or upgrade.

1.1 Key Terms

The following are a few key terms you need to know before you install or upgrade the system:

Term	Definition
Operating system CD–ROM	The CD–ROM containing the OpenVMS Alpha operating system. This software is supplied in a format that the computer cannot use until you perform an installation or upgrade.
HS*x* device	A self-contained, intelligent, mass storage subsystem that lets computers in an OpenVMS Cluster environment share disks. The disk on which you install or upgrade the operating system can be connected to one of these systems (for example, an HSC or HSD).
InfoServer	A general-purpose disk storage server that allows you to use the operating system CD–ROM to install the operating system on remote client systems connected to the same local area network (LAN).
Local drive	A drive, such as an RRD42 CD–ROM drive, that is connected directly to an Alpha computer. If you have a standalone Alpha computer, it is likely that all drives connected to the system are local drives.
Source drive	The drive that holds the operating system CD–ROM during the upgrade or installation.
System disk	The disk that contains (or will contain) the OpenVMS Alpha operating system in a usable format. The installation or upgrade procedure converts the OpenVMS Alpha operating system to this usable format when transferring the software from the operating system CD–ROM to the system disk.
Target drive	The drive that holds the system disk during the upgrade or installation.

1.2 Examining Software and Hardware Components

Before beginning an installation or upgrade, be sure you have all the required hardware and software components, as described in the following sections.

1.2.1 Hardware Components

Before you begin an installation or upgrade, do the following:

- Be sure the hardware has been installed and checked for proper operation. For detailed information, see the hardware manuals you received with your Alpha computer.

- Be sure you know how to turn on and operate the components of your system, including the system unit, console, monitor, drives, terminals, and printers. If necessary, read the hardware manuals that came with these components.
- Set up your system to record the installation procedure on either a hardcopy terminal or a printer attached to the console terminal. (See your hardware manuals for more details about connecting those components to your system.) If you do not do this, the screen messages will be lost. You will need a transcript in case there is a problem during the installation.

1.2.2 Software Components

Before you begin an installation or upgrade, do the following:

- Be sure you have all the items listed on the bill of materials in the distribution kit. If your distribution kit is incomplete, notify your Digital support representative and request priority shipment of any missing items.
- Before installing the OpenVMS Alpha operating system software, review all cover letters and release notes.

1.2.3 Operating System CD–ROM

Included in your kit is the OpenVMS Alpha operating system CD–ROM, which you use to install or upgrade the operating system, or to perform operations such as backing up the system disk. The CD–ROM is labeled similar to the following:

CD–ROM Label:	OpenVMS Alpha Operating System V7.1 Software
Volume Label:	ALPHA071

Note: The *volume label* is the machine-readable name that the OpenVMS Alpha operating system and InfoServer systems use to access the CD–ROM.

1.2.4 Required PALcode

The required and recommended minimum version of privileged architecture library code (PALcode) for Alpha computers is either 5.56 or 1.19, depending on your model.

If your computer console does not have a specific minimum version of the PALcode, you may not be able to boot your system during the installation or upgrade procedure. Digital recommends, therefore, that you do the following before performing an installation or upgrade:

1. At the console prompt (>>>) on your running Alpha system, enter the SHOW CONFIGURATION command (or SHOW PAL command on DEC 7000 and DEC 10000 Alpha series systems). The system display will indicate which version of PALcode your computer is running.
2. Refer to the most recent OpenVMS Alpha operating system cover letter or release notes, or contact your Digital support representative to determine whether your system is running the required or recommended minimum version of PALcode.
3. If the PALcode is *below* the required or recommended minimum, upgrade your console by following the directions contained in either the hardware manuals that came with your Alpha computer or supplementary release notes contained on the separate firmware CD–ROM.

Note: If you boot the operating system CD–ROM without first upgrading your console to the required or recommended minimum PALcode, the system will display messages similar to the following:

- If you do not have the *required* minimum PALcode, the system displays a fatal error message similar to the following:

```
APB-F-PALREV, PALcode revision 5.48 is below required minimum of 5.56
       UNABLE TO CONTINUE
```

- If you do not have the *recommended* minimum PALcode, the system displays a warning message similar to the following:

```
APB-W-PALREV, PALcode revision 1.17 is below recommended minimum of 1.19
```

  Although you will still be able to boot your system, contact your Digital support representative about upgrading your console to the recommended minimum version of the PALcode before installing or upgrading the operating system.

1.2.5 Device Naming Conventions

When you perform specific operations, you are asked to specify device names for the source drive and target drive. When specifying those device names, note the following naming conventions:

- When the source drive is a local CD–ROM drive, the device name is similar to the following:

```
DKA400
```

- When the source drive is a CD–ROM drive connected to the InfoServer, the device name is *always* the following:

```
DAD1
```

- When the target drive is a local disk, the device name is similar to the following:

```
DKA0:
```

  Note the following conventions:

  – *DK* is the device code of the boot device

  – *A* is the boot device controller designation

  – *0* is the unit number of the boot device

- On Alpha systems configured in certain OpenVMS Cluster or HS*x* environments, the device naming convention is similar to the following:

```
DUA20.14.0.2.0
```

  The values you specify identify components such as the boot device, controller, unit number of the boot device, HS*x* controller node number, and channel numbers. Because these values vary depending on your specific hardware configuration, refer to the owner, operator, and technical service manuals that came with your computer for detailed information.

1.3 Using the Operating System CD–ROM

The following sections describe how you use the operating system CD–ROM to install, upgrade, and modify your system disk.

1.3.1 Using the Menu

The OpenVMS Alpha operating system CD–ROM includes a menu system that allows you to easily upgrade or install the operating system and to perform related operations such as backing up the system disk, installing layered products, and removing or reconfiguring products. This command procedure starts automatically when you boot the OpenVMS Alpha operating system CD–ROM, displaying a menu from which you choose options to perform the following tasks:

- Install or upgrade the operating system from the CD–ROM, using the POLYCENTER Software Installation utility
- List the products that can be installed from the CD–ROM
- Install or upgrade layered products from the CD–ROM
- Show which products are installed on your system
- Reconfigure (change options) layered products installed on your system
- Remove products
- Enter a DCL environment from which you can perform preinstallation or maintenance tasks such as mounting or showing devices and backing up or restoring files on the system disk
- Shut down the system

Review the following sections to understand how the menu works. You will then be prepared to choose appropriate menu options when you are asked to do so before, during, and after an installation or upgrade.

1.3.2 Sample Menu Display

The following is a sample display of the menu:

```
    OpenVMS Alpha (TM) Operating System, Version 7.1

    Copyright (c) 1996 Digital Equipment Corporation.  All rights reserved.


    Installing required known files...

    Configuring devices...

    ****************************************************************

    You can install or upgrade the OpenVMS Alpha operating system
    or you can install or upgrade layered products that are included
    on the OpenVMS Alpha operating system CD-ROM.

    You can also execute DCL commands and procedures to perform
    "standalone" tasks, such as backing up the system disk.

    Please choose one of the following:

        1)  Install or upgrade OpenVMS Alpha Version V7.1
        2)  Display products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Execute DCL commands and procedures
        8)  Shut down this system

Enter CHOICE or ? to repeat menu: (1/2/3/4/5/6/7/8/?)
```

1.3.3 How the Install or Upgrade Option Works

When you choose the install or upgrade option (1) from the menu, the system asks whether you want to preserve or initialize the system disk. The display is similar to the following:

```
    There are two choices for Installation/Upgrade:

    INITIALIZE - removes all software and data files that were
        previously on the target disk and installs OpenVMS Alpha.

    PRESERVE -- installs or upgrades OpenVMS Alpha on the target disk
        and retains all other contents of the target disk.

   * NOTE: You cannot use PRESERVE to install OpenVMS Alpha on a disk on
        which OpenVMS VAX or any other operating system is installed.

Do you want to INITIALIZE or to PRESERVE? [PRESERVE]
```

1.3.3.1 Specifying the INITIALIZE Option

When you specify the INITIALIZE option, the following operations take place:

- All software and data files that were previously on the target disk are removed.
- The operating system is installed.

Specify the INITIALIZE option and perform a full installation under the following conditions:

- If your Alpha computer is new (it has never had any version of the operating system running on it, including factory-installed software).
- If your Alpha computer is running a version of the OpenVMS Alpha operating system and you want to overwrite the entire contents of the system disk (the operating system, application software, and user files).
- If you want to create a new system disk but keep the old one (if you want to alternate between the two).
- If you are running the OpenVMS Alpha operating system but cannot upgrade. For example, if you changed the names of system directories on the system disk, the upgrade procedure will not work correctly. Therefore, unless you chose to restore the system disk to its original directory structure, you would have to reinstall the operating system.

1.3.3.2 Specifying the PRESERVE Option

When you specify the PRESERVE option, the following operations take place:

IF ...	THEN ...
the OpenVMS Alpha operating system is *not* already installed on the target disk,	the following operations take place: • The operating system is *installed*. • All other contents of the target disk are retained.
the OpenVMS Alpha operating system *is* installed on the target disk,	the operating system is *upgraded*, as follows: • Old operating system files and new files are merged or replaced. • All other contents of the target disk are retained.

Note: If you intend to choose the PRESERVE option (because there are certain files on the disk that you want to retain), Digital recommends that you first make a backup copy of your system disk. If there is any problem during the installation or upgrade that might affect the integrity of the disk, you will have the backup copy as a safeguard.

1.3.4 How the Layered Products Options Work

After you have installed or upgraded the operating system, you can use the menu to show, install, reconfigure (change previously selected options for a layered product), or remove products as well.

Note: When you boot the OpenVMS operating system CD–ROM and select the option to install layered products, that installation procedure does not run the Installation Verification Procedure (IVP) for each layered product. Because the operating system is booted from the CD–ROM and the layered products are installed on a different device (the target disk), the IVPs cannot execute correctly. However, you can run the IVP for each layered product after you boot the target system (see the layered product installation documents for information on running the IVP).

1.3.5 How the DCL Option Works

When you choose the DCL option (4) from the menu, you can use a *subset* of DCL commands (such as SHOW DEVICE, MOUNT, and BACKUP) to perform specific preinstallation and maintenance operations. Note, however, that this is a restricted DCL environment in that certain DCL commands and utilities will not function as expected because you are booting from read-only or write-locked media and because the full system startup is not performed.

A triple dollar sign system prompt ($$$) indicates that you are in this restricted DCL environment, as shown in the following example:

```
$$$ SHOW DEVICE
```

To exit from the DCL environment and return to the menu, enter the LOGOUT command.

1.3.6 How the Shutdown Option Works

When you choose the shutdown option (5) from the menu, your system shuts down and you are returned to the console prompt (>>>). The system displays a message similar to the following:

```
Shutting down the system

    SYSTEM SHUTDOWN COMPLETE
```

1.3.7 What to Do Next

Now that you have reviewed key terms, examined hardware and software requirements, and learned how to use the menu system included on the OpenVMS Alpha operating system CD–ROM, you can do the following:

IF ...	THEN ...
you want to install the operating system in an OpenVMS Cluster environment,	go to Chapter 2.
you want to install the operating system in a nonclustered environment,	go to Chapter 3.
you want to upgrade the operating system in a standalone, Volume Shadowing, or OpenVMS Cluster environment,	go to Chapter 5.
you want only to back up or restore your system disk,	go to Appendix B.

2

Preparing to Install in an OpenVMS Cluster Environment

This chapter contains information that you should review before performing an installation in an OpenVMS Cluster environment.

2.1 For More Information

Before installing the operating system in an OpenVMS Cluster environment, be sure you review any relevant OpenVMS Cluster information, contained in the following documents:

- The cover letters and the software product descriptions included with your distribution kit
- *OpenVMS Version 7.1 New Features Manual*
- *OpenVMS Version 7.1 Release Notes*
- If you are installing the operating system in a DSSI OpenVMS Cluster system, the *DSSI OpenVMS Cluster Installation and Troubleshooting Guide*

Be sure the following sources of information are available as well:

- *OpenVMS Cluster Systems*
- *Guidelines for OpenVMS Cluster Configurations*
- Your network or system manager

2.2 Mixed-Version Support

OpenVMS Alpha Version 7.1 and OpenVMS VAX Version 7.1 provide two levels of support for mixed-version and mixed-architecture OpenVMS Cluster systems. These two support types are *warranted* and *migration*.

Warranted support means that Digital has fully qualified the two versions coexisting in an OpenVMS Cluster and will answer all problems identified by customers using these configurations.

Migration support is a superset of the Rolling Upgrade support provided in earlier releases of OpenVMS and is available for mixes that are not warranted. Migration support means that Digital has qualified the versions for use together in configurations that are migrating in a staged fashion to a newer version of OpenVMS VAX or to OpenVMS Alpha. Problem reports submitted against these configurations will be answered by Digital. However, in exceptional cases Digital may request that you move to a warranted configuration as part of answering the problem.

Migration support will help you move to warranted OpenVMS Cluster version mixes with minimal impact on your cluster environment. Table 2–1 shows the level of support provided for all possible version pairings.

Table 2–1 OpenVMS Cluster Warranted and Migration Support

	Alpha V6.2–*xxx*	**Alpha V7.0**	**Alpha V7.1**
VAX V6.2–*xxx*	WARRANTED	Migration	Migration
VAX V7.0	Migration	WARRANTED	Migration
VAX V7.1	Migration	Migration	WARRANTED

Note

Digital does not support the use of Version 7.1 with Version 6.1 (or earlier versions) in an OpenVMS Cluster environment. In many cases, mixing Version 7.1 with versions prior to Version 6.2 will successfully operate, but Digital cannot commit to resolving problems experienced with such configurations.

2.3 OpenVMS Cluster Information You Will Need

If during the installation you answer YES to the system prompt asking whether your system will be a member of an OpenVMS Cluster, you will need to provide the following information after you boot the system disk:

Required Information	**Explanation**
Type of configuration	Configuration types (CI, DSSI, SCSI, local area, or mixed-interconnect) are distinguished by the interconnect device that the VAX and Alpha computers in the OpenVMS Cluster use to communicate with one another.
DECnet node name and node address	See the network or system manager to obtain the DECnet node name and node address for the computer on which you are installing the OpenVMS Alpha operating system. If you install DECnet-Plus (Phase V) software and do not plan to use DECnet for OpenVMS (Phase IV) addresses, then you do not need to provide this information.
Allocation class value	During the installation procedure, you will be asked for the allocation class value (ALLOCLASS) of the Alpha computer on which you are installing the OpenVMS Alpha operating system. For example: `Enter a value for Alpha143 ALLOCLASS parameter:` Refer to *OpenVMS Cluster Systems* for the rules on specifying allocation class values. Note that in a mixed-interconnect OpenVMS Cluster environment, the allocation class value cannot be zero if the nodes serve DSSI or CI disks. It must be a value from 1 to 255. This is also true for any Alpha computer that is connected to a dual-pathed disk. After you enter the allocation class value, the installation procedure uses it to automatically set the value of the ALLOCLASS system parameter.

Required Information	Explanation
Whether you want a quorum disk	Refer to *OpenVMS Cluster Systems* to help you determine whether you want a quorum disk in the cluster.
Location of the page and swap files	On a nonclustered system, the page and swap files are on one or more local disks but on a clustered system, the files are on one or more local or clustered disks. See *OpenVMS Cluster Systems* to help you determine where the page and swap files will be located for the system on which you are installing the OpenVMS Alpha operating system software.
Systems that will be MOP[1] servers, disk servers, and tape servers	If you are going to set up either a local area or a mixed-interconnect cluster, you will need to make these determinations.
Cluster group number and cluster password	If you are going to set up a local area cluster or a mixed-interconnect cluster that is LAN-based, use the following rules to determine the cluster group number and password: • Cluster group number—A number in the range from 1 to 4095 or 61440 to 65535 • Cluster password—Must be from 1 to 31 alphanumeric characters in length and can include dollar signs ($) and underscores (_)

[1]Servers that use the DECnet maintenance operation protocol.

2.4 What to Do Next

After you have completed all the tasks in this chapter, go to Chapter 3 to begin the installation.

3

Installing the OpenVMS Alpha Operating System

This chapter describes the following tasks:

- Preparing to respond to prompts during the installation
- Installing from the operating system CD–ROM or from a running system
- Creating the system disk
- Registering licenses
- Selecting operating system components
- Installing layered products
- Booting the new system disk
- Rebooting the system
- Joining an OpenVMS Cluster (optional)
- Running AUTOGEN
- Logging in to the SYSTEM account

Note

Before you install the operating system, be sure your computer is running the correct version of PALcode, as described in Section 1.2.4.

3.1 Preparing to Respond to Prompts During the Installation

At different points during the installation, you must respond to prompts asking you to supply specific information. This manual and the Help text available during the installation procedure tell you how to obtain most of this information and how to make decisions when responding to specific prompts.

However, Digital recommends that you review the following summary before you begin the installation so that you have an understanding beforehand of the types of information you will need to provide.

3.1.1 Summary of Prompts

During the installation, the system will prompt you for the following information:

- The names of the source drive, target drive, and local area network device (if you are booting from an InfoServer system).
- Whether you want to select the INITIALIZE or PRESERVE option (as described in Chapter 1).

- A volume label for the target disk (if you choose not to use the default volume label).
- A password for the SYSTEM account. You will be prompted to enter a password of at least 8 characters (but not exceeding 31 characters).
- Whether you want to join an OpenVMS Cluster system and, if so, what kind (as described in Chapter 2).
- DECnet node name and address (or values for the system parameters, SCSNODE and SCSSYSTEMID).

  Note: If you install the DECnet-Plus for OpenVMS (Phase V) software but want to use addresses compatible with DECnet for OpenVMS (Phase IV) software, you still need to provide this information. These settings identify your system by name and number in a DECnet or cluster environment. Note as well that if you supply a DECnet address, the system will automatically calculate the SCSSYSTEMID value. If necessary, see the network or system manager to obtain this information.
- Information listed on Product Authorization Keys (PAKs) for your OpenVMS licenses. To register your licenses, you will need to enter the information listed on the PAK for each license.
- Operating system components that you want to install (including DECwindows and OpenVMS Management Station files). You can install all components by default, or you can select each component individually.

  (Note that you must install the DECwindows components if you plan to install the separate DECwindows Motif for OpenVMS Alpha layered product. You must also install all of the OpenVMS Management Station server and client software files if you plan to use this product with your PC.)

3.2 Installing from CD–ROM or from a Running System

The OpenVMS Alpha Version 7.1 operating system includes procedures that allow you to easily install the operating system using the POLYCENTER Software Installation utility. In console mode, you can boot the operating system CD–ROM to begin the installation procedure. On a system that is already running the OpenVMS Alpha operating system, you can invoke the installation procedure by entering a command at the DCL level.

Depending on whether you are installing the OpenVMS Alpha operating system from the operating system CD–ROM or from a running OpenVMS Alpha system, begin the procedure as follows:

If installing from ...	Then ...
the operating system CD–ROM,	go to Section 3.3
a running OpenVMS Alpha system,	go to Section 3.4

3.3 Booting the Operating System CD–ROM

To get started, boot the OpenVMS Alpha operating system CD–ROM either from your local CD–ROM drive or from a CD–ROM drive connected to the InfoServer, as described in the following sections.

3.3.1 Booting from the Local Drive

To boot the operating system CD–ROM from the local CD–ROM drive, follow these steps:

1. Insert the operating system CD–ROM into the local CD–ROM drive.
2. At the console prompt (>>>), enter the SHOW DEVICE command so you can identify the name of the CD–ROM drive (for example, DKA400:).
3. Enter the boot command in the following format:

   BOOT -flags 0,0 *source-drive*

   Substitute the device name of the CD–ROM drive (as listed in the SHOW DEVICE display) for *source-drive*.

   For example, if the SHOW DEVICE display lists the device name of your CD–ROM drive as DKA400, enter the following command and press the Return key:

   ```
   >>> BOOT -flags 0,0 DKA400
   ```

3.3.2 Booting from the InfoServer

To boot the operating system CD–ROM using the InfoServer, follow these steps:

1. At the console prompt, enter the following command:

   ```
   >>> BOOT -FL 0,0 -FI APB_071 lan-device-name
   ```

   Note the following conventions:

   - *APB_071* is the file name of the APB program used for the initial system load (ISL) boot program.
   - *lan-device-name* is the name of the local area network (LAN) device identified with your computer. For information about the LAN devices your system supports, refer to the following table. For additional information, see the hardware manuals that you received with your Alpha computer and the *OpenVMS Software Product Description*.

Alpha Computer	Ethernet Device	FDDI Device
ALPHAbook 1	EOA0	–
AlphaServer 400 series	EWA0	FWA0
AlphaServer 1000 series	ERA0, EWA0	FRA0
AlphaServer 1000A series	EWA0	FWA0
AlphaServer 2000 series	ERA0, EWA0	FRA0
AlphaServer 2100, 2100A series	ERA0, EWA0	FRA0
AlphaServer 4100 series	EWA0	FWA0
AlphaServer 8200 series	EXA0, EWA0	FXA0
AlphaServer 8400 series	EXA0, EWA0	FXA0
AlphaStation 200 series	EWA0	FWA0
AlphaStation 400 series	EWA0	FWA0
AlphaStation 500 series	EWA0	FWA0
AlphaStation 600 series	ERA0, EWA0	FWA0
DEC 2000 series	ERA0	–
DEC 3000 series	ESA0	"n/ESA0"
DEC 4000 series	EZA0	–
DEC 7000 series	EXA0	FXA0
DEC 10000 series	EXA0	FXA0

Notes: If you are using a DEC 3000 or 4000 series system, note the following:

- On DEC 3000 series systems, you can boot through the InfoServer using an alternate TURBOchannel device, such as a PMAD (Ethernet) or DEFTA (FDDI), by specifying the device name as ''*n*/ESA0''. The value for *n* is the TURBOchannel slot number, which you can obtain by entering the SHOW CONFIGURATION command at the console prompt (>>>) and examining the display. For more information, see Section A.1.8, in Appendix A.
- On DEC 4000 series systems, you *must* specify the ISL file name in uppercase (APB_071). In addition, if your system uses console firmware prior to Version 3.2, enter the BOOT command as follows:

```
>>> BOOT -FL 0,0 -start 0 -FI APB_071 EZA0
```

2. The InfoServer ISL program then displays the following menu:

```
Network Initial System Load Function
Version 1.1

  FUNCTION         FUNCTION
    ID
    1     -        Display Menu
    2     -        Help
    3     -        Choose Service
    4     -        Select Options
    5     -        Stop

Enter a function ID value:
```

3. Respond to the prompts as follows, pressing the Return key after each entry:
   a. Enter 3 for the function ID.

b. Enter 2 for the option ID.

c. Enter the service name (ALPHA071).

A sample display follows:

```
Enter a function ID value: 3 Return

OPTION          OPTION
   ID
   1     -       Find Services
   2     -       Enter known Service Name

Enter an Option ID value: 2 Return
Enter a Known Service Name: ALPHA071 Return
```

Note: If you boot the OpenVMS Alpha operating system CD–ROM from an InfoServer but lose your connection during the installation procedure (the system is unresponsive and pressing Ctrl/Y does not return you to the menu), do the following:

IF ...	THEN ...
you previously chose the INITIALIZE option,	do the following: 1. Reboot the OpenVMS Alpha operating system CD–ROM. 2. Choose the install option from the menu and perform the installation again, as described in this chapter.
you previously chose the PRESERVE option,	do the following: 1. Reboot the OpenVMS Alpha operating system CD–ROM. 2. Enter the DCL environment by choosing option 7 from the menu. 3. Mount the device containing your backup copy of the target disk and the device that is your target disk. 4. Restore the backup copy of your target disk by entering the appropriate BACKUP commands. (See Appendix B for complete information using MOUNT and BACKUP commands to restore a system disk.) 5. Log out from the DCL environment. 6. Choose the install option from the menu and perform the installation again, as described in this chapter.

3.4 Creating the System Disk

The following sections describe how to create the system disk from the operating system CD–ROM and from a running system.

3.4.1 Installing from the CD–ROM

After you boot the operating system CD–ROM, choose the install option (1) from the menu displayed on the screen. For example:

```
 OpenVMS Alpha (TM) Operating System, Version V7.1

Copyright (c) 1996 Digital Equipment Corporation.  All rights reserved.


Installing required known files...

Configuring devices...

****************************************************************

You can install or upgrade the OpenVMS Alpha operating system
or you can install or upgrade layered products that are included
on the OpenVMS Alpha operating system CD-ROM.

You can also execute DCL commands and procedures to perform
"standalone" tasks, such as backing up the system disk.

Please choose one of the following:

    1)  Install or upgrade OpenVMS Alpha Version V7.1
    2)  Display products that this procedure can install
    3)  Install or upgrade layered products
    4)  Show installed products
    5)  Reconfigure installed products
    6)  Remove installed products
    7)  Execute DCL commands and procedures
    8)  Shut down this system

Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?) 1
```

After you choose the install option, go to Section 3.4.3 to continue the procedure.

3.4.2 Installing from a Running System

If you are installing the operating system from an Alpha system that is already running the OpenVMS Alpha operating system, enter the following command from the SYSTEM account and then press the Return key:

```
$ @SYS$SYSTEM:AXPVMS$PCSI_INSTALL
```

After you enter the command, go to Section 3.4.3 to continue the procedure.

3.4.3 Choosing INITIALIZE or PRESERVE

After you choose the install option (if you are installing from the operating system CD–ROM) or start the AXPVMS$PCSI_INSTALL command procedure (if you are installing from a running OpenVMS Alpha system), the system displays the following information and prompts:

```
    ************************************************************

    The installation procedure will ask a series of questions.

          () - encloses acceptable answers
          [] - encloses default answers

    Type your response and press the <Return> key.  Type:

          ? - to repeat an explanation
          ^ - to change prior input (not always possible)


    There are two choices for Installation/Upgrade:

    INITIALIZE - removes all software and data files that were
        previously on the target disk and installs OpenVMS Alpha.

    PRESERVE -- installs or upgrades OpenVMS Alpha on the target disk
        and retains all other contents of the target disk.

   * NOTE: You cannot install OpenVMS Alpha on an existing disk on
        which OpenVMS VAX or any other operating system is installed.

Do you want to INITIALIZE or to PRESERVE? [PRESERVE])
```

Respond to the INITIALIZE or PRESERVE prompt as follows:

IF ...	THEN ...
your system disk is new,	do the following: 1. Enter INITIALIZE. 2. Press the Return key.
you want to remove all files from an existing system disk,	do the following: 1. Enter INITIALIZE. 2. Press the Return key.
you want to retain certain files on an existing disk,	press the Return key to accept the default (PRESERVE).

3.4.4 Specifying the Target Disk

The procedure next asks you for the name of the target disk. If you enter a question mark (?), the system displays a list of devices on your system. Select the appropriate disk and respond to the prompt. For example:

```
    You must enter the device name for the target disk on which
    OpenVMS Alpha will be installed.

Enter device name for target disk: (? for choices) ?

Device        Device           Error    Volume       Free  Trans Mnt
Name          Status           Count     Label      Blocks Count Cnt
DKA100:       Online               0
DKA200:       Online               0
DKA400:       Online wrtlck        0

Enter device name for target disk: (? for choices) DKA200
```

3.4.5 Specifying the Volume Label

The system then prompts you for the volume label and asks if the information is correct. You can keep the label already assigned to the disk, accept the default label assigned by the system (ALPHASYS), or specify a different volume label (with a limit of 12 characters that can be letters A–Z, numbers 0–9, dollar signs ($), hyphens (-), or underscores (_)). After you select the volume label and choose to continue by answering Yes to the next prompt, the target disk is initialized and mounted, and page and swap files are created. For example:

```
    DKA200: is now labeled SYSDISK

Do you want to keep this label? (Yes/No) [Yes] NO

Enter volume label for target system disk: [ALPHASYS]

    You have chosen to install OpenVMS Alpha on a new disk.

    The target system disk, DKA200:, will be initialized.
    It will be labeled ALPHASYS.
    Any data currently on the target system disk will be lost.

Is this OK? (yes/No) YES

    Initializing and mounting target ...
```

3.4.6 Setting the SYSTEM Account Password

Before you respond to the system prompt asking you to enter a password for the SYSTEM account, note the following:

- Passwords must be at least eight characters in length; they do not appear on the display.
- Press the Return key after you enter the password.
- After you enter the password, the procedure checks to make sure it meets the requirements for a valid password.

The following is a sample display:

```
    You must enter a password for the SYSTEM account.

    The password must be a minimum of 8 characters in length
    and may not exceed 31 characters.
    It will be checked and verified.
    The system will not accept passwords that can be guessed easily.

Password for SYSTEM account:

Re-enter SYSTEM password for verification:
```

If you enter the password incorrectly or if the system determines that the password is too easy for another user to guess, the system displays an error message and gives you the opportunity to specify a valid password.

3.4.7 Becoming a Cluster Member

The procedure now asks if your system will be part of a cluster. The display is similar to the following:

```
Will this system be a member of an OpenVMS Cluster? (Yes/No) [No]
```

If you answer Yes, you will be asked a series of questions about the cluster after you boot the new system disk.

3.4.8 Installing Windowing and Network Products

The procedure next allows you to install the DECwindows Motif for OpenVMS Alpha, DECnet-Plus (Phase V), and Digital TCP/IP Services for OpenVMS software that is included with the OpenVMS Alpha operating system.

Note that you can change the default values for these products later in the installation procedure. However, if you want to install DECnet for OpenVMS (Phase IV) software, you must do so separately as a layered product.

The display is similar to the following:

```
    If you want windowing and/or networking you can install any or all
    of the following products along with the OpenVMS operating system:

        o DECwindows Motif for OpenVMS Alpha
        o DECnet-Plus (Phase V)
        o Digital TCP/IP Services for OpenVMS

    If you want to change your selections, you can do so later in the
    installation by answering "NO" to the following question:

        "Do you want all of the default values for this product?"


    Do you want to install DECwindows Motif for OpenVMS Alpha V1.2-4?
(Yes/No) [YES]
```

```
    Beginning with OpenVMS V7.1 DECnet-Plus (Phase V) is provided with the OpenVMS
    operating system.  Digital strongly recommends that DECnet users
    install DECnet-Plus (Phase V).  DECnet Phase IV applications are supported
    by DECnet-Plus (Phase V).

    DECnet Phase IV is available for separate installation. Please see
    the  "OpenVMS  V7.1  Release  Notes"  for  important  information
    regarding DECnet Phase IV support.

    Do you want to install DECnet-Plus (Phase V) V7.1?
(Yes/No) [YES]


    Do you want to install Digital TCP/IP Services for OpenVMS V4.0-A?
(Yes/No) [YES] no
```

3.4.9 Setting System Parameters

If you install the DECnet-Plus for OpenVMS (Phase V) Alpha software but want to use addresses compatible with DECnet for OpenVMS (Phase IV) software, you need to set two parameters, SCSNODE and SCSSYSTEMID, so that your system is identified by name and number in a DECnet or cluster environment. You must specify a DECnet address (which the system uses to calculate the SCSSYSTEMID value). The following is an example of the system display and valid responses:

```
    For your system to operate properly, you must set two parameters:
        SCSNODE and SCSSYSTEMID.


    SCSNODE can be from 1 to 6 letters or numbers.  It must contain at
    least one letter.

    If  you  plan  to  use DECnet, SCSNODE must be the DECnet Phase IV
    node name, or the DECnet-Plus (Phase V) node synonym.

    If  you  have multiple OpenVMS systems, the SCSNODE on each system
    must be unique.

Enter SCSNODE: mynode

    If  you  plan  to use DECnet, SCSSYSTEMID must be set based on the
    DECnet address.

    DECnet Phase IV addresses are in the format

        DECnet_area_number.DECnet_node_number

    DECnet_area_number is a number between 1 and 63.
    DECnet_node_number is a number 1 and 1023.

    If you plan to use DECnet WITHOUT Phase IV compatible addresses,
    enter 0.0.


Enter DECnet (Phase IV) Address [1.1]: 63.180

    SCSSYSTEMID will be set to 64692, calculated as follows:

        (DECnet_area_number * 1024) + DECnet_node_number)
```

3.4.10 Updating Time Zone Information

At this point in the installation, the procedure asks you for information that is used for providing local time zone support. For local time zone support to work correctly, the installation procedure must set the time zone that accurately describes the location you want to be considered as your default time zone. Usually, this is the time zone in which your system is running. In addition, your system must be correctly configured to use a valid OpenVMS time differential factor (TDF).

The procedure displays a series of time zone menus and prompts you to make selections from each. You begin by selecting the desired time zone from the main time zone menu, which is the first menu displayed. If you do not select a time zone, the default is Greenwich Mean Time (GMT).

If you choose a time zone that has subcomponents, the system displays an additional menu. For example, if you choose the United States (US) time zone from the main menu, a second menu displays the specific time zones within the United States. You then select the menu item that best represents the desired time zone.

The procedure then prompts you for the TDF. The TDF is the difference between your system time and Coordinated Universal Time (UTC), which is an international standard (similar to Greenwich Mean Time) for measuring time of day.

A sample display follows:

```
Configuring the Local Time Zone


TIME ZONE SPECIFICATION -- Main Time Zone Menu

  1) Australia       11) GMT            21) Mexico          31) Turkey
  2) Brazil          12) Greenwich      22) NZ              32) UCT
  3) CET             13) Hongkong       23) NZ-CHAT         33) US
  4) Canada          14) Iceland        24) Navajo          34) UTC
  5) Chile           15) Iran           25) PRC             35) Universal
  6) Cuba            16) Israel         26) Poland          36) W-SU
  7) EET             17) Jamaica        27) ROC             37) WET
  8) Egypt           18) Japan          28) ROK             38) Zulu
  9) Factory         19) Libya          29) Singapore
 10) GB-Eire         20) MET            30) SystemV

  0) None of the above

Select the number above that best represents the desired time zone: 33

You selected US as your time zone.
Is this correct? (Yes/No) [YES]:

US Time Zone Menu

   1) Alaska           4) Central          7) Hawaii          10) Mountain
   2) Aleutian         5) East-Indiana     8) Indiana-Starke  11) Pacific
   3) Arizona          6) Eastern          9) Michigan        12) Samoa

   0) None of the above

Select the number above that best describes your location: 6

You selected US/Eastern as your time zone.
Is this correct? (Yes/No) [YES]:

    Default Time Differential Factor for standard time is -5:00.
    Default Time Differential Factor for daylight saving time is -4:00.

    The Time Differential Factor (TDF) is the difference between your
    system time and Coordinated Universal Time (UTC).  UTC is similar
    in most respects to Greenwich Mean Time (GMT).

    The TDF is expressed as hours and minutes, and should be entered
    in the hh:mm format.  TDFs for the Americas will be negative
    (-3:00, -4:00, etc.); TDFs for Europe, Africa, Asia and Australia
    will be positive (1:00, 2:00, etc.).

Is Daylight Savings time in effect? (Yes/No): NO

Enter the Time Differential Factor: -5

    NEW SYSTEM TIME DIFFERENTIAL FACTOR = -5:00.

Is this correct? [Y]:
```

For more information about TDF and local time zone support, see *OpenVMS System Manager's Manual*.

3.5 Registering Licenses

Before you can use the OpenVMS Alpha operating system and its components, you must register all licenses in one of two ways:

- During the installation (which Digital recommends), by responding to the prompts displayed by the SYS$UPDATE:VMSLICENSE.COM procedure.
- After the installation, by using the LICENSE REGISTER command or by invoking SYS$UPDATE:VMSLICENSE.COM.

3.5.1 Types of OpenVMS Alpha Licenses

The operating system uses one or more of the following types of licenses, depending on your hardware and software configuration.

Note: All OpenVMS Alpha licenses include the NO_SHARE attribute and remain with the initial host computer.

Type of License	Description
Operating System Base License	Grants the right to noninteractive use of the remote batch, print, application, and computing services of the operating system on a single processor and authorizes one direct login (for system management purposes only). This license is a prerequisite for OpenVMS Alpha Interactive User Licenses.
Interactive User Licenses	Grant the right to interactive use of the OpenVMS Alpha operating system, provided you have previously installed the appropriate OpenVMS Alpha Operating System Base License on your Alpha computer. These licenses, which are concurrent, are available in any quantity desired or as an unlimited user license. You can add interactive users to the computer at any time by specifying the same node name on the additional Interactive User License PAK and by following the license combination procedure described in the *OpenVMS License Management Utility Manual*.
Symmetric Multiprocessing (SMP) Extension to the Operating System Base License	Upgrades the Operating System Base License and all Interactive User licenses (including Unlimited) to the matching multiprocessing level of your DEC 4000 or DEC 7000 series Alpha computer. Because the Symmetric Multiprocessing (SMP) Extension grants all the rights the existing Base and User licenses provided at the uniprocessing level, you do not need to reinstall those licenses when you upgrade to a multiprocessing system. Each time you upgrade your system to a new multiprocessing level (for example, from a DEC 7000 Model 620 Alpha system to a DEC 7000 Model 630 Alpha system), you add an SMP Extension to your existing licenses.

3.5.2 For More Information

In addition to reviewing the license information provided in this chapter, you can also refer to the following:

- Appendix C, which contains notes and supplemental information about licenses and licensing procedures
- The *OpenVMS License Management Utility Manual*, which contains complete, detailed information about the licensing procedure

3.5.3 How to Register Licenses

After you install the OpenVMS Alpha operating system, the system displays the following message:

```
    If you have Product Authorization Keys (PAKs) to register,
    you can register them now.

Do you want to register any Product Authorization Keys? (Yes/No) [Yes]
```

Respond to the prompt as follows:

IF ...	THEN ...
you choose to register your licenses at this time (which Digital recommends),	do the following: 1. Be sure you review Appendix C and have the *OpenVMS License Management Utility Manual* available. 2. Be sure you have a copy of the Product Authorization Key (PAK) for each license that you will register. 3. Type Y and press the Return key. 4. Register your licenses, as described in the next section.
you choose *not* to register your licenses at this time,	do the following: 1. Type N and press the Return key. 2. Skip the next section about registering licenses and follow the directions in Section 3.6. 3. After completing the installation, register your licenses using the LICENSE REGISTER command or by invoking SYS$UPDATE:VMSLICENSE.COM *before* performing any other postinstallation tasks.

3.5.4 Using the Licensing Procedure

Entering Y (Yes) to register your licenses during the installation invokes the SYS$UPDATE:VMSLICENSE.COM procedure, which displays the following message:

```
VMS License Management Utility Options:

    1. REGISTER a Product Authorization Key
    2. AMEND an existing Product Authorization Key
    3. CANCEL an existing Product Authorization Key
    4. LIST Product Authorization Keys
    5. MODIFY an existing Product Authorization Key
    6. DISABLE an existing Product Authorization Key
    7. DELETE an existing Product Authorization Key
    8. COPY an existing Product Authorization Key
    9. MOVE an existing Product Authorization Key
   10. ENABLE an existing Product Authorization Key
   11. SHOW the licenses loaded on this node
   12. SHOW the unit requirements for this node

   99. Exit this procedure

   Type '?' at any prompt for a description of the information
   requested. Press Ctrl/Z at any prompt to return to this menu.

Enter one of the above choices [1]
```

1. Select the appropriate options (beginning with 1, as indicated in the display) until you have successfully registered all required PAKs.

2. After you register all your licenses, exit from the License Management procedure by entering option 99.

3.6 Completing the Installation

The following sections describe the remaining steps that you need to perform to complete the installation.

3.6.1 Choosing Descriptive Help Text

Next, the system prompts you as follows:

```
The installation can provide brief or detailed descriptions.
In either case, you can request the detailed descriptions by typing "?".

Do you always want detailed descriptions? (Yes/No) [No]
```

If you answer Yes, the system will display additional explanatory text with each prompt.

3.6.2 Selecting Components

The system next displays the following message, indicating that the procedure is ready to install the operating system:

```
The following product has been selected:
    DEC AXPVMS OPENVMS V7.1  [Platform]


*** DEC AXPVMS OPENVMS V7.1: OpenVMS and related products Platform

    COPYRIGHT (c) 11-NOV-1996 -- All rights reserved

    Digital Equipment Corporation
```

After the system displays a series of additional messages, it asks if you want all the default values, meaning all the files and subgroups of files for each component included in the operating system. The display is similar to the following:

```
    Do you want all the default values for this product [YES]
```

Notes: When selecting components, note the following:

- If you want all the default values, press the Return key.

  If you want to select components individually, answer NO. The system will then prompt you for each group and subgroup of files.

- If you are not sure whether you want certain files, request help by entering a question mark (?) at the prompt for that file (or group of files).

- After you select all the files you want, you will have an opportunity to view your selections and make changes (if necessary).

- OpenVMS Management Station software is automatically installed on your OpenVMS system disk when you accept all the default values. If you do not accept the default values, you must select the OpenVMS Management Station component (server and client files) if you plan to use that product. After the installation is complete, you can then prepare your OpenVMS Alpha system and your PC to run OpenVMS Management Station by following the procedures described in Appendix E.

- If you decide after the installation to change which OpenVMS Alpha operating system files you want installed on your system, you can use the POLYCENTER Software Installation utility on your running system to add or remove files.

- After you boot the new system disk and log in, you can obtain information about individual system files by entering HELP SYSTEM_FILES at the dollar sign prompt ($).

3.6.3 List of Components

Following is the list of components included with the OpenVMS Alpha Version 7.1 operating system:

```
Accounting Log Report Generator Utility
Access Control List Utilities
Print and Batch Queue Utilities
DECdtm Distributed Transaction Manager
DECnet-Plus (Phase V) Support
    DECnet-Plus (Phase V)
Programming Support
    Debugger Utility
    Image Dump Utility
    RMS Analyze and FDL Editor Utilities
    Message Utility
    System Shareable Image and Object Module Libraries
    Macro libraries
    Macro-32 Migration Compiler
    TLB intermediary form of STARLET
    Fortran Require Files
    C Object Libraries
    C Header Files
RMS Journaling Recovery Utility
System Programming Support
    Support for ISO 9660 and High Sierra CD-ROM Formats
    MONITOR
    Analyze Object File Utility
    Delta Debugger
    System Dump Analyzer Utility
    Miscellaneous Symbol Table Files
OpenVMS Management Station Software -- PC files
Utilities
    OpenVMS Mail Utility
    Dump Utility
    DIGITAL Standard Runoff (DSR) Text Formatter
    Phone Utility
    Help Library
    Foreign Terminal Support
    LAT-11 Terminal Server (via Ethernet)
    Error Log Generator Utility
    Terminal Fallback Facility
    TECO Interactive Text Editor
    National Character Set Utility (NCS)
    DIAGNOSE Utility
    XPG4 Internationalization Utilities
Bliss Require Files
Example Files
Message Facility Files (HELP/MESSAGE)
Translated Image Support
UETP Files
Support for DECwindows
    DECwindows workstation files
    Video fonts
        100 dots per inch video fonts
```

3.6.4 Completing the Procedure

When you have answered all the prompts and selected the components you want installed, the system allows you to review your selections (and make changes if necessary), then installs the product, provides informational messages, and returns you to the menu. Following is a sample display.

Note: If you are installing from a running OpenVMS Alpha Version system, the system displays the dollar sign prompt ($) instead of the 8-option menu when the installation is complete.

```
    Do you want to view the values? [NO]

Execution phase starting ...
The following products will be installed:
    DEC AXPVMS DECNET_OSI F7.1
    DEC AXPVMS DWMOTIF V1.2-4
    DEC AXPVMS OPENVMS X7.1-691
    DEC AXPVMS VMS X7.1-691
Portion done: 0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
The following products have been installed:
    DEC AXPVMS DECNET_OSI F7.1
    DEC AXPVMS DWMOTIF V1.2-4
    DEC AXPVMS OPENVMS X7.1-691
    DEC AXPVMS VMS X7.1-691


    The installation is now complete.

    When the newly installed system is first booted, a special
    startup procedure will be run.  This procedure will:

        o  Configure the system for standalone or OpenVMS Cluster operation.
        o  Run AUTOGEN to set system parameters.
        o  Reboot the system with the newly set parameters.


    You can shut down now or continue with other operations.


  Process SYSTEM_1 logged out at  29-NOV-1996 14:55:52.16

    ************************************************************

    You can install or upgrade the OpenVMS Alpha operating system
    or you can install or upgrade layered products that are included
    on the OpenVMS Alpha operating system CD-ROM.

    You can also execute DCL commands and procedures to perform
    "standalone" tasks, such as backing up the system disk.

    Please choose one of the following:

        1)  Install or upgrade OpenVMS Alpha Version V7.1
        2)  Display products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Execute DCL commands and procedures
        8)  Shut down this system

    Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?)
```

If you want to install layered products, go to Section 3.7.

If you do not want to install layered products or perform any other operations prior to booting the new system disk, choose option 8 from the menu to shut down the system. The system display is similar to the following:

```
Enter CHOICE or "?" to repeat menu: (1/2/3/4/5/6/7/8/?) 8

    Shutting down the system


 SYSTEM SHUTDOWN COMPLETE
```

After you complete the installation and shut down the system, go to Section 3.8.

3.7 Installing Layered Products

You can use the menu system included on the operating system CD–ROM to install certain layered products with the POLYCENTER Software Installation utility. You can view a list of the layered products that can be installed in this way by choosing option 2 from the menu. (To install layered products that are not listed, see Chapter 4 and the installation documentation for each layered product.)

To install layered products using the POLYCENTER Software Installation utility, choose option 2 to view the list and then option 3. For example:

```
    Please choose one of the following:

        1)  Install or upgrade OpenVMS Alpha Version V7.1
        2)  Display products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Execute DCL commands and procedures
        8)  Shut down this system

    Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?) 2

    The following layered product kits are available on the OpenVMS
    operating system CD-ROM and can be installed at this time:

DEC AXPVMS AMDS V6.1 found in DKB400:[KITS.AMDS061]
DEC AXPVMS SOFTWIN V1.0 found in DKB400:[KITS.SOFTWINDOWS]
.
.
.
    ************************************************************

    You can install or upgrade the OpenVMS Alpha operating system
    or you can install or upgrade layered products that are included
    on the OpenVMS Alpha operating system CD-ROM.

    You can also execute DCL commands and procedures to perform
    "standalone" tasks, such as backing up the system disk.

    Please choose one of the following:

        1)  Install or upgrade OpenVMS Alpha Version V7.1
        2)  Display products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Execute DCL commands and procedures
        8)  Shut down this system

    Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?) 3

    ************************************************************


    You must enter the device name for the target disk on which
    the layered product(s) will be installed.

Enter device name for target disk: (? for choices) DKA200

    DKA200: is labeled ALPHASYS.


    The installation can provide brief or detailed descriptions.
    In either case, you can request the detailed descriptions by typing "?".

Do you always want detailed descriptions? (Yes/No) [No]
.
.
.
```

If you do not want to perform any other operations after you install the layered products, enter option 8 to shut down the system. The system display is similar to the following:

```
Enter CHOICE or "?" to repeat menu: (1/2/3/4/5/6/7/8/?) 8

    Shutting down the system

 SYSTEM SHUTDOWN COMPLETE
```

After you complete the installation and shut down the system, go to the next section to boot the new system disk.

3.8 Booting the New System Disk

After you have successfully installed the operating system, boot the new system disk, as described in the following sections.

3.8.1 Preparing to Boot the New System Disk

Before you boot the new system disk, you must do the following:

1. Halt the system by entering Ctrl/P or by pressing the Halt button.[1]
2. At the console prompt (>>>), enter the SET BOOTDEF_DEV command in the following format:

   SET BOOTDEF_DEV *target-drive*

   Substitute the device name of the system disk for *target-drive*. The SET BOOTDEF_DEV command tells the system which disk to boot from. For example, if the system disk has the device name DKA400, enter the following command and press the Return key:

   ```
   >>> SET BOOTDEF_DEV DKA400
   ```

   If the system disk is connected to a hierarchical storage device (HSx), the format for specifying that drive is different. For example, on a DEC 7000 series system connected to an HSC, the command is similar to the following:

   ```
   >>> SET BOOTDEF_DEV DUA20.14.0.2.0
   ```

   For more information about setting and showing the default boot device, see Section A.2.2 in Appendix A.

3.8.2 How to Boot the New System Disk

To boot the system disk, enter the following command and press the Return key:

```
>>> BOOT -FLAGS 0,0
```

When the system finishes booting, it displays informational messages that begin as follows:

```
    OpenVMS Alpha (TM) Operating System, Version V7.1

$!  Copyright (c) 1996 Digital Equipment Corporation.  All rights reserved.
    Installing required known files...
    Configuring devices...
.
.
.
```

[1] For more information about halting your Alpha computer, see Appendix A.

3.9 Joining an OpenVMS Cluster

If during the installation, you previously answered Yes to the question about joining an OpenVMS Cluster, the system now asks a series of questions about your configuration (CI, DSSI, SCSI, local area, or mixed-interconnect).

You might need to refer to *OpenVMS Cluster Systems* or *Guidelines for OpenVMS Cluster Configurations* to answer these questions.

3.9.1 OpenVMS Cluster Prompts

Table 3–1 lists the OpenVMS Cluster prompts and suggested responses. Note that, depending on your responses and particular cluster configuration, some prompts will not be displayed.

Table 3–1 Prompts for OpenVMS Cluster Configurations

Question	How to Respond
Will this node be a cluster member (Y/N)?	Enter Y.
What is the node's DECnet node name?	Enter the DECnet node name (for example, MYNODE). The DECnet node name may be from one to six alphanumeric characters in length and cannot include dollar signs or underscores.
What is the node's DECnet node address?	Enter the DECnet node address—for example, 2.2.
Will the Ethernet be used for cluster communications (Y/N)?	Enter N for a CI only or DSSI-only OpenVMS Cluster. Otherwise, answer Y.[1]
Enter this cluster's group number:	Enter a number in the range from 1 to 4095 or 61440 to 65535.
Enter this cluster's password:	Enter the cluster password. The password must be from 1 to 31 alphanumeric characters in length and may include dollar signs and underscores.[2]
Reenter this cluster's password for verification:	Reenter the password.
Will MYNODE be a disk server (Y/N)?	Enter Y if you want local disks to be served to the cluster (mandatory for local area and mixed-interconnect configurations). Refer to *OpenVMS Cluster Systems* for information on served cluster disks.
Will MYNODE serve RFxx disks (Y)?	Enter a response appropriate for your DSSI configuration, if such disks are available to your system.
Enter a value for MYNODE's ALLOCLASS parameter:	In a CI only system (connected to a dual-ported disk), a DSSI-only system, or a local area or mixed-interconnect configuration where nodes serve DSSI or CI disks, enter the appropriate allocation class value (1 to 255). Otherwise, enter 0. For information about selecting the ALLOCLASS parameter, see *OpenVMS Cluster Systems*.

[1]The Ethernet may not be required for communication within a local area OpenVMS Cluster system configured with FDDI devices. Within certain DSSI or CI mixed-interconnect configurations, neither the Ethernet nor FDDI may be required for communication. If your configuration fits either scenario, you can answer No (N) to this prompt.

[2]If neither the Ethernet nor FDDI is being used for communication in your cluster configuration, you may not need to supply the cluster group number and password.

(continued on next page)

Table 3–1 (Cont.) Prompts for OpenVMS Cluster Configurations

Question	How to Respond
Does this cluster contain a quorum disk (Y/N)?	For CI only, SCSI, local area, and mixed-interconnect configurations, enter Y or N, depending on your configuration. For most DSSI systems, enter Y. However, if you are adding a two-system DSSI configuration to an existing cluster (in which case you might not need a quorum disk), you can answer N. If you enter Y, the system asks for the name of the quorum disk. Enter the device name of the quorum disk. Refer to *OpenVMS Cluster Systems* for information on quorum disks.

3.10 Running AUTOGEN

The system next runs AUTOGEN to evaluate your hardware configuration and estimate typical work loads. AUTOGEN then sets system parameters, the sizes of page, swap, and dump files, and the contents of VMSIMAGES.DAT. When AUTOGEN finishes and you reboot, the installation procedure is complete.

3.10.1 AUTOGEN Messages

The installation procedure displays messages similar to the following:

```
    AUTOGEN will now be run to compute the new SYSGEN parameters.  The system
    will then shut down and reboot, and the installation or upgrade will be
    complete.

    After rebooting you can continue with such system management tasks as:

            Decompressing the System Libraries
            Using SYS$MANAGER:CLUSTER_CONFIG.COM to create an OpenVMS Cluster
            Creating FIELD, SYSTEST and SYSTEST_CLIG accounts if needed

%AUTOGEN-I-BEGIN, GETDATA phase is beginning.
%AUTOGEN-I-NEWFILE, A new version of SYS$SYSTEM:PARAMS.DAT has been created.
        You may wish to purge this file.
%AUTOGEN-I-END, GETDATA phase has successfully completed.
%AUTOGEN-I-BEGIN, GENPARAMS phase is beginning.
%AUTOGEN-I-NEWFILE, A new version of SYS$MANAGER:VMSIMAGES.DAT has been created.
         You may wish to purge this file.
%AUTOGEN-I-NEWFILE, A new version of SYS$SYSTEM:SETPARAMS.DAT has been created.
        You may wish to purge this file.
%AUTOGEN-I-END, GENPARAMS phase has successfully completed.
%AUTOGEN-I-BEGIN, GENFILES phase is beginning.
%SYSGEN-I-EXTENDED, DKA200:[SYS0.SYSEXE]PAGEFILE.SYS;1 extended
%SYSGEN-I-EXTENDED, DKA200:[SYS0.SYSEXE]SWAPFILE.SYS;1 extended
%SYSGEN-I-CREATED, SYS$SYSROOT:[SYSEXE]SYSDUMP.DMP;1 created

%AUTOGEN-I-REPORT, AUTOGEN has produced some informational messages which
        have been stored in the file SYS$SYSTEM:AGEN$PARAMS.REPORT.  You may
        wish to review the information in that file.

%AUTOGEN-I-END, GENFILES phase has successfully completed.
%AUTOGEN-I-BEGIN, SETPARAMS phase is beginning.
.
.
.
```

3.11 Rebooting the System

After AUTOGEN finishes, the system shuts down, displaying messages similar to the following:

```
The system is shutting down to allow the system to boot with the
generated site-specific parameters and installed images.

The system will automatically reboot after the shutdown and the
installation will be complete.


        SHUTDOWN -- Perform an Orderly System Shutdown

%SHUTDOWN-I-BOOTCHECK, performing reboot consistency check...
%SHUTDOWN-I-CHECKOK, basic reboot consistency check completed
.
.
.
```

3.11.1 Rebooting the System Manually

If the system does not reboot automatically, reboot the system manually.

For example, if the system disk is on an RZ25 disk drive with a unit number of 1, enter the following command and press the Return key:

```
>>> BOOT DKA1
```

After the system reboots, the system displays a message similar to the following:

```
     OpenVMS Alpha (TM) Operating System, Version V7.1

    Copyright (c) 1996 Digital Equipment Corporation.  All rights reserved.
%STDRV-I-STARTUP, VMS startup begun at 15-NOV-1996 16:24:02.27
.
.
.
```

3.12 Logging in to the SYSTEM Account

The system next displays informational messages and accounting information indicating that your OpenVMS Alpha operating system is running. For example:

```
%SET-I-INTSET, login interactive limit = 64, current interactive value = 0
  SYSTEM       job terminated at  29-NOV-1996 12:55:43.92

  Accounting information:
  Buffered I/O count:            1733         Peak working set size:   3184
  Direct I/O count:               650         Peak page file size:    19440
  Page faults:                    974         Mounted volumes:            0
  Charged CPU time:          0 00:00:04.45    Elapsed time:     0 00:00:34.82
```

At this time, you can log in to the SYSTEM account (so you can perform postinstallation tasks), as described in the following sections.

3.12.1 Logging in to a Character Cell Terminal

Log in to a character cell terminal by entering the user name SYSTEM followed by the password. The display is similar to the following:

```
        Welcome to OpenVMS Alpha (TM) Operating System, Version V7.1

Username: SYSTEM
Password:
.
.
.
      Welcome to OpenVMS Alpha (TM) Operating System, Version V7.1
```

(If you forget your password, follow the instructions in Appendix A to perform an emergency startup.)

3.12.2 Logging in to a Workstation

If you installed the DECwindows Motif for OpenVMS Alpha software on your workstation, do the following after the login window displays on your screen:

1. Enter the user name SYSTEM followed by the password.
2. Click on the OK button.

3.12.3 What to Do Next

After you have successfully installed the OpenVMS Alpha operating system and logged in to the SYSTEM account, you must perform certain postinstallation tasks before you can use the system. For complete information, go to Chapter 4.

4

After Installing the OpenVMS Alpha Operating System

After you have installed the OpenVMS Alpha operating system, you must perform several important tasks to prepare the system for operation. These tasks, described in this chapter in the order in which you perform them, are as follows:

- Registering licenses
- Creating accounts
- Backing up the system disk
- Customizing the system
- Configuring and starting networking software
- Testing the system with UETP
- Decompressing the system libraries
- Adding and removing files
- Preparing your OpenVMS Alpha system and your PC to run OpenVMS Management Station
- Installing layered products
- Backing up the customized system disk
- Configuring a multihead system
- Running AUTOGEN
- Using the postinstallation checklist

4.1 Registering Your Licenses

The installation procedure gave you the opportunity to register any software product licenses. If you did not register your OpenVMS Alpha licenses at that time, you must do so before you can use the OpenVMS Alpha operating system. You must also register the licenses for OpenVMS Alpha layered products.

You can invoke the OpenVMS License utility by entering the following command:

```
$ @SYS$UPDATE:VMSLICENSE
```

(You can also use the LICENSE REGISTER command.)

For information about registering licenses, see the following:

- Section 3.5
- Appendix C

- The *OpenVMS License Management Utility Manual*

4.2 Creating Accounts

During the installation, DEFAULT and SYSTEM accounts are created for you automatically. However, if you plan to have Digital service representatives test your system or if you plan to run testing software such as UETP, you must create accounts for each representative and a SYSTEST (standalone system) or SYSTEST_CLIG (OpenVMS Cluster system) account to run UETP.

For complete information about creating accounts for Digital service representatives and UETP, see the *OpenVMS System Manager's Manual: Essentials*.

4.3 Backing Up Your System Disk

After you install the operating system, protect your work by making a backup copy of the system disk in case you have any problems while customizing it.

4.3.1 How to Back Up the System Disk

To back up the system disk:

1. Shut down the system (described in Appendix A).
2. Boot the operating system CD–ROM (locally or from the InfoServer).
3. Use the menu system to enter the DCL environment (option 7).
4. Mount the system disk and the target device on which you will make the backup copy.
5. Enter backup commands to back up the system disk to supported media.
6. Log out from the DCL environment.
7. Shut down the system by selecting option 8 from the menu.
8. Boot from the system disk.

4.3.2 When to Back Up the System Disk

In addition to backing up the system disk now before you customize it, you should back up your system disk again after you successfully complete your customization tasks and install layered products.

4.3.3 For More Information

For complete information about backup operations, including a description of an alternate method that does not require booting from the operating system CD–ROM and that allows you to back up a shadowed disk without disabling the shadow set, see Appendix B.

4.4 Customizing the System

You can customize the system to meet your site-specific needs. In addition, if your Alpha computer is part of an OpenVMS Cluster environment, you must prepare the cluster environment and configure the cluster.

For instructions on customizing the system, review the following documentation:

- If the computer is part of an OpenVMS Cluster environment, refer to *OpenVMS Cluster Systems* for further information on setting up a cluster.

- The release notes, for notes and restrictions that might be relevant to your customization plans.
- The *OpenVMS System Manager's Manual*, for instructions on customizing and using your system. You will find information about the following tasks:
  - Editing the template files SYCONFIG.COM, SYLOGICALS.COM, SYLOGIN.COM, and SYSTARTUP_VMS.COM
  - Starting the queue manager and creating a queue database
  - Setting up user accounts
  - Adjusting system parameters
  - Setting up your system to run DECdtm services
- Section 4.5.

Note: You can customize your DECwindows environment as well, but you must first install the separate DECwindows Motif for OpenVMS Alpha layered product (see Section 4.10).

4.5 Configuring and Starting Networking Software

The following sections describe how to configure and start your networking software.

4.5.1 DECnet-Plus (Phase V)

If you installed DECnet-Plus for OpenVMS (Phase V) software, refer *DECnet-Plus for OpenVMS Release Notes* and *DECnet-Plus for OpenVMS Installation and Basic Configuration* for postinstallation instructions.

4.5.2 DECnet (Phase IV)

If you plan to run DECnet for OpenVMS Alpha (Phase IV) software, note the following:

1. If DECnet-Plus for OpenVMS (Phase V) software is installed on your system, use the PRODUCT REMOVE command to remove that software before you install the separate DECnet for OpenVMS Alpha (Phase IV) layered product. (See *OpenVMS System Management Utilities Reference Manual: M–Z* for complete information about using the PRODUCT command.)
2. After you have registered the license for the DECnet for OpenVMS Alpha software, execute the interactive command procedure SYS$MANAGER:NETCONFIG.COM to automatically configure your system for networking. See the *DECnet for OpenVMS Guide to Networking* for instructions on using NETCONFIG.COM.
3. After you start the queue manager (see the *OpenVMS System Manager's Manual*), edit the commands in SYS$COMMON:[SYSMGR]SYSTARTUP_VMS.COM that pertain to networking so that the DECnet for OpenVMS software starts automatically when your system is booted. Edit the file as follows:
   - If you have batch queues set up on your system, choose the following command by removing the comment delimiter (!) from the command line. Enabling this command allows the system to start up more quickly and decreases the amount of time you must wait to log in.

     ```
     !$ SUBMIT SYS$MANAGER:STARTNET.COM
     ```

- If you do *not* have batch queues set up on your system, remove the comment delimiter (!) from the following lines:

```
$! DECNET_VERSION = F$INTEGER(F$EXTRACT(2,2,F$GETSYI("DECNET_VERSION")))
$! IF DECNET_VERSION .GE. 5
$!     THEN
$!         START/NETWORK "DECNET/OSI"
$!     ELSE
$!         START/NETWORK DECNET
$! ENDIF
```

4. If you plan to run both DECnet for OpenVMS Alpha and DECwindows software, you must also edit SYS$COMMON:[SYSMGR]SYSTARTUP_VMS.COM to *add* a comment delimiter (!) immediately following the dollar sign ($) in the following command:

```
$ DEFINE DECW$IGNORE_DECNET TRUE
```

   If you are not going to start the DECnet for OpenVMS Alpha software or have not yet started it, this command tells the DECwindows software not to wait for the DECnet for OpenVMS Alpha software.

4.6 Testing the System with UETP

The User Environment Test Package (UETP) is a software package designed to test whether the OpenVMS Alpha operating system is installed correctly. As part of the postinstallation procedure, Digital recommends that you run UETP to verify the installation.

For complete information about using UETP, see the *OpenVMS System Manager's Manual*.

4.7 Decompressing the System Libraries

Decompressing the system libraries gives the system faster access to them. The decompressed libraries require several thousand additional blocks of disk space for all libraries to be decompressed. You use the LIBDECOMP.COM procedure to decompress the libraries.

4.7.1 Determining Disk Space

To find out how much disk space you have, enter the following command and press the Return key:

```
$ SHOW DEVICE SYS$SYSDEVICE
```

If you have approximately 30,000 free blocks on the disk, you can decompress the libraries. Note that you can choose to decompress only the libraries that are used frequently.

4.7.2 Methods of Using LIBDECOMP.COM

You can use the LIBDECOMP.COM procedure to decompress libraries in three ways:

- Entering a command and responding to prompts from the procedure
- Entering an interactive command
- Entering a batch command

The following three sections describe each method.

Note: Before you use the LIBDECOMP.COM procedure, be sure you are logged in to the SYSTEM account.

4.7.3 Responding to LIBDECOMP.COM Prompts

If you want to decompress libraries by responding to prompts from the LIBDECOMP.COM procedure, do the following:

1. Enter the following command and then press the Return key:

```
$ @SYS$UPDATE:LIBDECOMP.COM
```

   The resulting display is similar to the following:

```
                OpenVMS Library Decompression Utility

 1  HELPLIB.HLB          14  NCPHELP.HLB          27  PHONEHELP.HLB
 2  STARLET.OLB          15  SDA.HLB              28  LIB.MLB
 3  ACLEDT.HLB           16  SHWCLHELP.HLB        29  STARLET.MLB
 4  ANLRMSHLP.HLB        17  SYSGEN.HLB           30  STARLETSD.TLB
 5  DBG$HELP.HLB         18  ANALAUDIT$HELP.HLB   31  SYS$STARLET_C.TLB
 6  DBG$UIHELP.HLB       19  SYSMANHELP.HLB       32  ERFLIB.TLB
 7  DISKQUOTA.HLB        20  TFF$TFUHELP.HLB      33  SYS$LIB_C.TLB
 8  EDFHLP.HLB           21  EXCHNGHLP.HLB        34  VAXCCURSE.OLB
 9  INSTALHLP.HLB        22  TPUHELP.HLB          35  VAXCRTL.OLB
10  LATCP$HELP.HLB       23  EVE$HELP.HLB         36  VAXCRTLD.OLB
11  MAILHELP.HLB         24  EVE$KEYHELP.HLB      37  VAXCRTLT.OLB
12  MNRHELP.HLB          25  UAFHELP.HLB          38  IMAGELIB.OLB
13  EDTHELP.HLB          26  TECO.HLB

     39  VMS$VOLATILE_PRIVATE_INTERFACES.OLB
     40  FMG_HELP_FILE__AMERICAN_ENGLISH.HLB

      A  ALL libraries to be decompressed
      E  EXIT this procedure

* Enter letter or number(s) of libraries to be decompressed
  (Separate multiple entries with a comma):
```

2. Enter the appropriate letter or the numbers of the libraries you want to decompress. (To decompress all libraries, the process takes approximately one-half hour.)

4.7.4 Using LIBDECOMP.COM Interactively

You can execute LIBDECOMP.COM interactively to decompress up to eight libraries at a time by listing the names of the libraries you want to decompress as parameters on the command line.

Be sure to separate the library names with commas and do not include the file extensions. For example, to decompress VAXCRTL.OLB, DISKQUOTA.HLB, and LIB.MLB interactively, enter the following command:

```
$ @SYS$UPDATE:LIBDECOMP VAXCRTL, DISKQUOTA, LIB
```

4.7.5 Using LIBDECOMP.COM in Batch

You can also execute LIBDECOMP.COM in batch mode to decompress up to eight libraries at a time by listing the names of the libraries you want to decompress as parameters on a command line that includes the SUBMIT command.

Be sure to separate the library names with commas and do not include the file extensions. For example, to decompress VAXCRTL.OLB, DISKQUOTA.HLB, and LIB.MLB as a batch job, enter the following command:

```
$ SUBMIT/NOTIFY/PARAMETERS=(VAXCRTL, DISKQUOTA, LIB)-
_$ SYS$UPDATE:LIBDECOMP
```

Note: When you enter the command for a batch job, be sure you enclose the list of library names within parentheses.

4.8 Adding and Removing Operating System Files

If you decide after the installation to change which OpenVMS Alpha operating system files you want installed on your system, you can use the menu system contained on the OpenVMS Alpha operating system CD–ROM to add or remove files.

Note that you can obtain information about individual system files by entering HELP SYSTEM_FILES at the dollar sign prompt ($).

4.8.1 How to Add and Remove Files

To add or remove operating system files:

1. Mount and boot the OpenVMS Alpha operating system CD–ROM.
2. Choose option 1 from the menu.
3. Choose the PRESERVE option.
4. Install or reconfigure files as necessary.

4.8.2 Sample Display

Following is a sample menu display:

```
    Please choose one of the following:

        1)  Install or upgrade OpenVMS Alpha Version V7.1
        2)  Display products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Execute DCL commands and procedures
        8)  Shut down this system

Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?) 1
    ************************************************************

.
.
.

Do you want to INITIALIZE or to PRESERVE? [PRESERVE]

.
.
.

    Version V7.1 of the OpenVMS operating system is already installed
    on the target disk.  You may choose one of the following actions:
```

```
      o Reconfigure the OpenVMS operating system.
        This action will allow you to change your choices about which
        options you included when the operating system was installed.
        Changes you make will cause options to be added or removed.

      o Reinstall the OpenVMS operating system.
        This action may be appropriate if you suspect that some of the
        operating system files have become corrupted.

    Either of these choices will allow you to change your choices for
    the operating system options you included when the OpenVMS operating
    system was installed or upgraded, including your choices for the DECnet
    and DECwindows support that is part of the OpenVMS operating system.

    If you want to install, reconfigure or remove the DECwindows Motif
    graphical user interface or any of the Digital network products, you
    must select options 3, 5 or 6 from the main menu.

Do you want to Reconfigure the OpenVMS operating system? (Yes/No) yes

The following product has been selected:
    DEC AXPVMS VMS V7.1

Do you want to continue? [YES]

*** DEC AXPVMS VMS V7.1: OpenVMS Operating System

    COPYRIGHT (c) 11-NOV-1996 -- All rights reserved

    Digital Equipment Corporation

    Do you want all the default values for this product? [YES]

    Do you want to view the values? [NO]

Execution phase starting ...
The following product will be reconfigured:
    DEC AXPVMS VMS V7.1
Portion done: 0%...10%...20%...30%...40%...50%...60%...80%...90%...100%
The following product has been reconfigured:
    DEC AXPVMS VMS V7.1
.
.
.
```

4.9 Preparing to Use OpenVMS Management Station

If you installed the OpenVMS Management Station software on your system (either by accepting all default values or by selecting the component manually during the installation procedure), you must perform several tasks on your OpenVMS Alpha system and your PC before you can use OpenVMS Management Station. These tasks include the following:

- Editing system files
- Starting OpenVMS Management Station on other nodes
- Verifying that you have the proper memory, disk space, media, and the required software to install and run OpenVMS Management Station on your PC
- Creating installation media for PC client software
- Installing the client software on your PC
- Defining DECnet nodes

For complete information about preparing your OpenVMS system and your PC to run the OpenVMS Management Station server and client software, see Appendix E.

Note

Note that after you complete the tasks described in Appendix E, which include transferring the client software files from your system to two floppy diskettes, you can then remove those files from your system to save disk space. (Use the PRODUCT RECONFIGURE command rather than a delete operation. See *OpenVMS System Management Utilities Reference Manual: M–Z* for complete information about using the PRODUCT command.)

4.10 Installing Layered Products

You can use the menu system included on the operating system CD–ROM to install certain layered products with the POLYCENTER Software Installation utility. If you did not install those layered products previously during the installation procedure, you can do so using the following procedure.

Note: To use this procedure, the target system must have the exact same version of the OpenVMS Alpha operating system as the CD–ROM. If you need to install layered products on a target system that has a *different* version of the operating system, use the alternate procedure described in the next section.

1. Shut down the system (described in Appendix A).
2. Boot the operating system CD–ROM (locally or from the InfoServer).
3. Choose option 2 from the menu to view which layered products can be installed using the POLYCENTER Software Installation utility.
4. Choose option 3 from the menu to install the layered products.
5. Shut down the system by selecting option 8 from the menu.
6. Boot from the system disk.

If the layered product that you want to install is not listed in the display, see the documentation you received with that layered product for installation information.

For additional information about installing layered products, see the *OpenVMS System Manager's Manual*.

Be sure you back up the system disk after you install all your layered products.

4.10.1 Alternate Procedure

Following is another method for installing layered products from the OpenVMS Alpha operating system CD–ROM:

1. From your running OpenVMS system (the target system disk), mount the OpenVMS Alpha operating system CD–ROM.
2. Locate the directories and files containing the available layered products by entering the following command (where, in the example, DKA400: is the device name of the CD–ROM):

```
$ DIRECTORY /NOHEAD/NOTRAIL DKA400:[*.KIT]
```

3. To install layered products that require VMSINSTAL (indicated in the directories by save-set file names with file types of .A, .B, and so on), enter the @SYS$UPDATE:VMSINSTAL command and then specify the CD–ROM device and directory. For example:

```
$ @SYS$UPDATE:VMSINSTAL
* Where will the distribution volumes be mounted: DKB400:[UCX032.KIT]
```

4. To install layered products that require the POLYCENTER Software Installation utility (indicated in the directories by file names with file types of .PCSI or .PCSI$DESCRIPTION), use the PRODUCT INSTALL command to specify the CD–ROM device name and directory. Following is an example of the PRODUCT INSTALL command:

```
$ PRODUCT INSTALL POSIX /SOURCE=DKB400:[POSIX020.KIT]
```

4.10.2 TCP/IP Services for OpenVMS

If you installed the Digital TCP/IP Services for OpenVMS software during the installation or if you choose to install it now as a layered product, note that you must also install the mandatory security update kit included with this release.

The Digital TCP/IP Kit and the mandatory Security Update Kit are available in the following directory on the OpenVMS Alpha CD–ROM:

```
[TCPIP_ALPHA_041]
```

If you choose to install the Digital TCP/IP Services for OpenVMS software, you must install both kits.

4.10.3 DECevent

In OpenVMS Alpha Version 7.0 and earlier releases of OpenVMS Alpha, the DECevent DCL command DIAGNOSE was defined during the operating system installation procedure.

Beginning with OpenVMS Alpha Version 7.1, the definition of the DIAGNOSE command during installation is disabled. To enable the DIAGNOSE command in OpenVMS Version 7.1, the DECevent kit provided on the OpenVMS Alpha Version 7.1 CD–ROM must be installed following the installation of OpenVMS Alpha Version 7.1. For information about the location of the DECevent kit, see the *Guide to OpenVMS Version 7.1 CD–ROMS*.

If the DECevent kit provided on the OpenVMS Alpha CD–ROM is not installed after you install the operating system, users attempting to use the DIAGNOSE command will receive the following system message:

```
$ DIAGNOSE [params]
%DIA-E-NO1HOME, DIAGNOSE functions not available on this system
%DIA-I-GETKIT, install DECevent for access to DIAGNOSE
$
```

4.10.4 Monitoring Performance History

The OpenVMS Alpha Version 7.1 operating system CD–ROM also includes a Monitoring Performance History (MPH) kit located in the [MPH] directory. See the *OpenVMS Version 7.1 Release Notes* for more information about installing and using this optional software.

4.11 Backing Up the Customized System Disk

After you have customized the OpenVMS Alpha operating system to your satisfaction and installed your layered products, protect your work by making a backup copy of the system disk.

4.11.1 How to Back Up the Customized System Disk

To back up the system disk:

1. Shut down the system (described in Appendix A).
2. Boot the operating system CD–ROM (locally or from the InfoServer).
3. Use the menu system to enter the DCL environment (option 7).
4. Mount the system disk and the target device on which you will make the backup copy.
5. Enter backup commands to back up the system disk to the target device.
6. Log out from the DCL environment.
7. Shut down the system by selecting option 8 from the menu.
8. Boot from the system disk.

4.11.2 For More Information

For complete information about backup operations, including a description of an alternate method that does not require booting from the operating system CD–ROM, see Appendix B.

4.12 Configuring a Multihead System

A multihead configuration consists of a single workstation (such as a DEC 3000 Alpha Model 500 system) that supports multiple graphics options. A graphics option consists of a graphics controller and a graphics display interface (monitor).

Your system can be automatically configured for multihead use if you rename the private server setup file from a template file type to a command procedure file type. The DECwindows Motif for OpenVMS Alpha server loads this command procedure on startup or restart. This file always configures the console as the primary head, or screen 0. The firmware always selects the lowest device found in the system (that is, the device with the lowest TURBOchannel slot address) as the console device.

4.12.1 How to Set Up the System

To set up your system for multihead support:

1. After installing the DECwindows Motif for OpenVMS Alpha software on your system, log in to your system.
2. Rename the private server setup file by entering the following command:

```
$ RENAME SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.TEMPLATE
_To: SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.COM
```

3. Restart the DECwindows server by entering the following command:

```
$ @SYS$STARTUP:DECW$STARTUP RESTART
```

4.12.2 For More Information

See the most recent version of the *DECwindows Motif for OpenVMS Installation Guide* and *Managing DECwindows Motif for OpenVMS Systems* for more information about customizing your DECwindows environment using the SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.COM file.

4.13 Running AUTOGEN

When you installed the operating system, the system executed the AUTOGEN.COM procedure to set the values of system parameters and the sizes of the page, swap, and dump files according to the system configuration. As a postinstallation procedure, you need to run the AUTOGEN.COM procedure again to properly tune the system.

4.13.1 When to Run AUTOGEN

Run AUTOGEN as follows:

1. After 24 hours of operation, run AUTOGEN in feedback mode and reboot the system.
2. Run AUTOGEN again in feedback mode two workdays later, and then reboot the system.
3. Digital recommends that you run AUTOGEN from SAVPARAMS through TESTFILES on a weekly basis thereafter, and examine AGEN$PARAMS.REPORT to determine the need for additional changes.

4.13.2 Modifying Parameters

Based on your examination of AGEN$PARAMS.REPORT, you might need to modify parameter values in MODPARAMS.DAT. If so, note the following:

- Hardcoded values in MODPARAMS.DAT should not hinder AUTOGEN's ability to calculate feedback parameters. AUTOGEN generally does not reduce the value of parameters that allocate resources; it considers current parameter values to be minimum values, which means that you do not have to add MIN_* symbols to MODPARAMS.DAT.
- AUTOGEN does increase parameter values according to its calculations unless you have specified explicit or maximum values (by adding MAX_* symbols) in MODPARAMS.DAT.

4.13.3 For More Information

For more information about the MODPARAMS.DAT file and about using AUTOGEN in general, see the *OpenVMS System Manager's Manual*.

4.14 Postinstallation Checklist

Use the following checklist to make sure you perform all the necessary postinstallation tasks:

- ☐ Register your licenses if you did not do so during the installation procedure.
- ☐ Create accounts.
- ☐ Back up the system disk as a safeguard before customizing the system.
- ☐ Customize the system.
- ☐ Configure and start the DECnet for OpenVMS Alpha software.
- ☐ Run the User Environment Test Package (UETP) to test the system.
- ☐ Decompress the system libraries using LIBDECOMP.COM.
- ☐ Add and remove files.
- ☐ Prepare your OpenVMS Alpha system and your PC to run OpenVMS Management Station by following the procedures described in Appendix E.
- ☐ Install layered products.
- ☐ Back up the system disk after you have customized it and installed layered products.
- ☐ Configure your multihead system (if applicable).
- ☐ After the system has been running for at least 24 hours, run AUTOGEN to collect feedback information and modify the MODPARAMS.DAT file (if necessary).

5

Before Upgrading the OpenVMS Alpha Operating System

This chapter describes which tasks you should perform prior to beginning an upgrade. Tasks described in this chapter include:

- Reviewing notes, cautions, and restrictions
- Preparing to upgrade in a volume shadowing environment
- Backing up the current system disk
- Preparing the system disk for the upgrade
- Shutting down the system
- Using the preupgrade checklist

In addition to reviewing the information in this chapter, you might need to refer to the following sources of information as well:

- *OpenVMS Version 7.1 Release Notes*
- *OpenVMS System Manager's Manual*, for information about using AUTOGEN, modifying the system parameters file (MODPARAMS.DAT), and related operations
- *OpenVMS System Management Utilities Reference Manual*, for information about using system management utilities such as SYSMAN and ANALYZE /DISK_STRUCTURE
- *OpenVMS Guide to System Security*, for information about reestablishing your security environment after the upgrade

5.1 Notes, Cautions, and Restrictions

This section provides important information that can affect the success of your upgrade. Review the cautions, restrictions, and notes carefully before you begin the upgrade.

5.1.1 Spiralog Notes and Restrictions

OpenVMS Alpha Version 7.1 requires a new version of the Spiralog file system. If you are running prior versions of Spiralog, you must upgrade to Spiralog Version 1.2, which is available on CD–ROM. Note the following:

- Before upgrading from OpenVMS Alpha Version 7.0, deinstall Spiralog. Once OpenVMS Alpha Version 7.1 has been installed, you can install Spiralog Version 1.2.
- If you upgrade your OpenVMS Alpha Version 7.0 system to OpenVMS Alpha Version 7.1 when Spiralog is installed, and later remove Spiralog or install any version of Spiralog, this action will cause a failure in the Backup utility, the batch and print queuing system, and DECdtm services.
- If you accidentally upgrade your OpenVMS Alpha system to Version 7.1 while Spiralog is installed, you must do the following to recover from this error:
  1. Deinstall Spiralog.
  2. Reinstall OpenVMS Alpha Version 7.1 using the PRESERVE option from the menu system.
  3. Install Spiralog Version 1.2.
  4. Reboot your system.
- See the release notes and Software Product Description (SPD) for additional information about Spiralog support, including ordering information.

5.1.2 Required Operating System Version

To upgrade to Version 7.1 of the OpenVMS Alpha operating system, you must be running at least Version 6.1, 6.2, or 7.0.

If you are upgrading in a cluster environment, also see Chapter 6 for information about required versions of the OpenVMS Alpha and OpenVMS VAX operating systems.

5.1.3 Upgrade Paths

Note the following:

- Upgrades are supported from Version 6.1, 6.2, and 7.0 of the OpenVMS Alpha operating system.
- Rolling upgrades are supported from Version 6.2 and 7.0 of the OpenVMS Alpha operating system (see Chapter 6 for more information).

5.1.4 Update License

To upgrade to OpenVMS Version 7.1, you must have an appropriate license. Digital's software licenses grant the right to use the current version of a product or any previous version of the product at the time of purchase. If you have an OpenVMS license prior to Version 7.1 and are not covered by a Software Product Services agreement, which includes the right to use new versions (RTNV), you must purchase an Update License before upgrading to OpenVMS Version 7.1.

If you do not have an Update License, please contact your Digital support representative who will assist you in obtaining the correct Product Authorization Key (PAK) needed to access the OpenVMS operating system.

5.1.5 Files and Directories

Note the following:

- If you choose not to install optional OpenVMS Alpha software during the upgrade, the upgrade procedure removes existing files for those components from the system disk.
- If you have changed directory structure on your system disk, the upgrade procedure will not work correctly. Restore your system disk to a standard directory structure before you attempt an upgrade.
- The OpenVMS Alpha Version 7.1 upgrade procedure provides new files and directories in the directory [VMS$COMMON...]. If you had any special protections and access control lists (ACLs) before the upgrade, you need to reapply them to reestablish the security environment you had previously set up. For more information about creating and maintaining a secure environment, see the *OpenVMS Guide to System Security*.

5.1.6 Licenses and Layered Products

Note the following:

- The upgrade procedure is designed so that you should not have to reinstall most layered products after the upgrade. However, you might need to reinstall certain layered products because of product-specific installation procedures.
- The upgrade procedure leaves your OpenVMS Alpha license and layered product licenses intact. You do not need to reinstall these licenses after you upgrade.

5.2 Preparing to Upgrade in a Volume Shadowing Environment

Because you cannot upgrade the operating system on a shadowed system disk (the upgrade will fail), you need to disable shadowing on that disk and perform other operations before you can upgrade the operating system.

There are several methods for creating a nonshadowed target disk. This chapter describes how to change one of your *existing* shadowed system disks in a multimember shadow set to a nonshadowed disk that you can use as your target disk for the upgrade.

If you have a larger configuration with disks that you can physically access, you may want to use a *copy* of the system disk as your target disk. *Volume Shadowing for OpenVMS* describes two methods you can use to create this copy (using volume shadowing commands or BACKUP commands) and how to disable volume shadowing.

5.2.1 Creating a Nonshadowed Target Disk

Change one of your existing shadowed system disks to a nonshadowed disk as follows:

1. Shut down all systems booted from the shadowed system disk.
2. Perform a conversational boot (see Appendix A if necessary) on the system disk you have chosen for your target disk. For example:

   ```
   >>> BOOT -FL 0,1 DKA100
   ```

3. At the SYSBOOT> prompt, enter the following command to disable volume shadowing on the disk:

   ```
   SYSBOOT> SET SHADOW_SYS_DISK 0
   ```

4. Enter the CONTINUE command to resume the boot procedure. For example:

   ```
   SYSBOOT> CONTINUE
   ```

5. After the boot completes, log in to the system.

5.2.2 Changing the Label

If you want to change the label on the upgrade disk, use the DCL command SET VOLUME/LABEL=*volume-label device-spec[:]* to perform this optional task. (The SET VOLUME/LABEL command requires write access [W] to the index file on the volume. If you are not the volume owner, you must have either a system UIC or the SYSPRV privilege.)

For OpenVMS Cluster systems, be sure that the volume label is a unique name across the cluster.

Note: If you need to change the volume label of a disk that is mounted across the cluster, be sure you change the label on all nodes in the OpenVMS Cluster system. The following example shows how you can use the SYSMAN utility to define the environment as a cluster and propagate the volume label change to all nodes in that cluster:

```
SYSMAN> SET ENVIRONMENT/CLUSTER
SYSMAN> DO SET VOLUME/LABEL=new-label disk-device-name:
```

5.2.3 Setting the Boot Device

Be sure your system is set to boot from the upgrade disk by default. Use the SHOW BOOTDEF_DEV and SET BOOTDEF_DEV console commands to accomplish this task. (See Appendix A for more information.)

5.2.4 What to Do Next

After you have created a nonshadowed system disk that you can use for the upgrade, perform the additional preupgrade procedures described in the balance of this chapter.

5.3 Backing Up the System Disk

Digital strongly recommends that you make a backup copy of the system disk and, if your configuration allows it, upgrade the *backup copy*. (If there are problems, you will still have a working system disk.)

5.3.1 How to Back Up the System Disk

To back up the system disk, do the following:

1. Shut down the system (described in Appendix A).
2. Boot the operating system CD–ROM (locally or from the InfoServer).
3. Use the menu system to enter the DCL environment (option 7).
4. Mount the system disk and the target device on which you will make the backup copy.
5. Enter backup commands to back up the system disk to the target device.
6. Log out from the DCL environment.
7. Shut down the system by selecting option 8 from the menu.
8. Boot from the system disk.

5.3.2 For More Information

For complete information about backup operations, including a description of an alternate method that does not require booting from the operating system CD–ROM, see Appendix B.

5.4 Preparing the System Disk

The following sections describe how to prepare the system disk for the upgrade. The operations include the following:

- Examining the system disk
- Checking the size of the system disk
- Verifying system parameters

5.4.1 Examining the System Disk

Examine and repair (if necessary) the system disk using the ANALYZE/DISK_STRUCTURE command. (See the *OpenVMS System Management Utilities Reference Manual* for more information about this command.) Use the following procedure:

1. Analyze the system disk for inconsistencies and errors in the file structure by entering the following command:

   ```
   $ ANALYZE/DISK_STRUCTURE SYS$SYSDEVICE
   ```

   Ignore the following message:

   ```
   %ANALDISK-I-OPENQUOTA, error opening QUOTA.SYS
   ```

2. If you find any other errors on the system disk, repair the errors by entering the following command:

   ```
   $ ANALYZE/DISK_STRUCTURE/REPAIR SYS$SYSDEVICE
   ```

5.4.2 Checking the Size of the System Disk

It is difficult to determine in advance how many blocks of disk space you will need for the upgrade. It depends on how many files you have on the target disk already and on how many components you select during the upgrade procedure. However, the following information will help:

- The *maximum* amount of disk space you will need is approximately 360,000 blocks, but your system might use substantially less.
- After you select the components you want installed on the system for the upgrade, the upgrade procedure calculates whether you have enough disk space, displaying the number of available blocks and the number required for the upgrade. If the procedure determines that your disk does not have enough space to perform the upgrade, it displays a message to alert you and allows you to terminate the upgrade so you can create more disk space and try the upgrade again.

To see how much space you have on the system disk, enter the following command:

```
$ SHOW DEVICE SYS$SYSDEVICE
```

5.4.3 Verifying System Parameters

Verify (and modify if necessary) system parameters, described as follows. (If necessary, see the *OpenVMS System Manager's Manual* for more information about modifying system parameters.) Any system parameters that you modified and *did not* enter in SYS$SYSTEM:MODPARAMS.DAT are lost during the upgrade. To retain these parameters, enter their names in SYS$SYSTEM:MODPARAMS.DAT and the value that AUTOGEN needs to add to the default minimum value. (When AUTOGEN runs after the upgrade, it uses the values in SYS$SYSTEM:MODPARAMS.DAT.)

For example, if you modified GBLPAGES by 128 pages above the default, add the following line to SYS$SYSTEM:MODPARAMS.DAT:

```
ADD_GBLPAGES=128
```

5.4.4 What to Do Next

Continue the preupgrade tasks as follows, depending on whether you are upgrading in a standalone or OpenVMS Cluster environment:

IF ...	THEN ...
you are upgrading a standalone system,	do the following: 1. Log in to the SYSTEM account. 2. Enter the following command and then press the Return key: `$ @SYS$SYSTEM:SHUTDOWN` 3. When the procedure asks if an automatic system reboot should be performed, enter N (No) and press the Return key. 4. Go to the checklist at the end of this chapter to verify that you have performed the necessary tasks; then go to Chapter 7 to begin the upgrade procedure.

IF ...	THEN ...
you are upgrading an OpenVMS Cluster system,	do the following: 1. Review the checklist at the end of this chapter. 2. Go to Chapter 6.

5.5 Preupgrade Checklist

Use the following checklist to make sure you have performed all the tasks before beginning the upgrade:

- ☐ Review all cover letters and the release notes.
- ☐ Review all cautions and notes.
- ☐ If your system disk is part of a shadow set, create a nonshadowed system disk to upgrade.
- ☐ Set up your system to record the upgrade procedure on either a hardcopy terminal or a printer attached to the console terminal. If you do not do this, the screen messages will be lost. You will need a transcript in case there is a problem during the upgrade. For information on how to record the procedure, see the hardware manuals that came with your Alpha computer.
- ☐ Make a backup copy of the system disk.
- ☐ Examine and repair (if necessary) the system disk using the ANALYZE /DISK_STRUCTURE command.
- ☐ Check the size of the system disk.
- ☐ Verify system parameters.
- ☐ Shut down the system (if you are upgrading in a standalone environment).
- ☐ If you are upgrading an OpenVMS Cluster system, go to Chapter 6. If you are not upgrading an OpenVMS Cluster system, go to Chapter 7 to begin the upgrade procedure.

6

Preparing to Upgrade in an OpenVMS Cluster Environment

6.1 Overview

This chapter describes how to prepare to upgrade in an OpenVMS Cluster environment, depending on the type of upgrade you perform and whether you need to add any new computers to the cluster.

Note: Be sure you have performed the preupgrade tasks described in Chapter 5 before you upgrade your OpenVMS Cluster system.

6.1.1 Mixed-Version Support

OpenVMS Alpha Version 7.1 and OpenVMS VAX Version 7.1 provide two levels of support for mixed-version and mixed-architecture OpenVMS Cluster systems. These two support types are *warranted* and *migration*.

Warranted support means that Digital has fully qualified the two versions coexisting in an OpenVMS Cluster and will answer all problems identified by customers using these configurations.

Migration support is a superset of the Rolling Upgrade support provided in earlier releases of OpenVMS and is available for mixes that are not warranted. Migration support means that Digital has qualified the versions for use together in configurations that are migrating in a staged fashion to a newer version of OpenVMS VAX or to OpenVMS Alpha. Problem reports submitted against these configurations will be answered by Digital. However, in exceptional cases Digital may request that you move to a warranted configuration as part of answering the problem.

Migration support will help you move to warranted OpenVMS Cluster version mixes with minimal impact on your cluster environment. Table 6–1 shows the level of support provided for all possible version pairings.

Table 6–1 OpenVMS Cluster Warranted and Migration Support

	Alpha V6.2–*xxx*	**Alpha V7.0**	**Alpha V7.1**
VAX V6.2–*xxx*	WARRANTED	Migration	Migration
VAX V7.0	Migration	WARRANTED	Migration
VAX V7.1	Migration	Migration	WARRANTED

Note

Digital does not support the use of Version 7.1 with Version 6.1 (or earlier versions) in an OpenVMS Cluster environment. In many cases, mixing Version 7.1 with versions prior to Version 6.2 will successfully operate,

but Digital cannot commit to resolving problems experienced with such configurations.

6.1.2 Types of Upgrades

There are two types of cluster upgrades: **concurrent** and **rolling**. The type of upgrade you use depends on whether you want to maintain the availability of the cluster during the upgrade and whether you have more than one system disk. Review this chapter and then perform the preliminary tasks for the upgrade procedure (concurrent or rolling) that best suits your configuration.

6.1.3 Adding a New System to the Cluster

If you need to add a new computer supported by OpenVMS Alpha Version 7.1 to an existing OpenVMS Cluster configuration, Digital supports two options, listed in the following preferred order:

1. Upgrade the entire cluster to Version 7.1 of the OpenVMS Alpha operating system and add the new computer as a member.
2. If you need to keep some systems in the cluster running the current version of OpenVMS Alpha, you must upgrade a system disk in the cluster to OpenVMS Alpha Version 7.1 using the rolling upgrade procedure. Then boot the new computer into the cluster using that upgraded system disk.

6.1.4 For More Information

When you upgrade the operating system in an OpenVMS Cluster environment, be sure the following information is available to review:

- The cover letters and the software product descriptions included with your distribution kit
- *OpenVMS Version 7.1 Release Notes*
- *OpenVMS Cluster Systems*
- *Guidelines for OpenVMS Cluster Configurations*
- *OpenVMS Version 7.1 New Features Manual*

6.2 Concurrent Upgrade

This section describes the following:

- How a concurrent upgrade works
- Tasks you need to perform to prepare your system for a concurrent upgrade.

6.2.1 How a Concurrent Upgrade Works

During a concurrent upgrade, you must shut down the entire cluster and upgrade each system disk. No one can use the cluster until you upgrade each system disk and reboot each Alpha computer. When the cluster reboots, each Alpha computer will be running the upgraded version of the OpenVMS Alpha operating system.

If all Alpha systems in the OpenVMS Cluster environment are booted from one system disk, you must perform a concurrent upgrade.

6.2.2 Preparing for a Concurrent Upgrade

To prepare for a concurrent upgrade, use the following procedure:

1. Log in locally to the SYSTEM account.
2. Shut down all systems by entering the following command on each system (satellites first, then the boot nodes):

   ```
   $ @SYS$SYSTEM:SHUTDOWN
   ```

3. When the procedure asks if an automatic system reboot should be performed, enter N (No) and press the Return key.
4. Choose the CLUSTER_SHUTDOWN option.
5. When the shutdown procedure is finished on all nodes, halt each system by entering Ctrl/P or by pressing the Halt button.[1]
6. If you have only one system disk for your cluster, go to Chapter 7 to begin the upgrade procedure.

   If you have more than one system disk, select the disk on which you already performed the preupgrade tasks and then go to Chapter 7 to begin the upgrade procedure.

   After the upgrade is complete, you will be instructed to reboot each computer in the OpenVMS Cluster environment before beginning other postupgrade procedures.

6.3 Rolling Upgrade

This section describes the following:

- How a rolling upgrade works
- Notes and restrictions
- Tasks you need to perform to prepare your system for a rolling upgrade.

6.3.1 How a Rolling Upgrade Works

During a rolling upgrade, you upgrade each system disk individually, allowing old and new versions of the operating system to run together in the same cluster, creating a **mixed-version** cluster. Because rolling upgrades allow mixed-version clusters, the systems that you are not upgrading remain available. During a rolling upgrade, you keep some of the computers in the cluster running while you upgrade others (you must have more than one system disk).

6.3.2 Notes and Restrictions

Before performing a rolling upgrade, note the following:

- Rolling upgrades are supported from Version 6.2 and 7.0 of the OpenVMS Alpha operating system. Rolling upgrades in mixed-architecture OpenVMS Cluster environments are supported with VAX computers running Versions 7.0 or 6.2 of the OpenVMS VAX operating system (see Table 6–1.
- The upgraded system does not attempt to access any disk that is being accessed by one or more of the remaining OpenVMS Cluster systems.
- The remaining OpenVMS Cluster systems do not attempt to access the target disk of the system being upgraded.

[1] For more information about halting your Alpha computer, see Appendix A.

If the target disk being upgraded is locally attached to the system performing the upgrade, then it is not accessible to the remaining OpenVMS Cluster systems. (The OpenVMS system booted from the operating system CD–ROM does not MSCP serve local disks.) Whenever possible, Digital recommends that you perform the upgrade on a local disk or that you perform a concurrent upgrade.

During the upgrade, be sure that the target disk you select, as well as any disk you access from the DCL menu option, is either a local disk or one that is not being accessed by any of the remaining OpenVMS Cluster members.

- Digital recommends that all Alpha computers in a cluster run the same (and preferably the latest) version of the OpenVMS Alpha operating system.
- You cannot perform a rolling upgrade if all systems boot from a single system disk. Perform a concurrent upgrade instead.
- The upgrade procedure affects the queuing system as follows:
  - The queuing system is not active on the system you are upgrading; do not attempt to execute a START/QUEUE/ MANAGER command.
  - You cannot create a queue database on the operating system CD–ROM (because it is not writable).
  - The queue manager process on other nodes in the cluster can continue to run during the upgrade if the queue database is not on the disk being upgraded.

6.3.3 Preparing for a Rolling Upgrade

To prepare for a rolling upgrade, follow these steps:

1. Log in to any node where the disk is mounted as a *data* disk, rather than as the *system* disk. (That disk must be the one on which you already performed the preupgrade tasks described in Chapter 5.)
2. Check the votes and make adjustments to maintain the proper quorum so the cluster can continue to operate throughout the upgrade. (*OpenVMS Cluster Systems* describes this procedure in detail.)
3. Use the DCL command DISMOUNT/CLUSTER to dismount the data disk. (You can also perform this operation using the SYSMAN utility.)

   Note that you can ignore messages from nodes where the specified data disk is being used as the system disk.
4. Verify that the data disk has been dismounted successfully by entering the following commands:

   ```
   $ MCR SYSMAN
   SYSMAN> SET ENVIRONMENT/CLUSTER
   SYSMAN> DO SHOW DEVICE disk-name
   ```

   Examine the display to be sure the disk is not mounted on any nodes as a data disk. Noting the value listed in the Trans Count field can help you make that determination: A value of less than 50 indicates that the disk is mounted as a data disk rather than as the system disk; a much larger value (for example, 300) indicates that the disk most likely is the system disk.
5. If the disk is still mounted on any nodes as a data disk, use the SYSMAN utility to dismount the disk; otherwise exit from the SYSMAN utility.

6. Shut down all nodes that boot from the system disk you are upgrading, including the node from which you will perform the upgrade. Enter the following command on each node:

   ```
   $ @SYS$SYSTEM:SHUTDOWN
   ```

7. When the procedure asks if an automatic system reboot should be performed, enter N (No) and press the Return key.

8. Choose the REMOVE_NODE option.

9. If proper quorum is not maintained at any time during the upgrade procedure, the shutdown procedure will hang the cluster. If the cluster hangs during a shutdown, enter the following commands on the system console of a system that is still a cluster member:

   ```
   $ Ctrl/P
   >>> D SIRR C
   >>> C
   IPC> Q
   IPC> Ctrl/Z
   ```

10. After the shutdown procedure is finished on all nodes, go to Chapter 7 to begin the upgrade procedure.

7

Upgrading the OpenVMS Alpha Operating System

This chapter describes the following tasks:

- Beginning the upgrade from the operating system CD–ROM or from a running system
- Specifying the target disk
- Specifying the volume label
- Updating time zone information
- Choosing descriptive help text
- Completing the upgrade
- Performing postupgrade tasks (including booting the upgraded system)
- Installing layered products

7.1 Upgrading from CD–ROM or from a Running System

The OpenVMS Alpha Version 7.1 operating system includes procedures that allow you to easily upgrade the operating system using the POLYCENTER Software Installation utility. In console mode, you can boot the operating system CD–ROM to begin the upgrade procedure. On a system that is already running the OpenVMS Alpha Version 7.1 operating system, you can invoke the upgrade procedure by entering a command at the DCL level.

Depending on whether you are upgrading the OpenVMS Alpha operating system from the operating system CD–ROM or from a running OpenVMS Alpha Version 7.1 system, begin the procedure as follows:

If upgrading from ...	Then ...
the operating system CD–ROM,	go to Section 7.2
a running Version 7.1 system,	go to Section 7.3

7.2 Booting the Operating System CD–ROM

To get started, boot the OpenVMS Alpha operating system CD–ROM either from your local CD–ROM drive or from a CD–ROM drive connected to the InfoServer, as described in the following sections.

7.2.1 Booting from the Local Drive

To boot the operating system CD–ROM from the local drive, follow these steps:

1. Insert the operating system CD–ROM into the local CD–ROM drive.
2. At the console prompt (>>>), enter the SHOW DEVICE command so you can identify the name of the CD–ROM drive (for example, DKA400:)
3. Enter the boot command in the following format:

   BOOT -FLAGS 0,0 *source-drive*

   Substitute the device name of the CD–ROM drive (as listed in the SHOW DEVICE display) for *source-drive*.

   For example, if the SHOW DEVICE display lists the device name of your CD–ROM drive as DKA400, enter the following command and press the Return key:

   ```
   >>> BOOT -FLAGS 0,0 DKA400
   ```

7.2.2 Booting from the InfoServer

To boot the operating system CD–ROM using the InfoServer, follow these steps:

1. At the console prompt, enter the following command:

   ```
   >>> BOOT -FLAGS 0,0 -FI APB_071 lan-device-name
   ```

   Note the following conventions:

   - *APB_071* is the file name of the APB program used for the initial system load (ISL) boot program.
   - *lan-device-name* is the name of the local area network (LAN) device Ethernet identified with your computer. For information about the LAN devices your system supports, refer to the following table. For additional information, see the hardware manuals that you received with your Alpha computer and the *OpenVMS Software Product Description*.

Alpha Computer	Ethernet Device	FDDI Device
ALPHAbook 1	EOA0	–
AlphaServer 400 series	EWA0	FWA0
AlphaServer 1000 series	ERA0, EWA0	FRA0
AlphaServer 1000A series	EWA0	FWA0
AlphaServer 2000 series	ERA0, EWA0	FRA0
AlphaServer 2100, 2100A series	ERA0, EWA0	FRA0
AlphaServer 4100 series	EWA0	FWA0
AlphaServer 8200 series	EXA0, EWA0	FXA0
AlphaServer 8400 series	EXA0, EWA0	FXA0
AlphaStation 200 series	EWA0	FWA0
AlphaStation 400 series	EWA0	FWA0
AlphaStation 500 series	EWA0	FWA0
AlphaStation 600 series	ERA0, EWA0	FWA0
DEC 2000 series	ERA0	–
DEC 3000 series	ESA0	"n/ESA0"
DEC 4000 series	EZA0	–
DEC 7000 series	EXA0	FXA0
DEC 10000 series	EXA0	FXA0

Notes: If you are using a DEC 3000 or 4000 series system, note the following:

- On DEC 3000 series systems, you can boot through the InfoServer with an Ethernet PMAD device or FDDI DEFTA device by specifying the device name as ''*n*/ESA0''. The value for *n* is the TURBOchannel slot number, which you can obtain by entering the SHOW CONFIGURATION command at the console prompt (>>>) and examining the display. For more information, see Section A.1.8.
- On DEC 4000 series, you *must* specify the ISL file name in uppercase (APB_071). In addition, if your system uses console firmware prior to Version 3.2, enter the BOOT command as follows:

```
>>> BOOT -FL 0,0 -start 0 -FI APB_071 EZA0
```

2. The InfoServer ISL program then displays the following menu:

```
Network Initial System Load Function
Version 1.1

  FUNCTION         FUNCTION
    ID
    1     -        Display Menu
    2     -        Help
    3     -        Choose Service
    4     -        Select Options
    5     -        Stop

Enter a function ID value:
```

3. Respond to the prompts as follows, pressing the Return key after each entry:

   a. Enter 3 for the function ID.

b. Enter 2 for the option ID.

c. Enter the service name (ALPHA071).

A sample display follows:

```
Enter a function ID value: 3 Return

 OPTION          OPTION
   ID
   1     -       Find Services
   2     -       Enter known Service Name

Enter an Option ID value: 2 Return
Enter a Known Service Name: ALPHA071 Return
```

Note: If you boot the OpenVMS Alpha operating system CD–ROM from an InfoServer system but lose your connection during the upgrade procedure (the system is unresponsive and pressing Ctrl/Y does not return you to the menu), do the following:

1. Reboot the OpenVMS Alpha operating system CD–ROM.
2. Enter the DCL environment by choosing option 2 from the menu.
3. Mount the device containing your backup copy of the target disk and the device that is your target disk.
4. Restore the backup copy of your target disk by entering the appropriate BACKUP commands. (See Appendix B for complete information about using MOUNT and BACKUP commands to restore a system disk.)
5. Log out from the DCL environment.
6. Perform the upgrade again by choosing the upgrade option (1) from the menu and following the procedures described in this chapter.

7.3 Performing the Upgrade

The following sections describe how to upgrade from the operating system CD–ROM and from a running system.

7.3.1 Upgrading from the CD–ROM

After you boot the operating system CD–ROM, choose the upgrade option (1) from the menu displayed on the screen. The display is similar to the following:

```
 OpenVMS Alpha (TM) Operating System, Version 7.1

Copyright (c) 1996 Digital Equipment Corporation.  All rights reserved.


Installing required known files...

Configuring devices...

****************************************************************

You can install or upgrade the OpenVMS Alpha operating system
or you can install or upgrade layered products that are included
on the OpenVMS Alpha operating system CD-ROM.

You can also execute DCL commands and procedures to perform
"standalone" tasks, such as backing up the system disk.

Please choose one of the following:
```

```
        1)  Install or upgrade OpenVMS Alpha Version V7.1
        2)  Display products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Execute DCL commands and procedures
        8)  Shut down this system

Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?) 1
```

After you choose the upgrade option, go to Section 7.3.3 to continue the procedure.

7.3.2 Upgrading from a Running System

If you are performing an upgrade from an Alpha system that is already running Version 7.1 of the OpenVMS Alpha operating system, enter the following command from the SYSTEM account and then press the Return key:

```
$ @SYS$SYSTEM:AXPVMS$PCSI_INSTALL
```

After you enter the command, go to Section 7.3.3 to continue the procedure.

7.3.3 Choosing INITIALIZE or PRESERVE

After you choose the upgrade option (if you are upgrading from the operating system CD–ROM) or start the AXPVMS$PCSI_INSTALL command procedure (if you are upgrading from a running OpenVMS Alpha Version 7.1 system), the system displays the following information and prompts:

```
    ************************************************************

    The installation procedure will ask a series of questions.

          () - encloses acceptable answers
          [] - encloses default answers

    Type your response and press the <Return> key.  Type:

          ? - to repeat an explanation
          ^ - to change prior input (not always possible)


    There are two choices for Installation/Upgrade:

    INITIALIZE - removes all software and data files that were
        previously on the target disk and installs OpenVMS Alpha.

    PRESERVE -- installs or upgrades OpenVMS Alpha on the target disk
        and retains all other contents of the target disk.

   * NOTE: You cannot install OpenVMS Alpha on an existing disk on which
        OpenVMS VAX or any other operating system is installed.

Do you want to INITIALIZE or to PRESERVE? [PRESERVE])
```

For an upgrade, press the Return key to accept the default (PRESERVE).

7.3.4 Specifying the Target Disk

Next, the procedure asks you for the name of the target disk. If you enter a question mark (?), the system displays a list of devices on your system. Select the appropriate disk and respond to the prompt. For example:

```
    You must enter the device name for the target disk on which
    OpenVMS Alpha will be installed.

Enter device name for target disk: (? for choices) DKA200
```

Note

If your system contains Spiralog Version 1.1 or lower, the following message is displayed:

```
The target system contains a version of SPIRALOG that is not
compatible with this version of the operating system.
SPIRALOG must be removed before upgrading OpenVMS Alpha.

*** WARNING ***  Continuing will corrupt the BACKUP utility!
Termination is strongly recommended.
```

If you receive this message, you must do the following:

1. Terminate the upgrade.
2. Remove Spiralog from your system.
3. Upgrade the operating system to Version 7.1.
4. Install Spiralog Version 1.2.

See Section 5.1.1 for more information.

7.3.5 Specifying the Volume Label

The system then prompts you for the volume label and asks if the information is correct. You can accept the default label assigned by the system (AXPVMSSYS) or specify a different volume label (with a limit of 12 characters that can be letters A-Z, numbers 0-9, dollar signs ($), hyphens (-), or underscores (_)). After you select the volume label, the target disk is mounted and page and swap files are created. For example:

```
    DKA200: is now labeled AXPVMSSYS.

Do you want to keep this label? (Yes/No) [Yes]

    OpenVMS Alpha will be upgraded on DKA200:.
```

7.3.6 Upgrading Windowing and Networking Products

The procedure next upgrades the DECwindows Motif for OpenVMS Alpha, DECnet-Plus (Phase V), and Digital TCP/IP Services for OpenVMS software that is installed on your system.

Note that you can change these default values later in the installation procedure. However, if you want to install DECnet for OpenVMS software (Phase IV), you must do so separately as a layered product. Note as well that if you do not have DECnet-Plus (Phase V) software installed on your system, you can install that software during the upgrade.

The display is similar to the following:

```
    The following windowing and networking products will be upgraded
    if necessary along with the OpenVMS operating system.

        o DECwindows Motif for OpenVMS Alpha
        o DECnet-Plus (Phase V)
        o Digital TCP/IP Services for OpenVMS

    If you want to add or delete these products, you can do so later in
    the upgrade by answering "NO" to the following question:

        "Do you want all of the default values for this product?"


    DECwindows Motif for OpenVMS Alpha is installed on your system.
    It will be upgraded.


    Beginning with OpenVMS V7.1 DECnet-Plus (Phase V) is provided with the OpenVMS
    operating system.  Digital strongly recommends that DECnet users
    install DECnet-Plus (Phase V).  DECnet Phase IV applications are supported
    by DECnet-Plus (Phase V).
```

```
DECnet Phase IV is available for separate installation. Please see
the "OpenVMS V7.1 Release Notes" for important information
regarding DECnet Phase IV support.

Do you want to install DECnet-Plus (Phase V) V7.1? (Yes/No) [YES]

Digital TCP/IP Services for OpenVMS is not installed on your system.
It will not be upgraded.
```

7.3.7 Updating Time Zone Information

On Version 6.1 and 6.2 systems, the procedure asks you for information that is used for providing local time zone support. For local time zone support to work correctly, the upgrade procedure must set the time zone that accurately describes the location you want to be considered as your default time zone. Usually, this is the time zone in which your system is running. In addition, your system must be correctly configured to use a valid OpenVMS time differential factor (TDF).

The procedure displays a series of time zone menus and prompts you to make selections from each. You begin by selecting the desired time zone from the main time zone menu, which is the first menu displayed. If you do not select a time zone, the default is Greenwich Mean Time (GMT).

Some time zone choices cause an additional menu to be displayed. This happens when the time zone you select has subcomponents. For example, if you choose the United States (US) time zone from the main menu, a second menu displays the specific time zones within the United States. You then select the menu item that best represents the desired time zone.

The procedure then prompts you for the TDF. The TDF is the difference between your system time and Coordinated Universal Time (UTC), which is an international standard (similar to Greenwich Mean Time) for measuring time of day.

A sample display follows:

```
Configuring the Local Time Zone


TIME ZONE SPECIFICATION -- Main Time Zone Menu

  1) Australia       11) GMT            21) Mexico         31) Turkey
  2) Brazil          12) Greenwich      22) NZ             32) UCT
  3) CET             13) Hongkong       23) NZ-CHAT        33) US
  4) Canada          14) Iceland        24) Navajo         34) UTC
  5) Chile           15) Iran           25) PRC            35) Universal
  6) Cuba            16) Israel         26) Poland         36) W-SU
  7) EET             17) Jamaica        27) ROC            37) WET
  8) Egypt           18) Japan          28) ROK            38) Zulu
  9) Factory         19) Libya          29) Singapore
 10) GB-Eire         20) MET            30) SystemV

  0) None of the above

Select the number above that best represents the desired time zone: 33

You selected US as your time zone.
Is this correct? (Yes/No) [YES]:

US Time Zone Menu

   1) Alaska          4) Central         7) Hawaii          10) Mountain
   2) Aleutian        5) East-Indiana    8) Indiana-Starke  11) Pacific
   3) Arizona         6) Eastern         9) Michigan        12) Samoa

   0) None of the above

Select the number above that best represents the desired time zone: 6

You selected US/Eastern as your time zone.
Is this correct? (Yes/No) [YES]:
```

```
    Default Time Differential Factor for standard time is -5:00.
    Default Time Differential Factor for daylight saving time is -4:00.

    The Time Differential Factor (TDF) is the difference between your
    system time and Coordinated Universal Time (UTC).  UTC is similar
    in most respects to Greenwich Mean Time (GMT).

    The TDF is expressed as hours and minutes, and should be entered
    in the hh:mm format.  TDFs for the Americas will be negative
    (-3:00, -4:00, etc.); TDFs for Europe, Africa, Asia, and Australia
    will be positive (1:00, 2:00, etc.).

Is Daylight Savings time in effect? (Yes/No): NO

Enter the Time Differential Factor: -5

    NEW SYSTEM TIME DIFFERENTIAL FACTOR = -5:00.

Is this correct? [Y]:
```

For more information about TDF and local time zone support, see *OpenVMS System Manager's Manual*.

7.3.8 Choosing Descriptive Help Text

The system next prompts you as follows:

```
The installation can provide brief or detailed descriptions.
In either case, you can request the detailed descriptions by typing "?".

Do you always want detailed descriptions? (Yes/No) [No]
```

If you answer Yes, the system will display additional explanatory text with each prompt.

7.3.9 Selecting Components

As you begin the upgrade procedure, the system asks if you want all the default values, meaning all the files and subgroups of files for each component included in the operating system. The display is similar to the following:

```
The following product has been selected:
DEC AXPVMS VMS V7.1         [Available]


*** DEC AXPVMS VMS V7.1: VMS Operating System, Version V7.1

    COPYRIGHT (c) 29-JUN-1996 -- All rights reserved

    Digital Equipment Corporation

     Do you want all the default values for this product? [YES]
```

During an upgrade, the POLYCENTER Software Installation utility defines ''default values'' as the values that you selected when you last installed or upgraded the OpenVMS Alpha operating system on your system. Therefore, before you respond to the prompt, note the following:

- If you answer YES (by pressing the Return key) to accept the default values, you will receive the same components that you selected when you last installed or upgraded the system (instead of *all* the components currently available) plus any new components that were not in the previous version of the OpenVMS Alpha operating system.
- If you want to include or exclude any components differently from the last installation or upgrade, you must answer NO and then respond to the prompts for *each* option, even those that you are not changing.
- If you want to review the current defaults first, you can answer NO. Then answer YES when the system asks if you want to view the values.

If you review the defaults and are satisfied, answer YES to the prompt asking if you are satisfied with the values. However, if you want to make changes, answer NO to that question and then answer YES when the system asks if you want to reenter the values.

Notes: When selecting components, note the following as well:

- Whether you choose all the default values or select individual files, the system will allow you to view your selections and make changes (if necessary).
- If you are not sure whether you want certain files, request help by entering a question mark (?) at the prompt for that file (or group of files).
- OpenVMS Management Station software is automatically installed on your OpenVMS system disk when you accept all the default values. If you do not accept the default values, you must select the OpenVMS Management Station component (server and client files) if you plan to use that product. After the installation is complete, you can then prepare your OpenVMS Alpha system and your PC to run OpenVMS Management Station by following the procedures described in Appendix E.
- If you decide after the upgrade to change which OpenVMS Alpha operating system files you want installed on your system, you can use the POLYCENTER Software Installation utility on your running system to add or remove files.
- After you boot the upgraded system disk and log in, you can obtain information about individual system files by entering HELP SYSTEM_ FILES at the dollar sign prompt ($).

7.3.10 Completing the Upgrade

When you have answered all the prompts and selected the components you want installed, the system allows you to review your selections (and make changes if necessary) and then displays messages about the following:

- The amount of space on the disk required for the upgrade, based on the components you have chosen. (If your disk does not have enough space to perform the upgrade, the system displays a message alerting you to that fact and allows you to terminate the upgrade.)
- Notification that DECwindows Motif for OpenVMS Alpha, DECnet-Plus (Phase V), and Digital TCP/IP Services for OpenVMS software has been upgraded (or installed) on your system.
- Notification that the upgrade has been completed.
- Information about running AUTOGEN.
- The menu.

Following is a sample display.

Note: If you are upgrading from a running OpenVMS Alpha system, the system displays the dollar sign prompt ($) instead of the 8-option menu when the upgrade is complete.

```
Do you want to view the values? [NO]

%PCSIUI-I-DONEASK, execution phase starting
The following product will be installed:
DEC AXPVMS VMS V7.1
%PCSI-I-VOLINFO, estimated space information for volume DISK$AXPVMSSYS
-PCSI-I-VOLSPC, 40 required; 185469 available; 185429 net
Portion Done: 0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
The following product has been installed:
DEC AXPVMS VMS V7.1

The following product has been selected:
    DEC AXPVMS DECNET_OSI V7.1


*** DEC AXPVMS DECNET_OSI V7.1: DECnet-Plus (Phase V) V7.1 for OpenVMS AXP

    Copyright © Digital Equipment Corporation 1996. All rights reserved.

    Digital Equipment Corporation

    This product requires one of two PAKs: DVNETEND or DVNETEXT.

    Do you want all the default values for this product? [YES]

    Do you want to view the values? [NO]

Execution phase starting ...
The following product will be installed:
    DEC AXPVMS DECNET_OSI V7.1
The following product will be removed:
    DEC AXPVMS DECNET_OSI V6.0
%PCSI-I-VOLINFO, estimated space information for volume DISK$AXPVMSSYS
-PCSI-I-VOLSPC, 78915 required; 185429 available; 106514 net
Portion done: 0%...10%...20%...30%...40%...50%...80%...90%...100%
The following product has been installed:
    DEC AXPVMS DECNET_OSI V7.1
The following product has been removed:
    DEC AXPVMS DECNET_OSI V6.0


    The upgrade is now complete.

    When the newly upgraded system is first booted, a special
    startup procedure will be run.  This procedure will:

        o  Run AUTOGEN to set system parameters.
        o  Reboot the system with the newly set parameters.

    You can shut down now or continue with other operations.


  Process AXPVMS_INSTALL logged out at 29-JUN-1996 13:21:07.90

    ****************************************************************

    You can install or upgrade the OpenVMS Alpha operating system
    or you can install or upgrade layered products that are included
    on the OpenVMS Alpha operating system CD-ROM.

    You can also execute DCL commands and procedures to perform
    "standalone" tasks, such as backing up the system disk.

    Please choose one of the following:

        1)  Install or upgrade OpenVMS Alpha Version V7.1
        2)  Display products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Execute DCL commands and procedures
        8)  Shut down this system
```

7.3.11 What to Do Next

If you want to install layered products, go to the next section.

If you do not want to to install layered products or perform any other operations prior to booting the upgraded disk, do the following:

1. Shut down the system by choosing the shutdown option (8) from the menu.
2. Go to Section 7.5.

7.4 Installing Layered Products

You can use the menu system included on the operating system CD–ROM to install certain layered products with the POLYCENTER Software Installation utility. You can view a list of the layered products that can be installed in this way by choosing option 2 from the menu. (To install layered products that are not listed, see Chapter 4 and the installation documentation for each layered product.)

To install layered products using the POLYCENTER Software Installation utility, choose option 2 to view the list and then option 3. For example:

```
    Please choose one of the following:

        1)  Install or upgrade OpenVMS Alpha Version V7.1
        2)  Display products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Execute DCL commands and procedures
        8)  Shut down this system

Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?) 2

    The following layered product kits are available on the OpenVMS
    operating system CD-ROM and can be installed at this time:

DEC AXPVMS AMDS V6.1 found in DKB400:[KITS.AMDS061]
DEC AXPVMS SOFTWIN V1.0 found in DKB400:[KITS.SOFTWINDOWS]
.
.
.
    ****************************************************************

    You can install or upgrade the OpenVMS Alpha operating system
    or you can install or upgrade layered products that are included
    on the OpenVMS Alpha operating system CD-ROM.

    You can also execute DCL commands and procedures to perform
    "standalone" tasks, such as backing up the system disk.

    Please choose one of the following:

        1)  Install or upgrade OpenVMS Alpha Version V7.1
        2)  Display products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Execute DCL commands and procedures
        8)  Shut down this system

Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?) 3

    ************************************************************

    If you choose to install or upgrade to DECwindows Motif,
    please note the following:

    You must enter the device name for the target disk on which
    the layered product(s) will be installed.
```

```
Enter device name for target disk: (? for choices) DKA200

    DKA200: is labeled ALPHASYS.

    The installation can provide brief or detailed descriptions.
    In either case, you can request the detailed descriptions by typing "?".

Do you always want detailed descriptions? (Yes/No) [No]
.
.
.
```

If you do not want to perform any other operations after you install the layered products, do the following:

1. Shut down the system by choosing the shutdown option (8) from the menu.
2. Go to the next section to perform specific tasks after the system shuts down.

7.5 What to Do After the Shutdown

After the system shuts down, you need to perform certain tasks, depending on the configuration of your system and the type of upgrade you are performing. Refer to the appropriate section.

Note: When you boot your system following the shutdown (regardless of the type of upgrade and configuration), note that your system will automatically run AUTOGEN and boot again.

7.5.1 Standalone Upgrade

If you are upgrading a standalone system, do the following:

1. Reboot the system.
2. Log in to the system.
3. Go to Chapter 8 to perform additional postupgrade procedures.

7.5.2 Concurrent OpenVMS Cluster Upgrade

If you are performing a concurrent upgrade in an OpenVMS Cluster environment, do the following:

IF ...	THEN ...
you have one system disk,	do the following: 1. Reboot each system that uses the upgraded disk. 2. Go to Chapter 8.
you have multiple system disks,	do the following: 1. Repeat the upgrade process for each system disk in the cluster, beginning with the preupgrade tasks described in Chapter 5. 2. Reboot each system in the cluster. 3. Log in to an upgraded system. 4. Go to Chapter 8 to perform additional postupgrade procedures.

7.5.3 Rolling OpenVMS Cluster Upgrade

If you are performing a rolling upgrade in an OpenVMS Cluster environment, do the following:

1. Log in to the upgraded system.
2. Go to Chapter 8 to perform additional postupgrade procedures. (You will reboot the other systems that boot from the upgraded disk after you complete those tasks.)

8

After Upgrading the OpenVMS Alpha Operating System

After you upgrade the OpenVMS Alpha operating system, you need to perform several important tasks before you can use the system. These tasks, described in the order in which you perform them, are as follows:

- Re-forming the shadow set (if applicable)
- Registering new licenses
- Examining the AUTOGEN report file
- Modifying the system parameters file (MODPARAMS.DAT)
- Examining your command procedures
- Decompressing the system libraries
- Testing the system with UETP
- Adding and removing files
- Preparing your OpenVMS Alpha system and your PC to run OpenVMS Management Station
- Installing layered products
- Backing up the customized system disk
- Rebooting cluster members (if applicable)
- Running AUTOGEN
- Using the postupgrade checklist

8.1 Re-Forming the Shadow Set

If you have upgraded a disk in a volume shadowing environment, you must now re-form the shadow set. Follow the procedure described in this section.

8.1.1 How to Add Shadow Set Members

Re-form the shadow set as follows:

1. Enter the SHOW DEVICE D command to display a list of disks available on your system. For example:

```
$ SHOW DEVICE D

Device                  Device           Error    Volume         Free  Trans Mnt
 Name                   Status           Count     Label        Blocks Count Cnt
DSA54:                  Mounted              0  SHADOWDISK       918150  100   1
$11$DKB100:    (NODE1)  Online               0  SCRATCH
$11$DKB200:    (NODE1)  ShadowSetMember      0  ALPHA070         918150    1  31
```

2. Enter a command in the following format:

```
$ MOUNT/CONFIRM/SYSTEM DSAn: /SHADOW=(upgraded-disk:,new-member:) volume-label
```

Note the following conventions:

- DSA*n*: is the virtual unit name of the shadow set.
- *upgraded-disk:* is the name of the shadowed system disk you just upgraded.
- *new-member:* is the name of the disk you want to add as a member of the shadow set.
- *volume-label* is the volume label of the shadowed system disk you just upgraded.

Note: When you re-form the shadow set, the contents of the new member are replaced by the contents of the disk you upgraded. Specifying the /CONFIRM qualifier reminds you of this fact, confirming that you are specifying the correct name of a disk that either is blank or contains files you no longer need.

8.1.2 Example

The following is an example of re-forming a shadow set:

```
$ MOUNT/CONFIRM/SYSTEM DSA54: /SHADOW=($11$DKB200:,$11$DKB100:) ALPHA070

%MOUNT-F-SHDWCOPYREQ, shadow copy required
Virtual Unit - DSA54 Volume label ALPHA070
     Member                    Volume label Owner UIC
     $11$DKB100:  (NODE1)      SCRATCH      [100,100]
Allow FULL shadow copy on the above member(s)? [N]: YES
```

8.2 Registering New Licenses

If you need to register new OpenVMS Alpha or layered product licenses, you can do so by entering the following command:

```
$ @SYS$UPDATE:VMSLICENSE
```

You can also use the LICENSE REGISTER command.

For information about registering licenses, see the following:

- Section 3.5 in Chapter 3
- Appendix C
- The *OpenVMS License Management Utility Manual*

8.3 Examining the AUTOGEN Report File

When AUTOGEN runs, it writes informational and, if necessary, warning messages to the file SYS$SYSTEM:AGEN$PARAMS.REPORT. You should examine the contents of this report file.

8.3.1 Interpreting the Report File

To view AGEN$PARAMS.REPORT on your screen, enter the following command and press the Return key:

```
$ TYPE SYS$SYSTEM:AGEN$PARAMS.REPORT
```

(You can also print this file or examine it using the EDIT/READ_ONLY command.)

For more information on AGEN$PARAMS.REPORT, see the *OpenVMS System Manager's Manual*.

If the report includes a message similar to the following, you might need to modify the size of the page, swap, or dump file:

```
%AUTOGEN-W-DSKSPC, The disk on which DKA0:[SYS0.SYSEXE]PAGEFILE.SYS
        resides would be over 95% full if it were modified to hold 20000
        blocks.
```

For more information about modifying the sizes of the page, swap, and dump files, see the next section.

8.4 Modifying the System Parameters File

Review the file SYS$SYSTEM:MODPARAMS.DAT. The upgrade procedure created a new version of this file. The old version is named SYS$SYSTEM:MODPARAMS.DAT_OLD. Modify the parameters in the new file as necessary. The following two sections are examples of instances where you need to modify parameters in MODPARAMS.DAT.

8.4.1 System File Sizes

AUTOGEN sets the following files at sizes appropriate for your system:

[SYSEXE]SYSDUMP.DMP
[SYSEXE]PAGEFILE.SYS
[SYSEXE]SWAPFILE.SYS

If you have special workloads or configurations, you can specify different sizes for these files by performing the following steps:

1. Log in to the SYSTEM account.
2. Enter the following command:

   ```
   $ @SYS$UPDATE:AUTOGEN SAVPARAMS TESTFILES
   ```

3. If the file sizes displayed need to be adjusted, add symbols to the MODPARAMS.DAT file (described in detail in the *OpenVMS System Manager's Manual: Tuning, Monitoring, and Complex Systems*) and repeat step 2 until you are satisfied with the file sizes.
4. When you are satisfied with the file sizes, enter the following command to ensure that the modified system files are installed when the system is rebooted:

   ```
   $ @SYS$UPDATE:AUTOGEN GENPARAMS REBOOT
   ```

8.4.2 OpenVMS Cluster Parameters

If you are upgrading an OpenVMS Cluster system, note the following:

- You must update the MODPARAMS.DAT file for each Alpha computer that boots from the system disk.
- Be sure the EXPECTED_VOTES value is correct. That value is the sum of all VOTES in the cluster. For example, if there are five Alpha computers in the cluster and each has one VOTE, the value is 5.
- As you reboot each Alpha computer, AUTOGEN runs automatically. The cluster forms when you have booted enough computers to attain cluster quorum.

8.5 Examining Your Command Procedures

The upgrade procedure retains the site-specific versions of the following files located in the [VMS$COMMON] directory:

```
[SYSMGR]LAT$SYSTARTUP.COM
[SYSMGR]LOGIN.COM
[SYSMGR]SYCONFIG.COM
[SYSMGR]SYLOGICALS.COM
[SYSMGR]SYLOGIN.COM
[SYSMGR]SYPAGSWPFILES.COM
[SYSMGR]SYSECURITY.COM
[SYSMGR]SYSHUTDWN.COM
[SYSMGR]SYSTARTUP_VMS.COM
[SYSMGR]TFF$SYSTARTUP.COM
[SYSMGR]WELCOME.TXT
[SYS$STARTUP]ESS$LAST_STARTUP.DAT
```

The upgrade procedure provides new templates for some of these files with the .TEMPLATE extension. The new templates might include features that are not in your site-specific files. Check the templates against your site-specific files and edit your files as necessary.

8.6 Decompressing the System Libraries

Decompressing the system libraries gives the system faster access to them. The decompressed libraries require several thousand additional blocks of disk space for all libraries to be decompressed. You use the LIBDECOMP.COM procedure to decompress the libraries.

8.6.1 Determining Disk Space

To find out how much disk space you have, enter the following command and press the Return key:

```
$ SHOW DEVICE SYS$SYSDEVICE
```

If you have approximately 30,000 free blocks on the disk, you can decompress the libraries. Note that you can choose to decompress only the libraries that are used frequently.

8.6.2 Methods of Using LIBDECOMP.COM

You can use the LIBDECOMP.COM procedure to decompress libraries in three ways:

- Entering a command and responding to prompts from the procedure
- Entering an interactive command
- Entering a batch command

The following three sections describe each method.

Note: Before you use the LIBDECOMP.COM procedure, be sure you are logged in to the SYSTEM account.

8.6.3 Responding to LIBDECOMP.COM Prompts

If you want to decompress libraries by responding to prompts from the LIBDECOMP.COM procedure:

1. Enter the following command and then press the Return key:

```
$ @SYS$UPDATE:LIBDECOMP.COM
```

   The resulting display is similar to the following:

```
                OpenVMS Library Decompression Utility

 1  HELPLIB.HLB          14  NCPHELP.HLB          27  PHONEHELP.HLB
 2  STARLET.OLB          15  SDA.HLB              28  LIB.MLB
 3  ACLEDT.HLB           16  SHWCLHELP.HLB        29  STARLET.MLB
 4  ANLRMSHLP.HLB        17  SYSGEN.HLB           30  STARLETSD.TLB
 5  DBG$HELP.HLB         18  ANALAUDIT$HELP.HLB   31  SYS$STARLET_C.TLB
 6  DBG$UIHELP.HLB       19  SYSMANHELP.HLB       32  ERFLIB.TLB
 7  DISKQUOTA.HLB        20  TFF$TFUHELP.HLB      33  SYS$LIB_C.TLB
 8  EDFHLP.HLB           21  EXCHNGHLP.HLB        34  VAXCCURSE.OLB
 9  INSTALHLP.HLB        22  TPUHELP.HLB          35  VAXCRTL.OLB
10  LATCP$HELP.HLB       23  EVE$HELP.HLB         36  VAXCRTLD.OLB
11  MAILHELP.HLB         24  EVE$KEYHELP.HLB      37  VAXCRTLT.OLB
12  MNRHELP.HLB          25  UAFHELP.HLB          38  IMAGELIB.OLB
13  EDTHELP.HLB          26  TECO.HLB

     39  VMS$VOLATILE_PRIVATE_INTERFACES.OLB
     40  FMG_HELP_FILE__AMERICAN_ENGLISH.HLB

      A  ALL libraries to be decompressed
      E  EXIT this procedure

* Enter letter or number(s) of libraries to be decompressed
  (Separate multiple entries with a comma):
```

2. Enter the appropriate letter or the numbers of the libraries you want to decompress. (Decompressing all libraries takes approximately one-half hour.)

8.6.4 Using LIBDECOMP.COM Interactively

You can execute LIBDECOMP.COM interactively to decompress up to eight libraries at a time by listing the names of the libraries you want to decompress as parameters on the command line.

Be sure to separate the library names with commas and do not include the file extensions. For example, to decompress VAXCRTL.OLB, DISKQUOTA.HLB, and LIB.MLB interactively, enter the following command:

```
$ @SYS$UPDATE:LIBDECOMP VAXCRTL, DISKQUOTA, LIB
```

8.6.5 Using LIBDECOMP.COM in Batch

You can also execute LIBDECOMP.COM in batch mode to decompress up to eight libraries at a time by listing the names of the libraries you want to decompress as parameters on a command line that includes the SUBMIT command.

Be sure to separate the library names with commas and do not include the file extension. For example, to decompress VAXCRTL.OLB, DISKQUOTA.HLB, and LIB.MLB as a batch job, enter the following command:

```
$ SUBMIT/NOTIFY/PARAMETERS=(VAXCRTL, DISKQUOTA, LIB)-
_$ SYS$UPDATE:LIBDECOMP
```

Note: When you type the command for a batch job, be sure you enclose the list of library names within parentheses.

8.7 Testing the System with UETP

Run the User Environment Test Package (UETP) to verify that the upgrade completed correctly.

For instructions on running UETP, see the *OpenVMS System Manager's Manual*.

8.8 Adding and Removing Operating System Files

If you decide after the upgrade to change which OpenVMS Alpha operating system files you want installed on your system, you can use the menu system contained on the OpenVMS Alpha operating system CD–ROM to add or remove files.

Note that you can obtain information about individual system files by entering HELP SYSTEM_FILES at the dollar sign prompt ($).

The procedure is as follows:

1. Mount and boot the OpenVMS Alpha operating system CD–ROM.
2. Choose option 1 from the menu.
3. Choose the PRESERVE option.
4. Install or reconfigure files as necessary.

8.8.1 Sample Display

Following is a sample reconfigure operation:

```
    Please choose one of the following:

        1)  Install or upgrade OpenVMS Alpha Version V7.1
        2)  Display products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Execute DCL commands and procedures
        8)  Shut down this system

Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?) 1
    ********************************************************

.
.
.

Do you want to INITIALIZE or to PRESERVE? [PRESERVE]
```

```
.
.
.
    Version V7.1 of the OpenVMS operating system is already installed
    on the target disk.  You may choose one of the following actions:

      o Reconfigure the OpenVMS operating system.
        This action will allow you to change your choices about which
        options you included when the operating system was installed.
        Changes you make will cause options to be added or removed.

      o Reinstall the OpenVMS operating system.
        This action may be appropriate if you suspect that some of the
        operating system files have become corrupted.

    Either of these choices will allow you to change your choices for
    the operating system options you included when the OpenVMS operating
    system was installed or upgraded, including your choices for the DECnet
    and DECwindows support that is part of the OpenVMS operating system.

    If you want to install, reconfigure or remove the DECwindows Motif
    graphical user interface or any of the Digital network products, you
    must select options 3, 5 or 6 from the main menu.

Do you want to Reconfigure the OpenVMS operating system? (Yes/No) yes

The following product has been selected:
    DEC AXPVMS VMS V7.1

Do you want to continue? [YES]

*** DEC AXPVMS VMS V7.1: OpenVMS Operating System

    COPYRIGHT (c) 11-MAY-1996 -- All rights reserved

    Digital Equipment Corporation

    Do you want all the default values for this product? [YES]

    Do you want to view the values? [NO]

Execution phase starting ...
The following product will be reconfigured:
    DEC AXPVMS VMS V7.1
Portion done: 0%...10%...20%...30%...40%...50%...60%...80%...90%...100%
The following product has been reconfigured:
    DEC AXPVMS VMS V7.1
.
.
.
```

8.9 Preparing to Use OpenVMS Management Station

If you installed the OpenVMS Management Station software on your system (either by accepting all default values or by selecting the component manually during the upgrade procedure), you must perform several tasks on your OpenVMS Alpha system and your PC before you can use OpenVMS Management Station. These tasks include the following:

- Editing system files
- Starting OpenVMS Management Station on other nodes
- Verifying that you have the proper memory, disk space, media, and the required software to install and run OpenVMS Management Station on your PC
- Creating installation media for PC client software
- Installing the client software on your PC
- Defining DECnet nodes

For complete information about preparing your OpenVMS system and your PC to run the OpenVMS Management Station server and client software, see Appendix E.

Note: After you complete the tasks described in Appendix E, which include transferring the client software files from your system to two floppy diskettes, you can then remove those files from your system to save disk space. (Use the PRODUCT RECONFIGURE command rather than a delete operation. See *OpenVMS System Management Utilities Reference Manual: M–Z* for complete information about using the PRODUCT command.)

8.10 Installing Layered Products

Except in certain instances, you should not have to reinstall layered products that you had on your system prior to the upgrade. However, if you need to install layered products, follow these directions:

You can use the menu system included on the operating system CD–ROM to install certain layered products with the POLYCENTER Software Installation utility. If you did not install those layered products previously during the upgrade procedure, you can do so using the following procedure.

Note: To use this procedure, the target system must have the exact same version of the OpenVMS Alpha operating system as the CD–ROM. If you need to install layered products on a target system that has a *different* version of the operating system, use the alternate procedure described in the next section.

1. Shut down the system (described in Appendix A).
2. Boot the operating system CD–ROM (locally or from the InfoServer).
3. Choose option 2 from the menu to view which layered products can be installed using the POLYCENTER Software Installation utility.
4. Choose option 3 from the menu to install the layered products.
5. Shut down the system by selecting option 8 from the menu.
6. Boot from the system disk.

If the layered product that you want to install is not listed in the display, see the documentation you received with that layered product for installation information.

For additional information about installing layered products, see the *OpenVMS System Manager's Manual*.

Be sure you back up the system disk after you install all your layered products.

8.10.1 Alternate Procedure

Following is another method for installing layered products from the OpenVMS Alpha operating system CD–ROM:

1. From your running OpenVMS system (the target system disk), mount the OpenVMS Alpha operating system CD–ROM.
2. Locate the directories and files containing the available layered products by entering the following command (where, in the example, DKA400: is the device name of the CD–ROM):

```
$ DIRECTORY /NOHEAD/NOTRAIL DKA400:[*.KIT]
```

3. To install layered products that require VMSINSTAL (indicated in the directories by saveset file names with file types of .A, .B, and so on), enter the @SYS$UPDATE:VMSINSTAL command and then specify the CD–ROM device and directory. For example:

```
$ @SYS$UPDATE:VMSINSTAL
* Where will the distribution volumes be mounted: DKB400:[UCX032.KIT]
```

4. To install layered products that require the POLYCENTER Software Installation utility (indicated in the directories by file names with file types of .PCSI or .PCSI$DESCRIPTION), use the PRODUCT INSTALL command or the Motif interface to the POLYCENTER Software Installation utility to specify the CD–ROM device name and directory. Following is an example of the PRODUCT INSTALL command:

```
$ PRODUCT INSTALL POSIX /SOURCE=DKB400:[POSIX020.KIT]
```

8.10.2 TCP/IP Services for OpenVMS

If you installed the Digital TCP/IP Services for OpenVMS software during the installation or if you choose to install it now as a layered product, note that you must also install the mandatory security update kit included with this release.

The Digital TCP/IP Kit and the mandatory Security Update Kit are available in the following directory on the OpenVMS Alpha CD–ROM:

```
[TCPIP_ALPHA_041]
```

If you choose to install the Digital TCP/IP Services for OpenVMS software, you must install both kits.

8.10.3 DECevent

In OpenVMS Alpha Version 7.0 and earlier releases of OpenVMS Alpha, the DECevent DCL command DIAGNOSE was defined during the operating system upgrade procedure.

Beginning with OpenVMS Alpha Version 7.1, the definition of the DIAGNOSE command during upgrade is disabled. To enable the DIAGNOSE command in OpenVMS Version 7.1, the DECevent kit provided on the OpenVMS Alpha Version 7.1 CD–ROM must be installed following the upgrade to OpenVMS Alpha Version 7.1. For information about the location of the DECevent kit, see the *Guide to OpenVMS Version 7.1 CD–ROMS*.

If the DECevent kit provided on the OpenVMS Alpha CD–ROM is not installed after you upgrade the operating system, users attempting to use the DIAGNOSE command will receive the following system message:

```
$ DIAGNOSE [params]
%DIA-E-NO1HOME, DIAGNOSE functions not available on this system
%DIA-I-GETKIT, install DECevent for access to DIAGNOSE
$
```

8.10.4 Monitoring Performance History

The OpenVMS Alpha Version 7.1 operating system CD–ROM also includes a Monitoring Performance History (MPH) kit located in the [MPH] directory. See the *OpenVMS Version 7.1 Release Notes* for more information about installing and using this optional software.

8.11 Backing Up the Customized System Disk

After you have upgraded and customized the OpenVMS Alpha operating system to your satisfaction and installed layered products, protect your work by making a backup copy of the system disk.

8.11.1 How to Back Up the Customized System Disk

To back up the system disk, use the following procedure:

1. Shut down the system (described in Appendix A).
2. Boot the operating system CD–ROM (locally or from the InfoServer).
3. Use the menu system to enter the DCL environment (option 4).
4. Mount the system disk and the target device on which you will make the backup copy.
5. Enter backup commands to back up the system disk to the target device.
6. Log out from the DCL environment.
7. Shut down the system by selecting option 8 from the menu.
8. Boot from the system disk.

For complete information about backup operations, including a description of an alternate method that does not require booting from the operating system CD–ROM and that allows you to back up a shadowed disk without disabling the shadow set, see Appendix B.

8.12 Rebooting Cluster Members

If you are performing a rolling upgrade in an OpenVMS Cluster environment and have completed all the postupgrade tasks required for your upgraded system disk, reboot each system that boots from that system disk.

For more information about booting your system, see Appendix A.

8.13 Running AUTOGEN

Although AUTOGEN runs automatically at the end of the upgrade procedure, Digital recommends that you run AUTOGEN periodically after you perform an upgrade. This section describes how often you should run AUTOGEN and what it does.

8.13.1 Running After the Upgrade

After 24 hours of operation, run AUTOGEN in FEEDBACK mode and reboot the system. Run AUTOGEN in this way again two workdays later.

8.13.2 Running Weekly

AUTOGEN sets the values of system parameters and the sizes of the page and swap files according to the system's work load. Digital recommends that you run AUTOGEN from SAVPARAMS through TESTFILES on a weekly basis and examine AGEN$PARAMS.REPORT to determine the need for additional changes.

Hardcoded values in MODPARAMS.DAT should not hinder AUTOGEN's ability to calculate feedback parameters. AUTOGEN generally does not reduce the value of parameters that allocate resources; it considers current parameter values to be minimum values, which means you do not have to add MIN_* symbols to

MODPARAMS.DAT. AUTOGEN does increase parameter values according to its calculations unless you have specified explicit or maximum values (by adding MAX_* symbols) in MODPARAMS.DAT.

8.13.3 For More Information

For more information about the MODPARAMS.DAT file and about using AUTOGEN in general, see the *OpenVMS System Manager's Manual*.

8.14 Postupgrade Checklist

Use the following checklist to make sure you have performed all the necessary tasks:

- ☐ In a volume shadowing environment, re-form the shadow set.
- ☐ Register new licenses.
- ☐ Examine AUTOGEN output stored in the file AGEN$PARAMS.REPORT.
- ☐ Examine MODPARAMS.DAT.
- ☐ Examine the command procedure templates supplied with the OpenVMS Alpha Version 7.1 operating system.
- ☐ Decompress the system libraries using LIBDECOMP.COM.
- ☐ Run the User Environment Test Package (UETP) to test the system (described in the *OpenVMS System Manager's Manual*).
- ☐ Add and remove files.
- ☐ Prepare your OpenVMS Alpha system and your PC to run OpenVMS Management Station by following the procedures described in Appendix E.
- ☐ Install layered products, including DECwindows (if necessary).
- ☐ Back up the customized system disk.
- ☐ Reboot each system that boots from the upgraded system disk (for a rolling upgrade in an OpenVMS Cluster environment).
- ☐ Run AUTOGEN.

A

Halt, Boot, and Shutdown Procedures

This appendix contains the following information:

- Booting operations, including the following:
  - Booting the operating system CD–ROM, locally and from an InfoServer system
  - Booting manually from the system disk
  - Performing a conversational boot
  - Booting with minimum startup
  - Booting with the XDelta utility (XDELTA)
  - Booting from a different directory
  - Booting with a PMAZB or PMAZC TURBOchannel adapter
  - Booting over the network with an alternate TURBOchannel adapter
  - Booting in an Emergency
- Set, Show, and Writeboot operations, including the following:
  - Setting the system for automatic booting
  - Setting and showing boot devices
  - Setting boot parameters
  - Using the Writeboot utility
- Halt and shutdown operations
- Troubleshooting procedures

A.1 Booting Operations

The following sections describe different methods of booting your system.

A.1.1 Booting the Operating System CD–ROM

If you need to boot the OpenVMS Alpha operating system CD–ROM, either to perform an installation or upgrade or to perform related operations such as mounting or backing up the system disk, follow the steps in the following sections, depending on whether you are booting locally or from the InfoServer.

Halt, Boot, and Shutdown Procedures
A.1 Booting Operations

A.1.1.1 Booting from the Local Drive

Boot from the local drive as follows:

1. Insert the operating system CD–ROM into the local CD–ROM drive.
2. At the console prompt (>>>), enter the SHOW DEVICE command so you can identify the name of the CD–ROM drive (for example, DKA400:)
3. Enter the boot command in the following format:

   BOOT -flags 0,0 *source-drive*

   Substitute the device name of the CD–ROM drive (as listed in the SHOW DEVICE display) for *source-drive*.

   For example, if the SHOW DEVICE display lists the device name of your CD–ROM drive as DKA400, enter the following command and press the Return key:

   ```
   >>> BOOT -flags 0,0 DKA400
   ```

After you boot, the system displays a menu from which you can choose options to perform the following tasks:

- Install or upgrade the operating system using the POLYCENTER Software Installation utility
- Enter a DCL environment from which you can perform preinstallation or maintenance tasks such as mounting or showing devices and backing up or restoring files on the system disk
- Shut down the system

A.1.1.2 Booting from the InfoServer

To boot the operating system CD–ROM using the InfoServer, do the following:

1. At the console prompt, enter the following command:

   ```
   >>> B -FL 0,0 -FI APB_061 lan-device-name
   ```

   Note the following conventions:

   - *APB_061* is the file name of the APB program used for the initial system load (ISL) boot program.
   - *lan-device-name* is the name of the local area network (LAN) device identified with your computer. For information about the LAN devices your system supports, refer to the following table. For additional information, see the hardware manuals that you received with your Alpha computer and the *OpenVMS Software Product Description*.

Alpha Computer	Ethernet Device	FDDI Device
ALPHAbook 1	EOA0	–
AlphaServer 400 series	EWA0	FWA0
AlphaServer 1000 series	ERA0, EWA0	FRA0
AlphaServer 1000A series	EWA0	FWA0
AlphaServer 2000 series	ERA0, EWA0	FRA0
AlphaServer 2100, 2100A series	ERA0, EWA0	FRA0
AlphaServer 4100 series	EWA0	FWA0
AlphaServer 8200 series	EXA0, EWA0	FXA0
AlphaServer 8400 series	EXA0, EWA0	FXA0
AlphaStation 200 series	EWA0	FWA0
AlphaStation 400 series	EWA0	FWA0
AlphaStation 500 series	EWA0	FWA0
AlphaStation 600 series	ERA0, EWA0	FWA0
DEC 2000 series	ERA0	–
DEC 3000 series	ESA0	"n/ESA0"
DEC 4000 series	EZA0	–
DEC 7000 series	EXA0	FXA0
DEC 10000 series	EXA0	FXA0

Notes: If you are using a DEC 3000 or 4000 series system, note the following:

- On DEC 3000 series systems, you can boot through the InfoServer with an Ethernet PMAD device or FDDI DEFTA device by specifying the device name as ‘‘*n*/ESA0’’. The value for *n* is the TURBOchannel slot number, which you can obtain by entering the SHOW CONFIGURATION command at the console prompt (>>>) and examining the display. For more information, see Section A.1.8 in Appendix A.
- On DEC 4000 series, you *must* specify the ISL file name in uppercase (APB_F70). In addition, if your system uses console firmware prior to Version 3.2, enter the BOOT command as follows:

```
>>> BOOT -FL 0,0 -start 0 -FI APB_F70 EZA0
```

2. The InfoServer ISL program then displays the following menu:

```
Network Initial System Load Function
Version 1.1

  FUNCTION         FUNCTION
    ID
    1     -        Display Menu
    2     -        Help
    3     -        Choose Service
    4     -        Select Options
    5     -        Stop

Enter a function ID value:
```

3. Respond to the prompts as follows, pressing the Return key after each entry:

   a. Enter 3 for the function ID.

b. Enter 2 for the option ID.

c. Enter the service name (ALPHAF70).

A sample display follows:

```
Enter a function ID value: 3 Return

 OPTION          OPTION
   ID
   1     -       Find Services
   2     -       Enter known Service Name

Enter an Option ID value: 2 Return
Enter a Known Service Name: ALPHAF70 Return
```

After you boot, the system displays a menu from which you can choose options to perform the following tasks:

- Install or upgrade the operating system using the POLYCENTER Software Installation utility.
- Enter a DCL environment from which you can perform preinstallation or maintenance tasks such as mounting or showing devices and backing up or restoring files on the system disk.
- Shut down the system.

A.1.2 Booting Manually from the System Disk

Boot the system disk manually as follows:

IF ...	THEN ...
the OpenVMS Alpha operating system is running,	go to step 1.
the OpenVMS Alpha operating system is *not* running,	go to step 4.

1. Log in to the SYSTEM account.
2. Enter the following command and press the Return key:

   ```
   $ @SYS$SYSTEM:SHUTDOWN
   ```

3. Answer the questions displayed by the system. When the procedure asks if an automatic reboot should be performed, press the Return key for NO. When the procedure is finished, it displays the following message:

   ```
   SYSTEM SHUTDOWN COMPLETE
   ```

4. Halt the system by entering Ctrl/P or by pressing the Halt button. (See Section A.3.1 for more information about how to halt your Alpha computer.)
5. Enter the BOOT command in the following format:

   BOOT *device-name*

   Substitute the device name of the system disk for *device-name*. For example, to boot from a drive with a device name of DKA400, enter the following command and press the Return key:

   ```
   >>> BOOT DKA400
   ```

   To boot from the network, enter the following command and press the Return key:

   ```
   >>> BOOT ESA0
   ```

A.1.3 Performing a Conversational Boot

A conversational boot is most commonly used in research and development environments and during software upgrades. Perform a conversational boot to stop the boot process before it completes. The boot process stops after it loads SYS$SYSTEM:SYSBOOT.EXE and displays the SYSBOOT> prompt. At the SYSBOOT> prompt, you can enter specific OpenVMS System Generation utility (SYSGEN) commands to do the following:

- Examine system parameter values
- Change system parameter values
- Specify another parameter file
- Specify another system startup command procedure
- Select the default system parameter file if you modified system parameters to values that render the system unbootable
- Specify a minimum startup

A.1.3.1 How to Perform a Conversational Boot

There are several ways to perform a conversational boot. The following procedure is the most direct:

IF ...	THEN ...
the OpenVMS Alpha operating system is running,	go to step 1.
the OpenVMS Alpha operating system is *not* running,	go to step 4.

1. Log in to the SYSTEM account.
2. Enter the following command and press the Return key:

   ```
   $ @SYS$SYSTEM:SHUTDOWN
   ```

3. Answer the questions displayed by the system. When the procedure asks if an automatic reboot should be performed, press the Return key for NO. When the procedure is finished, it displays the following message:

   ```
   SYSTEM SHUTDOWN COMPLETE
   ```

4. Halt the system by entering Ctrl/P or by pressing the Halt button. (See Section A.3.1 for more information about how to halt your Alpha computer.)
5. To begin the conversational boot, enter the BOOT command in the following format:

   BOOT -FL 0,1 [*device-name*]

   Substitute the device name of the drive from which you want to boot for *device-name*. For example, if the system disk has a device name of DKA400, enter the following command and press the Return key:

   ```
   >>> BOOT -FL 0,1 DKA400
   ```

   If you do not specify a device name, the system boots from the boot device assigned when you entered the SET BOOTDEF_DEV command.
6. At the SYSBOOT> prompt, you can enter any of the SYSGEN commands listed in Table A–1. For more information about these SYSGEN commands, see the *OpenVMS System Management Utilities Reference Manual*.

7. When you finish using the SYSGEN commands, enter the CONTINUE command to complete the boot process.

Table A–1 SYSGEN Commands Used in the SYSBOOT Procedure

Command	Description
CONTINUE	Resumes the boot procedure.
DISABLE CHECKS	Inhibits checking of parameter values specified with the SET command.
ENABLE CHECKS	Permits checking of parameter values specified with the SET command.
HELP	Displays a summary of the SYSBOOT commands on the terminal screen.
SET *parameter-name*	Establishes the value of a system parameter.
SET/STARTUP	Sets the name of the system startup command procedure.
SHOW *[parameter]*	Displays active, current, default, maximum, and minimum values for specific parameters. (Use qualifiers to display characteristics of parameters grouped by categories.)
USE *[file-spec]*	Specifies a parameter file to be used as a source of values. You must enter the entire file specification, including device and directory; you cannot specify a logical name.

For examples of using conversational booting, see Section A.1.4 and Section A.1.9.

A.1.4 Booting with Minimum Startup

In certain cases, you might want to boot your system without performing the full sequence of startup events. For example, if a startup event prevents you from logging in, you might want to boot the system without executing the startup so that you can log in and fix the problem. You can use the conversational boot to specify a minimum startup.

Note: Because this procedure bypasses specific startup operations, it does not autoconfigure the system's peripheral devices.

A.1.4.1 How to Boot with Minimum Startup

Boot the system with minimum startup as follows:

1. Perform a conversational boot by entering the following command at the console prompt:

```
>>> BOOT -FL 0,1 [device-name]
```

2. Enter the following command and press the Return key:

```
SYSBOOT> SET STARTUP_P1 "MIN"
```

3. Enter the following command to continue booting:

```
SYSBOOT> CONTINUE
```

4. After the system boots, log in and enter the following commands to invoke SYSMAN and clear the STARTUP_P1 parameter you set in step 2:

```
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SET STARTUP_P1 ""
SYSMAN> PARAMETERS WRITE CURRENT
```

A.1.5 Booting with the XDelta Utility (XDELTA)

The XDelta utility (XDELTA) is a debugging tool that system programmers use. The procedure for booting all Alpha computers with XDELTA is the same.

A.1.5.1 Boot Command Qualifier Values

The following table describes the valid values you can specify when booting with XDELTA:

Value	System Response
0	Normal, nonstop boot (default).
1	Begins a conversational boot and then displays the SYSBOOT prompt.
2	Includes XDELTA but does not take the initial breakpoint.
3	Displays the SYSBOOT prompt and includes XDELTA but does not take the initial breakpoint.
6	Includes XDELTA and takes the initial breakpoint.
7	Includes XDELTA, displays the SYSBOOT prompt, and takes the initial breakpoint at system initialization.

A.1.5.2 How to Boot with XDELTA

The following is an example of booting with XDELTA from the console prompt:

```
>>> BOOT -FL 0,7
```

For more information about using XDELTA, see the *OpenVMS Delta/XDelta Debugger Manual*.

A.1.6 Booting from a Different Directory

By default, the OpenVMS Alpha operating system is installed in the system root directory [SYS0]. However, if you have created a cluster system disk, you can use the SYS$MANAGER:CLUSTER_CONFIG.COM procedure to add a copy of the operating system to a different root directory. (See the *OpenVMS System Manager's Manual* for more information about using the SYS$MANAGER:CLUSTER_CONFIG.COM procedure.)

To boot from a different directory (for example, [SYS3]), enter the BOOT command as follows:

```
>>> BOOT -FL 3,0  DKA200
```

A.1.7 Booting with a PMAZB or PMAZC TURBOchannel Adapter

PMAZB and PMAZC TURBOchannel adapters are adapters that are software-compatible with the integrated SCSI ports on DEC 3000 Alpha series systems.

The DEC 3000 Alpha series system consoles implement the SHOW CONFIGURATION console command, which displays information about the TURBOchannel options and the built-in adapters in the system. When a PMAZB or PMAZC adapter is installed in the TURBOchannel, the SHOW CONFIGURATION command displays the ''PMAZB-AA'' or ''PMAZC-AA'' string, the TURBOchannel slot number, and the device status.

The DEC 3000 Alpha series consoles also implement the SHOW DEVICE command, which displays information about the devices in the system. Because the integrated SCSI adapter is built into every DEC 3000 Alpha series system, the SHOW DEVICE console command can display the SCSI devices connected

to the integrated SCSI ports. However, the SHOW DEVICE console command cannot display the SCSI devices connected to the PMAZB or PMAZC SCSI ports.

A.1.7.1 Displaying Devices

To make the console display the devices connected to the PMAZB or PMAZC SCSI ports, enter the following command at the console prompt, where *x* is the TURBOchannel slot number in which the PMAZB or PMAZC adapter is installed:

```
>>> TEST TCx CNFG
```

This command displays the devices that are connected to each SCSI port of the PMAZB or PMAZC adapter. The device controller letters are either A or B, based upon the PMAZB or PMAZC ports to which the devices are connected. Do not confuse these devices with any DKA*xxx* or DKB*xxx* devices displayed by the SHOW DEVICE command, which shows SCSI devices on the integrated SCSI ports only.

A.1.7.2 How to Boot

To boot from a device connected to a PMAZB or PMAZC adapter, enter the boot command as follows:

```
>>> BOOT "X/DKYzzz"
```

The following conventions are used:

- *X* is the TURBOchannel slot number in which the PMAZB or PMAZC adapter is installed
- *DK* is the device code of the boot device
- *Y* is either A or B, depending on the SCSI port of the PMAZB or PMAZC adapter that contains the boot device
- *zzz* is the SCSI unit number of the boot device

A.1.7.3 How Adapters Are Identified

The OpenVMS Alpha operating system does not distinguish between the PMAZB or PMAZC adapter and the integrated SCSI adapter. The operating system views them as identical adapters. Because the operating system searches for I/O adapters in backplane slot number order, device controller letters are assigned that correspond to the backplane order of the TURBOchannel options, followed by the integrated adapters. This is different from console SCSI device naming, which always designates SCSI devices on the integrated SCSI ports as either "A" or "B" port devices.

A.1.7.4 Example

On a DEC 3000 Model 500 Alpha system with no TURBOchannel options installed, the OpenVMS Alpha operating system names the integrated SCSI ports PKA0 and PKB0, and the devices connected to the ports inherit the controller letter from the port controller letter (A or B). However, if a PMAZB or PMAZC adapter is installed in the TURBOchannel, the operating system names the PMAZB or PMAZC SCSI ports PKA0 and PKB0 and names the integrated SCSI ports PKC0 and PKD0. The devices connected to the ports inherit the controller letter from the port controller letter (A, B, C, or D).

A.1.8 Booting Over the Network with an Alternate TURBOchannel Adapter

You can use an alternate TURBOchannel adapter to boot a DEC 3000 series Alpha computer (with the TURBOchannel option) over the network in an InfoServer or OpenVMS Cluster environment. Examples of alternate TURBOchannel adapters are the PMAD (which connects to the Ethernet) and the DEFTA (which connects to the FDDI).

To boot from a TURBOchannel device connected to one of these alternate adapters, enter the boot command as follows:

```
>>> BOOT "n/ESA0"
```

The value for *n* is the TURBOchannel slot number for the device, which you can obtain by entering the SHOW CONFIGURATION command at the console prompt (>>>) and examining the display. In the following example, the TURBOchannel slot number (listed under the ''TCINFO'' column) is 0:

```
>>> SHOW CONFIG

DEC 3000 - M300
Digital Equipment Corporation
     VPP PAL X5.56-80800101/OSF PAL X1.34-80800201 - Built on 18-DEC-1996 11:376

               TCINFO      DEVNAM        DEVSTAT
               ------      --------      --------
                 CPU       OK KN16-AA -V3.2-S6CD-I151-sV2.0-DECchip 21064 P3.0-150
                ASIC       OK
                 MEM       OK
                 MEM       OK
6
                 CXT       OK
5
                 NVR       OK
                 SCC       OK
                  NI       OK
                ISDN       OK
4
                SCSI       OK
0-PMAD-AA       TC0
```

A.1.9 Booting in an Emergency

If a system problem prevents your system from booting, you might need to perform an emergency boot operation. Table A–2 summarizes these emergency boot operations, and the sections that follow describe each boot operation in more detail.

Table A–2 Emergency Boot Procedures

Operation	When to Use
Booting with default system parameters	When parameter values in the parameter file have been modified so that the system is unbootable
Booting without startup and login procedures	If an error in the startup or login procedures prevents you from logging in
Booting without the user authorization file	If you have forgotten the password and cannot log in to a privileged account

A.1.9.1 Booting with Default System Parameters

If the current values stored in the parameter file have been incorrectly modified, these incorrect values might cause the system to become unbootable. With a conversational boot operation, you can reset the active values for all system parameters to the default value. (In most cases, Digital recommends that you use AUTOGEN to modify system parameters. In certain cases, however, you can use a conversational boot to modify a parameter value *temporarily*. To change a parameter value *permanently*, you must edit MODPARAMS.DAT and run AUTOGEN. For instructions, see the *OpenVMS System Manager's Manual*.) The default values allow you to boot the system temporarily so you can correct the problem.

The Procedure

1. Perform a conversational boot by entering the following command at the console prompt:

   ```
   >>> BOOT -FL 0,1 [device-name]
   ```

2. At the SYSBOOT> prompt, enter the following command:

   ```
   SYSBOOT> USE DEFAULT
   ```

   This command specifies that default values should be used for all parameters.

3. Enter the following command to continue booting:

   ```
   SYSBOOT> CONTINUE
   ```

4. When the system finishes booting, determine which changed parameter caused the problem and reset the parameter value. If you specified the value for the parameter in the AUTOGEN parameter file MODPARAMS.DAT, fix the value in that file and run AUTOGEN. For more information, see the *OpenVMS System Manager's Manual*.

5. Shut down and reboot the system.

Example

```
SYSBOOT> USE DEFAULT
SYSBOOT> CONTINUE
Username: SYSTEM
Password:
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SET NPAGEDYN 2999808
SYSMAN> PARAMETERS WRITE CURRENT
SYSMAN> EXIT
$ EDIT SYS$SYSTEM:MODPARAMS.DAT
   .
   .
   .
[Insert the following line in MODPARAMS.DAT:]
MIN_NPAGEDYN = 2999808
   .
   .
   .
$ @SYS$UPDATE:AUTOGEN SAVPARAMS REBOOT
```

A.1.9.2 Booting Without Startup and Login Procedures

If the system does not complete the startup procedures or does not allow you to log in, bypass the startup and login procedures. The startup and login procedures provided by Digital should always work. However, if you introduce an error when modifying the startup or login procedures, it is possible to accidentally lock yourself out of the system.

The Procedure

1. Perform a conversational boot by entering the following command at the console prompt:

   ```
   >>> BOOT -FL 0,1 [device-name]
   ```

2. Enter the following command at the SYSBOOT> prompt:

   ```
   SYSBOOT> SET/STARTUP OPA0:
   ```

3. Enter the following command to continue booting:

   ```
   SYSBOOT> CONTINUE
   ```

4. When the system is booted, the operator console displays the DCL command prompt ($). You are logged in.

5. Enter the following DCL command:

   ```
   $ SET NOON
   ```

   This command directs the operating system to ignore any errors that might occur. If you do not enter this command and you invoke an error, the system will log you out.

6. Correct the error condition that caused the login failure. (That is, make the necessary repairs to the startup or login procedures, or to the SYSUAF.DAT file.)

   Invoke a text editor to correct the startup or login file. Note that some system consoles might not supply a screen-mode editor. You can also copy a corrected file and delete the incorrect version by using the RENAME and DELETE commands.

7. Invoke SYSMAN and enter the following commands to reset the startup procedure:

```
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SET/STARTUP SYS$SYSTEM:STARTUP.COM
SYSMAN> PARAMETERS WRITE CURRENT
SYSMAN> EXIT
$
```

8. Perform a normal startup by entering the following command:

```
$ @SYS$SYSTEM:STARTUP
```

Example

```
SYSBOOT> SET/STARTUP OPA0:
SYSBOOT> CONTINUE
$ SET NOON
$ SET DEFAULT SYS$SYSROOT:[SYSEXE]
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SET/STARTUP SYS$SYSTEM:STARTUP.COM
SYSMAN> PARAMETERS WRITE CURRENT
SYSMAN> EXIT
$ @SYS$SYSTEM:STARTUP
```

A.1.9.3 Booting Without the User Authorization File

Ordinarily, the startup and login procedures provided by Digital always work; however, certain user interventions can cause them to fail. A very simple way to lock yourself out of the system is to set passwords to login accounts and forget them. In such an emergency, you can use the alternate user authorization file rather than the standard user authorization file.

Note: You can use this method only to log in to the system from the console terminal; you cannot use other terminal lines.

Setting the system parameter UAFALTERNATE defines the logical name SYSUAF to refer to the file SYS$SYSTEM:SYSUAFALT.DAT. If this file is found during a normal login, the system uses it to validate the account and prompts you for the user name and password.

If it cannot find this file, the system assumes that the UAF is corrupt and accepts any user name and any two passwords to log you in to the system from the system console. Logins are prohibited from all other terminal lines.

When you perform this procedure, the system assigns the following values to your user account:

Field	Value
Name	User name
UIC	[001,004]
Command interpreter	DCL
Login flags	None
Priority	Value of the system parameter, DEFPRI
Resources	Values of the PQL system parameters
Privileges	All

The process name is usually the name of the device on which you logged in (for example, _OPA0:).

The Procedure

1. Perform a conversational boot by entering the following command at the console prompt:

   ```
   >>> BOOT -FL 0,1 [device-name]
   ```

2. At the SYSBOOT> prompt, enter the following command:

   ```
   SYSBOOT> SET UAFALTERNATE 1
   ```

3. If your system is running DECwindows software, you must also disable the windowing system by entering the following command:

   ```
   SYSBOOT> SET WINDOW_SYSTEM 0
   ```

4. Enter the CONTINUE command to continue booting:

   ```
   SYSBOOT> CONTINUE
   ```

5. When the startup procedure completes, log in on the console terminal by entering any user name and any two passwords in response to the *Username:* and *Password:* prompts.

6. Enter the following command to use the default UAF:

   ```
   $ DEFINE/SYSTEM/EXECUTIVE_MODE SYSUAF SYS$SYSTEM:SYSUAF.DAT
   ```

7. Use the Authorize utility to fix the problem that caused you to be locked out of the system (for example, a forgotten password). Enter HELP MODIFY at the UAF> prompt for information about modifying passwords. For more details, see the *OpenVMS System Management Utilities Reference Manual*.

8. Enter the following commands to invoke SYSMAN and clear the UAFALTERNATE system parameter you set in step 2:

   ```
   $ RUN SYS$SYSTEM:SYSMAN
   SYSMAN> PARAMETERS USE CURRENT
   SYSMAN> PARAMETERS SET UAFALTERNATE 0
   ```

   In most cases, Digital recommends that you use AUTOGEN to modify system parameters. However, because this parameter is only being changed temporarily, you can use SYSMAN to change it back.

9. If you disabled the windowing system in step 3, reenable it by entering the following command:

   ```
   SYSMAN> PARAMETERS SET WINDOW_SYSTEM 1
   ```

10. Enter the following command to save the changed system parameter values:

    ```
    SYSMAN> PARAMETERS WRITE CURRENT
    ```

11. Shut down and reboot the system.

Example

```
SYSBOOT> SET UAFALTERNATE 1
SYSBOOT> SET WINDOW_SYSTEM 0
SYSBOOT> CONTINUE
Username: Return
Password: Return
Password: Return
$ DEFINE/SYSTEM/EXECUTIVE_MODE SYSUAF SYS$SYSTEM:SYSUAF.DAT
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
AUTHORIZE> MODIFY SYSTEM/PASSWORD=FGLFTUTU
AUTHORIZE> EXIT
$ RUN SYS$SYSTEM:SYSMAN
SYSMAN> PARAMETERS USE CURRENT
SYSMAN> PARAMETERS SET WINDOW_SYSTEM 1
SYSMAN> PARAMETERS SET UAFALTERNATE 0
SYSMAN> PARAMETERS WRITE CURRENT
SYSMAN> EXIT
$ @SYS$SYSTEM:SHUTDOWN
```

A.2 Set, Show, and Writeboot Operations

The following sections describe how to perform SET, SHOW, and Writeboot operations.

A.2.1 Setting the System for Automatic Booting

Alpha computers can boot automatically from a designated boot device. When you installed the OpenVMS Alpha operating system, you designated the system disk as the default boot device. Section A.2.2 describes how to change the default boot device.

A.2.1.1 When Systems Can Boot Automatically

Alpha computers can boot automatically from the default boot device under the following conditions:

- When you first turn on system power
- When system power comes on after a power failure
- After you shut down the system (if you enter Y when the shutdown procedure asks if an automatic reboot should be performed)
- After a bugcheck
- If the system halts under program control

A.2.1.2 How to Set the System

Set the system to boot automatically by performing the following steps:

IF ...	THEN ...
the OpenVMS Alpha operating system is running,	go to step 1.
the OpenVMS Alpha operating system is *not* running,	go to step 4.

1. Log in to the SYSTEM account.
2. Enter the following command and press the Return key:

   ```
   $ @SYS$SYSTEM:SHUTDOWN
   ```

3. Answer the questions displayed by the system. When the procedure asks if an automatic reboot should be performed, press the Return key for NO. When the procedure is finished, it displays the following message:

   ```
   SYSTEM SHUTDOWN COMPLETE
   ```

4. Halt the system by entering Ctrl/P or by pressing the Halt button. (See Section A.3.1 for more information about how to halt your Alpha computer.)

5. If you have an SMP system with multiple CPUs, enter the following command at the console prompt (>>>) to stop the other CPUs:

   ```
   >>> INITIALIZE
   ```

6. Enter the following command to show whether the system has been set to boot automatically:

   ```
   >>> SHOW AUTO_ACTION
   ```

   The system displays one of the following:

   - Restart
   - Boot
   - Halt

7. Enter the SET AUTO_ACTION command if you want to change the automatic booting behavior. For example, the following command sets the system to reboot automatically:

   ```
   >>> SET AUTO_ACTION RESTART
   ```

8. After you set this variable, Digital recommends that you set the boot device and operating system flags as well, using the SET BOOTDEF_DEV and SET BOOT_OSFLAGS commands described in the following sections.

A.2.2 Setting and Showing Boot Devices

Use the SET BOOTDEF_DEV command to tell the system which drive you want to boot from (that drive becomes the default boot device). Use the SHOW BOOTDEF_DEV command to display the current default boot device.

Note that when you set this variable, Digital recommends that you set the operating system boot parameters as well, using the SET BOOT_OSFLAGS command.

A.2.2.1 Setting the Boot Device

At the console prompt (>>>), enter the SET BOOTDEF_DEV command in the following format:

SET BOOTDEF_DEV *device-name*

Substitute the device name of the system disk for *device-name*. For example, to boot from a drive with a device name of DKA400 on a DEC 3000 Alpha series computer, enter the following command and press the Return key:

```
>>> SET BOOTDEF_DEV DKA400
```

The next time you boot the system, you can enter the BOOT command without specifying a device name (because DKA400 is now the default boot device). For example:

```
>>> BOOT
```

Note: If you have not used the SET BOOTDEF_DEV command to set the drive to boot from and you enter the BOOT command without specifying a device name, the system displays an error message.

A.2.2.2 Showing the Boot Device

Use the SHOW BOOTDEF_DEV command to find out what drive was specified in the last SET BOOT command. For example:

```
>>> SHOW BOOTDEF_DEV
```

A.2.2.3 Cancelling the Boot Device

To cancel the drive specified in a previous SET BOOTDEF_DEV command, enter the following command and press the Return key:

```
>>> SET BOOTDEF_DEV
```

Note: This command is not valid on DEC 3000 Alpha series systems.

A.2.3 Setting Boot Parameters

By default, when you boot the operating system, the flags parameter is set to 0. If you want to define parameters to enable specific functions during the booting process, use the SET BOOT_OSFLAGS console command.

A.2.3.1 List of Valid Parameters

The following is a list of values you can specify with the SET BOOT_OSFLAGS command:

Hexadecimal Value	System Response
1	Allows a conversational boot (the system displays the SYSBOOT> prompt).
2	Maps XDELTA to a running system.
4	Stops the boot procedure at the initial system breakpoint.
8	Performs a diagnostic bootstrap.
10	Stops the boot procedure at the bootstrap breakpoints.
20	Omits header from secondary bootstrap image.
80	Prompts for the name of the secondary bootstrap file.
100	Halts the system before the secondary bootstrap.
2000	Marks corrected read data error pages as bad.
10000	Displays extensive, detailed debug messages during the boot process.
20000	Displays selected user-oriented messages during the boot process.

A.2.3.2 How to Enter the SET BOOT_OSFLAGS Command

The following examples show how to use the SET BOOT_OSFLAGS command:

- The following command specifies the root directory as 0 and the parameter as 1, which sets the system to perform a conversational boot from the [SYS0] directory when you enter the BOOT command:

  ```
  >>> SET BOOT_OSFLAGS 0,1
  ```

- The following command specifies the root directory as 1 and the parameter as 0, which sets the system (for example, the second host in a two-system DSSI OpenVMS Cluster configuration) to boot from the [SYS1] directory (instead of [SYS0]) when you enter the BOOT command:

  ```
  >>> SET BOOT_OSFLAGS 1,0
  ```

- The following example specifies the root directory as 0 and the parameters as 1, 2, 4, and 20000 (for a total hexadecimal value of 20007). As a result, when you enter the BOOT command, the system will perform a conversational boot from the [SYS0] directory with XDELTA, stop at the initial system breakpoint, and display relevant user messages.

  ```
  >>> SET BOOT_OSFLAGS 0,20007
  ```

A.2.3.3 Displaying Parameters

To display the parameters you have just set, use the SHOW BOOT_OSFLAGS command. For example:

```
>>> SHOW BOOT_OSFLAGS
BOOT_OSFLAGS = 0,20007
```

A.2.4 Using the Writeboot Utility

The Writeboot utility (WRITEBOOT.EXE) is copied to your system disk during the installation procedure. It allows you to create a bootable OpenVMS Alpha system disk from one that was originally created by one of the following methods:

- A nonimage backup of an Alpha system disk (possibly corrupting the boot block)
- A nonimage restore of an Alpha system disk from an image save set

The Writeboot utility also allows you to rewrite the boot block of an OpenVMS Alpha system disk to point to a new version of the OpenVMS Alpha primary bootstrap file (APB.EXE) that you have previously copied to the disk. (Note that the file must be contiguous.)

To invoke the Writeboot utility, enter the following command:

```
$ RUN SYS$SYSTEM:WRITEBOOT
```

The utility prompts you as follows:

```
Update VAX portion of boot block (default is Y):
Update Alpha portion of boot block (default is Y):
```

Answer N (No) to the VAX prompt. If you answer Y (Yes) to update the Alpha boot block, the utility prompts you for the Alpha boot file:

```
Enter Alpha boot file:
```

Specify *device-name:*[VMS$COMMON.SYSEXE]APB.EXE in response to this prompt, where *device-name:* indicates the device on which the system disk is mounted.

A.3 Halt and Shutdown Operations

The following sections describe halt and shutdown operations for Alpha computers.

A.3.1 Halting the System

During installation, upgrade, and related system operations, you might need to halt your system. The methods for halting Alpha computers differ slightly with certain models, as described in the next section.

The following table summarizes the ways you can halt specific Alpha computers:

Alpha Computer	How to Halt
AlphaServer 1000, 2000, 2100 series	Do one of the following: • Press the Halt button. • Press Ctrl/P.
AlphaServer 8200, 8400 series	Press Ctrl/P.
AlphaStation 200, 400, 600 series	Do one of the following: • Press the Halt button (if the graphics monitor is serving as the console). • Press Ctrl/P (if you are using the alternate console and port).
DEC 2000, 3000 series	Do one of the following: • Press the Halt button (if the graphics monitor is serving as the console). • Press Ctrl/P (if you are using the alternate console and port).
DEC 4000 series	Do one of the following: • Press the Halt button. • Press the Break key on the console (the default setting). • Press Ctrl/P, but only after using the console command SET TTA0_HALTS *n* to enable this key combination, where *n* can be 6 (enables the Break key and Ctrl/P) or 2 (enables Ctrl/P but disables the Break key).
DEC 7000, 10000 series	Press Ctrl/P.

A.3.2 Shutting Down the System

Before you shut down the operating system, decide if you want it to reboot automatically or if you want to enter console-mode commands after the shutdown completes.

You can perform the following three types of shutdown operations:

- An orderly shutdown with SYS$SYSTEM:SHUTDOWN.COM
- An emergency shutdown with OPCCRASH.EXE
- An emergency shutdown with crash commands

If you want the system to reboot automatically after the shutdown, see Section A.2.1.

A.3.2.1 Orderly Shutdown

The SHUTDOWN.COM procedure shuts down the system while performing maintenance functions such as disabling future logins, stopping the batch and printer queues, dismounting volumes, and stopping user processes. To use the SHUTDOWN.COM command procedure, log in to the SYSTEM account, enter the following command, and press the Return key:

```
$ @SYS$SYSTEM:SHUTDOWN
```

For more information about the SHUTDOWN.COM command procedure, see the *OpenVMS System Manager's Manual*.

A.3.2.2 Emergency Shutdown with OPCCRASH.EXE

If you cannot perform an orderly shutdown with the SHUTDOWN.COM procedure, run the OPCCRASH.EXE emergency shutdown program. To run the OPCCRASH.EXE program, log in to the SYSTEM account, enter the following command, and press the Return key:

```
$ RUN SYS$SYSTEM:OPCCRASH
```

For more information about the OPCCRASH program, see the *OpenVMS System Manager's Manual*.

A.3.2.3 Emergency Shutdown with Crash Commands

Use crash commands only if the system is ''hung'' (stops responding to any commands) and you cannot log in to the SYSTEM account to use the SHUTDOWN.COM procedure or the OPCCRASH.EXE program.

Note: The method described here works on all Alpha computers. However, on certain systems, you can force your processor to fail (crash) by entering a specific console command. See the hardware manuals that came with your computer for that information.

To force your processor to fail, do the following:

1. Halt the system by entering Ctrl/P or by pressing the Halt button. (See Section A.3.1 for more information about how to halt your Alpha computer.)
2. To examine processor registers, enter the following commands and press the Return key:

   ```
   >>> E -N F R0
   >>> E PS
   ```

   The system displays the contents of the registers. Write down these values if you want to save information about the state of the system.
3. Enter the following commands and press the Return key:

   ```
   >>> D PC FFFFFFFF00000000
   >>> D PS 1F00
   ```

   By depositing these values, you cause the system to write a memory dump to the system dump file on the disk.
4. Enter the following command and press the Return key:

   ```
   >>> CONTINUE
   ```

   This causes the system to perform a bugcheck.
5. After the system reboots, log in to the SYSTEM account.

6. To examine the dump file, enter the following commands and press the Return key after each one:

```
$ ANALYZE/CRASH SYS$SYSTEM:SYSDUMP.DMP
SDA> SHOW CRASH
```

For more information about the System Dump Analyzer (SDA) utility, see the *OpenVMS Alpha System Dump Analyzer Utility Manual*.

A.4 Troubleshooting Procedures

The following sections describe procedures that you can follow if you encounter problems with your system.

A.4.1 If the System Does Not Boot

If the system does not boot because a hardware problem occurs, a question mark (?) usually precedes the error message displayed on the console terminal. An example of a hardware problem is a read error on a disk or tape cartridge drive.

A.4.1.1 For Hardware Problems

If you suspect a hardware problem, do the following:

1. Consult the hardware manual for your Alpha computer.
2. Contact a Digital support representative.

A.4.1.2 For Software Problems

When the operating system is loaded into memory, a message similar to the following appears on the terminal screen:

```
SYSTEM   job terminated at 19-DEC-1996 15:05:03.17
```

If the system does not display this message, a software problem has probably occurred. Do the following:

1. Turn off the system. Turn it back on and try to reboot.
2. Perform a conversational boot using the default system parameters or try one of the emergency boot procedures.
3. If the system boots, run the AUTOGEN procedure. For more information about the AUTOGEN procedure, see the *OpenVMS System Manager's Manual*.

A.4.2 Detecting and Responding to System Problems

If your system exhibits unexpected behavior, note the following:

- If the system displays a bugcheck message on the console terminal and shuts itself down, it means the system encountered a problem that made further operation impossible or dangerous. Reboot the system as explained in Section A.1.2, or let it reboot automatically as explained in Section A.2.1.
- If the system stops responding to your commands (that is, the system ''hangs''), there is a possible failure in a system software or hardware component or a possible power failure.
- If the system exhibits erratic behavior (it does not respond according to specifications), it indicates a possible failure in a system software or hardware component.

A.4.2.1 Detecting System Problems

To determine if the failure is a system problem, do the following:

- Be sure that you did not press the F1 key (the Hold Screen key). The Hold Screen light goes on when you press either F1 or enter Ctrl/S.
- Enter Ctrl/T to check the status of your process. A status line should appear, indicating the name of the program that is executing and other information. If the status line does not appear, the program you are executing might be stalled or ''hung.'' (If you have disabled Ctrl/T by entering the command SET NOCONTROL=T or have set the terminal to NOBROADCAST mode by entering the command SET TERMINAL/NOBROADCAST, this procedure does not work.)
- Make sure the cable connecting the terminal or monitor to the system is secure.

A.4.2.2 How to Respond

If you determine that you have a system problem, do the following:

1. Force an exit from a stalled or ''hung'' program by entering Ctrl/Y. Note that when you enter Ctrl/Y, any work performed by the program and not saved on disk is lost.
2. If the system is still unresponsive, halt it by entering Ctrl/P or by pressing the Halt button. (See Section A.3.1 for more information about how to halt your Alpha computer.)
3. Note in detail the sequence of events that caused the problem and notify a Digital support representative.

B

Backing Up and Restoring the System Disk

B.1 Overview

This appendix describes how to perform backup and restore operations on the system disk. You perform these tasks by entering commands from a specialized backup environment. You access this environment through the menu that is displayed when you boot the OpenVMS Alpha operating system CD–ROM or through an alternate method that does not require the CD–ROM.

This specialized backup environment is required because it allows you to create an *exact* copy of the system disk. You cannot create an exact copy in a standard operating system environment because the OpenVMS Backup utility saves only what is on the disk at the moment the BACKUP command is executing, excluding portions of open files contained in memory or data about files not yet written back to the disk (cache).

For more information about backup operations, including procedures for backing up and restoring files and directories, see the *OpenVMS System Manager's Manual*.

B.1.1 Reasons for Backing Up the System Disk

The primary reason why you should have a backup copy of the system disk is so you can fully restore your system in response to any hardware or software problem that affects the integrity of your original system disk or your ability to access it. For example, you would need to use the backup copy to restore your system under the following conditions:

- When a problem occurs during an OpenVMS Alpha upgrade or update, or during the installation of other software products. If you backed up the system disk *before* you attempted any of those procedures, you could restore the system disk and attempt the procedure again.
- When a system file that is accidentally deleted renders the system disk inoperable. If you backed up the system disk *after* you installed or upgraded the OpenVMS Alpha operating system and any other software products, you could restore the system disk.
- When the drive that holds the system disk malfunctions. If you have a backup copy of the system disk, you can restore it to a functioning disk and continue to use the system.

Another reason for backing up the system disk is to eliminate disk fragmentation, which occurs when files are stored noncontiguously on the disk. The BACKUP /IMAGE command creates a copy on which files are stored contiguously.

B.1.2 Suggested Procedures

Digital recommends the following:

- The preferred method for performing system disk backup and restore operations is to boot the operating system CD–ROM, choose the DCL option from menu, and then enter the appropriate backup commands. The detailed procedures are described in Section B.2 and Section B.3.

  However, if you do not have access to the compact disk or if you want to back up a shadowed system disk without disabling the shadow set, you can use a different procedure, described in Section B.4.

- Store the backup media in a safe place.

- If you have an OpenVMS Cluster environment with more than one system disk, be sure the volume label on each system disk and backup copies of system disks are unique. Use the SET VOLUME/LABEL command to change a volume label, if necessary.

B.1.3 OpenVMS Cluster Caution

If any nodes except the node used to run BACKUP are booted during the backup operations described in this appendix, your cluster will become partitioned, where nodes in the existing cluster divide into two or more independent clusters. This condition can cause data file corruption.

In addition, these backup environments do not restrict your use of DCL commands to the BACKUP command only, which further increases your risk of accidentally destroying or corrupting data on a disk. Therefore, to avoid jeopardizing the integrity of your data in any way, Digital recommends that you shut down the entire OpenVMS Cluster system before you back up your system disk.

B.2 Backing Up the System Disk

The following sections describe how to back up the system disk.

B.2.1 Getting Started

Before you back up the system disk, do the following:

1. In an OpenVMS Cluster environment, dismount the system disk from all systems in the cluster that have the disk mounted as a data disk (rather than as the system disk).
2. Shut down all systems booted from that disk.
3. Boot the operating system CD–ROM locally or from the InfoServer (as described in Appendix A).
4. Choose the DCL option (7) from the menu. For example:

```
************************************************************

You can install or upgrade the OpenVMS Alpha operating system.
You can also execute DCL commands and procedures to perform
"standalone" tasks, such as backing up the system disk.
Please choose one of the following:
```

```
     1)  Install or upgrade OpenVMS Alpha Version V7.1
     2)  Display products that this procedure can install
     3)  Install or upgrade layered products
     4)  Show installed products
     5)  Reconfigure installed products
     6)  Remove installed products
     7)  Execute DCL commands and procedures
     8)  Shut down this system

   Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?) 7
```

5. At the triple dollar sign prompt ($$$), enter the SHOW DEVICES command.
6. Examine the list of devices so you can determine which device is the source drive (the system disk you want to back up) and which device is your target drive (the supported disk or tape device that will hold the backed up files).

B.2.2 Mounting Devices

When you have determined which devices will be the source drive and target drive, mount those devices (and any other output devices you plan to use) before you perform any backup operations. Enter the MOUNT commands in the following format:

```
$$$ MOUNT/OVERRIDE=IDENTIFICATION  source-drive
$$$ MOUNT/FOREIGN target-drive
```

Note the following conventions:

- *source-drive* is the name of the drive holding the system disk.
- *target-drive* is the name of the drive that will hold the backup files.

B.2.3 Entering the BACKUP Command

When the system disk and output devices are mounted, back up the system disk by entering the BACKUP command in the following format:

```
$$$ BACKUP/IMAGE/VERIFY source-drive: target-drive:
```

(You must also include the save set name and the /SAVE_SET qualifier if the target drive is a tape device.)

B.2.4 Examples

In this example the system disk and a target disk are mounted so the BACKUP command can create a backup disk. (You can use a backup disk as a system disk.)

```
$$$ MOUNT/OVERRIDE=IDENTIFICATION DKA200
$$$ MOUNT/FOREIGN DKA300
$$$ BACKUP/IMAGE/VERIFY DKA200: DKA300:
```

In this example the system disk and a target tape device are mounted so the BACKUP command can create a backup tape.

```
$$$ MOUNT/OVERRIDE=IDENTIFICATION DKA200
$$$ MOUNT/FOREIGN MKA300
$$$ BACKUP/IMAGE/VERIFY DKA200: MKA300:APR_06_BACKUP.BCK/SAVE_SET
```

B.2.5 Changing the CLUSTER_SIZE Parameter

The BACKUP command creates a system disk that includes a set of volume parameters provided by Digital, including a CLUSTER_SIZE (disk access scheme) that is appropriate for your system. (The CLUSTER_SIZE refers to the way files are stored on the disk, *not* to cluster environments.) You can change most volume parameters later with the SET VOLUME command.

However, to change the CLUSTER_SIZE, you must back up the system disk to a disk that has been previously initialized with the CLUSTER_SIZE that you want. For more information about initializing a disk and using the BACKUP command, see the *OpenVMS System Manager's Manual* and the *OpenVMS System Management Utilities Reference Manual*, and see the description of the INITIALIZE and BACKUP commands in the *OpenVMS DCL Dictionary*.

B.2.6 What to Do Next

After you complete the backup operation, do the following:

1. Enter the LOGOUT command to exit from the DCL environment and return to the menu.
2. Choose the shutdown option (8).
3. After the shutdown completes, boot from the system disk.

B.3 Restoring the System Disk

The following sections describe how to restore the system disk.

B.3.1 Getting Started

Before you can restore the system disk, you must do the following:

1. Shut down the system.
2. Boot the operating system CD–ROM locally or from the InfoServer (as described in Appendix A).
3. Choose the DCL option (7) from the menu. For example:

```
****************************************************************

You can install or upgrade the OpenVMS Alpha operating system.
You can also execute DCL commands and procedures to perform
"standalone" tasks, such as backing up the system disk.

Please choose one of the following:

    1)  Install or upgrade OpenVMS Alpha Version V7.1
    2)  Display products that this procedure can install
    3)  Install or upgrade layered products
    4)  Show installed products
    5)  Reconfigure installed products
    6)  Remove installed products
    7)  Execute DCL commands and procedures
    8)  Shut down this system

Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/?) 7
```

4. At the triple dollar sign prompt ($$$), enter the SHOW DEVICES command.
5. Examine the list of devices so you can determine which device is the source drive (the drive holding the backed up files you want to restore) and which device is your target drive (the disk on which you want the files restored).

B.3.2 Mounting Devices

When you have determined which devices will be the source drive and target drive, mount those devices (and any other output devices you plan to use) before you perform any restore operations. Enter the MOUNT commands in the following format:

```
$$$ MOUNT/OVERRIDE=IDENTIFICATION  source-drive
$$$ MOUNT/FOREIGN target-drive
```

Note the following conventions:

- *source-drive* is the device holding the files you want to restore.

  (Note, however, that you must use the MOUNT/FOREIGN command if the source drive is a tape device.)

- *target-drive* is the destination.

B.3.3 Entering the BACKUP Command

Enter the BACKUP command in the following format:

```
$$$ BACKUP/IMAGE/VERIFY source-drive: target-drive:
```

(You must also include the save set name and the /SAVE_SET qualifier if the source drive is a tape device.)

B.3.4 Examples

In this example a backup disk and a target disk are mounted so the BACKUP command can restore the system disk from the backup disk:

```
$$$ MOUNT/OVERRIDE=IDENTIFICATION DKA300
$$$ MOUNT/FOREIGN DKA200
$$$ BACKUP/IMAGE/VERIFY DKA300: DKA200:
```

In this example a backup tape and a target disk are mounted so the BACKUP command can restore the system disk from the backup tape:

```
$$$ MOUNT/FOREIGN MKA300
$$$ MOUNT/FOREIGN DKA200
$$$ BACKUP/IMAGE/VERIFY MKA300:APR_06_BACKUP.BCK/SAVE_SET DKA200:
```

B.3.5 What to Do Next

After you complete the restore operation, do the following:

1. Enter the LOGOUT command to exit from the DCL environment and return to the menu.
2. Choose the shutdown option (8).
3. After the shutdown completes, boot from the system disk.

B.4 Alternate Backup and Restore Procedure

This section describes an alternate method of performing backup and restore operations on your system disk. With this method, you install the operating system (without options) on another disk and perform your backup and restore operations on the system disk from there. Use this method under the following conditions:

- If you do not have access to the operating system CD–ROM and its menu system
- If you want to back up a shadowed system disk without disabling the shadow set

Note: It it also possible to back up your running system disk by using the qualifier /IGNORE=INTERLOCK with the BACKUP command and ignoring warning messages. However, that method requires that all other use of the system be suspended, including disabling logins, stopping print and batch queues, and turning off networking software. In addition, you cannot use this method to restore files to the running system disk. Because of these limitations, Digital

recommends that if you must use an alternate method to back up or restore the system disk, you use the method described in this section.

B.4.1 Preparing an Alternate Disk

Prepare an alternate disk as follows:

1. Log in to a privileged account on your running OpenVMS Alpha system.
2. Using the SHOW DEVICE command, identify a data disk on which you can install the operating system, with no options. This will be your target disk during that installation. Note the following:
   - You will need approximately 75,000 blocks to install the operating system with no options.
   - Existing data will remain on the disk.
3. The target disk must be mounted privately to your process. (This prevents other users from accessing this disk during the installation and backup procedures.) Therefore, if the target disk was mounted with /SYSTEM, /CLUSTER, /GROUP, or /SHARE, dismount that disk and mount it without using those qualifiers or the /FOREIGN qualifier. For example:

   ```
   $ MOUNT/OVERRIDE=IDENTIFICATION DKA200
   ```

4. Enter the following command to install the OpenVMS Alpha operating system, with no options, on the target disk:

   ```
   $ @SYS$SYSTEM:AXPVMS$PCSI_INSTALL_MIN.COM [target-disk]
   ```

   (The procedure will prompt you for a device name if you do not specify it on the command line.)

5. As the procedure completes the installation, the display is similar to the following:

   ```
   *** DEC AXPVMS VMS V7.1: VMS Operating System, Version V7.1

       COPYRIGHT © (c) 21-NOV-1996 -- All rights reserved

       Digital Equipment Corporation

   %PCSIUI-I-DONEASK, execution phase starting
   The following product will be installed:
   DEC AXPVMS VMS V7.1
   %PCSI-I-VOLINFO, estimated space information for volume DISK$MINAlpha
   -PCSI-I-VOLSPC, -1 required; 741063 available; 741064 net
   Portion Done: 0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
   The following product has been installed:
   DEC AXPVMS VMS V7.1
       .
       .
       .
       The installation of minimum OpenVMS Alpha is now complete.

       Use the following command to boot minimum OpenVMS:

           BOOT -FLAGS E,0 <device-name>

       (Your system may require additional parameters to boot.)
   ```

   Caution: If your system is a cluster member, Digital recommends that you shut down the entire OpenVMS Cluster system before you back up your system disk. This will prevent you from creating a partitioned cluster and from jeopardizing the integrity of your data in any other way.

B.4.2 Using the Alternate Disk

Use the alternate disk (on which you installed the operating system with no options) to perform backup and restore operations as follows:

1. Shut down your system.
2. Boot the alternate disk from the SYSE root. For example:

   ```
   >>> BOOT -FLAGS E,0 DKA200
   ```

   The system automatically logs you in to the SYSTEM account and then displays a triple dollar sign prompt ($$$).

   Note: During the boot and login operations on this minimum version of the operating system, you can ignore license messages that are similar to the following:

   ```
   %LICENSE-I-NOLICENSE, no license is active for this software product
   ```

3. If your system disk is shadowed, install and load a Volume Shadowing license on this data disk. You will then be able to back up the shadowed system disk from this data disk without disabling the shadow set.

   Note: Digital recommends that you do *not* install any other licenses, including OpenVMS licenses, on this alternate system. You will be able to use the system only from the console.

4. Mount the system disk and any output devices you plan to use during the backup or restore operations.
5. Perform the necessary backup and restore operations by entering the appropriate BACKUP commands.
6. Shut down the system.
7. Boot from your original system disk.

C
License Management Supplement

This appendix contains information that supplements the license instructions in this manual and in the *OpenVMS License Management Utility Manual*.

After you install the OpenVMS Alpha operating system, you must register OpenVMS Alpha licenses, which let you use the OpenVMS Alpha operating system. You must also register the licenses for the OpenVMS Alpha layered products you have purchased, such as DECnet for OpenVMS. (Note that after an upgrade, however, you do not have to reregister licenses for the OpenVMS Alpha operating system or for the layered products.) To register a license, you need to obtain a Product Authorization Key (PAK). A PAK is a printed document provided by Digital that contains the appropriate information to authorize access to software on an Alpha computer (or in an OpenVMS Cluster environment). You can obtain a PAK from a Digital support representative in the same way as you obtain software.

C.1 Using the License Unit Requirement Table (LURT)

Many PAKs contain a table name in the availability or activity fields. This name refers to a column in the License Unit Requirement Table (LURT), which is shown in Table C–1. Column A in the LURT indicates the number of license units required for each processor listed in the System Marketing Model column. Column H refers to layered products you may choose to register as well. For example, if your PAK specifies *availability = A*, you would require 50 license units to load the license on a DEC 3000 Alpha Model 500 series computer, or 500 license units to load the license on a DEC 7000 Alpha Model 610 computer.

Note that some PAKs specify MOD_UNITS in the options field. The MOD_UNITS option allows the system manager to use the DCL command LICENSE MODIFY /UNITS to temporarily increase the size of the PAK. This permits a product to be used, in certain emergency situations, on a processor larger than the processor size specified in the license. Check your license terms and conditions before modifying license units. Reset the PAK size to its original size after the emergency situation is resolved.

License Management Supplement
C.1 Using the License Unit Requirement Table (LURT)

Table C–1 License Unit Requirement Table (LURT)

System Marketing Model	A	H
ALPHAbook 1	12	1050
AlphaServer 400	12	1050
AlphaServer 1000, 1000A	15	1050
AlphaServer 2000, 2000A (1 CPU)	400	1100
AlphaServer 2000, 2000A (2 CPU)	500	1100
AlphaServer 2100, 2100A (1 CPU)	400	1100
AlphaServer 2100, 2100A (2 CPU)	500	1100
AlphaServer 2100, 2100A (3 CPU)	600	1100
AlphaServer 2100, 2100A (4 CPU)	700	1100
AlphaServer 4100 (1 CPU)	400	1100
AlphaServer 4100 (2 CPU)	500	1100
AlphaServer 4100 (3 CPU)	600	1100
AlphaServer 4100 (4 CPU)	700	1100
AlphaServer 8200 (1 CPU)	2000	1150
AlphaServer 8200 (2 CPU)	2100	1150
AlphaServer 8200 (3 CPU)	2200	1150
AlphaServer 8200 (4 CPU)	2300	1150
AlphaServer 8200 (5 CPU)	2400	1150
AlphaServer 8200 (6 CPU)	2500	1150
AlphaServer 8400 (1 CPU)	2600	1150
AlphaServer 8400 (2 CPU)	2700	1150
AlphaServer 8400 (3 CPU)	2800	1150
AlphaServer 8400 (4 CPU)	2900	1150
AlphaServer 8400 (5 CPU)	3000	1150
AlphaServer 8400 (6 CPU)	3100	1150
AlphaServer 8400 (7 CPU)	3200	1150
AlphaServer 8400 (8 CPU)	3300	1150
AlphaServer 8400 (9 CPU)	3400	1150
AlphaServer 8400 (10 CPU)	3500	1150
AlphaServer 8400 (11 CPU)	2600	1150
AlphaServer 8400 (12 CPU)	2600	1150
AlphaStation 205, 250, 255, 500	12	1050
AlphaStation 400	12	1050
AlphaStation 600	12	1050

Key to License Type Codes and Values:

A—The number of OpenVMS Alpha operating system license units (Unlimited or Base) required for the system.
B through G—Omitted from table; reserved for future use.
H— The number of OpenVMS Alpha layered products license units required for the system.

(continued on next page)

Table C–1 (Cont.) License Unit Requirement Table (LURT)

System Marketing Model	A	H
DEC 2000-300/300S	12	1050
DEC 2000-500/500S	12	1050
DEC 3000-300	15	1050
DEC 3000-300L	15	1050
DEC 3000-400/400S	20	1050
DEC 3000-600/600S	20	1050
DEC 3000-500/500S	50	1100
DEC 3000-500X	50	1100
DEC 3000-800/800S	50	1100
DEC 4000-610	300	1150
DEC 4000-620	400	1200
DEC 4000-710	300	1150
DEC 4000-720	400	1200
DEC 7000-610	500	1200
DEC 7000-620	600	1250
DEC 7000-630	700	1250
DEC 7000-640	800	1250
DEC 10000-610	800	1250
DEC 10000-620	900	1300
DEC 10000-630	1000	1300
DEC 10000-640	1100	1300

Key to License Type Codes and Values:

A—The number of OpenVMS Alpha operating system license units (Unlimited or Base) required for the system.
B through G—Omitted from table; reserved for future use.
H— The number of OpenVMS Alpha layered products license units required for the system.

C.2 License Management Facility (LMF) Notes

The following list addresses some common concerns and questions regarding the License Management Facility (LMF). For full explanations of these issues, see the *OpenVMS License Management Utility Manual*.

- If you do not have a valid OpenVMS Alpha license that is registered and activated, the system displays a warning message as part of system startup and restricts system use to the operator's console, OPA0.
- If a checksum error is displayed when you register a license, check *all* the fields of data that you entered, including the checksum itself.
- After your PAKs are registered, they are activated (loaded) automatically as part of each system startup.
- If an OpenVMS Alpha license is registered with insufficient license units, the system displays the following message when the user (process) attempts to log in:

  ```
  %LICENSE-F-EXCEEDED, licensed product has exceeded current license limits
  ```

  Users can always log in to the operator's console, OPA0, however.
- The default LICENSE database is located in the file SYS$COMMON:[SYSEXE]LMF$LICENSE.LDB. You can move the database, although Digital does not recommend doing so. If you move the database, you must either define the logical name LMF$LICENSE at the system level to point to the new database or use the /DATABASE=*filespec* qualifier with all LICENSE commands. To redirect LMF to another database location on a more permanent basis, add the following line to the command procedure SYS$MANAGER:SYLOGICALS.COM:

  ```
  $ DEFINE/SYSTEM LMF$LICENSE device:[directory]LMF$LICENSE.LDB
  ```

  If you specify a device other than SYS$SYSDEVICE, you must also mount the specified disk from the SYLOGICALS.COM command procedure.
- Each OpenVMS Alpha find license is restricted to a single node for permanent PAKs. You must assign a System Communications Services (SCS) name to the license when you register with the VMSLICENSE.COM command procedure, or you must enter a LICENSE MODIFY/INCLUDE=*node-name* command after you register the license.

  Note: The SCS node name is not necessarily the DECnet node name. SCSNODE is a system parameter; it can be a maximum of six alphabetic characters.

C.2.1 Restrictions

Availability Product Authorization Keys (PAKs) are available for the OpenVMS Alpha operating system. An OpenVMS Alpha PAK is identified by the keyword ALPHA in the PAK's option field. Note the following restrictions:

- PAKs having the ALPHA option can be loaded and used only on Alpha computers. However, they can safely reside in a license database (LDB) shared by both VAX and Alpha systems.
- Because the LMF for Alpha systems is capable of handling all types of PAKs, including those for VAX systems, Digital recommends that you perform your LDB tasks using the Alpha LMF.

- Availability PAKs for VAX systems (availability PAKs without the ALPHA option) will not load on Alpha systems. Only those availability PAKs containing the ALPHA option will load on Alpha systems.
- Other PAK types such as activity (also known as concurrent or n-user) and personal use (identified by the RESERVE_UNITS option) work on both VAX and Alpha systems.
- Avoid using the following LICENSE commands from a VAX system on a PAK containing the ALPHA option:
  - REGISTER
  - DELETE/STATUS
  - DISABLE
  - ENABLE
  - ISSUE
  - MOVE
  - COPY
  - LIST
- **Caution:** By default, all Alpha availability PAKs look disabled to a VAX system. Never use the DELETE/STATUS=DISABLED command from a VAX system on an LDB that contains Alpha PAKs. If you do, all Alpha PAKs will be deleted.
- With the exception of the DELETE/STATUS=DISABLED command, if you inadvertently use one of the previously listed LICENSE commands on an Alpha PAK while using a VAX system, the PAK and the database will not be adversely affected. Repeat the command using LMF running on an Alpha system, and the PAK should return to a valid state.
- If you do not repeat the command using LMF on an Alpha system, the system that you intended to disable will remain enabled (the system is not otherwise affected). Only the Alpha LMF can disable an Alpha PAK.

  However, if you attempt to use any of the previously listed commands on a PAK located in an LDB that is shared with a VAX system, the following serious problems may result:
  - Because Alpha PAKs look disabled to a VAX system, they are normally ignored at load time by VAX systems. However, if one of the previously listed commands is entered from a VAX system and the PAK information is not set to a valid state by an Alpha system, there is a chance the VAX system will attempt to load the Alpha PAK. Because the VAX system will be unable to load the PAK, the VAX LMF will report an error.
  - Even if a valid VAX PAK for the affected product is in the LDB, it too may not load. In this case, system users might be denied access to the product.

  If the PAK cannot be restored to a valid state because all Alpha systems are inaccessible for any reason, use your VAX system to disable the Alpha PAK. This prevents your VAX system from attempting to load the Alpha PAK.

C.2.2 For More Information

For additional license information, see the release notes and the *OpenVMS License Management Utility Manual*.

D

OpenVMS Alpha Hardware Release Notes

This appendix contains release notes, restrictions, and related information about using the OpenVMS Alpha operating system on the following computers:

- ALPHAbook 1
- AlphaServer 1000A
- AlphaServer 4100
- AlphaServer 2100
- AlphaServer 2100A

This appendix also includes information about graphics support on Alpha computers.

D.1 ALPHAbook 1 Notes

The following sections contain release notes specific to the ALPHAbook 1 notebook computer.

D.1.1 Using the SCSI_MODE Utility

The OpenVMS Alpha operating system includes a generic SCSI_MODE utility that allows privileged users to modify a SCSI device's mode pages. By using this utility to enable automatic disk spindown, users can save approximately 2 watts of power. Because mode pages are saved on the disk drive, the state is saved across power cycles.

The following example shows how to enable automatic SCSI disk spindown after a one minute timeout period. (To select a spindown time other than one minute, replace the ''01'' following the offset f with the desired number of minutes expressed as a 2-digit hexadecimal value.) This procedure is recommended for use only on the internal drive of the ALPHAbook 1 notebook computer. Note that the parameter values shown in this example apply only to DVAS-2810 devices. To identify the SCSI disk devices on your system, use the SHOW DEVICE/FULL DK command.

```
$ define dcl$path sys$etc
$ scsi_mode -devnam dka0 -devtyp DVAS-2810 -offset f 01 -page 38 -mount -save
$!
$! Processing Page #38h
$!
$! Cur   00______ 04______ 08______ 0C______ 10______ 14______ 18______ 1C______
$! 0000  11000008 001829D0 00000200 B80400B4 0000
$!
$! Chng  00______ 04______ 08______ 0C______ 10______ 14______ 18______ 1C______
$! 0000  11000008 001829D0 00000200 B80400FF 0000
$!
$! Sel   00______ 04______ 08______ 0C______ 10______ 14______ 18______ 1C______
$! 0000  00000008 001829D0 00000200 38040001 0000
$! Perform MODE SELECT to page 38h [y/n] ? y
```

D.1.2 Naming Serial Line Devices

If an ALPHAbook 1 notebook computer is booted with the console environment variable set to graphics, the name of the serial line (COM1) will be different. On an ALPHAbook 1, the COM1 device is called TTA0.

The COM1 device is controlled by SYS$YSDRIVER, instead of SYS$OPDRIVER.

If the console is set to serial, the device is called OPA0.

D.1.3 Graphics Display Modes

The ALPHAbook 1 notebook computer contains a Western Digital 90C24A graphics controller displayed on a 10.4 inch active matrix Thin Film Transistor (TFT) display.

Note that, if a video monitor (CRT) is connected, the DECwindows display server software (which automatically detects the presence of an attached video monitor) will set the resolution to 1024 x 768 and disable the TFT display. If the server determines that no monitor is connected, it will force the size to match the LCD (800 x 600) and disable the CRT outputs (which saves power when the computer is running on battery).

D.1.4 Customizing the Graphics Display

You can override the size selection by modifying the SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.COM file.

You can also modify other parameters by using the DCL command DEFINE/SYSTEM for the following logical names:

- DECW$SERVER_DYNAMIC_SIZE

  If defined TRUE, then you will be prompted for the screen size when the system boots. The prompt times out in 10 seconds and the default is set (unless you have overridden the default in your private server setup).

- DECW$SERVER_DISPLAY_SELECT

  You can specify one of the following values:

Value	Result
1	LCD only operation
2	CRT only operation
3	Simultaneous operation

  Note the following:

  – The default is either 3 (if a monitor is available) or 1 (if *no* monitor is available.

  – If you have not explicitly selected the display or the resolution, then 1024 x 768 CRT-only is the default when a monitor is detected. If no monitor is detected, then 800 x 600 LCD-only is selected.

  – If you explicitly select the display, then that selection takes precedence over any other size requests. For example, if you select LCD, the 800 x 600 size supersedes any previous size specification.

- DECW$SERVER_REFRESH_RATE

Selects an alternate vertical refresh rate in Hertz (for example, 60 Hz). The defaults are as follows:

Mode	Resolution	Vertical Refresh Frequency in Hz
LCD Only	800 x 600	56
CRT Only	640 x 480	72
	800 x 600	72
	1024 x 768	70
Other CRT	640 x 480	60
	640 x 480	70
	800 x 600	56
	800 x 600	60[1]
	1024 x 768	60
	1024 x 768	75

[1] Actual refresh is 62 Hz.

- DECW$SERVER_VIRTUAL_MODE

  If this logical is set to 1, note the following:

  – The server operates as a virtual frame buffer.

  – The resolution can be *any* of the previously listed sizes (or higher).

  – An 800 x 600 window is displayed for the internal (TFT) monitor and a 1024 x 768 window is displayed for an external monitor. Moving the pointer to the screen edges pans the display within the virtual frame.

  – Drawing can be slower (due to offscreen memory requirements). Changed areas are updated on a batch count or when the server has no more work. You can set the batch count with the logical DECW$SERVER_BATCH_ COUNT (the default is 10).

D.1.5 Modifying DECterm Options

In the DECterm Options pull-down dialog box, the Window, General, and Printer options cannot be modified because the dialog box is larger than the screen. As a workaround, Digital recommends setting the display server to a large virtual screen size mode, which will allow access to the dialog box. A future version of DECwindows Motif (post-V1.2–3) will add a scroll bar to these dialog boxes for easier access.

D.1.6 UCX Configuration Procedure

The UCX Version 4.0 configuration procedure (UCX$CONFIG.COM) has not yet been updated to include support for the new 3Com PCMCIA Ethernet adapter for the ALPHAbook 1. Therefore, before you run UCX$CONFIG.COM, enter the following command to manually inform UCX of the new Ethernet controller:

```
$ UCX DEFINE COMMUNICATION_CONTROLLER EO /INTERNET_INTERFACE=0 -
_$  /TYPE=(ETHERNET,CLUSTER) /DESCRIPTION=PCMCIA_3COM
```

Other implementations of TCP/IP for OpenVMS may have a similar problem. Check with your TCP/IP vendor about device support for the new Ethernet controller.

D.1.7 PCMCIA Bus Support

The following notes apply to the PCMCIA bus.

Supported PCMCIA Cards

OpenVMS support for the PCMCIA bus on the ALPHAbook 1 system is limited to the following cards:

- 3Com EtherLink III (3C589C)
- Megahertz 28.8 FAX/Modem (XJ2288)
- Apex Data ClipperCom V.34 International Data/FAX Modem (011–20811)

The OpenVMS operating system can configure a maximum of one Ethernet card and one FAX/Modem card.

Hot Swapping PCMCIA Cards Not Supported

Hot swapping (removing and replacing cards while the computer is running) PCMCIA cards is not supported. If a PCMCIA card is inserted or removed while the OpenVMS operating system is running, it could result in a system hang (the system is unresponsive) or a system crash. A future release of the OpenVMS operating system is expected to include support for hot swapping PCMCIA cards.

PCMCIA Modem Setting

The highest recommended baud rate for the Apex Data ClipperCom V.34 International Data/FAX Modem card is 9600. For access to the modem, Digital recommends that you use the following DCL and modem commands:

```
$ SET TERM/PERM/SPEED=9600/ALT/MODEM TTB0:
$ SET HOST/DTE TTB0:
at*ncxx
at&k6
at&s1
at\g1
at\q1
at\x1)
```

(Note that *xx* represents the country number; for example, the United States is 22. See the Apex Data ClipperCom V.34 documentation for a list of country numbers.)

The highest recommended baud rate for the Megahertz 28.8 FAX/Modem card is 9600. For access to the modem, Digital recommends that you use the following DCL and modem commands:

```
$ SET TERM/PERM/SPEED=9600/ALT/MODEM TTB0:
$ SET HOST/DTE TTB0:
at&s1
at&r1
```

Audio Feedback Supported on PCMCIA Modem

Audio feedback is available for the telephone call status.

PCMCIA FAX Support

The Apex Data ClipperCom V.34 International Data/FAX Modem works correctly with the PMDF FAX and Gold-FAX software to transmit data.

The Megahertz 28.8 FAX/Modem works correctly with the PMDF FAX software to send and receive with line speeds up to 19.2 baud. However, if you are using Gold-FAX software to send a Fax, the maximum baud rate allowed with a Megahertz 28.8 FAX/Modem card is 9600 baud.

D.1.8 Audio Support

The DECsound utility included with DECwindows Motif Version 1.2–3 does not support the sound processor on the ALPHAbook 1 system. Audio support is available on the OpenVMS Multimedia services kit, a separately licensed layered product available from Digital.

D.1.9 Keyboard Mapping

The ALPHAbook 1 keyboard is an 88-key, PC layout keyboard. The following notes describe how to set up the keyboard and enable particular key functions.

Keyboard Setup

You can set up the keyboard to either follow the engravings or to map the keys in a manner that makes it easier for you as an OpenVMS user. To set up your keyboard either way, do the following:

1. Click on Options in the Session Manager box.
2. Select Keyboard from the list of options.
3. Select one of the following LK443 or LK444 keyboard types:
   - A keyboard type with the suffix *_PC* maps the keyboard to follow the engravings. For example, US_LK443AA_PC.
   - A keyboard type with the suffix *_LK* sets the keyboard to follow the LK style mapping common to OpenVMS systems. For example, US_LK443AA_LK.

Notes

- The procedure for setting up your keyboard is the same as that required for all current AlphaServer and AlphaStation systems. The only difference is that the ALPHAbook 1 keyboard does not have all of the keys directly on it. (The next section describes how to generate those missing keys.)
- You can also attach an LK411 (LK401 layout) compatible keyboard or a PCXAL (PS2 layout) keyboard directly to the AlphaBOOK 1 computer using the mini-docking station.

Key Functions

When mapping to an LK style keyboard, note the following:

- The right ALT key does not transmit any code. Instead, the keyboard controller generates missing LK style keys when pressed in combination with this key. These alternate keys are engraved in grey on the keyboard. For example, pressing RIGHT-ALT-U ([grey 4]) provides the function of KP4.

Note

By default, the right ALT key is set for the special functions described in the *ALPHAbook 1 User Guide* (such as increasing or decreasing display brightness). To set the right ALT key to perform different functions so you can emulate a LK style keyboard, you must change this setting at the console level by entering the following command at the console prompt:

```
>>> SET HOTKEY OFF
```

After you enter this command, either enter the INIT command or powercycle the system. You can then use the right ALT key to perform the LK style keyboard actions described in this section.

- Two keys are mislabeled. The KP_Subtract and KP_Add are engraved in grey on the minus (-) and plus (+) keys. However, the 0 (zero) and P keys actually provide the function for KP- and KP+ respectively.
- NUMLOCK is generated by SHIFT-NUMLOCK and KP_ENTER is generated by RIGHT-ALT-ENTER.
- There is no way to generate directly RIGHT-ALT, RIGHT-COMPOSE, or LEFT-COMPOSE. You can provide the function of the compose key by pressing LEFT ALT-SPACE.
- You can generate missing function keys by pressing CAPS LOCK-Fn. Pressing CAPS LOCK adds a value of 10 to the function key (Fn) that you also press. For example, pressing CAPS LOCK-F1 generates the F11 key; pressing CAPS LOCK-F2 generates the F12 key.
- Use the following table to help you determine which keys to press to provide the function of the corresponding LK style key.

LK Style Key	ALPHAbook Key Combination
PF1	[SHIFT] [grey Numlock]
PF2	[RIGHT ALT] [grey /]
PF3	[RIGHT ALT] [grey *]
PF4	[RIGHT ALT] [0]
KP,	[RIGHT ALT] [P]
KP-	[LOCK] [RIGHT ALT] [P]
KP_ENTER	[RIGHT ALT] [ENTER]
KP.	[RIGHT ALT] [grey .]
KP0	[RIGHT ALT] [grey 0]
KP1	[RIGHT ALT] [grey 1]
KP2	[RIGHT ALT] [grey 2]
KP3	[RIGHT ALT] [grey 3]
KP4	[RIGHT ALT] [grey 4]
KP5	[RIGHT ALT] [grey 5]
KP6	[RIGHT ALT] [grey 6]
KP7	[RIGHT ALT] [grey 7]

LK Style Key	ALPHAbook Key Combination
KP8	[RIGHT ALT] [grey 8]
KP9	[RIGHT ALT] [grey 9]
FIND	INS
INS	HOME
REMOVE	PAGE UP
SELECT	DEL
PREV	END
NEXT	PAGE DOWN
HELP	PRINT SCREEN
DO	SCROLL LOCK

D.1.10 Shutting Down the System

Previously, turning off the ALPHAbook 1 computer without first shutting down the system caused excessive battery drain. Although Digital recommends that you still run the OpenVMS shutdown procedure (@SYS$SYSTEM:SHUTDOWN.COM) before turning off your computer, it is no longer a requirement.

D.1.11 OpenVMS Cluster Restrictions

Due to controller limitations of the PCMCIA Ethernet card, Digital recommends that you use the ALPHAbook 1 computer only as a satellite node in a cluster environment, rather than as a cluster boot node.

D.1.12 Booting Across the Ethernet

On a busy network segment, the ALPHAbook 1 system may require several retries to downline load a MOP image if you are booting the system as a cluster satellite member. In addition, the system will be unable to reboot until the system has been powercycled. These console problems will be fixed in a future release.

D.2 AlphaServer 1000A Notes

The following sections contain release notes specific to the AlphaServer 1000A computer.

D.2.1 Bus Probe Algorithm

You cannot set the console variable BUS_PROBE_ALGORITHM to *OLD* on AlphaServer 1000A computers. The default setting is *NEW*. If you reset the bus probe algorithm to *OLD*, your OpenVMS system will not boot correctly.

D.2.2 Installation Failure with DEFPA Adapter

When you attempt to install the OpenVMS operating system on an AlphaServer 1000A computer that uses a DEFPA adapter, the installation might fail, resulting in a KERNEL STACK NOT VALID HALT error message. Should this failure occur, powercycle your system and restart the installation.

D.3 AlphaServer 41000 Notes

The following sections contain release notes specific to the AlphaServer 4100 computer.

D.3.1 MEMORY_TEST EV Console Variable

Be sure the AlphaServer 4100 console setting MEMORY_TEST EV is set to FULL. The following console commands illustrate how to show and set this variable:

```
>>> SHOW MEMORY_TEST
>>> SET MEMORY_TEST FULL
```

D.3.2 EISA Configuration Utility (ECU)

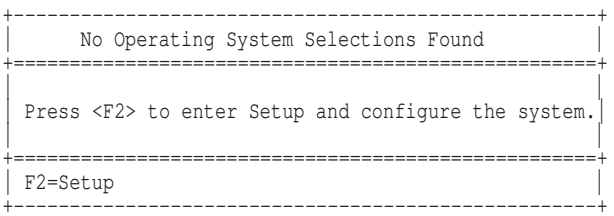
AlphaServer 4100 systems do not support automatic startup of the ECU (EISA Configuration Utility). Instead, follow the procedure described in this section.

Note

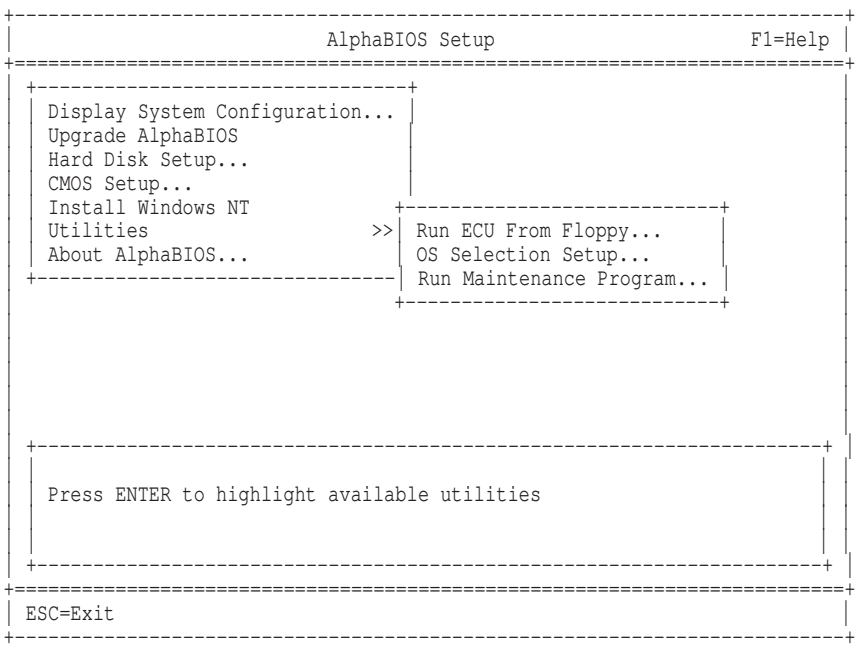
The OpenVMS operating system does not support the EISA bus on AlphaServer 4100 systems. If your computer is running another operating system that supports the EISA bus and you want to switch to the OpenVMS operating system, you may have to remove your EISA boards before running the ECU.

For more information about using the ECU, see the *AlphaServer 4100 System Drawer User's Guide*.

1. In the SRM console, enter the *arc* command. This starts the AlphaBIOS facility.
2. Press the F2 key after the following display:



3. Use the DownArrow key to select *Utilities*. Then use either the RightArrow or Enter key to highlight the first submenu entry, "Run ECU From Floppy...". The display is as follows:



4. Insert the ECU diskette in the floppy drive (if it isn't there already).
5. Press the Enter key to run the ECU.
6. After the ECU has run and returns control to AlphaBIOS, press the reset button to restart the system.

The OpenVMS operating system does not support the EISA bus on AlphaServer 4100 systems. If you switch from another operating system to OpenVMS on AlphaServer 4100 systems, you may have to remove your EISA boards and run the EISA Configuration Utility (ECU).

To run the ECU on other platforms, use the ECU command. To run the ECU on the AlphaServer 4100, use the ALPHABIOS command; and then run the ECU from the ALPHABIOS utility menu.

For more information about using the ECU, see the *AlphaServer 4100 System Drawer User's Guide*.

D.3.3 FRU Table Error

After you boot the OpenVMS operating system, the following message might display on the screen:

```
*****Config packet buffer allocation failure: Continuing without writing Errorlog
```

This message indicates that the FRU (Field Replaceable Units) table is too large for the default SYSGEN parameter ERLBUFFERPAGES. It is a warning message only and indicates that the FRU table was not written in the Error Log on this reboot.

If your system displays this message, Digital recommends that you change the ERLBUFFERPAGES parameter from 4 (the default) to 6. Following is an example of how to use the SYSGEN utility to accomplish this task:

```
$ MCR SYSGEN
SYSGEN>use current
SYSGEN>set erlbufferpages 6
SYSGEN>write current
SYSGEN>exit
```

If this warning appears again after you reboot the system, increase the ERLBUFFERPAGES parameter in increments of 2 (maximum value is 32) until the warning message is no longer displayed. The final size of ERLBUFFERPAGES (the value that resolves the problem) will vary depending on the configuration of your system.

D.4 AlphaServer 2100 Notes

The following section contains information specific to the AlphaServer 2100 series computer.

D.4.1 Console Display

On AlphaServer 2100 and 2100A systems, a console display similar to the following is normal and does not represent system errors:

```
P00>>>SET CONSOLE SERIAL
P00>>>INIT

VMS PALcode X5.48-112, OSF PALcode X1.35-81

starting console on CPU 0
initialized idle PCB
initializing semaphores
initializing heap
initial heap 1c0c0
memory low limit = 132000
heap = 1c0c0, 13fc0
.
.
.
probing hose 0, PCI
probing PCI-to-EISA bridge, bus 1
probing PCI-to-PCI bridge, bus 2
*** unable to assign PCI base address
*** bus 2, slot 7, function 0, size 00001000 (16 bit I/O)
bus 1, slot 1 -- fra -- DEFEA
bus 1, slot 2 -- vga -- Compaq Qvision
bus 1, slot 3 -- pua -- KFESA
bus 2, slot 1 -- pka -- NCR 53C810
bus 2, slot 6 -- pkb -- NCR 53C810
bus 2, slot 7 -- pkc -- DEC KZPSA
bus 0, slot 7 -- ewa -- DECchip 21041-AA
initializing keyboard
Memory Testing and Configuration Status
Module   Size    Base Addr   Intlv Mode  Intlv Unit  Status
------   -----   ---------   ----------  ----------  ------
  0       64MB   00000000      1-Way         0       Passed
Total Bad Pages 0
Testing the System
Testing the Disks (read only)
Testing the Network
econfig:            20041 99
econfig:            20042 04
econfig:            20043 00
AlphaServer 2100A Console V4.3-130, built on Oct 26 1996 at 19:44:57
P00>>>P
```

Note that in the previous display, the KZPSA adapter is successfully installed despite the error message displayed in the following lines:

```
*** unable to assign PCI base address
*** bus 2, slot 7, function 0, size 00001000 (16 bit I/O)
```

D.4.2 SCSI Controller Restriction

The Adaptec 1740/1742 SCSI controller (PB2HA–SA) is not supported on AlphaServer 2100 systems having more than 1 gigabyte (GB) of memory. If the controller is connected to such a system, the following message appears on the operator's console:

```
%PKJDRVR-E- The direct DMA window does not map all of memory. Port is going OFF LINE.
```

D.5 AlphaServer 2100A Notes

The following section contains information specific to the AlphaServer 2100A computer.

D.5.1 Trio64 Graphics Adapter

You must have a Trio64 ''Plug and Play'' (PNP) graphics adapter for the graphics card to operate *behind* the PCI-PCI bridge (on the secondary PCI bus) on all models of the AlphaServer 2100A computer. This graphics adapter will also operate if placed in front of the bridge (the primary PCI bus).

D.6 Graphics Support

The following sections contain information about support for Alpha computers with graphics capabilities.

D.6.1 TGA Graphics

AlphaServer computers do not support TGA graphics.

D.6.2 S3 Multihead Graphics

For this release of the OpenVMS operating system, Alpha computers equipped with S3 Trio32 or Trio64 graphics cards support single screen display only. Multihead graphics are not supported.

D.6.3 Console Window

System operator console window support (for example, pressing Ctrl/F2) has been disabled. Support for the operator console is now provided using a Motif-based window option that is enabled during DECwindows startup. Refer to the DECW$PRIVATE_APPS_SETUP.TEMPLATE file in SYS$COMMON:[SYSMGR] for details about how to enable this feature.

Caution

Directing any output directly to the operator console window (OPA0: device) might cause a system crash during a simultaneous graphics operation.

E

Preparing to Use OpenVMS Management Station

During the OpenVMS Version 7.1 installation or upgrade procedure, the OpenVMS Management Station software is automatically installed on your OpenVMS system disk when you accept all the default values. If you did not accept the default values and did *not* manually select the OpenVMS Management Station component, you must add those files to your OpenVMS system disk before you follow the instructions in this appendix. Use the OpenVMS Version 7.1 operating system CD–ROM and the DCL command PRODUCT RECONFIGURE VMS to add the OpenVMS Management Station files to your system. (See *OpenVMS System Management Utilities Reference Manual: M–Z* for complete information about using the PRODUCT command.)

After you have ensured that OpenVMS Management Station software is installed on your system, follow the procedures described in this appendix.

E.1 Preparing Your OpenVMS System

You must prepare your OpenVMS system to run the server software so that your system can properly interact with the PC running the client software. The procedures include the following:

- Set up within a mixed-architecture cluster environment (if applicable).
- Start the server on other nodes.
- Update the printer database.
- Edit the system files.
- Allow OpenVMS Management Station to control the printer environment.
- Keep your printer environment up to date.
- Check if running third-party TCP/IP stacks.
- Recover from a failure.
- Determine and report problems.

E.1.1 Files Installed on Your OpenVMS System

The following files are created on your OpenVMS system when the OpenVMS Management Station server is installed:

- SYS$SYSTEM:TNT$SERVER.EXE
- SYS$STARTUP:TNT$STARTUP.COM
- SYS$STARTUP:TNT$SHUTDOWN.COM
- SYS$STARTUP:TNT$UTILITY.COM

- SYS$TEST:TNT$IVP.COM
- SYS$COMMON:[SYSTEST.TNT]TNT$SERVER_IVP.EXE
- SYS$HELP:TNTV20.RELEASE_NOTES

These optional files are created when you install PC installation media files:

- SYS$COMMON:[TNT.CLIENT]DISKIMAG.EXE
- SYS$COMMON:[TNT.CLIENT]TNTCLID1.IMG
- SYS$COMMON:[TNT.CLIENT]TNTCLID2.IMG
- SYS$COMMON:[TNT.CLIENT]TNTCLID3.IMG
- SYS$COMMON:[TNT.CLIENT]TNTCLID4.IMG
- SYS$COMMON:[TNT.CLIENT]TNTCLID5.IMG
- SYS$COMMON:[TNT.CLIENT]TNTCLID6.IMG

These files are created when the server is started:

- SYS$COMMON:[SYSEXE]TNT$UADB.DAT
- SYS$COMMON:[SYSEXE]TNT$ACS.DAT
- SYS$COMMON:[SYSEXE]TNT$JOURNAL.TNT$TRANSACTION_JOURNAL

E.1.2 Setting Up in a Mixed-Architecture Cluster Environment

The OpenVMS Management Station server creates three main configuration files:

- TNT$UADB.DAT
- TNT$ACS.DAT
- TNT$JOURNAL.TNT$TRANSACTION_JOURNAL

In a common-environment cluster with one common system disk, you use a common copy of each of these files located in the SYS$COMMON:[SYSEXE] directory on the common system disk, or on a disk that is mounted by all cluster nodes. No further action is required.

However, to prepare a common user environment for an OpenVMS Cluster system that includes more than one common VAX system disk or more than one common Alpha system disk, you must coordinate the files on those disks.

Rules: The following rules apply:

- Disks holding common resources must be mounted early in the system startup procedure, such as in the SYLOGICALS.COM procedure.
- You must ensure that the disks are mounted with each cluster reboot.

Follow these steps to coordinate files:

1. Decide where to locate the files. In a cluster with multiple system disks, system management is much easier if the common system files are located on a single disk that is not a system disk.
2. Copy TNT$UADB.DAT, TNT$ACS.DAT, and TNT$JOURNAL.TNT$TRANSACTION_JOURNAL to a location other than the system disk.

3. Edit the file SYS$COMMON:[SYSMGR]SYLOGICALS.COM *on each system disk* and define logical names that specify the location of the cluster common files.

   Example: If the files will be located on 1DJA16, define logical names as follows:

```
$ DEFINE/SYSTEM/EXEC TNT$ACS -
_$ $1$DJA16:[VMS$COMMON.SYSEXE]TNT$ACS.DAT

$ DEFINE/SYSTEM/EXEC TNT$UADB -
_$ $1$DJA16:[VMS$COMMON.SYSEXE]TNT$UADB.DAT

$ DEFINE/SYSTEM/EXEC TNT$JOURNAL -
_$ $1$DJA16:[VMS$COMMON.SYSEXE]TNT$JOURNAL.TNT$TRANSACTION_JOURNAL
```

4. To ensure that the system disks are mounted correctly with each reboot, follow these steps:

   1. Copy the SYS$EXAMPLES:CLU_MOUNT_DISK.COM file to the [VMS$COMMON.SYSMGR] directory, and edit it for your configuration.
   2. Edit SYLOGICALS.COM and include commands to mount, with the appropriate volume label, the system disk containing the shared files.

      Example: If the system disk is 1DJA16, include the following command:

```
$ @SYS$SYSDEVICE:[VMS$COMMON.SYSMGR]CLU_MOUNT_DISK.COM -
_$ $1$DJA16: volume-label
```

E.1.3 Start the Server on Other Nodes

If you plan to run OpenVMS Management Station on more than one node in an OpenVMS Cluster without a reboot, you need to start the software on those nodes. Enter the following command:

```
$ @SYS$STARTUP:TNT$STARTUP.COM
```

If you are performing an upgrade or a reinstallation and OpenVMS Management Station is already running on the node, add the RESTART parameter to the startup command, as follows:

```
$ @SYS$STARTUP:TNT$STARTUP.COM RESTART
```

E.1.4 Update the Printer Database

When you installed OpenVMS Management Station, the installation started the OpenVMS Management Station server on the installation node and created an initial version of the printer database file TNT$ACS.DAT. However, this initial version of the database might not contain complete device and queue information for your OpenVMS Cluster system.

To complete the database, first start the OpenVMS Management Station server on each node in your cluster. The instances of the server communicate with each other to determine device and queue information, and the server must be running on each node for this communication to take place.

Once you have started the server on each node, run the following procedure to update the printer database:

```
$ @SYS$STARTUP:TNT$UTILITY UPDATE PRINTERS
```

E.1.5 Edit the System Files

To start the OpenVMS Management Station server from your system startup files, insert the following line into your system startup procedures (usually SYS$MANAGER:SYSTARTUP_VMS.COM) after both the Queue Manager and network are started, but before ENABLE AUTOSTART/QUEUES.

```
$ @SYS$STARTUP:TNT$STARTUP BOOT
```

(The best place for this is immediately prior to the ENABLE AUTOSTART /QUEUES command.)

Note

Remove any other invocations of TNT$STARTUP you might have added in previous releases of the OpenVMS Management Station.

OpenVMS Management Station cannot start until the network has started. If you start your network using a batch process, OpenVMS Management Station might start before the batch process completes and the network is started.

Add the following command line to the system shutdown file, SYS$MANAGER:SYSHUTDWN.COM:

```
$ @SYS$STARTUP:TNT$SHUTDOWN.COM
```

E.1.6 Allow OpenVMS Management Station to Control the Printer Environment

Placing the server startup before ENABLE AUTOSTART/QUEUES in the system startup procedure allows the server to start any queues not already started by your existing DCL command procedures.

It is not necessary to remove your existing queue startup DCL procedures immediately. The OpenVMS Management Station server will recognize that you started a queue with your command procedures and will assume that you want it that way.

As you become familiar with the server's management ability, you can remove or comment out the DCL commands and procedures that perform these tasks and allow OpenVMS Management Station to control your printer environment.

E.1.7 Keep Your Printer Environment Up to Date

The OpenVMS Management Station server installation creates a file named SYS$STARTUP:TNT$UTILITY.COM. This command procedure scans the OpenVMS system and updates the database of known printers, queues, and related devices. TNT$UTILITY.COM runs at regular intervals to keep the database files synchronized with the actual system.

E.1.7.1 When Does TNT$UTILITY.COM Run?

This TNT$UTILITY.COM runs:

- As part of the OpenVMS Management Station installation.
- When you specifically invoke it.

- At periodic intervals as a background thread. Two logical names control how often it runs:

Logical Name	Description
TNT$PRINTER_RECON_ INTERVAL	How often TNT$UTILITY.COM should run, in minutes, from when the server was last started on this node. If you do not define this logical, the default value is 1440 minutes (24 hours).
TNT$PRINTER_RECON_ INTERVAL_MIN	The minimum number of minutes that must elapse before TNT$UTILITY.COM should run again, starting from when the database was last updated. If you do not define this logical, the default value is 60 minutes (1 hour).

You can think of these logicals as meaning ''run TNT$UTILITY.COM this often (TNT$PRINTER_RECON_INTERVAL), but make sure this much time has elapsed since the database was last updated (TNT$PRINTER_RECON_ INTERVAL_MIN).''

Because you can run TNT$UTILITY.COM yourself, and because the OpenVMS Management Station server also updates the database, the TNT$PRINTER_ RECON_INTERVAL_MIN logical prevents the database from being updated more frequently than is actually needed.

If you want to change the defaults for one of these logicals, define the logical on all nodes on which the OpenVMS Management Station server is running.

E.1.7.2 Do You Need to Run TNT$UTILITY.COM Manually?

If you use OpenVMS Management Station to make all of the changes to your printer configuration, the configuration files are immediately modified to reflect the changes and you probably do not need to specifically run TNT$UTILITY.COM. TNT$UTILITY.COM runs at periodic intervals as a background thread to make sure that the database is kept up to date.

However, if you or someone else uses DCL to make a change — for example, if you use the DELETE /QUEUE command to delete a queue — the configuration files will not be synchronized. In this case, the OpenVMS Management Station client will advise you to run TNT$UTILITY.COM to resynchronize the database.

Run the following procedure on one node in the cluster to make the database match your system:

```
$ @SYS$STARTUP:TNT$UTILITY.COM UPDATE PRINTERS
```

For example, if you or someone else used DCL to delete a queue, you need to delete that queue from the database. TNT$UTILITY.COM assumes that your system is set up and running the way that you want it to, so you should fix any problems before you run TNT$UTILITY.COM.

E.1.7.3 Are There Any Requirements for Running TNT$UTILITY.COM?

You need the SYSNAM privilege to run TNT$UTILITY.COM.

TNT$UTILITY.COM connects to the OpenVMS Management Station server on the current OpenVMS system to determine device and queue information. Therefore, the OpenVMS Management Station server must be running on the node where you run TNT$UTILITY.COM.

The OpenVMS Management Station server then connects to the other OpenVMS Management Station servers in the OpenVMS Cluster to determine device and queue information. It is generally a good idea to keep the OpenVMS Management Station server running on the other nodes in an OpenVMS Cluster to keep the database up to the minute.

However, if the OpenVMS Management Server is not able to connect to the OpenVMS Management Station server on a given node, it uses the known information about that OpenVMS node from the database. That is, in the absence of a valid connection to that OpenVMS node, the information in the database is assumed to be correct.

E.1.8 Enabling Disk Quotas

Before installing OpenVMS Management Station, you might have disabled disk quotas on the SYSTEM disk. If so, you should reenable the quotas and then rebuild to update quota information by entering the following commands:

```
$ RUN SYS$SYSTEM:DISKQUOTA
DISKQUOTA> ENABLE
DISKQUOTA> REBUILD
DISKQUOTA> EXIT
```

E.1.9 Running Third-Party TCP/IP Stacks

Digital TCP/IP Services for OpenVMS Version 3.2 or higher is the only supported TCP/IP stack. Additional stacks have not been tested. However, TCP/IP stacks that are 100% compliant with the QIO interface for TCP/IP Services for OpenVMS should also work. (Contact your TCP/IP vendor for additional information and support issues.)

For the best chance of success, check the following:

- Make sure that the QIO service (for example, UCXQIO) is enabled.
- For TCPware, also make sure that TCPware's UCX$IPC_SHR.EXE is an installed image.

E.1.10 Determining and Reporting Problems

If you encounter a problem while using OpenVMS Management Station, please report it to Digital. Depending on the nature of the problem and the type of support you have, you can take one of the following actions:

- If your software contract or warranty agreement entitles you to telephone support, call Digital.
- If the problem is related to OpenVMS Management Station documentation, use the Internet address printed in front of this book to send us your comments.

E.2 Preparing Your PC

During the OpenVMS Version 7.1 installation or upgrade procedure, you selected the OpenVMS Management Station client software files to be installed on your OpenVMS system disk (or you added them later using the DCL command PRODUCT RECONFIGURE VMS). After you have prepared your OpenVMS system to run the server software, you must next prepare your PC to run the client software.

This section includes the following information:

- Required memory and disk space
- Required software
- TeamLinks support
- Creating the installation media
- Installing the client software
- Getting started using OpenVMS Management Station

E.2.1 Required Memory and Disk Space

Your PC requires 8 MB of random-access memory (RAM) and 11.5 MB of free disk space to install the OpenVMS Management Station client software.

E.2.2 Required Software

Table E–1 describes the software that must be installed on your PC before installing OpenVMS Management Station.

Table E–1 Prerequisite and Optional Software for PCs

Prerequisite Products	Purpose
Microsoft Windows NT Version 3.51 *or* Microsoft Windows 95 *or* Microsoft Windows Version 3.1 *or* Microsoft Windows for Workgroups Version 3.11	Operating system

Optional Products	Purpose
PATHWORKS Version 5.1 for DOS and Windows client software	Integrate with PATHWORKS, DECnet support
ManageWORKS Workgroup Administrator, Version 2.2	ManageWORKS integration
Your TCP/IP stack	IP connections

PATHWORKS for Windows 95 and any version of Windows NT prior to Version 3.51 are not officially supported.

E.2.3 TeamLinks Version 1.0 is Not Supported

If Version 1.0 of TeamLinks is installed on your PC, the OpenVMS Management Station PC installation program will ask whether to update the XTI library component of TeamLinks.

If you answer No, the OpenVMS Management Station installation terminates. However, if you allow OpenVMS Management Station to update the XTI library, Version 1.0 of TeamLinks will no longer work.

The version of the XTI library included with Version 1.0 of TeamLinks does not allow TCP/IP connections from your PC and is not supported in this version of OpenVMS Management Station. If you want to utilize both TCP/IP connections and TeamLinks, you must upgrade to a higher version of TeamLinks.

E.2.4 Creating the Installation Media

Create the PC installation media using the following procedure:

Note: You need six formatted 3-1/2-inch, high-density floppy disks.

1. For PCs running TCP/IP, at the MS–DOS prompt use the FTP utility on the PC to copy the files by entering commands similar to the following:

   ```
   C:\> cd temp-dir
   C:\temp> ftp
   ftp> open node
   Connected to node
   Username:  username
   Password:  password
   User logged in.
   ftp> cd sys$common:[tnt.client]
   ftp> type bin
   ftp> mget *.*
   ```

   where *node, username*, and *password* are the access control information for an account on the OpenVMS system, and *temp-dir* is the name of the temporary directory.

2. For PCs running DECnet, at the MS–DOS prompt use the NFT utility on the PC to copy the files by entering the following command:

   ```
   C:\> NFT COPY /BLOCK node"username password"::SYS$COMMON:
   [TNT.CLIENT]*.* \temp-dir
   ```

   where *node, username*, and *password* are the access control information for an account on the OpenVMS system, and *temp-dir* is the name of the temporary directory. The node name must be defined in the PC's network database.

3. Insert a formatted floppy disk in the 3-1/2-inch floppy disk drive (A in this example). At the MS–DOS prompt, type the following MS–DOS command:

   ```
   C:\> \temp-dir\DISKIMAG \temp-dir\TNTCLID1.IMG A:
   ```

   where *temp-dir* is the temporary directory used in step 2.

   When the DISKIMAG program returns to the MS–DOS prompt, remove the floppy disk and label it ''Disk 1—Setup.''

4. Repeat this process for TNTCLID2.IMG through TNTCLID6.IMG

5. You can delete the files DISKIMAG.EXE and TNTCLID1.IMG through TNTCLID6.IMG from *temp-dir* after creating the floppy disks.

E.2.5 Installing the OpenVMS Management Station Client Software on Your PC

This section provides the following information:

- How to install the OpenVMS Management Station client on a PC
- How to recover from errors during the installation
- How to define DECnet nodes after the installation
- The names of the files that are created on your PC after the installation
- How to access online help to get started using OpenVMS Management Station

E.2.5.1 Installation Directory

The installation procedure allows you to select the installation directory, and suggests \VMSTNT as the default.

Do not install OpenVMS Management Station into the PATHWORKS or ManageWORKS Workgroup Administrator directories. If you do want to configure PATHWORKS or ManageWORKS Workgroup Administrator to load OpenVMS Management Station, see Section E.2.7.

E.2.5.2 Installation Procedure

Follow these steps to install OpenVMS Management Station client:

1. Start your PC as you usually do.
2. Insert disk 1 in your floppy disk drive.
3. Enter the Windows environment and click on the Program Manager icon.
4. In the Menu bar of the Program Manager program group, click on File, and then choose Run from the pull-down menu.

   Result: The Run dialog box appears.
5. In the Run dialog box, type:

   ```
   A:\SETUP.EXE
   ```

   where A: is the name of the floppy disk drive.
6. Click on the OK button to start the installation.

   Result: A dialog box containing the message ‘‘Initializing setup, please wait...’’ appears. You are then prompted to continue.
7. To proceed with the installation, click on the Next button.

   Note: You can stop the installation at any time by clicking on the Cancel button.

   As the installation progresses, the system displays a status bar indicating what percentage of the installation is done. Also displayed is a reminder to read the OpenVMS Management Station Read Me file for important information.
8. When you are prompted by a dialog box message, remove disk 1 from the disk drive and insert disk 2. Click on OK.

   Repeat this process for the remaining disks.

E.2.5.3 Recovering from Errors

If an error occurs during installation, you will receive an error message describing the problem. This information can help you determine the cause of the problem. An error can occur during the installation if one or more of the following conditions exist:

- The operating system version is incorrect.
- The prerequisite software version is incorrect.
- Disk space and memory necessary for successful installation are inadequate.

E.2.5.4 Files Created on the PC

The following files (with their directory names) are created on your PC after the OpenVMS Management Station client software is installed:

- OpenVMS Management Station directory (usually \VMSTNT)
  - VMSACNT.DLL
  - VMSACNT.HLP
  - VMSCLU.DLL
  - VMSCUSCT.DLL
  - VMSINFRA.DLL
  - VMSMGMT.DLL
  - VMSMGMT.HLP
  - VMSMSCRL.DLL
  - VMSNODE.DLL
  - VMSPRINT.HLP
  - VMSSCOPE.HLP
  - VMSTAB.DLL
  - VMSTIMEL.DLL
  - VMSUAOMM.DLL
  - CLASS.IDX
  - CLASS.POD
  - CONTAIN.DLL
  - CONTAIN.IDX
  - CONTAIN.POD
  - DISPATCH.DLL
  - MWBROWSE.DLL
  - MW_OEM.DLL
  - MW_OEM2.DLL
  - MW_OEM3.DLL
  - OMMLIB.DLL
  - OBJECT.POD
  - OBJECT.IDX
  - POD.DLL
  - PRMAKTPL.EXE
  - PWMGMT.EXE
  - PWMGMT.HLP
  - PWMGMT.INI
  - PWSHELL.DLL

  - SVN.DLL
  - SVNVIEW.DLL
  - XMEM.DLL
- Windows directory (usually \WINDOWS)
  - XTIDNW.DLL
  - XTILIB.DLL
  - XTIWINS.DLL
  - VMSTNT.INI
- Windows systems directory (usually \WINDOWS\SYSTEM)
  - CTL3DV2.DLL
  - COMPOBJ.DLL
  - MFC250.DLL
  - MFCO250.DLL
  - MFCOLEUI.DLL
  - OLE2.DLL
  - OLE2DISP.DLL
  - OLE2NLS.DLL
  - STORAGE.DLL

E.2.6 After Installing the Client Software on Your PC

OpenVMS Management Station allows you to use both the TCP/IP and DECnet transports to establish connections.

You can have a mix of DECnet and TCP/IP connections, all DECnet connections, or all TCP/IP connections. OpenVMS Management Station does not have any DECnet dependencies and can run in a TCP/IP-only environment. Note that Windows NT and Windows 95 support TCP/IP connections only.

You do need to make sure that your PC can connect to the primary-server systems, as described in the following sections. OpenVMS Management Station connects your PC to the primary-server system and then routes management operations to the target systems.

E.2.6.1 Defining TCP/IP Nodes

If you select the TCP/IP transport, your host's file or name server must be able to resolve the IP name or address of all primary-server systems. If you can successfully ping the primary-server systems from your PC, then this condition is met.

E.2.6.2 DECnet Support

If you want to use DECnet connections, PATHWORKS Version 5.1 for DOS and Windows must be installed somewhere on the PC and listed in the PC's path statement.

Define the DECnet node names and network addresses of primary-server OpenVMS systems that you want to manage.

E.2.6.3 Procedure for Defining DECnet Nodes

Follow these steps to define DECnet nodes:

Step	Action
1	At the MS–DOS prompt, invoke the NCP utility as follows: `C:\> NCP`

2	At the NCP> prompt, type the following command:
	`NCP> DEFINE NODE addrs NAME name`
	where *addrs* is the DECnet address and *name* is the DECnet node name.
	Example:
	`NCP> DEFINE NODE 19.208 NAME ISTAR`

3	At the NCP prompt, type EXIT and press Return to exit the operation.

E.2.7 PATHWORKS and Workgroup Administrator Support

You no longer need the PATHWORKS client software to run OpenVMS Management Station. OpenVMS Management Station installs into its own directory and includes all of the ManageWORKS components it needs to run.

If you happen to have PATHWORKS or ManageWORKS Workgroup Administrator installed, both will continue to function independently of OpenVMS Management Station.

You can configure PATHWORKS Version 5.1 for DOS and Windows or the ManageWORKS Workgroup Administrator Version 2.2 to load the OpenVMS Management Station software if you want to.

To do this, run the ManageWORKS Setup application and use the Browse feature to select the file ARGUS.MMI in the VMSTNT directory. Refer to the ManageWORKS online help for step-by-step instructions.

E.2.8 POLYCENTER Manager on NetView for Windows NT, Version 3.0

You can launch OpenVMS Management Station from POLYCENTER Manager on NetView for Windows NT, Version 3.0. To do this, copy the file VMSTNT.REG from the temporary directory (or disk 1 if you requested client media) to the following directory:

```
\usr\ov\registration\c\
```

Note that NetView can be installed only on an NTFS partition.

E.3 Getting Started with OpenVMS Management Station

All information about getting started, setting up, and using OpenVMS Management Station is contained in online help and the *OpenVMS Management Station Overview and Release Notes*.

E.3.1 Accessing Online Help

Follow these steps to access the OpenVMS Management Station online help:

1. Open the OpenVMS Management Station program group.
2. Click on the OpenVMS Management Help icon for instructions on how to get started.

Glossary

This glossary defines key terms in the context of an OpenVMS Alpha computing environment.

boot, bootstrap

The process of loading system software into a processor's main memory.

boot server

An Alpha computer that is part of a local area OpenVMS Cluster. The boot server is a combination of a MOP server and a disk server for the satellite system disk. *See also* satellite node.

CI only OpenVMS Cluster

A computer system consisting of a number of Alpha computers. It uses only the computer interconnect, or CI, to communicate with other Alpha computers in the cluster. These computers share a single file system.

CI

A type of I/O subsystem. It links computers to each other and to HS*x* devices (for example, an HSC or HSD).

device name

The name used to identify a device on the system. A device name indicates the device code, controller designation, and unit number.

disk server

A computer that is part of a local area OpenVMS Cluster. This computer provides an access path to CI, DSSI, and locally connected disks for other computers that do not have a direct connection.

HS*x* device

A self-contained, intelligent, mass storage subsystem (for example, an HSC or HSD) that lets computers in an OpenVMS Cluster environment share disks.

HS*x* drive

Any disk or tape drive connected to an HS*x* device (for example, an HSC or HSD). A system disk on an HS*x* drive can be shared by several computers in an OpenVMS Cluster environment.

InfoServer

A general-purpose disk storage server that allows you to use the operating system CD–ROM to install the operating system on remote client systems connected to the same local area network (LAN).

local area OpenVMS Cluster

A configuration consisting of one or more computers that act as a MOP server and disk server, and a number of low-end computers that act as satellite nodes. The local area network (LAN) connects all of the computers. These computers share a single file system.

local drive

A drive, such as an RRD42 CD–ROM drive, that is connected directly to an Alpha computer. If you have a standalone Alpha computer, it is likely that all drives connected to the system are local drives.

media

Any packaging agent capable of storing computer software (for example, CD–ROMs, magnetic tapes, floppy diskettes, disk packs, and tape cartridges).

mixed interconnect OpenVMS Cluster

A computer system consisting of a number of computers. It uses CI, Ethernet, and DSSI adapters to communicate with other computers in the cluster.

MOP server

A computer system running DECnet software that downline loads OpenVMS Cluster satellites using the DECnet maintenance operations protocol.

OpenVMS Cluster environment

A computer system consisting of a number of Alpha and VAX computers. There are four types of OpenVMS Cluster environments: CI only, DSSI only, local area, and mixed-interconnect.

satellite node

A computer that is part of a local area OpenVMS Cluster. A satellite node is downline loaded from a MOP server and then boots remotely from the system disk served by a disk server in the local area OpenVMS Cluster.

scratch disk

A blank disk or a disk with files you no longer need.

source drive

The drive that holds the distribution kit during an upgrade or installation, or the drive from which you restore files to a target disk.

standalone system

A computer system with only one Alpha computer.

system disk

The disk that contains or will contain the OpenVMS Alpha operating system.

target drive

The drive that holds the system disk during an upgrade or installation, or the drive you designate when backing up the system disk.

UETP

User Environment Test Package. A software package that tests all the standard peripheral devices on your system, various commands and operating system functions, the system's multiuser capability, DECnet software, and the OpenVMS Cluster environment.

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