

VMS Installation and Operations: VAXstation 3100

Order Number: AA-MK77A-TE

February 1989

This guide describes the VMS installation procedure for the VAXstation 3100. It also explains the startup, shutdown, and backup operations for this VAX computer.

Revision/Update Information: This is a new guide.

Software Version: VMS Version 5.1-B

**digital equipment corporation
maynard, massachusetts**

February 1989

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

The software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license.

No responsibility is assumed for the use or reliability of software on equipment that is not supplied by Digital Equipment Corporation or its affiliated companies.

Copyright ©1989 by Digital Equipment Corporation

All Rights Reserved.
Printed in U.S.A.

The postpaid READER'S COMMENTS form on the last page of this document requests the user's critical evaluation to assist in preparing future documentation.

The following are trademarks of Digital Equipment Corporation:

DEC	DIBOL	UNIBUS
DEC/CMS	EduSystem	VAX
DEC/MMS	IAS	VAXcluster
DECnet	MASSBUS	VMS
DECsystem-10	PDP	VT
DECSYSTEM-20	PDT	
DECUS	RSTS	
DECwriter	RSX	

digital™

ZK5106

Production Note

This book was produced with the VAX DOCUMENT electronic publishing system, a software tool developed and sold by DIGITAL. In this system, writers use an ASCII text editor to create source files containing text and English-like code; this code labels the structural elements of the document, such as chapters, paragraphs, and tables. The VAX DOCUMENT software, which runs on the VMS operating system, interprets the code to format the text, generate a table of contents and index, and paginate the entire document. Writers can print the document on the terminal or line printer, or they can use DIGITAL-supported devices, such as the LN03 laser printer and PostScript[®] printers (PrintServer 40 or LN03R ScriptPrinter), to produce a typeset-quality copy containing integrated graphics.

Contents

PREFACE	xiii
NEW AND CHANGED FEATURES	xvii

PART I

CHAPTER 1	THE INSTALLATION, UPGRADE, AND UPDATE PROCEDURES	1-1
1.1	WHAT HAPPENS DURING AN INSTALLATION	1-1
1.2	WHAT HAPPENS DURING AN UPGRADE	1-1
1.3	WHAT HAPPENS DURING AN UPDATE	1-2
CHAPTER 2	VAXSTATION 3100 HARDWARE	2-1
2.1	THE ON/OFF SWITCH	2-1
2.2	THE HALT BUTTON	2-2
2.3	THE MONITOR	2-2
2.3.1	Turning On the Monitor _____	2-2
2.3.2	Alternate Console Terminal _____	2-3
2.4	DISK AND TAPE DRIVES	2-6
2.5	THE TZ30 TAPE CARTRIDGE DRIVE	2-6

Contents

2.6	THE TK50 TAPE CARTRIDGE DRIVE	2-8
2.6.1	Tape Cartridges	2-11
2.6.2	Inserting a Tape Cartridge in a TZ30 Drive	2-13
2.6.3	Inserting a Tape Cartridge in a TK50 Drive	2-14
2.6.4	Initializing a Tape Cartridge	2-17
2.6.5	Mounting a Tape Cartridge	2-17
2.6.6	Dismounting a Tape Cartridge	2-18
2.6.7	Removing a Tape Cartridge from a TZ30 Drive	2-18
2.6.8	Removing a Tape Cartridge from a TK50 Drive	2-18
2.7	THE COMPACT DISC DRIVE	2-19
2.7.1	Inserting a Compact Disc	2-20
2.7.2	Removing a Compact Disc	2-22
CHAPTER 3 BEFORE INSTALLING VMS		3-1
3.1	THE DISTRIBUTION MEDIA AND SYSTEM DISK	3-1
3.2	DEVICE NAMES	3-1
3.3	CHOOSING A SYSTEM DISK	3-2
3.4	INFORMATION ON VAXCLUSTER ENVIRONMENTS	3-2
CHAPTER 4 INSTALLING VMS FROM A TAPE CARTRIDGE		4-1
4.1	BEFORE YOU START	4-1
4.2	TURNING ON THE SYSTEM	4-2
4.3	PREPARING THE SYSTEM DISK	4-2
4.4	BOOTING STANDALONE BACKUP	4-3

4.5	CREATING A SYSTEM DISK	4-4
4.6	RUNNING AUTOGEN	4-9
CHAPTER 5 INSTALLING VMS FROM COMPACT DISC		5-1
5.1	BEFORE YOU START	5-1
5.2	TURNING ON THE SYSTEM	5-2
5.3	PREPARING THE SYSTEM DISK	5-2
5.4	BOOTING STANDALONE BACKUP	5-3
5.5	CREATING A SYSTEM DISK	5-4
5.6	RUNNING AUTOGEN	5-9
CHAPTER 6 AFTER INSTALLING VMS		6-1
6.1	REGISTERING YOUR LICENSES	6-1
6.2	REMOVING UNWANTED FILES WITH VMSTAILOR	6-2
6.3	CUSTOMIZING THE SYSTEM	6-2
6.4	TESTING THE SYSTEM	6-3
6.5	DECOMPRESSING THE SYSTEM LIBRARIES	6-3
6.6	BACKING UP THE SYSTEM DISK	6-3

Contents

CHAPTER 7	RUNNING UETP	7-1
<hr/>		
7.1	SUMMARY OF UETP OPERATING INSTRUCTIONS	7-1
<hr/>		
7.2	LOGGING IN	7-3
7.2.1	SYSTEST Directories	7-3
<hr/>		
7.3	SETTING UP FOR UETP	7-3
7.3.1	Setting Up the System Disk	7-4
7.3.2	Setting Up Additional Disks	7-4
7.3.3	Setting Up Tape Cartridge Drives	7-5
7.3.4	Setting Up Terminals and Line Printers	7-5
7.3.5	Preparing Ethernet Adapters for UETP Testing	7-6
7.3.6	Devices Not Tested	7-6
7.3.7	Preparing for VAXcluster Testing	7-6
7.3.8	Preparing DECnet	7-8
<hr/>		
7.4	STARTING UETP	7-8
7.4.1	Running a Subset of Phases	7-9
7.4.2	Single Run Versus Multiple Passes	7-9
7.4.3	Defining User Load for Load Test	7-10
7.4.4	Long and Short Report Format	7-10
7.4.5	Termination of UETP	7-11
7.4.5.1	Using CTRL/Y • 7-11	
7.4.5.2	Using CTRL/C • 7-12	
<hr/>		
7.5	TROUBLESHOOTING	7-12
7.5.1	Relationship of UETP to Error Logging and Diagnostics	7-12
7.5.2	Interpreting UETP Output	7-13
7.5.2.1	Defining a Remote Node for UETP Ethernet Testing • 7-14	
7.5.3	The Log Files	7-15
7.5.4	Possible UETP Errors	7-16
7.5.4.1	Wrong Quotas, Privileges, or Account • 7-17	
7.5.4.2	UETINITO1 Failure • 7-19	
7.5.4.3	Insufficient Disk Space • 7-20	
7.5.4.4	Incorrect Setup of a VAXcluster • 7-21	
7.5.4.5	Problems During the Load Test • 7-22	
7.5.4.6	DECnet Error • 7-23	
7.5.4.7	Errors Logged but Not Displayed • 7-24	
7.5.4.8	No PCB or Swap Slots • 7-24	
7.5.4.9	Hangs • 7-25	
7.5.4.10	Bugchecks and Machine Checks • 7-25	

7.6	UETP TESTS AND PHASES	7-25
7.6.1	Initialization Phase	7-26
7.6.2	Device Test Phase	7-26
7.6.2.1	How the Device Phase Works • 7-26	
7.6.2.2	Running a Single Device Test • 7-27	
7.6.3	System Load Test Phase	7-29
7.6.4	DECnet Test Phase	7-30
7.6.4.1	Environment • 7-30	
7.6.4.2	How the DECnet Phase Works • 7-30	
7.6.5	Cluster-Integration Test Phase	7-32

PART II

CHAPTER 8 STARTUP AND SHUTDOWN PROCEDURES 8-1

8.1	OVERVIEW OF BOOTING	8-1
8.2	BOOTING THE SYSTEM	8-2
8.3	THE SET BOOT COMMAND	8-2
8.4	AUTOMATIC BOOT	8-3
8.5	CONVERSATIONAL BOOT	8-4
8.6	BOOTING WITH XDELTA	8-6
8.7	IF THE SYSTEM DOES NOT BOOT	8-6
8.8	SHUTTING DOWN THE SYSTEM	8-7
8.8.1	Types of Shutdowns	8-7
8.8.2	Emergency Shutdown with CRASH Commands	8-8
8.9	IF THE SYSTEM FAILS	8-8

Contents

CHAPTER 9	BACKUP PROCEDURES	9-1
<hr/>		
9.1	OVERVIEW OF STANDALONE BACKUP	9-1
9.1.1	Installing Standalone BACKUP on the System Disk _____	9-1
9.1.2	Booting Standalone BACKUP from the System Disk _____	9-2
9.1.3	Installing Standalone BACKUP on a Tape Cartridge _____	9-3
9.1.4	Booting Standalone BACKUP from a Tape Cartridge _____	9-4
<hr/>		
9.2	USING STANDALONE BACKUP	9-5
9.2.1	Backing Up the System Disk _____	9-6
9.2.2	Restoring the System Disk _____	9-8
<hr/>		
APPENDIX A	VAXSTATION 3100 RELEASE NOTES	A-1
<hr/>		
A.1	RESTRICTION ON THE USE OF THE TAPE DRIVE	A-1
<hr/>		
A.2	RESTRICTIONS ON THE USE OF THE COMPACT DISC DRIVE	A-1
<hr/>		
A.3	RESTRICTIONS ON THE USE OF RX23 DISKETTES	A-1
<hr/>		
A.4	SCSI DISK AND TAPE DRIVES	A-2
<hr/>		
A.5	CHANGING THE IDENTIFICATION NUMBER OF THE CPU	A-4
<hr/>		
A.6	TURNING ON THE SYSTEM	A-4
<hr/>		
APPENDIX B	BAD BLOCK SUPPORT	B-1
<hr/>		
B.1	SCSI CONCEPTS	B-1
<hr/>		
B.2	CONSOLE DISK FORMATTER	B-2
<hr/>		
B.3	BAD UTILITY	B-2

B.4	THE INITIALIZE COMMAND AND THE FILE SYSTEM	B-2
B.5	SCSI DISK CLASS DRIVER	B-2
B.6	ERROR RECOVERY PARAMETERS	B-3
B.7	WHAT THE DISK CLASS DRIVER DOES WHEN IT DETECTS AN ERROR	B-3

APPENDIX C INSTALLING VMS DECWINDOWS SOFTWARE **C-1**

C.1	PREPARING TO INSTALL THE DECWINDOWS SOFTWARE	C-1
C.1.1	Disk Space Considerations _____	C-2
C.2	INSTALLING THE DECWINDOWS SOFTWARE	C-2
C.2.1	Running VMSINSTAL _____	C-3
C.3	STARTING UP DECWINDOWS	C-7
C.3.1	The Startup Command Procedure _____	C-7
C.3.2	Booting DECwindows _____	C-8
C.3.3	Choosing Between DECwindows and VWS _____	C-9
C.3.4	Console Support _____	C-9
C.4	DECWINDOWS LOGICAL NAMES	C-9
C.4.1	Defining Print Formats _____	C-11
C.4.2	Server Startup Command Procedures _____	C-12

GLOSSARY **Glossary--**

INDEX

Contents

FIGURES

2-1	The ON/OFF Switch and the Halt Button _____	2-1
2-2	Alternate Console Switch _____	2-4
2-3	TZ30 Tape Cartridge Drive _____	2-7
2-4	TK50 Tape Cartridge Drive _____	2-9
2-5	Inserting a Label on a Tape Cartridge _____	2-12
2-6	Positioning the Write-Protect Switch _____	2-13
2-7	Inserting a TZ30 Tape Cartridge _____	2-14
2-8	Inserting a TK50 Tape Cartridge _____	2-16
2-9	Compact Disc Drive on the System Unit _____	2-19
2-10	Compact Disc Drive in an Expansion Box _____	2-20
2-11	Inserting a Compact Disc _____	2-21

TABLES

2-1	Disk and Tape Drives _____	2-6
2-2	TZ30 Drive Controls _____	2-8
2-3	TZ30 Indicator Lights _____	2-8
2-4	TK50 Drive Controls _____	2-10
2-5	TK50 Indicator Lights _____	2-11
4-1	Installation Questions for Local Area and Mixed-Interconnect Configurations _____	4-6
5-1	Installation Questions for Local Area and Mixed-Interconnect Configurations _____	5-7
7-1	The Device Tests _____	7-29
8-1	SYSGEN Commands Used in SYSBOOT _____	8-5
A-1	SCSI ID Numbers for the VAXstation 3100, Model 30 (SCSI-ST506 Option) _____	A-2
A-2	SCSI ID Numbers for the VAXstation 3100, Model 30 (SCSI-SCSI Option) _____	A-3
A-3	SCSI ID Numbers for the VAXstation 3100, Model 40 _____	A-3
C-1	DECW\$LOGICAL_NAMES _____	C-10
C-2	DECW\$SERVER(n)_TABLE _____	C-11
C-3	Print Dialog Box Logical Names _____	C-12
C-4	DECwindows Keymap _____	C-13

Preface

VMS Installation and Operations: VAXstation 3100 contains specific installation and operations information for the VAXstation 3100.

Store this installation and operations guide in the binder that contains the current version of the *VMS Release Notes*. Place it in the section after the *VMS Release Notes*.

This guide refers to the VAXstation 3100 computer as the VAXstation 3100.

Intended Audience

This guide is for system managers, operators, and users of the VAXstation 3100.

Document Structure

VMS Installation and Operations: VAXstation 3100 is organized into two parts. Part I provides an overview of the system and covers installation and post-installation procedures. Part II describes operations that you perform frequently on the system such as system startup, shutdown, and backup.

Part I

- Chapter 1 describes the VMS operating system installation, upgrade, and update procedures.
- Chapter 2 describes the system hardware that you use during the installation.
- Chapter 3 summarizes the basic information you need to know before installing the VMS operating system.
- Chapter 4 describes how to install the VMS operating system from a tape cartridge.
- Chapter 5 describes how to install the VMS operating system from a compact disc.
- Chapter 6 lists the tasks you should perform after you install the VMS operating system.
- Chapter 7 describes the VMS User Environment Test Package (UETP) and how you can use it to test the system.

Part II

- Chapter 8 contains instructions for starting up the system. It also describes shutdown procedures.
- Chapter 9 describes backup procedures that you should perform on a regular basis.
- The Glossary lists and defines terms.

Associated Documents

The following documents might be useful:

- *VMS Release Notes*—provides notes on various aspects of the VMS operating system. More importantly, the release notes contain a description of the upgrade and update procedures. You should read the current version of the *VMS Release Notes* before installing, updating, or upgrading the VMS operating system or using your VAX computer.
- The hardware manuals supplied with your VAX computer provide detailed hardware information on system hardware.

Conventions

Convention	Meaning
<code>RET</code>	In examples, a key name (usually abbreviated) shown within a box indicates that you press a key on the keyboard; in text, a key name is not enclosed in a box. In this example, the key is the RETURN key. (Note that the RETURN key is not usually shown in syntax statements or in all examples; however, assume that you must press the RETURN key after entering a command or responding to a prompt.)
<code>CTRL/C</code>	A key combination, shown in uppercase with a slash separating two key names, indicates that you hold down the first key while you press the second key. For example, the key combination CTRL/C indicates that you hold down the key labeled CTRL while you press the key labeled C. In examples, a key combination is enclosed in a box.
<code>\$ SHOW TIME</code> <code>05-JUN-1989 11:55:22</code>	In examples, system output (what the system displays) is shown in black. User input (what you enter) is shown in red.
<code>\$ TYPE MYFILE.DAT</code> . . .	In examples, a vertical series of periods, or ellipsis, means either that not all the data that the system would display in response to a command is shown or that not all the data a user would enter is shown.

Convention	Meaning
input-file, . . .	In examples, a horizontal ellipsis indicates that additional parameters, values, or other information can be entered, that preceding items can be repeated one or more times, or that optional arguments in a statement have been omitted.
[logical-name]	Brackets indicate that the enclosed item is optional. (Brackets are not, however, optional in the syntax of a directory name in a file specification or in the syntax of a substring specification in an assignment statement.)
quotation marks apostrophes	The term quotation marks is used to refer to double quotation marks ("). The term apostrophe (') is used to refer to a single quotation mark.

New and Changed Features

Before VMS Version 5.0, the *VAX/VMS System Manager's Reference Manual* included specific information on booting and installing standalone BACKUP on the different VAX computers. The *Guide to VAX/VMS Software Installation* provided information on console subsystems, disk and tape drives, and booting during installation. There were also 19 separate booklets with step-by-step instructions for installing the VMS operating system.

DIGITAL now provides one guide for each family of VAX computers. Each guide provides a single source of information on the following:

- Disk and tape drives and the console subsystem
- Installing the VMS operating system on your particular VAX computer
- Testing the system with UETP
- Startup and shutdown operations
- Installing and booting standalone BACKUP
- Backing up and restoring the system disk
- Backing up the console media (if applicable)

The guide for your VAX computer provides all the specific information you need to install the VMS operating system and perform daily startup, shutdown, and backup operations.

Note the following restrictions for installing the VMS operating system:

- Dual system disks are no longer supported.
- The entire VMS operating system will not fit on an RC25, RD52, or RK07 system disk. DIGITAL suggests that you add more disk storage to your system.
- The VAX-11/782 is no longer supported.

Part I

Part I describes installation and post-installation procedures.

1

The Installation, Upgrade, and Update Procedures

This chapter describes what happens during the installation, upgrade, and update procedures. It also tells when you should do an installation, upgrade, or update and refers you to the appropriate documentation.

Before you install, upgrade, or update the VMS operating system, read this chapter.

1.1 What Happens During an Installation

When you install the VMS operating system, the installation procedure does the following:

- Initializes the system disk, erasing its contents
- Creates a system directory structure
- Transfers the VMS files from the distribution media to the system disk

Use the installation procedure under the following conditions:

- If your VAX computer is new (it has never had any version of the operating system running on it).
- If your VAX computer is running a version of the VMS operating system and you want to destroy the entire contents of the system disk (both VMS and user files).
- If you are running the VMS operating system but are not able to perform an upgrade. For example, if you do not have a standard version of the VMS operating system on your system disk, the upgrade procedure does not work correctly.

If you are going to install the VMS operating system, read Chapters 1 through 3 of this guide and follow the appropriate installation procedure.

CAUTION: The installation procedure initializes the system disk, erasing its contents. For this reason, use the installation procedure only on new VAX computers or if you want to destroy the contents of the system disk.

1.2 What Happens During an Upgrade

In most cases, if you are already running a standard version of the VMS operating system, you can use the upgrade procedure to obtain a higher version. The upgrade procedure does not initialize the system disk.

When you upgrade the VMS operating system, the upgrade procedure does the following:

- Makes room for the upgrade by purging and deleting some VMS files, but leaves some of the VMS files and all the user files intact
- Transfers the VMS files from the distribution media to the system disk

The Installation, Upgrade, and Update Procedures

1.2 What Happens During an Upgrade

- Merges the old VMS files and the new VMS files
- Cleans up files and structures used only during the upgrade

CAUTION: The upgrade procedure will not work correctly if you have changed the names of system directories on your system disk or if you have deleted VMS files from them. Restore your VMS system disk to a standard system before attempting an upgrade.

If you are going to perform an upgrade, see the *VMS Version 5.0 Release Notes* for a step-by-step description of the upgrade procedure.

1.3 What Happens During an Update

The update procedure is used to make minor fixes to the operating system. When you update the VMS operating system, the update procedure does the following:

- Applies patches to some VMS files
- Replaces some VMS files

After performing an installation or an upgrade, you perform an update. This update is referred to as the *mandatory update*. The directions for an installation or an upgrade indicate when to perform the mandatory update. Some maintenance releases of the VMS operating system are also applied with the update procedure.

2 VAXstation 3100 Hardware

Before you install the VMS operating system, you need to be familiar with the following VAXstation 3100 hardware components:

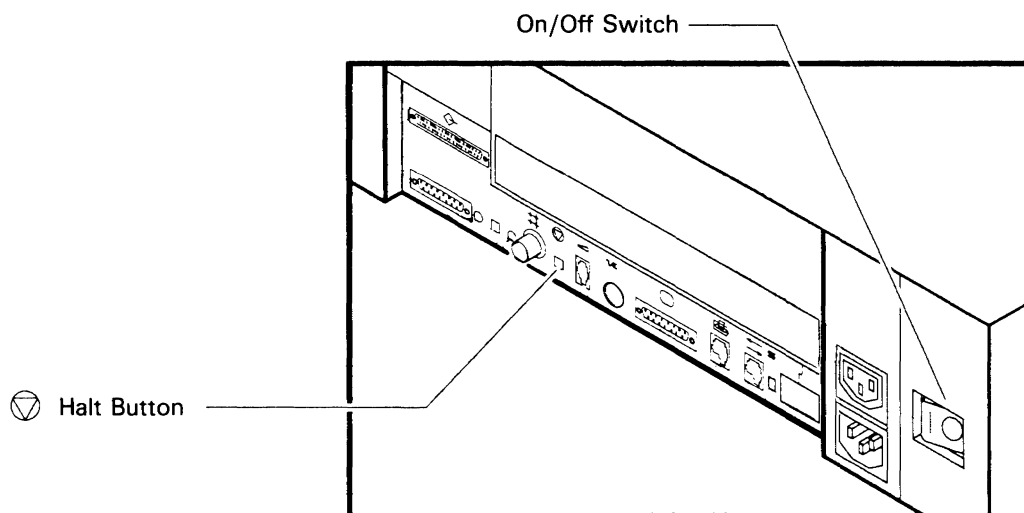
- On/Off switch
- Halt button
- Workstation display monitor
- Disk and tape drives

This chapter does not provide a detailed description of VAXstation 3100 hardware; it describes only the hardware components you need to perform system management operations. For a detailed description of hardware for your configuration, see the hardware manuals supplied with the VAXstation 3100 computer.

2.1 The On/Off Switch

The On/Off switch is on the back of the system unit. Setting the switch to 1 turns on the power. Setting the switch to 0 turns off the power. Figure 2-1 shows the location of the On/Off switch.

Figure 2-1 The ON/OFF Switch and the Halt Button



ZK-7889-HC

VAXstation 3100 Hardware

2.2 The Halt Button

2.2 The Halt Button

The Halt button is on the back of the system unit. It is underneath the Halt icon, an inverted triangle within a circle. The Halt button is a small square that projects from the back panel of the system unit. Figure 2-1 shows its location.

Press the Halt button with your fingertip to stop the VMS operating system and put the system in console mode. The console-mode prompt (> > >) is displayed on the workstation monitor.

2.3 The Monitor

The VAXstation 3100 comes with a workstation display monitor and keyboard. Section 2.3.1 describes how to turn on the power to the monitor.

You also can connect another terminal to the system to use as an alternate console terminal. Section 2.3.2 describes how to attach an alternate console terminal to a VAXstation 3100.

2.3.1 Turning On the Monitor

Turn on the power to the monitor before turning on the power to the system. To turn on the monitor, use the following procedure:

- 1 Make sure that the cable between the monitor and the system is connected properly.
- 2 Make sure that the power cable is connected to the monitor and plugged in to a wall outlet.
- 3 Press the power switch on the monitor.

The monitor runs in two different modes: console mode and program mode.

- Console mode—When the workstation display monitor is in console mode, the VMS operating system is not running and the console-mode prompt (> > >) is displayed. You can control and monitor system operations by entering console-mode commands.
- Program mode—When the workstation display monitor is in program mode, the VMS operating system is running and the dollar-sign prompt (\$) is displayed.. You can enter DCL commands, run programs, and receive system messages.

2.3.2 Alternate Console Terminal

The VAXstation 3100 has a serial port to which you can attach a printer. A picture of a small printer appears above this serial port. You can also attach another terminal to this port to use as the console terminal when the workstation display monitor is not working. You can also do this when you want a printout of what happens during the installation procedure.

There are two ways to get a printout of the installation procedure. You can attach a hardcopy terminal to the serial port, or you can attach a video terminal to the serial port and then connect a printer to the video terminal.

To attach any supported hardcopy or video terminal (but not a workstation display monitor) to the serial port and use it as an alternate console terminal, use the following procedure:

- 1 If the VMS operating system is not running, go to step 2.

If the VMS operating system is running, log into the SYSTEM account. Enter the following command and press RETURN:

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

Answer the questions. When the procedure asks if an automatic reboot should be performed, press RETURN for NO. When the procedure is finished, it displays the following message:

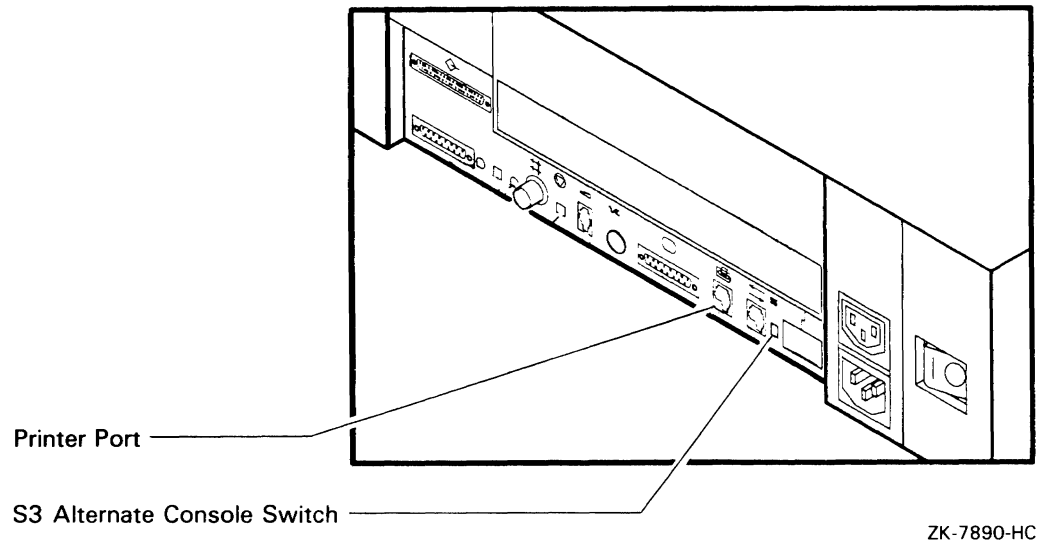
```
SYSTEM SHUTDOWN COMPLETE -- USE CONSOLE TO Halt SYSTEM
```

- 2 Turn the On/Off switch on the system unit and any expansion boxes to the 0 (off) position. Also turn off the power to the monitor.
- 3 Turn the alternate console switch to the 1 (on) position. Figure 2-2 shows the location of the alternate console switch. When this switch is turned to 1, the serial port becomes a terminal port.

VAXstation 3100 Hardware

2.3 The Monitor

Figure 2-2 Alternate Console Switch



- 4 Attach one end of an RS423 serial line to the serial port of the alternate console terminal. Attach the other end of the RS423 serial line to the serial port on the system unit. There a picture of a small printer above the serial port.
- 5 Turn on the alternate console terminal.
- 6 Check the baud rate on the alternate console terminal. The baud rate should be set to 9600. (For information on checking or setting the baud rate, see the documentation that came with your terminal.)
- 7 Turn the On/Off switch on the system unit and any expansion boxes to the 1 (on) position.
- 8 If the console-mode prompt (> > >) does not appear on the alternate console terminal screen, press the BREAK key on the alternate console terminal.

You can now use the alternate console terminal.

CAUTION: Do not turn off the alternate console terminal while the VMS operating system is running, because you might Halt the system. If you turn off the alternate console terminal accidentally and Halt the system, you can resume your work by turning on the terminal, pressing RETURN to get the console-mode prompt (> > >), and entering the CONTINUE command.

If you do not have a hardcopy terminal, you can get a printout of the installation procedure by connecting a printer to an alternate console terminal. For example, if you use a VT220 terminal as the alternate console terminal, you can attach an LA50 printer to the VT220 terminal. Set up the terminal so that whatever is displayed on the screen is printed. To attach a printer to the alternate console terminal, use the following procedure:

- 1 Make sure the power to the system unit, the alternate console terminal, any expansion boxes, and the printer is turned off.

VAXstation 3100 Hardware

2.3 The Monitor

- 2** Attach one end of a printer cable to the printer port of the alternate console terminal. Attach the other end of the cable to the connector on the printer.
- 3** Turn on the printer.
- 4** Check the baud rate on the printer (see the documentation that came with your printer). The baud rate should meet the requirements of your terminal (see the documentation that came with your terminal).
- 5** Turn on the alternate console terminal.
- 6** Check the set-up on the alternate console terminal to make sure that characters displayed on the terminal screen are printed. For example, on the VT220 you need to enable AUTOPRINT MODE in the primary set-up.
- 7** Turn on any expansion boxes and the system unit.

To disconnect the alternate console terminal, use the following procedure:

- 1** If the VMS operating system is not running, go to step 2.

If the VMS operating system is running, log into the SYSTEM account. Enter the following command and press RETURN:

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

Answer the questions. When the procedure asks if an automatic reboot should be performed, press RETURN for NO. When the procedure is finished, it displays the following message:

```
SYSTEM SHUTDOWN COMPLETE -- USE CONSOLE TO Halt SYSTEM
```

- 2** Turn the On/Off switch on the system unit and any expansion boxes to the 0 (off) position.
- 3** Turn off the alternate console terminal and disconnect the RS423 serial line that attaches the alternate console terminal to the serial port of the VAXstation 3100.
- 4** Turn the alternate console switch to the 0 (off) position. When this switch is turned to 0, you can use the serial port to attach a printer to the system.
- 5** Turn on components in the following order:
 - a.** Turn on the RZ55 drive, if you have one.
 - b.** Turn on any other optional drives that you have.
 - c.** Turn on the system unit.

VAXstation 3100 Hardware

2.4 Disk and Tape Drives

2.4 Disk and Tape Drives

Your VAXstation 3100 can contain one or more of the following drives within the system unit:

- TZ30 tape cartridge drive
- RZ22 fixed disk drive
- RZ23 fixed disk drive
- RX23 floppy diskette drive
- RRD40 compact disc drive

In addition to the disk and tape drives contained within the system unit, you also can equip your VAXstation 3100 with the following optional disk and tape drives:

- TK50 tape cartridge drive
- RRD40 compact disc drive
- RZ55 fixed disk drive

These drives are contained in separate units called expansion boxes. Table 2-1 lists the capacity of the disk and tape drives that can be part of a VAXstation 3100 system.

Table 2-1 Disk and Tape Drives

Drive	Storage Capacity
TZ30	95 Megabytes
RZ22	50 Megabytes
RZ23	105 Megabytes
RRD40	600 Megabytes
TK50	95 Megabytes
RX23	1.4 Megabytes
RZ55	332 Megabytes

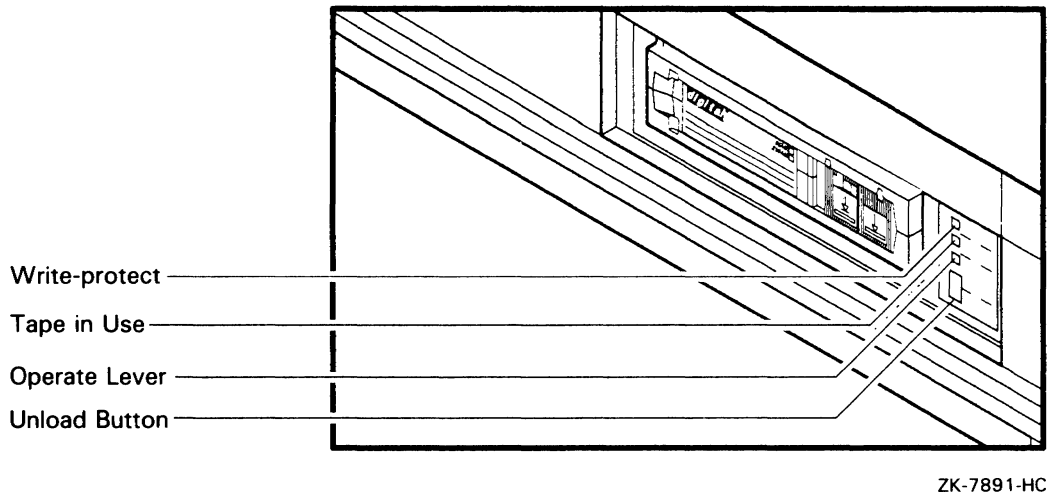
2.5 The TZ30 Tape Cartridge Drive

If you have a TZ30 tape cartridge drive, you can install the VMS operating system from a tape cartridge. Figure 2-3 shows a TZ30 tape cartridge drive.

VAXstation 3100 Hardware

2.5 The TZ30 Tape Cartridge Drive

Figure 2-3 TZ30 Tape Cartridge Drive



When using the TZ30 tape cartridge drive you should be aware of the following:

- The orange light glows when the tape cartridge is write-protected.
- The yellow light glows when the tape is loaded and blinks when the tape is in use.
- The green light glows when the tape is unloaded and blinks when the drive detects a tape cartridge error.

CAUTION: Never attempt to remove a tape cartridge under any of the following circumstances:

- The green light is off.
- The yellow light is on or blinking.
- You press the Unload button to rewind and unload the tape. When the tape is unloaded, the green light goes on and the tape drive beeps.
- The cartridge-release lever is located below the tape access slot. This lever controls the position of the tape drive spindle. Move the lever to the right to insert a tape cartridge and to the left to remove a tape cartridge.

CAUTION: Do not force the cartridge-release lever. Move it *only* when the green light glows steadily or blinks and the yellow light does not blink or glow. Otherwise, you might damage both the tape and the drive.

Table 2-2 summarizes the tape cartridge drive controls. Table 2-3 describes the tape cartridge drive lights.

VAXstation 3100 Hardware

2.5 The TZ30 Tape Cartridge Drive

Table 2-2 TZ30 Drive Controls

Control	Position	Function
Unload button	Pressed in	Rewinds and unloads the tape (15 seconds to 2 minutes).
Cartridge-release lever	Left	Lets you insert or remove a tape after rewind and unload operations are complete.
	Right	Locks tape in operating position.

Table 2-3 TZ30 Indicator Lights

Light	State	Condition
Orange-Write Protected	On	Tape is write-protected.
	Off	Tape is write-enabled.
Yellow-Tape in Use	On	Tape is loaded.
	Blinking	Tape is being used. Fast blinking (four times a second) indicates that a read or write operation is in progress. Medium blinking (two times a second) indicates that the tape is loading or unloading. Slow blinking (once a second) indicates that the tape is rewinding.
Green-Operate Lever	On	You can operate the lever to load or unload a tape.
	Off	Do not operate the lever.
	Blinking	Cartridge error detected.
All	On	Power-up diagnostics are running. All three lights stay on for a few seconds to test themselves. If all three lights remain lit for a long time, the power-up diagnostics have failed.
	Blinking	Drive fault.

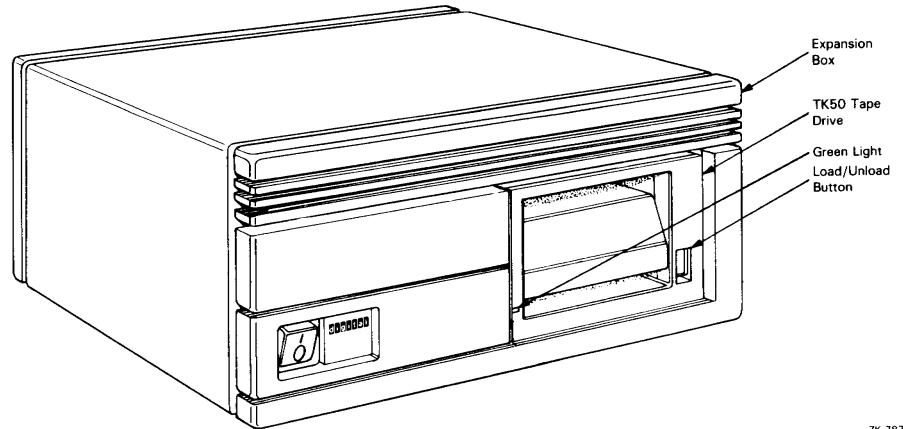
2.6 The TK50 Tape Cartridge Drive

If you have a TK50 tape cartridge drive, you can install the VMS operating system from tape cartridges. Figure 2-4 shows the TK50 tape cartridge drive.

VAXstation 3100 Hardware

2.6 The TK50 Tape Cartridge Drive

Figure 2-4 TK50 Tape Cartridge Drive



When using the TK50 tape cartridge drive shown in Figure 2-4, you should be aware of the following:

- The green light blinks when the tape in the drive is moving (being read from or written to). If a tape cartridge is in the drive and this light is off, the drive is inactive and the tape is not positioned at its beginning.

Note: *Never attempt to remove a tape when the green light is blinking or when it is off; this damages the tape and might damage the drive.*

The green light glows when the drive is empty. It also glows when the drive is inactive and positioned at the beginning of a tape. The only time you can remove a tape cartridge is when the green light is glowing steadily.

- The red Load/Unload button controls the loading of the tape.

When the button is pressed in, it is in the Load position. The red light or the button glows when the tape is loaded. It blinks *slowly* when the tape is rewinding. It blinks *rapidly* when there is a tape error (for some reason the tape could not be read). To clear a tape error, press the button four times.

VAXstation 3100 Hardware

2.6 The TK50 Tape Cartridge Drive

Note: *Never attempt to remove a tape cartridge when the Load/Unload Button is in the Load (in) position (the red light is on); you might damage both the tape and the drive.*

When the Load/Unload button is released, it is in the Unload (out) position. The only time you can remove a tape is when this button is in the Unload (out) position (the red light is off).

- The cartridge-release handle is located next to the tape access slot. This handle controls the position of the tape drive spindle. Pull the handle open to insert or remove a tape cartridge.

CAUTION: Pull the cartridge-release handle open *only* when all three of the following are true:

- The green light glows steadily.
- The Load/Unload button is in the Unload (out) position.
- The red light on the Load/Unload button is off.

Otherwise, you might damage both the tape and the drive.

Table 2-4 summarizes the tape cartridge drive controls. Table 2-5 describes the tape cartridge drive lights.

Table 2-4 TK50 Drive Controls

Control	Position	Function
Load/Unload button	In	Loads the tape (15 seconds to 3 1/2 minutes).
	Out	Rewinds and unloads the tape.
Cartridge release handle	Open	Lets you insert or remove a tape after rewind and unload operations are complete.
	Closed	Locks tape in operating position.

VAXstation 3100 Hardware

2.6 The TK50 Tape Cartridge Drive

Table 2–5 TK50 Indicator Lights

Red Light	Green Light	Condition
Off	Off	No power to the tape drive.
Off	On	Safe to move cartridge release handle. Power is turned on.
On	Off	Do not move the cartridge release handle. One of the following conditions exists: <ul style="list-style-type: none"> • Power-on self test is occurring. • Cartridge is inserted but handle is still in the up position. • Tape is loading or unloading. • Tape is stopped.
On	On	Tape loaded successfully.
On	Blinking	Tape is moving (except rewind). Read/write commands are being processed. Irregular rapid blinking means tape calibration is occurring.
Blinking	Blinking	Tape is rewinding.
Rapid Blinking	Off	A fault is occurring. Press and release the Load/Unload button four times. If the problem persists, do not attempt to remove the tape cartridge. Call DIGITAL Field Service.

2.6.1 Tape Cartridges

Follow these guidelines when using tape cartridges:

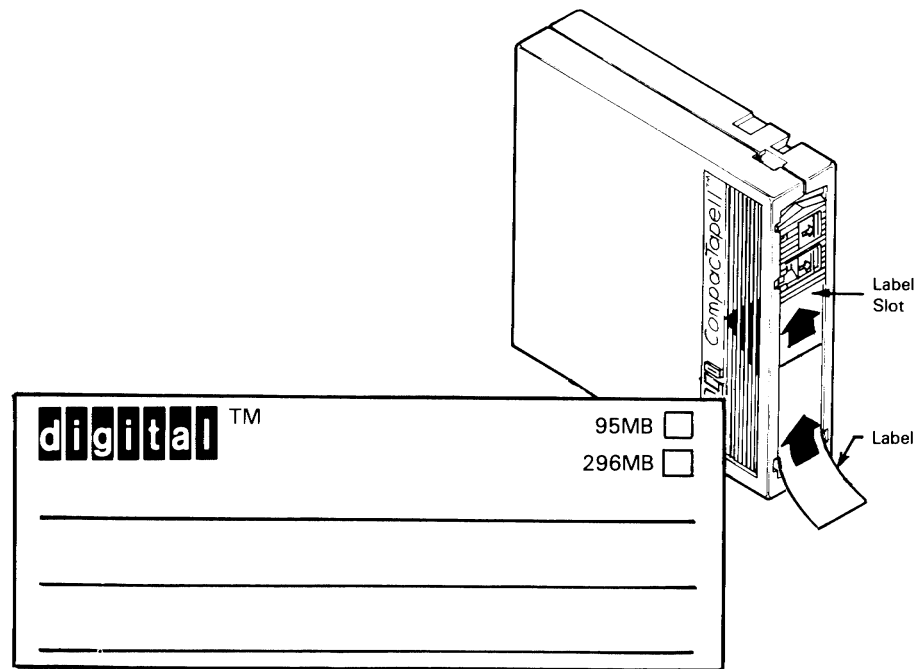
- Tape cartridges come in clear, plastic, protective cases. You should keep tape cartridges in these cases when you are not using them.
- Store tape cartridges in a vertical position.
- The label slot holds the label that provides information about the contents of the tape cartridge. Label a tape cartridge if you are going to copy files to it (distribution tape cartridges are already labeled).

To label a tape cartridge, insert a slide-in label into the slot located on the front of the tape cartridge. Figure 2–5 shows how to insert the label on a tape cartridge.

VAXstation 3100 Hardware

2.6 The TK50 Tape Cartridge Drive

Figure 2-5 Inserting a Label on a Tape Cartridge



ZK-6520-HC

CAUTION: Use only the label slot to label a tape cartridge. Applying adhesive labels or writing on the tape cartridge can damage it or the drive.

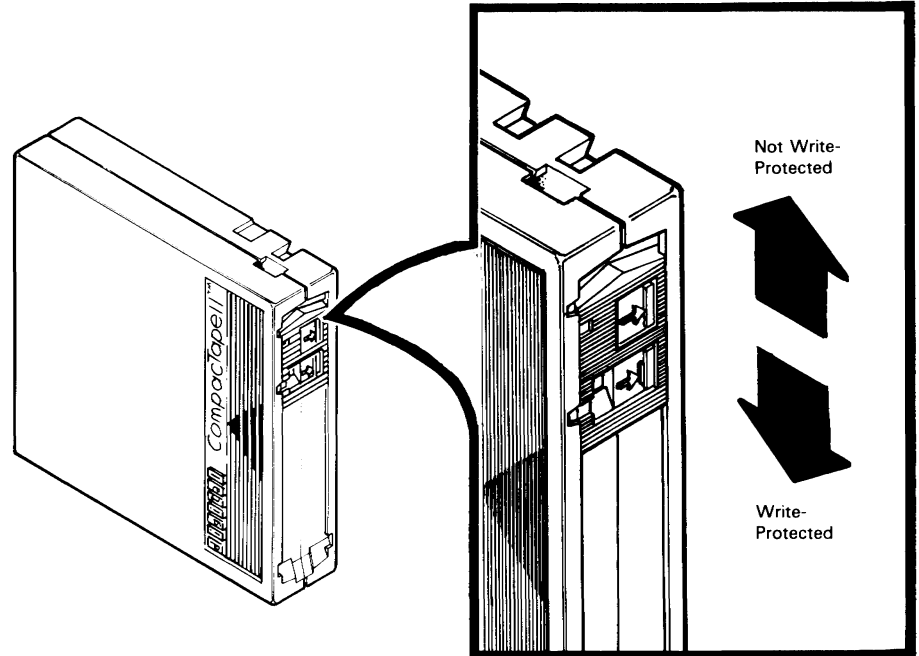
- The write-protect switch is a movable switch on the tape cartridge that controls whether you can write to the tape. To write-protect a tape cartridge, slide the write-protect switch toward the label slot. An orange rectangle is visible when the tape cartridge is write-protected.

Always write-protect the distribution tape cartridge before an installation. Figure 2-6 shows how to write-protect a tape cartridge.

VAXstation 3100 Hardware

2.6 The TK50 Tape Cartridge Drive

Figure 2-6 Positioning the Write-Protect Switch



ZK-6521-HC

2.6.2 Inserting a Tape Cartridge in a TZ30 Drive

To insert a tape cartridge in a TZ30 drive, do the following:

- 1 Make sure the tape drive is empty. If the VMS operating system is not running, go to step 2.

If the VMS operating system is running and a tape cartridge is already in the drive, enter the following command and press RETURN:

```
§ SHOW DEVICE MKA500
```

If the display indicates that the status of the tape cartridge is MOUNTED, you must dismount the tape before removing it from the drive. Follow the instructions in Section 2.6.6 to dismount the tape cartridge. Then follow the directions in Section 2.6.7 to remove the tape cartridge.

VAXstation 3100 Hardware

2.6 The TK50 Tape Cartridge Drive

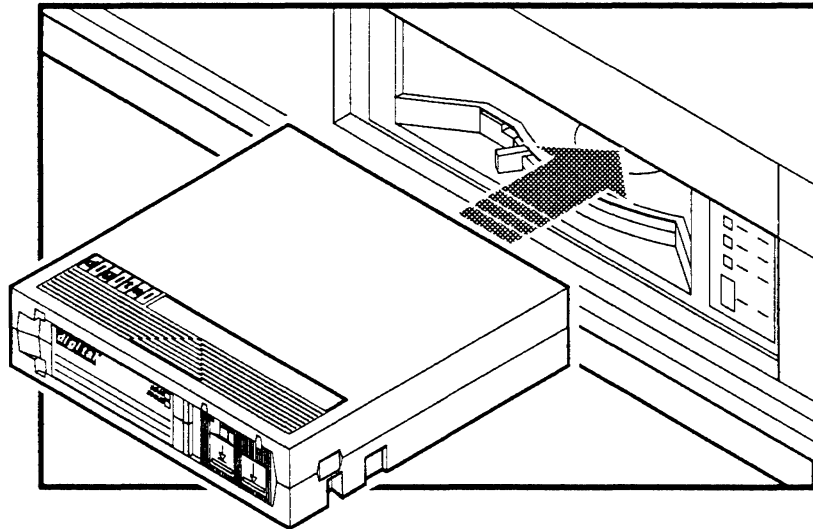
- 2 Remove the tape cartridge from its plastic case. You should write-protect a tape cartridge containing software that you are installing on your system. You should write-enable a tape cartridge if you are going to either copy or back up files to it.

CAUTION: Move the cartridge-release lever *only* when the green light glows steadily and the yellow and orange lights do not blink or glow. Otherwise, you might damage both the tape and the drive.

- 3 Hold the tape cartridge with the label facing you and the large arrow on the top of the tape cartridge pointing into the drive. Insert the tape cartridge in the drive. Push the tape cartridge into the drive until it locks into place.
- 4 Move the cartridge-release lever to the right until it locks into place. The green light turns off. The yellow light blinks as the tape cartridge loads, and glows when the tape cartridge is successfully loaded. If the tape is write-protected, the orange light also glows.

Figure 2-7 shows how to insert a TZ30 tape cartridge.

Figure 2-7 Inserting a TZ30 Tape Cartridge



ZK-7886-HC

2.6.3 Inserting a Tape Cartridge in a TK50 Drive

To insert a tape cartridge in a TK50 drive, do the following:

- 1 Make sure the tape drive is empty. If the VMS operating system is not running, go to step 2.

If the VMS operating system is running, and a tape cartridge is already in the drive, enter the following command and press RETURN:

```
$ SHOW DEVICE MKA500
```

VAXstation 3100 Hardware

2.6 The TK50 Tape Cartridge Drive

If the display indicates that the status of the tape cartridge is MOUNTED, you must first dismount the tape before removing it from the drive. Follow the instructions in Section 2.6.6 to dismount the tape cartridge. Then follow the directions for removing a tape cartridge in Section 2.6.8.

- 2 Press the Load/Unload button so that it is in the Unload (out) position. The green light glows steadily, and the red light is off.
- 3 Remove the tape cartridge from its plastic case. You should write-protect a tape cartridge containing software that you are installing on your system. You should write-enable a tape cartridge if you are going to either copy or back up files to it.

CAUTION: Never pull open the cartridge-release handle unless the green light glows, the red light is off, and the Load/Unload button is in the Unload (out) position; you might damage the drive.

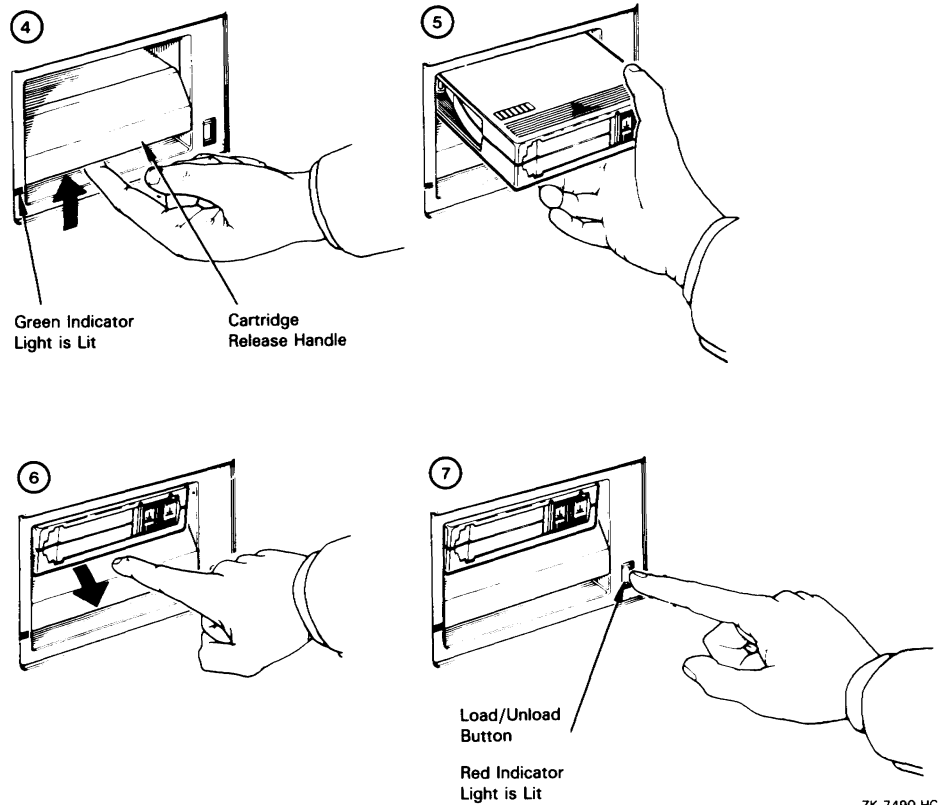
- 4 Pull open the cartridge-release handle.

Figure 2-8 shows how to insert a TK50 tape cartridge.

VAXstation 3100 Hardware

2.6 The TK50 Tape Cartridge Drive

Figure 2-8 Inserting a TK50 Tape Cartridge



- 5** Hold the tape cartridge with the label facing you and the large arrow on the top of the tape cartridge pointing into the drive. Insert the tape cartridge in the drive. Push the tape cartridge into the drive until it locks into place. The green light turns off, and the red light glows.
- 6** Push the cartridge-release handle closed until it locks into place. The red light turns off, and the green light glows.
- 7** Press the Load/Unload button so that it is in the Load (in) position. The red light glows. The tape cartridge goes through a load process that takes approximately 30 seconds. During this time, the green light blinks. When the tape is ready, the green light glows.

VAXstation 3100 Hardware

2.6 The TK50 Tape Cartridge Drive

2.6.4 Initializing a Tape Cartridge

Note: You do not need to initialize any tape cartridges when you install the VMS operating system.

Initializing a tape cartridge does the following:

- Erases any data stored on the tape cartridge
- Assigns a volume label to the tape cartridge
- Prepares the tape cartridge to store VMS files

You should initialize a new tape cartridge before you use it the first time. Initialize an old tape cartridge to erase it.

Before you initialize a tape cartridge, make sure that the account you are logged into has the volume protection (VOLPRO) privilege. Make sure the tape cartridge is write-enabled.

CAUTION: Do not initialize a tape cartridge that contains operating system software or files that you want to save. The INITIALIZE command erases the tape cartridge.

To initialize a tape cartridge, enter the INITIALIZE command in the following format and press RETURN:

```
$ INITIALIZE MKA500: volume-label
```

Substitute a 1- to 6-character name for *volume-label*. Write the volume label of the tape cartridge on the tape cartridge label. You need to know the volume label when you use the tape cartridge.

For example, the following command initializes the tape cartridge in the tape cartridge drive and gives it the label TEST:

```
$ INITIALIZE MKA500: TEST
```

2.6.5 Mounting a Tape Cartridge

Note: You do not need to mount any tape cartridges when you install the VMS operating system. The VMS installation procedure does this automatically.

After you insert a tape cartridge (and initialize it, if it is new) you must mount it, to make it available to the system. To mount a tape cartridge, enter the MOUNT command in the following format and press RETURN:

```
$ MOUNT MKA500: volume-label
```

The *volume-label* is the 1- to 6-character name you assigned to the tape cartridge with the INITIALIZE command.

If you do not specify the correct volume label when you mount the tape cartridge, the system displays the following message:

```
%MOUNT-F-INCROLLABEL, incorrect volume label
```

If you do not remember the volume label, enter the MOUNT command in the following format and press RETURN:

```
$ MOUNT/OVERRIDE=IDENTIFICATION MKA500:
```

VAXstation 3100 Hardware

2.6 The TK50 Tape Cartridge Drive

The system displays a message containing the volume label. In the following example, the volume label is TAPER.

```
%MOUNT-I-MOUNTED, TAPER mounted on _MKA500:.
```

After you mount a tape cartridge, you can determine its volume label at any time by entering the following command:

```
$ SHOW DEVICE MKA500:
```

The system displays the volume label.

2.6.6 Dismounting a Tape Cartridge

Note: You do not need to dismount any tape cartridges when you install the VMS operating system. The VMS installation procedure does this automatically.

When you finish using a tape cartridge, you should dismount it. To dismount a tape cartridge, enter the DISMOUNT command in the following format and press RETURN:

```
$ DISMOUNT MKA500:
```

After you dismount a tape cartridge, you can remove it from the drive.

2.6.7 Removing a Tape Cartridge from a TZ30 Drive

To remove a tape cartridge from a TZ30 drive, do the following:

- 1 Press the Unload button. If the tape is not rewound, the yellow light blinks slowly as the tape rewinds. When the tape is completely unloaded, the green light glows, the yellow light turns off, and you hear a beep.

CAUTION: Move the cartridge-release lever *only* when the green light glows steadily and the yellow and orange lights do not blink or glow. Otherwise, you might damage both the tape and the drive.

- 2 Move the cartridge-release lever to the left. The tape cartridge partially ejects.
- 3 Remove the tape cartridge and put it in its plastic case.

2.6.8 Removing a Tape Cartridge from a TK50 Drive

To remove a tape cartridge from a TK50 drive, do the following:

- 1 Press the Load/Unload button so that it is in the Unload (out) position. If the tape is not rewound, the red and green lights blink slowly as the tape rewinds. When the tape is completely unloaded, the red light turns off and the green light glows.

CAUTION: Never pull open the cartridge-release handle unless the green light glows, the red light is off, and the Load/Unload button is in the Unload (out) position; you might damage the tape drive.

VAXstation 3100 Hardware

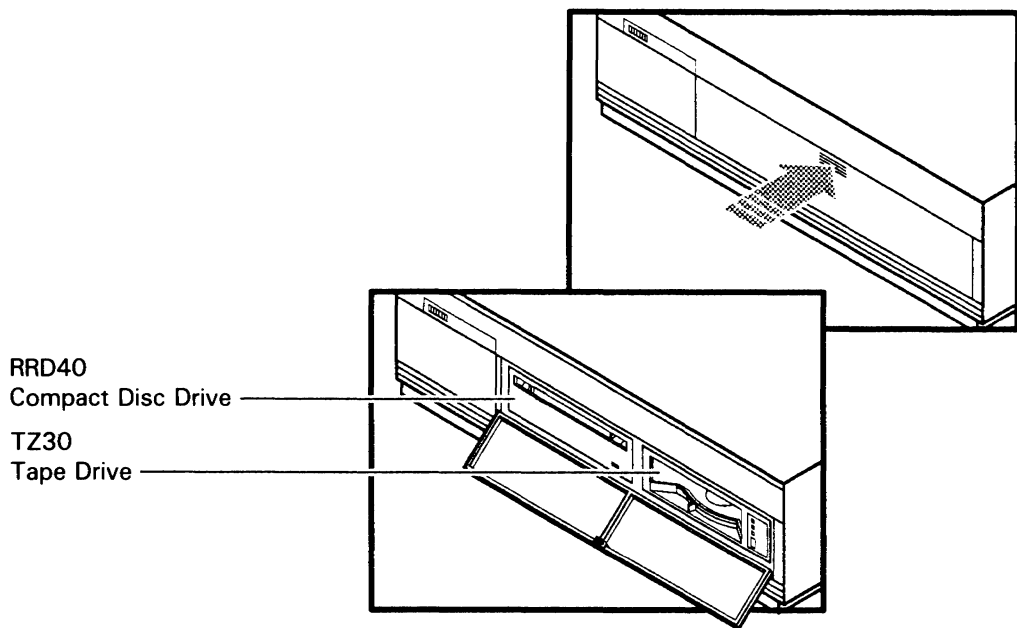
2.6 The TK50 Tape Cartridge Drive

- 2 Pull open the cartridge-release handle. The tape cartridge partially ejects.
- 3 Remove the tape cartridge and put it in its plastic case.
- 4 Push the cartridge-release handle closed until it locks firmly into place.

2.7 The Compact Disc Drive

If you have a VAXstation 3100 Model 40, there is a compact disc drive in the system unit. Whether you have a Model 40 or a Model 30, you have the option of adding a compact disc drive in an expansion box. The compact disc drive is a read-only drive that reads data stored on removable compact discs. A compact disc can store 600 Megabytes of data. Figure 2-9 and Figure 2-10 show the two types of compact disc drives.

Figure 2-9 Compact Disc Drive on the System Unit

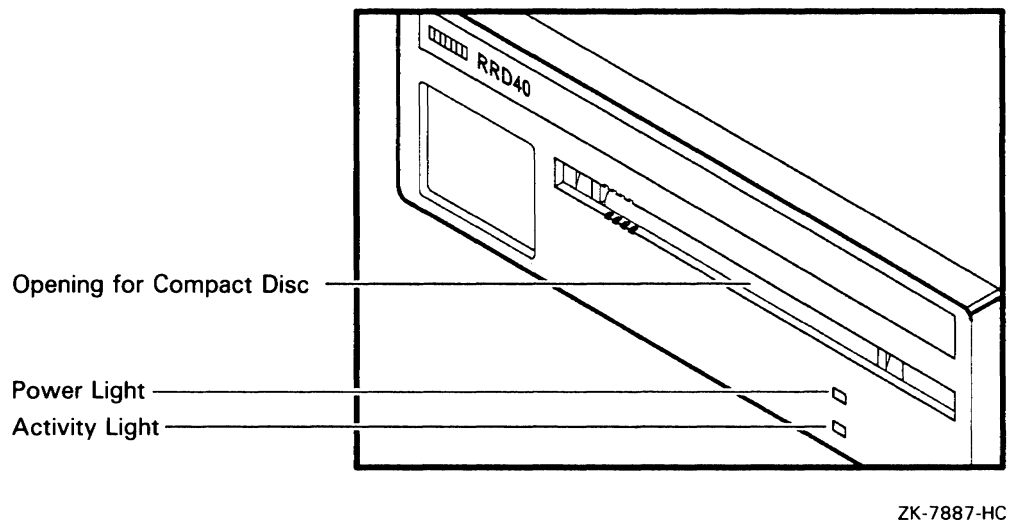


ZK-7885-HC

VAXstation 3100 Hardware

2.7 The Compact Disc Drive

Figure 2-10 Compact Disc Drive in an Expansion Box



ZK-7887-HC

2.7.1 Inserting a Compact Disc

A compact disc is contained within a clear plastic *caddy*. When you insert a compact disc in the drive, insert the entire caddy. **DO NOT** remove the disc from the caddy.

To insert a compact disc in the drive, do the following:

- 1 Make sure the power to the drive is on. The power light on the front of the drive should be lit.
- 2 Examine the caddy. Make sure it is not cracked or damaged in any way.
- 3 Examine the disc inside the caddy. One side of the disc is labeled. The label should always be facing up as you insert the disc in the drive. When the label is facing up, the four notches on the caddy are on the left as shown in Figure 2-11. These notches line up with four similar notches on the front of the drive.
- 4 Insert the caddy as shown in Figure 2-11. Make sure the notches on the left side of the disc caddy line up with the notches on the door of the drive. Slide the caddy in as far as it will go and then remove it. When you remove the caddy, notice that the disc remains in the drive. Only the clear plastic caddy comes out.
- 5 The front activity light should go on within five seconds.

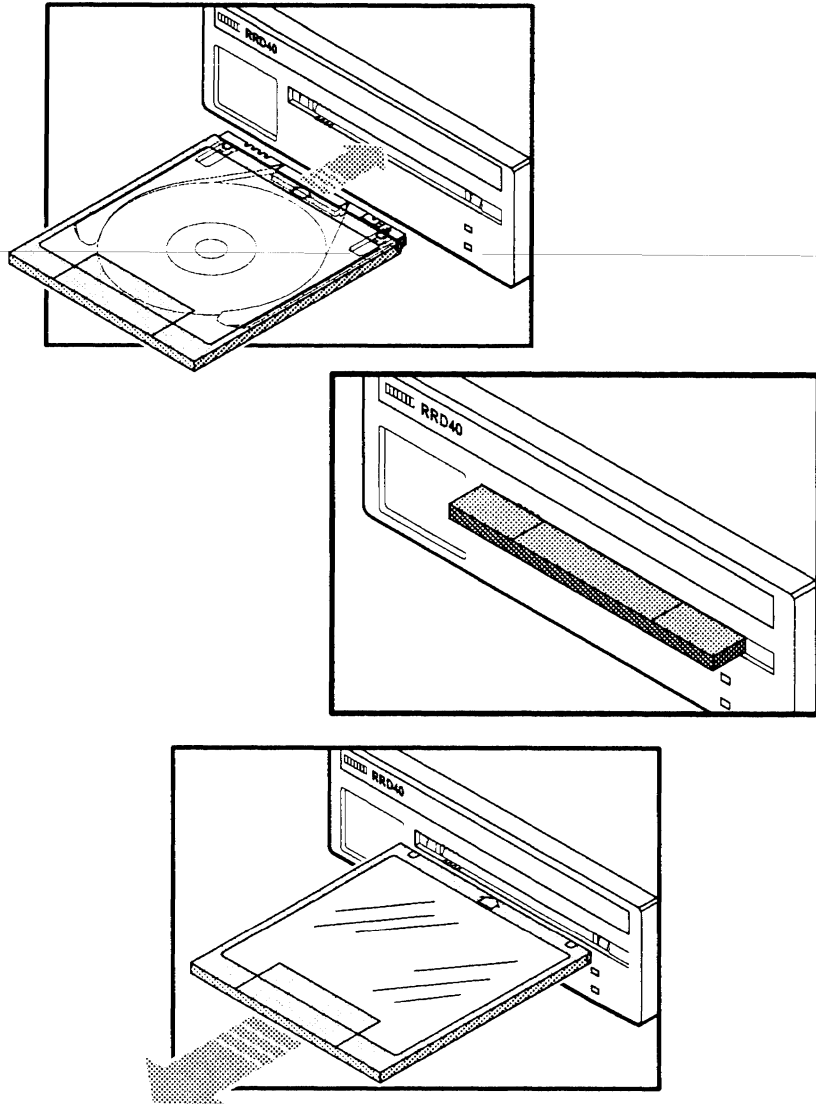
If the drive accepted the disc and the activity light does not light, the disc might be sitting incorrectly in the caddy. Unload the disc and try again.

VAXstation 3100 Hardware

2.7 The Compact Disc Drive

For more information on using a compact disc drive, see the hardware manuals.

Figure 2-11 Inserting a Compact Disc



ZK-7888-HC

VAXstation 3100 Hardware

2.7 The Compact Disc Drive

2.7.2 Removing a Compact Disc

Before removing a compact disc, make sure the activity light is not flashing. If it is flashing, wait for it to stop before you proceed.

To remove a compact disc from a drive, do the following:

- 1** Position the clear plastic caddy by matching the four notches on the disc to the four notches on the drive. Make sure the arrow is going into the drive first.
- 2** Insert the caddy into the drive door as far as it will go.
- 3** Remove the caddy. The disc will be back in the caddy. The activity light will go out.

3 Before Installing VMS

This chapter describes the following:

- Terms and procedures you need to know before you do an installation
- Information you need to install the VMS operating system in a VAXcluster environment

3.1 The Distribution Media and System Disk

When you install the VMS operating system, you work primarily with the distribution media and the system disk. The distribution media are the disks or tapes that the VMS operating system is supplied on. However, the distribution media has a format that the system cannot readily use.

The installation procedure transfers the VMS files from the distribution media to your system disk and puts them in a format that the system can use. A *system disk* is the disk that contains (or will contain) the VMS operating system in a usable format.

3.2 Device Names

At different times during the installation you need to tell the system which drive contains the distribution media and which drive contains the system disk. You do this by referring to the drive that holds the distribution media and to the fixed disk that you want to be your system disk. You refer to a drive with its *device name*. A device name has the following format:

ddciuu

where:

- *dd* is the device code. The device code tells what type of drive you are using. DK is the device code for disk drives and MK is the device code for tape drives.
- *c* is the controller designation. The controller designation on the standard system is A. The controller designation on the VAXserver 3100 can be A or B.
- *i* is the SCSI ID number. It can be a decimal number in the range of 0 to 7.
- *uu* is the logical unit number. It is usually zero.

For example, a fixed disk with a SCSI ID number of one has the device name DKA100. A fixed disk with a SCSI ID number of two has the device name DKA200. Note that, when the SCSI ID number is zero, the device name is DKA0.

Note: The device name for the RX23 floppy disk drive does not follow this convention. It is always referred to as DUA2.

Before Installing VMS

3.2 Device Names

Use the SHOW DEVICE command at the console-mode prompt (> > >) to find out the device names of the disk and tape drives on your system. For example:

```
>>> SHOW DEVICE
VMS/VMB  ULTRIX  ADDR      DEVTYP      NUMBYTES    RM/FX  WP  DEVNAM
-----  -
ESAO     SEO      08-00-2B-07-A7-B6
DKAO     RZO      A/0/0/00   RODISK      RM        WP  RRD40
DKA400   RZ4      A/4/0/00   DISK        104MB    FX        RZ23
MKA500   TZ5      A/5/0/00   TAPE        .....   RM
...HOST ID...  A/6      INTR
```

Each column gives the following information:

- **VMS/VMB**—the VMS device name
- **ULTRIX**—the ULTRIX device name
- **ADDR**—the address of the device
- **DEVTYP**—the type of device (RO stands for read-only, INTR stands for SCSI initiator)
- **NUMBYTES**—capacity of the drive in bytes
- **RM/FX**—tells whether the drive is removable (RM) or fixed (FX)
- **WP**—indicates if the drive is write-protected
- **DEVNAM**—indicates the device name

3.3 Choosing a System Disk

If your system has more than one fixed disk, you can choose which one will be the system disk. When choosing a system disk, you need to be aware of the capacity of the disk as well as the size of the VMS operating system. Keep in mind that a system disk in a VAXcluster environment needs more space for the operating system than a system disk for a standalone system.

Before you begin the installation procedure, make sure you know the device names for both the drive that will hold the distribution media and the fixed disk that will be the system disk.

3.4 Information on VAXcluster Environments

If you are installing the VMS operating system in a VAXcluster environment, the installation procedure asks you for information about your VAXcluster environment. Before proceeding, you must read the *VMS VAXcluster Manual*. If you have a clear understanding of VAXclusters before you do an installation, you are less likely to enter incorrect information during the installation. Entering incorrect information during the installation might force you to repeat the entire procedure.

Before Installing VMS

3.4 Information on VAXcluster Environments

Following is a list of the VAXcluster information you need to obtain. For a complete explanation of each item, see the *VMS VAXcluster Manual*.

- 1 Determine what type of configuration you want: local area or mixed-interconnect. These configuration types are distinguished by the interconnect device that the VAX computers in the cluster use to communicate with one another (CI, Ethernet, or both).

Note: The VAXstation 3100 cannot be part of a CI-only VAXcluster environment.

- 2 You need to know the *DECnet node name* and *node address* for the VAX computer on which you are installing the VMS operating system. The network or system manager determines the DECnet node name and node address for each VAX computer on the network. See your system or network manager for this information.
- 3 You need to know the allocation class value for the VAX computer on which you are installing the VMS operating system. During the installation procedure you are asked for the ALLOCLASS value, as follows:

Enter a value for ALICE's ALLOCLASS parameter:

Enter the appropriate allocation class value for the VAX computer on which you are installing the VMS operating system. Refer to the *VMS VAXcluster Manual* for the rules on specifying allocation class values. Note that, in a mixed-interconnect VAXcluster environment, the allocation class value cannot be zero. It has to be a value between 1 and 255. This is also true for any VAX computer that is connected to a dual-pathed disk

When you enter the allocation class value, the installation procedure uses it to automatically set the value of ALLOCLASS, a SYSGEN parameter.

- 4 If you are going to set up either a local area or a mixed-interconnect cluster, determine the *cluster group number* and the *cluster password*. 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 may include dollar signs (\$) and underscores (_).

4 Installing VMS from a Tape Cartridge

This chapter describes how to install the VMS operating system on a VAXstation 3100 from a tape cartridge. To install the VMS operating system from a compact disc, see Chapter 5.

CAUTION: The software installation procedure overwrites the contents of the system disk. Use the VMS installation procedure only if your VAX computer is new or if you want to destroy the contents of the system disk. If your system disk contains files you want to save, upgrade to the new version of the VMS operating system. For a complete description of the upgrade procedure, see the current version of the *VMS Release Notes*.

4.1 Before You Start

Before you install the VMS operating system, do the following:

- Make sure your hardware has been installed and checked for proper operation. For detailed hardware information, see the hardware manuals for the VAXstation 3100.
- Make sure you have all the items listed on the bill of materials in the VMS distribution kit. The tape cartridge distribution kit should have a tape cartridge that contains standalone BACKUP and the VMS *required*, *library*, and *optional* save sets.
- If you are installing the VMS operating system on a VAX computer in a VAXcluster environment, determine whether you want a local area or a mixed-interconnect configuration. For a complete description of configurations, see the *VMS VAXcluster Manual*. If you are installing the VMS operating system in a local area or mixed-interconnect configuration, you need to obtain the following information from either the network or VAXcluster manager:
 - DECnet node name and node address
 - Cluster group number and password
 - Allocation class value

The installation procedure transfers the VMS files from the distribution tape cartridge to the system disk. The procedure consists of the following stages:

- 1 Turning on the system
- 2 Preparing the system disk
- 3 Booting standalone BACKUP
- 4 Creating the system disk
- 5 Running AUTOGEN

Installing VMS from a Tape Cartridge

4.1 Before You Start

The entire procedure takes two to three hours.

Note: The screen displays and examples in this manual depict the installation of VMS Version 5.1-B. Your screen displays reflect the version that you are installing.

4.2 Turning On the System

This procedure assumes that the system is not turned on when you start the installation. The following steps describe how to turn on the system:

- 1 Turn components on in the following order:
 - a. Turn on the monitor.
 - b. Turn on the RZ55 drive, if you have one.
 - c. Turn on any other optional drives that you have. (Push the power switch on the front to the 1 (on) position.)
 - d. Push the power switch on the back of the system unit to the 1 (on) position.
- 2 The VAXstation 3100 should display self-test messages similar to the following:

```
KA42-B V1.0  
F...E...D...C...B...A...9...8...7...6...5...4...3...2...1...  
OK  
>>>
```

If the console-mode prompt (> > >) does not appear on the screen, press the Halt button.

If the system does not power up properly (for example, if you receive the message ?84 FAIL), refer to the troubleshooting section of the hardware manual supplied with your system.

- 3 To prepare the system disk, go to Section 4.3.

4.3 Preparing the System Disk

To set up the fixed disk you use during the installation, do the following:

- 1 If your system has more than one fixed disk, decide which one you want to be the system disk.
- 2 Enter the SHOW DEVICE command at the console-mode prompt (> > >) to find out the device names for the system disk and the tape cartridge drive. Write the device names on a piece of paper. You need this information throughout the installation.
- 3 To boot standalone BACKUP, go to Section 4.4.

Installing VMS from a Tape Cartridge

4.4 Booting Standalone BACKUP

4.4 Booting Standalone BACKUP

This section describes the steps for booting standalone BACKUP. Standalone BACKUP lets you transfer the VMS *required* save set from the distribution tape cartridge to your system disk. You need the tape cartridge from the VMS distribution kit that is labeled as follows:

Paper Label ¹	Volume Label ²
VAX/VMS V5.1-B	SYSTEM

¹A paper label is the label affixed to a tape cartridge.

²A volume label is the name the VMS operating system uses to refer to a tape cartridge. During the installation the procedure displays the volume label, not the paper label, in messages.

Booting standalone BACKUP takes approximately 20 minutes.

- 1 Insert the tape cartridge labeled VAX/VMS V5.1-B in the tape cartridge drive.
- 2 To boot standalone BACKUP, enter the following command and press RETURN:

```
>>> B MKA500
```

Note: MKA500 is usually the device name for the TZ30 and TK50 tape cartridge drives. If you get an error message when you use MKA500, enter the SHOW DEVICE command at the console-mode prompt (> > >). The SHOW DEVICE command displays the correct device name.

Ignore any error messages about missing drivers that resemble the following:

```
%SYSGEN-I-OPENIN, error opening SYS$SYSROOT:[SYSEXE]VEDRIVER.EXE; as input  
%SYSGEN-E-FNF, file not found
```

These messages might be displayed during the installation.

- 3 A few minutes later, standalone BACKUP displays the following message:

```
VAX/VMS Version V5.1-B Major version id = 1 Minor version id = 0
```

- 4 A few minutes later the procedure asks you for the date and time. Enter the date and time using the 24-hour clock format and press RETURN. For example:

```
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM) 31-DEC-1989 15:00
```

- 5 The procedure displays a list of the local devices on your system. For example:

```
Available device MKA500:           device type TK50  
Available device DKA100:           device type RRD40
```

```
.  
.  
.
```

Check the list of devices. If the list is incomplete, make sure that all the drives are properly connected to the system. See your hardware manuals for details.

Installing VMS from a Tape Cartridge

4.4 Booting Standalone BACKUP

- 6 When standalone BACKUP finishes booting, it displays an identification message followed by the dollar-sign prompt (\$):

```
%BACKUP-I-IDENT, Stand-alone BACKUP V5.1-B; the date is 31-DEC-1989 15:00
$
```

- 7 To create a system disk, go to Section 4.5.

4.5 Creating a System Disk

The VMS files are stored on the distribution tape cartridge as three save sets: *required*, *library*, and *optional*. This section describes the steps for transferring these save sets from the distribution tape cartridge to your system disk.

The instructions refer to the *target-drive*, which is the drive that holds the system disk.

- 1 To transfer the *required* save set to your system disk, enter the BACKUP command in the following format:

```
$ BACKUP/VERIFY/REWIND MKA500:VMSU1051.B/SAVE_SET target-drive:
```

Substitute the device name of your system disk for *target-drive*. Make sure you put a colon (:) after each device name and that you use zeros in the device name and VMS050.

For example, if your system disk has the device name DKA400, enter the following command and press RETURN:

```
$ BACKUP/VERIFY/REWIND MKA500:VMSU1051.B/SAVE_SET DKA400:
```

The *required* save set is transferred from the distribution tape cartridge to the system disk.¹ After approximately 25 minutes, the procedure displays the following message:

```
%BACKUP-I-STARTVERIFY, starting verification pass
```

This message indicates that the *required* save set has been transferred to the system disk and the files are being checked for errors. Approximately 25 minutes later, the procedure displays the following message:

```
%BACKUP-I-PROCDONE, Operation completed. Processing finished at 31-DEC-1989 15:30
If you do not want to perform another standalone BACKUP operation,
use the console to Halt the system.
```

```
If you do want to perform another standalone BACKUP operation,
ensure the standalone application volume is online and ready.
Enter "YES" to continue:
```

- 2 Press the Halt button located on the back of the system unit.
- 3 Enter the SET BOOT command in the following format:

```
>>> SET BOOT target-drive
```

¹ The BACKUP command creates a system disk that includes a set of volume parameters provided by DIGITAL, including a CLUSTER_SIZE (disk access scheme) of 1. For more information, see the note at the end of Section 9.2

Installing VMS from a Tape Cartridge

4.5 Creating a System Disk

Substitute the device name of the system disk for *target-drive*. The SET BOOT command tells the procedure what disk to boot from. For example, if the system disk has the device name DKA400, enter the following command and press RETURN:

```
>>> SET BOOT DKA400
```

For more information about the default boot device, see Section 8.3.

- 4 To boot the system disk, enter the following command and press RETURN:

```
>>> B
```

- 5 When the boot is complete, the procedure displays some messages and asks for the date and time. Enter the date and time using the 24-hour clock format and press RETURN.

Note: The procedure displays warning messages, similar to the following, that the VMS license is not registered. Continue with the installation procedure. Follow the instructions for registering the VMS license after you finish the installation.

For example:

```
VAX/VMS Version V5.1-B Major version id = 1 Minor version id = 0

VAX/VMS V5.1-B Installation Procedure

##### OPCOM 31-DEC-1989 15:00:00.00 #####
Logfile has been initialized by operator _$OPAO:
Logfile is SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;1

%LICENSE-F-EMTLDB, License database contains no license records
%LICENSE-E-NOAUTH, DEC VAX-VMS use is not authorized on this node
-%LICENSE-F-NOLICENSE, no license is active for this software product
-%LICENSE-I-SYSMGR, please see your system manager
##### OPCOM 31-DEC-1989 15:00:00.00 #####
Message from user SYSTEM
%LICENSE-E-NOAUTH, DEC VAX-VMS use is not authorized on this node
-%LICENSE-F-NOLICENSE, no license is active for this software product
-%LICENSE-I-SYSMGR, please see your system manager

Startup processing continuing...

Please enter the date and time (DD-MMM-YYYY HH:MM): 31-DEC-1989 15:00
```

- 6 The procedure asks for the volume label of the system disk. A volume label is the name the VMS operating system uses to refer to the system disk. If you have a VAXcluster environment, each system disk must have a unique volume label.

You can press RETURN to accept the default volume label, VMSRL5, or you can enter a volume label of your choice. The volume label can be 1 to 12 characters long; spaces are not allowed. For example:

If this system disk is to be used in a cluster with multiple system disks, then each system disk must have a unique volume label. Any nodes having system disks with duplicate volume labels will fail to boot into the cluster.

You may indicate a volume label of 1 to 12 characters in length. If you wish to use the default label of VMSRL5 just press RETURN in response to the next question.

```
Enter the volume label for this system disk (no spaces) [VMSRL5]: SYSD
```

Installing VMS from a Tape Cartridge

4.5 Creating a System Disk

- 7 The procedure asks which drive holds the distribution tape cartridge. Type MKA500 and press RETURN:

Enter the name of the drive holding the distribution media (DDCU): MKA500

- 8 Several minutes later the system displays the following messages:

%MOUNT-I-MOUNTED, SYSTEM mounted on _MKA500:

Restoring LIBRARY saveset.

- 9 The installation procedure now transfers the *library* and *optional* save sets to your system disk. This takes approximately 60 minutes. During this time the procedure displays the following message:

%BACKUP-I-STARTVERIFY, starting verification pass

Restoring OPTIONAL saveset.

%BACKUP-I-STARTVERIFY, starting verification pass

Creating [VMS\$COMMON] directory tree.

In a cluster, you can run multiple systems sharing all files except PAGEFILE.SYS, SWAPFILE.SYS, SYSDUMP.DMP AND VAXVMSSYS.PAR.

Will this node be a cluster member? (Y/N)

If you are installing the VMS operating system on a standalone system, type N (for NO), press RETURN, and go to step 12.

If you are installing the VMS operating system in a cluster, type Y (for YES), press RETURN, and go to step 10.

Note: If you answer YES to the VAXcluster question, you must have a VAXcluster license.

- 10 The procedure displays the following message:

Now configuring system to be a cluster member.

- 11 Table 4–1 lists the questions you are asked if you want either a local area or mixed-interconnect configuration. Typical responses are explained in the tables.

Table 4–1 Installation Questions for Local Area and Mixed-Interconnect 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, JUPITR. The DECnet node name may be from 1 to 6 alphanumeric characters in length and may not 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 Y. The Ethernet is required for cluster (SCS internode) communications in local area and mixed-interconnect configurations.

Installing VMS from a Tape Cartridge

4.5 Creating a System Disk

Table 4–1 (Cont.) Installation Questions for Local Area and Mixed-Interconnect Configurations

Question	How to Respond
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.
Re-enter this cluster's password for verification:	Re-enter the password.
Will JUPITR be a disk server (Y/N)?	Enter Y. In local area and mixed-interconnect configurations, the system disk is always served to the cluster. Refer to the <i>VMS VAXcluster Manual</i> for information on served cluster disks.
Will JUPITR serve HSC disks (Y)?	Enter a response appropriate for your configuration.
Enter a value for JUPITR's ALLOCLASS parameter:	Enter the appropriate allocation class value. If you have a mixed-interconnect configuration, the value must be between 1 and 255; you cannot enter 0.
Does this cluster contain a quorum disk (Y/N)?	Enter Y or N, depending on your configuration. If you enter Y, the procedure asks for the name of the quorum disk. Enter the device name of the quorum disk.

12 The procedure displays the following message:

You may now remove the distribution tape from _MKA500:

Remove the distribution tape cartridge from the tape cartridge drive.

13 The procedure asks you for new passwords for the SYSTEM, SYSTEST, and FIELD accounts. Passwords must be at least eight characters in length; they do not appear on the display. Press RETURN after you enter each one. After you enter the passwords, the procedure checks each one to make sure it meets the requirements for a good password. For example:

Now we will ask you for new passwords for the following accounts:
SYSTEM, SYSTEST, FIELD

Enter new password for account SYSTEM: PANCAKES

Re-enter the password for account SYSTEM for verification: PANCAKES

%UAF-I-MDFYMSG, user record(s) updated

Enter new password for account SYSTEST: BRATWURST

Re-enter the password for account SYSTEST for verification: BRATWURST

%UAF-I-MDFYMSG, user record(s) updated

Enter new password for account FIELD: ZIRHUMBA

Re-enter new password for account FIELD for verification: ZIRHUMBA

%UAF-I-MDFYMSG, user record(s) updated

Installing VMS from a Tape Cartridge

4.5 Creating a System Disk

The procedure will now check and verify passwords for the following accounts:

```
SYSTEM, SYSTEST, FIELD, SYSTEST_CLIG
```

Passwords that can be guessed easily will not be accepted.

If the procedure verifies the passwords, it displays the following messages:

```
%VMS-I-PWD_OKAY, account password for SYSTEM verified
%VMS-I-PWD_OKAY, account password for SYSTEST verified
%VMS-I-PWD_OKAY, account password for FIELD verified
```

If you enter a password incorrectly or if the password is too easy to guess, the procedure displays error messages similar to the following:

```
%VMS-I-PWD_INVALID, account password for SYSTEM is invalid
%VMS-I-PWD_WEAK, password is too easy to guess
```

Because of the preceding error, you must take action to secure this account. You must either disable this account, change its password, or do both.

When the procedure asks if you want to disable the account, type N (for NO) and press RETURN. When the procedure asks if you want to enter a new password, type Y (for YES) and press RETURN. Then enter a new password. For example:

```
Do you want to disable this account (Y/N)? N
Do you want to change the account password (Y/N)? Y
You must now select a new primary password for the SYSTEM account. The
password you select must be at least 8 characters in length and may not
be the same as the name of the account:
```

```
New password: WILLIAW
Verification: WILLIAW
```

```
%UAF-I-MDFYMSG, user record(s) updated
%VMS-I-PWD_SET, primary password for account SYSTEM set
```

The procedure displays the following messages:

```
%VMS-I-PWD_INVALID, account password for SYSTEST_CLIG is invalid
%VMS-I-PWD_WEAK, password is too easy to guess
```

Because of the preceding error, you must take action to secure this account. You must either disable this account, change its password, or do both.

When the procedure asks if you want to disable the account, type Y (for YES) and press RETURN. When the procedure asks if you want to enter a new password, type N (for NO) and press RETURN. For example:

```
Do you want to disable the account (Y/N)? Y
Do you want to change the account password (Y/N?) N
```

- 14 After you have entered the passwords, the procedure creates your RIGHTS database and displays the following messages:

```
Creating RIGHTS database file, SYS$SYSTEM:RIGHTSLIST.DAT
Ignore any "%SYSTEM-F-DUPIDENT, duplicate identifier" errors
```

```
%UAF-I-RDBDONEMSG, rights database modified
```

- 15 After the procedure creates your RIGHTS database, go to Section 4.6 to run AUTOGEN.

Installing VMS from a Tape Cartridge

4.6 Running AUTOGEN

4.6 Running AUTOGEN

Follow the directions in this section to run AUTOGEN. AUTOGEN evaluates your hardware configuration and estimates typical workloads. It then sets system parameters, the sizes of the page, swap, and dump files, and the contents of VMSIMAGES.DAT. When AUTOGEN finishes, the installation procedure is complete.

- 1 After the procedure creates the RIGHTS database, it displays the following messages:

After the installation finishes, you may want to do one or more of the following tasks:

- DECOMPRESS THE SYSTEM LIBRARIES - For space considerations, many of the system libraries are shipped in a data compressed format. If you have enough disk space, you may decompress them for faster access. Use `SYS$UPDATE:LIBDECOMP.COM` to data expand the libraries. If you choose not to decompress these libraries there will be a negative impact on the performance of the HELP and LINK commands.

-BUILD A STANDALONE BACKUP KIT - You can build a standalone backup kit using the procedure described in you VMS installation and operations guide which is supplied with your VAX processor.

Continuing with VAX/VMS 5.1-B installation procedure.

Configuring all devices on the system.

- 2 AUTOGEN runs and displays the following series of messages:

Running AUTOGEN to compute new SYSGEN parameters.

An attempt may be made to re-size the pagefile or swapfile. If there is insufficient room on the disk, the recommended size is displayed with a message that the file should be created or extended manually by the system manager later on.

Running AUTOGEN - Please wait

.

- 3 After AUTOGEN finishes, the procedure displays a series of shutdown messages that begin like this:

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 upgrade will be complete.

SHUTDOWN -- Perform an Orderly Shutdown

- 4 The system tries to reboot automatically.

If the system does not reboot automatically, press the Halt button located on the back of the system unit and enter the BOOT command in the following format:

```
>>> B target-drive
```

Substitute the device name of the system disk for *target-drive*. For example, if the system disk has a device name of DKA400, enter the following command and press RETURN:

```
>>> B DKA400
```

Installing VMS from a Tape Cartridge

4.6 Running AUTOGEN

- 5 After the system reboots, the procedure displays the following message:

Note: The procedure might display warning messages that the VMS and VAXcluster licenses must be registered. Be sure to register these licenses when the installation procedure finishes.

```
VAX/VMS Version V5.1-B Major version id = 1 Minor version id = 0
```

```
You have successfully installed the VMS operating system.  
The system is now executing the STARTUP procedure.  
Please await the completion of STARTUP before logging  
into the system (approximately three minutes).
```

```
XXXXXXXXXX OPCOM 31-DEC-1989 15:00:00.00 XXXXXXXXXXXX  
Logfile has been initialized by operator _OPAO:  
Logfile is SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;1
```

Finally, the procedure displays informational messages as well as accounting information. For example:

```
Startup processing continuing...
```

```
%SET-I-INTSET, login interactive limit=64, current interactive value = 0  
31-DEC-1989 16:40:02.30  
SYSTEM job terminated at 31-DEC-1989 15:00:00.00
```

```
Accounting information:  
Buffered I/O count: 133 Peak working set size: 401  
Direct I/O count: 12 Peak virtual size: 2379  
Page faults: 325 Mounted volumes: 0  
Charged CPU time: 0 00:00:55.23 Elapsed time: 0 00:01:31.24
```

At this point the VMS operating system is running.

- 6 Press RETURN. The system asks you for a user name and password. Log into the SYSTEM account so that you can perform certain post-installation tasks. For example:

```
Welcome to VAX/VMS V5.1-B  
  
USERNAME: SYSTEM  
PASSWORD: PANCAKES
```

```
.....  
Welcome to VAX/VMS V5.1-B
```

When you press RETURN, the VMS operating system prompt (\$) is displayed.

If you forget the password, follow the instructions for performing an emergency startup described in *Guide to Setting Up a VMS System*.

- 7 There are several things you must do before you can use the system. For complete information, see Chapter 6.

5

Installing VMS from Compact Disc

This chapter describes installing the VMS operating system on a VAXstation 3100 from a compact disc. To install the VMS operating system from a tape cartridge, see Chapter 4.

CAUTION: The software installation procedure overwrites the contents of the system disk. Use the VMS installation procedure only if your computer is new or if you want to destroy the contents of the system disk. If your system disk contains files that you want to save, you should upgrade to the new version of the VMS operating system. For a detailed description of the upgrade procedure, see the current version of the *VMS Release Notes*.

5.1 Before You Start

Before you install the VMS operating system, do the following:

- Make sure the hardware has been installed and checked for proper operation. For detailed information on the hardware, see the VAXstation 3100 hardware manuals.
- Make sure you have all the items listed on the bill of materials in the VMS distribution kit. The kit includes a compact disc that contains standalone BACKUP, the VMS *required, library, and optional* save sets.
- If you are installing the VMS operating system on a VAX computer in a VAXcluster environment, determine whether you want to create a local area or a mixed-interconnect configuration. For a complete description of configurations, see the *VMS VAXcluster Manual*. If you are installing the VMS operating system in a local area or mixed-interconnect configuration, you need to obtain the following information from either the network or VAXcluster manager:
 - DECnet node name and node address for the computer
 - Cluster group number and password
 - Allocation class value

The installation procedure transfers the VMS files from the distribution compact disc to the system disk. The procedure consists of the following stages:

- 1 Turning on the system
- 2 Preparing the system disk
- 3 Booting standalone BACKUP
- 4 Creating the system disk
- 5 Running AUTOGEN

Installing VMS from Compact Disc

5.1 Before You Start

The procedure takes two to three hours.

Note: The screen displays and examples in this manual depict the installation of VMS Version 5.1-B. Your screen displays reflect the version that you are installing.

5.2 Turning On the System

This procedure assumes that the system is not turned on when you start the installation. The following steps describe how to turn on the system:

- 1 Turn components on in the following order:
 - a. Turn on the monitor.
 - b. Turn on the RZ55 drive, if you have one.
 - c. Turn on any other optional drives that you have. (Push the power switch on the front to the 1 (on) position.)
 - d. Push the power switch on the back of the system unit to the 1 (on) position.
- 2 The VAXstation 3100 should display self-test messages similar to the following:

```
KA42-B V1.0  
F...E...D...C...B...A...9...8...7...6...5...4...3...2...1...  
OK  
>>>
```

If the console-mode prompt (> > >) does not appear on the screen, press the Halt button.

If the system does not power up properly (for example, if you receive the message ?84 FAIL), refer to the troubleshooting section of the hardware manual supplied with your system.

- 3 To prepare the system disk, go to Section 5.3.

5.3 Preparing the System Disk

To set up the fixed disk you use during the installation, do the following:

- 1 If your system has more than one fixed disk, decide which one you want to be the system disk.
- 2 Enter the SHOW DEVICE command at the console-mode prompt (> > >) to find out the device names of the system disk and the compact disc drive. Write the device names on a piece of paper. You need this information throughout the installation.
- 3 To boot standalone BACKUP, go to Section 5.4.

Installing VMS from Compact Disc

5.4 Booting Standalone BACKUP

5.4 Booting Standalone BACKUP

This section describes the steps for booting standalone BACKUP. Standalone BACKUP lets you transfer the VMS *required* save set from the distribution compact disc to your system disk. The compact disc is labeled as follows:

CD Label ¹	Volume Label ²
VAX/VMS V5.1-B	SYSTEM

¹The CD label is printed on the compact disc.

²A volume label is the name the VMS operating system uses to refer to a compact disc. During the installation, the procedure displays the volume label, not the paper label, in messages.

Booting standalone BACKUP takes approximately 3 minutes.

- 1 Insert the distribution compact disc in the compact disc drive.
- 2 To boot standalone BACKUP, enter a command in the following format:

```
>>> B source-drive
```

Substitute the device name of the compact disc drive for *source-drive*. If you do not know the device name, enter the SHOW DEVICE command at the console-mode prompt. Write the device name of the compact disc drive on a piece of paper. You need this information throughout the installation.

For example, if the compact disc drive has the device name DKA100, enter the following command and press RETURN:

```
>>> B DKA100
```

Ignore any error messages about missing drivers that resemble the following:

```
%SYSGEN-I-OPENIN, error opening SYS$SYSROOT:[SYSEXE]VEDRIVER.EXE; as input  
%SYSGEN-E-FNF, file not found
```

These messages might be displayed during the installation.

- 3 A few minutes later standalone BACKUP displays the following message:

```
VAX/VMS Version V5.1-B Major version id = 1 Minor version id = 0
```

- 4 A few minutes later the procedure asks for the date and time. Enter the date and time using the 24-hour clock format and press RETURN. For example:

```
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM) 31-DEC-1989 15:00
```

- 5 The procedure displays a list of the local devices on your system. For example:

```
Available device MKA500:    device type TK50  
Available device DKA100:    device type RRD40
```

```
.  
.  
.
```

Installing VMS from Compact Disc

5.4 Booting Standalone BACKUP

Check the list of devices. If the list is incomplete, make sure that all the drives are connected properly to the system. See your hardware manuals for details.

- 6 When standalone BACKUP finishes booting, the procedure displays an identification message followed by the dollar-sign prompt (\$):

```
%BACKUP-I-IDENT, Stand-alone BACKUP V5.1-B; the date is 31-DEC-1989 15:00  
$
```

- 7 To create a system disk, go to Section 5.5.

5.5 Creating a System Disk

The VMS files are stored on the distribution tape cartridge as three save sets: *required*, *library*, and *optional*. This section describes the steps for transferring these save sets from the distribution compact disc to your system disk.

The instructions refer to the *source-drive* and the *target-drive* where:

- The *source-drive* is the drive that holds the distribution compact disc
- The *target-drive* is the drive that holds the system disk

- 1 If you have not done so already, determine the device names for the *source-drive* and the *target-drive*. Write these names on a piece of paper. You will need this information throughout the installation.
- 2 To transfer the *required* save set to your system disk, enter the BACKUP command in the following format:

```
$ BACKUP/VERIFY source-drive:VMSU1051.B/SAVE target-drive:
```

Substitute the appropriate device names for the *source-drive* and the *target-drive*. Make sure you put a colon (:) after each device name and that you use zeros in the device names and in VMS050.

For example, if your system has the following configuration:

- A compact disc drive (the *source-drive*) with a device name of DKA100
- A system disk (the *target-drive*) with a device name of DKA400

Enter the following command and press RETURN:

```
$ BACKUP/VERIFY DKA100:VMSU1051.B/SAVE DKA400:
```

The *required* save set is transferred from the distribution compact disc to the system disk. ¹ This takes approximately 25 minutes. During the process the procedure displays the following message:

```
%BACKUP-I-STARTVERIFY, starting verification pass
```

¹ The BACKUP command creates a system disk that includes a set of volume parameters provided by DIGITAL, including a CLUSTER_SIZE (disk access scheme) of 1. For more information, see the note at the end of Section 9.2.

Installing VMS from Compact Disc

5.5 Creating a System Disk

This message indicates that the *required* save set has been transferred to the system disk and the files are being checked for errors. Approximately 15 minutes later, the procedure displays the following message:

```
%BACKUP-I-PROCDONE, operation completed. Processing finished at 31-DEC-1989 15:00
If you do not want to perform another standalone BACKUP operation,
use the console to Halt the system.
```

```
If you do want to perform another standalone BACKUP operation,
ensure the standalone application volume is online and ready.
Enter "YES" to continue:
```

- 3 Press the Halt button located on the back of the system unit.
- 4 Enter the SET BOOT command in the following format:

```
>>> SET BOOT target-drive
```

Substitute the device name of the system disk for *target-drive*. The SET BOOT command tells the procedure what disk to boot from. For example, if the system disk has the device name DKA400, enter the following command and press RETURN:

```
>>> SET BOOT DKA400
```

For more information about the default boot device, see Section 8.3.

- 5 To boot the system disk, enter the following command and press RETURN:

```
>>> B
```
- 6 When the boot is complete, the procedure displays some messages and asks for the date and time. Enter the date and time using the 24-hour clock format and press RETURN.

Note: The procedure displays warning messages, similar to the following, that the VMS license is not registered. Continue with the installation procedure. Follow the instructions for registering the VMS license after you finish the installation.

For example:

```
VAX/VMS Version V5.1-B Major version id = 1 Minor version id = 0
VAX/VMS Version 5.1-B Installation Procedure
%*****% OPCOM 31-DEC-1989 13:00:00.00 %*****%
Logfile has been initialized by operator _OPAO:
Logfile is in SYS$SYSROOT:[SYSMGR]OPERATOR.LOG:1
%LICENSE-F-EMTLDB, License database contains no license records
%LICENSE-E-NOAUTH, DEC VAX-VMS use is not authorized on this node
%*****% OPCOM 31-DEC-1989 13:00:00.00
Message from user SYSTEM
%LICENSE-E-NOAUTH, DEC VAX-VMS use is not authorized on this node
-LICENSE-F-NOLICENSE, no license is active for this software product
-LICENSE-I-SYSMGR, please see your system manager.
-%LICENSE-F-NOLICENSE, no license is active for this software product
-%LICENSE-I-SYSMGR, please see your system manager.
Startup processing continuing...
Please enter the date and the time (DD-MMM-YYYY HH:MM): 31-DEC-1989 15:00
```

- 7 The procedure asks for the volume label of the system disk. A volume label is the name the VMS operating system uses to refer to the system disk. If you have a VAXcluster environment, each system disk must have a unique volume label.

Installing VMS from Compact Disc

5.5 Creating a System Disk

You can press RETURN to accept the default volume label, VMSRL5, or you can enter a volume label of your choice. The volume label can be 1 to 12 characters long; spaces are not allowed. For example:

If this system disk is to be used in a cluster with multiple system disks, then each system disk must have a unique volume label. Any nodes having system disks with duplicate volume labels will fail to boot into the cluster.

You may indicate a volume label of 1 to 12 characters in length. If you wish to use the default name of VMSRL5 just press RETURN in response to the next question.

Enter the volume label for this system disk (no spaces) [VMSRL5]: SYSDSK

- 8 The procedure asks which drive holds the distribution compact disc. Enter the device name of the compact disc drive. For example, suppose the device name is DKA100. Type DKA100 and press RETURN:

Enter the name of the drive holding the distribution media (DDcu): DKA100

- 9 Several minutes later the system displays the following messages:

%MOUNT-I-MOUNTED, SYSTEM mounted on _DKA100:

Restoring LIBRARY saveset.

- 10 The installation procedure now transfers the *library* and *optional* save sets to the system disk. It takes approximately 60 minutes.

During this time the procedure displays the following messages:

%BACKUP-I-STARTVERIFY, starting verification pass

Restoring OPTIONAL saveset.

%BACKUP-I-STARTVERIFY, starting verification pass

Creating [VMS\$COMMON] directory tree.

In a cluster, you can run multiple systems sharing all files except PAGEFILE.SYS, SWAPFILE.SYS, SYSDUMP.DMP and VAXVMSSYS.PAR.

Will this node be a cluster member? (Y/N)

If you are installing the VMS operating system on a standalone system, type N (for NO), press RETURN, and go to step 13.

If you are installing the VMS operating system on a computer in a VAXcluster environment, type Y (for YES), press RETURN, and go to step 11.

Note: If you answer YES to the VAXcluster question, you must have a VAXcluster license.

- 11 The procedure displays the following message:

Now configuring system to be a cluster member.

- 12 Table 5-1 lists the questions you are asked if you want either a local area or a mixed-interconnect configuration. Typical responses are explained in the table.

Installing VMS from Compact Disc

5.5 Creating a System Disk

Table 5–1 Installation Questions for Local Area and Mixed-Interconnect 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, JUPITR. The DECnet node name may be from 1 to 6 alphanumeric characters in length and may not 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 Y. The Ethernet is required for cluster (SCS internode) communications in local area and mixed-interconnect configurations.
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.
Re-enter this cluster's password for verification:	Re-enter the password.
Will JUPITR be a disk server (Y/N)?	Enter Y. In local area and mixed-interconnect configurations, the system disk is always served to the cluster. Refer to <i>VMS VAXcluster Manual</i> for information on served cluster disks.
Will JUPITR serve HSC disks (Y)?	Enter a response appropriate for your configuration.
Enter a value for JUPITR's ALLOCLASS parameter:	Enter the appropriate allocation class value. If you have a mixed-interconnect configuration, the value must be between 1 and 255; you cannot enter 0.
Does this cluster contain a quorum disk [N]?	Enter Y or N, depending on your configuration. If you enter Y, the procedure prompts for the name of the quorum disk. Enter the device name of the quorum disk.

13 The procedure displays the following message:

You may now remove the distribution kit from _DKA100:

Do *not* remove the distribution compact disc from the compact disc drive.

14 The procedure asks you for new passwords for the SYSTEM, SYSTEST, and FIELD accounts. Passwords must be at least eight characters in length; they do not appear on the display. Press RETURN after you enter each one. After you enter the passwords, the procedure checks each one to make sure it meets the requirements for a good password. For example:

Installing VMS from Compact Disc

5.5 Creating a System Disk

Now we will ask you for passwords for the following accounts:
SYSTEM, SYSTEST, FIELD

Enter new password for account SYSTEM: PANCAKES
Re-enter the password for account SYSTEM for verification: PANCAKES

%UAF-I-MDFYMSG, user record(s) updated

Enter new password for account SYSTEST: BRATWURST
Re-enter the password for account SYSTEST for verification: BRATWURST

%UAF-I-MDFYMSG, user record(s) updated

Enter new password for account FIELD: ZIRHUMBA
Re-enter the password for account FIELD for verification: ZIRHUMBA

%UAF-I-MDFYMSG, user record(s) updated

The procedure will now check and verify passwords for the following accounts:

SYSTEM, SYSTEST, FIELD

Passwords that can be guessed easily will not be accepted.

If the procedure verifies the passwords, it displays the following messages:

%VMS-I-PWD_OKAY, account password for SYSTEM verified
%VMS-I-PWD_OKAY, account password for SYSTEST verified
%VMS-I-PWD_OKAY, account password for FIELD verified

If you enter a password incorrectly or if the password is too easy to guess, the procedure displays error messages similar to the following:

%VMS-W-PWD_INVALID, account password for SYSTEM is invalid
-VMS-I-PWD_WEAK, password is too easy to guess

Because of the preceding error, you must take action to secure this account. You must either disable this account, change its password, or do both.

When the procedure asks if you want to disable the account, type N (for NO) and press RETURN. When the procedure asks if you want to enter a new password, type Y (for YES) and press RETURN. Then enter a new password. For example:

Do you want to disable the account (Y/N)? N
Do you want to change the account password (Y/N)? Y
You must now select a new primary password for the SYSTEM account. The password you select must be at least 8 characters in length and may not be the same as the name of the account.

New password: WILLIWAW
Verification: WILLIWAW

%UAF-I-MDFMSG, user record(s) updated
%VMS-I-PWD-SET, primary password for account SYSTEM set

- 15** After you have entered the passwords, the procedure creates your RIGHTS database and displays the following message:

Creating RIGHTS database file, SYS\$SYSTEM:RIGHTSLIST.DAT
IGNORE ANY "%SYSTEM-F-DUPIDENT, duplicate identifier" errors

%UAF-I-RDBDONEMSG, rights database modified

- 16** After the procedure creates your RIGHTS database, go to Section 5.6 to run AUTOGEN.

Installing VMS from Compact Disc

5.6 Running AUTOGEN

5.6 Running AUTOGEN

Follow the directions in this section to run AUTOGEN. AUTOGEN evaluates your hardware configuration and estimates typical workloads. It then sets system parameters, the sizes of the page, swap, and dump files, and the contents of VMSIMAGES.DAT. When AUTOGEN finishes, the installation procedure is complete.

- 1 After the procedure creates the RIGHTS database, the procedure displays the following messages:

After the installation finishes, you may want to do one or more of the following tasks:

- DECOMPRESS THE SYSTEM LIBRARIES - For space considerations, many of the system libraries are shipped in a data compressed format. If you have enough disk space, you may decompress them for faster access. Use SYS\$UPDATE:LIBDECOMP.COM to data expand the libraries. If you choose not to decompress these libraries there will be a negative impact on the performance of the HELP and LINK commands.

- BUILD A STANDALONE BACKUP KIT - You can build a standalone backup kit using the procedure described in your VMS installation and operations guide which is supplied with your VAX processor.

Continuing with VAX/VMS V5.1-B Installation Procedure

Configuring all devices on the system.

- 2 AUTOGEN runs and displays the following series of messages:

Running AUTOGEN to compute the new SYSGEN parameters.

An attempt may be made to re-size the pagefile or swapfile. If there is insufficient room on the disk, the recommended size is displayed with a message that the file should be created or extended manually by the system manager later on.

Running AUTOGEN - Please wait.

.
.
.

- 3 After AUTOGEN finishes, the procedure displays a sequence of shutdown messages that begins like this:

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 upgrade will be complete.

SHUTDOWN -- Perform an Orderly System Shutdown

- 4 The system tries to reboot automatically.

If the system does not reboot automatically, press the Halt button located on the back of the system box and enter the BOOT command in the following format:

```
>>> B target-drive
```

Substitute the device name of the system disk for *target-drive*. For example, if the system disk has a device name of DKA400, enter the following command and press RETURN:

```
>>> B DKA400
```

Installing VMS from Compact Disc

5.6 Running AUTOGEN

- 5 After the system reboots, the procedure displays the following message:

Note: The procedure might display warning messages that the VMS and VAXcluster licenses must be registered. Be sure to register these licenses when the installation procedure finishes.

```
VAX/VMS Version V5.1-B Major version id = 1 Minor version id = 0
```

```
You have successfully installed the VMS operating system.  
The system is now executing the STARTUP procedure.  
Please await the completion of STARTUP before logging  
into the system (approximately three minutes).
```

Finally, the procedure displays informational messages as well as accounting information. For example:

```
Startup processing continuing...  
  
%SET-I-INTSET, login interactive limit=64, current interactive value = 0  
31-DEC-1989 13:00:00.00  
SYSTEM      job terminated at 31-DEC-1989 13:00:00.00  
  
Accounting information:  
Buffered I/O count:      133   Peak working set size:      401  
Direct I/O count:       12    Peak virtual size:      2379  
Page faults:           325    Mounted volumes:         0  
Charged CPU time 0 00:00:55.23  Elapsed time      0 00:01:31.24
```

At this point the VMS operating system is running.

- 6 Press RETURN. The system asks for the user name and password. Log into the SYSTEM account so that you can perform certain post-installation tasks. For example:

```
      Welcome to VAX/VMS Version V5.1-B  
  
USERNAME: SYSTEM  
PASSWORD: PANCAKES  
.  
.  
.  
      Welcome to VAX/VMS V5.1-B
```

When you press RETURN, the VMS operating system prompt (\$) is displayed.

If you forget the password, follow the instructions for performing an emergency startup described in *Guide to Setting Up a VMS System*.

- 7 There are several things you must do before you can use the system. For complete information, see Chapter 6.

6

After Installing VMS

After you have installed the VMS operating system, you need to perform several important tasks to prepare the system for operation. This chapter tells you what the tasks are, whether they are optional or required, and the order in which you perform them. The following list summarizes the tasks described in this chapter:

- 1 Registering your licenses—You must register the VMS license that came with the software. You must also register the licenses you have for any system integrated products that you purchased.
- 2 Removing unwanted files from the system disk—You can free space on the system disk by removing the VMS files that you do not need.
- 3 Customizing the system—Depending on whether you have a standalone system or a system that is part of a VAXcluster environment, there are several things you must do.
- 4 Testing the system—Once you have customized the system, run the VMS User Environment Test Program (UETP) to test the system.
- 5 Decompressing the system libraries—After you test the system you can decompress the system libraries.
- 6 Backing up the system disk—To protect all the work you have just done, make a backup copy of the system disk.

6.1 Registering Your Licenses

The VMS license lets you use the VMS operating system. You must register this license.

After you register the VMS license, you must register the licenses for any of the following system integrated products you have purchased:

- VAXclusters
- DECnet-VAX
- RMS Journaling
- Volume Shadowing

For step-by-step instructions on registering these licenses, see the most recent version of VMS Release Notes.

After Installing VMS

6.2 Removing Unwanted Files with VMSTAILOR

6.2 Removing Unwanted Files with VMSTAILOR

Read this section if you want to remove some of the VMS operating system files that you do not need from the system disk. For example, if you are not running DECnet-VAX, you do not need the network support files. You can remove unwanted files with the VMSTAILOR program. Enter the following command and press RETURN:

```
$ RUN SYS$UPDATE:VMSTAILOR
```

The VMSTAILOR program asks you if you want to tailor files ON or OFF. Type OFF to remove unwanted files.

The VMSTAILOR program lists each group of files and its size in blocks. Files are grouped according to their function. For example, all the files required for cluster support are in one group. A file group is made up of many small subgroups. You can eliminate an entire group of files, or you can eliminate one or more of its subgroups.

Decide which file groups or subgroups you do not need to support your system. The VMSTAILOR program displays step-by-step instructions that are easy to follow.

VMSTAILOR displays the names of the files it deletes. After it finishes, AUTOGEN runs automatically to make the adjustments that are necessary after system files are deleted.

Note: You can use VMSTAILOR at any time to add groups of VMS files to the system disk. After adding files to the system disk, you should apply any updates that affect them.

For example, suppose you do not need the VMS Version 5.0 Mail Utility and you run VMSTAILOR to remove those files. Later on, if you decide you want to use MAIL, you can run VMSTAILOR to return the MAIL files to the system disk. You then apply any VMS upgrade or update that has occurred since Version 5.0 that affected the Mail Utility.

6.3 Customizing the System

You must customize the system disk so that it automatically performs certain tasks when you boot. In addition, if your VAX computer is part of a VAXcluster environment, you must prepare the cluster operating environment and build the cluster.

For instructions on customizing the system, read the following documentation (in the order given):

- 1 Read Chapter 8 in this book. This chapter explains the different ways to boot the system. It also tells you how to shut down the system.
- 2 If your VAXstation 3100 is part of a VAXcluster environment, read the *VMS VAXcluster Manual* for further information on setting up a cluster.
 - a. Start by reading Chapter 1, which contains general information on VAXcluster environments.
 - b. Then follow the directions in Chapter 2 to configure the DECnet-VAX network. In addition, Chapter 2 tells you how to coordinate the cluster command procedures and system files.
 - c. Follow the directions in Chapter 3 to build the cluster.

After Installing VMS

6.3 Customizing the System

- 3 If you have a standalone system, read the *Guide to Setting Up a VMS System* for instructions on customizing and using your system. You will find information on the following tasks:
 - a. Editing the template files SYCONFIG.COM, SYLOGICALS.COM, SYLOGIN.COM, and SYSTARTUP_V5.COM
 - b. Setting up user accounts
 - c. Adjusting system parameters

6.4 Testing the System

You must run the User Environment Test Package (UETP) to verify the installation. For complete information, see Chapter 7. Note that UETP needs at least 1200 free blocks on the system disk.

6.5 Decompressing the System Libraries

Decompressing the system libraries gives the system faster access to them. The decompressed libraries require approximately 5000 additional blocks of disk space. To find out how much disk space you have, enter the following command and press RETURN:

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

If you have enough room on the disk, you can decompress the libraries. The decompression process takes approximately a half hour. Log into the SYSTEM account. Enter the following command and press RETURN:

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

6.6 Backing Up the System Disk

Now that you have spent a lot of time and effort customizing and testing the system, protect your work by making a backup copy of the system disk. DIGITAL recommends that you perform the following operations:

- Make a standalone backup kit
- Back up the system disk

For complete information on these operations, see Chapter 9. Once you have backed up the system disk, install any software products that you have purchased. Follow the directions given in the software product manuals.

7

Running UETP

The User Environment Test Package (UETP) is a VMS software package designed to test whether the VMS operating system is installed correctly. UETP puts the system through a series of tests that simulate a typical user environment by making demands on the system that are similar to demands that might occur in everyday use.

UETP is not a diagnostic program; it does not attempt to test every feature exhaustively. When UETP runs to completion without encountering nonrecoverable errors, the system being tested is ready for use.

UETP exercises devices and functions that are common to all VMS systems, with the exception of optional features such as high-level language compilers. The system components tested include the following:

- Most standard peripheral devices
- The system's multiuser capability
- DECnet-VAX
- Clusterwide file access and locks

7.1 Summary of UETP Operating Instructions

This section summarizes the procedure for running all phases of UETP with default values. If you are familiar with the test package, refer to this section. If you need further information, refer to Section 7.2.

- 1 Log into the SYSTEST account as follows:

```
Username: SYSTEST
Password:
```

Note: Because the SYSTEST and SYSTEST_CLIG accounts have privileges, unauthorized use of these accounts might compromise the security of your system.

- 2 Make sure that no user programs are running and that no user volumes are mounted. By design, UETP assumes and requests the exclusive use of system resources. Unpredictable results could occur if you ignore this restriction.
- 3 After you log in, check all devices to be sure that the following conditions exist:
 - All devices you want to test are powered up and are on line to the system.
 - Scratch disks are mounted and initialized.
 - Disks contain a directory named [SYSTEST] with OWNER_UIC=[1,7] (You can create this directory with the DCL command CREATE/DIRECTORY.)

Running UETP

7.1 Summary of UETP Operating Instructions

- Magnetic tape drives that you want to test contain a magnetic tape reel with at least 600 feet of tape. The magnetic tape is initialized with the label UETP (using the DCL command INITIALIZE). You should also mount the magnetic tape to make it available to the system.
- Scratch tape cartridges have been inserted in each drive you want to test and are mounted and initialized with the label UETP.
- Line printers and hardcopy terminals have plenty of paper.
- Terminal characteristics and baud rate are set correctly (see the user's guide for your terminal).

Note that some communications devices need to be set up by DIGITAL Field Service (see Section 7.3).

If you encounter any problems in preparing to run UETP, read Section 7.3 before proceeding.

- 4 To start UETP, enter the following command and press RETURN:

```
$ @UETP
```

UETP responds with the following question:

```
Run "ALL" UETP phases or a "SUBSET" [ALL]?
```

Press RETURN to choose the default response enclosed in brackets. UETP responds with three more questions in the following sequence:

```
How many passes of UETP do you wish to run [1]?
How many simulated user loads do you want [n]?
Do you want Long or Short report format [Long]?
```

Press RETURN after each prompt. After you answer the last question, UETP initiates its entire sequence of tests, which run to completion without further input. The final message should look like the following:

```
*****
*                               *
*   END OF UETP PASS 1 AT 31-DEC-1989 16:30:09.38   *
*                               *
*****
```

- 5 After UETP runs, check the log files for errors. If testing completes successfully, the VMS operating system is in proper working order.

Note: After a run of UETP, you should always run the Error Log Utility to check for hardware problems that can occur during a run of UETP. For information on running the Error Log Utility, refer to the *VMS Error Log Utility Manual*.

If UETP does not complete successfully, refer to Section 7.5.

If you want to run UETP without using the default responses, refer to Sections 7.4 through 7.4.4, which explain the options.

7.2 Logging In

Obtain the SYSTEST password from your system manager. Log into the SYSTEST account from the console terminal as follows:

```
Username: SYSTEST
Password:
```

Note: Because SYSTEST has privileges, unauthorized use of this account might compromise the security of your system.

UETP fails if you do not run the test from the SYSTEST account. Also, if you try to run UETP from a terminal other than the console terminal, the device test phase displays an error message stating that the terminal you are using is unavailable for testing. You can ignore this message.

After you log into the SYSTEST account, enter the command SHOW USERS to make sure no user programs are running and no user volumes are mounted. UETP requires exclusive use of system resources. If you ignore this restriction, UETP can interfere with applications that depend on these resources.

7.2.1 SYSTEST Directories

If you logged in successfully, you should be in the root directory [SYSTEST] on the system disk. UETP uses directories named [SYSTEST] to hold all the files used by UETP command procedure (UETP.COM) and temporary files used by UETP during testing.

The DCL command SHOW LOGICAL displays the translation of the logical name SYS\$TEST on a typical system:

```
$ SHOW LOGICAL SYS$TEST
"SYS$TEST" = "SYS$SYSROOT:[SYSTEST]" (LNM$SYSTEM_TABLE)
```

If you want UETP to test a particular disk, such as a scratch disk, create either a [SYSTEST] directory or a [SYS0.SYSTEST] directory on that disk. Section 7.3.2 discusses setting up scratch disks for testing.

7.3 Setting Up for UETP

After you log in, you need to set up the devices on the system for UETP testing.

Note: Your system may not have all the devices described in this section.

You should check all devices to be sure that the following conditions exist:

- All devices you want to test are turned on and are on line.
- Scratch disks are mounted and initialized.
- Disks contain a directory named [SYSTEST] with OWNER_UIC={1,7}. Use the CREATE/DIRECTORY command if the [SYSTEST] directory does not exist on the disk.
- Scratch tape cartridges have been inserted in each drive you want to test and are mounted and initialized with the label UETP.
- Line printers and hardcopy terminals have plenty of paper.

Running UETP

7.3 Setting Up for UETP

- Terminal characteristics and baud rate are set correctly (see the user's guide for your terminal).

Note that some communications devices discussed in this section need to be set up by DIGITAL Field Service.

7.3.1 Setting Up the System Disk

Before running UETP, make sure that the system disk has at least 1200 blocks available. Note that large systems, such as systems that run more than 20 load test processes, might require a minimum of 2000 available blocks. Running multiple passes of UETP causes log files to accumulate in the default directory, further reducing the amount of disk space available for subsequent passes.

If disk quotas are enabled on the system disk, you should disable them before you run UETP.

7.3.2 Setting Up Additional Disks

The disk test uses most of the available free space on each testable disk. UETP estimates the space that the disk test uses for normal testing as follows:

- On each testable disk, the device test phase tries to create two files. The size of these files depends on how much free space is available on the disk. Usually the test creates each file with 5% of the free space on the disk. However, if the disk is nearly full, the test creates files that are 5 blocks. If the test cannot create 5 block files, it fails. Only the initial file creation can cause the device test to fail because of lack of disk space.
- The test randomly reads and writes blocks of data to the files. After every multiple of 20 writes for each file, the test tries to extend the file. The size of this extension is either 5% of the free disk space or 5 blocks if the file was created with 5 blocks. This process of extension continues until the combined space of the files reaches 75% of the free disk space.

By creating and extending fragmented files in this way, UETP exercises the disk. This allows the test to check for exceeded quotas or a full disk and to adjust for the amount of available disk space.

To prepare each disk drive in the system for UETP testing, use the following procedure:

- 1 Place a scratch disk in the drive and spin up the drive. If a scratch disk is not available, use any disk with a substantial amount of free space; UETP does not overwrite existing files on any volume. If your scratch disk contains files that you want to keep, do not initialize the disk; go to step 3.
- 2 If the disk does not contain files you want to save, initialize it. For example:

```
$ INITIALIZE DKA200: TEST1
```

This command initializes DKA200, and assigns the volume label TEST1 to the disk. All volumes must have unique labels.

Running UETP

7.3 Setting Up for UETP

3 Mount the disk. For example:

```
$ MOUNT/SYSTEM DKA200: TEST1
```

This command mounts the volume labeled TEST1 on DKA200. The /SYSTEM qualifier indicates that you are making the volume available to all users on the system.

4 UETP uses the [SYSTEST] directory when testing the disk. If the volume does not contain the directory [SYSTEST], you must create it. For example:

```
$ CREATE/DIRECTORY/OWNER_UIC=[1,7] DKA200:[SYSTEST]
```

This command creates a [SYSTEST] directory on DKA200 and assigns a user identification code (UIC) of [1,7]. The directory must have a UIC of [1,7] to run UETP.

If the disk you have mounted contains a root directory structure, you can create the [SYSTEST] directory in the [SYS0.] tree.

7.3.3 Setting Up Tape Cartridge Drives

To set up tape cartridge drives that you want to test, use the following procedure:

- 1 Insert a scratch tape cartridge in the tape cartridge drive.
- 2 Initialize the tape cartridge. For example:

```
$ INITIALIZE MKA500: UETP
```

Tape cartridges must be labeled UETP to be tested.

If you encounter a problem initializing the tape cartridge or if the test has a problem accessing the tape cartridge, refer to the description of the DCL INITIALIZE command in the *VMS DCL Dictionary*.

7.3.4 Setting Up Terminals and Line Printers

Terminals and line printers must be turned on to be tested by UETP. They must also be on line. Check that line printers and hardcopy terminals have enough paper. The amount of paper required depends on the number of UETP passes that you plan to execute. Each pass requires two pages for each line printer and hardcopy terminal.

Check that all terminals are set to the correct baud rate and are assigned appropriate characteristics (see the user's guide for your terminal).

Spooled devices and devices allocated to queues fail the initialization phase of UETP and are not tested.

Running UETP

7.3 Setting Up for UETP

7.3.5 Preparing Ethernet Adapters for UETP Testing

Make sure that no other processes are sharing the device when you run UETP.

Note: If your system is part of a local area VAXcluster, you will not be able to test your Ethernet adapter because you need the Ethernet adapter to maintain your cluster connection.

UETP automatically shuts down DECnet and the LAT-11 server for the duration of the device tests and restarts them when the device tests are completed. You must shut down any local applications.

7.3.6 Devices Not Tested

UETP does not test the following devices; their status has no effect on UETP execution:

- Devices that require operator interaction (such as card readers)
- Software devices (such as the null device and local memory mailboxes)

UETP does not have specific tests for UDA, HSC, or CI devices; they are tested implicitly by the disk, magnetic tape, and DECnet tests.

UETP also does not test the console terminal or console drives. If you boot the system, log in, and start UETP, you have shown that these devices can be used.

7.3.7 Preparing for VAXcluster Testing

Before you run UETP in a VAXcluster environment, you should check the SYSTEST_CLIG account. The SYSTEST_CLIG account parallels SYSTEST except that it is dedicated to running the cluster-integration test. The requirements for the SYSTEST_CLIG account are as follows:

- 1 The account should be present in the user authorization file, exactly as distributed by DIGITAL, on each system in your VAXcluster.

Note: You may have disabled the SYSTEST_CLIG account as part of the VMS Version 5.0 upgrade procedure. If you did, you should reenoble the SYSTEST_CLIG account before you run UETP.

To reenoble the SYSTEST_CLIG account, enter the following commands and press RETURN after each one:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
UAF> MODIFY /FLAGS=NODISUSER SYSTEST_CLIG
UAF> EXIT
```

- 2 The account should have a null password.

Note: You may have supplied a password for the SYSTEST_CLIG account as part of the VMS Version 5.0 upgrade procedure. If you did, you should set the password to the null password before you run UETP.

Running UETP

7.3 Setting Up for UETP

To set the password of the SYSTEST_CLIG account to the null password enter the following commands and press RETURN after each one:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
UAF> MODIFY /NOPASSWORD SYSTEST_CLIG
UAF> EXIT
$
```

Note: DIGITAL recommends that you disable the SYSTEST_CLIG account after testing has completed.

To disable the SYSTEST_CLIG account, enter the following commands and press RETURN after each one:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
UAF> MODIFY /FLAGS=DISUSER SYSTEST_CLIG
UAF> EXIT
```

3 The privileges and quotas of the SYSTEST_CLIG account should match those of the SYSTEST account.

UETP requires little additional preparation for the cluster-integration test phase beyond the requirements for other UETP test phases. The additional requirements for cluster integration testing are as follows:

- Your system must be a member of a VAXcluster. If it is not, UETP displays a message and does not attempt to run the test.
- Your system must use the same deadlock detection interval as the other systems in the VAXcluster.
- The files UETCLIG00.COM and UETCLIG00.EXE, located in SYS\$TEST, are necessary for each system included in the test.
- DECnet must be set up between the VAXcluster nodes; UETP uses DECnet to create a process on those nodes. All checks that the test make depend on its ability to create the SYSTEST_CLIG processes and to communicate with them using DECnet.
- There must be a [SYSTEST] or [SYS0.SYSTEST] directory on some disk available to the VAXcluster for each node (both VMS and HSC) in the cluster. The test uses the same directory as the UETP disk test to create a file on each cluster node and to see if some other VMS node in the cluster can share access to that file. There must be one such directory per node; the test continues with the next cluster node once it has finished with a file.

Running UETP

7.3 Setting Up for UETP

7.3.8 Preparing DECnet

The DECnet phase of UETP uses more system resources than most. Before you start UETP, you can choose the remote node from which you want the DECnet phase of the test to run. By specifying the least busy node to run the DECnet test from, you can minimize disruption to remote system users.

By default, the file UETDNET00.COM chooses the node to run the DECnet test from. If you want to choose the node on which to run the DECnet test, enter the following command before you invoke UETP:

```
$ DEFINE/GROUP UETP$NODE_ADDRESS node_address
```

This command equates the group logical name UETP\$NODE_ADDRESS to the node address of the node in your area on which you want to run the DECnet phase of UETP.

For example:

```
$ DEFINE/GROUP UETP$NODE_ADDRESS 2.121
```

When you run UETP, a router node attempts to establish a connection between your node and the node defined by UETP\$NODE_ADDRESS. Occasionally the connection between your node and the router node might be busy or non-existent. When this happens, the system displays the following error messages:

```
%NCP-F-CONNED, Unable to connect to listener  
-SYSTEM-F-REMRSRC, resources at the remote node were insufficient  
  
%NCP-F-CONNED, Unable to connect to listener  
-SYSTEM-F-NOSUCHNODE, remote node is unknown
```

7.4 Starting UETP

Once you have logged in and prepared the system and devices, you are ready to begin the test.

To start UETP, enter the following command and press RETURN:

```
$ @UETP
```

UETP displays the following prompt:

```
Run "ALL" UETP phases or a "SUBSET" [ALL]?
```

Throughout the startup dialog, brackets indicate the default value, which you can choose by pressing RETURN.

When running UETP for the first time, it is a good idea to choose the default value (ALL) and run all the phases. If you choose ALL, UETP displays three more questions, which are described in Sections 7.4.2 through 7.4.4. If you want to run all the test phases, skip the next section.

7.4.1 Running a Subset of Phases

You can run a single phase by entering SUBSET or S in response to the following prompt:

Run "ALL" UETP phases or a "SUBSET" [ALL]?

UETP prompts you for the phase you want to run as follows:

You can choose one or more of the following phases:

DEVICE, LOAD, DECNET, CLUSTER

Phase(s) :

There is no default; enter one or more phase names from the list. Separate two or more phases with spaces or commas.

If your choice includes the LOAD phase, UETP displays the three prompts described in the next sections. To run the LOAD phase, refer to the next section.

If you exclude the LOAD phase, UETP responds with only two prompts:

How many passes of UETP do you wish to run [1]?
Do you want Long or Short report format [Long]?

Sections 7.4.2 and 7.4.4 discuss these questions. After you answer both questions, the phase you have selected runs to completion.

7.4.2 Single Run Versus Multiple Passes

If you specified the default ALL or a subset of phases at the last prompt, UETP displays the following message:

How many passes of UETP do you wish to run [1]?

You can repeat the test run as many times as you want. If you enter 1 in response to the prompt (or press RETURN for the default), UETP stops after completing a single run. If you specify a number greater than 1, UETP restarts itself continuously until it completes the number of passes (runs) specified.

You can run UETP once to check that the system is working or many times to evaluate the system's response to continuous use. For example, a field service technician who is interested only in verifying that a newly installed system works might run UETP once or twice. A manufacturing technician might let the system run for several hours as part of the system integration and test.

When you specify multiple UETP runs, you might want to request a short console log (see Section 7.4.4). Make certain that all line printers and hardcopy terminals have enough paper; each run requires two pages.

Running UETP

7.4 Starting UETP

7.4.3 Defining User Load for Load Test

After you specify the number of passes, UETP prompts you as follows:

```
How many simulated user loads do you want [n]?
```

Note: UETP displays this prompt only if you choose to run the LOAD phase, either implicitly (by running all phases) or explicitly (by running a subset and specifying the LOAD phase).

The purpose of the load test is to simulate a situation in which a number of users (detached processes) are competing for system resources. In response to this prompt, enter the number of users you want to simulate for this test. The number in brackets is the default value that UETP computed for your system. The default value depends on the amount of memory and the paging and swapping space that your system has.

Although the given default value is the best choice, you can increase or decrease the user load by entering your own response to the prompt. However, be aware that an increase might cause the test to fail because of insufficient resources.

If you want to see UETP display the user-load equation as it runs, see Section 7.5.2.

7.4.4 Long and Short Report Format

The following prompt allows you to choose one of two console report formats:

```
Do you want Long or Short report format [Long]?
```

If you choose the long report format (the default), UETP sends all error messages as well as information on the beginning and end of all phases and tests to the console terminal. UETP records all its output in the UETP.LOG file, regardless of your response to this question.

In many cases, it may not be convenient to have UETP write the bulk of its output to the terminal. For example, if you run UETP from a hardcopy terminal, the printing of all the output can slow the progress of the tests. This delay may not be a problem if you have requested only one run; however, you might prefer to use the short format if you intend to run multiple passes of UETP from a hardcopy terminal.

If you request the short format, UETP displays status information at the console, such as error messages and notifications of the beginning and end of each phase. This information enables you to determine whether UETP is proceeding normally. If the short console log indicates a problem, you can look at UETP.LOG for further information. UETP.LOG contains all the output generated by the various phases, as well as the status information displayed at the console.

After you choose the report format, UETP initiates its sequence of tests and runs to completion. If UETP does not complete successfully, refer to Section 7.5 for troubleshooting information.

7.4.5 Termination of UETP

At the end of a UETP pass, the master command procedure UETP.COM displays the time at which the pass ended. In addition, UETP.COM determines whether UETP needs to be restarted. (You can request multiple passes when you start up the test package; see Section 7.4.2.)

At the end of an entire UETP run, UETP.COM deletes temporary files and does other cleanup activities.

By pressing CTRL/Y or CTRL/C, you can terminate a UETP run before it completes normally. Normal completion of a UETP run, however, includes the deletion of miscellaneous files that have been created by UETP for the purpose of testing. The use of CTRL/Y or CTRL/C might interrupt or prevent these cleanup procedures.

The effect of these control characters depends on what part of UETP you are executing. For an explanation of the organization of UETP and its components, refer to Section 7.6.

7.4.5.1 Using CTRL/Y

You can press CTRL/Y to interrupt a UETP run. Note, however, that cleanup of files and network processes in the [SYSTEST] directory may not be complete.

If you are running an individual test image, pressing CTRL/Y interrupts the current UETP test and temporarily returns control to the command interpreter. While the test is interrupted, you can enter a subset of DCL commands that are executed within the command interpreter and do not cause the current image to exit. The *VMS DCL Concepts Manual* contains a table of commands that you can use within the command interpreter. In addition, you can enter any of the following commands:

- The CONTINUE command continues the test from the point of interruption (except during execution of the cluster test).
- The STOP command terminates the test; the test aborts and control returns to the command interpreter.

Note: Using the STOP command may prevent cleanup procedures from executing normally. You should use the EXIT command if you want the image to do cleanup procedures before terminating.

- The EXIT command does cleanup procedures and terminates the test (except during execution of the cluster test); then control returns to the command interpreter.

If you enter any DCL command other than CONTINUE, STOP, or EXIT, the test does cleanup procedures and terminates, and the DCL command executes.

Running UETP

7.4 Starting UETP

7.4.5.2 Using CTRL/C

You can press CTRL/C to abort a UETP run. You cannot continue the same test phase after you press CTRL/C. UETP automatically goes to the next phase in the master command procedure.

Some UETP phases react to CTRL/C by cleaning up all activity and terminating immediately. Such tests display the following message:

```
%UETP-I-ABORTC, 'testname' to abort this test, type ^C
```

The phases that do not display this message terminate all processes they have started. These processes might not have a chance to complete normal cleanup procedures.

If you are running an individual test image, however, you can use CTRL/C to terminate the execution of the image and complete cleanup procedures.

Note that CTRL/C does not complete cleanup procedures for the cluster test.

7.5 Troubleshooting

This section explains the role of UETP in interpreting operational errors in a VMS operating system. Section 7.5.4 discusses common errors that can appear in a UETP run and describes how to correct them.

7.5.1 Relationship of UETP to Error Logging and Diagnostics

When UETP encounters an error, it reacts like a user program. Either it returns an error message and continues, or it reports a fatal error and terminates the image or phase. In either case, UETP assumes that the VMS hardware is correctly installed and operating and does not attempt to diagnose the error.

If the cause of an error is not readily apparent, use the following methods to diagnose the error:

- *VMS Error Log Utility*—Run the Error Log Utility to obtain a detailed report of hardware and system errors. Error log reports provide information about the state of the hardware device and I/O request at the time of each error. For information about running the Error Log Utility, refer to the *VMS Error Log Utility Manual*.
- *Diagnostic facilities*—Use the diagnostic facilities to test exhaustively a device or medium to isolate the source of the error.

7.5.2 Interpreting UETP Output

You can monitor the progress of UETP tests at the terminal from which they were started. This terminal always displays status information, such as messages that announce the beginning and end of each phase and messages that signal an error.

The tests send other types of output to various log files depending on how you started the tests. The log files contain output generated by the actual test procedures. Even if UETP completes successfully, with no errors displayed at the terminal, it is good practice to check these log files for errors. Furthermore, when errors are displayed at the terminal, check the log files for more information about their origin and nature.

Each test returns a final completion status to the test controller image, UETPHAS00, using a termination mailbox. This completion status is an unsigned longword integer denoting a condition value. As a troubleshooting aid, UETPHAS00 displays the test's final completion status using the \$FAO and \$GETMSG system services. Sometimes, however, the \$FAO service needs additional information that cannot be provided using the termination mailbox. When this happens, UETP displays an error message similar to the following:

```
UETP-E-ABORT, !AS aborted at !%D
```

When UETP displays these types of error messages, check the log files for more information. You can also run the individual test to attempt to diagnose the problem.

The error messages that appear at the terminal and within the log files have two basic sources:

- UETP tests
- System components that are tested

To interpret the messages, you might need to refer either to the *VMS System Messages and Recovery Procedures Reference Volume* or to the manual that describes the individual system component.

Several parts of UETP, such as UETINIT00.EXE, UETCLIG00.EXE, UETDNET00.COM, and some device tests, let you obtain additional information concerning the progress of the test run or the problems it encounters. Because this information is usually insignificant, it is not displayed on the screen. To view the information, enter the following command and run the program:

```
$ DEFINE MODE DUMP
```

The following example shows the output for UETINIT00.EXE on a VAX-11/750:

```
$ RUN UETINIT00
```

```
      Welcome to VAX/VMS UETP Version V5.0
```

```
%UETP-I-ABORTC, UETINIT00 to abort this test, type ^C
```

```
You are running on an 11/750 CPU with 8704 pages of memory.  
The system was booted from _DKA200:[SYS0.]
```

Running UETP

7.5 Troubleshooting

```
Run "ALL" UETP phases or a "SUBSET" [ALL]?
How many passes of UETP do you wish to run [1]?

The default number of loads is the minimum result of

1) CPU_SCALE * ((MEM_FREE + MEM_MODIFY) / (WS_SIZE * PER_WS_INUSE))
   0.80 * (( 8704 + 323) / ( 350 * 0.20)) = 103

2) Free process slots = 56

3) Free page file pages / Typical use of page file pages per process
   18040 / 1000 = 18

How many simulated user loads do you want [18]?
Do you want Long or Short report format [Long]?

UETP starting at 31-DEC-1989 09:08:26.71 with parameters:
DEVICE LOAD DECNET CLUSTER phases, 1 pass, 18 loads, long report.
$
```

This program does not initiate any phase; it displays the equation used by UETP to determine user load and the specific factors that are employed in the current run.

You should respond to the questions by pressing RETURN. After you respond to the first prompt, the program displays the expressions that determine the default number of simultaneous processes. The following definitions apply:

- CPU_SCALE refers to the relative processing power of the CPU in relation to a VAX-11/780. For example, a VAX-11/785 has a CPU_SCALE of 1.5 because it has 1.5 times the processing power of a VAX-11/780 (1.0).
- MEM_FREE represents memory in pages available to users.
- MEM_MODIFY represents memory pages on the modified page list.
- WS_SIZE represents working set size.
- PER_WS_INUSE represents typical percentage of the working set in active use for each process.

UETINIT00 also displays the specific values represented by the expressions. In this example, UETP selects 18 as the default for simulated user loads, because 18 is the minimum result of the three expressions.

You should deassign the logical name MODE before running UETP, unless you prefer to see the previous breakdown every time you run UETP.

7.5.2.1 Defining a Remote Node for UETP Ethernet Testing

When the UETUNAS00 test of the UETP executes, it is sometimes difficult to determine whether the problems it reports concern the device under test or the remote device. The easiest way to ensure that the test properly reports errors on the device under test is to define a "good turnaround." A good turnaround is a remote node that you know turns around Ethernet packets correctly and is up and waiting in the ready state.

You can make the UETUNAS00 test use a known good turnaround by performing the following actions. In the commands that follow, assume that the "good" device is on node BETA, and that node BETA is already defined in the network database.

Running UETP

7.5 Troubleshooting

- 1 Find the address of the good Ethernet node by using the Network Control Program (NCP). In order to use NCP, the following conditions must apply:

- DECnet must be up and running on the system.
- The account you are using must have TMPMBX and NETMBX privileges.

Enter the following commands and press RETURN:

```
$ RUN SYS$SYSTEM:NCP
  TELL BETA SHOW CHARACTERISTICS ACTIVE LINES
```

If node BETA has not been defined in your network database, NCP displays an error message. In this event, specify another good node and retry the command. Otherwise, see your system or network manager.

NCP displays information similar to the following:

```
Active Line Volatile Characteristics as of 15-OCT-1986 16:13:02
Line = UNA-0
Counter timer           = 28800
Receive buffers         = 6
Controller              = normal
Protocol                = Ethernet
Service timer          = 4000
Hardware address        = AA-00-04-00-46-D3
UNA device buffer size  = 1498
```

- 2 Use the displayed *hardware address* (in this case, AA00040046D3) to define the logical name TESTNIADR to point to the good turnaround. Note that you do *not* specify the hyphens (-).

First, log in to the SYSTEST account. Then enter the following command:

```
$ DEFINE/SYSTEM TESTNIADR AA00040046D3
```

- 3 Run UETP.
- 4 When UETP has completed, deassign the logical name TESTNIADR by entering the following command:

```
$ DEASSIGN/SYSTEM TESTNIADR
```

7.5.3 The Log Files

At the end of a UETP run, the directory SYS\$TEST contains a log file named UETP.LOG. This file contains all information generated by all UETP tests and phases. If the run involves multiple passes, you will find a version of UETP.LOG for each pass.

Although UETP.LOG contains information from all the passes, only information from the latest run is stored in this file. Information from the previous run is stored in a file named OLDUETP.LOG, which also has a version for each pass. Using these two files, UETP provides the output from its tests and phases from the two most recent runs.

The cluster test creates a NETSERVER.LOG file in SYS\$TEST for each pass on each system included in the run. If the test is unable to report errors (for example, if the connection to another node is lost), the NETSERVER.LOG file on that node contains the result of the test run on that node. UETP does

Running UETP

7.5 Troubleshooting

not purge or delete NETSERVER.LOG files; therefore, you must delete them occasionally to recover disk space.

If a UETP run does not complete normally, SYS\$TEST might contain other log files. Ordinarily, these log files are concatenated and placed within UETP.LOG. You can use any log files that appear on the system disk for error checking, but you must delete these log files before you run any new tests. You can delete these log files yourself or rerun the entire UETP, which checks for old UETP.LOG files and deletes them.

7.5.4 Possible UETP Errors

This section is intended to help you identify and solve problems you might encounter running UETP. You should refer to this section if you need help understanding a system failure and isolating its cause. This section is not intended as a repair manual and is not expected to diagnose any flaws in your system. It should, however, help you to interpret and act upon the information in the error messages.

If you are unable to correct an error after following the steps in this section, you should contact your DIGITAL Field Service representative. Any information you can supply about the measures you have taken to isolate the problem can help your DIGITAL Field Service representative diagnose the problem.

The following are the most common failures encountered while running UETP:

- Wrong quotas, privileges, or account
- UETINIT01 failure
- Insufficient disk space
- Incorrect VAXcluster setup
- Problems during the load test
- DECnet error
- Errors logged but not displayed
- No PCB or swap slots
- Hangs
- Bugchecks and machine checks

The following sections describe these errors and offer the best course of action for dealing with each one.

7.5.4.1 Wrong Quotas, Privileges, or Account

If your assigned quotas or privileges do not match standard quotas and privileges for the SYSTEST account, UETP displays the following error message:

```
*****
* UETINITOO          *
* Error count = 1    *
*****
-UETP-W-TEXT, The following:
```

```
OPER privilege,
BIOLM quota,
ENQLM quota,
FILLM quota,
```

are nonstandard for the SYSTEST account and may result in UETP errors.

This message informs you that the OPER privilege and the BIOLM, ENQLM, and FILLM quotas either are not assigned correctly or are not assigned at all.

Note: UETP displays a similar message if you run the cluster integration test phase, and the privileges and quotas for the SYSTEST_CLIG account are incorrect. The SYSTEST and SYSTEST_CLIG accounts require the same privileges and quotas. Take the same action described in this section.

Solution

To correct the problem, use the following procedure:

- 1 Display all privileges and quotas in effect for the current account using the DCL commands SHOW PROCESS/PRIVILEGE and SHOW PROCESS /QUOTA as follows:

```
$ SHOW PROCESS/PRIVILEGES
```

```
31-DEC-1989 18:06:02.89 OPA0: User : SYSTEST
```

```
Process privileges :
```

```
CMKRNL      may change mode to kernel
CMEXEC      may change mode to exec
SYSNAM      may insert in system logical name table
GRPNAM      may insert in group logical name table
DETACH      may create detached processes
DIAGNOSE    may diagnose devices
LOG_IO      may do logical I/O
GROUP       may affect other processes in same group
PRMCEB      may create permanent common event clusters
PRMMBX      may create permanent mailbox
SETPRV      may set any privilege bit
TMPMBX      may create temporary mailbox
NETMBX      may create network device
VOLPRO      may override volume protection
PHY_IO      may do physical I/O
SYSPRV      may access objects via system protection
```

Running UETP

7.5 Troubleshooting

\$ SHOW PROCESS/QUOTAS

31-DEC-1989 18:06:03.36 OPA0: User: SYSTEST
Process Quotas:

Account name:	SYSTEST		
CPU limit:	Infinite	Direct I/O limit:	55
Buffered I/O byte count quota:	32768	Buffered I/O limit:	18
Timer queue entry quota:	20	Open file quota:	100
Paging file quota:	19543	Subprocess quota:	8
Default page fault cluster:	64	AST limit:	98
Enqueue quota:	300	Shared file limit:	0
Max detached processes:	0	Max active jobs:	0

- 2 Check that the privileges and quotas assigned to the account match the following:

Privileges

CMKRNL CMEXEC NETMBX DIAGNOSE
DETACH PRMCEB PRMMBX PHY_IO
GRPNAM TMPMBX VOLPRO LOG_IO
SYSNAM SYSPRV SETPRV GROUP

Quotas

BIOLM: 18 PRCLM: 8
DIOLM: 55 ASTLM: 100
FILLM: 100 BYTLM: 32768
TQELM: 20 CPU: no limit
ENQLM: 300 PGFLQUOTA: 20480
WSDEFAULT: 256 WSQUOTA: 512
WSEXTENT: 2048

- 3 If any privileges or quotas are incorrect, run the Authorize Utility (AUTHORIZE) to add them (AUTHORIZE is explained in the *VMS Authorize Utility Manual*). As an alternative, you can temporarily assign the correct privileges with the DCL command SET PROCESS /PRIVILEGES.

If you are logged in to the wrong account, the following error message asks you to log in to the SYSTEST account:

\$ @UETP

```
*****
* UETINIT00 *
* Error count = 1 *
*****
-UETP-E-ABORT, UETINIT00 aborted at 31-DEC-1989 14:24:10.13
-UETP-E-TEXT, You are logged in to the wrong account.
Please log in to the SYSTEST account.
$
```

You must run UETP from the SYSTEST account.

7.5.4.2 UETINIT01 Failure

UETINIT01 failures are related to peripheral devices; this type of error message might indicate any of the following:

- Device failure
- Device not supported or not mounted
- Device allocated to another user
- Device write-locked
- Lost vacuum on a magnetic tape drive
- Drive off line

In some cases, the course of action you should take is explicit in the error message. For example, you might receive a message from the Operator Communication Facility (OPCOM) process informing you of a problem and recommending a corrective measure:

```
%OPCOM, 31-DEC-1989 14:10:52.96, request 1, from user SYSTEST
Please mount volume UETP in device _MKA500:
%MOUNT-I-OPRQST, Please mount volume UETP in device _MKA500:
```

Other error messages might relate information in which the solution is implicit:

```
%UETP-S-BEGIN, UETDISK00 beginning at 31-DEC-1989 13:34:46.03
```

```
*****
* DISK_DRA *
* Error count = 1 *
*****
-UETP-E-TEXT, RMS file error in file DKA200:DKA200.TST
-RMS-E-DNR, device not ready or not mounted
%UETP-S-ENDED, UETDISK00 ended at 31-DEC-1989 13:34:46.80
```

This message tells you that a disk drive is either not ready or not mounted. From this information, you know where to look for the cause of the failure—at the disk drive. If you cannot see the cause of the problem immediately, check the setup instructions in Section 7.3.

In other cases, the cause of a failure might not be obvious from the information in the message. The problem might be related to hardware rather than software. For example, the Ethernet adapter test may produce one of the following messages if UETP does not have exclusive access to the Ethernet adapter:

- Inter-module cable unplugged
- Self-test failure code 0000000

To run the self-test diagnostic on the Ethernet adapter successfully, UETP needs exclusive access to the adapter. Either DECnet or the LAT terminal server might also want to use the Ethernet adapter, which is a shareable device. UETP shuts down DECnet and the LAT terminal server for the duration of the device tests and restarts them when the tests are completed.

Running UETP

7.5 Troubleshooting

Solution

To determine where or when the failure occurs in the execution of UETP, use the following procedure:

- 1 Run the device test individually (see Section 7.4.1). By doing this, you can determine if the failure can be re-created. Also, you are isolating the cause of the problem by reproducing it using the least amount of software possible. For example, if the failure occurs only when you run the entire device phase, and not when you run the affected device test individually, you can conclude the problem is related to device-interaction. Conversely, if you can re-create the error by running the single device test, then you have proved that the error is not related to device interaction.
- 2 Run the device test with different media. If your run of the single device test succeeded in reproducing the error, the magnetic tape or disk media could be defective. Running the same test with new media determines whether this is the problem.
- 3 Call DIGITAL Field Service. If you have tried all the previous steps without solving the problem, you should contact your DIGITAL Field Service representative.

7.5.4.3 Insufficient Disk Space

When you run continuous passes of UETP, log files accumulate on the disk from which UETP was run. These files reduce the amount of free disk space available for each successive pass. If the amount of disk space available becomes too small for the current load, the following error message appears:

```
%UETP-S-BEGIN, UETDISK00 beginning at 31-DEC-1989 08:12:24.34
%UETP-I-ABORTC, DISK_DJA to abort this test, type ^C

*****
* DISK_DJA *
* Error count = 1 *
*****
-UETP-F-TEXT, RMS file error in file DKA200:DKA200.TST
-RMS-F-FUL, device full (insufficient space for allocation)

*****
* DISK_DJA *
* Error count = 2 *
*****
-UETP-F-TEXT, RMS file error in file DKA200:DKA200.TST
-RMS-F-FUL, device full (insufficient space for allocation)
%UETP-E-DESTP, DISK_DJA stopped testing DJA unit 0 at 08:12:36.91
%UETP-S-ENDED, UETDISK00 ended at 31-DEC-1989 08:12:37.98
```

Solution

Make more space available on the disk. You can do this by using one or more of the following techniques:

- Delete unnecessary files to create more space.
- Purge files, if multiple versions exist.
- Mount a volume with sufficient space.

Running UETP

7.5 Troubleshooting

- Check for disk quotas that may be enabled on the disk. If disk quotas are enabled, either disable or increase them (see the *VMS SYSMAN Utility Manual* for a description of the Disk Quota Utility).
- Run VMSTAILOR if you have a small-disk system. See Chapter 6 for more information.

See Sections 7.2.1 and 7.3.2 for a further discussion of disk space.

7.5.4.4 Incorrect Setup of a VAXcluster

Most problems that can occur during the cluster-integration test are related to improper setup of the VAXcluster or of UETP on the VAXcluster. These problems are most likely to occur at the following stages of the VAXcluster test:

- Near the beginning, when processes on VMS nodes are started
- Toward the end, when cluster file access is checked

The cluster test phase shows that various VMS nodes in your cluster can simultaneously access files on selected nodes in the cluster. First, UETP tries to create a file on a disk drive that is accessible to the other selected nodes in the cluster. The following are the requirements for creating a file in the cluster test phase:

- There must be a [SYSTEST] directory on the disk in either the master file directory (MFD) or in the root directory [SYS0.].
- The [SYSTEST] directory must be protected so that the SYSTEST account can create a file in it.

If UETP is unable to find a suitable device on a certain node, the test displays a warning message and proceeds to the next cluster node.

Nodes on which the operator's terminal (OPA0) is set to the No Broadcast terminal characteristic will generate the following error message during the cluster test:

```
*****
* UETCLIG00master *
* Error count = 1 *
*****
-UETP-E-TEXT, 0 operator consoles timed out on the cluster test warning
    and 1 operator console rejected it.
-UETP-E-TEXT, Status returned was,
    "%SYSTEM-F-DEVOFFLINE, device is not in configuration or not
    available"
```

Disregard this message if OPA0 is set to No Broadcast.

Solution

Whenever you suspect a problem, you should try to recover the SYS\$TEST:NETSERVER.LOG file that was created when the SYSTEST_CLIG process was created. This file may contain additional error information that could not be transmitted to the node running the test. If it was not possible to create the SYSTEST_CLIG process on some node, the system accounting file for that node may contain a final process status in a process termination record.

Running UETP

7.5 Troubleshooting

The following problems can occur during a cluster test:

- Logging in at other nodes—This problem is due to incorrect setup for the cluster test at the remote VMS node. For example, if you specified a password for the SYSTEST_CLIG account or if you disabled the SYSTEST_CLIG account, the test displays the following message:

```
%SYSTEM-F-INVLOGIN, login information invalid at remote node
```

Refer to Section 7.3.7 and Section 7.5.2.1 for information on preparing for VAXcluster testing.
- Communicating with other nodes—A message indicates a DECnet problem. Check the NETSERVER.LOG file on the affected node to determine the cause.
- Taking out locks or detecting deadlocks—The most likely cause of this problem is that you are not logged in to the SYSTEST account. Another possibility is that your cluster is not configured properly.
- Creating files on VAXcluster nodes—This problem is due to incorrect setup for the cluster test; refer to Section 7.3.7 for information on preparing for VAXcluster testing.

7.5.4.5 Problems During the Load Test

A variety of errors can occur during the load test, because the command procedures that are started during the tests run several utilities and do many functions. Tracking a problem can be difficult because UETP deletes the log files that are generated during the load test (see Section 7.6.3).

Solution

If a problem occurs during the load test and the cause is not obvious, you can modify UETP.COM to preserve the log files as follows:

- 1 Add the /NODELETE qualifier to the following line:

```
$ TCNTRL UETLOAD00.DAT/PARALLEL_COUNT='LOADS/REPORT_TYPE='REPORT
```

- 2 Delete the following line:

```
$ DELETE UETLO*.LOG;*
```

Rerun the load test with these changes to try to re-create the problem.

If you re-create the problem, look at the contents of the appropriate log file. To determine which log file to read, you need to understand the scheme by which the load test names its processes and log files. (The log file names are derived from the process names.)

The load test creates processes that are named in the following format:

```
UETLOADnn_nnnn
```

Running UETP

7.5 Troubleshooting

For example:

```
%UETP-I-BEGIN, UETLOAD00 beginning at 31-DEC-1989 15:45:08.97
%UETP-I-BEGIN, UETLOAD02_0000 beginning at 31-DEC-1989 15:45:09.42
%UETP-I-BEGIN, UETLOAD03_0001 beginning at 31-DEC-1989 15:45:09.63
%UETP-I-BEGIN, UETLOAD04_0002 beginning at 31-DEC-1989 15:45:10.76
%UETP-I-BEGIN, UETLOAD05_0003 beginning at 31-DEC-1989 15:45:11.28
%UETP-I-BEGIN, UETLOAD06_0004 beginning at 31-DEC-1989 15:45:12.56
%UETP-I-BEGIN, UETLOAD07_0005 beginning at 31-DEC-1989 15:45:13.81
%UETP-I-BEGIN, UETLOAD08_0006 beginning at 31-DEC-1989 15:45:14.94
%UETP-I-BEGIN, UETLOAD09_0007 beginning at 31-DEC-1989 15:45:16.99
%UETP-I-BEGIN, UETLOAD10_0008 beginning at 31-DEC-1989 15:45:19.32
%UETP-I-BEGIN, UETLOAD11_0009 beginning at 31-DEC-1989 15:45:19.94
%UETP-I-BEGIN, UETLOAD02_0010 beginning at 31-DEC-1989 15:45:20.20
%UETP-I-BEGIN, UETLOAD03_0011 beginning at 31-DEC-1989 15:45:21.94
%UETP-I-BEGIN, UETLOAD04_0012 beginning at 31-DEC-1989 15:45:22.99
```

Note that, if more than ten processes are created, the numbering sequence for the UETLOADnn portion of the process name starts over at UETLOAD02, however, the four digits of the _nnnn portion continue to increase.

Each load test process creates two log files. The first log file is created by the test controller; the second log file is created by the process itself. The log file that you need to look at for error information on any given load test process is the one that was created by the test controller (the first log file).

The load test log file derives its file name from the process name, appending the last four digits of the process name (from the _nnnn portion) to UETLO. The test-controller log file and the process log file for each process use the same file name; however, the process log file has the higher version number of the two. For example, the log files created by the process UETLOAD05_0003 would be named as follows:

UETLO0003.LOG;1 (test-controller log file)

UETLO0003.LOG;2 (process log file)

Make sure that you look at the log file with the lower version number; that file contains the load test commands and error information.

After you have isolated the problem, restore UETP.COM to its original state and delete the log files from the load test (UETLO*.LOG;*); failure to delete these files might result in disk space problems.

7.5.4.6 DECnet Error

A DECnet error message might indicate that the network is unavailable.

Solution

- If DECnet is included in your system, register the authorization key (see the *VMS Release Notes*).
- If DECnet is not included in your system, ignore the message; it is normal and does not affect the UETP run.

If you encounter other DECnet-related errors, you should do the following:

- Run DECnet as a single phase (see Section 7.4.1) to determine whether the error can be re-created.
- Refer to the *VMS System Messages and Recovery Procedures Reference Volume*.

Running UETP

7.5 Troubleshooting

7.5.4.7 Errors Logged but Not Displayed

If no errors are displayed at the console terminal or reported in the UETP.LOG file, you should run the Error Log Utility to see if any errors were logged in the ERRLOG.SYS file. See the *VMS Error Log Utility Manual* for information about running the Error Log Utility.

7.5.4.8 No PCB or Swap Slots

The following error message indicates that no process control block (PCB) or swap slots are available:

```
%UETP-I-BEGIN, UETLOAD00 beginning at 31-DEC-1989 07:47:16.50
%UETP-I-BEGIN, UETLOAD02_0000 beginning at 31-DEC-1989 07:47:16.76
%UETP-I-BEGIN, UETLOAD03_0001 beginning at 31-DEC-1989 07:47:16.92
%UETP-I-BEGIN, UETLOAD04_0002 beginning at 31-DEC-1989 07:47:17.13
%UETP-I-BEGIN, UETLOAD05_0003 beginning at 31-DEC-1989 07:47:17.35
%UETP-I-BEGIN, UETLOAD06_0004 beginning at 31-DEC-1989 07:47:17.61
%UETP-W-TEXT, The process -UETLOAD07_0005- was unable to be created,
the error message is
-SYSTEM-F-NOSLOT, no pcb or swap slot available
%UETP-W-TEXT, The process -UETLOAD08_0006- was unable to be created,
the error message is
-SYSTEM-F-NOSLOT, no pcb or swap slot available
%UETP-W-TEXT, The process -UETLOAD09_0007- was unable to be created,
the error message is
-SYSTEM-F-NOSLOT, no pcb or swap slot available
%UETP-W-TEXT, The process -UETLOAD10_0008- was unable to be created,
the error message is
-SYSTEM-F-NOSLOT, no pcb or swap slot available
%UETP-W-TEXT, The process -UETLOAD11_0009- was unable to be created,
the error message is
-SYSTEM-F-NOSLOT, no pcb or swap slot available
%UETP-W-ABORT, UETLOAD00 aborted at 31-DEC-1989 07:47:54.10
-UETP-W-TEXT, Aborted via a user CTRL/C.
*****
*                               *
*   END OF UETP PASS 1 AT 31-DEC-1989 07:48:03.17   *
*                               *
*****
```

Solution

To solve this problem, use the following procedure:

- 1 Rerun individually the phase that caused the error message (the LOAD phase in the previous example) to see if the error can be reproduced.
- 2 Increase the size of the page file, using either the command procedure `SYSS$UPDATE:SWAPFILES.COM` or the System Generation Utility (see the *VMS System Generation Utility Manual*).
- 3 Increase the SYSGEN parameter `MAXPROCESSCNT`, if necessary, and reboot the system.
- 4 Increase both the page file size and the `MAXPROCESSCNT`, if necessary.

7.5.4.9 Hangs

If there is no keyboard response or system disk activity, the system may be hung.

Solution

A system hang can be difficult to trace; you should always save the dump file for reference. To learn why the system hung, run the System Dump Analyzer as described in the *VMS System Dump Analyzer Utility Manual*. Reasons for a system hang include the following:

- Insufficient pool space—Reboot the system with a larger value for NPAGEVIR.
- Insufficient page file space—Increase the page file space using the System Generation Utility as described in the *VMS System Generation Utility Manual*.
- I/O device failure causing driver-permanent loop—Call DIGITAL Field Service.

7.5.4.10 Bugchecks and Machine Checks

When the system aborts its run, a bugcheck message appears at the console.

Solution

Call DIGITAL Field Service. Often a hardware problem causes bugchecks and machine checks; there is no easy way to solve bugchecks or machine checks. It is important, however, that you save the SYS\$SYSTEM:SYSDUMP.DMP and ERRLOG.SYS files so that they are available for examination. It is also important to know whether the failure can be re-created; you can verify this by running UETP again.

7.6 UETP Tests and Phases

This section explains in detail the organization of UETP and the individual components within the test package.

You run UETP by starting the master command procedure, UETP.COM, which contains commands that start each test phase. The procedure begins by prompting you for information needed by the various test phases. (See Section 7.4 for a detailed description of starting UETP.) UETP.COM also contains commands that do such tasks as defining logical names and manipulating files generated by the tests.

The UETP.COM procedure also issues commands to start the test controlling program, UETPHAS00.EXE, which in turn controls each test phase. The test controller starts up multiple detached processes. It also reports their completion status and other information the processes report to it.

The following sections describe the various UETP test phases.

Running UETP

7.6 UETP Tests and Phases

7.6.1 Initialization Phase

The following occurs during the initialization phase:

- The image UETINIT00.EXE prompts you for information (see Section 7.4). Your information defines variables that affect the execution of UETP tests.
- The image UETINIT01.EXE gathers information on all the controllers in the system and on their associated devices. This image writes the information into a file called UETINIDEV.DAT.
- Using the information in UETSUPDEV.DAT, UETINIT01.EXE verifies which devices in the system are operable by running the appropriate device test. Each device test completes a simple read/write operation to each device. If a device fails this test, the device's entry in UETINIDEV.DAT specifies that the device cannot be tested. As a result, subsequent UETP tests ignore that device.
- For each testable controller, UETINIT01.EXE writes a line into a file called UETCONT00.DAT. The line associates a test file with the controller it tests.

A summary of UETINIDEV.DAT always exists in UETP.LOG, and UETINIT01.EXE sends that summary to the console if you have requested the long report format.

7.6.2 Device Test Phase

The device test phase includes separate tests for each type of device, such as disk, magnetic tape, line printer, and terminal. This section explains the device test phase and presents instructions for testing a single device. If you want to run the entire device test phase individually, refer to Section 7.4.1.

7.6.2.1 How the Device Phase Works

The UETP device test phase starts an executable image, the phase controller UETPHAS00, which creates a detached process for every device controller to be tested. For example, if a system includes three terminal controllers, one line printer controller, and two disk controllers, the image creates six detached processes. In parallel, the detached processes execute images that test the various types of devices.

The initialization phase of UETP creates a file called UETINIDEV.DAT and a file called UETCONT00.DAT. UETINIDEV.DAT contains data on the VMS-supported controllers in the system and their associated devices; UETCONT00.DAT associates a device test image with each testable controller.

UETPHAS00 uses the information in UETCONT00.DAT to find a device controller name to pass to each detached process that it creates. UETPHAS00 passes the controller name by writing it to a mailbox that is the SYS\$INPUT to individual tests. Each detached process uses that data to determine which controller to test. The test image then searches UETINIDEV.DAT for the device controller and for all testable units on that controller. The phase controller terminates when all devices on all controllers have completed testing.

Because UETCONT00.DAT is deleted automatically at the end of a UETP run, you cannot run the device phase unless you start UETP.COM; you can run only individual test images. UETINIDEV.DAT exists in SYS\$TEST unless you explicitly delete it.

Running UETP

7.6 UETP Tests and Phases

7.6.2.2 Running a Single Device Test

You must be logged in to the SYSTEST account to run the individual tests as described in this section. Also, a copy of UETINIDEV.DAT must exist. If a copy of the file is not present from a previous run (a run of the entire UETP or a run of the device test phase creates UETINIDEV.DAT), you can create it. Note that, when you run a single test, no log file is created; the test sends all its output to your terminal.

If you do not want to test all the device types, you can test a specific controller by choosing a test image name from Table 7-1 and executing it as in the following example:

```
$ RUN UETTTYS00
Controller designation?: TTB
```

UETP prompts you for the controller designation and the device code. Unless you are testing your own terminal, you must explicitly designate a controller name. If you are running the terminal test, you can press RETURN to test your terminal only.

If you plan to repeat the run several times, you might find it more convenient to define the logical name CTRLNAME as follows:

```
$ DEFINE CTRLNAME TTB
$ RUN UETTTYS00
```

When you define the controller name in this way, the logical name CTRLNAME remains assigned after the test completes. To deassign this logical name, use the DCL command DEASSIGN as follows:

```
$ DEASSIGN CTRLNAME
```

Format of UETINIDEV.DAT

The UETINIDEV.DAT file is an ASCII sequential file that you can type or edit if necessary. To look at the contents of this file, enter the following command:

```
$ TYPE UETINIDEV.DAT
```

The system displays the following:

```
DDB x ddd
UCB y uuuuu
END OF UETINIDEV.DAT
```

The symbols in this example are defined as follows:

Symbol	Value
x	T, if there are any testable units for this controller; N, if this controller is not to be tested
y	T, if this unit is testable; N, if this unit is not testable
ddd	device controller name, for example DUA
uuuuu	device unit number, for example 25

UETINIDEV.DAT contains a DDB (device data block) line for each controller connected or visible to your system. After the DDB line there is a UCB (unit control block) line for each unit connected to that controller. A device test can

Running UETP

7.6 UETP Tests and Phases

test a particular device only if both the DDB line and the UCB line indicate that the device is testable.

Running a Test in Loop Mode

If you want to put extra stress on a device, you can run the device test in loop mode, which causes the test to run indefinitely. For example:

```
$ DEFINE MODE LOOP
$ RUN UETDISKOO
Controller designation?: DRA
%UETP-I-TEXT, End of pass 1 with 980 iterations at 31-DEC-1989 16:18:51:03

^C
```

You must use CTRL/C to terminate the test run. If you use CTRL/Y, UETP does not complete cleanup procedures.

Functions of Individual Device Tests

For each disk in the system, the disk test allocates two files into which it randomly writes blocks of data. The test then checks the data, reports any errors to SYS\$OUTPUT, and deletes the disk files.

When you run the disk test phase in a cluster environment, the test accesses all disks that are mounted by the system being tested, and users of the disk being tested might encounter an insufficient disk space problem. You should warn users on remote nodes (who share disks with users on the local system) that UETP may be testing a disk they are using.

The magnetic tape test exercises all the magnetic tape drives in the system. The test creates a large file on each mounted magnetic tape, into which it writes multiple sequential records of varying sizes. After writing the records, the test rewinds the magnetic tape, validates the written records, and reinitializes the magnetic tape.

The terminal and line printer test generates several pages or screens of output, each of which contains a header line and a test pattern of ASCII characters. A header line contains the test name, the device name, the date, and the time.

For the laboratory peripheral accelerator (LPA11-K), the test image determines the configuration on the LPA11-K's I/O bus. The image loads all types of microcode to the LPA11-K and reads or writes data for each device on the LPA11-K I/O bus.

The communications device tests fill the transmit message buffer with random data; then, using loopback mode, they transmit and receive the message several times. To check that the looped-back data is correct, an AST routine is associated with a \$QIO read to compare the received message against the transmitted message. The procedure is repeated using messages of different lengths.

The interface device tests put their respective devices in maintenance mode, write random data, and then verify the data.

The Ethernet adapter test does self-test diagnostics on the device. It also does read and write tasks with test data that uses various adapter modes (such as internal loopback and external loopback).

Running UETP

7.6 UETP Tests and Phases

Table 7–1 lists the device test images and the devices to be tested.

Table 7–1 The Device Tests

Test Image Name	Devices Tested
UETDISK00.EXE	Disks
UETTAPE00.EXE	Magnetic tape drives and tape cartridge drives
UETTTYS00.EXE	Terminals and line printers
UETLPAK00.EXE	LPA11–K
UETCOMS00.EXE	DMC11, DMR11
UETDMPF00.EXE	DMF32, DMP11
UETDR7800.EXE	DR780, DR750
UETUNAS00.EXE	Ethernet Adapters

7.6.3 System Load Test Phase

The purpose of the system load test is to simulate a number of terminal users simultaneously demanding system resources. The system load tests, directed by the file UETLOAD00.DAT, create a number of detached processes that execute various command procedures. Each process simulates a user logged in at a terminal; the commands within each procedure are the same types of commands that a user enters from a terminal. The load test creates the detached processes in quick succession, and generally the processes execute their command procedures simultaneously. The effect on the system is analogous to an equal number of users concurrently entering commands from terminals. In this way, the load test creates an environment that is similar to normal system use.

The load test uses the logical name LOADS to determine the number of detached processes to create. When you initiate the UETP command procedure, it prompts for the number of users to be simulated (see Section 7.4.3) and, consequently, the number of detached processes to be created. Your response, which depends on the amount of memory and the swapping and paging space in your system, defines the group logical name LOADS.

The UETP master command procedure deassigns all group logical names assigned by its tests as part of the termination phase. The group logical name LOADS remains assigned only if the UETP package does not complete normally.

The command procedures executed by the load test can generate a large amount of output, depending on the number of detached processes created. For each detached process (or user), the test creates a version of an output file called UETLOnnnn.LOG (*nnnn* represents a string of numeric characters). The console displays only status information as the load test progresses.

Whether the load test runs as part of the entire UETP or as an individual phase, UETP combines the UETLOnnnn.LOG files, writes the output to the file UETP.LOG, and deletes the individual output files.

You can run the system load test as a single phase by selecting LOAD from the choices offered in the startup dialog (see Section 7.4.1).

Running UETP

7.6 UETP Tests and Phases

7.6.4 DECnet Test Phase

If DECnet is included in your VMS system, a run of the entire UETP automatically tests DECnet hardware and software. Because communications devices are allocated to DECnet and the DECnet devices cannot be tested by the UETP device test, UETP shuts down DECnet for the duration of the initialization and device test phases. It turns DECnet on again after those phases are completed. The DECnet node and circuit counters are zeroed at the beginning of the DECnet test to allow for failure monitoring during the run.

As with other UETP phases, you can run the DECnet phase individually by following the procedure described in Section 7.4.1.

7.6.4.1 Environment

The DECnet test will work on VMS systems connected to all DECnet-supported node types, including routing and nonrouting nodes and several different types of operating systems (such as RSTS, RSX, TOPS, and RT). However, there must be some sort of default access on remote systems to copy files between systems. The DECnet phase tests the following:

- The node UETP is running on
- All circuits in sequence
- All adjacent or first-hop nodes and all circuits in parallel

There is no limit on the number of communication lines supported by the tests. A test on one adjacent node should last no more than two minutes at normal communications transfer rates.

7.6.4.2 How the DECnet Phase Works

UETP (under the control of UETPHAS00.EXE) reads the file UETDNET00.DAT and completes the following steps during the DECnet phase:

- 1 Executes a set of Network Control Program (NCP) LOOP EXECUTOR commands to test the node on which UETP is running.
- 2 Uses NCP to execute the command SHOW ACTIVE CIRCUITS. The results are placed in UETININET.TMP, from which UETP creates the data file UETININET.DAT. The UETININET.TMP file contains the following information for any circuit in the ON state but not in transition:
 - Circuit name
 - Node address
 - Node name (if one exists)

The UETININET.TMP file is used throughout the DECnet phase to determine which devices to test.

- 3 Uses the UETININET.TMP file to create an NCP command procedure for each testable circuit. Each command procedure contains a set of NCP commands to zero the circuit and node counters and to test the circuit and adjacent node by copying files back and forth.

Note: If you do not want the counters zeroed, do not test DECnet.

Running UETP

7.6 UETP Tests and Phases

- 4 Executes the command procedures from step 3 in parallel to simulate a heavy user load. The simulated user load is the lesser of the following values:
 - The number of testable circuits, multiplied by two
 - The maximum number of user-detached processes that can be created on the system before it runs out of resources (determined by UETINIT00)
- 5 Executes a program, UETNETS00.EXE, that uses the UETININET.DAT file to check the circuit and node counters for each testable circuit. If a counter indicates possible degradation (by being nonzero), its name and value are reported to the console. All counters are reported in the log file, but only the counters that indicate degradation are reported to the console. Following is an example of UETNETS00 output:

```
%UETP-S-BEGIN, UETNETS00 beginning at 31-DEC-1989 13:45:33.18
%UETP-W-TEXT, Circuit DMC-0 to (NODENAME1) OK.
%UETP-I-TEXT, Node (NODENAME2) over DMC-1 response timeouts = 1.
%UETP-I-TEXT, Circuit DMC-1 to (NODENAME2) local buffer errors = 34.
%UETP-I-TEXT, Node (NODENAME3) over DMP-0 response timeouts = 3.
%UETP-S-ENDED, UETNETS00 ended at 31-DEC-1989 13:45:36.34
```

Because degradation is not necessarily an error, the test's success is determined by you, not the system. The following conditions indicate possible degradation:

For Circuits

- Arriving congestion loss
- Corruption loss
- Transit congestion loss
- Line down
- Initialization failure
- Data errors inbound
- Data errors outbound
- Remote reply timeouts
- Local reply timeouts
- Remote buffer errors
- Local buffer errors
- Selection timeouts
- Remote process errors
- Local process errors
- Locally initiated resets
- Network initiated resets

Running UETP

7.6 UETP Tests and Phases

For Nodes

- Response timeouts
- Received connect resource errors
- Aged packet loss
- Node unreachable packet loss
- Node out of range packet loss
- Oversized packet loss
- Packet format error
- Partial routing update loss
- Verification reject

7.6.5 Cluster-Integration Test Phase

The cluster-integration test phase, which consists of a single program and a command file, depends heavily on DECnet. This phase uses DECnet to create SYSTEST_CLIG processes on each VMS node in the cluster and to communicate with each node. SYSTEST_CLIG is an account that is parallel to SYSTEST, but limited so that it can only be used as part of the cluster-integration test. The following restrictions on the SYSTEST_CLIG account are necessary for a correct run of the cluster test phase:

- The account must be enabled and the password must be null. For more information, see Section 7.3.7.
- The UIC must be the same as that of the SYSTEST account.
- The account must have the same privileges and quotas as the SYSTEST account. For more information, see Section 7.5.4.1.
- The account can allow login only through DECnet.
- The account must be locked into running UETCLIG00.COM when it logs in.

These items are necessary to ensure the security and privacy of your system. If the test cannot create a SYSTEST_CLIG process on some VMS node, it gives the reason for the failure and ignores that node for the lock tests and for sharing access during the file test. The test makes no attempt to report information relating to a failure at the node where creation was attempted; that is, any possible log file is not copied to the node running the test. If there is a problem communicating with a SYSTEST_CLIG process after it has been created, the test excludes it from further lock and file sharing tests. At the end of the cluster-integration test, an attempt is made to report any errors seen by that node.

UETCLIG00.EXE has two threads of execution: the primary and the secondary. The first, or primary thread, checks the cluster configuration; that is, it checks the VMS and HSC nodes and the disks attached to each of them that can be seen from the node running the test. For selected VMS nodes, the primary thread attempts to start up a SYSTEST_CLIG process through DECnet. Those nodes on which the primary thread was able to start a SYSTEST_CLIG process run the command file UETCLIG00.COM, which starts up UETCLIG00.EXE and runs the secondary execution thread.

Running UETP

7.6 UETP Tests and Phases

The process running the primary thread checks to see that it can communicate with the processes running the secondary threads. It then instructs them to take out locks so that a deadlock situation is created.

The primary thread tries to create a file on some disk on selected VMS and HSC nodes in the cluster. The primary thread writes a block, reads it back, and verifies it. The primary thread selects one VMS node at random and asks that node to read the block and verify it. Then, the primary thread extends the file by writing another block and has the secondary thread read and verify the second block. The file is deleted.

The secondary processes exit. They copy to the primary process the contents of their SYS\$ERROR files, so that the UETP log file and console report show all problems in a central place. DECnet automatically creates a NETSERVER.LOG in SYS\$TEST as the test is run, so that, if necessary, you can read that file later from the node in question.

During the test run, the primary process uses cluster \$BRKTHRU to announce the beginning and ending of the test to each VMS node's console terminal.

You can define the group logical name MODE to the equivalence string DUMP to trace most events as they occur. Note that the logical name definitions apply only to the node on which they were defined. You must define MODE on each system in the VAXcluster on which you want to trace events.

Part II

Part II describes frequently performed system operations such as system startup, shutdown, and backup.

8

Startup and Shutdown Procedures

This chapter contains information on the following:

- Overview of booting the system
- Ways to boot the system
- Shutting down the system

8.1 Overview of Booting

Booting is the process of loading system software into the processor's main memory. The VAXstation 3100 uses an internal memory device to boot the VMS operating system from the system disk into memory. The boot process consists of the following steps:

- 1** You enter the `BOOT` command. The boot procedure deposits information in the general purpose registers.
- 2** `VMB`, the primary boot program, is loaded from read-only memory (ROM) into main memory. `VMB` is a program that allows access to the system disk. `VMB` locates `SYS$SYSTEM:SYSBOOT.EXE` on the system disk and loads it into memory.
- 3** `SYSBOOT.EXE` loads the `SYSGEN` parameters stored in `SYS$SYSTEM:VAXVMSSYS.PAR` and checks the conversational boot flag. If the flag is set, the procedure stops and displays the `SYSBOOT>` prompt. If the flag is not set, `SYSBOOT` loads the VMS executive into memory and transfers control to the VMS executive.
- 4** When the VMS executive finishes, it executes the `SWAPPER` process.
- 5** The `SWAPPER` creates the `SYSINIT` process.
- 6** `SYSINIT` creates the `STARTUP` process.
- 7** `STARTUP` executes `SYS$SYSTEM:STARTUP.COM` (unless you indicated another file at the `SYSBOOT>` prompt) and `SYSTARTUP_V5.COM`. The current values of `SYSGEN` parameters are written back to `VAXVMSSYS.PAR`.
- 8** The boot process finishes, and you can log into the VMS operating system.

Startup and Shutdown Procedures

8.2 Booting the System

8.2 Booting the System

To boot the VMS operating system from the system disk, use the following procedure:

- 1 If the VMS operating system is not running, go to step 2.

If the VMS operating system is running, log into the SYSTEM account. Enter the following command and press RETURN:

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

Answer the questions. When the procedure asks if an automatic reboot should be performed, press RETURN for NO. When the procedure is finished, it displays the following message:

```
SYSTEM SHUTDOWN COMPLETE -- USE CONSOLE TO Halt SYSTEM
```

- 2 Press the Halt button located on the back of the system unit.

- 3 Enter the BOOT command in the following format:

```
>>> B 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 RETURN:

```
>>> B DKA400
```

To boot from the network, enter the following command and press RETURN:

```
>>> B ESAO
```

For more information on device names, see Section 3.2.

- 4 After the system boots, it displays the following message:

```
VAX/VMS Version V5.1-B 31-DEC-1989 15:00
```

```
The VAX/VMS system is now executing the system startup procedure.
```

```
The VAX/VMS system is now executing the site-specific startup commands.
```

```
%SET-I-INTSET, login interactive limit=64, current interactive value = 0  
SYSTEM      job terminated at 31-DEC-1989 15:00:00.00
```

8.3 The SET BOOT Command

There are two commands you can use at the console-mode prompt (> > >) to set, display, and cancel the drive from which you want the system to boot.

Use the SET BOOT command to tell the system what drive you want to boot from. Enter the SET BOOT command in the following format:

```
>>> SET 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 RETURN:

```
>>> SET BOOT DKA400
```

Startup and Shutdown Procedures

8.3 The SET BOOT Command

The next time you boot the system you can enter the BOOT command without specifying a device name. For example:

```
>>> B
```

Use the SHOW DEVICE/BOOT command to find out what drive was specified in the last SET BOOT command. For example:

```
>>> SHOW DEVICE/BOOT
```

To cancel the drive specified in the last SET BOOT command, enter the following command and press RETURN:

```
>>> SET BOOT
```

If you have not used the SET BOOT command to set the drive to boot from and you enter the BOOT command without specifying a device name, the system will ask you for a device name. If you do not enter a device name within 30 seconds, the system boots from the network device, ESA0.

8.4 Automatic Boot

You can set the VAXstation 3100 to boot automatically or you can boot it manually. This section describes how to control whether the VAXstation 3100 boots automatically.

The VAXstation 3100 can boot automatically from the device designated in RAM. By default, the network device, ESA0, is the designated boot device. When you installed the VMS operating system, you designated the system disk as the default boot device. Section 8.3 describes how to change the default boot device.

The VAXstation 3100 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 entered Y at the auto reboot prompt)
- After a bugcheck
- If the system Halts under program control

To control whether the system boots automatically in these situations, do the following:

- 1 If the VMS operating system is not running, go to step 2.

If the VMS operating system is running, log into the SYSTEM account. Enter the following command and press RETURN:

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

Answer the questions. When the procedure asks if an automatic reboot should be performed, press RETURN for NO. When the procedure is finished, it displays the following message:

```
SYSTEM SHUTDOWN COMPLETE -- USE CONSOLE TO HALT SYSTEM
```

- 2 Press the Halt button located on the back of the system unit.

Startup and Shutdown Procedures

8.4 Automatic Boot

- 3 Enter the following command to show whether the system has been set to boot automatically:

```
>>> SHOW Halt
```

The system displays a value of 2 or 3, which are defined as follows:

2—If the power comes on or the system Halts under program control, the system attempts to reboot from the default boot device designated in RAM.

3—When power comes on to the system or the system Halts under program control, it displays the console-mode prompt (> > >) and does not attempt to reboot. The system reboots automatically only if you enter Y at the auto reboot prompt when you shut down the system with the SHUTDOWN.COM command procedure.

- 4 Enter the SET Halt command if you want to change the automatic booting behavior. The following example changes the value to 3.

```
>>> SET Halt 3
```

8.5 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 certain SYSGEN commands to do the following:

- Look at 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

There are several ways to perform a conversational boot. The following procedure is the most direct:

- 1 If the VMS operating system is not running, go to step 2.

If the VMS operating system is running, log into the SYSTEM account. Enter the following command and press RETURN:

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

Answer the questions. When the procedure asks if an automatic reboot should be performed, press RETURN for NO. When the procedure is finished, it displays the following message:

```
SYSTEM SHUTDOWN COMPLETE - USE CONSOLE TO Halt SYSTEM
```

- 2 Press the Halt button located on the back of the system box.

Startup and Shutdown Procedures

8.5 Conversational Boot

- 3 To begin the conversational boot, enter the BOOT command in the following format:

```
>>> B/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 RETURN:

```
>>> B/1 DKA400
```

If you do not specify a device name, the VAXstation 3100 boots from the boot device specified by the last SET BOOT command.

- 4 At the SYSBOOT> prompt, you can enter any of the SYSGEN commands listed in Table 8-1. For more information about these SYSGEN commands, see the *VMS System Generation Utility Manual*.
- 5 When you finish using the SYSGEN commands, enter the CONTINUE command to complete the boot process.

Table 8-1 SYSGEN Commands Used in SYSBOOT

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).

The following examples illustrate some operations you can perform during a conversational boot.

You can enter the following command to set a new value for the SYSGEN parameter WSMAX to 512. The CONTINUE command completes the boot process.

```
SYSBOOT> SET WSMAX 512  
SYSBOOT> CONTINUE
```

When the VMS operating system displays the following message, the new SYSGEN parameter value becomes active:

```
SYSTEM job terminated at 31-DEC-1989 15:05:11.01
```

Startup and Shutdown Procedures

8.5 Conversational Boot

If you modified the system parameters to values that render the system unbootable, enter the following commands to boot using default system parameter values:

```
SYSBOOT> USE DEFAULT  
SYSBOOT> CONTINUE
```

You can also use the conversational boot operation to specify a minimum startup. For example, if you want to boot the system and avoid autoconfiguring all the peripheral devices, enter the following command and press RETURN:

```
SYSBOOT> SET STARTUP_P1 "MIN"
```

This command initiates a minimum startup that performs the following sequence of operations:

- 1 Starts the processes that control error logging, the job controller, and the operator's log
- 2 Installs known images
- 3 Defines the number of interactive users as eight
- 4 Logs off

Because this procedure does not invoke SYSTARTUP_V5.COM, it does not autoconfigure the system's peripheral devices.

The value of STARTUP_P1 is saved and affects future boot operations. After the operating system boots, you can log into the SYSTEM account and run SYSGEN to reset STARTUP_P1. For example, enter the following commands to reset STARTUP_P1 to its default value (null):

```
RUN SYS$SYSTEM:SYSGEN  
SYSGEN> USE CURRENT  
SYSGEN> SET STARTUP_P1 ""  
SYSGEN> WRITE CURRENT  
SYSGEN> EXIT
```

8.6 Booting with XDELTA

XDELTA is a debugging tool that system programmers use. To use XDELTA, you need to boot the system in a special way. For information on booting with XDELTA, see the *VMS Delta/XDelta Utility Manual*.

8.7 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. If you suspect a hardware problem, do the following:

- 1 Consult the hardware manual for your VAXstation 3100.
- 2 Contact DIGITAL Field Service.

When the operating system is loaded into memory, a message similar to the following appears on the terminal screen:

```
SYSTEM          job terminated at 31-DEC-1989 15:05:03.17
```

Startup and Shutdown Procedures

8.7 If the System Does Not Boot

If the system does not display this message, a software problem has probably occurred. Do the following:

- 1 Turn off the system box. Turn it back on and try to reboot.
- 2 Do a conversational boot using default SYSGEN parameters as described in Section 8.5. If the system boots, run AUTOGEN. For more information on AUTOGEN, see the *Guide to Setting Up a VMS System*.

8.8 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.

If you want the system to reboot automatically after the shutdown, see Section 8.4.

8.8.1 Types of Shutdowns

You can perform the following three types of shutdown operations:

- **An orderly shutdown with SYSS\$SYSTEM:SHUTDOWN.COM.** This 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 command procedure, log into the SYSTEM account, enter the following command, and press RETURN:

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

To Halt the system after the procedure completes, press the Halt button located on the back of the system box.

For more information about the SHUTDOWN command procedure, see the *Guide to Setting Up a VMS System*.

- **An emergency shutdown with OPCCRASH.EXE.** If you cannot perform an orderly shutdown with SHUTDOWN.COM, run the OPCCRASH emergency shutdown program. To run the OPCCRASH program, log into the SYSTEM account, enter the following command, and press RETURN:

```
$ RUN SYS$SYSTEM:OPCCRASH
```

To Halt the system after the procedure completes, press the Halt button located on the back of the system box.

For more information about the OPCCRASH program, see the *Guide to Setting Up a VMS System*.

- **An Emergency Shutdown with CRASH Commands** Use this emergency shutdown procedure if OPCCRASH fails. Section 8.8.2 describes using CRASH commands.

Startup and Shutdown Procedures

8.8 Shutting Down the System

8.8.2 Emergency Shutdown with CRASH Commands

Note: Use CRASH commands only if the system is hung and you cannot log into the SYSTEM account to use SHUTDOWN or OPCCRASH.

To force your processor to fail, do the following:

- 1 Press the Halt button located on the back of the system box.
- 2 To examine processor registers, enter the following commands and press RETURN:

```
>>> E/N:F RO  
>>> E PSL
```

The system displays the contents of the registers. Write these values down if you want to save information about the state of the system.

- 3 Enter the following commands and press RETURN:

```
>>> D PC FFFFFFFF  
>>> D PSL 041F0000
```

By depositing these values, you cause the system to write a memory dump to the system dump file on disk.

- 4 Enter the following command and press RETURN:

```
>>> CONTINUE
```

This causes the system to perform a bugcheck.

- 5 After the system reboots, you can examine the dump file. Log into the SYSTEM account.

- 6 Enter the following commands and press RETURN after each one:

```
$ ANALYZE/CRASH SYS$SYSTEM:SYSDUMP.DMP  
SDA> SHOW CRASH
```

For more information about the System Dump Analyzer (SDA) see the *VMS System Dump Analyzer Utility Manual*.

8.9 If the System Fails

Your system can fail in the following ways:

- Bugcheck—The system displays a bugcheck message on the console terminal and shuts itself down. This happens because the system encountered a problem that made further operation impossible. Reboot the system.
- Hang—The system stops responding to your commands. The problem could be a failure in system software or a hardware component or a power failure.
- Erratic behavior—The system does not respond according to specifications. The problem could be a failure in system software or a hardware component.

Startup and Shutdown Procedures

8.9 If the System Fails

To see if the failure is a system problem and not something you have done, try the following:

- Make sure that you did not press the F1 key.
- Press 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 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 box is secure.

Usually you can force an exit from a hung program by pressing CTRL/Y. When you press CTRL/Y, any work performed by the program and not saved on disk is lost.

If the system is hung, press the Halt button and reboot without a normal shutdown.

If you have a problem with the system that DIGITAL has not warned you about, note in detail the sequence of events that caused the problem and notify DIGITAL Field Service.

9 Backup Procedures

This chapter describes the following procedures:

- Installing and booting standalone BACKUP on the system disk
- Installing and booting standalone BACKUP on a tape cartridge
- Backing up and restoring the system disk

9.1 Overview of Standalone BACKUP

The Backup Utility lets you create and restore backup copies of files, directories, and user disks. Because the Backup Utility copies only what is on the disk and ignores sections of any open files contained in memory, you should use it to back up user disks, not the system disk. If you use the Backup Utility to back up the system disk, the portions of the files that were in memory and data about files not yet written back to the disk (cache) will not be recorded on the resulting backup copy.

Use standalone BACKUP to make a complete backup of the system disk. Standalone BACKUP is a version of the Backup Utility that runs without the support of the entire VMS operating system. Before you use standalone BACKUP, you must shut down the VMS operating system. The shutdown procedure sends the contents of the caches back to the disk and closes any open files. By shutting the system down and using standalone BACKUP, you can make an exact copy of the system disk.

You can keep standalone BACKUP on the system disk, a tape cartridge, or any other media that the system supports. DIGITAL recommends that you keep standalone BACKUP on your system disk and on a tape cartridge. Usually you boot standalone BACKUP from the system disk because it saves time. However, you need to keep a copy of standalone BACKUP on a tape cartridge in case the system disk becomes damaged. As part of your distribution kit, you received standalone BACKUP on a tape cartridge.

9.1.1 Installing Standalone BACKUP on the System Disk

You can install standalone BACKUP in any available root directory on the system disk from [SYS1] to [SYSE]. However, DIGITAL has established [SYSE] as the standard directory for standalone BACKUP.

To install standalone BACKUP in [SYSE] on the system disk, use the following procedure:

- 1 Log into the SYSTEM account.
- 2 Enter the following command and press RETURN:

```
$ @SYS$UPDATE:STABACKIT SYS$SYSDEVICE:
```

Backup Procedures

9.1 Overview of Standalone BACKUP

The procedure places the files in the directories [SYSE.SYSEXEXE] and [SYSE.SYS\$LDR] on the system disk. It lists the files as they are copied. When the procedure finishes, it displays the following message:

The kit is complete.

- 3 To boot standalone BACKUP from the system disk, go to Section 9.1.2.

9.1.2 Booting Standalone BACKUP from the System Disk

To boot standalone BACKUP from the system disk, use the following procedure:

- 1 If the VMS operating system is not running, go to step 2.

If the VMS operating system is running, log into the SYSTEM account. Enter the following command and press RETURN:

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

Answer the questions. When the procedure asks if an automatic system boot should be performed, press RETURN for NO. When the procedure is finished, it displays the following message:

```
SYSTEM SHUTDOWN COMPLETE -- USE CONSOLE TO Halt SYSTEM
```

- 2 Press the Halt button.
- 3 Enter the BOOT command in the following format:

```
>>> B/E0000000 device-name
```

Substitute the device name of the system disk for *device-name*. For example, if the system disk has a device name of DKA400, enter the following command and press RETURN:

```
>>> B/E0000000 DKA400
```

For more information on device names, see Section 3.2.

- 4 Standalone BACKUP displays the following message:

```
VAX/VMS Version V5.1-B Major version id = 01 Minor version id = 00
```

- 5 The procedure asks you for the date and time. Enter the date and time using the 24-hour clock format and press RETURN. For example:

```
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM) 31-DEC-1989 15:00
```

- 6 The procedure displays a list of the local devices on your system. For example:

```
Available device MKA500:           device type TK50
Available device DKA100:           device type RRD40
.
```

Check the list of devices. If the list is incomplete, make sure that all the drives are properly connected to the system. See your hardware manuals for details.

Backup Procedures

9.1 Overview of Standalone BACKUP

- 7 When standalone BACKUP finishes booting, it displays an identification message followed by the dollar sign prompt (\$):

```
%BACKUP-I-IDENT, Standalone BACKUP V5.1-B; the date is 31-DEC-1989 15:00
$
```

To make a backup copy of the system disk, go to Section 9.2. To restore the system disk, go to Section 9.2.2.

9.1.3 Installing Standalone BACKUP on a Tape Cartridge

If your system has a tape cartridge drive, DIGITAL recommends that you keep standalone BACKUP on a tape cartridge in case the system disk becomes damaged. To install standalone BACKUP on a tape cartridge, use the following procedure:

Note: You should have standalone BACKUP on the tape cartridge that came with your distribution kit. Use the procedure in this section if your copy of standalone BACKUP becomes damaged, or if you need to make extra copies.

- 1 Obtain one blank tape cartridge. Write the name S/A BKUP V5.1-B on the paper label. Insert the label in the label slot.
- 2 Write-enable the tape cartridge.
- 3 Insert the tape cartridge labeled S/A BKUP V5.1-B into the drive.
- 4 Log into the SYSTEM account.
- 5 Enter the following command and press RETURN:

```
$ @SYS$UPDATE:STABACKIT
```

- 6 The procedure asks you for the name of the target device. Type MKA500 and press RETURN. For example:

```
Enter the name of the device on which to build the kit: MKA500
```

```
.
```

```
Please place the scratch tape cartridge in drive _MKA500:
This volume will receive the volume label SYSTEM.
```

```
Enter "YES" when ready:
```

- 7 When you are ready to continue, type Y (for YES) and press RETURN.
- 8 The system displays verification messages informing you that files are being copied.
- 9 When standalone BACKUP is installed, the procedure displays a message similar to the following:

```
Ending time 31-DEC-1989 16:44:29.90
Starting time 31-DEC-1989 16:30:39.05
```

```
The Kit is complete.
```

```
$
```

Backup Procedures

9.1 Overview of Standalone BACKUP

- 10 Remove the tape cartridge labeled S/A BKUP V5.1-B from the tape cartridge drive.
- 11 Write-protect the tape cartridge and store it in a safe place.

9.1.4 Booting Standalone BACKUP from a Tape Cartridge

If the system disk containing standalone BACKUP should become unusable, you can boot standalone BACKUP from a tape cartridge. Booting standalone BACKUP from a tape cartridge takes approximately 20 minutes. You need a tape cartridge that contains standalone BACKUP (either the distribution tape cartridge or one that you created). To boot standalone BACKUP from a tape cartridge, use the following procedure:

- 1 If the VMS operating system is not running, go to step 2.

If the VMS operating system is running, log into the SYSTEM account. Enter the following command and press RETURN:

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

Answer the questions. When the procedure asks if an automatic system boot should be performed, press RETURN for NO. When the procedure is finished, it displays the following message:

```
SYSTEM SHUTDOWN COMPLETE -- USE CONSOLE TO Halt SYSTEM
```

- 2 Press the Halt button.
- 3 Insert the tape cartridge that contains standalone BACKUP into the tape cartridge drive.
- 4 To boot standalone BACKUP, enter the following command at the console-mode prompt (> > >) and press RETURN:

```
>>> B MKA500
```

- 5 Standalone BACKUP displays the following message:

```
VAX/VMS Version V5.1-B Major version id = 01 Minor version id = 00
```

- 6 The procedure asks you for the date and time. Enter the date and time using the 24-hour clock format and press RETURN. For example:

```
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM) 31-DEC-1989 15:00
```

- 7 The procedure displays a list of the local devices on your system. For example:

```
Available device MKA500:                device type TK50
Available device DKA100:                device type RRD40
.
.
.
```

- 8 When standalone BACKUP finishes booting, it displays an identification message followed by the dollar sign prompt (\$):

```
%BACKUP-I-IDENT, standalone BACKUP V5.1-B; the date is 31-DEC-1989 15:50
$
```

- 9 Remove the tape cartridge containing standalone BACKUP from the tape cartridge drive.

Backup Procedures

9.1 Overview of Standalone BACKUP

To make a backup copy of the system disk, go to Section 9.2.

To restore the system disk, go to Section 9.2.2.

9.2 Using Standalone BACKUP

There are several reasons to back up a system disk:

- In case a problem occurs during a VMS upgrade or update or during the installation of other software products. *Before* you attempt any of these procedures you should back up the system disk. If a problem does occur, you can restore the backup copy to the system disk.
- To prevent loss of system files if they are accidentally deleted. *After* you install or upgrade the VMS operating system or any other software products, you should back up the system disk. If a system file is deleted and renders the system disk inoperable, you can restore the backup copy and continue to use the system.
- In case the system disk malfunctions. If you have a backup copy of the VMS operating system, you can restore it to a functioning disk and continue to use the system.
- To eliminate disk fragmentation. Fragmentation happens when files are not stored contiguously on the disk. Back up the system disk to a tape cartridge, diskettes, or another disk. Then restore the files to the original system disk. The BACKUP command creates a copy on which files are stored contiguously.

DIGITAL recommends that you use standalone BACKUP, which uses a subset of Backup Utility qualifiers, to back up and restore your system disk. It is especially important that you understand the functions of the /IMAGE and /PHYSICAL qualifiers to the BACKUP command before using standalone BACKUP.

Qualifier	Function
/IMAGE	Lets you create a functionally equivalent copy of the entire system disk
/PHYSICAL	Copies, saves, restores, or compares the entire system disk in terms of logical blocks, ignoring any file structure

For a complete description of the Backup Utility and its qualifiers, see the *VMS Backup Utility Manual*.

Backup Procedures

9.2 Using Standalone BACKUP

9.2.1 Backing Up the System Disk

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

- 1 Decide whether you want to back up the system to another fixed disk or to a tape cartridge. If you are using a tape cartridge, obtain a scratch tape cartridge that you can use for the backup copy. A scratch tape cartridge is a tape cartridge that is either blank or contains files that you no longer need.
- 2 If you are using a tape cartridge, write-enable it. To write-enable a tape cartridge, slide the write-protect switch away from the tape cartridge label. Insert the tape cartridge in the tape cartridge drive.
- 3 Determine the device names of the drive holding the system disk and the drive holding the backup disk or tape cartridge. Enter the SHOW DEVICE command at the console-mode prompt (> > >).
- 4 Boot standalone BACKUP as described in either Section 9.1.2 or Section 9.1.4.
- 5 Enter the BACKUP command in one of the following formats. If you are backing up the system disk to a disk, use the first command. If you are backing up the system disk to a tape cartridge, use the second command.

```
$ BACKUP/IMAGE/VERIFY source-drive: target-drive:
```

```
$ BACKUP/IMAGE/VERIFY/BUFFER_COUNT=5 source-drive: MKA500:saveset.BCK/REWIND/LABEL=volume-label
```

where:

- *source-drive* is the location of the files you want to backup. Use the device name of the drive holding the system disk.
- *target-drive* is the destination. Use the device name of the drive holding the backup disk or tape cartridge.
- *saveset.BCK* is the name of the save set (the name should reflect the contents of the backup tape and can have up to 17 characters).
- *volume-label* is the volume label of the tape cartridge in the tape cartridge drive. If the tape cartridge has been initialized already, use the same volume label that was assigned by the INITIALIZE command. If the tape cartridge has not been initialized, you can assign a volume label at this time. The volume label can have up to six characters.

The following example uses the BACKUP command to make a backup disk. You can use a backup disk as a system disk.

```
$ BACKUP/IMAGE/VERIFY DKA400: DKA300:
```

The following example uses the BACKUP command to make a backup tape cartridge. The contents of a backup tape cartridge have to be restored to a disk before you can use them. For more information, see Section 9.2.2.

```
$ BACKUP/IMAGE/VERIFY/BUFFER_COUNT=5 DKA400: MKA500:DEC_31_1989.BCK/REWIND/LABEL=SYSDSK
```

- 6 The procedure displays the following message:
%BACKUP-I-STARTVERIFY, starting verification pass
- 7 If you are backing up the system disk to another disk, go to step 8.

Backup Procedures

9.2 Using Standalone BACKUP

If you are backing up the system disk to a tape cartridge and the contents of the system disk fit on one tape cartridge, remove the backup tape cartridge from the drive. Label the tape COMPLETE SYSTEM BACKUP and include the date. Then go to step 8.

If you are backing up the system disk to a tape cartridge and the system disk contains more data than one tape cartridge can store, the procedure displays the following messages:

```
%BACKUP-I-RESUME, Resuming operation on volume 2
%BACKUP-I-READYWRITE, Mount volume 2 on _MKA500: for writing
Enter "YES" when ready.
```

Do the following:

- a. Remove the backup tape cartridge from the drive.
- b. Label it COMPLETE SYSTEM BACKUP, number it, and include the date.
- c. Write-protect the tape cartridge.
- d. Write-enable another scratch tape cartridge and insert it in the drive.
- e. When you are ready to continue, type Y (for YES) and press RETURN. The procedure displays the following message:

```
%BACKUP-I-STARTVERIFY, starting verification pass
```

Each time the procedure displays a mount request, repeat steps A through E.

- 8 When the procedure is finished, it displays the following message:

```
%BACKUP-I-PROCDONE, Operation completed. Processing finished at 31-DEC-1989 15:30
If you do not want to perform another standalone BACKUP operation,
use the console to Halt the system.
```

```
If you do want to perform another standalone BACKUP operation,
ensure the standalone application volume is online and ready.
Enter "YES" to continue:
```

- 9 Press the Halt button.

- 10 Reboot the system.

Store backup tape cartridges in a safe place.

Note: The BACKUP command creates a system disk that includes a set of volume parameters provided by DIGITAL, including a CLUSTER_SIZE (disk access scheme) of one. (The CLUSTER_SIZE refers to the way files are stored on the disk, *not* to VAXclusters.) 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. To prevent the BACKUP command from reinitializing the target disk, use the /NOINITIALIZE qualifier. For more information about initializing a disk see the *Guide to Maintaining a VMS System*. For more information on the BACKUP command, see the *VMS Backup Utility Manual*.

Backup Procedures

9.2 Using Standalone BACKUP

9.2.2 Restoring the System Disk

To restore the system disk, use the following procedure:

- 1 Determine the device names of the drive holding the system disk and the drive holding the backup disk or tape cartridge. Enter the SHOW DEVICE command at the console-mode prompt (> > >).
- 2 Boot standalone BACKUP as described in Section 9.1.2 or Section 9.1.4.
- 3 If you have a backup tape cartridge, make sure it is write-protected. Insert it in the drive.
- 4 Enter the BACKUP command in one of the following formats. If you have a backup disk, use the first command. If you have a backup tape cartridge, use the second command.

```
$ BACKUP/IMAGE/VERIFY source-drive: target-drive:
```

```
$ BACKUP/IMAGE/VERIFY/BUFFER_COUNT=5 MKA500:saveset.BCK/REWIND target-drive:
```

where:

- *source-drive* is the location of the files you want to restore. Use the device name of the drive holding the backup disk or tape cartridge.
- *saveset.BCK* is the name of the save set, if you have a backup tape cartridge.
- *target-drive* is the destination. Use the device name of the drive holding the system disk.

The following example uses the BACKUP command to restore the system disk from a backup disk:

```
$ BACKUP/IMAGE/VERIFY DKA400: DKA300:
```

The following example uses the BACKUP command to restore the system disk from a backup tape cartridge:

```
$ BACKUP/IMAGE/VERIFY/BUFFER_COUNT=5 MKA500:DEC_31_1989.BCK/REWIND DKA400:
```

- 5 The procedure displays the following message:

```
%BACKUP-I-STARTVERIFY, starting verification pass
```

- 6 If you have a backup disk or only one backup tape cartridge, go to step 7.

If you have more than one backup tape cartridge, the procedure displays the following message:

```
%BACKUP-I-RESUME, Resuming operation on volume 2  
%BACKUP-I-READYREAD, Mount volume 2 on MKA500: for reading  
Enter "YES" when ready.
```

Remove the first backup tape cartridge from the drive. Insert the next backup tape cartridge in the drive, type Y (for YES), and press RETURN. Each time you receive a mount request, repeat this step.

Backup Procedures

9.2 Using Standalone BACKUP

7 When the procedure is finished, it displays the following message:

```
%BACKUP-I-PROCDONE, Operation completed. Processing finished at 31-DEC-1989 15:30  
If you do not want to perform another standalone BACKUP operation,  
use the console to Halt the system.
```

```
If you do want to perform another standalone BACKUP operation,  
ensure the standalone application volume is online and ready.  
Enter "YES" to continue:
```

8 Press the Halt button.

9 Reboot the system.

A VAXstation 3100 Release Notes

These release notes describe special features and restrictions for the VAXstation 3100 computer.

A.1 Restriction on the Use of the Tape Drive

You can have only one tape drive on a VAXstation 3100 system.

A.2 Restrictions on the Use of the Compact Disc Drive

When you enter the SHOW DEVICE command at the console-mode prompt (> > >), the display might not include information on the compact disc drive you have in an expansion box. If this happens, check the cable from the system box to the drive. Also make sure the power to the drive is turned on. If the problem still persists, turn the power to the drive off and then on again. Wait 10 seconds or more before trying the SHOW DEVICE command again. At this time the compact disc drive should be included in the display.

If you want to boot standalone BACKUP from the compact disc drive, make sure the compact disc is in the drive *before* you enter the BOOT command. If you try to boot standalone BACKUP while there is no compact disc in the drive, the following error message will be displayed:

```
DKB400 Device type not recognized
```

A.3 Restrictions on the Use of RX23 Diskettes

You can use the following types of diskettes in the RX23 drive:

- Double Density (DD)—A double density diskette contains nine sectors (512 bytes per sector), 80 cylinders, and two heads.
- High Density (HD)—A High Density diskette contains 18 sectors (512 bytes per sector), 80 cylinders, and two heads.

You can only read double density diskettes that have been formatted and written on by another computer. You cannot write on a double density diskette.

You can read and write on a high density diskette. Before you can use a high density diskette you must format it. After you boot the VMS operating system, put the diskette you want to format in the drive. Enter the following command and press RETURN:

```
$ INITIALIZE/DENSITY=DOUBLE DUA2:volume-label
```

For more information on the INITIALIZE command, see the *VMS DCL Dictionary*.

VAXstation 3100 Release Notes

A.3 Restrictions on the Use of RX23 Diskettes

Do not build a standalone BACKUP kit on an RX23 diskette. You cannot boot the VMS operating system from an RX23 diskette. DIGITAL recommends that you build one standalone BACKUP kit on the system disk and one on a TK50 tape cartridge.

A.4 SCSI Disk and Tape Drives

A *bus* is a channel (a set of wires) along which communication signals in a computer system travel. One type of bus is the Input/Output bus (I/O bus). The central processing unit (CPU) of a computer uses the I/O bus to communicate with the disk and tape drives on the system. The VAXstation 3100 has a special I/O bus that is based on the ANSI standard known as the Small Computer System Interface (SCSI). This bus is called the SCSI bus.

The CPU and each disk and tape drive on the SCSI bus are assigned a unique identification number in the range of 0 to 7. The device with the highest identification number (7) has the highest priority. The device with the lowest identification number (0) has the lowest priority. DIGITAL ships pre-configured systems from the factory with the proper identification numbers set. You can use the SHOW DEVICE command at the console-mode prompt (> > >) to display the identification numbers assigned to the devices on your system.

Table A-1 and Table A-2 list the identification numbers that DIGITAL assigns to the devices on the SCSI bus on a VAXstation 3100, Model 30:

Table A-1 SCSI ID Numbers for the VAXstation 3100, Model 30 (SCSI-ST506 Option)

ID Number	
7	reserved for expansion
6	SCSI CPU
5	TZ30 or TZK50
4	RRD40 expansion box
3	RZ22 or RZ23 (system disk)
2	RZ22 or RZ23
1	reserved for expansion
0	reserved for expansion

VAXstation 3100 Release Notes

A.4 SCSI Disk and Tape Drives

Table A–2 SCSI ID Numbers for the VAXstation 3100, Model 30 (SCSI-SCSI Option)

Internal Bus ID Number		External Bus ID Number	
7	unused	7	reserved for expansion
6	SCSI A CPU	6	SCSI B CPU
5	TZ30 or TK50Z expansion box	5	TZ30 or TK50Z expansion box
4	unused	4	RRD40 expansion box
3	RZ22 or RZ23 (system disk)	3	RZ22 or RZ23
2	unused	2	reserved for expansion
1	unused	1	reserved for expansion
0	unused	0	reserved for expansion

The VAXstation 3100, Model 40 has two SCSI busses. Table A–3 lists the identification numbers that DIGITAL assigns to the devices on the SCSI busses on a VAXstation 3100, Model 40.

Table A–3 SCSI ID Numbers for the VAXstation 3100, Model 40

Internal Bus ID Number		External Bus ID Number	
7	reserved for expansion	7	reserved for expansion
6	SCSI A CPU	6	SCSI B CPU
5	TZ30	5	TZK50 expansion box
4	unused	4	RRD40
3	RZ22 or RZ23 (system disk)	3	RZ22 or RZ23
2	unused	2	RZ22 or RZ23
1	unused	1	reserved for expansion
0	unused	0	reserved for expansion

These identification numbers give optimal performance on most systems. However, if you have special performance needs, you can set the identification number on each SCSI device manually. Each device has a switchpack or jumpers that you can set. For more information, see the hardware manuals.

When you set SCSI identification numbers, follow these rules:

- You can have as many as 7 drives on one bus as long as you reserve the number 6 for the CPU.
- Each device must have a *unique* identification number.

VAXstation 3100 Release Notes

A.4 SCSI Disk and Tape Drives

If you fail to follow these rules, you might have the following problems with the system:

- Self-test errors when you turn the power on to the system
- Unexpected results from the SHOW DEVICE console command
- Inability to boot the system
- Unexplained system crashes

A.5 Changing the Identification Number of the CPU

DIGITAL assigns the SCSI identification number 6 to the CPU. The CPU automatically uses this value whenever you turn on the power to the system and when the battery backup is exhausted.

If you need to change the identification number of the CPU, use the SET SCSIA and SET SCSIB console commands. Note that the identification number is changed back automatically to 6 whenever the battery backup is exhausted. For more information on the SET SCSIA and SET SCSIB commands, see the hardware manuals.

A.6 Turning On the System

Turn components on in the following order:

- 1 Turn on the monitor.
- 2 Turn on the RZ55 drive, if you have one.
- 3 Turn on any other optional drives that you have. (Push the power switch on the front to the 1 (On) position.)
- 4 Push the power switch on the back of the system unit to the 1 (On) position.

B Bad Block Support

This section describes the VMS bad block support for SCSI disks. The following components contain VMS bad block support:

- Console disk formatter
- Bad Block Locator (BAD) Utility
- INITIALIZE command and the file system
- SCSI disk class driver

B.1 SCSI Concepts

This section describes the following commands and concepts:

- FORMAT UNIT command
- REASSIGN BLOCKS command
- No forced error bit
- Non-last track

FORMAT UNIT Command

All SCSI disks can implement a FORMAT UNIT command. This command makes sure that every block on a disk is accessible. It also causes a drive to initialize control structures that manage media defects.

REASSIGN BLOCKS Command

Some SCSI disks can implement a REASSIGN BLOCKS command. Host software can use this command to relocate the data for a specific logical block to a different physical location on a fixed disk. It is used when a read or write operation to a disk block fails due to a media defect. The REASSIGN BLOCKS command is not guaranteed to move the data from the old to the new location on the disk.

No Forced Error Bit

A unique forced error bit is associated with each block on a DIGITAL Storage Architecture (DSA) disk. When a read operation to a DSA disk block results in a nonrecoverable error, the block is reassigned to a different physical location on the disk and the forced error bit for this block is set. Once this bit is set, error status is displayed when an attempt is made to read this disk block.

SCSI disks have no forced error bit. This means that in the particular case of a nonrecoverable read error, reassignment operations are not performed. If a read operation to a SCSI disk block results in a nonrecoverable error and the block is reassigned to a different physical location on the disk, subsequent reads to this block result in success status.

Bad Block Support

B.1 SCSI Concepts

Non-last Track

Some types of disks reserve the last track for recording bad block information. SCSI disks, however, use the last good block to record bad block information. This is called "non-last track."

B.2 Console Disk Formatter

The console disk formatter is a program that can be run before VMS is booted and before any user data is placed on the disk. It performs the FORMAT UNIT command, followed by a sequence of reads and writes to ensure that every disk block can store data reliably. Reassignment operations are performed for blocks that return errors during read or write operations.

B.3 BAD Utility

The BAD Utility runs under VMS. It ensures that every block on the disk can store data reliably. Like the console disk formatter, it performs reads and writes to every block on the disk. Information about any sequence of bad blocks found on the disk is saved in the Detected Bad Block File (DBBF). This table is stored on the last good block of the disk.

B.4 The INITIALIZE Command and the File System

The INITIALIZE command prepares disks to store files. It creates the file BADBLK.SYS (located at [0,0]). Blocks found to have nonrecoverable errors are allocated to this file so that they won't be allocated to user files.

Usually, all I/O operations to SCSI disks go through the SCSI disk class driver. If a nonrecoverable error is detected for a SCSI disk block, the driver returns an error status (SS\$_PARITY) to the file system. The file system then sets a flag in the file header for the file that contains the bad block. When you delete a file that contains a bad block, a process is created that attempts to read and write every block within the file. This is called the "scrub" process. It allocates any bad blocks that are found to BADBLK.SYS.

Note the following about the reinitialization of a disk:

- The contents of BADBLK.SYS are *not* preserved.
- Any blocks entered in the DBBF by the BAD Utility are *not* allocated to BADBLK.SYS.

B.5 SCSI Disk Class Driver

Upon completion of a read or write operation, SCSI disks return one of the following status indications:

- Successful
- Recoverable (soft error)
- Nonrecoverable (hard error)

Bad Block Support

B.5 SCSI Disk Class Driver

Recoverable errors fall into two categories:

- Recoverable with read retries—These errors are considered to be successful by the disk class driver.
- Recoverable with ECC correction—These errors can lead to class driver retries and possibly to the reassignment of blocks.

Nonrecoverable errors lead to retries and possibly to the reassignment of blocks.

B.6 Error Recovery Parameters

SCSI disks have a set of flags, called error recovery parameters. These flags control what happens when an error is detected. The settings of each of these flags are as follows:

- **AWRE, ARRE**—Control whether the disk automatically reassigns blocks when errors are detected during write and read operations. All SCSI disks supplied by DIGITAL have these flags set to zero, preventing automatic block reassignment. Thus, all reassign operations are performed under host software control.
- **TB**—Controls whether the disk transfers the block for which an error occurs. This feature is enabled by the SCSI disk class driver (that is, the bad block is transferred).
- **PER**—Controls whether the disk informs the host when a recoverable error occurs. This flag is set by the SCSI disk class driver.
- **DTE**—Determines whether the disk stops a transfer when the first error is detected. If this flag is not set, the disk class driver is informed of only the last error in a transfer with errors on multiple blocks. The disk class driver sets this flag for all disks which support this feature.
- **DCR**—When set, prevents the disk from applying correction in the course of error recovery. The disk class driver clears this flag for all SCSI disks.

B.7 What the Disk Class Driver Does When it Detects an Error

When the disk class driver detects a read or write error, it tries the operation again several times. If appropriate, it reassigns blocks to prevent media defects from causing future errors. Following is a summary of the retry algorithms implemented by the SCSI disk class driver:

- 1 The driver detects an error during a read or write operation.
- 2 The driver retries the operation three times. If a retry is successful, it exits.
- 3 If the three retries fail and this is a nonrecoverable read, it returns a status of `SS$_PARITY`. (A reassignment would result in undetected user data corruption because there is no forced error bit in SCSI.)

In all other cases—a recoverable read, a recoverable write, a non-recoverable write—the driver attempts to reassign the block up to three times.

Bad Block Support

B.7 What the Disk Class Driver Does When it Detects an Error

- 4** If the reassignment succeeds, the driver writes the original data to the reassigned block. The REASSIGN BLOCKS command is not guaranteed to move the data from the old to the new location on the disk.

If the write operation after the reassign fails and fewer than three reassigns have been performed, return to the reassign loop.

C

Installing VMS DECwindows Software

After installing Version 5.1-B of the VMS operating system, you can install VMS DECwindows software.

Note: If you do not have a satisfactory backup copy of your system disk, do not attempt to install the DECwindows software on it. You should back up the system disk (as described in the VMS installation and operations guide for your system) before you install the DECwindows software.

C.1 Preparing to Install the DECwindows Software

DIGITAL requires a minimum system configuration of 6 megabytes of memory for workstations that are members of a local area VAXcluster (LAVc) and 4 megabytes of memory for standalone workstation configurations. However, DIGITAL recommends that you have at least 8 megabytes and 6 megabytes, respectively. For more information about performance considerations, see the *VMS Version 5.1 Release Notes*.

Note: When DECwindows components are installed on a cluster, only one installation per system root is required. No system-specific files are installed.

Prepare to install the DECwindows software by following these steps:

- 1 Log in to a privileged account such as the system manager's (SYSTEM) account.
- 2 Check your network setup. Set the executor characteristic PipeLine Quota to be greater than or equal to 10000, as follows:

```
$ RUN SYS$SYSTEM:NCP
NCP> DEFINE EXEC PIPELINE QUOTA 10000
NCP> EXIT
```

If this setting is incorrect, the DECwindows startup procedure corrects the problem and gives you a warning message every time the system starts up.

- 3 Save the MicroVMS Workstation Software (VWS) system parameters. If you are currently running the VWS software and expect to alternate between VWS and DECwindows, use a separate system parameter file for each. When you boot the system, choose whether you want to run DECwindows or VWS.

To save the VWS system parameters, enter the following commands:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> USE CURRENT
SYSGEN> WRITE SYS$SYSTEM:VWS.PAR
SYSGEN> EXIT
```

Installing VMS DECwindows Software

C.1 Preparing to Install the DECwindows Software

- 4 Before running AUTOGEN to configure a workstation to run DECwindows, it may be necessary to edit `SYS$SYSTEM:MODPARAMS.DAT` to remove the line that sets `WINDOW_SYSTEM`. Check the file; if that line is present, see Section C.3.2 to remove it.
- 5 If you plan to add workstations to a cluster with the `CLUSTER_CONFIG` command file, install DECwindows (see Section C.2) before running the command file. This allows you to select DECwindows for each workstation.

C.1.1 Disk Space Considerations

Approximately 55,000 blocks of free disk space are required to install all of the VMS DECwindows components. However, because you do not have to install the entire DECwindows software, your actual disk space requirements may be less.

The following list describes how many blocks are needed for each portion of the software:

- Base kit: 15,000 blocks.
- Workstation device support: 10,000 blocks. This number includes both the 75 dots per inch (dpi) (2500) and 100 dpi (3000) fonts. You can install one or both of the font sets.
- Programming environment: 30,000 blocks. This number includes all of the programming language support. The actual block requirements may be less depending on the language support that you select.

To determine the number of free blocks that you have, enter the following DCL command:

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

If you do not have enough space, you can delete or tailor off files that you do not need by running the `VMSTAILOR` program. See the VMS installation and operations guide for your computer system to find information on removing files using `VMSTAILOR`.

C.2 Installing the DECwindows Software

The DECwindows installation takes approximately one hour, depending on the distribution media and the processor type. The `VMSINSTAL` procedure installs DECwindows on your system.

Installing VMS DECwindows Software

C.2 Installing the DECwindows Software

C.2.1 Running VMSINSTAL

Perform the following steps to run the VMSINSTAL command procedure and install the DECwindows software:

- 1 The DECwindows kit is on the same piece of media as the VMS kit (either a tape cartridge or a compact disc).
- 2 If the system is not already running, start up the system and log in to a privileged account such as the system manager (SYSTEM) account. If a password has been set for this account, you must enter the password before you can proceed.
- 3 Start the VMSINSTAL procedure. You must specify a product name on the command line. The product name for the DECwindows Version 5.1 installation is DECW051. Enter the following command:

```
$ @SYS$UPDATE:VMSINSTAL DECW051 device-name:
```

Substitute the device name of the drive that holds the distribution media for *device-name*. For more information about the format of device names on your system, see the VMS installation and operations guide for your VAX computer system. For example, if you are installing VMS DECwindows software from a tape cartridge, enter the following command line to start the VMSINSTAL command procedure:

```
$ @SYS$UPDATE:VMSINSTAL DECW051 MKA500:
```

- 4 The VMSINSTAL procedure identifies itself. Answer YES to the following prompt if you are satisfied with the backup of your system disk:

```
VAX/VMS Software Product Installation Procedure V5.1
```

```
It is dd-mmm-yyyy at hh:mm
```

```
Enter a question mark (?) at any time for help.
```

```
* Are you satisfied with the backup of your system disk [YES]?
```

Press RETURN if your backups are current. Otherwise, you should enter NO to exit from VMSINSTAL, back up the system disk (see your VMS installation and operations guide), and begin the DECwindows installation procedure again (see Section C.2).

- 5 If you pressed RETURN to continue, VMSINSTAL instructs you to mount the first volume of the set. Put the distribution media in the drive, enter YES, and press RETURN. For example:

```
Please mount the first volume of the set on MKA500:.
```

```
* Are you ready? Y
```

```
%MOUNT-I-MOUNTED, VMS051 mounted on _MKA500:
```

- 6 When the installation begins, VMSINSTAL displays informational text similar to the following:

```
The following products will be processed:
```

```
DECW V5.1
```

```
Beginning installation of DECW V5.1 at hh:mm
```

```
%VMSINSTAL-I-RESTORE, Restoring product saveset A...
```

```
*** Installing VMS DECwindows software ***
```

Installing VMS DECwindows Software

C.2 Installing the DECwindows Software

You can install the DECwindows kit completely or in selected portions. A complete installation requires 55,000 blocks. If you choose to perform a partial installation, you can tailor the device support that you want provided for DECwindows workstations and the programming support that you want provided for DECwindows application development. Whether you perform a complete or partial installation, this kit provides support for running DECwindows applications on VMS compute servers.

7 The DECwindows software can be installed in whole or in parts. The parts of the kit that you can choose to install are as follows:

- DECwindows base (always installed)
- DECwindows workstation device support
- DECwindows programming environment

To install the whole kit, answer YES to the following prompt:

* Do you want to install the entire kit [Y]?

If you are not installing this kit on a workstation, or on a VAXcluster that includes workstations, you can save up to 8,000 blocks by omitting the device support required to make workstation graphics hardware available to DECwindows.

If you do not want to install the entire kit, enter NO and press RETURN.

8 To install device support, answer YES to the following prompt:

* Do you want to install DECwindows device support [Y]?

This installation procedure provides video fonts for specific monitor resolutions. Fonts are supplied for the following monitor resolutions:

75 dots per inch
100 dots per inch

All DECwindows applications run with 75 dots per inch (dpi) fonts. Some applications take advantage of 100 dpi fonts. If you select 100 dpi fonts, 75 dpi fonts are automatically provided. Both font resolutions are provided to allow your system to run those DECwindows applications that require 100 dpi fonts and those that require 75 dpi fonts.

For instructions on how to configure your system with both 75 and 100 dpi fonts, see the installation guide or examine the template command procedure `SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.TEMPLATE`. By default, systems start up using 75 dpi fonts.

Note that this procedure deletes previously installed fonts before installing new ones. If you choose to reinstall this kit at a later date, be sure to install all required fonts.

If you answer NO, the next message is skipped and you continue to the programming environment messages in step 10.

9 If you installed device support, you must specify the type of video fonts you want installed (75 dpi or 100 dpi). You are prompted by the following message:

* Do you want both sets of video fonts installed [Y]?

Installing VMS DECwindows Software

C.2 Installing the DECwindows Software

Answer YES if you want both the 75 and 100 dpi fonts installed. If you answer NO, you will be prompted for which of the fonts you want installed. Note that, if you select 100 dpi fonts, 75 dpi fonts are automatically installed.

- 10** To install the DECwindows programming environment, answer YES to the following prompt:

This installation procedure provides support files for developing DECwindows applications in several programming languages. These files are needed only to develop applications and are not required to run DECwindows applications. Support for each programming language requires approximately 3,000 blocks.

* Do you want to install DECwindows programming support [Y]?

Support files are supplied for the following VAX programming languages:

Ada, BASIC, BLISS, C, FORTRAN, MACRO, Pascal, PL/1

In addition, support files are supplied for programming in the C language using conventions and standards developed at the Massachusetts Institute of Technology.

Note that this procedure deletes previously installed programming language support files before installing any new ones. If you choose to reinstall this kit at a later date, be sure to install all required programming language support files.

If you answer NO, you skip the next step and continue to step 12.

- 11** You are asked if you want to install all of the programming support files.

* Do you want to install all programming language support files [Y]?

Answer YES if you want all the languages installed.

If you only want particular languages installed, answer NO. The languages are displayed. Answer YES to each language you want installed.

- 12** The parts of the kit that you have chosen are displayed and you must verify that these are correct. A message similar to the following is displayed:

You have selected the following portions of the kit:

.

* Are these selections correct [Y]?

No further questions will be asked.

If you want to change your answers, enter NO and you will be prompted by the previous questions again starting at step 6.

Installing VMS DECwindows Software

C.2 Installing the DECwindows Software

- 13** If you do not have sufficient disk space to install the kits you have chosen, the installation fails and an error message similar to the following is displayed:

```
%DECW-E-NOBLOCKS, ##### free blocks are required for peak
                    installation use
-DECW-E-NOBLOCKS, ##### free blocks are required for net
                    installation use.
%VMSINSTAL-E-INSFAIL, The installation of DECW V5.1 has failed.
```

The installation procedure checks to see if there are enough free blocks. If the blocks are available, the installation continues and no further questions are asked. If the blocks are not available, you receive a message indicating that the installation has failed. See Section C.1.1 for information on creating more disk space.

After you delete files, check your disk space and start the DECwindows installation again (see Section C.2).

- 14** VMSINSTAL lists the directories that are created and the save sets that are restored. These messages are similar to the following:

```
%VMSINSTAL-I-SYSDIR, This product creates system disk directory
                    VMM$ROOT:[SYS$KEYMAP].
%VMSINSTAL-I_RESTORE, Restoring product saveset B...
```

- 15** VMSINSTAL moves files to their target directories. The following text is displayed:

```
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target
                    directories...
```

- 16** The installation runs AUTOGEN, depending on the type of system you are using. The types of systems are as follows:

- Workstation running VWS software—If you are installing DECwindows on a workstation that is currently running the VWS software, the following message is displayed:

```
Your workstation is already running VWS.
To run DECwindows, you must switch the
SYSGEN parameter WINDOW_SYSTEM to 1 and then reboot
```

The installation completes normally, but you must reboot as described in Section C.3.2 before you can run DECwindows.

- A non-workstation system—If you are installing DECwindows on a non-workstation system, that is, you are installing on a VMS host system, the following message is displayed:

```
This system is not a workstation.
It will not be necessary to run AUTOGEN.
```

- Workstation running DECwindows with correct SYSGEN parameters—If you are installing DECwindows on a workstation system and your SYSGEN parameters are correct, the following message is displayed:

```
Your SYSGEN parameters are correctly set.
It will not be necessary to run AUTOGEN.
```

Installing VMS DECwindows Software

C.2 Installing the DECwindows Software

- Workstation running DECwindows with incorrect SYSGEN parameters—If you are installing DECwindows on a workstation system and your SYSGEN parameters need to be reset, the following message is displayed:

The VMS AUTOGEN procedure will now be automatically run so that your system parameters will be set, and your system will be properly configured. After that, your system will be automatically shut down.

When the shut down is complete, press the RESTART button to reboot the system.

After the system has been rebooted and initialized, successful installation of the workstation software will be indicated by the appearance of the Start Session window.

- 17** When the installation is completed, the following text is displayed:

```
Installation of DECW V5.1 completed at hh:mm
```

```
VMSINSTAL procedure done at hh:mm
```

Your system is automatically shut down if AUTOGEN was run.

- 18** Start up DECwindows as described in Section C.3.

C.3 Starting Up DECwindows

The following sections show you how to start up DECwindows by using the startup command procedure and booting the system.

C.3.1 The Startup Command Procedure

To install the DECwindows startup command procedure, perform the following steps:

- 1** Use an editor to add the following line to the SYS\$SYSROOT:[SYSMGR]SYSTARTUP_V5.COM file:

```
$ @SYS$MANAGER:DECW$STARTUP
```

The SYSTARTUP_V5.COM file can have entries for both DECwindows and VWS. The DECwindows or VWS parameter file determines which software to load. The DECW\$STARTUP.COM file should run on all systems (workstation and non-workstation) where any or all DECwindows components are installed.

- 2** Shut down the system and proceed to Section C.3.2. Do not automatically restart the system because you need to set the WINDOW_SYSTEM parameter before you boot DECwindows.

Installing VMS DECwindows Software

C.3 Starting Up DECwindows

3.3.2 Booting DECwindows

Note: You must reboot all workstations running DECwindows.

You must specifically set the WINDOW_SYSTEM SYSGEN parameter to 1 the first time that you start DECwindows on a workstation.

Perform the following steps to boot DECwindows:

- 1 Press the HALT or RESTART button to reboot the system.
- 2 Enter the following commands at your workstation's console prompt (> > >) to set the WINDOW_SYSTEM parameter:

```
>>> B/1
SYSBOOT>SET WINDOW_SYSTEM 1
SYSBOOT>CONTINUE
```

Note: If you are booting as a member of a local area VAXcluster (LAVc), the SYSGEN parameter NISCS_CONV_BOOT must be set to 1 to allow a conversational boot.

The @SYS\$MANAGER:DECW\$STARTUP entry that you previously added to the SYS\$SYSROOT:[SYSMGR]SYSTARTUP_V5.COM file runs DECwindows automatically.

If you are running DECwindows on a workstation and your system's SYSGEN parameters are not correct, you will see warnings similar to the following:

```
%DECW-W-BADVALUE, SYSGEN parameter XXX is set to M, should be N
```

It is strongly recommended that you either contact your system manager or run AUTOGEN via the command

```
$ @SYS$UPDATE:AUTOGEN getdata reboot nofeedback
```

Note this command will cause your system to reboot.

Would you like the system to invoke AUTOGEN for you [Yes]?

Press RETURN to run AUTOGEN. AUTOGEN automatically sets your SYSGEN parameters to properly configure your system. Your system is then automatically shut down. When the shutdown is complete, press the RESTART button to reboot the system.

Note: If you do not respond to the AUTOGEN prompt within approximately four minutes, the DECwindows startup will not proceed. In this case, the system startup will continue, but DECwindows will not be started. It is necessary to run AUTOGEN interactively after startup completes.

If you enter NO to the AUTOGEN prompt, the DECwindows startup proceeds without running AUTOGEN. In this case, the DECwindows system may not operate correctly because the SYSGEN parameters are wrong.

After the system is rebooted and the startup is complete, the Start Session window should appear.

The DECwindows software is now installed and is running on your system.

Installing VMS DECwindows Software

C.3 Starting Up DECwindows

C.3.3 Choosing Between DECwindows and VWS

You must choose to run either DECwindows or VWS (UIS) when you boot your system. You cannot run both simultaneously, and you must reboot to switch between DECwindows and VWS.

As described in Section C.1, if you expect to alternate between DECwindows and VWS, you should use a separate system parameter file for each. Then, when you boot the system, you can choose whether you want to run DECwindows or VWS.

To save the DECwindows system parameters, enter the following commands:

```
$ MC SYSGEN
SYSGEN>USE CURRENT
SYSGEN>WRITE SYS$SYSTEM:DECW.PAR
SYSGEN>EXIT
```

You can boot DECwindows by entering the following commands at the console prompt:

```
>>> B/1
SYSBOOT> USE DECW.PAR
SYSBOOT> CONTINUE
```

Or, you can boot VWS by entering the following commands at the console prompt:

```
>>> B/1
SYSBOOT> USE VWS.PAR
SYSBOOT> CONTINUE
```

C.3.4 Console Support

The DECwindows software allows you to boot all configurations from the main console. You can then toggle between displaying the operator window or not displaying the operator window by pressing CTRL/F2. The main console is always a workstation screen.

For an alternative console, you can use a terminal hooked up to the workstation by means of a terminal port.

If you boot from the main console, the alternative console is connected when you invoke the DECwindows startup command procedure.

C.4 DECwindows Logical Names

After you have run @SYS\$MANAGER:DECW\$STARTUP (see Section C.3.1), a systemwide logical name table is created and is added to the default logical name table search lists. Table C-1 lists the logical names contained in this table.

Installing VMS DECwindows Software

C.4 DECwindows Logical Names

Table C-1 DECW\$LOGICAL_NAMES

Logical Name	Definition
CDA\$LIBRARY	DDIF document style guide.
DECW\$BOOK	Online documentation.
DECW\$EXAMPLES	DECwindows example files directory.
DECW\$INCLUDE	DECwindows MIT-compatible C language include files.
DECW\$KEYMAP	DECwindows keyboard map definitions directory used by the Session Manager.
DECW\$SERVER_TRANSPORTS	A list of transport types that the DECwindows server will load when it starts up.
DECW\$STARTVUECOM	Startup file for FileView.
DECW\$SYSTEM_DEFAULTS	The systemwide directory where DECwindows applications will look for resource files.
DECW\$USER_DEFAULTS	The user directory where DECwindows applications will look for resource files.
DECW\$WINMGREXE	Window manager executable file used by the Session Manager.
DECW\$XLIBERRDB	Pointer to the Xlib error resource database
VUE\$LIBRARY	Directory containing FileView command files and the FileView default system profile

After you start the server, a per-server logical name table is created on your system but is not added to the default logical name table search lists. Table C-2 lists the logical names.

Installing VMS DECwindows Software

C.4 DECwindows Logical Names

Table C-2 DECW\$SERVER(n)_TABLE

Logical Name	Definition
DECW\$COLOR	Determines whether the server will consider a VAXstation/GPX to be color or intensity.
DECW\$DEFAULT_FONT	Determines the font which is initially loaded in a graphics context.
DECW\$DEFAULT_KEYBOARD_MAP	Determines which keyboard map file the server uses.
DECW\$FONT	Directory where the server will look for fonts.
DECW\$KEYBOARD	Device name for system keyboard.
DECW\$KEYMAP	DECwindows keyboard map definitions directory used by the server.
DECW\$MONITOR_DENSITY	Determines what monitor density the server will use to calculate the monitor size.
DECW\$POINTER	Device name for system pointer.
DECW\$RGB_*	Definitions of color names used by the XStoreNamedColor and XAllocNamedColor requests.
DECW\$SERVER_DISABLE_CH	If defined to be true, server exception will cause the server to crash and produce a dump file, rather than attempt to continue.
DECW\$SERVER_SCREEN	Device name used by the server. The first two characters indicate the shareable image to be loaded for device support (for example, GCA0:).
DECW\$XSIZE_IN_PIXELS	Specifies the size of the workstation screen.
DECW\$YSIZE_IN_PIXELS	Specifies the size of the workstation screen.

Note: These logical names may change in a future release.

C.4.1 Defining Print Formats

The print dialog box is used in many applications for the queuing of files or screens to a printer. (See the *VMS DECwindows User's Guide* for more information about the print dialog box.) By default, all printing devices on the system are displayed in the "Printers" listbox. However, you can take advantage of a feature where print queues can be associated with print formats through the definition of logical names. The logical name is defined to be a comma-separated or space-separated list of print queues with the first queue being the default choice.

For example, if DECW\$PRINTER_FORMAT_ANSI2 is defined to be "MY_PRINTER, CLUSTER_LN03, ANOTHER_LN03", when you select "ANSI2" from the print format listbox, only MY_PRINTER, CLUSTER_LN03, and ANOTHER_LN03 will be shown in the printer listbox, with MY_PRINTER being the default choice.

Installing VMS DECwindows Software

C.4 DECwindows Logical Names

Table C-3 lists the logical names and the print formats associated with each:

Table C-3 Print Dialog Box Logical Names

Logical name	Print format
DECW\$PRINTER_FORMAT_TEXT	Text
DECW\$PRINTER_FORMAT_LINE	Line Printer
DECW\$PRINTER_FORMAT_TERM	Terminal
DECW\$PRINTER_FORMAT_ANSI2	ANSI2
DECW\$PRINTER_FORMAT_ANSI	ANSI
DECW\$PRINTER_FORMAT_REGIS	ReGIS
DECW\$PRINTER_FORMAT_TEK	Tektronix
DECW\$PRINTER_FORMAT_DDFD	DDFF
DECW\$PRINTER_FORMAT_DDIF	DDIF

The logical names can be defined by system managers in the appropriate logical name tables and be overridden by users.

If you have any of the logical names in Table C-3 defined in your environment, they will serve as the list of printer queue names to be presented when the corresponding print format is selected. This method is much faster than making the print dialog box derive the names of all the queues on the system, most of which are inappropriate for the print format under consideration, as the following example shows:

```
$ define DECW$PRINTER_FORMAT_TEXT "CLUSTER_LN03,CLUSTER_PRINT, -  
_ $ ANSI_ARTWRK,ANSI_PROTON"  
$ define DECW$PRINTER_FORMAT_LINE "CLUSTER_PRINT"  
$ define DECW$PRINTER_FORMAT_ANSI2 "CLUSTER_LN03,ANSI_ARTWRK,ANSI_PROTON"  
$ define DECW$PRINTER_FORMAT_ANSI "CLUSTER_LN03,ANSI_ARTWRK,ANSI_PROTON"  
$ define DECW$PRINTER_FORMAT_PS "PS_ARTWRK,PS_PROTON"  
$ define DECW$PRINTER_FORMAT_REGIS "SYS$NULL"
```

C.4.2 Server Startup Command Procedures

The startup command procedures automatically determine most of the configuration variables for the DECwindows server. However, there are two items which the command procedures cannot determine:

- If you have a VAXstation 2000/GPX, a VAXstation 3xxx/GPX, or a VAXstation II/GPX, the startup procedures assume that you have a color monitor.
- The startup procedures assume that you have a North American keyboard layout (you have an LK201-AA or -LA keyboard).

If either of these assumptions is incorrect, you must override them as follows:

- 1 Make a copy of the file SYS\$MANAGER:DECW\$PRIVATE_SERVER_SETUP.TEMPLATE and rename it *.COM. This file shows how to customize individual workstations by adding a section of DCL commands for each workstation. The section for monochrome /GPX workstations should contain the following line:

```
$ DECW$COLOR == "FALSE"
```

Installing VMS DECwindows Software

C.4 DECwindows Logical Names

The section for workstations with keyboards that are not North American should contain the following line:

```
$ DECW$DEFAULT_KEYMAP == "xxxxxx"
```

- 2 In the previous line, you must replace "xxxxxx" with the correct DECwindows keymap name. You can determine the correct name from the model number of your LK201 keyboard. Turn the keyboard upside down, and look for a label which specifies the model number. The model number should be in a format similar to LK201-xx. The model number may also be listed as simply LK201. In this case, the "xx" that you need is in another part of the label where there will be a number that looks similar to the following:

```
nn-nnnnn-xx.
```

- 3 Use this number to choose a keymap name from the following table. The table is arranged based on the dialect that each keyboard is designed for. Choose the keymap ending in _DP for the data processing keyboard layout, or the keymap ending in _TW for the typewriter layout.

Table C-4 DECwindows Keymap

Dialect	Model	DECwindows Keymap
Austrian/German	LK201-(AG,LG,BG,MG)	AUSTRIAN_GERMAN_LK201LG_DP AUSTRIAN_GERMAN_LK201LG_TW
	LK201-(NG,PG)	AUSTRIAN_GERMAN_LK201NG_DP AUSTRIAN_GERMAN_LK201NG_TW
Belgian/French	LK201-(AP,LP,BP,MP)	BELGIAN_FRENCH_LK201LP_DP BELGIAN_FRENCH_LK201LP_TW
British	LK201-(AE,LE,BE,ME)	BRITISH_LK201LE_DP BRITISH_LK201LE_TW
Canadian/French	LK201-(AC,LC,BC,MC)	CANADIAN_FRENCH_LK201LC_DP CANADIAN_FRENCH_LK201LC_TW
Danish	LK201-(AD,LD,BD,MD)	DANISH_LK201LD_DP DANISH_LK201LD_TW
	LK201-(ED,RD,FD)	DANISH_LK201RD_DP DANISH_LK201RD_TW
Dutch	LK201-(AH,LH,BH,MH)	DUTCH_LK201LH_DP DUTCH_LK201LH_TW
	LK201-(NH,PH)	DUTCH_LK201NH
Finnish	LK201-(AF,LF,BF,MF)	FINNISH_LK201LF_DP FINNISH_LK201LF_TW
	LK201-(NF,PF)	FINNISH_LK201NF_DP FINNISH_LK201NF_TW
	LK201-(NX,PX)	FINNISH_LK201NX_DP FINNISH_LK201NX_TW

Installing VMS DECwindows Software

C.4 DECwindows Logical Names

Table C-4 (Cont.) DECwindows Keymap

Dialect	Model	DECwindows Keymap
Flemish	LK201-(AB,LB,BB,MB)	FLEMISH_LK201LB_DP
		FLEMISH_LK201LB_TW
Icelandic	LK201-(AU,LU,BU,MU)	ICELANDIC_LK201LU_DP
		ICELANDIC_LK201LU_TW
Italian	LK201-(AI,LI,BI,MI)	ITALIAN_LK201LI_DP
		ITALIAN_LK201LI_TW
North American	LK201-(AA,LA,BA,MA)	NORTH_AMERICAN_LK201LA
Norwegian	LK201-(AN,LN,BN,MN)	NORWEGIAN_LK201LN_DP
		NORWEGIAN_LK201LN_TW
		NORWEGIAN_LK201RN_DP
	LK201-(EN,RN,FN)	NORWEGIAN_LK201RN_TW
Portuguese	LK201-(AV,LV,BV,MV)	PORTUGUESE_LK201LV
Spanish	LK201-(AS,LS,BS,MS)	SPANISH_LK201LS_DP
		SPANISH_LK201LS_TW
Swedish	LK201-(AM,LM,BM,MM)	SWEDISH_LK201LM_DP
		SWEDISH_LK201LM_TW
		SWEDISH_LK201NM_DP
	LK201-(NM,PM)	SWEDISH_LK201NM_TW
Swiss/French	LK201-(AK,LK,BK,MK)	SWISS_FRENCH_LK201LK_DP
		SWISS_FRENCH_LK201LK_TW
Swiss/German	LK201-(AL,LL,BL,ML)	SWISS_GERMAN_LK201LL_DP
		SWISS_GERMAN_LK201LL_TW
Combined US/UK	LK201-(EE,RE,PE)	UK_LK201RE
		US_LK201RE

Glossary

- boot or bootstrap:** The process of loading system software into a processor's main memory. This guide uses the term *boot* to refer to this process.
- boot server:** A computer that is part of a local area VAXcluster. The boot server in a local area VAXcluster has a system disk that contains files common to the cluster; other nodes in the cluster (satellite nodes) can access these files. See also *satellite node*.
- CI-only VAXcluster:** A computer system consisting of a number of VAX computers. It uses only the computer interconnect (CI) to communicate with other VAX computers in the cluster. A VAXstation 3100 cannot be part of a CI-only VAXcluster.
- console mode:** In console mode, you control the system by entering console-mode commands. In console mode, the VMS operating system is not running.
- device name:** The name you use to identify a device on the system. A device name indicates the device code, controller designation, and unit number.
- local area VAXcluster:** Consists of a VAX computer that acts as a boot server and a number of low-end VAX computers that act as satellite nodes. Ethernet connects all of the computers. These computers share a single file system. See also *boot server* and *satellite node*.
- local drive:** Any drive that is connected directly to a computer is referred to as a local drive.
- media:** A generic term that refers to any packaging agent capable of storing computer software. Examples of media are magnetic tapes, diskettes, disk packs, compact discs (CDROM), tape cartridges, etc.
- mixed-interconnect VAXcluster:** A computer system consisting of a number of VAX computers. It uses both the computer interconnect (CI) and the Ethernet to communicate with other VAX computers in the cluster.
- program mode:** In program mode, the CPU is running and the system is controlled by the VMS operating system. In program mode, you can enter DCL commands, run programs, and receive system messages. See also *console mode*.
- satellite node:** A computer that is part of a local area VAXcluster. A satellite node is booted remotely from the system disk of the boot server in the local area VAXcluster. See also *boot server*.
- save set:** The format that the BACKUP utility stores files in. The VMS operating system is shipped in this format.
- scratch media:** Media that are blank or have files that you no longer need. For example, a scratch tape cartridge.
- standalone BACKUP:** A version of the BACKUP utility that is booted into memory. It runs without the control of the VMS operating system.

Glossary

standalone system: A computer system with only one VAX computer.

system disk: The disk that contains (or will contain) the VMS operating system. A VMS system disk is set up so that most of the VMS files can be shared by several computers. In addition, each computer has its own directory on the system disk that contains its page, swap, and dump files.

VAXcluster environment: A computer system consisting of a number of highly integrated VAX computers. There are three types of VAXcluster environments: CI-only, local area, and mixed-interconnect.

VAXserver: A VAX computer that functions primarily as the boot server in a local area VAXcluster. It also can serve as the batch computer for the cluster. A VAXserver is licensed for only two users.

VMS User Environment Test Package (UETP): A software package that tests all the standard peripheral devices on your system, various commands and operating system functions, the system's multi-user capability, DECnet-VAX, and the VAXcluster environment.

VMSTAILOR: A software program that lets you remove files from or add files to your system disk.

Index

A

Adding files to a system disk • 6–2
ALLOCLASS parameter • 3–3
Alternate console terminal • 2–3
 disconnecting • 2–5
ANALYZE/CRASH command • 8–8
AUTOGEN
 function during installation • 4–9, 5–9

B

BACKUP
 See Backup Utility
BACKUP command • 9–5
 /IMAGE qualifier • 9–5
 /PHYSICAL qualifier • 9–5
Backup Utility (BACKUP) • 9–1
Bugcheck • 8–8
Bugcheck message
 during UETP • 7–25

C

Cartridge-release handle
 on the tape cartridge drive • 2–10
Cartridge-release lever
 on the tape cartridge drive • 2–7
Cluster group number • 3–3
Cluster password • 3–3
CLUSTER_SIZE attribute • 9–7
Compact disc distribution kit • 5–1
Console mode • 2–2
Console report during UETP • 7–26
 choosing format of • 7–10
 error messages • 7–10, 7–12
Console terminal
 See also alternate console terminal
 See Workstation display monitor
CONTINUE command • 8–5
Controller designation
 definition • 3–1

CRASH commands • 8–8
CTRL/T • 8–9
CTRLNAME • 7–27

D

DECnet node address • 3–3
DECnet node name • 3–3
DECnet-VAX
 error message during UETP • 7–23
 preparing for UETP • 7–8
 registering the license • 6–1
 UETP test of • 7–30
 UETP test phase • 7–30
DECwindows
 See VMS DECwindows
Device code
 definition • 3–1
Device name
 controller designation • 3–1
 device code • 3–1
 device number • 3–1
 logical unit number • 3–1
 of the tape cartridge drive • 2–11
 syntax • 3–1
Device number
 definition • 3–1
Device test
 running individually • 7–27
Diagnostics
 relationship to UETP • 7–12
Disk
 See System disk, User disk
Distribution kit
 compact disc • 5–1
 tape cartridge • 4–1
Distribution media • 3–1

E

Error during UETP
 diagnosing • 7–12
 sources of • 7–13

Index

Error Log Utility

relationship to UETP • 7-2, 7-12, 7-24

Ethernet

defining a remote node for UETP • 7-14
preparing for UETP • 7-6

F

Fixed disk

RD33 • 2-6
storage capacity of • 2-6

H

Halt button

location • 2-2

Hang

See System hang

Hardware problem

diagnosing • 8-6

I

/IMAGE qualifier • 9-5

Installation procedure

definition • 1-1
stages of • 4-1, 5-1

L

License registration

for system integrated products • 6-1
for VMS • 6-1

Line printer

preparing for UETP • 7-2, 7-3, 7-5
UETP output • 7-28
UETP test image • 7-29
UETP test of • 7-26

LOADS • 7-29

Load test

defining user load for UETP • 7-10
description • 7-10, 7-29
error during UETP • 7-22
running individually • 7-9

Load/Unload Button

on the tape cartridge drive • 2-10

Log file generated by UETP

See also UETP.LOG
during the load test • 7-22
NETSERVER.LOG • 7-21
OLDUETP.LOG • 7-15

Logical name used by UETP

CTRLNAME • 7-27
LOADS • 7-29
MODE • 7-13
SYS\$INPUT • 7-26
SYS\$OUTPUT • 7-28
SYS\$TEST • 7-3, 7-7, 7-15
UETP\$NODE_ADDRESS • 7-8

Logical unit numberr

definition • 3-1

Long report format

See Console report during UETP

M

Magnetic tape

preparing for UETP • 7-2
test of • 7-26, 7-28
UETP test image • 7-29

Mandatory update • 1-2

Master command procedure

See UETP.COM

MODE • 7-13, 7-33

Monitor

See Workstation display monitor

N

No PCB or swap slots error message • 7-24

O

On/Off switch

location • 2-1

OPCCRASH.EXE • 8-7

Output during UETP

See also UETP.LOG
console report • 7-10, 7-26

Output during UETP (cont'd.)
 interpreting • 7-13
 terminal and line printer • 7-28

P

Phase controller for UETP
 See UETPHAS00.EXE
 /PHYSICAL qualifier • 9-5
 Privilege
 required for UETP • 7-18
 Program mode • 2-2

Q

Quota
 required for UETP • 7-18

R

RD33 fixed disk
 See fixed disk
 Removing files from a system disk • 6-2
 RMS Journaling
 registering the license • 6-1

S

Saveset.BCK • 9-6
 SDA
 See System Dump Analyzer
 Short report format
 See Console report during UETP
 SHOW CRASH command • 8-8
 SHUTDOWN.COM • 8-7
 Source-drive • 5-4, 9-6
 STABACKIT.COM • 9-1, 9-3
 Standalone BACKUP
 definition • 9-1
 function during installation • 4-3, 5-3
 relation to Backup Utility • 9-1
 SYS\$INPUT • 7-26
 SYS\$OUTPUT • 7-28
 SYS\$TEST • 7-3, 7-7, 7-15

SYSBOOT.EXE • 8-1, 8-4
 commands • 8-5

SYSGEN

See System Generation Utility

System

logging into for UETP • 7-1, 7-3
 resource requirements for UETP • 7-1, 7-3

System disk

checking amount of free space on • 6-3
 definition • 3-1
 free space required for DECwindows • C-2
 guidelines for choosing • 3-2
 reasons for backing up • 9-5
 space requirements for UETP • 7-4
 test error during UETP • 7-19, 7-20
 UETP test image • 7-29
 UETP test of • 7-28
 using VMSTAILOR to customize • 6-2

System Dump Analyzer (SDA) • 8-8

System Generation Utility (SYSGEN)

ALLOCLASS parameter • 3-3
 commands for conversational boot • 8-5

System hang • 7-16, 7-25, 8-8

SYSTEST account

logging into for UETP • 7-1, 7-3
 privileges required for UETP • 7-18
 quotas required for UETP • 7-18

SYSTEST directory

creating for UETP • 7-5
 function during UETP • 7-3

SYSTEST_CLIG account

reenabling for UETP • 7-6
 requirements for UETP • 7-6, 7-32

T

Tailored system disk

See VMSTAILOR

Tape cartridge

description of • 2-11
 dismounting • 2-18
 initializing • 2-17
 inserting • 2-13, 2-14
 label slot • 2-12
 mounting • 2-17
 removing • 2-18
 write-protecting • 2-12
 write-protect switch • 2-12

Tape cartridge distribution kit • 4-1

Index

Tape cartridge drive
description of • 2-7, 2-9
indicator light • 2-9
indicator lights • 2-7
Load/Unload button • 2-10
preparing for UETP • 7-5
summary of controls • 2-7, 2-10
summary of indicator lights • 2-8, 2-10
Unload button • 2-7

Target-drive • 4-4, 5-4, 9-6

Terminal
preparing for UETP • 7-2, 7-3, 7-5, 7-9
simulating users for UETP • 7-29
test of • 7-26
UETP output • 7-28
UETP test image • 7-29
UETP test of • 7-28

TK50 tape cartridge drive
See tape cartridge drive

TZ30 tape cartridge drive
See tape cartridge drive

U

UETCONT00.DAT • 7-26

UETDISK00
error message • 7-20

UETDNET00.DAT • 7-30

UETINIDEV.DAT • 7-26, 7-27
format • 7-27

UETININET.DAT • 7-30, 7-31

UETINIT00.EXE • 7-14, 7-26

UETINIT01
error message • 7-19

UETINIT01.EXE • 7-16, 7-26
failure • 7-19

UETLOAD00.DAT • 7-29

UETNETS00.EXE • 7-31

UETP
See User Environment Test Package

UETP\$NODE_ADDRESS • 7-8

UETP.COM • 7-25
termination of • 7-11

UETP.LOG • 7-10, 7-15, 7-24, 7-29

UETPHAS00.EXE • 7-25, 7-26, 7-30

UETUNAS00.EXE • 7-14

UIC
See User Identification Code

Unload button
on the tape cartridge drive • 2-7

Update procedure
See also Mandatory update
definition • 1-2

Upgrade procedure
definition • 1-1
restrictions • 1-2

User disk
preparing for UETP • 7-1, 7-4, 7-5
space requirements for UETP • 7-4
test error during UETP • 7-19
UETP test image • 7-29
UETP test of • 7-28

User Environment Test Package (UETP)
aborting execution of • 7-11
description of • 7-1
displaying tests as they run • 7-13
initialization phase • 7-26
interpreting output of • 7-13
master command procedure • 7-25
normal completion of • 7-10
organization of • 7-25
required privileges • 7-18
required quotas • 7-18
running all phases of • 7-2
running individual phase of • 7-9
running multiple passes of • 7-9, 7-15
starting • 7-8
typical failures reported by • 7-16
when to run • 6-3

User Identification Code (UIC)
for UETP • 7-5

User load
defined for UETP DECnet test • 7-31
defining for the UETP load test • 7-10
equation used to determine for UETP load test • 7-14

V

VAXcluster environment
how to prepare • 6-2
preparing for UETP • 7-7
registering the VMS license • 6-1
test failure during UETP • 7-21

VAXVMSSYS.PAR • 8-1

VMB.EXE • 8-1

VMS license • 6-1

Volume-label

- definition • 4-3, 5-3
- used with BACKUP command • 9-6

Volume Shadowing

- registering the license • 6-1

W

Workstation display monitor

- console mode • 2-2
- description of • 2-2
- program mode • 2-2

Wrong account error message • 7-18

Wrong privileges error message • 7-17

Wrong quotas error message • 7-17

How to Order Additional Documentation

Technical Support

If you need help deciding which documentation best meets your needs, call 800-343-4040 before placing your electronic, telephone, or direct mail order.

Electronic Orders

To place an order at the Electronic Store, dial 800-DEC-DEMO (800-332-3366) using a 1200- or 2400-baud modem. If you need assistance using the Electronic Store, call 800-DIGITAL (800-344-4825).

Telephone and Direct Mail Orders

Your Location	Call	Contact
Continental USA, Alaska, or Hawaii	800-DIGITAL	Digital Equipment Corporation P.O. Box CS2008 Nashua, New Hampshire 03061
Puerto Rico	809-754-7575	Local DIGITAL subsidiary
Canada	800-267-6215	Digital Equipment of Canada Attn: DECdirect Operations KAO2/2 P.O. Box 13000 100 Herzberg Road Kanata, Ontario, Canada K2K 2A6
International	-----	Local DIGITAL subsidiary or approved distributor
Internal ¹	-----	SDC Order Processing - WMO/E15 <i>or</i> Software Distribution Center Digital Equipment Corporation Westminster, Massachusetts 01473

¹For internal orders, you must submit an Internal Software Order Form (EN-01740-07).

Reader's Comments

VMS Installation and
Operations:
VAXstation 3100
AA-MK77A-TE

Please use this postage-paid form to comment on this manual. If you require a written reply to a software problem and are eligible to receive one under Software Performance Report (SPR) service, submit your comments on an SPR form.

Thank you for your assistance.

I rate this manual's:	Excellent	Good	Fair	Poor
Accuracy (software works as manual says)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Completeness (enough information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clarity (easy to understand)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organization (structure of subject matter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Figures (useful)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Examples (useful)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Index (ability to find topic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Page layout (easy to find information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I would like to see more/less _____

What I like best about this manual is _____

What I like least about this manual is _____

I found the following errors in this manual:

Page	Description
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Additional comments or suggestions to improve this manual:

I am using **Version** _____ of the software this manual describes.

Name/Title _____ Dept. _____

Company _____ Date _____

Mailing Address _____

_____ Phone _____

o Not Tear - Fold Here and Tape



No Postage
Necessary
if Mailed
in the
United States



BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 33 MAYNARD MASS.

POSTAGE WILL BE PAID BY ADDRESSEE

DIGITAL EQUIPMENT CORPORATION
Corporate User Publications—Spit Brook
ZK01-3/J35
110 SPIT BROOK ROAD
NASHUA, NH 03062-9987



o Not Tear - Fold Here

Cut Along Dotted Line

Reader's Comments

VMS Installation and
Operations:
VAXstation 3100
AA-MK77A-TE

Please use this postage-paid form to comment on this manual. If you require a written reply to a software problem and are eligible to receive one under Software Performance Report (SPR) service, submit your comments on an SPR form.

Thank you for your assistance.

I rate this manual's:	Excellent	Good	Fair	Poor
Accuracy (software works as manual says)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Completeness (enough information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clarity (easy to understand)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organization (structure of subject matter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Figures (useful)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Examples (useful)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Index (ability to find topic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Page layout (easy to find information)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I would like to see more/less _____

What I like best about this manual is _____

What I like least about this manual is _____

I found the following errors in this manual:

Page	Description
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Additional comments or suggestions to improve this manual:

I am using **Version** _____ of the software this manual describes.

Name/Title _____ Dept. _____

Company _____ Date _____

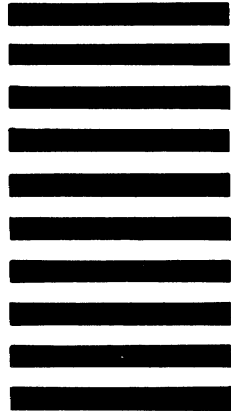
Mailing Address _____

Phone _____

o Not Tear - Fold Here and Tape



No Postage
Necessary
if Mailed
in the
United States



BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 33 MAYNARD MASS.

POSTAGE WILL BE PAID BY ADDRESSEE

DIGITAL EQUIPMENT CORPORATION
Corporate User Publications—Spit Brook
ZK01-3/J35
110 SPIT BROOK ROAD
NASHUA, NH 03062-9987



o Not Tear - Fold Here

Cut Along Dotted Line