



OpenVMS Systems Operations Guide:
VAX 8200 and VAX 8300 Systems

EK-V8283-OG. A01

February, 1993

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

Copyright © Digital Equipment Corporation 1993

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

FCC NOTICE: The equipment described in this manual generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense may be required to take measures to correct the interference.

The following are trademarks of Digital Equipment Corporation: CI, HSC, MSCP, OpenVMS, RT-11, RX50, VAX, VAX 8200, VAX 8300, VAX 8350, VAXBI, VMS, and the DIGITAL logo.

Contents

About This Guide	v
-------------------------	---

1 Console Subsystem

1.1	Introduction	1-1
1.2	Console Terminal	1-1
1.3	Control Panel	1-1
1.4	Console Dual-Diskette Drive	1-5
1.4.1	Inserting or Removing a Diskette	1-5
1.5	Console Command Language	1-7

2 System Boot Procedures

2.1	Introduction	2-1
2.2	Boot Command Procedures	2-2
2.3	The BOOT58 Program	2-4
2.4	Booting from a Local Drive	2-6
2.4.1	Automatic Boot	2-6
2.4.2	Manual Boot	2-7
2.4.3	Creating Auxiliary Boot Command Procedures	2-8
2.4.4	Using Auxiliary Boot Command Procedures	2-11
2.4.5	Writing a New Boot Block on a Local System Disk	2-12
2.5	Booting from an HSC Drive	2-14
2.5.1	Using the BOOT58 Program	2-14
2.6	Creating Default Boot Command Procedures	2-17
2.6.1	Booting with DEFBOO.CMD	2-20
2.6.2	Booting with DEFBOO.GEN	2-20
2.7	Conversational Boot	2-21
2.7.1	Local Drive	2-21
2.7.2	HSC Drive	2-23
2.8	Booting from a Different Directory on the System Disk	2-24
2.9	Booting from SYSF During an Upgrade	2-27

3 System Shutdown Procedures

3.1	Orderly Shutdown with SHUTDOWN.COM	3-1
3.2	Emergency Shutdown with CRASH Commands	3-1

4 System Backup Procedures

4.1	Introduction	4-1
4.2	Using Standalone BACKUP	4-2
4.3	Installing Standalone BACKUP on the System Disk	4-3
4.4	Bootting Standalone BACKUP from the System Disk	4-3
4.5	Installing Standalone BACKUP on Floppy Diskettes	4-8
4.6	Bootting Standalone BACKUP from Floppy Diskettes	4-11
4.7	Backing Up the Console RX50	4-15

Examples

3-1	Sample CRASH Command Sequence	3-3
-----	---	-----

Figures

1-1	Control Panel	1-2
1-2	Inserting a Diskette into CSA2	1-6

Tables

1-1	Upper Keylock Switch Settings	1-2
1-2	Lower Keylock Switch Settings	1-3
1-3	Indicator Lights	1-3
1-4	Restart Push Button Functions	1-4
1-5	Most Commonly Used Console Mode Commands	1-8
2-1	BOOT58 Commands	2-4

About This Guide

This document is a quick reference guide of basic systems operations for VAX 8200 and VAX 8300 systems. It summarizes such system tasks as booting and console operation as they relate to VAX 8200 and VAX 8300 systems.

Intended Audience

This guide is designed primarily for the following:

- System software support personnel
- Digital Services personnel
- System managers
- Instructors and participants in certain OpenVMS operating system courses:
 - Systems Troubleshooting
 - System and Network Management I, II, and III

Document Scope

This guide describes various aspects of VAX 8200 and VAX 8300 systems operations including:

- Console subsystem overview
- Operators control panel
- Console command language
- System boot procedures
- System shutdown procedures
- System backup procedures

1

Console Subsystem

1.1 Introduction

The console subsystem provides the means to control and monitor system operations and to examine and deposit data in memory or processor registers. The console subsystem consists of the following:

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

1.2 Console Terminal

The console terminal is a hardcopy terminal which prints a log of processor activities. Ensure that the terminal always contains enough paper.

1.3 Control Panel

VAX 8200 and VAX 8300 control panels are nearly identical. The panel is located on the front of the system cabinet and includes the following:

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

Figure 1-1 shows the control panel. Refer to Tables 1-1 to Table 1-4 for descriptions of the two keylock switches, the three indicator lights, and the restart push button.

Figure 1-1 Control Panel

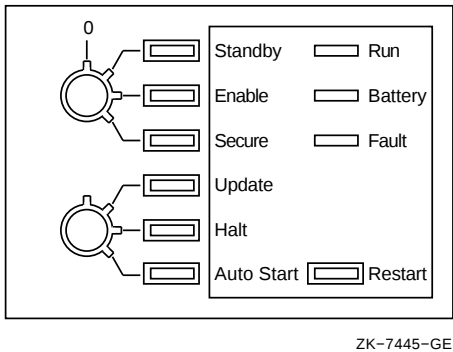


Table 1-1 Upper Keylock Switch Settings

Setting	Meaning
Off	Turns off power in the entire system, including the battery backup unit. There is no corresponding light for this key position.
Standby	Turns on the power supply, the blower in the main unit, and system memory; the corresponding indicator light glows red.
Enable	When the switch setting is changed from <i>Standby</i> to <i>Enable</i> , the system self-tests run. When the upper keylock switch is set to <i>Enable</i> , 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 <i>Auto Start</i> , pressing the Restart push button reboots the system.
Secure	This setting maintains power to the entire system and is used for normal operation; the corresponding indicator light glows green. 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 Lower Keylock Switch Settings

Setting	Meaning
Update	When the lower keylock switch is set to <i>Update</i> , 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 <i>Halt</i> , 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 <i>Auto Start</i> , 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 <i>Enable</i> , pressing the Restart push button reboots the system.

Table 1–3 Indicator Lights

Label	Meaning										
Run	Glow when the processor is running and the console subsystem is in program mode.										
Battery	Indicates the state of the backup battery unit (BBU):										
	<table> <tr> <th>Indicator State</th><th>BBU State</th></tr> <tr> <td>Steady glow</td><td>Fully charged</td></tr> <tr> <td>Slow flashing</td><td>Charging</td></tr> <tr> <td>Quick flashing</td><td>Supplying power to system</td></tr> <tr> <td>No light</td><td>Not present or failed</td></tr> </table>	Indicator State	BBU State	Steady glow	Fully charged	Slow flashing	Charging	Quick flashing	Supplying power to system	No light	Not present or failed
Indicator State	BBU State										
Steady glow	Fully charged										
Slow flashing	Charging										
Quick flashing	Supplying power to system										
No light	Not present or failed										
Fault	Glow 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 OpenVMS operating system boots, the system has detected a failure in a hardware module.										

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 OpenVMS operating system
Enable	Update or Halt	Runs self-test
Stand by or Secure	Any position	Disabled

1.4 Console Dual-Diskette Drive

The RX50, a dual-diskette drive, is located on the front of the system cabinet.

The diskette drive is mounted vertically on some processors and horizontally 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 RX50** diskette contains the BOOT58 program. BOOT58 *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

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.

1.4.1 Inserting or Removing a Diskette

Refer to Figure 1–2.

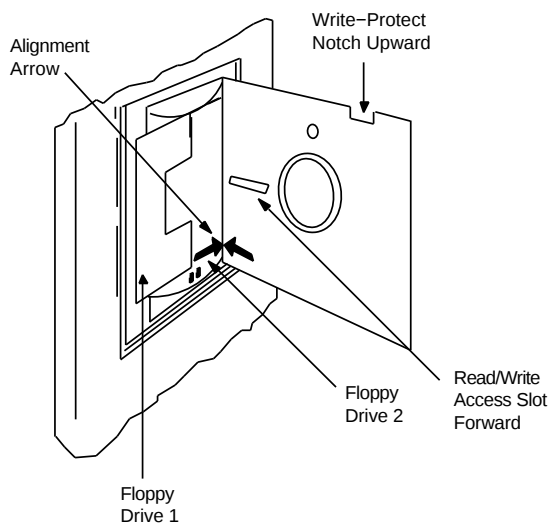
To insert a diskette into console diskette drive CSA2, follow steps 1 through 6. To remove a diskette, follow steps 1 through 3.

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.

1-6 Console Subsystem

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



ZK-1680-GE

1.5 Console Command Language

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

Program mode

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

If the OpenVMS operating system is running and you want to go to console mode, follow the shutdown procedure. 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 (>>>).

Console mode

When the console subsystem is in console mode, the OpenVMS 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 OpenVMS operating system.

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.

2

System Boot Procedures

2.1 Introduction

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

The method selected to boot the system 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.

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 *VMS System Generation Utility 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).

2.2 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 OpenVMS operating system into memory
- Starts the CPU

The console RX50 contains the BOOT58 program and the boot command procedures. To boot the OpenVMS 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 OpenVMS 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
CIB00.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:
```

2.3 The BOOT58 Program

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

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

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

The BOOT58> prompt is displayed. Table 2-1 lists the commands that you can enter at the BOOT58> prompt.

Table 2-1 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.

Table 2-1 (Continued) BOOT58 Commands

Command	Function
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 OpenVMS operating system.

2.4 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.

2.4.1 Automatic Boot

You can boot the OpenVMS 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.

2.4.2 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 OpenVMS operating system is not running, go to step 4.

If the OpenVMS 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.

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 OpenVMS operating system the first time, so that auxiliary boot command procedures will be available if you need them.

2.4.3 Creating Auxiliary Boot Command Procedures

There are two auxiliary boot command procedures that you can use to boot the OpenVMS operating system from a local drive if the boot block on the system disk becomes corrupted: 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 OpenVMS 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 r00000000 ! 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 OpenVMS 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
```

2-10 System Boot Procedures

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

```
$ EDIT KDBB00.GEN
```

- a. In the first line of the command procedure, change the name KDBB00.CMD to KDBB00.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 OpenVMS 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 KDBB00.CMD and KDBB00.GEN to the console RX50. Enter the following commands and press Return after each one:

```
$ EXCHANGE COPY KDBB00.CMD CSA1:KDBB00.CMD  
$ EXCHANGE COPY KDBB00.GEN CSA1:KDBB00.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 KDBB00.CMD and KDBB00.GEN to boot the OpenVMS operating system from a local drive, as described in Section 2.4.4, when the boot block on the system disk becomes corrupted.

2.4.4 Using Auxiliary Boot Command Procedures

You should boot the OpenVMS 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> @KDBB00.CMD
```

The system performs a nonstop boot using the boot block on the console RX50 and boots from the system disk designated in the KDBB00.CMD command procedure.

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

```
BOOT58> @KDBB00.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 2.7.

After booting with an auxiliary boot command procedure, use the Writeboot utility to write a new boot block to the system disk. Section 2.4.5 describes writing a new boot block on a local system disk.

2.4.5 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 OpenVMS 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. 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.

VCN must be >= 1

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

2.5 Booting from an HSC Drive

The first time you boot the OpenVMS operating system, use the procedure described in Section 2.5.1. Then create default boot command procedures, DEFBOO.COM and DEFBOO.GEN, as described in Section 2.6. Use these boot command procedures to perform subsequent boots as described in Section 2.6.1 and Section 2.6.2..

2.5.1 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 OpenVMS operating system is not running, go to step 4.

If the OpenVMS 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 OpenVMS operating system. By default, the OpenVMS 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
```

2-16 System Boot Procedures

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

```
B00T58> D/G 5 20000000
```

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

```
B00T58> @CIB00.CMD
```

2.6 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 OpenVMS 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
```

2-18 System Boot Procedures

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 r00000000 ! 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 OpenVMS 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 OpenVMS 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 CIB00.CMD DEFB00.CMD
$ RENAME CIB00.GEN DEFB00.GEN
```
10. Use the Exchange utility to copy DEFB00.CMD and DEFB00.GEN to the console RX50. Enter the following commands and press Return after each one:
- ```
$ EXCHANGE COPY DEFB00.CMD CSA1:DEFB00.CMD
$ EXCHANGE COPY DEFB00.GEN CSA1:DEFB00.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 DEFB00.CMD and DEFB00.GEN to boot the OpenVMS operating system as described in Section 2.6.1 and Section 2.6.2.

If you change the system configuration, use the previous procedure to modify DEFB00.CMD and DEFGEN.CMD.

2.6.1 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.

2.6.2 Booting with DEFBOO.GEN

You can use DEFBOO.GEN to perform a conversational boot from a system disk on an HSC drive. See Section 2.7.

2.7 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. For more information about these SYSGEN commands, see the *VMS System Generation Utility Manual*.

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

2.7.1 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 OpenVMS operating system is not running, go to step 4.

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

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

2-22 System Boot Procedures

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
```

NOTE

If this command does not boot the OpenVMS operating system from a local drive, the boot block of the system disk may be corrupted. See Section 2.4.4 for booting instructions.

2.7.2 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 OpenVMS operating system is not running, go to step 4.

If the OpenVMS 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> @DEFB00.GEN
```
6. At the SYSBOOT> prompt, you can enter any of the SYSGEN commands.

2.8 Booting from a Different Directory on the System Disk

The OpenVMS operating system is installed on the system disk in the root directory named [SYS0]. You can use VMSKITBUILD, described in the *Guide to Setting Up a VMS System*, to add a copy of the OpenVMS 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 DEFB00.CMD SYSCB00.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 SYSCB00.CMD, enter the following command and press Return:

```
$ EXCHANGE COPY SYSCB00.CMD CSA1:SYSCB00.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 OpenVMS operating system is not running, go to step 4.

If the OpenVMS 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
```

2-26 System Boot Procedures

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> @ SYSCB00.CMD
```

2.9 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:
```

2-28 System Boot Procedures

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

System Shutdown Procedures

3.1 Orderly Shutdown with SHUTDOWN.COM

To use the SHUTDOWN command procedure, log in to the SYSTEM account and enter the following command:

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

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

3.2 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 the system 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:

3-2 System Shutdown Procedures

```
>>> 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 *VMS System Dump Analyzer Utility Manual*.

Example 3-1 Sample CRASH Command Sequence

```

[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

System Backup Procedures

4.1 Introduction

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 OpenVMS operating system.

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

- In case a problem occurs during a OpenVMS 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 OpenVMS 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 OpenVMS 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.

4-2 System Backup Procedures

- 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.

4.2 Using Standalone BACKUP

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.)

4.3 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 4.4.

4.4 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 OpenVMS operating system is not running, go to step 4.

If the OpenVMS 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
```

4-4 System Backup Procedures

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
```

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:DEFB00.CMD XEFB00.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 XEFB00.CMD CSA1:XEFB00.CMD
```

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

```
$ DISMOUNT CSA1
```

4-6 System Backup Procedures

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 OpenVMS operating system is not running, go to step 4.

If the OpenVMS 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  
$
```

4.5 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 OpenVMS 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 OpenVMS 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 OpenVMS 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 OpenVMS 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:

4-10 System Backup Procedures

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.

4.6 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 4.5). They are labeled as follows, where n is the version of the OpenVMS 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

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

²A volume label is the name the OpenVMS 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 4/5	SYSTEM_4
VMS V5.n S/A BKUP RX50 5/5	BACKUP

4-12 System Backup Procedures

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 OpenVMS operating system is not running, go to step 4.

If the OpenVMS 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> @CSAB00.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

4-14 System Backup Procedures

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. If you are not restoring the system disk, you may remove the last floppy diskette from the console drive.

4.7 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 OpenVMS 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
```

4-16 System Backup Procedures

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 OpenVMS 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.

