

VMS Upgrade and Installation Supplement: VAX-11/750

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This document supplements the current version of *VMS Upgrade and Installation Manual* with information specific to the VAX-11/750 computer. This information includes startup, shutdown, and backup procedures.

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Preface

The *VMS Upgrade and Installation Supplement: VAX-11/750* contains installation and upgrade information specific to the VAX-11/750 computer. Use it in conjunction with the *VMS Upgrade and Installation Manual*.

IMPORTANT: When you are ready to upgrade, install, or update the VMS operating system, use the supplied documentation as follows:

- 1 Read all release-specific cover letters (if any) included with your distribution kit.
- 2 Read the most current version of the *VMS Release Notes*.
- 3 Consult the *VMS Upgrade and Installation Manual* for the VMS version that you are installing or upgrading to. It is your *primary* source of step-by-step upgrade and installation procedures.
- 4 Refer to this supplement for computer-specific information when the *VMS Upgrade and Installation Manual* directs you to do so.
- 5 Store this supplement and the *VMS Upgrade and Installation Manual* in the binder that contains the *VMS Release Notes*.

Intended Audience

The *VMS Upgrade and Installation Supplement: VAX-11/750* is intended for anyone responsible for installing or upgrading the VMS operating system on a VAX-11/750 computer.

Document Structure

This manual is organized as follows:

- Chapter 1 describes the console subsystem that you use during a VMS upgrade or installation.
- Chapter 2 describes some of the tasks you need to perform when you install the VMS operating system.
- Chapter 3 contains instructions for starting up the system. It also describes system shutdown procedures.
- Chapter 4 describes backup procedures you should perform on a regular basis.

The Glossary defines key terms used in this manual.

Associated Documents

You must have and be familiar with the contents of the following documents:

- The *VMS Upgrade and Installation Manual*, which is your primary source of upgrade and installation information. Use the *VMS Upgrade and Installation Manual* in conjunction with *VMS Upgrade and Installation Supplement: VAX-11/750* when you are performing an installation or upgrade.
- The *VMS Release Notes*, which provides important information on various aspects of the VMS operating system. You should read the *VMS Release Notes* before installing, upgrading, or updating the VMS operating system.
- The hardware manuals supplied with your VAX computer. These manuals contain detailed information about your system hardware.

Conventions

The following conventions are used in this manual:

Ctrl/x	A sequence such as Ctrl/x indicates that you must hold down the key labeled Ctrl while you press another key or a pointing device button.
.	A vertical ellipsis indicates the omission of items from a code example or command format; the items are omitted because they are not important to the topic being discussed.
red ink	Red ink indicates information that you must enter from the keyboard or a screen object that you must choose or click on. For online versions of the book, user input is shown in bold .
boldface text	Boldface text represents the introduction of a new term or the name of an argument, an attribute, or a reason. Boldface text is also used to show user input in online versions of the book.
<i>italic text</i>	Italic text represents information that can vary in system messages (for example, Internal error <i>number</i>).
UPPERCASE TEXT	Uppercase letters indicate that you must enter a command (for example, enter OPEN/READ), or they indicate the name of a routine, the name of a file, the name of a file protection code, or the abbreviation for a system privilege.
numbers	Unless otherwise noted, all numbers in the text are assumed to be decimal. Nondecimal radixes—binary, octal, or hexadecimal—are explicitly indicated.

1 Console Subsystem

Before you install the VMS operating system, you need to be familiar with the console subsystem. The console subsystem consists of the following:

- Console terminal
- Computer control panel
- Console tape cassette drive
- Console command language
- Remote diagnostic port

In general, use the console subsystem to examine and deposit data in memory or computer registers, stop the computer, and boot the operating system. During installation, use it to boot the computer and monitor the installation process.

This chapter describes the parts of the console subsystem that you use during a VMS installation or upgrade. For a complete description of the console subsystem, see the hardware manual supplied with your system.

1.1 Console Terminal

There are two types of console terminals:

- The local console terminal is a hardcopy terminal that prints a log of computer activities. Use it to control and monitor system operations.
- The remote console terminal is optional. If you purchase one, a Digital diagnostics center uses the remote console terminal (located at the diagnostics center) to control system operations during diagnostic testing.

1.2 Control Panel

The VAX-11/750 control panel is located on the front of the computer and consists of the following:

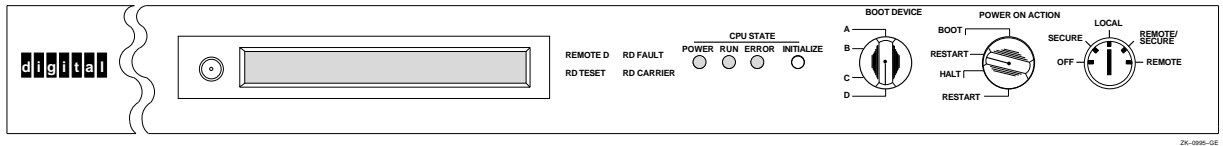
- Seven indicator lights
- Power On Action switch
- Boot Device switch
- Reset button
- Five-position keylock switch
- Tape cassette drive

Console Subsystem

1.2 Control Panel

Figure 1-1 shows the control panel.

Figure 1-1 VAX-11/750 Control Panel



1.2.1 Indicator Lights

There are seven indicator lights on the control panel. The first three indicate the state of the computer. Where applicable, the remaining four indicate the state of the remote diagnostic procedures.

Table 1-1 describes the first three indicator lights on the VAX-11/750 control panel.

Table 1-1 Status Lights on the VAX-11/750

Label	Function
Power	Glows green when power is supplied to the computer.
Run	Glows green when the computer is running.
Error	When dimly lit, the computer is running normally. When brightly lit, the computer has experienced an unrecoverable error. If an error occurs, push the white Reset button to reset the machine. (The Error light remains dimly lit.) If the light is not lit during normal operation, the bulb is probably defective.

If your system has a remote diagnostic read-only memory (ROM), there are four additional lights on the control panel. These lights indicate the state of the remote diagnostic procedures. They are only visible when lit. Table 1-2 describes the remote diagnostic lights on the VAX-11/750 control panel.

Table 1-2 VAX-11/750 Remote Diagnostic Lights

Label	Function
Remote D	Glows green when the keylock switch is in the Remote or the Remote Secure position.
RD Fault	Glows red for 10 seconds when a computer with a remote diagnostic ROM is turned on. This indicates that a self test is in progress. When this light glows red for more than 10 seconds, the remote diagnostic ROM has detected an error in the remote diagnostic module.

(continued on next page)

Table 1–2 (Cont.) VAX–11/750 Remote Diagnostic Lights

Label	Function
RD Test	Glows amber when remote diagnostic tests are in progress.
RD Carrier	Glows green when the remote diagnostic center has established a connection with the console subsystem.

1.2.2 Switches

The control panel has the following switches:

- Power On Action switch
- Boot Device switch
- Five-position keylock switch
- Reset button

1.2.2.1 Power On Action Switch

The Power On Action switch has the following settings:

Boot	Boots the system from the drive selected by the Boot Device switch. This is the setting for normal system operations.
Restart (Boot)	Attempts to restart the system. If the restart fails, boots the system from the drive selected by the Boot Device switch.
Halt	Stops the computer and displays the console-mode prompt (>>>) at the console terminal.
Restart (Halt)	Attempts to restart the system. If the restart fails, stops the computer and displays the console-mode prompt (>>>) at the console terminal.

The setting of the Power On Action switch determines what happens after any of the following events:

- The power is turned on
- A power failure occurs (and the contents of memory are not saved by the battery backup unit)
- A shutdown occurs (if you entered Y at the auto reboot prompt)
- The microprogram detects an error halt condition (for example, a HALT instruction executed in kernel mode)

Set the Power On Action switch to Boot during normal system operations.

1.2.2.2 Boot Device Switch

The setting of the Boot Device switch tells the computer which drive holds the system disk. The computer checks the position of the Boot Device switch and tries to boot from the indicated drive in the following situations:

- When you enter the BOOT command without specifying a device name
- When the system attempts to boot automatically

Console Subsystem

1.2 Control Panel

The Boot Device switch has four positions: A, B, C, and D. In position A the system boots from the console tape cassette drive. Positions B, C, and D indicate the controller designations for the disk controllers attached to your system. Consult your Digital Customer Service representative to determine how these positions correspond to the available disk controllers. The computer assumes that the selected drive has a unit number of zero on the disk controller designated by the Boot Device switch.

If your system disk is on a local disk drive, set the Boot Device switch to the position that corresponds to the controller designation of that drive. If your system disk is connected to an HSC device, set the Boot Device switch to position A.

1.2.2.3 Reset Button

Press the Reset button to shut down and restart the system.

Note: In some models this button is labeled INITIALIZE.

The way the system responds depends on the position of the Power On Action switch.

1.2.2.4 Keylock Switch

The five-position keylock switch controls system power and determines how the computer responds to commands from local and remote console terminals. Table 1–3 describes each keylock switch setting.

Table 1–3 Keylock Switch Settings

Setting	Meaning
Off	Power is supplied to the battery backup unit and to the time-of-year clock, but not to the computer.
Secure ¹	You cannot use the local console terminal in console mode to control the computer. You can use it in program mode as a user terminal. Pressing Ctrl/P has no effect. A Digital diagnostics center cannot use the remote console terminal when the switch is set to Secure.
Local	You can use the local console terminal in console mode to control the computer. A Digital diagnostics center cannot use the remote console terminal when the switch is set to LOCAL.
Remote/Secure ¹	You cannot use the local console terminal. A Digital diagnostics center can use the remote console terminal in both console and program mode, but cannot use it for fault isolation.
Remote	A Digital diagnostics center is in control of the remote console terminal. You cannot use the local console terminal. However, the Digital diagnostics center can enter commands to restore control to the local console terminal.

¹Pressing the Reset button has no effect because it executes a console mode command.

1.3 Tape Cassette Drive

The console subsystem has a *console tape cassette drive*. The console subsystem refers to the console tape cassette drive as DDA0. The VMS operating system refers to it as CSA1.

The **console TU58** is the tape cassette that contains the BOOT58 program that is used to *boot*, or load, the operating system into computer memory. It is also used to do the following tasks:

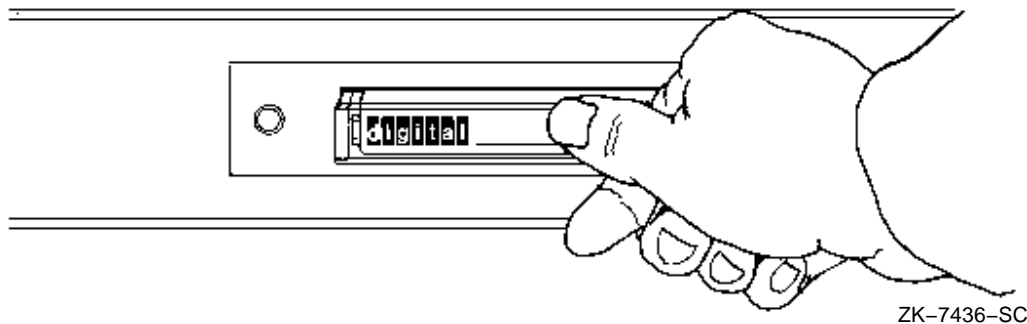
- Install updates
- Install optional software products
- Boot standalone BACKUP
- Store boot command procedures (for more information on boot command procedures, see Chapter 3)

1.3.1 Inserting and Removing a Tape Cassette

Insert a TU58 tape cassette into the console tape cassette drive as follows:

- 1 Find the slotted opening at the front of the drive.
- 2 If a tape cassette is already in the drive, remove it by gripping it with your fingertips and pulling it gently towards you.
- 3 Hold a tape cassette with the label facing up and the RECORD tab facing forward.
- 4 Insert the tape cassette into the drive and gently push it into the slot until it stops. When fully inserted, the tape cassette protrudes about one-half inch from the drive. Figure 1-2 shows how to insert a tape cassette.

Figure 1-2 Inserting a Tape Cassette



A red light to the left of the drive flashes when data is being read from or written to the tape cassette in the drive.

Console Subsystem

1.4 Console Command Language

1.4 Console Command Language

The console subsystem runs in two different modes:

- **Console mode**—When the console subsystem is in console mode, the VMS operating system is not running and the CPU is stopped. The console-mode prompt (>>>) is displayed. In console mode you control and monitor system operations.

To go from console mode to program mode, boot the VMS operating system as described in Chapter 3.

- **Program mode**—When the console subsystem 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.

If the VMS operating system is running and you want to go to console mode, follow the shutdown procedure described in Chapter 3.

Table 1–4 describes the console mode commands you use during the installation procedure.

Table 1–4 Commonly Used Console Mode Commands

Command	Definition
BOOT	Executes a boot command procedure that loads a VAX software program into memory. The boot command procedure transfers control to the program in memory and puts the console subsystem in program mode. During the installation procedure use the abbreviation, B, for the BOOT command.
DEPOSIT	Puts a value in the specified register or memory location. During the installation procedure use the abbreviation, D, for the DEPOSIT command.
HALT	Stops the computer and puts it in console mode.

For more information on the console subsystem and command language, see the hardware manuals supplied with your VAX computer.

2

Installing the VMS Operating System

The *VMS Upgrade and Installation Manual* is your primary source for step-by-step upgrade and installation procedures. Start any VMS installation or upgrade by following the instructions in the *VMS Upgrade and Installation Manual*.

Refer to this chapter for installation information specific to the VAX-11/750 computer. For example, before installing VMS you need to know how to determine device names for the drives that you will use for the distribution media and the the system disk. In addition to helping you determine device names, this chapter also provides instruction for the following functions:

- Turning on the system
- Booting standalone BACKUP
- Booting the new system disk

Note: The screen displays and examples in this manual depict the installation of a particular VMS version. Your screen displays reflect the version that you are installing.

If you are installing the VMS operating system on a VAX computer that is part of a VAXcluster environment, see also the *VMS VAXcluster Manual*.

2.1 Before Installing VMS

Before you install the VMS operating system, you must determine the device names for the drive that contains the distribution media and the drive that contains the system disk. A device name has the following format:

ddcu

where:

- *dd* is the *device code*. The device code tells what type of drive you are using.
- *c* is the *controller designation*. A controller designation can be one of the alphabetic letters A through Z. The controller designation, along with the unit number, identifies the location of the device.
- *u* is the *unit number*. A unit number can be a decimal number in the range of 0 to n .¹ The unit number, along with the controller designation, identifies the location of the device.

¹ The first drive on a controller is usually assigned a unit number of zero, the next drive is assigned a unit number of one, and so on. The range is determined by the bus that supports the device. For example, MASSBUS disks can have unit numbers in the range of 0 to 7. UDA disks can have unit numbers in the range of 0 to 254.

Installing the VMS Operating System

2.1 Before Installing VMS

Note: The only part of the name you can readily modify is the unit number. The device code is fixed and the controller designation is made when the hardware is installed.

For example, DDA0 is a device name for the console tape cassette drive. *DD* is the device code. *A* names the controller (the controller provides the interface between the computer and the drive). *0* is the unit number.

If a drive is connected to an HSC device, precede the device name with the name of the HSC and a dollar sign (\$). For example:

TROUT\$DJA0

TROUT is the name of the HSC device and DJA0 is the device name for an RA60 drive that is connected to it.

Table 2-1 lists the device names for the different drives that can be part of a VAX-11/750 system. Note that for some drives you use a different device code when you are booting from that drive. For example, the device code for an RA60 drive is usually DJ. However, when you boot from an RA60 drive, the device code is DU.

Table 2-1 Device Names for VAX-11/750 Devices

Device	Device Name ¹	Device Name for Booting ¹
Console drive (TU58) ²	CSA1	DDA0
RA60 disk drive	DJcu	DUcu
RA80, RA81, and RA82 disk drives	DUcu	DUcu
RK07 disk drive	DMcu	DMcu
RM03, RM05, RM80, and RP07 disk drives	DRcu	DBcu
RP05 and RP06 disk drives	DBcu	DBcu
RL02 disk drive ³	DLcu	—
TA78 and TU78 magnetic tape drives	MFcu	—
TA81, TU81, and TU81-PLUS magnetic tape drives	MUcu	—
TE16, TU45, and TU77 magnetic tape drives	MTcu	—
TS11 and TU80 magnetic tape drives	MScu	—

¹*c* is the controller designation and *u* is the unit number.

²The console subsystem refers to the console tape cassette drive as DDA0. The VMS operating system refers to it as CSA1.

³Do not use an RL02 as a system disk.

You can use any of the disk drives (except the RL02) to hold 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.

Installing the VMS Operating System

2.1 Before Installing VMS

Due to space limitations, the RK07 may not be a good choice for a system disk. Consider the following about the RK07:

- VMS does not fit on one RK07 disk.
- You cannot upgrade an RK07 system disk.

Return to the *VMS Upgrade and Installation Manual* to continue.

2.2 Turning On the System

These instructions assume that the system is not turned on when you start the installation. The following steps describe how to turn on the system and how to set the switches on the computer control panel.

- 1 Turn on the console terminal.
- 2 Make sure the Boot Device switch is set correctly. For more information, see Section 1.2.2.2.
- 3 Set the Power On Action switch to Halt.
- 4 From the Off position, set the keylock switch to Local.
- 5 As power is applied to the system, the Power light goes on and the Error light is dimly lit. If the Error light is brightly lit, press the Reset button to reset the system.
- 6 Return to the *VMS Upgrade and Installation Manual* to continue the installation.

2.3 Booting Standalone BACKUP

This section provides step-by-step instructions for booting standalone BACKUP from magnetic tape, from a local disk and from an HSC disk.

2.3.1 Booting Standalone BACKUP from Magnetic Tape

This section describes the steps for booting standalone BACKUP from magnetic tape. Standalone BACKUP lets you restore the VMS *required* save set from the distribution magnetic tape to your system disk. You need the five tape cassettes from the VMS distribution kit. They are labeled as follows:

Installing the VMS Operating System

2.3 Booting Standalone BACKUP

Paper Label ¹	Volume Label ²
VMS V5.n S/A BKUP TU58 1/6	SYSTEM_1
VMS V5.n S/A BKUP TU58 2/6	SYSTEM_2
VMS V5.n S/A BKUP TU58 3/6	SYSTEM_3
VMS V5.n S/A BKUP TU58 4/6	SYSTEM_4
VMS V5.n S/A BKUP TU58 5/6	SYSTEM_5
VMS V5.n S/A BKUP TU58 6/6	BACKUP

¹A paper label is a label affixed to a tape cassette.

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

The procedure asks you to place the tape cassettes containing standalone BACKUP, successively, in the console drive:

- 1 Make sure the console TU58 is in the console tape cassette drive. At the console-mode prompt (>>>), start the BOOT58 program. Enter the following command and press Return:

```
>>> B/800 DDA0
```

- 2 At the BOOT58 prompt, enter the following command and press Return:

```
BOOT58> @CSABOO.CMD
```

The red light next to the console tape cassette drive flashes. The RUN light glows green. The procedure displays a series of messages similar to the following:

```
! CS1 BOOT COMMAND FILE - CS1BOO.CMD
!
D/G 0 40 ! CONSOLE BLOCK STORAGE
.
.
```

```
Please remove the volume "750 console" from the console device.
Insert the first standalone system volume and enter "YES" when ready:
```

- 3 Remove the console TU58 and insert the tape cassette labeled VMS V5.n S/A BKUP TU58 1/6 in the console tape cassette drive. When you are ready to continue, type Y and press Return. After several minutes, the procedure displays the following messages:

```
Resuming load operation on volume "SYSTEM_1", please stand by...
```

```
Please remove the volume "SYSTEM_1" from the console device.
Insert the next standalone system volume and enter "YES" when ready:
```

Notice that the red light to the left of the console tape cassette drive flashes while the tape is being read.

- 4 Remove the standalone BACKUP tape that is in the drive, and insert the next one in the sequence. When you are ready to continue, type Y and press Return. The procedure displays messages similar to the following:

Installing the VMS Operating System

2.3 Booting Standalone BACKUP

Resuming load operation on volume "SYSTEM_n", please stand by...

VAX/VMS Version V5.n Major version id = 1 Minor version id = 0

Please remove the volume "SYSTEM_n" from the console device.

Insert the next standalone system volume and enter "YES" when ready:

- 5 Repeat step 4 until the procedure prompts 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) 19-JUN-1990 15:00
```

- 6 The procedure displays a list of the local devices on your system and, if you have them, HSC and MSCP-served devices. For example:

```
Available device DJA2:    device type RA60
Available device DJB3:    device type RA60
.
.
.
```

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.

- 7 The procedure displays messages similar to the following:

```
Please remove the volume "SYSTEM_n" from the console device.
```

```
Insert the standalone application volume and enter "YES" when ready:
```

Insert the last standalone BACKUP tape into the drive. When you are ready to continue, type Y and press Return. The procedure displays the following message:

```
Resuming load operation on volume "BACKUP", please stand by...
```

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

```
%BACKUP-I-IDENT, standalone BACKUP V5.n; the date is 19-JUN-1990 15:00
$
```

Note: Do not remove the last standalone BACKUP tape cassette from the drive until the documentation directs you to do so.

- 9 Return to the *VMS Upgrade and Installation Manual* to continue the installation.

2.3.2 Booting Standalone BACKUP from a Local Disk

This section describes the steps for booting standalone BACKUP from from a local disk drive. Standalone BACKUP lets you restore the VMS *required* save set from the distribution disk to your system disk. You boot standalone BACKUP from the distribution disk using the following procedure:

- 1 Make sure the console TU58 is in the console tape cassette drive.

Installing the VMS Operating System

2.3 Booting Standalone BACKUP

- 2 To boot standalone BACKUP, enter the BOOT command in the following format:

```
>>> B ddcu
```

Substitute the device name of the local disk drive that contains the distribution disk for *ddcu*. For the list of device names, see Table 2-1.

For example, suppose the distribution disk is on an RA60 drive with a controller designation of A and a unit number of zero. Enter the following command and press Return:

```
>>> B DUA0
```

- 3 The procedure prompts you for the date and time. Enter the date and time using the 24-hour clock format and press Return. For example:

```
VAX/VMS Version V5.n Major version id = 1 Minor version id = 0  
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM) 19-JUN-1990 15:00
```

- 4 The procedure displays a list of the local devices on your system and, if you have them, HSC and MSCP-served devices. For example:

```
Available device DJA2:    device type RA60  
Available device DJB3:    device type RA60  
.  
.  
.
```

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.

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

```
%BACKUP-I-IDENT, standalone BACKUP V5.n; the date is 19-JUN-1990 15:00  
$
```

- 6 Return to the *VMS Upgrade and Installation Manual* to continue the installation.

2.3.3 Booting Standalone BACKUP from an HSC Disk Drive

This section describes the steps for booting standalone BACKUP from an HSC disk Drive. Standalone BACKUP lets you restore the VMS *required* save set from the distribution disk to your system disk.

Begin the procedure with the BOOT58 program, located on the console TU58. Then boot standalone BACKUP from the distribution disk.

- 1 Identify the disk drive that contains the distribution disk and the HSC that controls it. You need to know the unit number of the disk drive and the node number of the HSC.
- 2 Make sure the console TU58 is in the console tape cassette drive. At the console-mode prompt (>>>), start the BOOT58 program with the following command:

```
>>> B/800 DDA0
```

Press Return.

Installing the VMS Operating System

2.3 Booting Standalone BACKUP

- 3 At the BOOT58> prompt, deposit the HSC node number into register 2 (R2) using the following format:

```
BOOT58> D/G 2 node-number
```

For example, if the HSC is node number 12 (hexadecimal C), enter the following command and press Return:

```
BOOT58> D/G 2 C
```

Note: If the drive holding the system disk is accessible to two HSCs, deposit both node numbers. Put the greater number in hexadecimal digits 3 and 2. Put the lesser number in digits 1 and 0. For example, if one HSC is node number 18 (hexadecimal 12) and the other is node number 10 (hexadecimal A), enter the following command and press Return:

```
BOOT58> D/G 2 120A
```

- 4 Deposit the unit number of the drive holding the system disk into register 3 (R3) using the following format:

```
BOOT58> D/G 3 unit-number
```

For example, if the drive holding the system disk is unit number 21 (hexadecimal 15), enter the following command and press Return:

```
BOOT58> D/G 3 15
```

- 5 To boot standalone BACKUP, enter the following command and press Return:

```
BOOT58> @CIB00.COMD
```

- 6 The procedure might ask you for the date and time. Enter the date and time using the 24-hour clock format and press Return. For example:

```
VAX/VMS Version V5.n Major version id = 1 Minor version id = 0  
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM) 19-JUN-1990 15:00
```

- 7 The procedure displays a list of the local devices on your system and, if you have them, HSC and MSCP-served devices. For example:

```
Available device DJA2:    device type RA60  
Available device DJB3:    device type RA60  
.  
.  
.
```

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.

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

```
%BACKUP-I-IDENT, standalone BACKUP V5.n; the date is 19-JUN-1990 15:00  
$
```

- 9 Return to the *VMS Upgrade and Installation Manual* to continue the installation.

Installing the VMS Operating System

2.4 Booting the new System Disk

2.4 Booting the new System Disk

As a result of the BACKUP command you type to start the installation, the *required* save set on the distribution kit is restored to the system disk. During the process, the procedure displays the following message:

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

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

```
%BACKUP-I-PROCDONE, Operation completed. Processing finished at 19-JUN-1990 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:
```

At this point, halt the system and boot the system disk into memory using the appropriate procedure (see Section 2.4.1 or (Section 2.4.2).

2.4.1 Booting from a Local System Disk

To boot the new system from a local system disk, use the following procedure:

- 1 Press Ctrl/P to put the system in console mode.
- 2 At the console mode prompt (>>>), enter the following command and press Return:

```
>>> HALT
```
- 3 Remove the VMS V5.n S/A BKUP TU58 5/5 tape cassette and insert the console TU58 in the console tape cassette drive.
- 4 Enter the BOOT command in the following format:

```
>>> B ddcu
```

Use the boot name of the *target-drive* in place of the variable *ddcu*. For a list of the boot names for the various drives in your system, see Table 2-1. For example, if the system disk is on an RP06 disk drive designated as unit one, enter the following command and press Return:

```
>>> B DBA1
```

Booting the operating system into memory from the disk takes several minutes. During the boot process, the installation procedure displays the following messages:

```
CPU HALTED  
INIT SEQ DONE  
.  
.  
.  
LOAD DONE, 000A400 BYTES LOADED
```

Installing the VMS Operating System

2.4 Booting the new System Disk

- 5 When the boot is complete, the procedure displays some messages including warning messages that the VMS license is not registered. You can ignore these warnings and continue with the installation. After you finish the installation, follow the instructions for registering the VMS license.
- 6 When the installation procedure prompts for it, enter the date and time using the 24-hour clock format.

If the system does not boot, a hardware or software problem might exist. Refer to Section 3.1.11 for the symptoms and actions you can take to correct these problems.
- 7 Return to the *VMS Upgrade and Installation Manual* to continue the installation.

2.4.2 Booting from an HSC System Disk

To boot the new system from an HSC system disk, you must create a boot command procedure using code stored on the console TU58 and then execute it as shown in the following procedure:

- 1 Make sure the console TU58 is in the console tape cassette drive.
- 2 Connect the console drive to the system using the following commands:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> CONNECT CONSOLE
SYSGEN> EXIT
```

- 3 Use the Exchange Utility to copy CIBOO.COMD from the console TU58 to your current directory on the system disk using the following command:

```
$ EXCHANGE COPY CSA1:CIBOO.COMD CIBOO.COMD
```

- 4 Use an editor to add the following commands to CIBOO.COMD on the system disk:
 - a. Add a command to deposit the HSC drive's unit number (in hexadecimal notation) into register 3 (R3). For example, if the HSC system disk is on the drive assigned unit number 3, add the following line to the file:

```
DEPOSIT R3 3 !DISK DRIVE UNIT NUMBER
```

- b. Add a command to deposit the HSC controller's node number (in hexadecimal notation) in register 2 (R2). For example, if the HSC controller is node number 12 (hexadecimal C), add the following line to the file:

```
DEPOSIT R2 C
```

Note: If the drive holding the HSC system disk is attached to two HSC controllers, deposit both node numbers in register 2 (R2). Put the greater number in hexadecimal digits 3 and 2. Put the smaller number in digits 1 and 0. For example, if one HSC is node number 18 (hexadecimal 12) and the

Installing the VMS Operating System

2.4 Booting the new System Disk

other is node number 10 (hexadecimal A), add the following command:

```
DEPOSIT R2 120A
```

- 5 Designate CIBOO.COMD as the default boot command procedure with the following command:

```
$ RENAME CIBOO.COMD DEFBOO.COMD
```

- 6 Copy DEFBOO.COMD to the console TU5 using the following command:

```
$ EXCHANGE COPY DEFBOO.COMD CSA1:DEFBOO.COMD
```

- 7 Next, write the boot block on the console TU58 using the Writeboot Utility in the following sequence:

- a. Invoke the Writeboot Utility using the following command:

```
$ RUN SYS$SYSTEM:WRITEBOOT
```

- b. When the Writeboot Utility prompts for the target system device, type CSA1:B00T58.EXE as shown in the following example:

```
Target system device (and boot file if not VMB.EXE):? CSA1:BOOT58.EXE
```

- c. When the utility prompts for the VBN of the boot file code, take the default value (one) by pressing the Return key:

```
Enter VBN of boot file code (default is one):
```

- d. When the utility prompts for the load address of the primary bootstrap, enter C000 as shown in the following example:

```
Enter load address of primary bootstrap in HEX (default is 200): C000
```

- 8 When you return to the DCL command level, enter the following command:

```
$ DISMOUNT CSA1
```

- 9 With the BOOT DEVICE switch set to position A, set the POWER ON ACTION switch to BOOT. The new system will then boot into memory.

- 10 When the boot is complete, the procedure displays some messages including warning messages that the VMS license is not registered. You can ignore these warnings and continue with the installation. After you finish the installation, follow the instructions for registering the VMS license.

- 11 When the installation procedure prompts for it, enter the date and time using the 24-hour clock format.

If the system does not boot, a hardware or software problem might exist. Refer to Section 3.1.11 for the symptoms and actions you can take to correct these problems.

- 12 Return to the *VMS Upgrade and Installation Manual* to continue the installation.

3

Startup and Shutdown Procedures

During a VMS installation or upgrade, your system will shut down and automatically restart (boot) the system several times. Although the installation and upgrade procedures usually perform these tasks automatically, you may have to manually shut down or boot the system. Furthermore, you may have to occasionally boot the system during normal operation.

The method you use to boot the system depends on where you have the system disk. If the system disk is on a local drive, the easiest way to boot the system is to use the Boot Device switch. Alternatively, you could use the BOOT58 program and a boot command procedure, but this is a relatively time-consuming process.

If the system disk is on an HSC drive, you must use the BOOT58 program and a boot command procedure. You can also create default boot command procedures so that the system automatically boots from a particular drive.

This chapter begins with a general description of booting the system and follows with descriptions peculiar to using a local or HSC disk. It then provides instructions the use of boot command procedures and on the use of a conversational boot. Finally, the chapter provides information for shutting down your system.

3.1 Booting the System

Booting is the process of loading system software into memory. The boot process consists of the following steps:

- 1 You enter the BOOT command. There are several ways to do this, depending on whether the system disk is on a local or an HSC drive.
- 2 VMB.EXE, the primary boot program, is loaded from the boot block on the system disk into memory. VMB.EXE is a program that allows access to the system disk. VMB.EXE locates SYS\$SYSTEM:SYSBOOT.EXE on the system disk and loads it into memory.
- 3 SYSBOOT 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.EXE 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.

Startup and Shutdown Procedures

3.1 Booting the System

- 7 STARTUP executes SYSSSYSTEM: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 in to the VMS operating system.

Note: If you plan to boot from a UDA50-supported device, you must keep in mind the following restrictions when you configure the system:

- Each UNIBUS up to (but not including) the one that supports the system disk must have exactly one UDA50. Each UNIBUS from the system disk upwards can have up to the legally allowable number of UDA50s.
- You can boot only from the first UDA50 on a UNIBUS (that is, the one with the fixed CSR and vector).
- The maximum unit number that can be booted is 15 (hexadecimal F).

3.1.1 Boot Command Procedures

A boot command procedure does the following:

- Sets up the system environment
- Deposits values in registers
- Loads the VMS operating system into memory
- Starts the CPU

The instructions for booting the system vary slightly for different types of drives. Therefore, there is a boot command procedure for each type of drive that the computer supports.

For example, you can boot an RP07 drive that has a controller designation of A and a unit number of zero with DB0BOO.COM. Use CIBOO.COM to boot from a system disk on an HSC drive.

The console TU58 contains both the BOOT58 program and the boot command procedures. To boot the VMS operating system with a boot command procedure, you must place the console TU58 in the console tape cassette drive and start the BOOT58 program.

To find out what is on the console TU58, use the following procedure:

Note: This procedure assumes that you have installed and booted the VMS operating system and are logged in to the SYSTEM account.

- 1 Make sure the console TU58 is in the console tape cassette drive.
- 2 To connect the console drive to the system, enter the following commands and press Return after each one:

```
$ RUN SYSSSYSTEM:SYSGEN
SYSGEN> CONNECT CONSOLE
SYSGEN> EXIT
```

Startup and Shutdown Procedures

3.1 Booting the System

- 3 Use the Exchange Utility to display a list of the boot command procedures on the console TU58. Boot command procedures are files that start with either CI or D and end with either BOO or GEN. The file type is either CMD or null. Enter the following command and press Return:

```
$ EXCHANGE DIRECTORY CSA1:C*,D*
```

For example:

```
Directory of RT-11 volume _$CSA1: 19-JUN-1990 15:00

  CIGEN.
  CSABOO.CMD
  DB0GEN.
  DB1BOO.CMD
  DBAGEN.
  .
  .
  .
```

- 4 You can view the contents of a file with the TYPE command. For example:

```
$ EXCHANGE TYPE CSA1:DB1BOO.CMD
```

- 5 When you are finished, enter the following command and press Return:

```
$ DISMOUNT CSA1
```

- 6 To secure the console TU58 from unauthorized access, you must enter the following command and press Return:

```
$ MOUNT/FOREIGN/SYSTEM/NOWRITE/NOASSIST CSA1
```

Section 3.1.2 describes using the BOOT58 program and boot command procedures to boot from either a local or an HSC drive.

3.1.2 Using BOOT58 to Boot from a Local or an HSC Drive

You can use the BOOT58 program, located on the console TU58, to boot the VMS operating system from either a local or an HSC drive. In general, after starting the BOOT58 program you enter the @ command followed by the name of the boot command procedure you want to use. Depending on the system configuration, you might also need to use the DEPOSIT command.

To boot with the BOOT58 program, use the following procedure:

- 1 Make sure the console TU58 is in the console tape cassette drive and the keylock switch is set to Local.
- 2 Set the Boot Device switch to position A.
- 3 If the VMS operating system is not running, go to step 4.

If the VMS operating system is running, log in to the SYSTEM account. Enter the following command and press Return:

```
$ @SYSS$SYSTEM:SHUTDOWN
```

Startup and Shutdown Procedures

3.1 Booting the System

The system displays a series of questions which you should answer to complete the shutdown. When the procedure asks if an automatic system 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
```

4 Press Ctrl/P.

5 At the console-mode prompt (>>>), start the BOOT58 program. Enter the following command and press Return:

```
>>> B/800 DDA0
```

6 If the system disk is on a local drive, go to step 7.

If the system disk is on an HSC drive, enter the following commands. Note that all numeric entries are made in hexadecimal notation.

a. At the BOOT58> prompt, deposit the HSC node number into register 2 (R2) using the following format:

```
BOOT58> D/G 2 node-number
```

For example, if the HSC is node number 12 (hexadecimal C), enter the following command and press Return:

```
BOOT58> D/G 2 C
```

Note: If the drive holding the system disk is accessible to two HSCs, deposit both node numbers. Put the greater number in hexadecimal digits 3 and 2. Put the lesser number in digits 1 and 0. For example, if one HSC is node number 18 (hexadecimal 12) and the other is node number 10 (hexadecimal A), enter the following command and press Return:

```
BOOT58> D/G 2 120A
```

b. Deposit the unit number of the drive holding the system disk into register 3 (R3) using the following format:

```
BOOT58> D/G 3 unit-number
```

For example, if the drive holding the system disk is unit number 21 (hexadecimal 15), enter the following command and press Return:

```
BOOT58> D/G 3 15
```

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

```
BOOT58> @CIBOO.CMD
```

You can also set up default boot command procedures so that the system automatically boots from a particular drive. For more information, see Section 3.1.5.1.

7 If the system disk is on a local drive, check the controller designation and do the following:

a. If the drive holding the system disk has a controller designation of A, enter the BOOT command in the following format:

Startup and Shutdown Procedures

3.1 Booting the System

```
BOOT58> @dduBOO.CMD
```

Substitute the device code of the drive holding the system disk for *dd*. Substitute the unit number of the drive for *u*. For a list of device codes, see Table 3–1.

Table 3–1 Device Codes for VAX–11/750 Disks

Device	Used to Boot the System
RA60 disk drive	DU
RA80, RA81, and RA82 disk drives	DU
RK07 disk drive	DM
RM03, RM05, RM80, and RP07 disk drives	DB
RP05 and RP06 disk drives	DB

For example, suppose the system disk is on an RP06 disk drive that has a controller designation of A and a unit number of one. Enter the following command and press Return:

```
BOOT58> @DB1BOO.CMD
```

- b.** If the drive holding the system disk does not have a controller designation of A, deposit the unit number of the drive in register 3 (R3), as follows:

```
BOOT58> D/G 3 unit-number
```

Substitute a hexadecimal value that represents the unit number of the drive for the *unit-number*. For example, if the drive has a unit number of one, enter the following command and press Return:

```
BOOT58> D/G 3 1
```

Then enter the BOOT command in the following format:

```
BOOT58> @ddcBOO.CMD
```

Substitute the device code of the drive holding the system disk for *dd*. Substitute the controller designation of the drive for *c*. For a list of device codes, see Table 3–1.

For example, suppose the system disk is on an RP06 disk drive that has a controller designation of C and a unit number of one. Enter the following commands and press Return after each one:

```
BOOT58> D/G 3 1  
BOOT58> @DDBCBOO.CMD
```

The following example uses the BOOT58 program to boot from a system disk on an RP07 drive with a controller designation of A and a unit number of zero. Before displaying the BOOT58 prompt, the VAX–11/ 750 displays a double percent sign to indicate successful verification of the microcode.

Startup and Shutdown Procedures

3.1 Booting the System

```
>>> E/800 DDA0
%%
BOOT58> @DB0BOO.CMD

!
!      DB0 BOOT COMMAND FILE - DB0BOO.CMD
!

D/G 0 0          ! DISK PACK DEVICE TYPE
D/G 1 F28000     ! BASE OF MBA0 ADDRESS SPACE
D/G 2 0          ! ADAPTER UNIT = 0
D/G 3 0          ! CONTROLLER UNIT = 0
D/G 4 0          ! BOOT BLOCK LBN   (UNUSED)
D/G 5 0          ! SOFTWARE BOOT FLAGS
D/G E 200        ! ADDRESS OF WORKING MEMORY + ^X200

LOAD VMB.EXE/START:200 ! LOAD PRIMARY BOOTSTRAP
START 200          ! START PRIMARY BOOTSTRAP

VMS Version 5.4 19-JUN-1990 15:00:00.00

%%%%%%%%%%%% OPCOM, 19-JUN-1990 15:00:00.00 %%%%%%%%%%%%%
Logfile has been initialized by operator _OPAO:
Logfile is SYSSYSROOT:[SYSMGR]OPERATOR.LOG;1

%SET-I-INTSET, login interactive limit = 64, Current interactive value = 0
SYSTEM          job terminated at 19-JUN-1990 15:00:00.00
```

3.1.3 BOOT58 Commands

Table 3-2 lists the BOOT58 commands.

Table 3-2 BOOT58 Commands

Command	Function
BOOT [ddcu]	Boots the system from the specified drive. If you omit <i>ddcu</i> , the system boots with DEFBOO.CMD. Note that you cannot specify this command within a command procedure, and you cannot use the name of a command procedure as a command qualifier. This format is valid only at the console-mode prompt (>>>). For example: >>> BOOT DUA0

(continued on next page)

Startup and Shutdown Procedures

3.1 Booting the System

Table 3–2 (Cont.) BOOT58 Commands

Command	Function
DEPOSIT [loc-qual] [,size-qual] location value	Deposits a hexadecimal value in the specified location. The location is interpreted according to the location and size qualifiers. The location qualifier can be expressed as follows: /G general register /I internal register /P physical memory The size qualifier can be expressed as follows: /B byte /W word /L longword If you do not specify the location or size qualifier, the default values established by a previous command are used.
EXAMINE [loc-qual] [,size-qual] location	Displays the contents of the specified location. The location is interpreted according to the location and size qualifiers. The location qualifier can be expressed as follows: /G general register /I internal register /P physical memory The size qualifier can be expressed as follows: /B byte /W word /L longword If you do not specify the location or size qualifier, the default values established by a previous command are used.
HELP	Displays the BOOT58 help file at the console terminal. You cannot specify this command within a command procedure.
LOAD file-spec [/START:address]	Loads a file from the boot device into memory, starting at the address specified with the /START qualifier. If you omit the /START qualifier, the file is loaded into memory beginning at the first free address.

(continued on next page)

Startup and Shutdown Procedures

3.1 Booting the System

Table 3–2 (Cont.) BOOT58 Commands

Command	Function
START address	Transfers control to the address specified. Use this command with the LOAD command.
@file-spec	Executes the specified command procedure. The file specification for a command procedure cannot have more than six characters. This format is valid only at the BOOT58> prompt. For example: BOOT58> @DU1BOO.COMD

3.1.4 Booting from a Local Drive with the Boot Device Switch

The simplest and most common way to boot a VAX–11/750 from a local drive is to use the Boot Device switch. The setting of the Boot Device switch tells the system what drive the system disk is on. The system looks for VMB.EXE, the primary boot program, on the boot block of the disk in that drive.

When you use the Boot Device switch, the system assumes that the unit number of the drive holding the system disk is zero. If the unit number is not zero, you must boot with the BOOT58 program as described in Section 3.1.2.

Set the Boot Device switch to correspond to the disk drive that contains the system disk. Positions B, C, and D correspond to the disk controllers attached to your system. Consult your Digital Customer Service representative to determine how the Boot Device switch positions correspond to the available disk controllers.

As long as the Boot Device switch is set properly, you can cause the system to boot when you do any of the following:

- Set the Power On Action switch to Boot or Restart (Boot). Turn on the power. The system boots automatically.
- Set the keylock switch to Local. At the console-mode prompt (>>>), enter the following command and press Return:

>>> B
- Set the Power On Action switch to Boot or Restart (Boot). Execute the SHUTDOWN procedure and specify the auto reboot option. The system reboots automatically.
- If the Power On Action switch is set to Boot or Restart (Boot) when the system shuts down due to a bugcheck, the system reboots automatically.

If the Power On Action switch is set to Boot or Restart (Boot) when a power failure occurs and the contents of memory are lost, the system reboots when power is restored.

If a power failure occurs and the battery backup unit saves the contents of memory, the system restarts execution where it was interrupted by the power failure.

Note: If the system does not boot automatically under these conditions, the boot block on the system disk might be corrupted. For more information, see Section 3.1.12.

3.1.5 Booting from an HSC Drive

The first time you boot the VMS operating system, use the procedure described in Section 3.1.2. Then create default command procedures that let you boot automatically. Section 3.1.5.1 explains how to create default boot command procedures. Section 3.1.5.2 explains how to use them.

3.1.5.1 Creating Default Boot Command Procedures

There are two default boot command procedures: DEFBOO.COMD and DEFGEN.. DEFBOO.COMD is the nonstop boot procedure. When you boot with DEFBOO.COMD you have no control over the system until the boot process has finished. Use DEFGEN., the conversational boot procedure, when you want to interrupt the boot process and change system parameters.

DEFGEN. and DEFBOO.COMD do not exist on the console TU58. However, Digital provides boot command procedures that you can edit and rename using the following procedure.

Note: This procedure assumes that you have installed and booted the VMS operating system and are logged in to the SYSTEM account.

- 1 Make sure the console TU58 is in the console tape cassette drive.
- 2 To connect the console drive to the system, enter the following commands and press Return after each one:

```
$ RUN SYSS$SYSTEM:SYSGEN
SYSGEN> CONNECT CONSOLE
SYSGEN> EXIT
```

- 3 Use the Exchange Utility to copy CIBOO.COMD and CIGEN. from the console TU58 to your current directory on the system disk. Enter the following commands and press Return after each one:

```
$ EXCHANGE COPY CSA1:CIBOO.COMD CIBOO.COMD
$ EXCHANGE COPY CSA1:CIGEN. CIGEN.
```

- 4 Use an editor to add the following commands to both CIBOO.COMD and CIGEN.
 - a. Add a command to deposit the unit number of the drive holding the system disk in register 3 (R3). Use hexadecimal notation. For example, suppose the system disk is on an RA60 disk drive with a controller designation of B and a unit number of three. Add the following line to both files:

```
DEPOSIT R3 3 !DISK DRIVE UNIT NUMBER
```

Startup and Shutdown Procedures

3.1 Booting the System

- b. Add a command to deposit the HSC node number in register 2 (R2). Use the following format:

```
DEPOSIT R2 node-number
```

Substitute a hexadecimal value between 0 and F for *node-number*. For example, if the HSC is node number 12 (hexadecimal C), add the following command:

```
DEPOSIT R2 C
```

Note: If the drive holding the system disk is attached to two HSC controllers, deposit both node numbers in register 2 (R2). Put the greater number in hexadecimal digits 3 and 2. Put the smaller number in digits 1 and 0. For example, if one HSC is node number 18 (hexadecimal 12) and the other is node number 10 (hexadecimal A), add the following command:

```
DEPOSIT R2 120A
```

The following example shows CIBOO.CMD after you add commands to boot from a disk drive with a unit number of 3 (hexadecimal 3) that is connected to an HSC with a node number of 12 (hexadecimal C).

```
.  
. .  
D/G R0 20          !CI PORT DEVICE  
D/G R1 E           !CI TR=E  
D/G R2 C           !HSC NODE NUMBER  
D/G R3 3           !DEVICE UNIT NUMBER  
D/G R4 0           !BOOT BLOCK LBN (NOT USED)  
D/G R5 A0004000    !SOFTWARE BOOT CONTROL FLAGS  
. .  
.
```

- 5 Rename the files. Enter the following commands and press Return after each one:

```
$ RENAME CIBOO.CMD DEFBOO.CMD  
$ RENAME CIGEN. DEFGEN.
```

- 6 Copy the edited boot command procedures to the console TU58. Enter the following commands and press Return after each one:

```
$ EXCHANGE COPY DEFBOO.CMD CSA1:DEFBOO.CMD  
$ EXCHANGE COPY DEFGEN. CSA1:DEFGEN.
```

- 7 Before you can use DEFBOO.CMD or DEFGEN. to boot automatically, you need to write the boot block on the console TU58 using the Writeboot Utility. Do the following:

- a. To start the Writeboot Utility, enter the following command and press Return:

```
$ RUN SYSS$SYSTEM:WRITEBOOT
```

- b. When the procedure displays the following message, type CSA1:B00T58.EXE and press Return. For example:

```
Target system device (and boot file if not VMB.EXE):? CSA1:BOOT58.EXE
```

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3.1 Booting the System

- c. The procedure displays the following message:

```
Enter VBN of boot file code (default is one):
```

Press Return to accept the default.

- d. When the procedure displays the following message, type C000 and press Return. For example:

```
Enter load address of primary bootstrap in HEX (default is 200): C000
```

- 8 When you are finished, enter the following command and press Return:

```
$ DISMOUNT CSA1
```

- 9 To secure the console TU58 from unauthorized access, you must enter the following command and press Return:

```
$ MOUNT/FOREIGN/SYSTEM/NOWRITE/NOASSIST CSA1
```

Now you can use DEFBOO.CMD and DEFGEN. to boot the VMS operating system from a system disk on an HSC drive. If you change the system configuration in the future, use the previous procedure to modify DEFBOO.CMD and DEFGEN.CMD.

To use DEFBOO.CMD to boot from a system disk on an HSC drive, see Section 3.1.5.2. To use DEFGEN. to boot from a system disk on an HSC drive, see Section 3.1.6.2.

3.1.5.2 Booting with DEFBOO.CMD

As long as the Boot Device switch is set to A, you can cause the system to boot using DEFBOO.CMD from the console TU58 when you do any of the following:

- Set the Power On Action switch to Boot or Restart (Boot). Turn on the power. The system boots automatically.
- Set the keylock switch to Local. At the console-mode prompt (>>>), enter the following command and press Return:

```
>>> B
```
- Set the Power On Action switch to Boot or Restart (Boot). Execute the SHUTDOWN procedure and specify the auto reboot option. The system reboots automatically.
- If the Power On Action switch is set to Boot or Restart (Boot) when the system shuts down due to a bugcheck, the system reboots automatically.

If the Power On Action switch is set to Boot or Restart (Boot) when a power failure occurs and the contents of memory are lost, the system reboots when power is restored.

If a power failure occurs and the battery backup unit saves the contents of memory, the system restarts execution where it was interrupted by the power failure.

Note: If the system does not boot automatically under these conditions, the boot block on the system disk might be corrupted. For more information, see Section 3.1.12.

Startup and Shutdown Procedures

3.1 Booting the System

3.1.6 Conversational Boot

A conversational boot is most commonly used in research and development environments and during software upgrades. Perform a conversational boot when you want to interrupt the boot process before it completes. The boot process stops after it loads SYSSYSTEM: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

At the SYSBOOT> prompt, you can enter any of the SYSGEN commands listed in Table 3–3. When you finish using the SYSGEN commands, enter the CONTINUE command to complete the boot process. For more information about these SYSGEN commands, see the *VMS System Generation Utility Manual*.

Table 3–3 SYSGEN Commands Used in SYSBOOT

Command	Description
CONTINUE	Resumes the boot process.
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-name]	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.

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3.1 Booting the System

You can enter the following commands to set the SYSGEN parameter WSMAX to 512 and complete 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 19-JUN-1990 15:00:00.00
```

If you modified the system parameters to values that render the system unbootable, enter the following commands to boot using default values:

```
SYSBOOT> USE DEFAULT
SYSBOOT> CONTINUE
```

You can also use a conversational boot to specify a minimum startup. For example, if you want to boot the system and avoid autoconfiguring all your peripheral devices, enter the following command:

```
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 call 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 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
$
```

There are several ways to perform a conversational boot depending on whether the system disk is on a local or an HSC drive.

3.1.6.1 Local Drive

The simplest way to perform a conversational boot when the system disk is on a local drive is to set the Boot Device switch. Use the following procedure:

- 1 Make sure the console TU58 is in the console tape cassette drive and the keylock switch is set to Local.
- 2 Set the Boot Device switch to correspond to the disk drive that contains the system disk.
- 3 If the VMS operating system is not running, go to step 4.

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3.1 Booting the System

If the VMS operating system is running, log in to the SYSTEM account. Enter the following command and press Return:

```
$ @SYSS$SYSTEM:SHUTDOWN
```

The system displays a series of questions which you should answer to complete the shutdown. When the procedure asks if an automatic system 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
```

4 Press Ctrl/P.

5 Enter the following BOOT command and press Return:

```
>>> B/1
```

Note: If this command does not boot the operating system, the boot block of the system disk might be corrupted. For more information, see Section 3.1.12.

6 At the SYSBOOT> prompt, you can enter the commands in Table 3-3. When you finish using the SYSGEN commands, enter the CONTINUE command to complete the boot process.

You can also use the BOOT58 program to perform a conversational boot from a local drive. Use the following procedure:

- 1 Make sure the console TU58 is in the console tape cassette drive and the keylock switch is set to Local.
- 2 If the VMS operating system is not running, go to step 3.

If the VMS operating system is running, log in to the SYSTEM account. Enter the following command and press Return:

```
$ @SYSS$SYSTEM:SHUTDOWN
```

The system displays a series of questions which you should answer to complete the shutdown. When the procedure asks if an automatic system 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
```

3 Press Ctrl/P.

4 Enter the following command and press Return:

```
>>> B/800 DDA0
```

5 If the drive holding the system disk does not have a controller designation of A, go to step 6.

If the drive holding the system disk has a controller designation of A, enter the BOOT command in the following format:

```
BOOT58> @dduGEN.COMD
```

Substitute the device code of the drive holding the system disk for *dd*. Substitute the unit number of the drive for *u*. For the list of device codes, see Table 2-1.

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3.1 Booting the System

For example, suppose the system disk is on an RP07 disk drive that has a controller designation of A and a unit number of one. Enter the following command and press Return:

```
BOOT58> @DB1GEN.CMD
```

Go to step 7.

- 6 If the drive holding the system disk does not have a controller designation of A, use the following procedure:

- a. Deposit the unit number of the drive in register 3 (R3), as follows:

```
BOOT58> D/G 3 unit-number
```

Substitute a hexadecimal value that represents the unit number of the drive for *unit-number*. For example, if the drive has a unit number of one, enter the following command and press Return:

```
BOOT58> D/G 3 1
```

- b. Enter the BOOT command in the following format:

```
BOOT58> @ddcGEN.CMD
```

Substitute the device code of the drive holding the system disk for *dd*. Substitute the controller designation of the drive for *c*. For the list of device codes, see Table 2-1.

For example, suppose the system disk is on an RP07 disk drive that has a controller designation of C and a unit number of one. Enter the following commands and press Return after each one:

```
BOOT58> D/G 3 1  
BOOT58> @DBCGEN.CMD
```

- 7 At the SYSBOOT> prompt, you can enter the commands listed in Table 3-3. When you finish using the SYSGEN commands, enter the CONTINUE command to complete the boot process.

3.1.6.2 HSC Drive

To perform a conversational boot from a system disk on an HSC drive, use the following procedure:

- 1 Make sure the console TU58 is in the console tape cassette drive and the keylock switch is set to Local.
- 2 Set the Boot Device switch to A.
- 3 If the VMS operating system is not running, go to step 4.

If the VMS operating system is running, log in to the SYSTEM account. Enter the following command and press Return:

```
$ @SYSS$SYSTEM:SHUTDOWN
```

The system displays a series of questions which you should answer to complete the shutdown. When the procedure asks if an automatic system 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
```

- 4 Press Ctrl/P.

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3.1 Booting the System

- 5 If you have created DEFGEN., enter the following command and press Return:

```
>>> @DEFGEN.
```

If you have not created DEFGEN., do the following:

- a. Enter the following command and press Return:

```
>>> B/800 DDA0
```

- b. At the BOOT58> prompt, enter the following command and press Return:

```
BOOT58> @CIGEN.
```

- 6 At the SYSBOOT> prompt, you can enter the commands listed in Table 3-3. When you finish using the SYSGEN commands, enter the CONTINUE command to complete the boot process.

3.1.7 Booting From SYSF During an Upgrade

When you perform a VMS upgrade, you must boot the system from the SYSF directory on the system disk. To boot from [SYSF], create a command procedure named SYSFBOO.CMD.

To create SYSFBOO.CMD, use the following procedure:

Note: This procedure assumes that you have installed and booted the VMS operating system and are logged in to the SYSTEM account.

- 1 Make sure that the console TU58 is in the console tape cassette drive.
- 2 To connect the console drive to the system, enter the following commands and press Return after each one:

```
$ RUN SYSS$SYSTEM:SYSGEN
SYSGEN> CONNECT CONSOLE
SYSGEN> EXIT
```

- 3 Use the Exchange Utility to copy the appropriate boot command procedure from the console TU58 to your current directory on the system disk. If the system disk is on an HSC drive and you have created DEFBOO.CMD as described in Section 3.1.5.1, enter the following command and press Return:

```
$ EXCHANGE COPY CSA1:DEFBOO.CMD DEFBOO.CMD
```

If the system disk is on a local drive, copy the boot command procedure that matches the drive that holds the system disk. For example, suppose the system disk is on an RP06 drive and has a controller designation of A and a unit number of one. Enter the following command and press Return:

```
$ EXCHANGE COPY CSA1:DB1BOO.CMD DB1BOO.CMD
```

- 4 Edit the boot command procedure by changing the line that deposits a value in register 5 (R5) so that the left-most digit of the value reflects the name of the [SYSF] root directory as shown in the following example:

```
D/G/L R5 F0000000
```


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3.1 Booting the System

- 5 Rename the boot command procedure to SYSFBOO.COMD using the following format:

```
$ RENAME nnnBOO.COMD SYSFBOO.COMD
```

For example, if the boot command procedure is DEFBOO.COMD, enter the following command and press Return:

```
$ RENAME DEFBOO.COMD SYSFBOO.COMD
```

- 6 Use the Exchange Utility to copy SYSFBOO.COMD back to the console TU58:

```
$ EXCHANGE COPY SYSFBOO.COMD CSA1:SYSFBOO.COMD
```

- 7 When you are finished, enter the following command and press Return:

```
$ DISMOUNT CSA1
```

- 8 To secure the console TU58 from unauthorized access, you must enter the following command and press Return:

```
$ MOUNT/FOREIGN/SYSTEM/NOWRITE/NOASSIST CSA1
```

- 9 Make sure the console TU58 is in the console tape cassette drive and the keylock switch is set to Local.

- 10 Set the Boot Device switch to position A.

- 11 If the VMS operating system is not running, go to step 4.

If the VMS operating system is running, log in to the SYSTEM account. Enter the following command and press Return:

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

The system displays a series of questions which you should answer to complete the shutdown. When the procedure asks if an automatic system 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
```

- 12 Press Ctrl/P.

- 13 At the console-mode prompt (>>>), enter the following command and press Return:

```
>>> B/800 DDA0
```

- 14 At the BOOT58> prompt, enter a command in the following format:

```
BOOT58> @SYSFBOO.COMD
```

3.1.8 Booting from a Different Directory on the System Disk

The VMS operating system is installed on the system disk in a root directory named [SYS0]. You can use VMSKITBLD, described in the *Guide to Setting Up a VMS System*, to add a copy of the VMS operating system to another root directory on the system disk.

To boot from a directory other than [SYS0], create a command procedure named SYnBOO.COMD, where *n* stands for the name of the other root directory on the system disk.

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3.1 Booting the System

To create SYnBOO.CMD, use the following procedure:

Note: This procedure assumes that you have installed and booted the VMS operating system and are logged in to the SYSTEM account.

- 1 Make sure that the console TU58 is in the console tape cassette drive.
- 2 To connect the console drive to the system, enter the following commands and press Return after each one:

```
$ RUN SYSS$SYSTEM:SYSGEN
SYSGEN> CONNECT CONSOLE
SYSGEN> EXIT
```

- 3 Use the Exchange Utility to copy the appropriate boot command procedure from the console TU58 to your current directory on the system disk. If the system disk is on an HSC drive and you have created DEFBOO.CMD as described in Section 3.1.5.1, enter the following command and press Return:

```
$ EXCHANGE COPY CSA1:DEFBOO.CMD DEFBOO.CMD
```

If the system disk is on a local drive, copy the boot command procedure that matches the drive that holds the system disk. For example, suppose the system disk is on an RP06 drive and has a controller designation of A and a unit number of one. Enter the following command and press Return:

```
$ EXCHANGE COPY CSA1:DB1BOO.CMD DB1BOO.CMD
```

- 4 Edit the boot command procedure. Change the line that deposits a value in register 5 (R5). This line contains the comment *!software boot flags*. The value is a hexadecimal number with eight digits. For example:

```
D/G R5 0      !software boot flags
```

Change the left-most digit of the value to reflect the name of the root directory from which you want to boot. For example, if you want to boot from the directory named [SYSC], change the line as follows:

```
D/G/L R5 C0000000      !designated root is SYSC
```

- 5 Rename the boot command procedure to SYnBOO.CMD, where *n* stands for the name of the other root directory. Use the following format:

```
$ RENAME nnnBOO.CMD SYnBOO.CMD
```

For example, if the boot command procedure is DEFBOO.CMD and the directory is named [SYSC], enter the following command and press Return:

```
$ RENAME DEFBOO.CMD SYCBOO.CMD
```

- 6 Use the Exchange Utility to copy SYnBOO.CMD back to the console TU58. Use the following format:

```
$ EXCHANGE COPY SYnBOO.CMD CSA1:SYnBOO.CMD
```

For example, if the file name is SYCBOO.CMD, enter the following command and press Return:

```
$ EXCHANGE COPY SYCBOO.CMD CSA1:SYCBOO.CMD
```

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- 7 When you are finished, enter the following command and press Return:

```
$ DISMOUNT CSA1
```

- 8 To secure the console TU58 from unauthorized access, you must enter the following command and press Return:

```
$ MOUNT/FOREIGN/SYSTEM/NOWRITE/NOASSIST CSA1
```

To boot from a different directory on the system disk, use the following procedure:

- 1 Make sure the console TU58 is in the console tape cassette drive and the keylock switch is set to Local.
- 2 Set the Boot Device switch to position A.
- 3 If the VMS operating system is not running, go to step 4.

If the VMS operating system is running, log in to the SYSTEM account. Enter the following command and press Return:

```
$ @SYSSSYSTEM:SHUTDOWN
```

The system displays a series of questions which you should answer to complete the shutdown. When the procedure asks if an automatic system 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
```

- 4 Press Ctrl/P.
- 5 At the console-mode prompt (>>>), enter the following command and press Return:

```
>>> B/800 DDA0
```

- 6 At the BOOT58> prompt, enter a command in the following format:

```
BOOT58> @SYnBOO.COMD
```

For example, to boot from [SYSC], enter the following command and press Return:

```
BOOT58> @SYCBOO.COMD
```

3.1.9 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*.

3.1.10 Suggestions for Improving System Boot Time

Booting the VAX-11/750 from the console TU58 can be time-consuming. Under certain circumstances you might have trouble booting a VAX-11/750 from an HSC. For example, a timeout error can result while the computer is waiting for the console TU58 to rewind. You can reduce the amount of time needed to boot from the console TU58 by ensuring that the console TU58 is rewound after each time the system is booted. For example, to

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accomplish this you could place the following commands at the end of SYSTARTUP_V5.COM:

```
$ RUN SYS$SYSTEM:SYSGEN
  CONNECT CONSOLE
  EXIT
$ MOUNT/FOREIGN/SYSTEM/NOWRITE/NOASSIST CSA1 !prevents unauthorized access
$ DEFINE/USER SYS$OUTPUT NL: !suppresses display of system messages
$ EXCHANGE DIRECTORY CSA1:VMB.EXE
```

Another solution is to physically place the files needed for booting as close as possible to the beginning of the tape. Although the console TU58 is a tape device, the file system treats it as a disk with four cylinders. Blocks 0, 128, 256, and 384 are located at the beginning of the tape. The directory is also at the beginning of the tape on blocks 6 through 9. Figure 3-1 shows the physical structure of the console TU58.

Figure 3-1 File Structure of the Console TU58

Track 0:	block 000 block 001 block 002 // block 127
Track 1:	block 128 block 129 block 130 // block 255
Track 2:	block 256 block 257 block 258 // block 383
Track 3:	block 384 block 385 block 386 // block 511
	-----//-----
	"beginning" of tape "end" of tape

You can use the Exchange Utility and the COPY/START_BLOCK command to specify the exact block placement of files on the console TU58. By physically placing the files needed for booting after the directory on the tape, you can minimize the amount of time the tape has to rewind during the boot process. In addition to helping you avoid the timeout problem, this file placement strategy might save you several minutes during the boot process. The following files are typically needed to boot the system:

```
DEFBOO.CMD
BOOT58.EXE
VMB.EXE
CI780.BIN
PCS750.BIN
PCSLOD.EXE
```

Note: Digital strongly recommends that you make a backup copy of the console TU58 before making any modifications to it. If you make an error and corrupt the file structure of the console TU58, it could prevent you from booting.

3.1.11 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. Examples of hardware problems are a read error on a disk drive or a machine check error. If you suspect a hardware problem, do the following:

- 1 Consult the hardware manual for your VAX computer.
- 2 Contact the appropriate Digital Customer Service representative.

When the operating system is loaded into memory, a message similar to the following appears on the terminal screen:

```
SYSTEM          job terminated at  
19-JUN-1990 15:00:00.00
```

If the system does not display this message, a software problem has probably occurred. Do the following:

- 1 Try to boot the system again.
- 2 Put a backup copy of the system disk in another drive and try to boot from it.

If you suspect that the boot block on the system disk has been corrupted, see Section 3.1.12.

3.1.12 Writing a New Boot Block on the System Disk

If you suspect that the boot block on the system disk is corrupted, you can use the Writeboot Utility to rewrite it.

Note: You must have LOG_IO privilege to use the Writeboot Utility.

To write a boot block on a system disk, use the following procedure:

- 1 Use the BOOT58 program as described in Section 3.1.2 to boot with a backup copy of the system disk.
- 2 To start the Writeboot Utility, enter the following command and press Return:

```
$ RUN SYSS$SYSTEM:WRITEBOOT
```

The procedure displays the following message:

```
Target system device (and boot file if not VMB.EXE):?
```

- 3 Enter the device name of the drive holding the system disk on which you want to rewrite the boot block. Use the *ddcu* format described in Chapter 2. If you want to use a boot file other than SYSS\$SYSTEM:VMB.EXE, provide the full file specification, including device and directory.

For example, suppose the system disk is on an RP07 disk drive that has a controller designation of A and a unit number of zero. Enter the following and press Return:

```
Target system device (and boot file if not VMB.EXE):?  DRA0
```

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- 4 The procedure displays the following message:

Enter VBN of boot file code (default is one):

Press Return to accept the default.

- 5 The procedure displays the following message:

Enter load address of primary bootstrap in HEX (default is 200):

If the system disk is on a local drive, press Return to accept the default. If it is on an HSC drive, type C000 and press Return.

- 6 The Writeboot Utility writes the boot file to the boot block (block 0) of the system disk.

The Writeboot Utility might display one or more of the following error messages:

You lack LOG_IO privilege

Explanation: This message means you do not have the correct privilege to use the Writeboot Utility.

You lack READ and/or WRITE access to TARGET DEVICE. DISMOUNT and REMOUNT

Explanation: This message means that access to the target device is limited. Check the WRITE PROTECT button on the disk drive.

VBN must be >= 1

Explanation: This message means you cannot specify a zero as the virtual block number (VBN).

3.2 Shutting Down the System

Before you shut down the VMS 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 VMS operating system to reboot automatically, set the Power On Action switch to Boot or Restart (Boot). If you want to enter console-mode commands, stop the system after the shutdown completes.

You can perform the following three types of shutdown operations:

- 1 **An orderly shutdown with SYSSYSTEM:SHUTDOWN.COM**—See Section 3.2.1.
- 2 **An emergency shutdown with OPCCRASH.EXE**—See Section 3.2.2.
- 3 **An emergency shutdown with CRASH**—See Section 3.2.3.

3.2.1 Orderly Shutdown with SHUTDOWN.COM

SHUTDOWN.COM shuts down the system while performing maintenance functions such as disabling future logins, stopping the batch and printer queues, dismounting mounted volumes, and stopping user processes. To use the SHUTDOWN command procedure, log in to the SYSTEM account, enter the following command, and press Return:

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

To halt the system after the procedure completes, press Ctrl/P and enter the HALT command at the console-mode prompt (>>>).

For more information about the SHUTDOWN command procedure, see the *Guide to Setting Up a VMS System*.

3.2.2 Emergency Shutdown With OPCCRASH.EXE

If you cannot perform an orderly shutdown with SHUTDOWN.COM, run the OPCCRASH emergency shutdown program. Enter the following command and press Return:

```
$ RUN SYS$SYSTEM:OPCCRASH
```

To halt the system after the procedure completes, press Ctrl/P and enter the HALT command at the console-mode prompt (>>>).

For more information about the OPCCRASH program, see the *Guide to Setting Up a VMS System*.

If OPCCRASH fails, use the emergency crash procedure described in Section 3.2.3

3.2.3 Emergency Crash

Note: Use the CRASH procedure only if the system is hung and you cannot log in to the SYSTEM account to use SHUTDOWN.COM or OPCCRASH.

The following commands cause the system to fail, resulting in immediate shutdown. To force your system to fail, do the following:

- 1 Make sure the console TU58 is in the console tape cassette drive and the keylock switch is set to Local.
- 2 Set the Boot Device switch to A.
- 3 Press Ctrl/P.
- 4 Enter the following commands and press Return after each one:

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```
>>> E/G F
>>> E P
>>> E/I 0
>>> E/I 1
>>> E/I 2
>>> E/I 3
>>> E/I 4
>>> D/G F FFFFFFFF
>>> D P 1F0000
>>> C
```

Note: If the **E P** command results in a value where **4** is the second left-most digit (such as **X4XXXXXX**), the **D P** command should use the value **041F0000**.

The procedure displays a fatal bugcheck message as well as additional messages and information. It examines the program counter (PC), the processor status longword (PSL), and the stack pointers. It then deposits values in the PC and PSL to cause an exception condition that sends the contents of memory to the dump file on the system disk. Later you can read the dump file to determine why the system did not respond.

- 5 If the system does not reboot automatically, reboot it manually.
- 6 After the system reboots, you can examine the dump file. To examine the dump file, log in to the **SYSTEM** account. 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*.

4

Backup Procedures

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 system.

You should back up the system disk for the following reasons:

- 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 occurs, you can restore the backup copy of the system disk.
- To prevent the 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 drive that holds 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, which happens when files are stored noncontiguously on the disk. The BACKUP command creates a copy of the system on which files are stored contiguously.
 - If the system disk is removable, eliminating disk fragmentation is a one-step process. Use the backup copy as the new system disk. Store the old system disk in a safe place.
 - If you use a fixed (nonremovable) system disk, back it up to a disk or magnetic tape. Then restore the files to the original system disk.

This chapter contains information on the following:

- Installing and booting standalone BACKUP on the system disk
- Installing and booting standalone BACKUP on TU58 tape cassettes
- Backing up and restoring the system disk

You should also make a copy of the console TU58 in case the original becomes damaged. Section 4.4 describes using CONSCOPY.COM to do this.

Backup Procedures

4.1 Using Standalone BACKUP

4.1 Using 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, on TU58 tape cassettes, or on any other media that your system supports. DIGITAL recommends that you keep standalone BACKUP on the system disk and on tape cassettes. Usually you boot standalone BACKUP from the system disk because it saves time. However, you need a copy of standalone BACKUP on tape cassettes in case the system disk becomes damaged.

4.1.1 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], use the following procedure:

- 1 Log in to the SYSTEM account.
- 2 Enter the following command and press Return:

```
$ @SYS$UPDATE:STABACKIT SYS$SYSDEVICE:
```

The procedure places the files in the directories [SYSE.SYSEXE] 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 Create a boot command procedure that lets you boot standalone BACKUP from [SYSE]. For more information, see Section 4.1.2.

4.1.2 Booting Standalone BACKUP from the System Disk

The following sections describe booting standalone BACKUP from a system disk on a local drive and on an HSC drive.

Backup Procedures

4.1 Using Standalone BACKUP

4.1.2.1 Local Drive

If the system disk is on a local drive, use the following procedure to boot standalone BACKUP from [SYSE]:

- 1 Make sure the console TU58 is in the console tape cassette drive and the keylock switch is set to LOCAL.
- 2 Set the BOOT DEVICE switch to correspond to the drive that holds the system disk.
- 3 If the VMS operating system is not running, go to step 4.

If the VMS operating system is running, log in to the SYSTEM account. Enter the following command and press Return:

```
$ @SYSSSYSTEM:SHUTDOWN
```

Answer the questions. When the procedure asks if an automatic system 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
```

- 4 Press Ctrl/P.
- 5 At the console-mode prompt (>>>), enter the following command and press Return:

```
>>> B/5 E0000000
```

- 6 The procedure might ask 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) 19-JUN-1990 15:00
```

- 7 The procedure displays a list of the local devices on your system and, if you have them, HSC and MSCP-served devices. For example:

```
Available device DJA2:    device type RA60
Available device DJA3:    device type RA60
.
.
```

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.

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

```
%BACKUP-I-IDENT, standalone BACKUP V5.4; the date is 19-JUN-1990 15:00
$
```

If you have not yet made a backup copy of the system disk, follow the directions in Section 4.2.

Backup Procedures

4.1 Using Standalone BACKUP

4.1.2.2 HSC Drive

You need a special boot command procedure to boot standalone BACKUP from an HSC system disk. DIGITAL recommends that you modify an existing boot command procedure. Ideally, this should be the default boot command procedure, DEFBOO.CMD.

You can choose any unique name in the form xxxBOO.CMD for the command procedure you create. However, DIGITAL suggests you use an existing file name and change the first letter to an X. For example, if you use a copy of DEFBOO.CMD, name the new file XEFBOO.CMD.

To create a boot command procedure that boots standalone BACKUP from [SYSE], use the following procedure. The procedure assumes you are making a copy of DEFBOO.CMD and renaming it XEFBOO.CMD.

- 1 Make sure the console TU58 is in the console tape cassette drive.
- 2 Log in to the SYSTEM account.
- 3 To connect the console drive to the system, enter the following commands and press Return after each one:

```
$ RUN SYSS$SYSTEM:SYSGEN
SYSGEN> CONNECT CONSOLE
SYSGEN> EXIT
```

- 4 Use the EXCHANGE Utility to copy DEFBOO.CMD to the current directory on the system disk. Enter the following command and press Return:

```
$ EXCHANGE COPY CSA1:DEFBOO.CMD XEFBOO.CMD
```

- 5 Edit XEFBOO.CMD. Change the line that deposits a value in register 5 (R5). Change the left-most digit so that it specifies the [SYSE] directory. For example:

```
D/G/L 5 E0000000 !designated root is SYSE
```

- 6 Exit from the editor to save the modified version of the file.
- 7 To copy XEFBOO.CMD to the console TU58, enter the following command and press Return:

```
$ EXCHANGE COPY XEFBOO.CMD CSA1:XEFBOO.CMD
```

- 8 When you are finished, enter the following command and press Return:

```
$ DISMOUNT CSA1
```

- 9 To secure the console TU58 from unauthorized access, you must enter the following command and press Return:

```
$ MOUNT/FOREIGN/SYSTEM/NOWRITE/NOASSIST CSA1
```

After you copy XEFBOO.CMD to the console TU58, you can use it to boot standalone BACKUP from a system disk on an HSC drive. To boot standalone BACKUP from [SYSE], use the following procedure:

- 1 Make sure the console TU58 is in the console tape cassette drive and the keylock switch is set to LOCAL.
- 2 If the VMS operating system is not running, go to step 3.

Backup Procedures

4.1 Using Standalone BACKUP

If the VMS operating system is running, log in to the SYSTEM account. Enter the following command and press Return:

```
$ @SYSSYSTEM:SHUTDOWN
```

Answer the questions. When the procedure asks if an automatic system 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
```

3 Press Ctrl/P.

4 At the console-mode prompt (>>>), enter the following command and press Return:

```
>>> B/800 DDA0
```

5 At the BOOT58> prompt, enter the following command and press Return:

```
BOOT58> @XEFBOO.COMD
```

6 The procedure might ask 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) 19-JUN-1990 15:00
```

7 The procedure displays a list of the local devices on your system and, if you have them, HSC and MSCP-served devices. For example:

```
Available device DJA2:    device type RA60
Available device DJA3:    device type RA60
.
.
```

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.

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

```
%BACKUP-I-IDENT, standalone BACKUP V5.4; the date is 19-JUN-1990 15:00
$
```

If you have not yet made a backup copy of the system disk, follow the directions in Section 4.2.

4.1.3 Installing Standalone BACKUP on Tape Cassettes

DIGITAL recommends that you keep standalone BACKUP on tape cassettes in case the system disk becomes damaged. To install standalone BACKUP on tape cassettes, use the following procedure.

Note: If you have the VMS magnetic tape distribution kit, you already have standalone BACKUP on tape cassettes. If the original tape cassettes become damaged or you want to make extra copies, use this procedure.

Backup Procedures

4.1 Using Standalone BACKUP

- 1 Obtain five TU58 tape cassettes. Affix a paper label to each one. Use a felt-tip pen to write a name on each one. Use the following names:

```
S/A BKUP TU58 V5.4 1/6
S/A BKUP TU58 V5.4 2/6
S/A BKUP TU58 V5.4 3/6
S/A BKUP TU58 V5.4 4/6
S/A BKUP TU58 V5.4 5/6
S/A BKUP TU58 V5.4 6/6
```

A paper label is the label affixed to a tape cassette. The procedure displays a volume label, not the paper label, in messages. A volume label is the name the VMS operating system uses to refer to a tape cassette.

- 2 Log in to the SYSTEM account.
- 3 Enter the following command and press Return:
- 4 The procedure asks you for the name of the target device. Enter CSA1 and press Return. For example:

```
$ @SYS$UPDATE:STABACKIT
```

```
%STABACKIT-I-SYMDEL, all global symbols deleted
Enter the name of the device on which to build the kit:  CSA1
SYSGEN CONNECT CONSOLE was used to make the console device available.
```

- 5 The procedure displays the following messages. Press Return (for YES) after each question.

```
The standalone kit requires six TU58 cartridges. The first five
TU58 cartridges contain the standalone VMS system files, the last
TU58 cartridge contains the BACKUP application image.
```

```
The system kit and the application kit can be built separately.
```

```
Do you want to build the system kit? [Yes/No, default Yes]:
```

```
Do you want to build the application kit? [Yes/No, default Yes]:
```

- 6 The procedure gives you two options that you can use to verify the reliability of the standalone BACKUP kit. It uses the ANALYZE/MEDIA Utility to check for bad blocks. ANALYZE/MEDIA is only relevant for diskettes and disks.

The procedure can also verify each file that it copies. This adds another hour and a half to the time it takes the procedure to run. DIGITAL suggests that you enter Y and press Return when the procedure asks the following question:

```
Do you want to verify copies? [Yes/No, default No]:  Y
```

- 7 The procedure displays the following messages:

```
Sysgen parameters for standalone VMS have been placed in file
SYS$SYSROOT:<SYSUPD>VAXVMS$SYS.PAR-TEMP-46E00121;1
```

```
Please place the first system TU58 cartridge in drive _CSA1:.
This volume will receive the volume label SYSTEM_1.
```

```
Enter "YES" when ready:
```

- 8 Insert the first tape cassette into the console tape cassette drive. When you are ready to continue, enter Y and press Return.

Backup Procedures

4.1 Using Standalone BACKUP

- 9 The procedure mounts the tape cassette, copies a set of system files, and displays a number of informational messages. For example:

```
%MOUNT-I MOUNTED, SYSTEM_1 mounted on _CSA1:
%CREATE-I-CREATED, _CSA1:<SYS0.SYSEXE> created
%CREATE-I-CREATED, _CSA1:<SYS0.SYSS$LDR> created
.
.
```

- 10 When the last file is copied, the procedure asks you to insert the next tape cassette. Remove the tape cassette that is in the drive, and insert the next one in the sequence. When you are ready to continue, enter Y and press Return. For example:

```
Please place the second system TU58 cartridge in drive _CSA1:.
This volume will receive the volume label SYSTEM_2.

Enter "YES" when ready: Y
```

- 11 Repeat step 10 until the files are copied to the last tape cassette, and the procedure displays the following message:

```
The console volume will be mounted /NOWRITE for protection.
Please make sure that the original console TU58 cartridge is
in the drive CSA1:.

Enter "YES" when ready:
```

- 12 Remove the last tape cassette and insert the console TU58. When you are ready to continue, enter Y and press Return. When the procedure finishes, it displays the following message:

```
The kit is complete.
```

4.1.4 Booting Standalone BACKUP from Tape Cassettes

If the system disk containing standalone BACKUP should become unusable, you can boot standalone BACKUP from TU58 tape cassettes. You need the six tape cassettes that contain standalone BACKUP. They are labeled similar to the following:

Paper Label ¹	Volume Label ²
S/A BKUP TU58 V5.4 1/6	SYSTEM_1
S/A BKUP TU58 V5.4 2/6	SYSTEM_2
S/A BKUP TU58 V5.4 3/6	SYSTEM_3
S/A BKUP TU58 V5.4 4/6	SYSTEM_4
S/A BKUP TU58 V5.4 5/6	SYSTEM_5
S/A BKUP TU58 V5.4 6/6	BACKUP

¹A paper label is a label affixed to a tape cassette.

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

The procedure asks you to place the tape cassettes containing standalone BACKUP, successively, in the console drive. Booting standalone BACKUP from tape cassettes takes approximately one and a half hours.

Backup Procedures

4.1 Using Standalone BACKUP

- 1 Make sure the console TU58 is in the console tape cassette drive and the keylock switch is set to LOCAL.

- 2 If the VMS operating system is not running, go to step 3.

If the VMS operating system is running, log in to the SYSTEM account. Enter the following command and press Return:

```
$ @SYSSSYSTEM:SHUTDOWN
```

Answer the questions. When the procedure asks if an automatic system 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
```

- 3 Press Ctrl/P.

- 4 At the console-mode prompt (>>>), start the BOOT58 program. Enter the following command and press Return:

```
>>> B/800 DDA0
```

- 5 At the BOOT58> prompt, enter the following command and press Return:

```
BOOT58> @CSABOO.CMD
```

The red light next to the console tape cassette drive flashes. The RUN light glows green. The procedure displays a series of messages similar to the following:

```
! CS1 BOOT COMMAND FILE - CS1BOO.CMD
!
D/G 0 40 ! CONSOLE BLOCK STORAGE
.
.
.
```

```
Please remove the volume "750 console" from the console device.
Insert the first standalone system volume and enter "YES" when ready:
```

- 6 Remove the console TU58 and insert the first standalone BACKUP tape cassette into the console tape cassette drive. When you are ready to continue, enter Y and press Return. The procedure displays the following messages:

```
Resuming load operation on volume "SYSTEM_1", please stand by...
```

```
Please remove the volume "SYSTEM_1" from the console device.
Insert the next standalone system volume and enter "YES" when ready:
```

Notice that the red light to the left of the console tape cassette drive glows and flashes while the tape is being read.

- 7 Remove the standalone BACKUP tape that is in the drive, and insert the next one in the sequence. When you are ready to continue, type Y and press Return. The procedure displays messages similar to the following:

```
Resuming load operation on volume "SYSTEM_2", please stand by...
```

```
VAX/VMS Version V5.4 Major version id = 1 Minor version id = 0
```

```
Please remove the volume "SYSTEM_2" from the console device.
Insert the next standalone system volume and enter "YES" when ready:)
```


Backup Procedures

4.1 Using Standalone BACKUP

- 8 Repeat step 7 until the procedure prompts 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) 19-JUN-1990 15:00
```

- 9 The procedure displays a list of the local devices on your system and, if you have them, HSC and MSCP-served devices. For example:

```
Available device DJA2:    device type RA60
Available device DJA3:    device type RA60
.
.
```

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.

- 10 The procedure displays the following messages:

```
Please remove the volume "SYSTEM_5" from the console device.
Insert the standalone application volume and enter "YES" when ready:
```

Remove the tape cassette in the drive, and insert the last standalone BACKUP tape cassette into the drive. When you are ready to continue, enter Y and press Return. The procedure displays the following message:

```
Resuming load operation on volume "BACKUP", please stand by...
```

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

```
%BACKUP-I-IDENT, standalone BACKUP V5.4; the date is 19-JUN-1990 15:00
$
```

To backup the system disk, go to Section 4.2.

To restore the system disk, follow the directions in Section 4.3.

4.2 Backing Up the System Disk

Standalone BACKUP 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

4.2 Backing Up the System Disk

To backup the system disk, use the following procedure:

- 1 Obtain a scratch disk or tape that you can use for the backup copy. Place it in the appropriate drive. If you are using a tape drive, put it on line. If you are using a disk drive, spin it up.
- 2 Write-protect the system disk by pressing the Write Protect button on the disk drive.
- 3 Boot standalone BACKUP as described in Section 4.1.2 or Section 4.1.4.
- 4 Determine the device names of the drive holding the system disk and the drive holding the backup disk or tape. For the list of device names for a VAX-11/750, see Table 2-1.
- 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 magnetic tape, use the second command.

```
$ BACKUP/IMAGE/VERIFY source-drive: target-drive:
```

```
$ BACKUP/IMAGE/VERIFY source-drive: target-drive: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.
- *saveset.BCK* is the name of the saveset (the name should reflect the contents of the backup tape and cannot exceed 17 characters in length).
- *volume-label* is the volume label of the tape in the target-drive. If the tape has already been initialized, use the same volume label that was assigned by the INITIALIZE command. If the tape 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 DUA0: DUA1:
```

The following example uses the BACKUP command to make a backup tape. You must restore the contents of a backup tape to a disk before you can use them.

```
$ BACKUP/IMAGE/VERIFY DUA0: MSA0:DEC_31_1988.BCK/REWIND/LABEL=SYSDSK
```

- 6 When the procedure is finished, it displays the following message:

```
%BACKUP-I-PROCDONE, Operation completed. Processing finished at 19-JUN-1990 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:
```

- 7 Press Ctrl/P.
- 8 Reboot the system.

Store the backup copy of the system disk in a safe place.

Note: The **BACKUP** command creates a system disk that includes a **DIGITAL**-provided set of volume parameters, 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*.

4.3 Restoring the System Disk

To restore the system disk, use the following procedure:

- 1 Write-protect the backup disk or tape.
- 2 Place the backup disk or tape in an appropriate drive. If you are using a tape drive, put it on line. If you are using a disk drive, spin it up.
- 3 Boot standalone **BACKUP** as described in Section 4.1.2 or Section 4.1.4.
- 4 Place a scratch disk in the drive you intend to use for the new system disk. Spin it up but do not write-protect it.
- 5 Determine the device names of the drive holding the system disk and the drive holding the backup disk or tape. For the list of device names for a VAX-11/750, see Table 2-1.
- 6 Enter the **BACKUP** command in one of the following formats. If you have a backup disk, use the first command. If you have backup tape, use the second command.

```
$ BACKUP/IMAGE/VERIFY source-drive: target-drive:  
$ BACKUP/IMAGE/VERIFY source-drive: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.
- *saveset* is the name of the saveset, if you have a backup tape.
- *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 DUA1: DUA0:
```

Backup Procedures

4.3 Restoring the System Disk

The following example uses the BACKUP command to restore the system disk from a backup tape.

```
$ BACKUP/IMAGE/VERIFY MSA0:DEC_31_1988.BCK/REWIND DUAL:
```

7 When the procedure is finished, it displays the following message:

```
%BACKUP-I-PROCDONE, Operation completed. Processing finished at 19-JUN-1990 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:
```

8 Press Ctrl/P.

9 Reboot the system.

4.4 Backing Up the Console TU58

Make a backup copy of the console TU58 to protect against corruption or loss of the original. First, use CONSCOPY.COM to restore the files on the console TU58 to a directory on the system disk. Then use CONSCOPY.COM to *restore* the files to a new tape cassette.

To restore the console files to the system disk, use the following procedure:

1 Make sure the console TU58 is in the console tape cassette drive.

2 Log in to the SYSTEM account.

3 Enter the following command and press Return:

```
$ @SYSSUPDATE:CONSCOPY
```

The procedure displays the following messages:

```
SYSSUPDATE:CONSCOPY.COM  
Save or restore a VMS console medium.  
Which CPU kit do you want to build?  
78X includes 11/780 and 11/785  
8600 includes 8650  
8200 includes 8250, 8300 and 8350  
[8600, 8200, 78X, 750 or 730, default 750]:
```

4 Press Return. The procedure displays the following messages:

```
A SAVE operation involves copying the console medium to  
an RT-11 virtual volume, which is a Files-11 file that  
is an image of the RT-11 console volume.  
  
A RESTORE operation involves copying the entire contents  
of a virtual volume to a console medium.
```

5 When the procedure asks which operation you want, enter SAVE and press Return. For example:

```
Do you want to SAVE or RESTORE your console TU58?: SAVE
```

6 The procedure asks you for the name of the *virtual disk* that you want the files to be saved on. Press Return to select the default (SYSSDISK:CONSOLE.DSK). For example:

```
Enter file name of virtual disk [default SYSSDISK:CONSOLE.DSK]:]
```

Backup Procedures

4.4 Backing Up the Console TU58

- 7 To verify the operation, press Return (for YES) in response to the following question:

Do you want log messages as files are copied? [Y/N, default YES]

- 8 The procedure asks for the name of the console drive. Enter CSA1: and press Return. For example:

Enter console device drive (DDCU): CSA1:

- 9 When the procedure displays the following message, press Return (the console TU58 is already in the drive):

Put your console TU58 cartridge into drive _CSA1:,
and enter Return when ready:

After you press Return, the procedure mounts the console TU58 and uses the Exchange Utility to begin the *save* operation. The procedure displays several EXCHANGE messages, file header information, and a list of the files that are being saved. When the procedure is complete, it displays the following message:

The SAVE of your console TU58 cartridge is complete.

To save the files that are on the system disk to a new tape cassette, use the following procedure:

- 1 Enter the following command and press Return:

```
$ @SYSSUPDATE:CONSCOPY
```

The procedure displays the following messages:

```
S Y S $ U P D A T E : C O N S C O P Y . C O M
      Save or restore a VMS console medium.
Which CPU kit do you want to build?
      78X includes 11/780 and 11/785
      8600 includes 8650
      8200 includes 8250, 8300 and 8350
[8600, 8200, 78X, 750 or 730, default 750]:
```

- 2 Press Return. The procedure displays the following messages:

```
A SAVE operation involves copying the console medium to
an RT-11 virtual volume, which is a Files-11 file that
is an image of the RT-11 console volume.
```

```
A RESTORE operation involves copying the entire contents
of a virtual volume to a console medium.
```

- 3 When the procedure asks which operation you want, enter RESTORE and press Return. For example:

Do you want to SAVE or RESTORE your console TU58 cartridge?: RESTORE

- 4 The procedure asks for the name of the *virtual disk* from which the files are to be restored. Press Return to select the default (SYSSDISK:CONSOLE.DSK). For example:

Enter file name of virtual disk [default SYSSDISK:CONSOLE.DSK]:

- 5 To verify the operation, press Return in response to the following question:

Do you want log messages as files are copied? [Y/N, default YES]

Backup Procedures

4.4 Backing Up the Console TU58

- 6 The procedure asks for the name of the console drive. Enter CSA1: and press Return. For example:

```
Enter console device drive (DDCU:): CSA1:
```

- 7 The procedure displays the following message:

```
Put your console TU58 cartridge into drive _CSA1:,  
and enter Return when ready:
```

Remove the console TU58 from the console tape cassette drive. Insert the new tape cassette in the drive. When you are ready to continue, press Return.

- 8 The procedure mounts the tape cassette and uses the Exchange Utility to begin the *restore* operation. The procedure displays several EXCHANGE messages, file header information, and a list of the files that are being restored. When the procedure is complete, it displays the following message:

```
The RESTORE of your console TU58 cartridge is complete.
```

Use the console TU58 that you just created to make sure it works. Treat the original as the backup copy.

Glossary

boot or bootstrap: The process of loading system software into a computer's main memory. This guide uses the term *boot* to refer to this process.

boot command procedure: A program stored on the console TU58 that is used to boot the VMS operating system from a specified drive. DIGITAL provides a boot command procedure for each device that the system supports.

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 cluster common files; other nodes in the cluster (satellite nodes) can access these files. See also *satellite node*.

BOOT58: A program stored on the console TU58 that is used to boot the VMS operating system from either an HSC drive or a local drive.

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.

CI750: An interface between the memory interconnect (CMI) of the CPU on a VAX-11/750 and the computer interconnect (CI).

CI780: An interface between the synchronous backplane interface (SBI) of the CPU on the VAX-11/780 and VAX 8600 families and the computer interconnect (CI).

computer interconnect: A computer interconnect (CI) is a type of I/O subsystem. It links VAX computers to each other and to HSC devices.

console mode: In console mode you control the system through the console subsystem.

console TU58: The TU58 tape cassette that contains the console program. It is not shipped as part of the VMS distribution kit. The console TU58 is used in the console tape cassette drive.

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.

Hierarchical Storage Controller (HSC) device: A self-contained, intelligent, mass storage subsystem that lets computers in a VAXcluster environment share disks. Examples of HSC devices are the HSC50 and the HSC70.

HSC drive: Any drive that is connected to an HSC device is referred to as an HSC drive. A system disk on an HSC drive can be shared by several computers in a VAXcluster environment.

Glossary

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.

local drive: Any drive that is connected directly to a computer is referred to as a local drive.

Mass Storage Control Protocol (MSCP): The protocol used to communicate between a VAX computer and a disk or tape controller. An MSCP server makes local MASSBUS, UNIBUS, and UDA50 disks accessible to all the nodes in a VAXcluster environment.

MASSBUS: A high-speed I/O subsystem. Some of the devices that can be connected to the MASSBUS are RM05 disk drives, RP07 disk drives, and TA78 magnetic tape drives.

media: A generic term that refers to any packaging agent capable of storing computer software. Examples of media are magnetic tapes, floppy diskettes, disk packs, tape cartridges, etc.

mixed-interconnect VAXcluster: A computer system consisting of a number of VAX computers. It uses both the computer interconnect (CI) and Ethernet to communicate with other VAX computers in the cluster.

program mode: In program mode you control the system through the VMS operating system.

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 disk: A blank disk or a disk with files that you no longer need.

spin up/spin down: To spin up means to bring a disk drive up to operating speed. To spin down means to bring it to a gradual stop.

standalone BACKUP: A version of the Backup Utility that runs from memory without the control of the VMS operating system.

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.

UDA50: An intelligent disk drive controller that supports up to four disk drives on the UNIBUS.

UNIBUS: A medium-speed I/O subsystem. Some of the devices that can be connected to the UNIBUS are UDA50s, RL02 disk drives, and TU81 magnetic tape drives.

VAXcluster environment: A computer system consisting of a number of VAX computers. There are three types of VAXcluster environments: CI-only, local area, and mixed-interconnect.

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 customize your system disk.

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