OpenVMS VAX Upgrade and Installation Supplement: VAX 8200, 8250, 8300, 8350

Order Number: AA–PS6PA–TE

May 1993

This document supplements the current version of the *Upgrade and Installation Manual* with information specific to VAX 8200, VAX 8250, VAX 8300, and VAX 8350 computers. This information includes startup, shutdown, and backup procedures.

This document was prepared using VAX DOCUMENT Version 2.1.

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Preface

The *OpenVMS VAX Upgrade and Installation Supplement: VAX 8200, 8250, 8300, 8350* contains installation and upgrade information specific to VAX 8200, VAX 8250, VAX 8300, and VAX 8350 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 *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 *Upgrade and Installation Manual* in the binder that contains the *VMS Release Notes.*

Intended Audience

OpenVMS VAX Upgrade and Installation Supplement: VAX 8200, 8250, 8300, 8350 is intended for anyone responsible for installing or upgrading the VMS operating system on VAX 8200, VAX 8250, VAX 8300, and VAX 8350 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 contains instructions for configuring serial lines on a VAX 8200, VAX 8250, VAX 8300, or VAX 8350 computer.

- 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 *OpenVMS VAX Upgrade and Installation Supplement: VAX 8200, 8250, 8300, 8350* 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.

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 VAX 8200, VAX 8250, VAX 8300, and VAX 8350 console subsystems. In general, use the console subsystem to examine and deposit data in memory or processor registers, stop the processor, and start the operating system. During installation, use the console subsystem to start the processor and monitor the process. The console subsystem consists of the following:

- Console terminal
- Control panel
- Console diskette drive
- Console command language

This chapter describes each component of the console subsystem.

1.1 Console Terminal

The console terminal is a hardcopy terminal attached to the system. Use it to control and monitor system operations. Because this hardcopy terminal prints a log of processor activities, make sure it always contains enough paper.

1.2 Control Panel

The VAX 8200, VAX 8250, VAX 8300, and VAX 8350 control panels are nearly identical. The panel is located on the front of the computer and includes the following:

- A 4-position keylock switch
- A 3-position keylock switch
- Three processor indicator lights
- Restart push button

Figure 1–1 illustrates how the switches and lights on VAX 8200, VAX 8250, VAX 8300, and VAX 8350 control panels are labeled.

Figure 1–1   VAX 8200, 8250, 8300, 8350 Control Panel


```
     0
              ┌──────┐  Standby   ┌────┐  Run
    ╭──╮       └──────┘            └────┘
    │  │      ┌──────┐  Enable    ┌────┐  Battery
    ╰──╯       └──────┘            └────┘
              ┌──────┐  Secure    ┌────┐  Fault
               └──────┘            └────┘

              ┌──────┐  Update
    ╭──╮       └──────┘
    │  │      ┌──────┐  Halt
    ╰──╯       └──────┘
              ┌──────┐  Auto Start ┌────┐ Restart
               └──────┘            └────┘
```
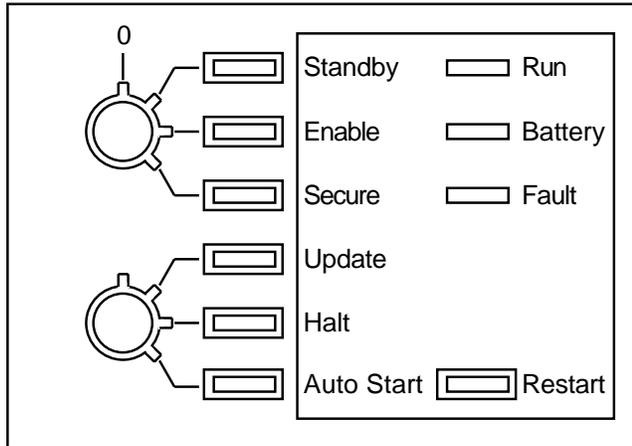
ZK–7445–GE

1.2.1 Switches

The control panel of a VAX 8200, VAX 8250, VAX 8300, or VAX 8350 computer has the following two keylock switches:

- An upper keylock switch. This switch has four positions. Use it to turn power on and off.

- A lower keylock switch. This switch has three positions. Use it to enable and disable automatic restart after a power failure.

To change a setting, insert a key in the keylock switch and turn it to the appropriate setting. Table 1–1 lists the settings of the upper keylock switches. Table 1–2 lists the settings of the lower keylock switches.

Table 1–1   VAX 8200, 8250, 8300, 8350 Upper Keylock Switch Settings

Setting	Meaning
Off	The upper keylock switch is set in the vertical position; there is no corresponding light. Turns off the power in the entire system, including the battery backup unit.
Standby	When the upper keylock switch is set to *Standby*, the corresponding indicator light glows red. Turns on the power supply, the blower in the main unit, and system memory.
Enable	When the switch setting is changed from *Standby* to *Enable*, the system self-tests run. When the upper keylock switch is set to *Enable*, the corresponding indicator light glows yellow. Power is supplied to the entire system. You can use the local console terminal in console mode to control the computer.
	If the lower keylock switch is set to *Auto Start*, pressing the Restart push button reboots the system.

(continued on next page)

Table 1–1 (Cont.)   VAX 8200, 8250, 8300, 8350 Upper Keylock Switch Settings

Setting	Meaning
Secure	When the upper keylock switch is set to *Secure*, the corresponding indicator light glows green. This setting maintains power to the entire system and is used for normal operation. You cannot use the local console terminal in console mode to control the processor. You cannot reboot the operating system by pressing the Restart push button.

Table 1–2   VAX 8200, 8250, 8300, 8350 Lower Keylock Switch Settings

Setting	Meaning
Update	When the lower keylock switch is set to *Update*, the corresponding indicator light glows red. You can change data in the Electrically Erasable Programmable Read-Only Memory (EEPROM) using the EEPROM Utility.
Halt	When the lower keylock switch is set to *Halt*, the corresponding indicator light glows yellow. The system halts in console mode. It displays the console-mode prompt (>>>) at the console terminal when power is turned on after a power failure, after an error halt, or after a shutdown. This setting prevents booting of the operating system when power is turned on.
Auto Start	When the lower keylock switch is set to *Auto Start*, the corresponding indicator light glows green. Use this setting for normal system operation to let the system reboot automatically when power is restored after a power failure, after an error halt, or after a shutdown. If the upper keylock switch is set to *Enable*, pressing the Restart push button reboots the system.

1.2.2 Indicator Lights

Table 1–3 describes the three indicator lights on the control panel.

Table 1–3 Indicator Lights

Label	Meaning	
Run	Glows when the processor is running and the console subsystem is in program mode.	
Battery	Tells you the condition of the backup battery.	
	Steady glow	The backup battery is fully charged.
	Slow flashing	The backup battery is charging itself.
	Quick flashing	The backup battery is supplying power to the system.
	No light	The backup battery unit is broken or is not present.

Table 1–3 (Cont.) Indicator Lights

Label	Meaning
Fault	Glows during self-tests and turns off when self-tests complete successfully. If the Fault light continues to glow after self-tests complete, the self-tests have detected a hardware fault. If the Fault light glows after self-tests complete and the VMS operating system boots, the system has detected a failure in a hardware module.

1.2.3 Restart Push Button

The Restart push button is located on the lower right side of the control panel. Table 1–4 details the functions of the Restart push button, which depend on the positions of the upper and lower keylock switches.

Table 1–4 Restart Push Button Functions

Upper Keylock Switch Setting	Lower Keylock Switch Setting	Restart Button Function
Enable	Autostart	Runs self-test and reboots the VMS operating system
Enable	Update or Halt	Runs self-test
Stand by or Secure	Any position	Does not function

1.3 Console Dual-Diskette Drive

The VAX 8200, VAX 8250, VAX 8300, and VAX 8350 computers have an RX50 dual-diskette drive. The dual-diskette drive is located on the front of the computer.

The dual-diskette drive is vertical on some processors and horizontal on others. On a vertical drive, the left diskette drive is referred to as CSA1, and the right diskette drive as CSA2. On a horizontal drive, the top diskette drive is referred to as CSA1, and the bottom diskette drive as CSA2.

The console dual-diskette drive holds RX50 diskettes. The **console RX50** is the diskette that contains the BOOT58 program. The BOOT58 program *boots*, or loads, the operating system into processor memory. It also is used to do the following tasks:

- Install updates

- Install optional software products

- Boot standalone BACKUP

- Store boot command procedures (for more information on boot command procedures, see Chapter 3)

When using the console dual-diskette drive shown in Figure 1–2, you should be aware of the following:

- The light below the drive flashes when the floppy diskette is actually moving (being read or written to). If this light is off, the drive is inactive. *Never* attempt to remove a floppy diskette when the light is flashing or glowing; this damages the floppy diskette and might damage the drive.

- The light is off when the drive is empty. The only time you can remove a floppy diskette is when the light is off.

1.3.1 Inserting or Removing a Floppy Diskette

To insert a floppy diskette into console diskette drive CSA2, see Figure 1–2 and follow steps 1 through 6.

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

1. Make sure the diskette drive is inactive. The light below the drive should be off. *Never* attempt to open the diskette drive door if the light is glowing or flashing.

2. Press the outer portion of the right door to open console diskette drive CSA2.

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

4. Remove the diskette to be inserted from its paper envelope; do not touch any exposed platter surfaces.

5. Align the orange arrow on the diskette with the orange bar on the drive. Slide the diskette into the *left-hand side* of the drive. (If the diskette is aligned improperly, the system displays an error message. If the system displays an error message, remove the diskette, realign it, and reinsert it.)

6. Close the diskette drive door.

Figure 1–2   Inserting a Diskette into CSA2

Write–Protect
Notch Upward

Alignment
Arrow

Floppy
Drive 2

Read/Write
Access Slot
Forward

Floppy
Drive 1
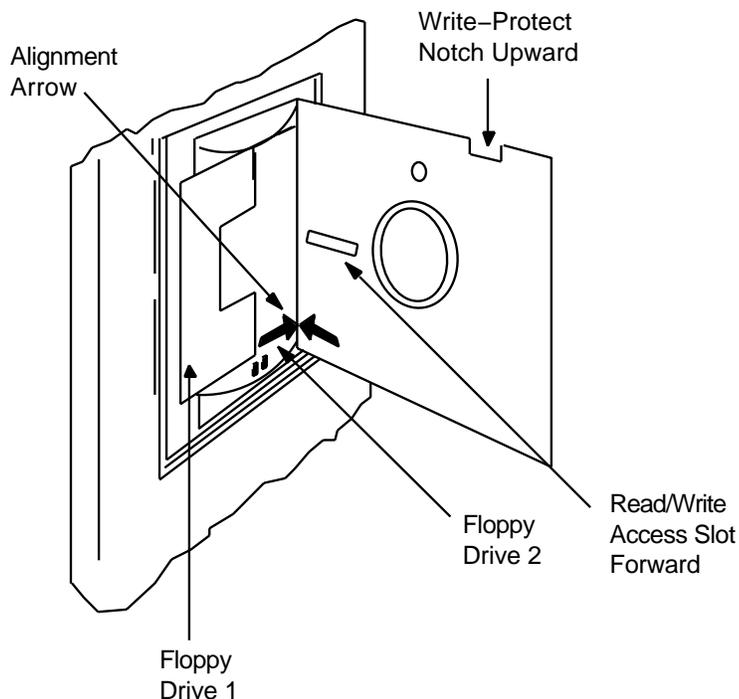
ZK–1680–GE

1.4 Console Command Language

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

- Console mode—When the console subsystem is in console mode, the VMS operating system is not running and the console-mode prompt (>>>) is displayed. The CPU can be running or it can be stopped. When the CPU is running, it responds to a limited number of commands. When the CPU is stopped, it responds to all console-mode commands. To stop the CPU, press Ctrl/P at the console-mode prompt (>>>).

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

- Program mode—When the console subsystem is in program mode, the VMS operating system is running and the dollar sign prompt ($) is displayed. You can enter DCL commands, run programs, and receive system messages.

  If the VMS operating system is running and you want to to go to console mode, follow the shutdown procedure described in Chapter 3. You also can press Ctrl/P to suspend program mode temporarily and go to console mode. To get back to program mode, enter the CONTINUE command at the console-mode prompt (>>>).

Table 1–5 describes the most commonly used console mode commands.

Table 1–5   Most Commonly Used Console Mode Commands

Command	Definition
BOOT	Executes a console command procedure that loads a VAX software program into memory. The console command procedure then transfers control to the program in memory and puts the console subsystem in program mode. During the installation procedure, use the abbreviation, B, for the BOOT command.
CONTINUE	Changes from console mode to program mode. If the CPU clock is operating when you type the CONTINUE command, the processor restarts execution of the halted program. If the CPU clock is not operating when you type the CONTINUE command, the CPU clock starts as the console subsystem enters program mode.
DEPOSIT	Puts a value in the specified register or memory location. During the installation procedure, use the abbreviation, D, for the DEPOSIT command.
EXAMINE	Displays a value in the specified register or memory location.
HALT	Resets the default console conditions after the processor stops.

For more information on the console subsystem and command language, see the *Console User's Guide*.

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 8200, VAX 8250, VAX 8300, and VAX 8350 computers, such as the following:

- Specifying device names (Section 2.1.1)
- Turning on the system (Section 2.1.2)
- 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 and turning on the system.

2.1.1 Specifying Device Names

Before you install the VMS operating system, you must determine which drive contains the distribution media 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 device you are using.
- *c* is the *controller designation*. A controller designation can be one of the alphabetic letters A through Z. The controller designation, along with the unit number, identifies the location of the device.

- *u* is the *unit number.* A unit number can be a decimal number in the range of 0 to *n*.[1] The unit number, along with the controller designation, identifies the location of the device.

_____ **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 RX50 dual diskette drive. *CS* is the device code for the console diskette drive. *A* names the controller (the controller provides the interface between the processor and the drive). *1* and *2* are the unit numbers.

If a drive is connected to a Hierarchical Storage Controller (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.

Before you begin the installation procedure, make sure you know the device names for both the drive that will hold the distribution media and the drive that will hold the system disk. Table 2–1 lists the device names for the different drives that can be part of the VAX 8200, VAX 8250, VAX 8300, and VAX 8350 family of computers.

Table 2–1   Device Names and Boot Names for VAX 8200, 8250, 8300, 8350 Systems

Device	Device Name[1]	Boot Name[2]
Console drive (RX50)	CSA1 CSA2	CSA1[3]
RA60 disk drive	DJcu	DUnu
RA70, RA80, RA81, and RA82 disk drives	DUcu	DUnu
TA78 disk drive	MUcu	–
TA81 and TA81 plus magnetic tape drives	MUcu	–
TU80 tape drive	MScu	–
TU81 and TU81 plus magnetic tape drives	MUcu	–

[1]Variable *c* stands for the controller designation.

[2]Variable *n* stands for the VAXBI node identification number. Variable *u* stands for the unit number.
[3]Standalone BACKUP is the only thing you can boot from console diskette drive CSA1.

_____

[1]   The first drive on a controller is usually assigned a unit number of 0, 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.

Once you have determined the device names for the drives holding the distribution media and the system disk, return to the *Upgrade and Installation Manual* guide to continue the installation.

2.1.2 Turning On the System

Follow these steps to turn on the system and set the switches on the control panel:

Note

This procedure assumes that the system is not turned on and that you are familiar with the console subsystem.

---

1. Turn on the console terminal.

2. Check the dual-diskette drive in the console subsystem. Make sure that the console RX50 is in console diskette drive CSA1.

3. At the control panel on the computer, set the lower key switch to Halt (number 2 if you have the international control panel).

4. Set the upper key switch to Enable (the | | symbol if you have the international control panel).

   At this point, the system runs an initialization self-test. (The red Fault light glows during this test.)

Note

If your console displays garbled characters at this point, the baud rates of the processor and console terminal do not match. If your terminal and CPU baud rates do not match, the self-test console display described next does not appear. To continue with the installation, press the Break key, pause, and press the Break key again until the console prompt (>>>) appears. Each time you press the Break key, the baud rate changes.

If the CPU successfully completes its self-test, the system displays the following message on the console terminal:

```
#ABCDEFGHIJK.MN#
```

If the CPU fails its self-test, the system displays only a part of the string of letters (for example, #ABCD-). For a complete description of the self-test indicators, see the hardware manuals supplied with your VAX computer. As the system initializes itself, modules and adapters on the system bus run their self-tests. If they successfully complete their self-tests, the red indicator light labeled "Fault" goes out, and the system displays a message like the following:

```
0 . 2 . 4 . 6 . . . . . . . . .
00400000

PC = 00000208
>>>
```

The first line of the display should contain only hexadecimal characters and periods. Each character in the first line represents the VAXBI node identification number. If any module or adapter fails its self-test, the Fault light remains lit, and a minus sign precedes one or more characters. If this occurs, consult your Digital Customer Service representative. The second line of the display specifies the memory available on the system.

5. Set the lower keylock switch to Update. To ensure that automatic restart works correctly, change the default boot device to CSA1. See the hardware manual for your VAX computer details. When you have changed the default boot device, set the lower keylock switch to Halt (number 2 if you have the international control panel).

6. Return to the *Upgrade and Installation Manual* 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. Refer to the section that describes the appropriate media.

2.2.1 Booting Standalone BACKUP from a Local or HSC Tape Drive

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 a 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 the 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 diskette drive, as follows:

1. Make sure the console RX50 is in console diskette drive CSA1. To boot standalone BACKUP from the console diskette drive, enter the following command and press Return:

   ```
   >>> B/R5:800 CSA1
   ```

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

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

   The procedure displays the following message:

   ```
   Please remove the volume "8200X console" from the console device.
   Insert the first standalone system volume and type "YES" when ready:
   ```

3. Remove the console RX50 from console diskette drive CSA1. Insert the floppy diskette labeled S/A BKUP RX50 1/5 in console diskette drive CSA1. When you are ready to continue, type Y (for YES) and press Return. The procedure displays the following message:

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

   Approximately 3 minutes later, the procedure displays the following message:

   ```
   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 type "YES" when ready:
   ```

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

   ```
   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, enter Y and press Return. The procedure displays the following message:

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

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

   ```
   PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM) 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 DJA2    device type RA60
Available device DJA3    device type RA60
```

Check the list of devices. If the list is incomplete, make sure that all the drives are connected properly 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 V5.4; 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*.

2.2.2 Booting Standalone BACKUP from a Local RA60 Disk Drive

1. Make sure the console RX50 is in console diskette drive CSA1. To boot standalone BACKUP, enter the BOOT command in the following format:

```
>>> B/R5:E0000000 ddnu
```

Substitute the boot name of the drive that holds the distribution disk for *ddnu*. For a list of boot names, see Table 2–1.

For example, suppose the distribution disk is on an RA series disk drive on VAXBI node 4 and device unit number 1. Enter the following command and press Return:

```
>>> B/R5:E0000000 DU41
```

2. The procedure asks 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-YYY HH:MM:)19-JUN-1990 13:00
```

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

```
Available device DJA2    device type RA60
Available device DJA3    device type RA60
```

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

4. When standalone BACKUP finishes booting, it displays an identification
    message followed by the dollar sign prompt ($).

```
%BACKUP-I-IDENT, Stand-alone BACKUP V5.4; the date is 19-JUN-1990 13:00:00.00
$
```

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

2.2.3 Booting Standalone BACKUP from an HSC Disk Drive

1. Identify the disk drive that contains the distribution disk and the HSC that
    controls it. You need to know the node number of the HSC and the unit
    number of the disk drive.

2. Make sure the console RX50 is in console diskette drive, CSA1.

3. Start the BOOT58 program by entering the following command and then
    pressing Return:

    ```
    >>> B/R5:800 CSA1
    ```

4. At the *BOOT58>* prompt, deposit the following values. Note that all numeric
    entries are made using hexadecimal notation.

    a. Deposit the value 20 for the type code for the boot device for the HSC on
        a CIBCI or CIBCA device into register 0 using the following command:

        ```
        BOOT58> D/G 0 20
        ```

    b. Deposit the VAXBI node number into register 1 using the following
        format:

        ```
        BOOT58> D/G 1 node-number
        ```

        For example, if the VAXBI is node 6, enter the following and press Return:

        ```
        BOOT58> D/G 1 6
        ```

    c. Deposit the HSC node number into register 2, using the following format:

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

        For example, if the HSC is node 12 on a CIBCI device, enter the following
        command and press Return:

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

        _____ **Note** _____

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

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

        _____

    d. Deposit the unit number of the drive holding the system disk into register
        3 using the following format:

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

For example, if the drive holding the system disk is unit number 21, deposit hexadecimal 15 into register 3:

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

e. Deposit the number of the correct root directory from which to boot, using the following format (where *r* is the directory root):

```
BOOT58> D/G 5 r0000000
```

In this instance, you need to specify the BACKUP directory root, SYSE, as follows:

```
BOOT58> D/G 5 E0000000
```

f. Enter the following commands and press Return after each one:

```
BOOT58> D/G 4 0
```

```
BOOT58> D/G E 200
```

```
BOOT58> LOAD VMB.EXE/START:200
```

```
BOOT58> START 200
```

5. The procedure asks 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-YYY 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 DJA2     device type RA60
Available device DJA3     device type RA60
```

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

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

```
%BACKUP-I-IDENT, Stand-alone BACKUP V5.4; the date is 19-JUN-1990 13:00:00.00)
$
```

9. 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-APR-1990 15:45
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, boot the new system disk. If you have a local system disk, follow the instructions in Section 2.3.1. If you have an HSC system disk, follow the instructions in Section 2.3.2.

Note

If the system does not boot, a hardware or software problem might exist. Refer to Section 3.1.9 for symptoms of hardware and software problems and the actions you can take to correct them.

2.3.1 Local System Boot

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

   Note

   If the console-mode prompt (>>>) does not appear, press the Break key, pause, and press the Break key again until the console-mode prompt appears.

   ---

2. If you created the system disk from a local disk drive, go to the next step. If you created the system disk from a tape drive, remove the last standalone BACKUP floppy diskette (S/A BKUP RX50 5/5, for example) and insert the console RX50 in console diskette drive CSA1.

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

   ```
   >>> B ddnu
   ```

   Substitute the boot name of the *target-drive* for *ddnu*. The system disk must have a unit number between 0 and 15 (inclusive). For a list of boot names, see Table 2–1.

   For example, suppose the system disk is on an RA series disk drive on VAXBI node 4 and device unit number 1. Enter the following command and press Return:

   ```
   >>> B DU41
   ```

4. Booting the system takes several minutes. As the system initializes itself, modules and adapters on the system bus run their self-tests. If they successfully complete their self-tests, the red indicator light labeled "Fault" goes out, and the system displays a message like the following:

   ```
   0 . 2 . 4 . 6 . . . . . . . . .
   00400000
   ```

5. When the boot is complete, the procedure displays a message and asks for the date and time. Enter the date and time using the 24-hour clock format and press Return. Return to the *Upgrade and Installation Manual* to continue the installation.

2.3.2 HSC System Boot

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

   _____ **Note** _____

   If the console-mode prompt (>>>) does not appear, press the Break key,
   pause, and press the Break key again until the console-mode prompt
   appears.

   _____

2. If you created the system disk from a disk drive, go to the next step. If
   you created the system disk from a tape drive, remove the last standalone
   BACKUP floppy diskette (S/A BKUP RX50 5/5, for example) and insert the
   console RX50 in console diskette drive CSA1.

3. Start the BOOT58 program by entering the following command and pressing
   Return. (Note throughout this procedure that all numeric entries are made
   using hexadecimal notation.)

   ```
   >>> B/R5:800 CSA1
   ```

4. Deposit the type code for the boot device for the HSC on a CI device into
   register 0 using the following format:

   ```
   BOOT58> D/G 0 boot device type code
   ```

   For example, if the type code is hexadecimal 20, enter the following and press
   Return:

   ```
   BOOT58> D/G 0 20
   ```

5. Deposit the VAXBI node number into register 1 using the following format:

   ```
   BOOT58> D/G 1 node-number
   ```

   For example, if the VAXBI is node number 6, enter the following and press
   Return:

   ```
   BOOT58> D/G 1 6
   ```

6. Deposit the HSC node number into register 2 using the following format:

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

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

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

   _____ **Note** _____

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

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

   _____

7. Deposit the unit number of the drive holding the system disk into register 3 using the following format:

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

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

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

8. To boot the system disk, enter the following commands at the BOOT58> prompt. Press Return after each command.

   ```
   BOOT58> D/G 5 0

   BOOT58> D/G E 200

   BOOT58> LOAD VMB.EXE/START:200

   BOOT58> START 200
   ```

9. When the boot is complete, the procedure displays a message and asks for the date and the time. Enter the date and the time using the 24-hour clock format and press Return.

10. Return to the *Upgrade and Installation Manual* to continue the installation.

Note

Once you have installed and booted the VMS operating system, you can log in to the SYSTEM account, where you can edit specific command procedures that will perform subsequent boots automatically. See Section 3.1.4.2 for more information.

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.

3.1 Booting the System

Booting is the process of loading system software from the system disk into the processor's memory. VAX 8200, VAX 8250, VAX 8300, and VAX 8350 computers use the BOOT command and boot command procedures to perform this operation.

The method you use to boot a VAX 8200, VAX 8250, VAX 8300, or VAX 8350 computer depends on whether the system disk is on a local drive or on an HSC drive. If the system disk is on a local drive, the easiest way to boot the system is to do an automatic boot from the drive designated in the EEPROM (Electrically Erasable Programmable Read-Only Memory). If you want to boot from a drive other than the one designated in the EEPROM, you can do a manual boot. In either case, you do not need a boot command procedure. If the boot block on the system disk becomes corrupted, you can use auxiliary boot command procedures that let you boot from a local drive.

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

A typical boot consists of the following steps:

1. You enter the BOOT command. The BOOT command 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 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 8300 or VAX 8350 computer, you can set certain SYSGEN parameters to control how many CPUs are activated at boot time and the character of a multiprocessing system. In a multiprocessing system, the primary CPU is always booted. By default, all available CPUs are booted in a multiprocessing system. If you want to change this, you can set the SYSGEN parameter SMP_CPUS to tell the system which CPU to boot. For information on SYSGEN parameters that affect multiprocessing, see the *OpenVMS System Management Utilities Reference Manual*.

_____ **Note** _____

If you plan to boot from a UDA50-supported device, you must keep in mind when you configure the system that the maximum unit number that can be booted is 15 (hexadecimal F).

_____

3.1.1 Boot Command Procedures

A boot command procedure does the following:

- Sets up the system environment

- Deposits values in registers

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

- Loads the VMS operating system into memory

- Starts the CPU

The console RX50 contains the BOOT58 program and the boot command procedures. To boot the VMS operating system with a boot command procedure, you must insert the console RX50 in console diskette drive CSA1 and start the BOOT58 program.

To find out what is on the console RX50, use the following procedure:

_____ **Note** _____

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

_____

1. Make sure that the console RX50 is in console diskette drive CSA1.

2. To connect the console drive to the system, enter the following commands and press Return after each one:

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

3. Use the Exchange Utility to display a list of the boot command procedures on the console RX50. Boot command procedures are files that start with either CI or D and end with either BOO or GEN. The file type is CMD. Enter the following command and press Return:

```
$ EXCHANGE DIR CSA1 C*,D*
```

For example:

```
Directory of RT-11 volume _CSA1:    19-JUN-1990 13:00

CIBOO.CMD
CI0GEN.CMD
CI4GEN.CMD
C16GEN.CMD
C18GEN.CMD
   .
   .
   .
```

4. When you are finished, enter the following command and press Return:

```
$ DISMOUNT CSA1:
```

5. To secure the console RX50 from unauthorized access, you must enter the following command and press Return:

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

Section 3.1.3.4 describes using the BOOT58 program and auxiliary boot command procedures to boot the VMS operating system from a local drive if the boot block on the system disk becomes corrupted. Section 3.1.4 describes using the BOOT58 program and boot command procedures to boot from an HSC drive.

3.1.2 The BOOT58 Program

You can use the BOOT58 program, which is located on the console RX50, to boot the VMS operating system from an HSC drive. You also can use the BOOT58 program to boot the VMS operating system from a local drive when the boot block on the system disk becomes corrupted.

To start the BOOT58 program, enter the following command and press Return:

```
>>> B/R5:800 CSA1
```

The BOOT58> prompt is displayed. Table 3–1 lists the commands that you can enter at the BOOT58> prompt.

Table 3–1 BOOT58 Commands

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

Enter the BOOT command or use the @ command to choose a boot command procedure with which to boot the VMS operating system.

3.1.3 Booting from a Local Drive

There are several ways to boot the system from a local drive. You can perform an automatic boot from the default boot device designated in the EEPROM. You also can perform a manual boot. In either case you do not need a boot command procedure.

Create auxiliary boot command procedures after you boot the system the first time. These procedures let you boot from a local drive if the boot block on the system disk becomes corrupted.

3.1.3.1 Automatic Boot

You can boot the VMS operating system automatically from the drive designated in the EEPROM, the default boot device, when you do any of the following:

Note

The default boot device must be the local drive, CSA1. To change the designation of the default boot device in the EEPROM, see the hardware documentation for your system.

- Set the upper keylock switch to Enable and the lower keylock switch to Auto Start. Turn on the power. The system boots automatically.

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

  ```
  >>> B
  ```

- Set the upper keylock switch to Enable and the lower keylock switch to Auto Start. Execute SHUTDOWN.COM and specify the auto reboot option. The system reboots automatically.

- If the upper keylock switch is set to Enable and the lower keylock switch is set to Auto Start when the system shuts down due to a bugcheck, the system reboots automatically.

The system sometimes boots automatically when a power failure occurs. If the upper keylock switch is set to Enable and the lower keylock switch to AUTO START, when a power failure occurs and the contents of memory are lost, the system boots when power is restored.

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

3.1.3.2 Manual Boot

When you want to boot from a drive other than the one designated in the EEPROM, do a manual boot. To perform a manual boot from a local drive, use the following procedure:

1. Make sure the console RX50 is in console diskette drive CSA1.

2. Set the upper keylock switch to Enable and the lower keylock switch to Halt.

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

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

```
$ @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
```

4. Press Ctrl/P.

5. Enter the BOOT command followed by the *boot name* of the drive that holds the system disk. The format for a boot name is as follows:

```
>>> B ddnu
```

where:

*   *dd* is the device code of the drive.

*   *n* is the controller's VAXBI node identification number.

*   *u* is the unit number.

The system disk must have a unit number between 0 and 15 (inclusive).

For example, to boot from an RA80-series disk drive with a VAXBI node identification number of 4 and a unit number of 1, enter the following command and press Return:

```
>>> B DU41
```

where:

*   B stands for the BOOT command.

*   DU41 is the boot name for the RA80-series disk drive. *DU* is the device code for an RA80-series disk drive, 4 is the VAXBI node identification number, and 1 is the unit number.

See Table 2–1 to determine the boot name of the system disk.

_____ **Note** _____

If the boot block on the system disk becomes corrupted, boot from a local drive attached to the KDB50 disk controller using auxiliary boot command procedures. Set up auxiliary boot command procedures after you boot the VMS operating system the first time, so that auxiliary boot command procedures will be available if you need them. Section 3.1.3.3 describes how to set up auxiliary command procedures. Section 3.1.3.4 describes how to use auxiliary boot command procedures.

_____

3.1.3.3 Creating Auxiliary Boot Command Procedures

There are two auxiliary boot command procedures that you can use to boot the VMS operating system from a local drive if the boot block on the system disk becomes corrupted. They are KDBBOO.CMD and KDBBOO.GEN. KDBBOO.CMD is the nonstop boot procedure. When you boot with KDBBOO.CMD, you have no control over the system until the boot process has finished. Use KDBBOO.GEN, the conversational boot procedure, when you want to interrupt the boot process and change system parameters.

KDBBOO.GEN does not exist on the console RX50. To create auxiliary boot command procedures, use the following procedure:

Note

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

---

1. Make sure the console RX50 is in console diskette drive CSA1.

2. To connect the console drive to the system, enter the following commands and press Return after each one:

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

3. Use the Exchange Utility to copy KDBBOO.CMD from the console RX50 to your current directory on the system disk. Enter the following command and press Return:

   ```
   $ EXCHANGE COPY CSA1:KDBBOO.CMD *.*
   ```

4. Edit KDBBOO.CMD. Enter the following command and press Return:

   ```
   $ EDIT KDBBOO.CMD
   ```

   KDBBOO.CMD contains the following text:

   ```
   ! KDBBOO.CMD : Boot command file to boot a VAX 8200 from a KDB50 disk
   ! bypassing the boot block (i.e. utilizing the boot
   ! block and VMB.EXE from the RX50 console device.)
   !
   ! Note: "n", "u", and "r" represent single hexadecimal characters
   !
   !
   D/G 0 21              ! KDB50 Device Type Code
   !D/G 1 n              ! n = VAXBI node number of KDB50
   !D/G 3 u              ! u = Disk drive unit number
   !D/G 5 r0000000       ! r = number of system root directory
   D/G E 200
   LOAD VMB.EXE/START:200
   START 200
   ```

   a. Delete the comment character (!) that appears before the D/G 1 command and replace *n* with the VAXBI node identification number of the local drive.

   b. Delete the comment character (!) that appears before the D/G 3 command and replace *u* with the unit number of the local drive.

    c.   Delete the comment character (!) that appears before the D/G 5 command and replace *r* with the number of the correct root directory from which to boot. By default, the VMS operating system is in SYS0.

    d.   Exit from the editor to save the modified version of the file.

5.   To make a copy of KDBBOO.CMD named KDBBOO.GEN, enter the following command and press Return:

```
$ COPY KDBBOO.CMD KDBBOO.GEN
```

6.   Edit KDBBOO.GEN. Enter the following command and press Return:

```
$ EDIT KDBBOO.GEN
```

    a.   In the first line of the command procedure, change the name KDBBOO.CMD to KDBBOO.GEN.

    b.   Delete the comment character (!) that appears before the D/G 5 command and replace *r* with the number of the correct root directory from which to boot. By default, the VMS operating system is in SYS0. Replace the final zero of *r0000000* with the number 1. The command should read D/G 5 r0000001. This command instructs the system to perform a conversational boot.

    c.   Exit from the editor to save the modified version of the file.

7.   Use the Exchange Utility to copy KDBBOO.CMD and KDBBOO.GEN to the console RX50. Enter the following commands and press Return after each one:

```
$ EXCHANGE COPY KDBBOO.CMD CSA1:KDBBOO.CMD
$ EXCHANGE COPY KDBBOO.GEN CSA1:KDBBOO.GEN
```

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

```
$ DISMOUNT CSA1:
```

9.   To secure the console RX50 from unauthorized access, you must enter the following command and press Return:

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

Now you can use KDBBOO.CMD and KDBBOO.GEN to boot the VMS operating system from a local drive, as described in Section 3.1.3.4, when the boot block on the system disk becomes corrupted.

3.1.3.4 Using Auxiliary Boot Command Procedures

You should boot the VMS operating system using an auxiliary boot command procedure when the boot block on the local system disk becomes corrupted. To boot using an auxiliary boot command procedure, use the following procedure:

1.   Make sure the console RX50 is in console diskette drive CSA1.

2.   Set the upper keylock switch to Enable and the lower keylock switch to Halt.

3.   To start the BOOT58 program, enter the following command and press Return:

```
>>> B/R5:800 CSA1
```

4.   *To perform a nonstop boot*, enter the following command and press Return:

```
BOOT58> @KDBBOO.CMD
```

The system performs a nonstop boot using the boot block on the console RX50 and boots from the system disk designated in the KDBBOO.CMD command procedure.

To perform a conversational boot, enter the following command and press Return:

```
BOOT58> @KDBBOO.GEN
```

The system performs a conversational boot using the boot block on the console RX50. The SYSBOOT> prompt appears on the console terminal. At the SYSBOOT> prompt, you can enter certain SYSGEN commands to change system parameters. When you finish using the SYSGEN commands, you enter the CONTINUE command to complete the boot process. For complete information about a conversational boot, see Section 3.1.5.

After booting with an auxiliary boot command procedure, use the Writeboot Utility to write a new boot block to the system disk. Section 3.1.3.5 describes writing a new boot block on a local system disk.

3.1.3.5 Writing a New Boot Block on a Local System Disk

This section discusses using the Writeboot Utility (WRITEBOOT) to write a boot block on a local system disk.

Note

The LOG_IO privilege is required to use WRITEBOOT.

To write a boot block on the local system disk, do the following:

1. Use an auxiliary boot command procedure to boot the VMS operating system.

2. To start the WRITEBOOT Utility, enter the following command and press Return:

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

The procedure displays the following message:

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

3. Enter the device name of the system disk on which you want to rewrite the boot block. For a list of device names for VAX 8200, VAX 8250, VAX 8300, and VAX 8350 computers, see Table 2–1. If you want to use a boot file other than SYS$SYSTEM:VMB.EXE, provide the full file specification, including device and directory.

   For example, suppose your system disk is an RA80 disk that has controller designation A and unit number 0. Enter the following and press Return:

```
Target system device (and boot file if not VMB.EXE):? DUA0
```

4. The procedure displays the following message:

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

   Press Return to accept the default value.

5. The procedure displays the following message:

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

   Press Return to accept the default value.

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

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

You lack LOG_IO privilege

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

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

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

VBN must be >= 1

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

3.1.4 Booting from an HSC Drive

The first time you boot the VMS operating system, use the procedure described in Section 3.1.4.1. Then create default boot command procedures, DEFBOO.CMD and DEFBOO.GEN, as described in Section 3.1.4.2. Use these boot command procedures to perform subsequent boots as described in Section 3.1.4.3 and Section 3.1.4.4..

3.1.4.1 Using the BOOT58 Program

The first time you boot from a system disk on an HSC drive, use the following procedure. Note that all numeric entries are made using hexadecimal notation.

1. Make sure that the console RX50 is in console diskette drive CSA1.

2. Set the top keylock switch to Enable and the bottom keylock switch to Halt.

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

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

   ```
   $ @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
   ```

4. Determine the following values:

   a. The VAXBI node number of the CI adapter.

   b. The unit number of the system disk and the node number of the HSC controlling it. If the drive holding the system disk has two HSC controllers, determine both node numbers.

   c. The system directory from which you will boot the VMS operating system. By default, the VMS operating system is stored in the system directory named SYS0.

5. Press Ctrl/P.

6. To start the BOOT58 program, enter the following command and press Return:

   ```
   >>> B/R5:800 CSA1
   ```

7. Deposit the VAXBI node number into register 1, using the following format:

   ```
   BOOT58> D/G 1 node-number
   ```

   For example, if the VAXBI is node number 6, enter the following command and press Return:

   ```
   BOOT58> D/G 1 6
   ```

8. Deposit the HSC node number into register 2, using the following format:

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

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

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

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

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

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

   ----

9. Deposit the unit number of the drive holding the system disk into register 3, using the following format:

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

   For example, if the drive holding the system disk is unit number 1, enter the following command and press Return:

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

10. Specify the correct root directory from which to boot. Deposit the number in register 5 using the following format:

    ```
    BOOT58> D/G 5 r0000000
    ```

    For example, if you are booting the VMS operating system from SYS2, enter the following command and press Return:

    ```
    BOOT58> D/G 5 20000000
    ```

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

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

3.1.4.2 Creating Default Boot Command Procedures

To boot the system, you can enter the BOOT command and specify the boot name for a particular drive. You also can create default boot command procedures that boot the system automatically. There are two default boot command procedures: DEFBOO.CMD and DEFBOO.GEN.

DEFBOO.CMD is the nonstop boot procedure. When you boot with DEFBOO.CMD, you have no control over the system until the boot process has finished. Use DEFBOO.GEN, the conversational boot procedure, when you want to interrupt the boot process and change system parameters.

DEFBOO.GEN and DEFBOO.CMD do not exist on the console RX50. However, Digital provides boot command procedures that you can edit and rename using the following procedure.

Note

This procedure assumes that the VMS operating system is running and that you are logged in to the SYSTEM account.

---

1. Make sure the console RX50 is in console diskette drive CSA1.

2. Set the upper keylock switch to Enable and the lower keylock switch to Halt.

3. To connect the console drive to the system, enter the following commands and press Return after each one:

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

4. Use the Exchange Utility to display a list of the files on the console RX50. Boot command procedures are files that start with either CI or D and end with either BOO or GEN. The file type is CMD. Enter the following command and press Return:

    ```
    $ EXCHANGE DIRECTORY CSA1:CI*.CMD,D*.CMD
    ```

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

    ```
    $ EXCHANGE TYPE CSA1:DU0BOO.COM
    ```

6. Use the Exchange Utility to copy CIBOO.CMD and CIBOO.GEN to the system disk. Enter the following commands and press Return after each one:

    ```
    $ EXCHANGE COPY CSA1:CIBOO.CMD *.*
    $ EXCHANGE COPY CSA1:CIBOO.GEN *.*
    ```

7. The code in CIBOO.CMD and CIBOO.GEN is nearly identical. CIBOO.CMD contains the following text:

```
!CIBOO.CMD   :Boot command file to boot a VAX 8200/8300 from an HSC disk.
!
!
!    Note "n", "p" (and "q"), "u", and "r" are single hexadecimal characters
!
D/G 0 20                  ! CI Port Device Type Code
!D/G 1 n                  ! n = CI adapter's VAXBI node number
!D/G 2 p                  ! Use the HSC controller at CI node p
!D/G 2 0p0q               ! Use either the HSC controller at CI nodes p and q
!D/G 3 u                  ! u = Disk drive unit number
D/G 4 0                   ! Boot Block LBN (not used)
!D/G 5 r0000000           ! r = system root [SYSR...], Software boot flags
D/G E 200                 ! Address of Working Memory+^X200
LOAD VMB.EXE/START:200    ! Load Primary Bootstrap
START 200                 ! Start Primary Bootstrap
```

Only the following line of code is different in CIBOO.GEN:

```
D/G 5 1
```

8. Edit CIBOO.CMD and CIBOO.GEN. Enter the following command and press Return:

```
$ EDIT CIBOO.CMD
```

   a. Delete the comment character (!) that appears before the D/G 1 command and replace *n* with the VAXBI node number of the CI device.

   b. If your processor is connected to one HSC controller, delete the comment character (!) that appears before the first D/G 2 command. Replace *p* with the HSC controller number in hexadecimal notation.

   If the drive holding the system disk is connected to two HSC controllers, delete the comment character (!) that appears before the second D/G 2 command, replace *p* with the controller number of the first HSC in hexadecimal notation, and replace *q* with the controller number of the second HSC in hexadecimal notation.

   c. Delete the comment character (!) that appears before the D/G 3 command and replace *u* with the unit number of the HSC drive from which you will boot the VMS operating system. Use hexadecimal notation.

   d. Delete the comment character (!) that appears before the D/G 5 command and replace *r* with the number of the correct root directory from which to boot. By default, the VMS operating system is in SYS0.

   e. Exit from the editor.

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

```
$ RENAME CIBOO.CMD DEFBOO.CMD
$ RENAME CIBOO.GEN DEFBOO.GEN
```

10. Use the Exchange Utility to copy DEFBOO.CMD and DEFBOO.GEN to the console RX50. Enter the following commands and press Return after each one:

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

11. When you are finished, enter the following command and press Return:

    ```
    $ DISMOUNT CSA1:
    ```

12. To secure the console from unauthorized access, you must enter the following command and press Return:

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

Now you can use DEFBOO.CMD and DEFBOO.GEN to boot the VMS operating system as described in Section 3.1.4.3 and Section 3.1.4.4.

If you change the system configuration, use the previous procedure to modify DEFBOO.CMD and DEFGEN.CMD.

3.1.4.3 Booting with DEFBOO.CMD

You can cause the system to boot using DEFBOO.CMD when you do any of the following:

Note

The default boot device must be the local drive, CSA1. To change the designation of the default boot device in the EEPROM, see the hardware documentation for your system.

- Set the upper keylock switch to Enable and the lower keylock switch to Auto Start. Turn on the power. The system uses DEFBOO.CMD to boot automatically.

- Set the upper keylock switch to Enable, the lower keylock switch to Halt. At the console-mode prompt (>>>), enter the following command and press Return:

  ```
  >>> B
  ```

- Set the upper keylock switch to Enable and the lower keylock switch to Auto Start. Execute SHUTDOWN.COM and specify the auto reboot option. The system uses DEFBOO.CMD to reboot automatically.

- If the upper keylock switch is set to Enable and the lower keylock switch is set to Auto Start when the system shuts down due to a bugcheck, the system uses DEFBOO.CMD to reboot automatically.

The system sometimes boots automatically when a power failure occurs. If the upper keylock switch is set to Enable and the lower keylock switch to AUTO START when a power failure occurs and the contents of memory are lost, the system boots when power is restored.

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

3.1.4.4 Booting with DEFBOO.GEN

You can use DEFBOO.GEN to perform a conversational boot from a system disk on an HSC drive. See Section 3.1.5.

3.1.5 Conversational Boot

A conversational boot is used most commonly in research and development environments or 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

At the SYSBOOT> prompt, you can enter any of the SYSGEN commands listed in Table 3–2. For more information about these SYSGEN commands, see the *OpenVMS System Management Utilities Reference Manual*.

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

Table 3–2   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 generation parameter.
SET/STARTUP	Sets the name of the system startup command procedure.
SHOW [parameter]	Displays active, current, default, maximum, and minimum values for specific parameters; displays, with appropriate qualifiers, characteristics of parameters grouped by categories.
USE [file-spec]	Optionally 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 also can use a conversational boot to specify a minimum startup. For example, if you want to boot the system and avoid autoconfiguring all the peripheral devices, enter the following command and press Return:

```
SYSBOOT> SET STARTUP_P1 "MIN"
```

This command initiates a minimum startup that performs the following sequence of operations:

1. Starts the processes that control error logging, the job controller, and the operator's log

2. Installs known images

3. Defines the number of interactive users as eight

4. Logs off

Because this procedure does not call SYSTARTUP_V5.COM, it does not autoconfigure your 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
$
```

3.1.5.1 Local Drive

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

1. Make sure the console RX50 is in console diskette drive CSA1.

2. Set the upper keylock switch to Enable and the lower keylock switch to Halt.

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

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

    ```
    $ @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
```

4. Press Ctrl/P.

5. Enter the BOOT command followed by the *boot name* of the drive that holds the system disk. The format for a boot name is as follows:

```
>>> B/R5:1 ddnu
```

where:

- *dd* is the device code of the drive.

- *n* is the VAXBI node number.

- *u* is the unit number of the drive.

The system disk must have a unit number between 0 and 15 (inclusive).

For example, to boot from an RA80-series disk drive with a VAXBI node identification number of 4 and a unit number of 1, enter the following command and press Return:

```
>>> B/R5:1 DU41
```

See Table 2–1 to determine the boot name of the system disk.

_____ **Note** _____

If this command does not boot the VMS operating system from a local drive, the boot block of the system disk may be corrupted. See Section 3.1.3.4 for booting instructions.

_____

3.1.5.2 HSC Drive

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

1. Make sure the console RX50 is in console diskette drive CSA1.

2. Set the top keylock switch to Enable and the bottom keylock switch to Halt.

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

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

```
$ @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
```

4. To start the BOOT58 program, enter the following command and press Return:

```
>>> B/R5:800 CSA1
```

5. To begin the conversational boot, enter the following command and press Return:

```
BOOT58> @DEFBOO.GEN
```

6. At the SYSBOOT> prompt, you can enter any of the SYSGEN commands listed in Table 3–2. For more information about these commands, see the *OpenVMS System Management Utilities Reference Manual*.

3.1.6 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 VMSKITBUILD, described in the *OpenVMS System Manager's Manual*, to add a copy of the VMS operating system to another root directory on the system disk.

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

1. Make sure that the console RX50 is in console diskette drive CSA1.

2. To connect the console drive, enter the following commands and press Return after each one:

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

3. Use the Exchange Utility to copy DEFBOO.CMD from the console RX50 to your current directory on the system disk. Enter the following command and press Return:

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

4. Edit DEFBOO.CMD. Change the line that deposits a value in register 5. This line contains the comment *! r = system root [SYSR . . .], Software boot flags*. The value is a hexadecimal number with eight digits. For example:

```
D/G/L 5 10000000  ! r = system root [SYSR...], Software boot flags
```

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

```
D/G/L 5 C0000000
```

5. Rename DEFBOO.CMD to SYSnBOO.CMD, where *n* stands for the name of the other system root directory. Use the following format:

```
$ RENAME DEFBOO.CMD SYSnBOO.CMD
```

For example, if the directory is named [SYSC], enter the following command and press Return:

```
$ RENAME DEFBOO.CMD SYSCBOO.CMD
```

6. Use the Exchange Utility to copy SYSnBOO.CMD to the console RX50. Use the following format:

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

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

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

7. When you have finished, enter the following command and press Return:

```
$ DISMOUNT CSA1:
```

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

1. Make sure the console RX50 is in console diskette drive CSA1.

2. Set the upper keylock switch to Enable and the lower keylock switch to Halt.

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

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

```
$ @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
```

4. Press Ctrl/P.

5. To start the BOOT58 program, enter the following command and press Return:

```
>>> B/R5:800 CSA1
```

6. Use the command procedure you created to boot from the different directory. For example, to boot from [SYSC], enter the following command and press Return:

```
BOOT58> @ SYSCBOO.CMD
```

3.1.7 Booting from SYSF During an Upgrade

To boot from [SYSF], create and then invoke the command procedure named SYSFBOO.CMD, as follows:

1. Make sure that the console RX50 is in console diskette drive CSA1.

2. To connect the console drive, enter the following commands and press Return after each one:

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

3. Use the Exchange Utility to copy DEFBOO.CMD from the console RX50 to your current directory on the system disk. Enter the following command and press Return:

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

4. Edit DEFBOO.CMD. Change the line that deposits a value in register 5. This line contains the comment *! r = system root [SYSR . . .], Software boot flags.* The value is a hexadecimal number with eight digits. For example:

```
D/G/L 5 10000000  ! r = system root [SYSR...], Software boot flags
```

Change the leftmost digit of the value to reflect the name of the root directory from which you want to boot. For example, to boot from [SYSF], change the line as follows:

```
D/G/L 5 F0000000
```

5. Rename DEFBOO.CMD to SYSFBOO.CMD, as follows:

```
$ RENAME DEFBOO.CMD SYSFBOO.CMD
```

6. Use the Exchange Utility to copy SYSFBOO.CMD to the console RX50. Use the following format:

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

7. When you have finished, enter the following command and press Return:

```
$ DISMOUNT CSA1:
```

To boot from [SYSF] during an upgrade, use the following procedure:

1. Make sure the console RX50 is in console diskette drive CSA1.

2. Set the upper keylock switch to Enable and the lower keylock switch to Halt.

3. Press Ctrl/P.

4. To start the BOOT58 program, enter the following command and press Return:

```
>>> B/R5:800 CSA1
```

5. Use SYSFBOO.CMD to boot from [SYSF]. Enter the following command and press Return:

```
BOOT58> @ SYSFBOO.CMD
```

3.1.8 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*.

3.1.9 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 console diskette, or a machine check error. If you suspect a hardware problem, do the following:

• Consult the hardware manual for your VAX computer.

• 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 13:00:00.00
```

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

• Try booting the system again.

- 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 operating system, decide if you want the operating system to reboot automatically or if you want to enter console-mode commands after the shutdown completes.

If you want the system to reboot automatically after the shutdown, set the upper keylock switch to Enable and the lower keylock switch to Auto Start.

If you want to enter console-mode commands after the shutdown, set the upper keylock switch to Enable and the lower keylock switch to Halt. 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 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 commands only if the system is hung and you cannot log in to the SYSTEM account to use SHUTDOWN or OPCCRASH.

_____

CRASH commands cause the system to fail, resulting in immediate shutdown. To force your VAX 8200, VAX 8250, VAX 8300, or VAX 8350 computer to fail, use the following procedure (as shown in Example 3–1):

1. Make sure the console RX50 is in console diskette drive CSA1.

2. Set the upper keylock switch to Enable and the lower keylock switch to Halt.

3. Press Ctrl/P. This stops the CPU and displays the program counter (PC).

4. Enter the following commands and press Return after each one:

   ```
   >>> E/I 0
   >>> E/I 1
   >>> E/I 2
   >>> E/I 3
   >>> E/I 4
   >>> E P
   >>> D P 041F0000
   >>> D/G F FFFFFFFF
   >>> C
   ```

   CRASH commands display 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 why the system did not respond.

5. CRASH commands stop the system, display the contents of the program counter, and display the console-mode prompt (>>>).

   If you are booting *from a local drive*, and if the upper keylock switch is set to Enable and the lower keylock switch is set to Auto Start, the system reboots.

   If you are booting *from an HSC drive*, and if the upper keylock switch is set to Enable and the lower keylock switch is set to Auto Start, the system executes DEFBOO.CMD and reboots.

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

6. After the system reboots, you can examine the dump file. To examine the dump file, 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*.

Example 3–1 Running CRASH on a VAX 8200, 8250, 8300, 8350 System

```
Ctrl/P
?02 External Halt
PC = 801A208D
>>>E/I 0
    I       00000000      7FFE7CE0
>>>E/I 1
    I       00000001      7FFE9D88
>>>E/I 2
    I       00000002      7FFED04E
>>>E/I 3
    I       00000003      0001FAC8
>>>E/I 4
    I       00000004      80631200
>>>E P
    04030004
>>>D P 041F0000
>>>D/G F FFFFFFFF

>>>>C
**** FATAL BUG CHECK, VERSION = V5.4  INVEXCEPTN, Exception while
above ASTDEL or on interrupt stack

    CRASH CPU:  02        PRIMARY CPU: 02

    ACTIVE/AVAILABLE CPU MASKS: 00000016/00000016

    CURRENT PROCESS = NULL

    REGISTER DUMP
    .
    .
    .

    #ABCDEFGHIJK.MN#

    0 1 2 3 4 5 6 7 8 . . B C D E F
    02000000
    ?06
         PC = 20090252
    ?42
         PC = 20090252
    >>>
```

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 describes the following procedures:

• 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)

• Backing up the console RX50 using CONSCOPY.COM (Section 4.4)

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 command procedure sends the contents of the caches back to the disk and closes any open files. By shutting down the system and using standalone BACKUP, you can make an exact copy of the system disk.

You can keep standalone BACKUP on the system disk, on RX50 floppy diskettes, or on any other media that the 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

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

1. Set the top keylock switch to ENABLE and the bottom keylock switch to HALT.

2. Make sure the console RX50 is in console diskette drive CSA1.

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

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

```
$ @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 finishes, it displays the following message:

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

4. Press Ctrl/P.

5. Enter the BOOT command in the following format:

```
>>> B/R5:E0000000 [ddnu]
```

where *ddnu* is the boot name of the drive holding the system disk. A boot name has the following format:

```
ddnu
```

where:

- *dd* is the device code of the drive.

- *n* is the controller's VAXBI node identification number.

- *u* is the unit number.

For example, to boot from an RA80-series disk drive with a VAXBI node 4 and unit 1, use the following command:

```
>>> B/R5:E0000000 DU41
```

To determine the boot name of the drive, see Table 2–1. If you do not specify the boot name of the drive, standalone BACKUP boots from the drive designated in the EEPROM.

6. The procedure asks 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
```

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

```
Available device DJA2    device type RA60
Available device DJA3    device type RA60
```

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

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

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

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

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

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

1. Make sure the console RX50 is in console diskette drive CSA1.

2. Log in to the SYSTEM account.

3. To connect the console drive to the system, enter the following commands and press Return after each one:

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

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

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

5. Edit XEFBOO.CMD. Change the line that deposits a value in register 5. This line contains the comment *! r = system root [SYSR . . .], Software boot flags*. Change the leftmost digit so that it specifies the SYSE directory. For example:

   ```
   D/G 5 E0000000
   ```

6. Exit from the editor to save the modified version of the file.

7. To copy XEFBOO.CMD to the console RX50, enter the following command and press Return:

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

8. When you have finished, enter the following command and press Return:

   ```
   $ DISMOUNT CSA1
   ```

After you copy XEFBOO.CMD to the console RX50, you can use it to boot standalone BACKUP from a system disk on an HSC drive. To boot standalone BACKUP from SYSE on an HSC drive, use the following procedure:

1. Make sure the console RX50 is in console diskette drive CSA1.

2. Set the top keylock switch to ENABLE and the bottom keylock switch to HALT.

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

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

   ```
   $ @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 finishes, it displays the following message:

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

4. Press Ctrl/P.

5. To start the BOOT58 program, enter the following command and press Return:

   ```
   >>> B/R5:800 CSA1
   ```

6. Enter the following command and press Return:

   ```
   BOOT58> @XEFBOO.CMD
   ```

7. The procedure asks 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
   ```

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

   ```
   Available device DJA2    device type RA60
   Available device DJA3    device type RA60
   ```

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

9. When standalone BACKUP finishes booting, it displays an identification message followed by the dollar sign prompt (`$`):

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

To back up the system disk, go to Section 4.2.

To restore the system disk, go to Section 4.3.

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 n is the version of the VMS operating system and x is the total number of floppy diskettes included with the distribution kit:

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, place those floppy diskettes (five, in this example) successively in the console drive, as follows:

1. Make sure the console RX50 is in console diskette drive CSA1.

2. Set the upper keylock switch to ENABLE and the lower keylock switch to HALT.

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

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

   ```
   $ @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
   ```

4. Press Ctrl/P.

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

   ```
   >>> B/R5:800 CSA1
   ```

6. At the BOOT58> prompt enter the following command and press Return:

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

   The procedure displays the following message:

```
Please remove the volume "8200x console" from the console device. Insert the
first standalone system volume and enter "YES" when ready:
```

7. Remove the console RX50 and insert the floppy diskette labeled S/A BKUP RX50 1/4 in console diskette drive CSA1. When you are ready to continue, type Y (for YES) and press Return. The procedure displays the following message:

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

   Approximately 3 minutes later the procedure displays the following message:

   ```
   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:
   ```

8. 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 (for YES) 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:
   ```

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

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

10. 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
    ```

11. 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:
    ```

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

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

13. 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:
    ```

    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 (for YES) and press Return. The procedure displays the following message:

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

14. 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
    $
    ```

15. If you are restoring the system disk, leave the last floppy diskette in the console drive and continue the restore procedure, as described in Section 4.3. If you are not restoring the system disk, you may remove the last floppy diskette from the console drive.

To back up 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 the Backup Utility qualifiers to back up and restore the 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 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 a list of device names for a VAX 8200, see Table 2–1.

5. Enter the BACKUP command in one of the following formats. Use the first command if you are backing up the system disk to a disk. Use the second command if you are backing up the system disk to a magnetic tape. 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 that you want to back up. 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 disk or 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 been initialized already, 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 cannot have more than 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. For more information, see Section 4.3.

```
$ BACKUP/IMAGE/VERIFY DUA0: MUA0: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.

8. Reboot the system.

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

Note

The BACKUP command creates a system disk that includes a Digital-provided set of volume parameters, including a CLUSTER_SIZE (disk access scheme) of one. (The CLUSTER_SIZE refers to the way files are stored on the disk, NOT to VAXclusters.) You can change most volume parameters later with the SET VOLUME command. However, to change the CLUSTER_SIZE you must back up the system disk to a disk that has been initialized previously 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*.

4.3 Restoring the System Disk

To restore the system disk, use the following procedure:

1. Write-protect the backup disk or tape.

2. Insert 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. Leave the fourth standalone BACKUP diskette (labeled BACKUP) in console diskette drive CSA1 throughout this procedure.

4. Place a scratch disk in the drive you intend to use for the new system disk. Spin up the disk but do not write-protect it.

5. Determine the device names of the drive holding the system disk and the drive holding the backup tape. For a list of device names for a VAX 8200, see Table 2–1.

6. Enter the BACKUP command in one of the following formats. Use the first command if you have a backup disk. Use the second command if you have a backup tape.

   ```
   $ 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.BCK* 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 MUA0:JUN_19_1990.BCK/REWIND DUA1:
   ```

7. When the procedure finishes, it displays the following message:

```
%BACKUP-I-PROCDONE, Operation completed. Processing finished at 19-JUN-1990 15:00
If you do not want to perform another standalone BACKUP operation,
use the console to halt the system.

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

8. Press Ctrl/P.

9. Reboot the system.

4.4 Backing Up the Console RX50

Make a backup copy of the console RX50 to protect against corruption or loss of the original. First use CONSCOPY.COM to transfer the files on the console RX50 to a directory on the system disk. Then use CONSCOPY.COM to *restore* the files to a new floppy diskette.

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

1. Log in to the SYSTEM account.

2. Make sure the console RX50 is in console diskette drive CSA1.

3. Enter the following command and press Return:

   ```
   $ @SYS$UPDATE:CONSCOPY
   ```

   The procedure displays the following messages:

   ```
    S Y S $ U P D A T E : C O N S C O P Y . C O M

        Save or restore a VMS console medium.

   Which CPU kit do you want to build ?
   ```

```
78X includes 11/780 and 11/785
8600 includes 8650
8200 includes 8250,8300 and 8350
[8600, 8200, 78X, 750 or 730, default 8200]:
```

4. Press Return. The procedure displays the following messages:

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

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

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

```
Do you want to SAVE or RESTORE your console RX50?: SAVE
```

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

```
Enter file name of virtual disk [default SYS$DISK:CONSOLE.DSK]:
```

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

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

8. The procedure asks for the name of the console drive. Type CSA1: and press Return. Make sure you put a colon (:) after the device name. For example:

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

9. When the procedure displays the following message, press Return (the console RX50 is in the drive already).

```
Put your console RX50 into drive _CSA1:, and type Return when ready:
```

After you press Return, the procedure mounts the console RX50, and uses the Exchange Utility to begin the *save* operation. The procedure displays several EXCHANGE messages, file header information, and a list of the files that are being saved. When the procedure is complete, it displays the following message:

```
The SAVE of your console floppy is complete.
```

To transfer the files that are on the system disk to a new floppy diskette, use the following procedure:

1. Enter the following command and press Return:

```
$ @SYS$UPDATE:CONSCOPY
```

2. The procedure displays the following message:

```
S Y S $ U P D A T E : C O N S C O P Y . C O M

    Save or restore a VMS console medium.
```

```
Which CPU kit do you want to build ?
```

```
78X includes 11/780 and 11/785
8600 includes 8650
8200 includes 8250, 8300 and 8350
```

```
[8600, 8200, 78X, 750 or 730, default 8200]:
```

3. Press Return. The procedure displays the following messages:

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

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

4. When the procedure asks which operation you want, type RESTORE and press Return. For example:

   ```
   Do you want to SAVE or RESTORE your console RX50?: RESTORE
   ```

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

   ```
   Enter file name of virtual disk [default SYS$DISK:CONSOLE.DSK]:
   ```

6. To verify the operation, press Return in response to the following question:

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

7. The procedure asks for the name of the console drive. Type CSA1: and press Return. Make sure you put a colon (:) after the device name. For example:

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

8. The procedure displays the following message:

   ```
   Put your console RX50 into drive _CSA1:,
   and type Return when ready:
   ```

   Remove the console RX50 from console diskette drive CSA1. Insert the new floppy diskette in the drive. When you are ready to continue, press Return.

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

   ```
   The RESTORE of your console floppy is complete.
   ```

Use the console RX50 that you just created to make sure it works. Treat the original as the backup copy.

A

Configuring Serial Lines on the VAX 8200, 8250, 8300, 8350 Computer

Serial lines on optional BI controllers are configured automatically by the System Generation Utility (SYSGEN) at boot time. However, the serial lines on the KA820 board must be configured using the following SYSGEN command:

```
SYSGEN> CONNECT SERIAL_LINE_UNIT=n
```

You also can use one of the following command lines:

```
SYSGEN> CONNECT SERIAL_LINE_UNIT:n
```

```
SYSGEN> CONNECT SLU=n
```

```
SYSGEN> CONNECT SLU:n
```

The *n* must be 1, 2, or 3.

When you enter this command, SYSGEN configures the serial lines as follows:

- When n = 1, device TCA0 is configured.
- When n = 2, device TCB0 is configured.
- When n = 3, device TCC0 is configured.

Thus, *TC* is the device name for 3 of the 4 serial lines on the VAX 8200.[1]

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

The first serial-line unit, numbered *0*, is the console serial-line port and has the usual device name of *OPA0*. You do not need to configure *OPA0* explicitly.

In a VAX 8300 or 8350 configuration, only the serial lines on the primary KA820 board can be configured. VMS support of multiprocessing requires that all supported I/O devices are accessible to the primary CPU. This requirement excludes the serial lines that secondary CPUs provide. For more information on SYSGEN parameters that affect multiprocessing, see the *OpenVMS System Management Utilities Reference Manual*.

---

[1] The VMS operating system always supports the first serial line as a console interface. The first serial line, as are the remaining three serial lines, is also supported as a user terminal interface at a maximum speed of 1200 baud in configurations that include a LAT terminal interface and in configurations without other terminal interfaces. However, the VMS operating system does not support these serial lines as a user terminal interface if a terminal interface other than the LAT is configured.

Glossary

boot or bootstrap

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

boot command procedure

A program stored on the console RX50 that is used to boot the VMS operating system from a specified drive.

boot name

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

BOOT58 program

A program stored on the console RX50 that is used to boot the VMS operating system from either an HSC drive or a local drive.

boot server

A computer that is part of a local area VAXcluster. The boot server in a local area VAXcluster has a system disk that contains cluster common files; other nodes in the cluster (satellite nodes) can access these files. See also satellite node.

CIBCA

A cluster interconnect port on a VAX backplane interconnect (BI). A CIBCA does not require a cabinet.

CIBCI

A cluster interconnect port on a VAX backplane interconnect (VAXBI). A CIBCI requires a cabinet.

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.

computer interconnect

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

console mode

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

console RX50

The RX50 diskette that contains the console program. It is not shipped as part of the VMS distribution kit. The console RX50 is used in the CSA1 and CSA2 drives.

device name

The name you use to identify a device on the system. A device name indicates the device code, controller designation, and unit number.

Hierarchical Storage Controller (HSC) device

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

HSC drive

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

local area VAXcluster

Consists of a VAX computer that acts as a boot server and a number of low-end VAX computers that act as satellite nodes. Ethernet connects all of the computers. These computers share a single file system.

local drive

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

Mass Storage Control Protocol (MSCP)

The protocol used to communicate between a VAX computer and a disk or tape controller. An MSCP server makes local MASSBUS, UNIBUS, and UDA disks accessible to all the nodes in a VAXcluster environment.

MASSBUS

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

media

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

mixed-interconnect VAXcluster

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

program mode

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

satellite node

A computer that is part of a local area VAXcluster. A satellite node is booted remotely from the system disk of the boot server in the local area VAXcluster. See also boot server.

save set

The format that the Backup Utility stores files in. The VMS operating system is shipped in this format.

scratch disk

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

spin up/spin down

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

standalone BACKUP

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

standalone system

A computer system with only one VAX computer.

system disk

The disk that contains (or will contain) the VMS operating system. A VMS system disk is set up so that most of the VMS files can be shared by several computers. In addition, each computer has its own directory on the system disk that contains its page, swap, and dump files.

UDA50

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

UNIBUS

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

VAXBI

BI stands for *backplane interconnect*. It is a system bus that connects the CPU and memory to the I/O busses.

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.

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