OpenVMS VAX Upgrade and Installation Supplement: VAX 8530, 8550, 8810 (8700), and 8820–N (8800)

Order Number: AA–PS6QA–TE

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This document supplements the current version of the *Upgrade and Installation Manual* with information specific to VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers. This information includes startup, shutdown, and backup procedures.

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Contents

4 Backup Procedures

A Logical Console Terminals

Glossary

Index

Figures

Tables

Preface

The *OpenVMS VAX Upgrade and Installation Supplement: VAX 8530, 8550, 8810 (8700), and 8820–N (8800)* contains installation and upgrade information specific to VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers. Use it in conjunction with the *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 *Upgrade and Installation Manual* for the VMS version that you are installing or upgrading to. It is your primary source for step-by-step upgrade and installation procedures.

4. Refer to this supplement for computer-specific information when the *Upgrade and Installation Manual* directs you to do so.

5. Store this supplement and the *Upgrade and Installation Manual* in the binder that contains the *VMS Release Notes*.

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Intended Audience

The *OpenVMS VAX Upgrade and Installation Supplement: VAX 8530, 8550, 8810 (8700), and 8820–N (8800)* is intended for anyone responsible for installing or upgrading the VMS operating system on VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers.

Document Structure

This manual is organized as follows:

- Chapter 1 describes the parts of 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.

- Appendix A describes logical console terminals.

- 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 *Upgrade and Installation Manual*, which is your primary source of upgrade and installation information. Use the *Upgrade and Installation Manual* in conjunction with the *OpenVMS VAX Upgrade and Installation Supplement: VAX 8530, 8550, 8810 (8700), and 8820–N (8800)* when you are performing an installation or an upgrade.

- The *VMS Release Notes*, which provides important information on various aspects of the VMS operating system. You should read the current version of the *VMS Release Notes* before installing, upgrading, or updating the VMS operating system or using your VAX computer.

- The hardware manuals that are supplied with your VAX computer. These manuals provide detailed information about your system hardware.

Restrictions

If you are running VAX–11 RSX (a software product that lets you run RSX applications on VAX computers), note the following compatibility mode restrictions:

- VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers do not include hardware support for the PDP–11 instruction set that VAX–11 RSX uses; those instructions are now emulated in software. This causes RSX applications to experience performance degradation.

- The TECO editor that is packaged with the VMS operating system is implemented in PDP–11 compatibility mode. Therefore, to use the TECO editor on VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers, you need to first install VAX–11 RSX.

Conventions

In this manual, every use of VAX VMS means the OpenVMS VAX operating system.

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.
PF1 x	A sequence such as PF1 x indicates that you must first press and release the key labeled PF1, then press and release another key or a pointing device button.
Return	In examples, a key name enclosed in a box indicates that you press a key on the keyboard. (In text, a key name is not enclosed in a box.)

. . .	A horizontal ellipsis in examples indicates one of the following possibilities:
	• Additional optional arguments in a statement have been omitted.
	• The preceding item or items can be repeated one or more times.
	• Additional parameters, values, or other information can be entered.
. . .	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.
( )	In format descriptions, parentheses indicate that, if you choose more than one option, you must enclose the choices in parentheses.
[ ]	In format descriptions, brackets indicate optional elements. You can choose one, none, or all of the options. (Brackets are not optional, however, in the syntax of a directory name in a VMS file specification, or in the syntax of a substring specification in an assignment statement.)
{ }	In format descriptions, braces surround a required choice of options; you must choose one of the options listed.
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 manual.
italic text	Italic text emphasizes important information, indicates variables, and indicates complete titles of manuals. Italic text also represents information that can vary in system messages (for example, Internal error *number*), command lines (for example, /PRODUCER=*name*), and command parameters in text.
UPPERCASE TEXT	Uppercase text indicates a command, the name of a routine, the name of a file, or the abbreviation for a system privilege.
-	A hyphen in code examples indicates that additional arguments to the request are provided on the line that follows.
numbers	All numbers in text are assumed to be decimal, unless otherwise noted. Nondecimal radixes—binary, octal, or hexadecimal—are explicitly indicated.
mouse	The term *mouse* refers to any pointing device, such as a mouse, a puck, or a stylus.
MB1, MB2, MB3	MB1 indicates the left mouse button, MB2 indicates the middle mouse button, and MB3 indicates the right mouse button. (The buttons can be redefined by the user.)
PB1, PB2, PB3, PB4	PB1, PB2, PB3, and PB4 indicate buttons on the puck.
SB, SB	SB and SB indicate buttons on the stylus.

1

Console Subsystem

Before you install or upgrade the VMS operating system, you need to be familiar with the console subsystem. In general, use the console subsystem to examine and deposit data in memory or processor registers, stop the processor, and boot the operating system. During installation, use it to boot the system and monitor the installation process. The console subsystem consists of the following:

- Console terminal and optional printer
- PDP–11 microcomputer
- Console fixed disk drive
- Console dual-diskette drive
- Console command language

This chapter describes the parts of the console subsytem that you use to install or upgrade the VMS operating system. For a complete description of the console subsystem, see the hardware manuals supplied with your system.

1.1 Console Terminal

The console terminal is the video terminal attached to the console microcomputer. It is named OPA0. The console terminal is the only terminal on the system that can execute all the console mode commands. Use it to control and monitor system operations. You can also set up logical console terminals. For more information, see Appendix A.

A Digital diagnostics center uses a *remote console terminal* (located at the diagnostics center) to control system operations during diagnostic testing. A remote console terminal is named OPA5. It can execute a subset of the console commands.

During the VMS installation procedure, Digital recommends that you keep track of system operations. There are two ways to keep track of system operations:

- View the console log file on the terminal
- Send the information to a printer

The console terminal keeps a record of system operations in a *console log file.* For example, information that has scrolled off the terminal screen is stored in the console log file. To view the contents of this file, enter the SHOW LOGFILE command.[1] You can then use the following commands and key combinations to move through the console log file:

- PREV SCREEN—Enables you to move up in the file
- NEXT SCREEN—Enables you to move down in the file

---

[1] On a VAX 8820-N (8800) processor, the SHOW LOGFILE command displays the log file for the CPU that the terminal is currently connected to.

- Arrow keys—Move the cursor in the indicated direction

- Ctrl/C—Enables you to exit from the log file and return to console mode

Another way to keep track of system operations is to attach a printer to the console subsystem. The printer can then record the terminal display. To send the terminal display to the printer, enter the following command and press Return:

```
>>> ENABLE PRINTER
```

To stop sending the terminal display to the printer, enter the following command and press Return:

```
>>> DISABLE PRINTER
```

1.2 Console Fixed Disk Drive

The console fixed disk is the primary storage device for the console subsystem. It contains the console software and is referred to as CSA3. The VMS operating system has only read access to the console fixed disk. The operating system of the console microcomputer (P/OS) has full access.

1.3 Console Dual-Diskette Drive

The console dual-diskette drive is the secondary storage device for the console subsystem. It consists of two diskette drives on the front of the microcomputer. The diskette drive located on the top (in some models it is on the left) is referred to as CSA1. The diskette drive located on the bottom (in some models it is on the right) is referred to as CSA2. These drives hold the RX50 diskettes that do the following tasks:

- Install updates and optional products

- Install standalone BACKUP

1.3.1 Inserting or Removing a Floppy Diskette

To insert a floppy diskette into console diskette drive CSA1, see Figure 1–1 and follow steps 1 through 6.

To remove a floppy diskette, follow steps 1 through 3.

1. Check the drive to ensure that it is inactive. The red light for the drive should be off. Do not open the diskette drive door if the red light is glowing or flashing.

2. Press the upper portion of the top door to open the CSA1 diskette drive or press the lower portion of the bottom door to open the CSA2 diskette drive.

Figure 1–1   Inserting a Diskette into CSA1

Write–Protect
Notch

Read/Write
Access Slot

Alignment
Arrow
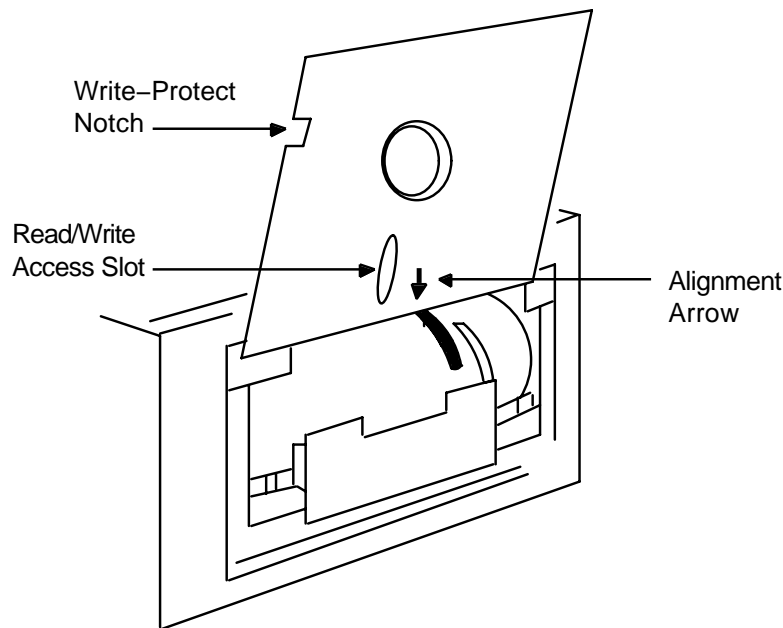
ZK–5192–GE

3. If there is a floppy diskette in the drive already, remove it gently, taking
    care not to touch any exposed platter surfaces. Place the diskette in a paper
    envelope.

4. Remove the diskette that you want to insert from its paper envelope. Do not
    touch any exposed platter surfaces.

5. Align the diskette so that the orange arrow on the diskette is in line with
    the orange bar on the drive. Slide the diskette into the compartment. (If the
    diskette is aligned improperly, error messages are displayed on the console
    terminal screen. If an error message appears, remove the diskette, realign it,
    and reinsert it.)

6. Close the diskette drive door.

1.4 Console Subsystem Modes

The console subsystem runs in five different modes. Most of the time the system
runs in either program mode or console mode.

*   **Program mode**—When the console subsystem is in program mode, the VMS
    operating system is running and the dollar sign prompt ($) is displayed. In
    program mode, 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. You can also press Ctrl/P to suspend program mode temporarily and go to console mode. To return to program mode when the CPU is running, enter the SET TERMINAL PROGRAM command. To get back to program mode when the CPU is stopped, enter the CONTINUE command.

- **Console mode**—When the console subsystem is in console mode, the VMS operating system is not running and the console-mode prompt (>>>) is displayed. In console mode, you control and monitor system operations. The CPU can be running or it can be stopped. When the CPU is running, it responds to a limited number of console commands. When the CPU is stopped, it responds to most console commands.

  To go from console mode to program mode while the CPU is running, enter the SET TERMINAL PROGRAM command.

From console mode, you can access three other modes. Choose the appropriate mode for the function you want.

- **P/OS-DCL mode**—Used to modify files on the console fixed disk using standard DCL commands. To go to P/OS-DCL mode, enter the EXIT command at the console-mode prompt (>>>). To return to console mode from P/OS-DCL mode, enter the RUN CONTROL command at the P/OS-DCL prompt ($).

- **P/OS mode** —Used to modify files on the console fixed disk using menu-driven commands. To go to P/OS mode, enter the EXIT command at the P/OS-DCL prompt ($). A menu item returns you directly to console mode from P/OS mode.

- **Micromonitor mode**—Used to run diagnostics. For more information, see the *Console User's Guide*. To return to console mode from micromonitor mode, enter the EXIT command at the micromonitor prompt (MIC>).

1.5 Console Command Language

The console subsystem on VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers is different from that of other VAX computers. It does not have a control panel with lights and switches. Use the console command language to control all functions. The console command language lets you do the following tasks:

- Turn on the system

- Boot the system

- Provide information on the operational state of the CPU and other system components

- Dictate how the system reacts to initial booting, shutdowns, and restarts

Table 1–1 describes some of the commonly used commands. You can use these commands when the system is in console mode.

Table 1–1   Console Commands

Command	Definition
BOOT	Boots the system. During the installation procedure use the abbreviation, B, for the BOOT command. The following example uses the boot command procedure DEFBOO.COM to boot the system: `>>> B`

ENABLE/DISABLE AUTO BOOT	In combination with AUTO RESTART, determines how the system reacts after one of the following events:
	
	• The system is initialized.
	
	• A power failure occurs.
	
	• An error halt after a restart attempt fails.
	
	For example, the following commands cause the system to automatically reboot after any of the events listed above:
	
	`>>> DISABLE AUTO RESTART`
	`>>> ENABLE AUTO BOOT`
	
	The following command prevents the system from automatically rebooting after any of the events listed above:
	
	`>>> DISABLE AUTO BOOT`

ENABLE/DISABLE AUTO POWERON	Determines what happens when power is restored after a power failure. For example, the following command automatically applies power to the CPU when power is restored after a power failure.
	
	`>>> ENABLE AUTO POWERON`
	
	The following command prevents the automatic application of power to the CPU when power is restored after a power failure:
	
	`>>> DISABLE AUTO POWERON`

ENABLE/DISABLE AUTO RESTART	In combination with AUTO BOOT, determines what happens after a power failure or an error halt. For example, the following command causes automatic restart after a power failure or an error halt:
	
	`>>> ENABLE AUTO RESTART`
	
	The following command prevents automatic restart after a power failure or an error halt:
	
	`>>> DISABLE AUTO RESTART`
	
	AUTO RESTART takes precedence over AUTO BOOT. If AUTO RESTART and AUTO BOOT are both enabled, the system first tries to restart. If the system is unable to restart, it tries to reboot.

(continued on next page)

Table 1–1 (Cont.)   Console Commands

Command	Definition

HALT	Halts the CPU execution of macro instructions. Use the HALT command to stop the CPU, as follows:
	
	```>>> HALT```
	
	Note that if you halt the system *before* a boot completes, you must also enter the CLEAR RESTART_FLAGS command to clear the WARM_RESTART and COLD_RESTART flags (see your hardware manuals for more about these commands). For example:
	
	```>>> HALT```
	```>>> CLEAR RESTART_FLAGS```
	
	Clearing these flags prevents the automatic boot and restart procedures from looping indefinitely when you enter the next BOOT command.
	
	Do *not* use the HALT command for a system shutdown; use the procedures described in Chapter 3.

POWER	Changes the state of the power system. For example, the following command turns on power for the entire system (except for the EMM, which is already on):
	
	```>>> POWER ON```
	
	The following command turns off power for all components of the system except the EMM and memory. The contents of memory are preserved.
	
	```>>> POWER STANDBY```
	
	The following command turns off power for the entire system except the EMM (the only time power is off for the EMM is when a power disruption occurs or the circuit breaker that controls power to the system is tripped):
	
	```>>> POWER OFF```

ENABLE/DISABLE REMOTE CONSOLE	In combination with REMOTE USER, determines the status of a remote console terminal. For example, the following command allows a remote terminal (connected to the communications port of the console) to enter console mode and function as a remote console terminal:
	
	```>>> ENABLE REMOTE CONSOLE```
	
	The following command prevents a remote terminal connected to the communications port of the console from entering console mode and functioning as a remote console terminal:
	
	```>>> DISABLE REMOTE CONSOLE```
	
	Disabling the remote console automatically enables the remote user.

Table 1–1 (Cont.) Console Commands

Command	Definition
ENABLE/DISABLE REMOTE USER	Causes a remote console terminal to operate as an ordinary terminal. The terminal cannot enter console mode. Pressing Ctrl/P has no effect.
SHOW CPU	Displays the operational state of the CPU. On a VAX 8820-N (8800) computer, this command displays the operational state of both CPUs.

Table 1–2 lists some commands you can use when the system is in console mode and the CPU is stopped.

Table 1–2 Console Commands Requiring the CPU to Be Stopped

Command	Definition
CONTINUE	Resumes execution of macro instructions and switches the console back to program mode.
DEPOSIT	Puts a value in the specified register or memory location.
EXAMINE	Displays the contents of a specified address.
INITIALIZE	Sets selected and available CPUs or memory to a defined initial state.

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

2

Installing the VMS Operating System

The *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 *Upgrade and Installation Manual*.

Refer to this chapter for installation information specific to VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers, such as the following:

- Specifying device names (Section 2.1.1)

- Turning on the system and initializing the hardware for the first time (Section 2.1.2)

- Editing the boot command procedures (Section 2.1.3)

- Editing DEFBOO.COM (Section 2.1.4)

- Completing the hardware initialization (Section 2.1.5)

- Booting standalone BACKUP (Section 2.2)

- Booting the new system disk (Section 2.3)

---------------------------------- **Note** ----------------------------------

The screen displays and examples in this manual depict the installation of VMS Version 5.4. 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, read the *VMScluster Systems for OpenVMS*.

2.1 Before Installing VMS

The following sections describe operations you must perform before you install the VMS operating system. These include specifying device names, turning on the system, initializing the hardware, editing certain boot command procedures, editing DEFBOO.COM, and completing the hardware initialization.

2.1.1 Specifying Device Names

At different times during the installation, you need to tell the system which drive contains the distribution magnetic tape and which drive contains the system disk. You refer to a drive by its *device name*. 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 drive.

- *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 drive.

---------------------------- **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, CSA1 and CSA2 are the device names for the console diskette drives. *CS* is the device code for the console drives. *A* names the controller (the controller provides the interface between the processor and the drive). *1* and *2* are their unit numbers.

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 8530, VAX 8550, VAX 8810 (8700), or VAX 8820-N (8800) system.

Table 2–1   Device Names for VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers

Device	Device Name[1]
Console diskette drives	CSA1, CSA2
Console fixed disk	CSA3
RA60 disk drive	DJcu
RA70, RA80, RA81, and RA82 disk drives	DUcu
TU80 magnetic tape drive	MScu
TA78, TU81, and TU81-plus magnetic tape drives	MUcu

[1]c stands for the controller designation, u stands for the unit number

---

You can use any of the disk drives (except the console drives) to hold the system disk. When choosing a system disk, you must 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.

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

Before you begin the installation procedure, make sure you know the device names for the drive that will hold the distribution magnetic tape and the drive that will hold the system disk.

2.1.2 Turning On the System and Initializing the Hardware

Follow these steps to turn on the system and initialize the hardware for the first time:

Note

This procedure assumes that you have already installed the console software and that you are familiar with the hardware manuals supplied with your system.

---

1. If the power to the console is turned off, push the console power switch to the 1 (On) position. If the power to the console is turned on, turn it off and then turn it on again.

   This automatically executes SYSINIT.COM, a command procedure that initializes the system hardware. The first time SYSINIT.COM executes, it exits to console mode.[1]

2. At the console-mode prompt (>>>), enter the following commands. Press Return after each one.

   ```
   >>> ENABLE AUTO POWERON
   >>> ENABLE AUTO BOOT
   >>> ENABLE AUTO RESTART
   ```

3. To change to P/OS-DCL mode, enter the EXIT command and press Return:

   ```
   >>> EXIT
   ```

   A message similar to the following is displayed:

```
19-JUN-90 12:15:45 *** WARNING, SYSTEM INITIALIZATION NOT COMPLETED
19-JUN-90 12:15:45 *** WARNING, INITIALIZE SYSTEM WHEN CONSOLE IS RUN AGAIN
EXITING FROM CONSOLE Version 6.0
$
```

4. If you have a VAX 8530, VAX 8550, or VAX 8810 (8700) computer, go to step 5. If you have a VAX 8820-N (8800) computer with more than one VAXBI power supply, go to step 5.

   If you have a VAX 8820-N (8800) computer with one VAXBI power supply, copy the EMM file DMMREGON.1BI to DMMREGON.DAT. Enter the following command and press Return:

   ```
   $ COPY DMMREGON.1BI DMMREGON.DAT
   ```

5. To edit the boot command procedures, go to Section 2.1.3.

---

[1] The system is in console mode because AUTO POWERON is disabled on all new systems. After you enable AUTO POWERON, SYSINIT.COM exits to program mode whenever you turn on the power to the console.

2.1.3 Editing Boot Command Procedures

During the installation procedure you are asked to boot the system. When you boot the system, a boot command procedure is used to deposit values in the processor registers, load the VMS operating system into memory, and start the CPU.

All the boot command procedures that you might need are stored on the console fixed disk (CSA3). On VAX 8530, VAX 8550, and VAX 8810 (8700) computers, they are stored in the [CONSOLE] directory. The VAX 8820-N (8800) computer uses its own, slightly different versions of these boot command procedures. The boot command procedures for a VAX 8820-N (8800) computer are stored in the [8800] directory. Table 2–2 lists the boot command procedures that are on the console fixed disk.

Table 2–2   Boot Command Procedures

BCIBOO.COM	Used to boot from an HSC disk on a CIBCI or a CIBCA[1]
BCIGEN.COM	Used for a conversational boot from an HSC disk on a CIBCI or a CIBCA
BCIXDT.COM	Used to boot with XDELTA from an HSC disk on a CIBCI or a CIBCA
BDABOO.COM	Used to boot from a disk attached to a KDB50 disk controller
BDAGEN.COM	Used for a conversational boot from a disk attached to a KDB50 disk controller
BDAXDT.COM	Used to boot with XDELTA from a disk attached to a KDB50 disk controller
UDABOO.COM	Used to boot from a disk attached to a UDA50 disk controller
UDAGEN.COM	Used for a conversational boot from a disk attached to a UDA50 disk controller
UDAXDT.COM	Used to boot with XDELTA from a disk attached to a UDA50 disk controller

[1]Use BCI for either the CIBCI or the CIBCA controller.

Before you can use these boot command procedures, you must edit certain lines. Some of the lines contain DEPOSIT commands that put the value zero in registers 1 through 5. You must edit these lines so that the DEPOSIT commands put the correct values for your system in the registers.

Edit the three boot command procedures that correspond to the controller type for your system disk. For example, if your system disk is attached to a CIBCI controller, edit BCIBOO.COM, BCIGEN.COM, and BCIXDT.COM. After you decide which boot command procedures you need to edit, check Table 2–3, Table 2–4, or Table 2–5 to find the correct values to deposit for your system.

To edit a boot command procedure, follow these steps:

1. After completing the steps in Section 2.1.2, the console subsystem should be in P/OS-DCL mode. The console prompt for P/OS-DCL mode is a dollar sign($).

   Before editing a boot command procedure, make a copy of it . Use the COPY command in the following format:

   ```
   $ COPY filename.COM filename.SAV
   ```

where *filename* is the file name of the boot command procedure. For example, to make a copy of BCIBOO.COM, enter the following command and press Return:

```
$ COPY BCIBOO.COM BCIBOO.SAV
```

If you have a VAX 8800 computer, specify the [8800] directory. For example:

```
$ COPY [8800]BCIBOO.COM [8800]BCIBOO.SAV
```

2. After you have copied a boot command procedure, edit the original. Enter the RUN EDT command and press Return. If you have a VAX 8530, VAX 8550, or VAX 8810 (8700) computer, enter the name of the file you want to edit and press Return. For example:

    ```
    $ RUN EDT
    EDT> BCIBOO.COM
    ```

    If you have a VAX 8820-N (8800) computer, specify the [8800] directory. For example:

    ```
    $ RUN EDT
    EDT> [8800]BCIBOO.COM
    ```

    The contents of the boot command procedure are displayed on the screen.

    _____ **Note** _____

    The P/OS-DCL EDT editor works just like the VMS EDT editor. If you need more information on using EDT, press the PF2 key for online help or see the *OpenVMS User's Manual*.

    _____

3. Change the DEPOSIT commands for R1 and R2. Use the values shown in Table 2–3, Table 2–4, or Table 2–5.

4. Delete the exclamation characters (!) that precede the DEPOSIT commands for R1 and R2.

5. Do not change the DEPOSIT command for R3 unless you want to force a specific unit to be booted every time. The value in R3 would then override any value specified in either a BOOT command or DEFBOO.COM.

    Do not change the DEPOSIT command for R5 unless you want to force the system to use specific boot flags.

6. When you have finished editing the boot command procedure, press Ctrl/Z. At the asterisk (*) prompt, enter the EXIT command and press Return:

    ```
    * EXIT
    ```

    The modified version of the boot command procedure is saved and the P/OS-DCL prompt ($) is displayed.

7. Repeat steps 1 through 6 for each boot command procedure that you need to edit.

8. To edit DEFBOO.COM, go to Section 2.1.4.

    _____ **Note** _____

    If you change the system configuration in the future, use the previous procedure to modify the boot command procedures.

    _____

Table 2–3 Values to Deposit in R1-R5: BCIBOO.COM, BCIGEN.COM, BCIXDT.COM

Register Number	Bit Position	Possible Values	Meaning
R1	<31:06>	Must be zero	No meaning.
	<05:04>	0-3 (hex)	The VAXBI that has the CIBCI or CIBCA that accesses the system disk. These processors support a maximum of four VAXBIs.
	<03:00>	0-F (hex)	The VAXBI node number of the CIBCI or CIBCA adapter.
R2	<31:16>	Must be zero	No meaning.
	<15:08>	0-F (hex)	Node number of the second HSC if the boot device is dual ported. If one of the HSCs is node 0, that node must be specified as the lowest byte. For example, 0100 means boot from either HSC 0 or 1, while 0001 means boot from HSC 1 only.
	<07:00>	0-F (hex)	Node number of the first HSC.
R3[1]	<31:00>		Unit number of the drive that holds the system disk (expressed in decimal).
R4	<31:00>		If Bit 3 is set in R5, deposit the hexadecimal value of the logical block number of the secondary boot block in R4.
R5	<31:00>		See Appendix D of the *Console User's Guide* for information about the boot control flags that may be set in R5.

[1]Note that if you install volume shadowing, you must deposit special values in R3. For information, see the *Volume Shadowing for OpenVMS*.

Table 2–4 Values to Deposit in R1-R5: BDABOO.COM, BDAGEN.COM, BDAXDT.COM

Register Number	Bit Position	Possible Values	Meaning
R1	<31:06>	Must be zero	No meaning.
	<05:04>	0-3 (hex)	The VAXBI that has the CIBCI or CIBCA that accesses the system disk. These processors support a maximum of four VAXBIs.
	<03:00>	0-F (hex)	The VAXBI node number of the CIBCI or CIBCA adapter.
R2	<31:24>	Must be zero	No meaning.

Table 2–4 (Cont.)   Values to Deposit in R1-R5: BDABOO.COM, BDAGEN.COM,
BDAXDT.COM

Register Number	Bit Position	Possible Values	Meaning
R3[1]	<31:00>		Unit number of the drive that holds the system disk (expressed in decimal).
R4	<31:00>		If Bit 3 is set in R5, deposit the hexadecimal value of the logical block number of the secondary boot block in R4.
R5	<31:00>		See Appendix D of the *Console User's Guide* for information about the boot control flags that may be set in R5.

[1]Note that if you install volume shadowing, you must deposit special values in R3. For information, see the *Volume Shadowing for OpenVMS*.

Table 2–5   Values to Deposit in R1-R5: UDABOO.COM, UDAGEN.COM,
UDAXDT.COM

Register Number	Bit Position	Possible Values	Meaning
R1	<31:06>	Must be zero	No meaning.
	<05:04>	0-3 (hex)	The UNIBUS adapter that controls the drive that holds the system disk.
	<03:00>	0-F (hex)	The VAXBI node number of the adapter.
R2	<31:24>	Must be zero	No meaning.
	<23:18>	Must be zero	No meaning.
	<17:00>	3F468 (hex)	UNIBUS address of the device's Control and Status Register. The value shown is only valid if you are booting off the first or only UDA on this UNIBUS. If you need to boot off another UDA, consult your local Digital Customer Services representative.
R3[1]	<31:00>		Unit number of the drive that holds the system disk (expressed in decimal).
R4	<31:00>		If Bit 3 is set in R5, deposit the hexadecimal value of the logical block number of the secondary boot block in R4.
R5	<31:00>		See Appendix D of the *Console User's Guide* for information about the boot control flags that may be set in R5.

[1]Note that if you install volume shadowing, you must deposit special values in R3. For information, see the *Volume Shadowing for OpenVMS*.

2.1.4 Editing DEFBOO.COM

The default boot command procedure, DEFBOO.COM, consists of a single BOOT command. DEFBOO.COM is executed under the following circumstances:

- When you enter the BOOT command without specifying a boot name

- When you enable AUTO BOOT and the system reboots automatically after a power failure or error halt

Edit DEFBOO.COM so that it refers to the boot command procedures you modified in Section 2.1.3. Follow these steps:

1. After completing the steps in Section 2.1.3, the console subsystem should still be in P/OS-DCL mode. The P/OS-DCL mode prompt ($) should be displayed.

   Before editing DEBOO.COM, make a copy of it. Enter the following command and press Return:

   ```
   $ COPY DEFBOO.COM DEFBOO.SAV
   ```

   If you have a VAX 8800 computer, specify the [8800] directory, as follows:

   ```
   $ COPY [8800]DEFBOO.COM [8800]DEFBOO.SAV
   ```

2. After you have copied DEFBOO.COM, edit the original. Enter the RUN EDT command and press Return. If you have a VAX 8530, VAX 8550, or VAX 8810 (8700) computer, enter the following commands and press Return after each one:

   ```
   $ RUN EDT
   EDT> DEFBOO.COM
   ```

   If you have a VAX 8820-N (8800) computer, specify the [8800] directory, as follows:

   ```
   $ RUN EDT
   EDT> [8800]DEFBOO.COM
   ```

   The contents of DEFBOO.COM are displayed. For example:

   ```
   !DEFBOO.COM
   SET VERIFY
        .
        .
        .
   BOOT dddn
   ```

   _____ **Note** _____

   The P/OS-DCL EDT editor works just like the VMS EDT editor. If you need more information on using EDT, press the PF2 key for online help or see the *OpenVMS User's Manual.*

   _____

3. Edit the line that contains the BOOT command. Substitute BCI, BDA, or UDA for *ddd*. Substitute the unit number of the drive that will hold the system disk for *n*.

   For example, suppose the system disk is on a CIBCI controller and it has a unit number of two. Change the BOOT command in DEFBOO.COM as follows:

   ```
   BOOT BCI2
   ```

If you have a VAXcluster environment, specify the correct root directory. For example, if you want to boot the system from [SYS3], enter the following:

```
BOOT BCI12 /R5:30000000
```

4. When you have finished editing DEFBOO.COM, press Ctrl/Z. At the asterisk prompt (*), enter the EXIT command and press Return:

```
* EXIT
```

The modified version of DEFBOO.COM is saved and you see the P/OS-DCL prompt ($).

5. To complete the hardware initialization, go to Section 2.1.5.

2.1.5 Completing the Hardware Initialization

This section describes the procedure for completing the hardware initialization.

1. After completing the steps in Section 2.1.4, the console subsystem should still be in P/OS-DCL mode. The P/OS-DCL mode prompt ($) should be displayed.

2. To return to console mode, enter the following command and press Return:

```
$ RUN CONTROL
```

The system displays the following messages:

```
19-JUN-90 12:34:46 *** WARNING, PREVIOUS INITIALIZATION FAILED
19-JUN-90 12:34:46 *** WARNING, RETRYING FIRST TIME INITIALIZATION
     .
     .
     .
!  REV 1.0
! -

>>>
```

3. At the console-mode prompt (>>>), enter the following commands. Press Return after each one.

```
>>> POWER ON
>>> @SYSINIT
```

4. SYSINIT.COM runs. The procedures applies power to the system, runs diagnostics, and loads microcode. It displays the following messages before returning to the console-mode prompt (>>>), which indicates that SYSINIT.COM is finished:

```
SET NOVERIFY              !Skip some comments
!+
!   THIS IS SYSINIT.COM FOR A VAX SINGLE CPU SYSTEM
     .
     .
     .
>>>
```

5. After you have successfully initialized the hardware, return to the *Upgrade and Installation Manual* guide to continue the installation.

2.2 Booting Standalone BACKUP

This section describes the steps for booting standalone BACKUP. Standalone BACKUP lets you transfer the VMS *required* save set from the distribution magnetic tape to your system disk. You need the floppy diskettes from your VMS distribution kit. They are labeled as follows, where *n* is the version of the VMS operating system and *x* is the total number of floppy diskettes:

Paper Label[1]	Volume Label[2]
VMS V5.n S/A BKUP RX50 1/x	SYSTEM_1
VMS V5.n S/A BKUP RX50 2/x	SYSTEM_2
VMS V5.n S/A BKUP RX50 3/x	SYSTEM_3
.	.
.	.
.	.
VMS V5.n S/A BKUP RX50 x/x	BACKUP

[1]A paper label is the label affixed to a floppy diskette.

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

Regardless of how many floppy diskettes you have containing standalone BACKUP, note that the last floppy diskette always has the volume label, *BACKUP*. If, for example, you have five floppy diskettes containing standalone BACKUP, they will be labeled as follows:

Paper Label	Volume Label
VMS V5.n S/A BKUP RX50 1/5	SYSTEM_1
VMS V5.n S/A BKUP RX50 2/5	SYSTEM_2
VMS V5.n S/A BKUP RX50 3/5	SYSTEM_3
VMS V5.n S/A BKUP RX50 3/5	SYSTEM_4
VMS V5.n S/A BKUP RX50 5/5	BACKUP

As you boot standalone BACKUP, the procedure asks you to place those floppy diskettes (five, in this example) successively in the console drive, as follows:

1. To enable automatic reboot, enter the following command and press Return:[1]

   ```
   >>> ENABLE AUTO BOOT
   ```

2. Insert the floppy diskette labeled S/A BACKUP RX50 1/5 in the CSA1 diskette drive.

3. To boot standalone BACKUP, enter the following command and press Return:

   ```
   >>> @CSBOO
   ```

---

[1]   For the system to reboot automatically, you must enter the ENABLE AUTO BOOT command and edit the boot command procedures as described in Sections 2.1.3 and 2.1.4.

The procedure displays the following messages:

```
SET VERIFY
! CSBOO.COM
        .
        .
        .
VAX/VMS Version V5.n Major version id = 1 Minor version id = 0

Please remove the volume "SYSTEM_1" from the console device.

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

4. Remove the S/A BKUP RX50 1/5 floppy diskette and insert the floppy diskette labeled S/A BKUP RX50 2/5 in the drive. When you are ready to continue, type Y and press Return. The procedure displays the following message:

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

Please remove the volume "SYSTEM_2" from the console device.

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

5. Remove the S/A BKUP RX50 2/5 floppy diskette and insert the floppy diskette labeled S/A BKUP RX50 3/5 in the drive. When you are ready to continue, type Y and press Return. The procedure displays the following messages:

```
Resuming load operation on volume "SYSTEM_3", please stand by...
```

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

```
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM) 19-JUN-1990 15:00
```

7. The procedure displays the following messages:

```
Please remove the volume "SYSTEM_3" from the console device.

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

8. Remove the S/A BKUP RX50 3/5 floppy diskette and insert the floppy diskette labeled S/A BKUP RX50 4/5 in the drive. When you are ready to continue, type Y and press Return. The procedure displays a message and a list of the local devices on your system and, if you have them, HSC and MSCP-served devices. For example:

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

9. The procedure displays the following messages:

```
Please remove the volume "SYSTEM_4" from the console device.

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

10. Remove the S/A BKUP RX50 4/5 floppy diskette and insert the floppy diskette labeled S/A BKUP RX50 5/5 in 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...
```

11. 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
    $
    ```

12. If you are going to perform another BACKUP operation, leave the last floppy diskette (with volume label, *BACKUP*) in the drive; otherwise, remove the last floppy diskette from the drive.

13. To create a system disk on a local drive or on an HSC drive, return to the *Upgrade and Installation Manual*.

2.3 Booting the New System Disk

As a result of the BACKUP command you enter to start an installation, the *required* save set from the distribution kit is transferred to your system disk. You know the *required* save set is on the new system disk when you see the following message:

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

This message indicates that the *required* save set from the distribution media has been transferred to the system disk and that the files are being checked for errors. Several 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:
```

To continue the installation, halt the system and boot the new system disk as follows:

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 S/A BKUP R50 5/5 floppy diskette from the CSA1 diskette drive.

4. To boot the new system disk, use the BOOT command in the following format:

   ```
   >>> B dddn
   ```

   Substitute BCI, BDA, or UDA for *ddd*. Substitute the unit number of the *target-drive* for *n*.

   For example, if the system disk is on a BDA-controlled drive and the unit number is 6, you enter the following command and press Return:

   ```
   >>> B BDA6
   ```

   Booting the system takes several minutes.

_____ **Note** _____

If you should halt the system *before* the boot completes, you must enter
the CLEAR RESTART_FLAGS command to clear the WARM_RESTART
and COLD_RESTART flags before you try booting the system again.
Clearing these flags prevents the automatic boot and restart procedures
from looping indefinitely when you enter the next BOOT command. For
more about these and related commands, see the description of the HALT
command in Table 1–1 and check your hardware manuals.

If the system does not boot, due to a hardware or software problem, see
Section 3.1.7 for more information.

_____

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

6. Return to *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 reboot several times. Although the installation and upgrade procedures usually can perform these tasks automatically, you might need to manually shut down or reboot your system. Also, you will occasionally need to reboot the system during normal operation. This chapter describes different ways of booting and shutting down the system.

Before you can use the information in this chapter, you must edit the boot command procedures and DEFBOO.COM as described in Chapter 2.

3.1 Booting the System

Booting is the process of loading system software from the system disk into the processor's memory. The VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers use boot command procedures to boot the VMS operating system from the system disk into memory. A boot command procedure does the following:

- Sets up the system environment

- Deposits values in registers

- Tells the system what type of controller the system disk is on and the unit number of the drive

- Loads the VMS operating system into memory

- Starts the CPU

The instructions for booting the system vary slightly for each type of controller. Therefore, there is a boot command procedure for each type of controller that the system supports.

For example, the boot command procedures BCIBOO.COM, BCIGEN.COM, and BCIXDT.COM let you boot from disk drives connected to a CIBCI or a CIBCA controller. All boot command procedures are stored on the console fixed disk (CSA3). To view the contents of the console fixed disk, enter the DIRECTORY command at the P/OS-DCL prompt.

The boot process consists of the following steps:

1. You enter the BOOT command. The specified boot command procedure deposits information in the general purpose registers.

2. VMB.EXE, the primary boot program, is loaded 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.EXE loads the SYSGEN parameters stored in SYS$SYSTEM:VAXVMSSYS.PAR and checks the conversational boot flag. If the flag is set, the procedure stops and displays the SYSBOOT> prompt. If the flag is not set, SYSBOOT.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.

7. STARTUP executes SYS$SYSTEM:STARTUP.COM (unless you indicated another file at the SYSBOOT> prompt) and SYSTARTUP_V5.COM. The current values of SYSGEN parameters are written back to VAXVMSSYS.PAR.

8. The boot process finishes, and you can log in to the VMS operating system.

If you have a VAX 8820-N (8800) computer, you can set certain SYSGEN parameters to control how many CPUs are activated at boot time and the character of the multiprocessing system. In a multiprocessing system, the primary CPU is always booted. By default, all available CPUs are also booted. If you want to change this, you can set the SYSGEN parameter SMP_CPUS to tell the system which secondary CPUs to boot. For information on SYSGEN parameters that affect multiprocessing, see the *VMS System Generation Utility Manual*.

3.1.1 Booting with DEFBOO.COM

The most direct way to boot the system is to type the BOOT command and press Return. By default, DEFBOO.CMD is used to boot the system. DEFBOO.CMD is the boot command procedure that you edited in Chapter 2.

To boot the system with DEFBOO.COM, use the following procedure:

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

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

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

   The procedure displays several questions that you must 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
   ```

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

   ```
   >>> HALT
   ```

3. Enter the following command and press Return:

   ```
   >>> B
   ```

3.1.2 Booting from Another System Disk

To boot the system from a drive other than the one specified in DEFBOO.COM, use the following procedure:

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

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

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

   The procedure displays several questions that you must 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
   ```

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

   ```
   >>> HALT
   ```

3. Enter the BOOT command in the following format:

   ```
   >>> B dddn
   ```

   Substitute BCI, BDA, or UDA for *ddd*. Substitute the unit number of the drive holding the system disk for *n*.

   For example, suppose the system disk is on a CIBCI-controlled drive and the unit number is 6. Enter the following command and press Return:

   ```
   >>> B BCI6
   ```

3.1.3 Booting from a Different Directory on the System Disk

The VMS operating system is installed on the system disk in the root directory named [SYS0]. You can use VMSKITBLD, described in the *OpenVMS System Manager's Manual*, to put a copy of the VMS operating system in another root directory on the system disk.

To boot the system from a directory other than [SYS0], use the following procedure:

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

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

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

   The procedure displays several questions that you must 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
   ```

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

   ```
   >>> HALT
   ```

3. Enter the BOOT command in the following format:

```
>>> B dddn /R5:nnnnnnnn
```

Substitute BCI, BDA, or UDA for *ddd*. Substitute the unit number of the drive holding the system disk for *n*. Use *nnnnnnnn* to identify the root from which you want to boot.

For example, suppose the system disk is on a CIBCI-controlled drive, the unit number is 6, and you want to boot from SYS3. Enter the following command and press Return:

```
>>> B BCI6 /R5:30000000
```

3.1.4 Booting from SYSF During an Upgrade

To boot the system from SYSF, use the following procedure:

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

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

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

   The procedure displays several questions that you must 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
```

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

```
>>> HALT
```

3. Enter the BOOT command in the following format:

```
>>> B dddn /R5:F0000000
```

   Substitute BCI, BDA, or UDA for *ddd*. Substitute the unit number of the drive holding the system disk for *n*.

   For example, if you are booting from SYSF and the system disk is on a CIBCI-controlled drive and the unit number is 6, enter the following command and press Return:

```
>>> B BCI6 /R5:F0000000
```

3.1.5 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 stop the boot process before it completes. The boot process stops after it loads SYS$SYSTEM:SYSBOOT.EXE and displays the SYSBOOT> prompt. At the SYSBOOT> prompt, you can enter certain SYSGEN commands to do the following:

- Look at system parameter values
- Change system parameter values
- Specify another parameter file
- Specify another system startup command procedure

- Select the default system parameter file if you modified system parameters to values that render the system unbootable

- Specify a minimum startup

There are two ways to perform a conversational boot. The following procedure is the most direct way:

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

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

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

   The procedure displays several questions that you must 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
   ```

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

   ```
   >>> HALT
   ```

3. To begin the conversational boot, enter the BOOT command in the following format:

   ```
   >>> B dddn /R5:1
   ```

   Substitute BCI, BDA, or UDA for *ddd*. Substitute the unit number of the drive holding the system disk for *n*. The /R5:1 qualifier deposits one in register 5 (R5).

   For example, suppose the system disk is on a CIBCI-controlled drive and the unit number is 2. Enter the following command and press Return:

   ```
   >>> B BCI2/R5:1
   ```

   This command tells the console to boot with BCIBOO.COM, deposit 2 in register 3 (R3), and deposit one in register 5 (R5).

   If you want to perform a conversational boot from a root directory other than SYS0 (SYS3, for example), enter the command as follows:

   ```
   >>> B BCI2 /R5:30000001
   ```

4. At the SYSBOOT> prompt, you can enter any of the SYSGEN commands listed in Table 3–1. For more information about these SYSGEN commands, see the *OpenVMS System Management Utilities Reference Manual*.

5. When you finish using the SYSGEN commands, enter the CONTINUE command to complete the boot process.

Table 3–1   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.

You can enter the following commands to set a new value for the SYSGEN parameter WSMAX to 512 and to 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 automatically configure 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
$
```

3.1.6 Booting with XDELTA

XDELTA is a debugging tool that system programmers use. To use XDELTA, you need to boot the system in a special way. For information on booting with XDELTA, see the *OpenVMS Delta/XDelta Debugger Manual*.

3.1.7 If the System Does Not Boot

If the system does not boot because a hardware problem occurs, a question mark (?) usually precedes the error message displayed on the console terminal. 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. To correct the situation, do the following:

1. Try to boot the system again.

2. Place a backup copy of the system disk in another drive and try to boot from it.

3.2 Shutting Down the System

Before you shut down the VMS operating system, decide if you want the VMS operating system to reboot automatically or if you want to enter console commands after the shutdown completes.

If you want the VMS operating system to reboot automatically, you must have entered the ENABLE AUTO BOOT command when you last were in console mode. If you want to enter console commands, stop the system after the shutdown completes.

You can perform the following types of shutdown operations:

1. See Section 3.2.1.

2. See Section 3.2.2.

3. 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 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.

For more information about the SHUTDOWN command procedure, see the
OpenVMS System Manager's Manual.

3.2.2 Emergency Shutdown with OPCCRASH.EXE

If you cannot perform an orderly shutdown with SHUTDOWN.COM, run the
OPCCRASH emergency shutdown program. Log in to the SYSTEM account,
enter the following command and press Return:

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

To halt the system after the procedure completes, press Ctrl/P.

For more information about the OPCCRASH program, see the *OpenVMS System
Manager's Manual*.

3.2.3 Emergency Shutdown with CRASH commands

—————————————————————— **Note** ——————————————————————

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

——

The CRASH command procedure causes the system to fail, resulting in immediate
shutdown. To force your system to fail with CRASH, do the following:

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

    ```
    >>> HALT
    ```

2. Enter the following command and press Return:

    ```
    >>> @CRASH
    ```

    CRASH displays a fatal bugcheck message, as well as additional messages
    and information. The procedure 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 add why the system did not respond.

3. CRASH halts the system, displays the contents of the program counter, and
    displays the console-mode prompt (>>>).

    If AUTO BOOT is enabled, the system reboots after CRASH runs. If the
    system does not automatically reboot, enter the BOOT command at the
    console-mode prompt (>>>).

4. 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 *OpenVMS VAX 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 operating 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 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 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 your system disk is fixed, back it up to a disk or magnetic tape. Then restore the files to the original system disk.

Digital recommends that you use standalone BACKUP to back up your system disk.

This chapter contains information on the following:

- Installing and booting standalone BACKUP on the system disk (Section 4.1.1 and Section 4.1.2)

- Installing and booting standalone BACKUP on RX50 floppy diskettes (Section 4.1.3 and Section 4.1.4)

- Backing up and restoring the system disk (Section 4.2 and Section 4.3)

4.1 Using Standalone BACKUP

The VMS 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, 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, RX50 floppy diskettes, or any other media that your system supports. Digital recommends that you keep standalone BACKUP on both the system disk and the floppy diskettes. (Although you usually boot standalone BACKUP from the system disk because it saves time, you should also keep a copy of standalone BACKUP on floppy diskettes 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

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

You can choose any unique name in the form xxxBOO.COM 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.COM, name the new file XEFBOO.COM.

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.COM and renaming it XEFBOO.COM.

1. Put the console subsystem in P/OS-DCL mode.

2. To make a copy of DEFBOO.COM and rename it XEFBOO.COM, enter the following command and press Return:

    ```
    $ COPY DEFBOO.COM XEFBOO.COM
    ```

    If you have a VAX 8820-N (8800) computer, enter the following command and press Return:

    ```
    $ COPY [8800]DEFBOO.COM [8800]XEFBOO.COM
    ```

3. Enter the RUN EDT command and press Return. At the EDT> prompt, enter XEFBOO.COM and press Return. For example:

    ```
    $ RUN EDT
    EDT> XEFBOO.COM
    ```

    If you have a VAX 8820-N (8800) computer, specify the [8800] directory, as follows:

    ```
    $ RUN EDT
    EDT> [8800]XEFBOO.COM
    ```

    The contents of XEFBOO.COM are displayed on the screen.

4. Change the line that contains the BOOT command so that it tells the system to boot from the [SYSE] directory. For example:

    ```
    BOOT BCI12 /R5:E0000000
    ```

5. When you have finished editing XEFBOO.COM, press Ctrl/Z. At the asterisk prompt (*), enter the EXIT command and press Return. The modified version of XEFBOO.COM is saved and you see the P/OS-DCL prompt ($).

Use the following procedure to boot standalone BACKUP from [SYSE]:

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

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

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

2. Press Ctrl/P to put the system in console mode.

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

    ```
    >>> HALT
    ```

4. Enter the following command and press Return:

    ```
    >>> @XEFBOO
    ```

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

```
VAX/VMS Version V5.4 Major version id = 1 Minor version id = 0
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY  HH:MM) 19-JUN-1990 13:00
```

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 MINE$DJA3:    device type RA60
Available device MINE$DJA2:    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. 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 Floppy Diskettes

Digital recommends that you keep standalone BACKUP on floppy diskettes in case the system disk becomes damaged. You should have received standalone BACKUP on floppy diskettes as part of your VMS distribution kit. If the original floppy diskettes become damaged or if you want to make extra copies, use the following procedure:

1. Obtain the required number of RX50 floppy diskettes, based on the number you received with the distribution kit. The procedure will ask you to place those floppy diskettes (five, in this example) successively in the console drive. To keep the floppy diskettes properly labeled and organized during the procedure, affix a paper label to each one and use a soft, felt-tip pen (a hard pencil or ballpoint pen may damage the floppy diskette) to write a name on each label. Label the floppy diskettes as follows, where *n* is the version of the VMS operating system:

   VMS V5.n S/A BKUP RX50 1/5
   VMS V5.n S/A BKUP RX50 2/5
   VMS V5.n S/A BKUP RX50 3/5
   VMS V5.n S/A BKUP RX50 4/5
   VMS V5.n S/A BKUP RX50 5/5

   A paper label is the label affixed to a diskette. 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 floppy diskette.

2. Log in to the SYSTEM account.

3. Enter the following command and press Return:

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

4. The procedure asks you for the name of the target device. Type CSA1 and press Return. For example:

   ```
   %STABACKIT-I-SYMDEL, all global symbols deleted
   ```

   ```
   Enter the name of the device on which to build the kit: CSA1
   ```

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

   ```
   SYSGEN CONNECT CONSOLE was used to make the console device available.

   The standalone kit requires five floppy diskettes. The first four
   floppy diskettes contain the standalone VMS system files, the last
   floppy diskette 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. First, it asks if you want to use the ANALYZE/MEDIA Utility to check for bad blocks on the target floppy diskette. Next, it asks if you want to verify each file that it copies. In this case, neither operation is necessary for RX50 floppy diskettes. Therefore, press Return when the procedure asks the following question:

   ```
   Do you want to scan for bad blocks? [Yes/No, default No]:
   ```

   The procedure displays the following message:

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

   Press Return (for NO). Copy verification is only relevant for tape media.

7. The procedure displays the following messages:

   ```
   Sysgen parameters for standalone VMS have been placed in file
                   SYS$SYSROOT:<SYSUPD>VAXVMSSYS.PAR-TEMP-00000084;1

   Please place the first system floppy diskette in drive _CSA1:.
   This volume will receive the volume label SYSTEM_1.

   Enter "YES" when ready:
   ```

8. Insert the floppy diskette labeled S/A BKUP RX50 1/5 in the console diskette drive. When you are ready to continue, type Y and press Return.

9. The procedure mounts the floppy diskette, 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.SYS$LDR> created
         .
         .
         .
   ```

10. When the last file is copied, the procedure asks you to insert the next floppy diskette. Remove the floppy diskette labeled S/A BKUP RX50 1/5. Insert the floppy diskette labeled S/A BKUP RX50 2/5. When you are ready to continue, type Y and press Return. For example:

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

    Enter "YES" when ready: Y
    ```

11. Repeat steps 8 through 10 for each floppy diskette until the procedure asks you for the last floppy diskette, as follows:

    ```
    Please place the application floppy diskette in drive _CSA1:.
    This volume will receive the volume label BACKUP.

    Enter "YES" when ready: Y
    ```

12. Remove the floppy diskette labeled S/A BKUP RX50 4/5. Insert the floppy diskette labeled S/A BKUP RX50 5/5. When you are ready to continue, type Y and press Return.

13. After the files are copied to the last floppy diskette, the procedure displays the following message:

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

14. Remove the floppy diskette labeled S/A BKUP RX50 5/5 from diskette drive CSA1. Insert the console RX50. When you are ready to continue, type Y (for YES) and press Return. When the procedure finishes, it displays the following message:

    ```
    The kit is complete.
    ```

4.1.4 Booting Standalone BACKUP from Floppy Diskettes

If the system disk containing standalone BACKUP should become unusable, you can boot standalone BACKUP from the RX50 floppy diskettes containing standalone BACKUP (either the set you received with your distribution kit or the set you created yourself, as described in Section 4.1.3). They are labeled as follows, where *x* is the total number of floppy diskettes included with your distribution kit and *n* is the version of the VMS operating system:

Paper Label[1]	Volume Label[2]
VMS V5.n S/A BKUP RX50 1/x	SYSTEM_1
VMS V5.n S/A BKUP RX50 2/x	SYSTEM_2
VMS V5.n S/A BKUP RX50 3/x	SYSTEM_3
.	.
.	.
.	.
VMS V5.n S/A BKUP RX50 x/x	BACKUP

[1]A paper label is the label affixed to a floppy diskette.

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

Regardless of how many floppy diskettes you need to boot standalone BACKUP, note that the last floppy diskette always has the volume label, *BACKUP*. If, for example, you use five floppy diskettes containing standalone BACKUP, they will be labeled as follows:

Paper Label	Volume Label
VMS V5.n S/A BKUP RX50 1/5	SYSTEM_1
VMS V5.n S/A BKUP RX50 2/5	SYSTEM_2
VMS V5.n S/A BKUP RX50 3/5	SYSTEM_3
VMS V5.n S/A BKUP RX50 3/5	SYSTEM_4
VMS V5.n S/A BKUP RX50 5/5	BACKUP

As you boot standalone BACKUP, you place those floppy diskettes (five, in this example) successively in the console drive, as follows:

1. Insert the floppy diskette labeled S/A BACKUP RX50 1/5 in the CSA1 diskette drive.

2. To boot standalone BACKUP, enter the following command and press Return:

   ```
   >>> @CSBOO
   ```

   The procedure displays the following messages:

   ```
   SET VERIFY
   ! CSBOO.COM
        .
        .
        .
   VAX/VMS Version V5.n Major version id = 1 Minor version id = 0

   Please remove the volume "SYSTEM_1" from the console device.

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

3. Remove the S/A BKUP RX50 1/5 floppy diskette and insert the floppy diskette labeled S/A BKUP RX50 2/5 in the drive. When you are ready to continue, type Y and press Return. The procedure displays the following message:

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

   Please remove the volume "SYSTEM_2" from the console device.

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

4. Remove the S/A BKUP RX50 2/5 floppy diskette and insert the floppy diskette labeled S/A BKUP RX50 3/5 in the drive. When you are ready to continue, type Y and press Return. The procedure displays the following message:

   ```
   Resuming load operation on volume "SYSTEM_3", please stand by...
   ```

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

   ```
   PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM) 19-JUN-1990 15:00
   ```

6. The procedure displays the following messages:

   ```
   Please remove the volume "SYSTEM_3" from the console device.

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

7. Remove the S/A BKUP RX50 3/5 floppy diskette and insert the floppy diskette labeled S/A BKUP RX50 4/5 in the drive. When you are ready to continue, type Y and press Return. The procedure displays a message and a list of the local devices on your system and, if you have them, HSC and MSCP-served devices. For example:

```
Available device MINE$DJA3:   device type RA60
Available device MINE$DJA2:   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. The procedure displays the following messages:

```
Please remove the volume "SYSTEM_4" from the console device.

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

9. Remove the S/A BKUP RX50 4/5 floppy diskette and insert the floppy diskette labeled S/A BKUP RX50 5/5 in 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...
```

10. 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
$
```

To backup the system disk, go to Section 4.2.

To restore the system disk, go to 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 *OpenVMS System Manager's Manual*.

To back up 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 VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers, 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. These commands use the following variables:

```
$ 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 6 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:JUN_19_1990.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. At the console-mode prompt (>>>), enter the HALT command and press Return.

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-supplied 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 *OpenVMS System Manager's Manual*. For more information on the BACKUP command, see the *OpenVMS System Management Utilities Reference Manual*.

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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 VAX 8530, VAX 8550, VAX 8810 (8700), and VAX 8820-N (8800) Computers, 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:
   ```

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

   ```
   $ BACKUP/IMAGE/VERIFY MSA0:JUN_19_1990.BCK/REWIND DUA1:
   ```

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. At the console-mode prompt (>>>), enter the HALT command and press Return.

9. Reboot the system.

A
Logical Console Terminals

This appendix explains how to use SYSGEN to connect logical console terminals. You can connect the physical console terminal to two logical console terminals named OPA4 and OPA5. You can use logical console terminals in the following ways:

- Use OPA4 as a local user terminal.

- Use OPA5 as a remote diagnostic terminal. If you connect a terminal to the remote diagnostic port (as described in the *Console User's Guide*), that terminal automatically becomes the OPA5 console terminal.

Information displayed on logical console terminals is not written to the console log file. If you use a logical console terminal and do not have a printer attached to the console subsystem, all the information displayed on the terminal screen is lost as it scrolls off the console terminal screen.

When you connect to a different console terminal, output sent to the original console terminal is suspended. Therefore, you do not see any messages sent to the first console terminal. The messages are stored and will appear when you set the console terminal back to the original one.

Enter the following commands to connect OPA4 (local user terminal) and OPA5 (remote diagnostics port) permanently:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> CONNECT CONSOLE/USER       !Connects OPA4
SYSGEN> CONNECT CONSOLE/REMOTE     !Connects OPA5
SYSGEN> EXIT
```

To use the OPA4 console terminal, press Ctrl/P and then enter the following commands:

```
>>> SET TERMINAL OPA4
>>> SET TERMINAL PROGRAM
```

To use the OPA5 console terminal, press Ctrl/P and then enter the following commands:

```
>>> SET TERMINAL OPA5
>>> SET TERMINAL PROGRAM
```

Note that you do *not* need to halt the system before entering the SET TERMINAL command.

You cannot perform all console-mode operations from OPA4 and OPA5. Some VMS programs and utilities require direct communication with the console terminal. These programs work *only* with the OPA0 console terminal.

For example, if you want to use the XDELTA Utility or any other utility that performs input and output (I/O) operations directly with the console terminal, the console terminal must be set to OPA0.

Logical Console Terminals

The reason for this restriction is that OPA0, OPA4, and OPA5 share the same interface and you can enable all three simultaneously. To clarify the ambiguous situation of having multiple console terminals, the VMS operating system performs I/O operations only with the OPA0 console terminal.

If you are using OPA4 or OPA5 and the operating system begins an I/O operation to OPA0, the console will appear to be inoperative. To switch back to OPA0, press Ctrl/P and then enter the following commands:

```
>>> SET TERMINAL OPA0
>>> SET TERMINAL PROGRAM
```

Glossary

boot or bootstrap

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

boot command procedure

A program stored on the console fixed disk that is used to boot the VMS operating system from a specified controller. Digital provides a boot command procedure for each controller that the processor supports.

boot name

The abbreviated name of the boot command procedure you use to boot the system.

boot server

A VAX 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.

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.

CIBCA

A computer interconnect (CI) port on a VAX backplane interconnect (BI) that does not require a cabinet.

CIBCI

A computer interconnect (CI) port on a VAX backplane interconnect (BI) that requires a cabinet.

computer interconnect

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

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 VAX 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 VAX computers in a VAXcluster environment.

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 these computers together. These computers share a single file system.

local drive

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

Mass Storage Control Protocol (MSCP)

The protocol used to communicate between a VAX processor 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.

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, and tape cartridges.

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.

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 node.

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 and TU81 magnetic tape drives.

VAX Backplane Interconnect (VAXBI)

A system bus that connects the CPU and memory to the I/O buses.

VAXBI node

A device on the VAXBI. I/O adaptors are one type of node on the VAXBI.

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.

Index

N

/NOINITIALIZE qualifier, 4–9

O

OPA4
   definition, A–1
OPA5
   definition, A–1
OPCCRASH.EXE, 3–8

P

/PHYSICAL qualifier, 4–8
P/OS mode, 1–4
P/OS-DCL mode, 1–4
Program mode, 1–3

S

SAVESET.BCK
   definition, 4–9
SDA
   See System Dump Analyzer
SET TERMINAL command, A–1
SET VOLUME command, 4–9
SHOW CRASH command, 3–9
SHOW LOGFILE command, 1–2
SHUTDOWN.COM command procedure, 3–8

Source-drive
   definition, 4–9, 4–10
STABACKIT.COM, 4–2, 4–4
Standalone BACKUP
   function during installation, 2–10, 4–6
   relation to Backup Utility, 4–2
SYSBOOT.EXE, 3–1
SYSINIT.COM, 2–3
System disk
   guidelines for choosing, 2–2
   specifying root directory to boot from, 2–9
System Disk
   Backing up, 4–8
System Dump Analyzer (SDA), 3–9
System Generation Utility (SYSGEN)
   commands for conversational boot, 3–6
   setting multiprocessing parameters, 3–2

T

Target-drive
   definition, 4–9, 4–10

U

Unit number
   definition, 2–1

V

VAXcluster environment
   specifying system root directory to boot from,
      2–9
VAXVMSSYS.PAR, 3–1
Volume label
   definition, 2–10, 4–6
Volume-label
   used with BACKUP command, 4–9