MicroVMS VAXstation 2000/MicroVAX 2000 Installation Guide

Order Number: AA-JR84A-TN

March 1987

This document describes the procedure for installing or upgrading Version 4.5B of the MicroVMS operating system on a VAXstation 2000 or MicroVAX 2000 processor from diskettes or a tape cartridge.

Revision/Update Information:	This is a new manual.
Operating System and Version:	MicroVMS Version 4.5B
Software Version:	MicroVMS Version 4.5B

digital equipment corporation
maynard, massachusetts

March 1987

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Preface

Intended Audience

This manual is intended for anyone who wants to install or upgrade to the Version 4.5B MicroVMS operating system on a VAXstation 2000 or MicroVAX 2000 processor.

Structure of This Document

This manual consists of six chapters:

- Chapter 1 provides an overview of the installation and upgrade procedures.
- Chapter 2 describes how to install the MicroVMS operating system on a VAXstation 2000/MicroVAX 2000 from diskettes.
- Chapter 3 describes how to upgrade the MicroVMS operating system on a VAXstation 2000/MicroVAX 2000 from diskettes.
- Chapter 4 describes how to install the MicroVMS operating system on a VAXstation 2000/MicroVAX 2000 from a tape cartridge.
- Chapter 5 describes how to upgrade the MicroVMS operating system on a VAXstation 2000/MicroVAX 2000 from a tape cartridge.
- Chapter 6 describes how to install the MicroVMS DECnet license key from a diskette or tape cartridge and how to configure and start up the network.
- Appendix A describes the components of the base kit and the optional software products.

Which chapters you use in this manual depends upon whether your software is on diskettes or a tape cartridge, and whether you are performing an installation or an upgrade. Chapters 2 and 4 are divided into several parts. Each part describes a single installation procedure. Which procedure you use depends on the piece of software you want to install.

This manual describes how to install the following pieces of software:

- **MicroVMS base system**—files of the MicroVMS operating system that are essential to creating a bootable system.
- **MicroVMS options**—facilities of the MicroVMS operating system that are not required for basic system operations but may be installed optionally. The MicroVMS distribution kit contains four options: PROG, SYSP, USER, and UTIL. The MicroVMS base system must be installed before any options. See Appendix A for a list of all the options.
- **DECnet optional software product and license key**—the communication network. To start up the DECnet network, you must have purchased a DECnet license key and have already installed the MicroVMS DECnet optional product.
- **Optional software products**—any MicroVMS optional product, such as a programming language processor. If you purchased DECnet, you must install it before installing any other optional products. Note that some products require a particular MicroVMS option to be installed *before* the optional product can be installed.

NOTE: Before attempting any installation procedures described in this manual, you should be familiar with the hardware and startup/shutdown procedures described in Chapters 1 and 2 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*.

Associated Documents

The following hardware and software documents are associated with this manual:

- *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide* provides system management information for the VAXstation 2000/MicroVAX 2000.
- *VAXstation 2000 Hardware Installation Guide* provides information about installing and testing VAXstation 2000 hardware.
- *MicroVAX 2000 Hardware Installation Guide* provides information about installing and testing MicroVAX 2000 hardware.
- *VAXstation 2000 Owner's Manual* provides hardware operations and troubleshooting information for the VAXstation 2000.
- *MicroVAX 2000 Owner's Manual* provides hardware operations and troubleshooting information for the MicroVAX 2000.
- *VAXstation 2000, MicroVAX 2000, and VAXmate Network Guide* provides information about installing and maintaining a network environment on the VAXstation 2000/MicroVAX 2000.

Conventions Used in This Document

Conventions	Meaning
Key Names	VT200-series terminal key names appear first in text and examples in this guide. Key names that are different on the VT100-series terminal keyboard are shown in parentheses after the VT200-series key names.
RETURN Key	The RETURN key is not shown in formats and examples. Assume that you must press RETURN after typing a command or other input to the system unless instructed otherwise.
CTRL Key	The letters CTRL followed by a slash followed by a letter means that you must press the letter while holding down the CTRL key. For example, CTRL/Z means hold down the CTRL key and press the letter Z.
Lists	When a format item is followed by a comma and an ellipsis (, . . .), you can enter a single item or a number of those items separated by commas. When a format item is followed by a plus sign and an ellipsis (+ . . .), you can enter a single item or a number of those items connected by plus signs. If you enter a list (more than one item), you must enclose the list in parentheses. A single item need not be enclosed in parentheses.
Square Brackets	An item enclosed in square brackets ([ ]) is optional.
Key Symbols	In examples, keys and key sequences appear as symbols, such as PF2 and CTRL/Z .
Ellipses	A vertical ellipsis indicates that part of the format or example is not shown. The missing text is irrelevant to the topic being discussed.
Delete Key	The key on the VT200-series terminal keyboard that performs the DELETE function is labeled <X . The key on the VT100-series terminal keyboard that performs the DELETE function is labeled DELETE . Assume that DELETE in text and examples refers to the DELETE key on your terminal keyboard.
Examples	Examples show both system output (prompts, messages, and displays) and user input. User input is printed in red.

Chapter 1

Determining Whether to Install or Upgrade the Base System

This chapter describes what happens during the installation and upgrade procedures, and explains how to determine which method to use.

Some versions of MicroVMS contain a mandatory update. If your MicroVMS kit contains a mandatory update, instructions for installing it are provided in the *MicroVMS Release Notes*. Install the mandatory update after installing the base system, MicroVMS options, and DECnet. Install other optional software products after installing the mandatory update.

For more than two users to access your MicroVMS operating system simultaneously, you may need to install the user license key for your processor. See the *Cover Letter for VMS Original License* and *Proof of Purchase for VMS Software-User License* for available options.

1.1 What Happens During an Installation

When you *install* the MicroVMS base system, the installation procedure does the following:

- Initializes the system disk, erasing its entire contents (both system and user files)
- Creates a system directory structure
- Restores the MicroVMS base system files from the distribution media to the system disk

If you are installing MicroVMS because you cannot satisfy the conditions required to perform an upgrade, and you want to save the contents of the system disk, you must back up the files that you want to save. This is important because the system disk is initialized (all files that reside on it are erased) during an installation. Chapters 2 and 4 describe how to back up files to either diskettes or tape cartridges.

If your processor is currently running a version of the MicroVMS operating system and you want to destroy the entire contents of the system disk, follow the steps for installing on a new processor.

1.2 What Happens During an Upgrade

When you *upgrade* the MicroVMS base system, the upgrade procedure does the following:

- Makes room for the upgrade by purging and deleting some system files, but leaves some of the system files and all the user files intact
- Creates a parallel system directory structure
- Restores the MicroVMS base system files from the distribution media to the system disk
- Merges the old system files and the new system files
- Cleans up files and structures used only during the upgrade

1.3 Determining Which Procedure to Use

You *must* install Version 4.5B of the MicroVMS operating system if any of the following conditions apply:

- If your MicroVAX processor is *new*, that is, if it has never had any version of the operating system running on it.
- If your MicroVAX processor is running a version of MicroVMS, and you want to destroy the entire contents (both system and user files) of the system disk.
- If you cannot satisfy the conditions to perform an upgrade.

If you determine that you must install the MicroVMS operating system on your processor, read Chapter 1 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide* first to familiarize yourself with the system hardware and common procedures. Then proceed to Chapter 2 or Chapter 4 (depending upon whether your kit is distributed on diskettes or a tape cartridge) for a step-by-step description of the installation procedure.

If you do not meet any of the conditions that *require* you to perform an installation, DIGITAL recommends that you upgrade to the new version. The following three additional conditions, however, must be met for an upgrade procedure to succeed:

- You must have a minimum of 16,000 free blocks on the system disk.

  Confirm the free-block count of the system disk by entering the following DCL command:

  ```
  $ SHOW DEVICES SYS$SYSDEVICE
  ```

  If the system disk does not have 16,000 free blocks, you must recover space by purging and deleting files. If you cannot free up enough space, you *cannot* upgrade and must *install* the system. Note that you must perform a two-step backup procedure to save the files on your system disk before you perform the installation.

- The system page file must contain at least 4604 blocks.

  Confirm the number of blocks in the system page file by entering the following DCL command:

  ```
  $ @SYS$UPDATE:SWAPFILES
  ```

  The SWAPFILES procedure displays current file sizes and prompts you to enter desired new values. To retain the current values, press RETURN. If the page file does not contain at least 4604 blocks, enter the value 4604 at the following prompt:

  ```
  Enter new size for paging file:
  ```

  Press RETURN in response to the following two prompts:

  ```
  Enter new size for system dump file:
  Enter new size for swapping file:
  ```

  If you change the size of the page file, you must shut down and reboot the system before you proceed. For instructions on shutting down and booting the system, see Sections 2.3 and 2.5 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*.

- The SYSGEN parameter SCSNODE must be null on your system.

  Determine the current value of SCSNODE and (if necessary) set the value to null by invoking SYSGEN, as follows:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> USE CURRENT
SYSGEN> SHOW SCSNODE
Parameter Name              Current   Default   Minimum   Maximum Unit  Dynamic
--------------              -------   -------   -------   ------- ----  -------
SCSNODE                   "SALONE  "    "     "     "     "     "ZZZZ" Ascii
SYSGEN> SET SCSNODE ""
SYSGEN> WRITE CURRENT
SYSGEN> SHOW SCSNODE
Parameter Name              Current   Default   Minimum   Maximum Unit  Dynamic
--------------              -------   -------   -------   ------- ----  -------
SCSNODE                   "         "    "     "     "     "     "ZZZZ" Ascii
SYSGEN> EXIT
```

If your system meets all the conditions for performing an upgrade, read Chapters 1 and 2 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*. Then proceed to Chapter 3 or Chapter 5 (depending upon whether you will perform the upgrade using diskettes or a tape cartridge) to begin the upgrade procedure.

If your system cannot meet these conditions, you must install the new version of MicroVMS. Read Chapters 1 and 2 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*. Then proceed to Chapter 2 or Chapter 4 (depending upon whether you are installing MicroVMS from diskettes or a tape cartridge) to begin the installation procedure.

1.4 The Order of a Software Installation or Upgrade

The typical order of a software installation or upgrade is as follows:

1. Install or upgrade the base system.
2. Install or reinstall the desired MicroVMS options.
3. Install or reinstall the DECnet optional software product and license key if you have purchased DECnet.
4. Install the mandatory update, if the version of MicroVMS contains one. See the *MicroVMS Release Notes* for instructions.
5. Install or reinstall any other optional software products you may have purchased.

6. Start or restart the network.
7. Install the user license key for your processor, if one is required. See the *Cover Letter for VMS Original License* and *Proof of Purchase for VMS Software-User License* for available options.

When you upgrade to a new version of the MicroVMS operating system, you must reinstall optional software products and reconfigure the network.

Chapter 2

Installing MicroVMS from Diskettes

This chapter describes how to install the MicroVMS software on a VAXstation 2000/MicroVAX 2000 using diskettes. The base system is the first piece of software that you install on your system. After the base system is installed, you may install the MicroVMS options and optional software products, and then start up the network.

2.1 Preparing for Installation on a New System

The MicroVMS Workstation Software legend strip should be inserted into the slot at the top of the keyboard.

Make sure you are familiar with the hardware and the startup/shutdown procedures in Chapters 1 and 2 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*.

You are now ready to prepare your system for the MicroVMS base system installation. Proceed to Section 2.3.

2.2 Preparing for Installation on a System Already Running MicroVMS

Preparing for the base system installation on a system currently running MicroVMS is a two-step procedure.

1. Perform a backup procedure to save all files on the system disk and to provide a means of returning to the previous version, if necessary. If you want to discard the entire contents of the system disk, and choose not to save a copy of your old system, follow the steps for installing MicroVMS on a new processor.
2. Prepare the system for the MicroVMS base system installation.

Backup procedures are described in the following subsections. Section 2.3 describes the steps required to prepare the system for the MicroVMS base system installation.

Make sure you are familiar with the hardware and the startup/shutdown procedures in Chapters 1 and 2 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide.*

2.2.1 Backup Procedures Prior to Installation

During the installation, all the files on your system disk are deleted. Because of this, you must perform *two* separate backup procedures.

1. Back up the complete system disk, in case you want to return to the earlier version at a later date.
2. Use a separate procedure to back up any files you want to retain for use with the new version of the operating system. Typically, you keep user files and certain system files that have been customized to your site. After the new version of the operating system is installed, you can restore these files.

The following sections describe both backup procedures in detail.

2.2.1.1 Backing Up the Complete System Disk

Before you can install the MicroVMS operating system, you must back up all system and user files on the system disk. You should back up your system disk to preserve a copy of the preinstallation system. If, for any reason, the installation fails or if you want to return to the old version of the operating system, you can then restore this complete disk backup.

Before you back up the complete system disk, perform these preparatory steps:

1. Shut down the system, unless it is already shut down. Use the shutdown procedure in Section 2.5 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide.*
2. Boot standalone BACKUP. Insert the first standalone BACKUP diskette labeled *MicroVMS V4.5B SABKUP 1/3* in the diskette drive.
3. At the console-mode prompt (> > >) enter the following command:

   ```
   >>> B DUA2
   ```

   You are then prompted as follows:

   ```
   Please remove volume 'SYSTEM_1' from the console device.
   ```

   NOTE: If you receive an error message instead, remove the diskette from the drive, reinsert it, and start again at step 3.
4. Remove the first standalone BACKUP diskette, and insert the diskette labeled *MicroVMS V4.5B SABKUP 2/3* in the drive. Type Y and press RETURN.

After another 20 seconds, you may be prompted for the current date and time.

```
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
```

Enter the date and time in exactly the format shown. March 25, 1987, at 3:30 P.M. is typed as follows:

```
25-MAR-1987 15:30
```

You must be exact in the value of the date and time; otherwise, subsequent file activity, security-related events, and accounting data will not be recorded properly. If you will be performing incremental backups, starting up the system with the correct time is essential. For information about incremental backups, see the *MicroVMS User's Manual*.

You are prompted as follows:

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

5. Remove the second standalone BACKUP diskette from the drive. You are prompted as follows:

   ```
   Insert the standalone application volume and enter 'Yes' when ready.
   ```

6. Insert the diskette labeled *MicroVMS V4.5B SABKUP 3/3* in the drive, type Y, and press RETURN.

   When you receive the following message, you have successfully booted standalone BACKUP:

   ```
   %BACKUP-I-INDENT, Standalone BACKUP V4.5; the date is <dd-mmm-yyyy hh:mm>
   $
   ```

7. Remove the third standalone BACKUP diskette labeled *MicroVMS V4.5B SABKUP 3/3* from the diskette drive.

To back up the contents of the system disk to diskettes, follow these steps:

NOTE: You use more than one diskette for this operation. Label your diskettes in sequence. You are prompted for each diskette until the operation is complete.

1. Insert a scratch diskette that is write-enabled into the diskette drive. (To write-enable a diskette, remove the foil adhesive tab covering the write-protect notch.)

Enter the following command at the dollar sign ($) prompt:

```
$ BACKUP/IMAGE/VERIFY ddcu: DUA2:saveset.BCK/SAVE_SET
```

where:

ddcu: is the physical device name of the system disk that you want to back up, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.

saveset.BCK is the name of the save set, which you choose, with the recommended file type BCK. The save-set name is a file specification that identifies a file containing data in BACKUP format. Use a meaningful save-set name (not to exceed 17 characters), such as MARCH_25_1987.BCK. Label your diskettes with this save-set name.

In approximately one minute, you receive a message that the verification pass is starting. In another minute, you receive the following messages:

```
%BACKUP-I-RESUME, Resuming operation on volume 2
%BACKUP-I-READYREAD, Mount volume 2 on DUA2: for writing
Enter "YES" when ready.
```

2. Remove the diskette from the drive. Label the diskette *Complete System Backup, Diskette 1,* and include the number of the diskette in the backup sequence and today's date. Write-protect the diskette.

3. Insert another scratch diskette in the drive, type Y, and press RETURN. You again receive a message stating that the verification pass is starting.

   Repeat this step each time you receive a mount message, labeling, numbering, and write-protecting each diskette in the sequence.

4. When the backup is complete, you receive the following messages and prompt:

   ```
   Operation completed.  Processing finished at <dd-mmm-yyy hh:mm>.

   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:
   ```

5. Halt the system by pressing the halt button. Then, reboot the system from the system disk.

6. Remove the last diskette of the backup save set from the diskette drive. Label this diskette, and include the number of the diskette in the backup sequence and today's date. Write-protect the diskette.

If you restore the backup of your complete system disk after the installation, you will be restoring the *old* version of the operating system. Chapter 3 describes the restore procedure.

2.2.1.2 Backing Up Files Using BACKUSER.COM

Certain files on the system disk that you typically want to save across versions of the operating system are as follows:

- All user files
- All system files in the SYS$MANAGER directory
- Certain system files in the SYS$SYSTEM directory

The system files that you should probably save are ones that have been modified to custom-fit your site. For example, save the SYS$SYSTEM:SYSUAF.DAT file so that you do not have to reenter all the user account informion.

DIGITAL provides the BACKUSER.COM command procedure to assist you in backing up these files. This command procedure backs up your user files (using User Identification Codes), all versions of all system files in the SYS$MANAGER directory, and the following system files in the SYS$SYSTEM directory:

SYSUAF.DAT
RIGHTSLIST.DAT
VAXVMSSYS.PAR
NET*.DAT
NOTICE.TXT
MODPARAMS.DAT
VMSMAIL.DAT

If you want to back up any other system files, copy them to a user file directory before invoking the BACKUSER.COM command procedure.

After you install the new version of the MicroVMS operating system, you can restore the files that you backed up with BACKUSER.COM by using the RESTUSER.COM command procedure (also provided by DIGITAL). Section 2.4.1 describes how to restore files using RESTUSER.COM.

The BACKUSER.COM command procedure puts each user file save set in a separate file, and names the file as follows:

`nnn_nnn.SAV`

where:

nnn,nnn is the UIC of the files.

To back up user files and selected system files using BACKUSER.COM, follow these steps:

1. **Start up the system, unless it is already running.** See Section 2.3 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide.*

2. **Log in to the system manager's account from the console terminal.** See Section 2.4 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide.*

3. **Exit to DCL.** Select option 1 of the system manager menu.

   If the system manager menu is not available, you are already at the DCL prompt.

4. **Define the logical name RIGHTSLIST.** Enter the following DCL command:

   ```
   $ DEFINE/SYSTEM/EXEC RIGHTSLIST NL:
   ```

5. **Invoke the BACKUSER command procedure.** Enter the following command:

   ```
   $ @SYS$UPDATE:BACKUSER
   ```

   The procedure prompts for the media to be backed up.

   ```
   Media to be backed up (SYS$SYSDEVICE:):
   ```

6. **Press RETURN.** This indicates that the media to be backed up is the system disk.

   The procedure prompts for the scratch media to which the files are to be backed up.

   ```
   Scratch backup media (ddcu:):
   ```

7. You may have a choice of backing up across the network or to removable media.

   - If DECnet is installed on your system and you want to back up the files over the network, respond to the prompt with the node name and directory you are backing up to, using the following format:
     node::disk:[directory]

     To include an access-control string, specify the following format:
     node"""username password""":disk:[directory]

     NOTE: The node you specify must be running Version 4.0 or higher of the MicroVMS operating system.

     If you are backing up files over the network, the procedure continues automatically until completion.

   - If you want to back up the disk to diskettes, type $FLOPPY1: and press RETURN. The system prompts you to mount the media to which the *system* files are to be backed up. (The BACKUSER.COM command procedure backs up the system files before the user files.)

     ```
     Mount media for saving system files on $FLOPPY1:
     * Are you ready:
     ```

     a. **Insert a scratch diskette that is not write-protected in the diskette drive, type YES after the prompt, and press RETURN.** If a diskette is write-protected, the write-protect notch is covered with a silver tab. A scratch diskette contains no data that you want to save.

If you insert the diskette into the drive upside down, or if it is improperly aligned, you may receive the following error message:

```
%MOUNT-F-MEDOFL, medium is offline
```

If you receive this error message, remove the diskette from the drive and reinsert it.

Be sure to label the diskette appropriately (*SYSTEM*, and today's date, for example), because you will use it to restore system files after the installation.

Ignore any "No files selected" or "file is open by another user" messages.

After the procedure backs up the system files, it begins to back up user files. The procedure determines the first UIC for which it backs up files and then prompts you to mount the first diskette on which *user* files associated with that UIC are backed up.

```
Please place first diskette for user [nnn,nnn] in drive $FLOPPY1:
* Are you ready:
```

b. **Label the diskette with the correct UIC so that you will know the UIC when you use the RESTUSER.COM procedure to restore the files.** Use a separate scratch diskette for each UIC. (If you need to use more than one diskette for a single UIC, you are prompted to insert the next diskette.)

CAUTION: You *must* save the files for each UIC on a separate scratch diskette, because a diskette is initialized (its contents are erased) at the beginning of the backup for each UIC.

c. **Insert the diskette, type YES after the prompt, and press RETURN.**

8. **When the backup is complete**, the following message appears on the terminal screen:

```
***** user backup is now complete *****
```

9. **Deassign the logical name RIGHTSLIST.** Enter the following DCL command:

```
$ DEASSIGN/SYSTEM/EXEC RIGHTSLIST
```

You are now ready to prepare your system for the MicroVMS base system installation. Proceed with the steps in Section 2.3.

2.3 Preparing the System for the Software Installation

To prepare your system for the MicroVMS base system installation, follow these steps:

1. **Turn on the console terminal, unless it is already on.** During the software installation, enter all commands from the console terminal.

   Your console terminal must be set to 8 bits, no parity transmit, and no parity receive. This is the default for most terminals, except the LA120. For instructions on checking these settings, see the owner's manual provided with your LA120 terminal.

2. **Turn on the system, unless it is already on.** Push the system power switch on the front of the system box and any expansion boxes to the 1 (on) position. You should be able to feel the breeze from the fan at the back of the box. When you turn on a VAXstation 2000/MicroVAX 2000, you should receive a verification message similar to the following:

   ```
   KA410-A V1.0

   F...E...D...C...B...A...9...8...7...6...5...4...3...2...1...


    83 BOOT SYS

   >>>
   ```

   If the system does not power up properly—for example, if you receive the message ?84 FAIL—refer to the troubleshooting section of your VAXstation 2000 or MicroVAX 2000 owner's manual. At this point, your system should be running in console mode. The console-mode prompt (> > >) should be showing on the console terminal screen. If the console-mode prompt does not appear on the screen, press the halt button.

You are now ready to begin the MicroVMS base system installation procedure. Proceed to Section 2.4.

NOTE: If your VAXstation 2000 or MicroVAX 2000 has not run MicroVMS previously, you *must* format the fixed disk(s) before installing MicroVMS. For instructions on formatting fixed disks, refer to the *VAXstation 2000 Hardware Installation Guide* or the *MicroVAX 2000 Hardware Installation Guide*. After your fixed disk is formatted, you may continue with the software installation.

Do not reformat a fixed disk after installing software, as the formatting procedure erases the disk.

2.4 Installing the MicroVMS Base System

This section describes the procedure for installing the MicroVMS V4.5B base system.

Before you can install the base system, you must load standalone BACKUP in memory. Standalone BACKUP is the component of the Backup Utility that is used to copy the base system from the diskettes to the system disk. A standalone BACKUP kit is supplied on three diskettes as part of the base system kit. These diskettes are labeled *MicroVMS V4.5B SABKUP 1/3* through *MicroVMS V4.5B SABKUP 3/3*. Locate these diskettes.

You use standalone BACKUP to install the MicroVMS Version 4.5B base kit, which consists of 15 diskettes. These diskettes are labeled *MicroVMS V4.5B BASE 1/15* through *MicroVMS V4.5B BASE 15/15*. Locate these diskettes.

NOTE: You may abort the installation at any time during this procedure by pressing CTRL/Y. If the installation of the base system fails for any reason, you must reinstall standalone BACKUP and start the installation from the beginning.

To install the MicroVMS base system, follow these steps:

1. **Determine the physical device names of the system disk(s) and diskette drive for your system configuration.** If your VAXstation 2000/MicroVAX 2000 configuration has more than one hard disk, you can choose which disk is to be the system disk.
   - DUA0—disk drive in the system box
   - DUA1—disk drive in the expansion box
   - DUA2—diskette drive
2. **Boot standalone BACKUP.**
   a. **Insert the first standalone BACKUP diskette labeled *MicroVMS V4.5B SABKUP 1/3* in the diskette drive.**
   b. **Boot standalone BACKUP.** At the console-mode prompt (> > >), enter the following command:

      ```
      >>> B DUA2
      ```

      where:

      DUA2 is the device name of the diskette drive.

      If you insert the diskette into the drive upside down, or if it is improperly aligned, you may receive the following error message:

      ```
      ?84 FAIL
      ```

If you receive this error message, remove the diskette from the drive and reinsert it.

When the first diskette is loaded, you receive the following messages and prompt:

```
-DUA2

Please remove volume "SYSTEM_1" from the console device.

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

NOTE: When you load standalone BACKUP onto the system disk, the activity light does *not* turn off when the diskette labeled *MicroVMS V4.5B SABKUP 1/3* (SYSTEM_1) has finished loading. You may raise the lever and remove this diskette without damaging it. This is the only exception to the drive's activity light behavior. Under no other circumstances should you attempt to remove a diskette when the activity light is on.

c. **Remove the first standalone BACKUP diskette from the drive and insert the second standalone BACKUP diskette labeled *MicroVMS V4.5B SABKUP 2/3*.** Type Y and press RETURN.

You receive the following messages and prompt:

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


MicroVMS VERSION V4.5B  09-MAR-1987 02:00

PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
```

d. **Enter the date and time** in the following format and press RETURN:

```
dd-mmm-yyyy hh:mm
```

For example, March 25, 1987, 3:30 P.M. is typed as follows:

```
25-MAR-1987 15:30
```

You must be exact in the value of the date and time. Otherwise, subsequent file activity, security-related events, and accounting data will not be recorded properly.

You receive the following message and prompt:

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

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

e. **Remove the second standalone BACKUP diskette from the diskette drive and insert the third standalone BACKUP diskette labeled *MicroVMS V4.5B SABKUP 3/3*.** Type Y and press RETURN.

You receive a message stating the version of standalone BACKUP that is running and the current date and time. Then the DCL prompt ($) appears on your screen. You have now successfully booted standalone BACKUP.

f. **Remove the third standalone BACKUP diskette from the diskette drive.**

3. **Start the base system installation.** Insert the diskette labeled *MicroVMS V4.5B BASE 1/15* in the diskette drive. At the DCL prompt ($), enter the following command:

```
$ BACKUP/VERIFY/INITIALIZE DUA2:MICROVMS/SAVE_SET ddcu:
```

where:

ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

During the next few minutes, you receive the following messages and prompt:

```
%BACKUP-I-STARTVERIFY, starting verification pass
%BACKUP-I-RESUME, Resuming operation on volume 2
%BACKUP-I-READYREAD, Mount volume 2 on _SABKUP$DUA2: for reading
Enter "YES" when ready:
```

a. **Remove the first diskette from the drive and insert the second base system diskette.** Insert the diskette labeled *MicroVMS BASE 2/15* in the drive. Type Y and press RETURN.

You again receive verification and mount messages. Repeat this step for the remaining MicroVMS diskettes. Each diskette takes approximately 90 seconds to process.

After the last diskette is processed, you receive the following messages:

```
%BACKUP-I-PROCDONE, operation completed.  Processing finished at 15-Mar-1987
16:39:29.34
To perform another operation, ensure the standalone application disk is
online and ready.
Otherwise, use the console to halt the system.
Enter "YES" when ready:
```

NOTE: Do *not* respond YES to this prompt.

You have now successfully installed the base system.

b. **Halt the system.** Press the halt button located on the rear of the system box. The console-mode prompt (> > >) appears on your terminal screen.

c. **Remove the last base system diskette from the drive.**

d. **Boot the newly installed base system.** To start up the system, enter the following command:

```
>>> B ddcu
```

where:

ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

A message indicating the current version of MicroVMS appears on your terminal screen.

NOTE: When you boot the MicroVMS base system, the System Generation Utility (SYSGEN) may report errors while trying to load certain drivers for special pieces of hardware. Later in the installation procedure, after you have installed the MicroVMS option or optional software product that includes the driver, you must reboot your system to load that driver correctly.

After you install the Version 4.5B base system and start up the system, the AUTOGEN command procedure starts automatically and displays the following messages:

```
AUTOGEN computes the SYSGEN parameters for your
configuration and then reboots the system with the new parameters.

The system will be rebooted after AUTOGEN has finished running.

Running AUTOGEN -- Please wait.
```

The AUTOGEN command procedure shuts down the system and issues several informational messages. This step takes approximately 5 minutes. After the AUTOGEN procedure completes, the following message appears:

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

e. **Halt the system.** Press the halt button. The console-mode prompt (> > >) appears on your terminal screen.

f. **Reboot the system.** Enter the following command:

```
>>> B ddcu
```

where:

ddcu is either DUA0 or DUA1, the disk you chose to be your system disk.

After the system has booted, you should receive the following message:

```
You have successfully installed and started
the MicroVMS base kit. The system is now
ready for you to login.

%SET-I-INTSET, login interactive limit = 64, current interactive value = 0
```

If you backed up files using BACKUSER.COM, restore them using RESTUSER.COM before installing MicroVMS options. Proceed to Section 2.4.1.

If you did not back up files, you may proceed to Section 2.5 to install the MicroVMS options.

2.4.1 Restoring Files Using RESTUSER.COM

DIGITAL provides the RESTUSER.COM command procedure to assist you in restoring the files that you backed up using the BACKUSER.COM command procedure. The RESTUSER.COM command procedure restores your user files (using User Identification Codes), all versions of all system files in the SYS$MANAGER directory, and the following system files in the SYS$SYSTEM directory:

SYSUAF.DAT
RIGHTSLIST.DAT
VAXVMSSYS.PAR
NET*.DAT
NOTICE.TXT
MODPARAMS.DAT
VMSMAIL.DAT

You must reinstall the DECnet layered product and license, and reconfigure and turn on the DECnet network before you can use the RESTUSER.COM command procedure to restore your files.

To restore files that were backed up to the system disk with the BACKUSER.COM command procedure, follow these steps:

1. **Log in to the system manager's account.**
2. **Exit to DCL.** Select option 1 of the system manager menu.

   If the system manager menu is not available, you are already at the DCL prompt.
3. **Define the logical name RIGHTSLIST.** Enter the following DCL command:

   ```
   $ DEFINE/SYSTEM/EXEC RIGHTSLIST -
   _$ SYS$SYSDEVICE:[SYSO.SYSEXE.OLD]RIGHTSLIST
   ```
4. **If you backed up over the network, determine the User Identification Codes (UICs) of the user files that you are going to restore.** Enter the following commands:

   ```
   $ SET DEFAULT node"""username password""""::disk:[directory]
   $ DIRECTORY *.SAV
   ```

   where:

node"""username password""""::disk:[directory]	is the access control string that you entered during the BACKUSER.COM command procedure.

The user file save sets are of the following form:

```
nnn_nnn.SAV
```

where:

nnn,nnn is the UIC of the save set.

5. **If you backed up to diskettes, determine the User Identification Codes (UICs) of the user files that you are going to restore.** Enter the following commands:

```
$ MOUNT/OVERRIDE=IDENTIFICATION $FLOPPY1
$ DIRECTORY *.SAV
```

The user file save sets are of the following form:

```
nnn_nnn.SAV
```

where:

nnn,nnn is the UIC of the save set.

6. **Invoke the RESTUSER.COM command procedure.** Enter the following command:

```
$ @SYS$UPDATE:RESTUSER
```

The procedure prompts you for the name of the device on which you want to place the user files.

```
Device to restore files to (SYS$SYSDEVICE:):
```

7. **Indicate that the device to which files are going to be restored is the system disk.** Press RETURN.

The procedure prompts you for the name of the device on which the backup media is to be mounted.

```
Drive containing Backup media (ddcu:):
```

8. **Respond to the prompt with the location of the backup save sets created with the BACKUSER.COM command procedure.** How you backed up the files determines how you respond to this prompt.

- If you created the save sets over the network, specify the network node, disk, and directory where the save sets are stored, using the following format:

  ```
  node::disk:[directory]
  ```

  To include an access-control string, specify the following format:

  ```
  node"""username password""""::disk:[directory]
  ```

- Specify $FLOPPY1: if you are restoring from diskettes.

The following prompt appears:

```
Mount system specific save media on drive $FLOPPY1:
* Are you ready:
```

Insert the first diskette labeled *SYSTEM* that you created using the BACKUSER.COM command procedure into the drive. Type Y and press RETURN.

The saved *system* files are now restored to the system disk.

NOTE: Only the following files in the SYS$SYSTEM directory are saved: SYSUAF.DAT, RIGHTSLIST.DAT, VAXVMSSYS.PAR, NET*.DAT, NOTICE.TXT, MODPARAMS.DAT, and VMSMAIL.DAT. Every version of every file in the SYS$MANAGER directory is saved. No other files owned by the system UIC in other directories are saved, unless you move them to user directories prior to backing up with the BACKUSER.COM command procedure.

After you restore the system files to the system disk, the procedure prompts for any user file save sets, as follows:

```
Are there any user save sets:
```

9. **Restore the user files.** Type Y and press RETURN. The procedure prompts for the UIC of a save set containing user files to be restored. You determined the UICs of the user files before you invoked the RESTUSER.COM command procedure.

   ```
   UIC for the saveset ([nnn,nnn]):
   ```

10. **Specify a user UIC.** Enter one of the user UICs you determined before restoring the files. Be sure to include the comma but not the brackets (the system supplies the brackets automatically). If you are restoring from diskettes, the procedure prompts for the diskette that contains the saved user files of the UIC you specified. (During the backup procedure, you labeled each diskette with the UIC of the files being saved on it.)

    ```
    Please place first diskette for user [nnn,nnn] in drive $FLOPPY1:
    * Are you ready:
    ```

    Insert the appropriate diskette, type Y, and press RETURN.

    The procedure processes all files associated with the specified UIC, and then prompts for the next save set, as follows:

    ```
    Are there any user save sets:
    ```

11. **Repeat steps 9 and 10 until there are no more user save sets to restore.** If you are restoring from diskettes and the files of a single UIC are saved on more than one diskette, the procedure processes everything on the first diskette, then prompts you for the additional media, as follows:

    ```
    Please place next diskette for user [nnn,nnn] in drive $FLOPPY1:
    * Are you ready:
    ```

Insert the diskette, type Y, press RETURN, and continue responding to the prompts.

12. **Stop the restore procedure.** When you have no more user save sets to process, type N and press RETURN in response to the following prompt:

    ```
    Are there any user save sets:
    ```

    This exits the procedure. The following message indicates successful completion:

    ```
    ***** User Restore complete *****
    ```

13. **Deassign the logical name RIGHTSLIST.** Enter the following DCL command:

    ```
    $ DEASSIGN/SYSTEM/EXEC RIGHTSLIST
    ```

14. **Customize the restored system files.** When you are restoring files using the RESTUSER.COM command procedure, files that were saved from the system directories (SYS$SYSTEM and SYS$MANAGER) are placed in a subdirectory [.OLD] below their respective directories ([SYSEXE.OLD] and [SYSMGR.OLD]). You may choose to handle these files in either of the following ways:

    - You may copy any files you want to keep to the appropriate directory ([SYS0.SYSEXE] or [SYS0.SYSMGR]) and then delete the [.OLD] subdirectory.

      To do this, use the following commands:

      ```
      $ RENAME/LOG SYS$SYSROOT:[SYSEXE.OLD]file-spec -
      _$ SYS$SYSROOT:[SYSEXE]
      $ RENAME/LOG SYS$SYSROOT:[SYSMGR.OLD]file-spec -
      _$ SYS$SYSROOT:[SYSMGR]
      $ DELETE SYS$SYSROOT:[SYSEXE]OLD.DIR;1
      $ DELETE SYS$SYSROOT:[SYSMGR]OLD.DIR;1
      ```

    - You may define logical names for search lists in SYS$MANAGER:SYSTARTUP.COM, as follows:

      ```
      $ DEFINE/SYSTEM/EXEC SYS$SYSTEM SYS$SYSROOT:[SYSEXE],-
      _$ SYS$SYSROOT:[SYSEXE.OLD]
      $ DEFINE/SYSTEM/EXEC SYS$MANAGER SYS$SYSROOT:[SYSMGR],-
      _$ SYS$SYSROOT:[SYSMGR.OLD]
      ```

      This allows users to access any files in the SYS$SYSTEM or SYS$MANAGER directories—either old or new. If the file has been re-created for MicroVMS Version 4.5B, all users can access the new file; if the file does not exist in MicroVMS Version 4.5B, users have access to only the saved version of the file.

After you restore the system and user files, you may install the MicroVMS options and layered products. Proceed to Section 2.5.

2.5 Installing and Removing MicroVMS Options

The MicroVMS base system includes standalone BACKUP and the MicroVMS options and suboptions. The following subsections describe how to install and remove these options and suboptions.

2.5.1 Installing MicroVMS Options

The MicroVMS distribution kit is divided into four options.

- PROG—8 diskettes
- SYSP—5 diskettes
- USER—2 diskettes
- UTIL—10 diskettes

Each MicroVMS option is further divided into a number of suboptions. (For a description of the contents of each MicroVMS option and suboption, see Appendix A.) Although you are not required to install all the MicroVMS options and suboptions, DIGITAL suggests that you do unless you need to conserve disk space.

If you are installing an optional software product that requires a MicroVMS option, you *must* install the MicroVMS option first. For example, the Program Development option must be installed before any language kit such as FORTRAN.

NOTE: You can abort the MicroVMS option installation by pressing CTRL/Y at any time during this procedure. If you abort the installation or if it fails for any other reason, you must install the option again from the beginning. If a subsequent installation procedure fails, software already installed is not affected.

To install MicroVMS options, follow these steps:

1. **Start up the system, unless it is already running.** Enter the following at the console-mode prompt (> > >):

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

2. **Log in to the system manager's account (SYSTEM) from the console terminal.** Press RETURN and enter the user name SYSTEM.

When you log in, the following system manager menu is displayed on the terminal screen:

```
          Welcome to MicroVMS V4.5B

------------------------------------------------------------

Main Menu
          1 - Exit to DCL
          2 - Log out of the SYSTEM account
          3 - Invoke the MAIL utility
          4 - Invoke the PHONE utility
          5 - Add a user account to the system
          6 - Install optional software
          7 - Add or Delete a MicroVMS component
          8 - Create or Modify an Autologin Terminal
          9 - Back up or Restore the user files on a disk
         10 - Build a Standalone BACKUP kit
         11 - Set the maximum number of interactive logins
         12 - Configure the network
         13 - Shut down or start up the network
         14 - SHUT DOWN the system

Enter a number (? or ?# for HELP):
```

This system manager menu appears on the terminal screen each time you log in to the system manager's account.

3. **Select option 7 of the system manager menu.** Type 7 and press RETURN. You are asked if you want to add or delete a MicroVMS option. Choose ADD; the system invokes a command procedure that adds the MicroVMS options.

   If the system manager menu is not available, enter the following command at the DCL prompt ($):

   ```
   $ @SYS$UPDATE:VMSINSTAL
   ```

   You are prompted as follows:

   ```
   * Are you satisfied with the backup of your system disk [YES]?
   ```

   Press RETURN for the default answer, YES. You are prompted as follows:

   ```
   * Where will the distribution volumes be mounted:
   ```

   Type $FLOPPY1 (the logical device name of the diskette drive) and press RETURN.

   The following message and prompt are displayed:

   ```
   Enter the products to be processed from the first distribution volume set.
   * Products:
   ```

   Type an asterisk (*) and press RETURN.

The system displays the following message and prompt:

```
Please mount the first volume of the set on $FLOPPY1:
* Are you ready?
```

4. **Insert the first diskette of the option in the drive, type Y and press RETURN.** The diskette is labeled with the name of the item, the version number, and the sequence number of the diskette. For example, the first diskette of the Common Utilities option is labeled *MicroVMS V4.5B UTIL 1/10.* The last diskette is labeled *MicroVMS V4.5B UTIL 10/10.*

   When you install a MicroVMS option, in approximately 30 seconds you are asked whether you want to install the entire kit. Type Y or N and press RETURN.

   If you respond with Y, all suboptions are installed. If you respond with N, you are prompted for each suboption; respond with Y to install the suboption or with N to avoid installing it.

   Although you are not required to install all options and suboptions, DIGITAL suggests that you do unless you need to conserve disk space. For a description of the options and suboptions, refer to Appendix A.

   As the installation proceeds, you receive messages telling you that items are being processed.

5. **Insert continuation media.** After installing the first diskette, you receive a message telling you to mount the next volume. (You may also receive a "no such file" message, which you can ignore.) Remove the diskette from the drive. Insert the next diskette of the option in sequence. Type Y and press RETURN. You receive verification and mount messages. Repeat this step until you have loaded all the diskettes for the option in sequential order.

   After the option is installed, you receive a message indicating that the installation of the option is complete. You are then prompted for the next option that you want to install. Repeat steps 4 through 7 for each option you want to install.

6. **Terminate the installation command procedure.** After all the options you want are installed, press CTRL/Z to terminate the installation command procedure.

   When you receive the DCL prompt ($), you have successfully installed the MicroVMS options. Remove the last diskette from the drive.

7. **Log out and reinitialize your process environment.** Log out by selecting option 2 of the system manager menu. If the system manager menu is not available, enter the command LOGOUT. Then, log back in to the SYSTEM account to reinitialize your process environment.

NOTE: After installing certain options (for example, queues from the Secure User option) you may need to remove comment characters from the appropriate commands in the template command procedure SYS$MANAGER:SYSTARTUP.COM. All command procedures are internally documented. Use a text editor to edit this command procedure.

8. **Shut down the system.** Follow the instructions in Section 2.5 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide.*

9. **Reboot the system.** Enter the following command at the console-mode prompt (> > >):

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

10. **Determine how to proceed.** After the MicroVMS options are successfully installed, you may choose to remove an option or suboption. If so, proceed to Section 2.5.2. If you do not want to remove options or suboptions, see Section 1.4 to determine how to proceed with the software installation.

2.5.2 Removing a MicroVMS Option or Suboption

To remove previously installed MicroVMS options or suboptions, use option 7 of the system manager menu. You should not attempt to remove options or suboptions by directly deleting system files. Deleting a required system file may damage your operating system and prevent reboots and normal system operation.

To remove a MicroVMS option or suboption, follow these steps:

1. **Start up the system, unless it is already running.** Enter the following command at the console-mode prompt (> > >):

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

2. **Log in to the system manager's account (SYSTEM).** Press RETURN, and enter the user name SYSTEM.

3. **Select option 7 of the system manager menu.** You are asked if you want to add or delete a MicroVMS option. Choose DELETE; the system then invokes the command procedure that removes MicroVMS options and suboptions.

   If the system manager menu is not available, enter the following command at the DCL prompt ($):

   ```
   $ @SYS$UPDATE:REMOVE
   ```

This procedure prompts you for the name of the option or suboption you want to remove. You cannot remove a suboption without first specifying the option in which it is contained. You may need to use CTRL/S (stops screen scroll) and CTRL/Q (resumes screen scroll) to control the rate of the screen scroll. Depending on the size of the option or suboption you want to remove, the procedure may take several minutes.

2.6 Installing Optional Software Products

The following steps explain how to install optional software products. In addition to these steps, you may receive special installation instructions with the update or product. If so, read and follow those special installation instructions. Note that if you install an optional software product at a date later than the rest of the system, you should back up the system disk before the installation.

You can abort the installation at any time during the procedure by pressing CTRL/Y. If you abort the installation, or if it fails for any other reason, you must perform the installation again from the beginning.

1. **Start up the system, unless it is already running.**
2. **Log in to the system manager's account (SYSTEM) from the console terminal.**
3. **Notify users to log out.** Select option 11 of the system manager menu and respond to the prompt by entering the numeral 0.

   If the system manager menu is not available, enter the following command at the DCL prompt ($):

   ```
   $ SET LOGINS/INTERACTIVE=0
   ```

4. **Shut down the network if it is running.** Select option 13 of the system manager menu. Enter the command SHUTDOWN at the prompt.

   If the system manager menu is not available, enter the following commands:

   ```
   $ RUN SYS$SYSTEM:NCP
   NCP> SET EXEC STATE SHUT
   ```

5. **Invoke the installation command procedure.** Select option 6 of the system manager menu.

   If the system manager menu is not available, enter the following command at the DCL prompt ($):

   ```
   $ @SYS$UPDATE:VMSINSTAL
   ```

6. **Reply to the installation command procedure prompts.** You are prompted as follows:

   ```
   Are you satisfied with the backup of your system disk [YES]?
   ```

Press RETURN for the default response YES. You are prompted as follows:

```
* Where will the distribution volumes be mounted:
```

Type $FLOPPY1 (the logical device name of the diskette drive) and press RETURN.

The following message is displayed:

```
Enter the products to be processed from the first distribution volume set.
* Products:
```

Respond by typing an asterisk (*) and pressing RETURN.

Depending on the item being installed, you may be asked other questions. Usually a default reply appears in brackets at the end of the question; you can enter the default reply by pressing RETURN. Otherwise, type your reply after each question and press RETURN.

The system prompts as follows:

```
Please mount the first volume of the set on $FLOPPY1:
Are you ready?
```

7. **Insert the first diskette containing the optional software product in the drive.** The diskette is labeled with the name of the item, the version number, and the sequence number of the diskette. Type Y and press RETURN.

   As the installation proceeds, you receive messages telling you that items are being processed.

8. **Insert continuation media.** You receive a message telling you to insert the next volume in the drive. (You may also receive a "no such file" message, which you can ignore.) Remove the first diskette. Insert the next diskette in the sequence and press RETURN.

9. **Terminate the installation command procedure.** At the end of the installation, you receive the following prompt:

   ```
   Enter the products to be processed from the next distribution volume set.
   * Products:
   ```

   Unless the update or optional software product includes instructions to the contrary, press CTRL/Z to terminate the command procedure.

   Note that, for some installations, the command procedure may terminate directly or reboot the system rather than display the message and prompt.

   When the DCL prompt ($) appears, you have successfully installed the optional software products. Remove the last diskette from the drive.

10. **Reinitialize your process environment.** Log out by selecting option 2 of the system manager menu. If the system manager menu is not available, enter the following command:

    ```
    $ LOGOUT
    ```

    Then, log back in to reinitialize your process environment.

11. **Restore interactive logins.** Select option 11 of the system manager menu and respond to the prompt by entering the maximum number of users that you want to use the system (64 is the system maximum).

    If the system manager menu is not available, enter the following command at the DCL prompt ($):

    ```
    $ SET LOGINS/INTERACTIVE=n
    ```

    where:

    n is the number of users you want to permit to use the system.

12. **Restart the network if you previously shut it down.** Select option 13 of the system manager menu and respond to the prompt by entering the command STARTUP.

    If the system manager menu is not available, enter the following command at the DCL prompt ($):

    ```
    $ @SYS$MANAGER:STARTNET
    ```

If you have just installed the MicroVMS DECnet optional software product, proceed to Chapter 6 to install the DECnet license key.

Chapter 3

Upgrading the MicroVMS Base System Using Diskettes

If you are currently running the MicroVMS operating system and want to save the user files on your system disk, you may upgrade your system to the new version of MicroVMS. Before attempting the upgrade procedure, be sure that you are aware of all the requirements and you have read this entire chapter. To determine whether you can upgrade your MicroVMS operating system, see Chapter 1.

3.1 System Upgrade Preliminaries

Before you attempt to upgrade your system, you should be aware of the following contingencies:

- If you have changed the names of system directories in your current operating system or if you have deleted MicroVMS files from them, the upgrade procedure may not work correctly. You must restore your operating system to a standard system before you can begin the upgrade.
- The upgrade procedure does *NOT* work across the network.
- The system disk cannot be moved from one device to another during the upgrade procedure.
- The page, swap, dump, and authorization files are purged to one version each as part of the upgrade procedure.
- All files in the [SYSERR] directory are deleted.
- All operator and accounting logs are deleted.

If you want to keep any of these files, copy them to a user directory before starting the upgrade.

To complete the upgrade procedure, you need the MicroVMS Version 4.5B BASE kit. The BASE kit consists of 15 diskettes labeled *MicroVMS V4.5B BASE 1/15* through *MicroVMS V4.5B BASE 15/15*. Locate these diskettes.

The following conditions must also be met:

- The system disk must contain a minimum of 16,000 free blocks. To confirm the free-block count of the system disk, enter the following DCL command:

  ```
  $ SHOW DEVICES SYS$SYSDEVICE
  ```

- The system page file must contain at least 4604 blocks.

  Confirm the number of blocks in the system page file by entering the following DCL command:

  ```
  $ @SYS$UPDATE:SWAPFILES
  ```

  The SWAPFILES.COM command procedure displays the current size of the paging file, system dump file, and swapping file and prompts you to enter new values. Press RETURN to retain the current values. You are then prompted as follows:

  ```
  Enter new size for paging file:
  ```

  If the page file does not contain at least 4604 blocks, enter the value 4604.

  You are prompted as follows:

  ```
  Enter new size for system dump file:
  Enter new size for swapping file:
  ```

  Press RETURN in response to both prompts.

  If you change the size of the page file, you must shut down and reboot your system before you proceed.

- The SYSGEN parameter SCSNODE must be null on your system. To determine the current value of SCSNODE and (if necessary) to set the value to null, invoke SYSGEN as follows:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> USE CURRENT
SYSGEN> SHOW SCSNODE
Parameter Name              Current   Default   Minimum   Maximum Unit  Dynamic
--------------              -------   -------   -------   ------- ----  -------
SCSNODE                   "SALONE  "    "     "     "     "     "ZZZZ" Ascii

SYSGEN> SET SCSNODE ""
SYSGEN> WRITE CURRENT
SYSGEN> SHOW SCSNODE
Parameter Name              Current   Default   Minimum   Maximum Unit  Dynamic
--------------              -------   -------   -------   ------- ----  -------
SCSNODE                   "         "     "     "     "     "ZZZZ" Ascii

SYSGEN> EXIT
```

- The following UAF parameters for the SYSTEM account must be greater than or equal to these values:

  ASTlm—24
  BIOlm—18
  Bytlm—20480
  DIOlm—18
  Enqlm—30
  Fillm—20

  Run the Authorize Utility to check the values of these parameters by entering the following commands:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
UAF> SHOW SYSTEM
```

  If the parameter is less than the recommended value, modify the value of the parameter. For example, if ASTlm is equal to 22, enter the following AUTHORIZE command to increase its value to 24:

```
UAF> MODIFY SYSTEM/ASTLM=24
```

  After you modify the necessary UAF parameters, exit from the Authorize Utility by entering the EXIT command.

If you have met these conditions, you can begin backing up the entire system disk to diskettes, as described in Section 3.1.1.

If you do not have enough free space on your system disk, you must delete enough user files to acquire the free space you need before performing the upgrade. If you are able to create enough free space on your system disk by deleting user files, you can begin the backup procedure.

If you cannot create enough free space on your system disk by deleting user files, you must *install* MicroVMS Version 4.5B (see Chapter 1).

3.1.1 Backing Up and Restoring the Complete System Disk

Before you can upgrade the MicroVMS operating system, you must back up and restore all system and user files on the system disk. You should back up your system disk to preserve a copy of the preupgrade system. If, for any reason, the upgrade fails or if you want to return to the old version of the operating system, you can then restore this complete disk backup.

Restore the backup of the system disk to eliminate disk fragmentation problems. If your disk is too fragmented when you perform the upgrade procedure, you will be unable to boot the system and the upgrade will not complete successfully.

Before you back up the complete system disk, perform these preparatory steps:

1. Shut down the system, unless it is already shut down. Use the shutdown procedure in Section 2.5 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide.*

2. Boot standalone BACKUP. Insert the first standalone BACKUP diskette labeled *MicroVMS V4.5B SABKUP 1/3* in the diskette drive.

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

   ```
   >>> B DUA2
   ```

   You are then prompted as follows:

   ```
   Please remove volume 'SYSTEM_1' from the console device.
   ```

   NOTE: If you receive an error message instead, remove the diskette from the drive, reinsert it, and start again at step 3.

4. Remove the first standalone BACKUP diskette, and insert the diskette labeled *MicroVMS V4.5B SABKUP 2/3* in the drive. Type Y and press RETURN.

   After another 20 seconds, you may be prompted for the current date and time.

   ```
   PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
   ```

   Enter the date and time in exactly the format shown. March 25, 1987, at 3:30 P.M. is typed as follows:

   ```
   25-MAR-1987 15:30
   ```

You must be exact in the value of the date and time; otherwise, subsequent file activity, security-related events, and accounting data will not be recorded properly. If you will be performing incremental backups, starting up the system with the correct time is essential. For information about incremental backups, see the *MicroVMS User's Manual.*

You are prompted as follows:

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

5. Remove the second standalone BACKUP diskette from the drive. You are prompted as follows:

   ```
   Insert the standalone application volume and enter 'Yes' when ready.
   ```

6. Insert the diskette labeled *MicroVMS V4.5B SABKUP 3/3* in the drive, type Y, and press RETURN.

   When you receive the following message, you have successfully booted standalone BACKUP:

   ```
   %BACKUP-I-INDENT, Standalone BACKUP V4.5; the date is <dd-mmm-yyyy hh:mm>
   $
   ```

7. Remove the third standalone BACKUP diskette labeled *MicroVMS V4.5B SABKUP 3/3* from the diskette drive.

To back up the contents of the system disk to diskettes, follow these steps:

NOTE: You use more than one diskette for this operation. Label your diskettes in sequence. You are prompted for each diskette until the operation is complete.

1. Insert a scratch diskette that is write-enabled into the diskette drive. (To write-enable a diskette, remove the foil adhesive tab covering the write-protect notch.) Enter the following command at the DCL prompt ($):

   ```
   $ BACKUP/IMAGE/VERIFY ddcu: DUA2:saveset.BCK/SAVE_SET
   ```

   where:

   ddcu: is the physical device name of the system disk that you want to back up, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.

   saveset.BCK is the name of the save set, which you choose, with the recommended file type BCK. The save-set name is a file specification that identifies a file containing data in BACKUP format. Use a meaningful save-set name (not to exceed 17 characters), such as MARCH_15_1987.BCK. Label your diskettes with this save-set name.

In approximately one minute, you receive a message stating that the verification pass is starting. In another minute, you receive the following messages:

```
%BACKUP-I-RESUME, Resuming operation on volume 2
%BACKUP-I-READYREAD, Mount volume 2 on DUA2: for writing
Enter "YES" when ready.
```

2. Remove the diskette from the drive. Label the diskette *Complete System Backup, Diskette 1,* and include today's date. Write-protect the diskette.
3. Insert another scratch diskette in the drive, type Y, and press RETURN. You again receive a message stating that the verification pass is starting.

   Repeat this step each time you receive a mount message, labeling, numbering, and write-protecting each diskette in the sequence.
4. When the backup is complete, you receive the following messages and prompt:

   ```
   Operation completed.  Processing finished at <dd-mmm-yyy hh:mm>.

   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:
   ```
5. Remove the last diskette of the backup save set from the diskette drive. Ensure that all the diskettes of the backup save set are write-protected.
6. Insert the diskette labeled *MicroVMS V4.5B SABKUP 3/3* in the diskette drive, type YES, and press RETURN.

   You receive the following message and prompt:

   ```
   %BACKUP-I-INDENT, Standalone BACKUP V4.5; the date is <dd-mmm-yyyy hh:mm>
   $
   ```
7. Remove the diskette labeled *MicroVMS V4.5B SABKUP 3/3* from the drive.

You must now restore the backup to the system disk by copying the backup kit you built onto the system disk. Complete the following steps:

1. Insert the first diskette containing the backup of the complete system disk in the diskette drive. Make sure you have the first diskette of the correct save set.

2. To restore the system disk, enter the following command at the dollar sign ($) prompt:

   ```
   $ BACKUP/IMAGE/VERIFY DUA2:saveset.BCK/SAVE_SET ddcu:
   ```

   where:

ddcu:	is the physical device name of the system disk to which you restore the backup, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.
saveset.BCK	is the name of the save set, which you chose as part of the backup procedure.

3. In approximately one minute, you receive a message that the verification pass is starting. In another minute, you receive the following message and prompt:

   ```
   %BACKUP-I-RESUME, Resuming operation on volume 2
   %BACKUP-I-READYREAD, Mount volume 2 on DUA2: for reading
   Enter "YES" when ready.
   ```

4. Remove the diskette from the drive. Insert the next diskette of the backup save set in the drive, type Y, and press RETURN. You again receive a message stating that the verification pass is starting.

   Repeat this step each time you receive a mount request.

   When the restore is complete, you receive the following messages and prompt:

   ```
   Operation completed.  Processing finished at <dd-mmm-yyy hh:mm>.

   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:
   ```

5. Remove the last diskette from the drive.

6. Halt the system by pressing the halt button. Then, reboot the system using the following command:

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the physical device name of your system disk.

You have successfully backed up and restored the entire contents of the system disk. Proceed to Section 3.1.2.

3.1.2 Preparing to Upgrade the MicroVMS Operating System

Determine the physical device names of the system disk and diskette drive for your system configuration. If your VAXstation 2000/MicroVAX 2000 system has more than one hard disk, you can choose which disk is to be the system disk.

- DUA0—disk in the system box
- DUA1—disk in the expansion box

Next, boot the restored version of your system, as follows:

1. Shut down the system by entering the following command:

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

2. After the system shuts down, you are prompted to halt the system. Press the halt button. At the console-mode prompt (> > >), enter the following command:

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the physical device name of your system disk.

   In approximately 20 seconds, a message appears stating the version number of the operating system.

3. You may be prompted for the current date and time.

   ```
   PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
   ```

   You must enter the date and time in exactly the format requested. Otherwise, subsequent file activity, security-related events, and accounting data will not be recorded properly.

   Startup takes several minutes. Several MicroVMS messages appear, ending with the following:

   ```
   SYSTEM      Job terminated at dd-mmm-yyyy hh:mm:ss.ss
   ```

4. After the restored system boots, log in to the system manager's account (SYSTEM) from the console terminal.

5. Exit to DCL. Select option 1 of the system manager menu.

   If the system manager menu is not available, you are already at the DCL prompt.

6. Make sure that no users are logged in to the system. Prevent any users from logging in to the system by entering the following DCL command:

   ```
   $ SET LOGINS/INTERACTIVE=0
   ```

7. If you are running the network, shut it down by invoking NCP as follows:

```
$ RUN SYS$SYSTEM:NCP
NCP> SET EXECUTOR STATE SHUT
NCP> EXIT
```

8. Stop all batch queues by entering the following DCL command once for each batch queue that is set up for your system:

```
$ STOP/QUEUE/NEXT queue-name
```

where:

queue-name is the name of a queue that is set up on your system. The /NEXT qualifier allows the current job to complete before stopping the queue.

3.2 Performing the Upgrade

Now that you have checked the requirements for an upgrade, determined if it is possible to upgrade your system, and performed the required backup and restore procedures, you are ready to begin the upgrade procedure.

NOTE: If the upgrade terminates abnormally, see Section 3.3.

To perform the upgrade, follow these steps:

1. Invoke the VMSINSTAL command procedure by entering the following command:

```
$ @SYS$UPDATE:VMSINSTAL
```

If DECnet is running on your system, you receive the following message:

```
%VMSINSTAL-W-DECNET, Your DECnet is up and running.
* Do you want to continue anyway [NO]?
```

Because you must shut down the network before continuing with the upgrade procedure, press RETURN; the system exits from the upgrade procedure. After you shut down the network, as described in Section 3.1.2, you can restart the upgrade procedure by reinvoking the VMSINSTAL command procedure.

VMSINSTAL prompts as follows:

```
Are you satisfied with the backup of your system disk [YES]?
```

If you completed the backup and restore procedures described in Section 3.1.1, press RETURN. If not, type N and press RETURN to exit from VMSINSTAL; back up and restore the system disk and then restart the upgrade procedure by invoking VMSINSTAL.

2. VMSINSTAL prompts as follows:

```
* Where will the distribution volumes be mounted:
```

Respond by typing **DUA2:** (the physical device name of the diskette drive).

Note that if you specify the logical name, $FLOPPY1, VMSINSTAL does not display an error message, but the upgrade fails in Phase 2 (see Section 3.2.2).

If you specify a nonexistent device or a device that is not connected to the system, an "invalid device" error message is displayed and the upgrade procedure terminates. If this happens, press CTRL/Y to exit from VMSINSTAL, and use the DCL command SHOW DEVICES to verify device status. (If you exit from VMSINSTAL, you must restart this procedure from step 1.)

3. VMSINSTAL prompts you for the name of the product you want to install. Respond by entering VMS as in the following example:

```
Enter the products to be processed from the next distribution volume set.
* Products: VMS
```

If you want to exit from the upgrade procedure, press CTRL/Z in response to this prompt.

4. You receive the following message and prompt:

```
Please mount the first volume of the set on DUA2:
Are you ready?
```

Insert the diskette labeled *MicroVMS Version 4.5B BASE 1/15* in the drive, type Y, and press RETURN.

If you insert the diskette into the drive upside down, or if it is improperly aligned, you may receive the following error message:

```
%MOUNT-F-MEDOFL, medium is offline
```

If you receive this error message, remove the diskette from the drive and reinsert it.

If you have correctly inserted the diskette into the drive, the following messages appear on your terminal screen:

```
%MOUNT-I-MOUNTED, MICROVMS      mounted on _DUA2:

The following products will be processed:

  MicroVMS    V4.5B

        Beginning installation of VMS V4.5B at 14:27

%VMSINSTAL-I-RESTORE, Restoring product save set A...
```

This step takes approximately 30 minutes.

5. VMSINSTAL displays a series of messages that describe cautions and requirements related to completing the upgrade. After the messages are displayed, you are prompted as follows:

   ```
   Do you want to continue? (Y/N):
   ```

   - To interrupt the upgrade to comply with any of the conditions listed, type N and press RETURN. The procedure displays the following prompt:

     ```
     Enter the products to be processed from the next distribution volume set.
     * Products:
     ```

   - To terminate the procedure and return to the DCL prompt ($), press CTRL/Z. If you terminate the upgrade at this point, you must reinvoke VMSINSTAL when you are ready to resume the upgrade.
   - To proceed with Phase 1 of the upgrade procedure (see Section 3.2.1), type Y and press RETURN.

3.2.1 Upgrade Phase 1

The remainder of the upgrade consists of five phases. This section describes the first phase of the upgrade procedure.

1. The upgrade procedure turns off disk quotas on the system disk. Ignore any error messages about disk quotas being disabled.
2. The procedure stops the job controller, OPCOM, and the error formatter. Ignore any "nonexistent process" error messages.
3. The procedure purges directories and removes installed images.
4. The procedure purges all accounting data files, operator logs, and the directory [SYSERR]; ignore any error messages about files not being purged.
5. The procedure deletes all JNL files in the directory [SYS0] and in all of its subdirectories. Ignore any "file not found" error messages.
6. The procedure builds the directory tree [SYSF] and deletes all the old operating system files that will not be needed if the system needs to be rebooted during the upgrade. This step takes approximately 10 to 15 minutes.

   NOTE: The files deleted include all files installed from optional MicroVMS kits such as the Common Utilities option and the Secure User Environment option.

7. The upgrade procedure restores the Version 4.5B BASE kit. You are prompted to remove the first MicroVMS Version 4.5B BASE kit diskette and to insert the rest of the diskettes in the sequence (numbered 2/15 through 15/15). This step takes approximately 30 minutes.

8. When the procedure displays the following message, remove the last base system diskette from the drive:

   ```
   You may now remove the kit from DUA2:.
   ```

9. The procedure purges the page, swap, dump, and authorization files and puts the most current version in the new directory tree.

10. The procedure uses AUTOGEN to save your old SYSGEN parameters and sets up the system to continue with Phase 2 of the upgrade procedure.

11. The procedure announces that it is shutting down the system, that the system disk must not be moved during the upgrade, and that SYSGEN parameters must not be changed while the system reboots.

    When the system shutdown has completed, halt the system by pressing the halt button on the processor control panel. Then, reboot the system by entering the following command at the console-mode prompt (> > >):

    ```
    >>> B/F0000000 ddcu
    ```

    where:

    ddcu is either DUA0 or DUA1, the name of the system disk.

12. The system prompts you to enter the date and time, and continues automatically with Phase 2 of the upgrade procedure.

3.2.2 Upgrade Phase 2

This section describes the second phase of the upgrade procedure.

1. The following system message is displayed on your terminal screen:

   ```
   MicroVMS Version 4.5B     25-APR-1987 15:26
   ```

2. You may be prompted to enter the current date and time.

   ```
   PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
   ```

   Enter the date and time in the format requested. You must be exact in the value of the date and time. Otherwise, subsequent file activity, security-related events, and accounting data will not be recorded properly.

3. The following system message is displayed:

   ```
   Continuing with MicroVMS V4.5B Upgrade Procedure.

        Upgrade Phase 2  25-APR-1987  15:32
   ```

4. The upgrade procedure removes the remaining files from the old version of the MicroVMS operating system. (This step takes approximately 10 to 15 minutes.)

3.2.3 Upgrade Phase 3

This section describes the third phase of the upgrade procedure.

1. The following system message is displayed on your terminal screen:

```
Continuing with MicroVMS V4.5B Upgrade Procedure.
    Upgrade Phase 3  25-APR-1987  15:35
```

2. The upgrade procedure merges new versions of the MicroVMS system files (files that are commonly edited by system managers) with existing files. This step takes approximately 10 to 15 minutes.
3. The procedure removes the directory entries for page, swap, dump, and authorization files from the old directory tree.
4. The procedure deletes all the remaining accounting data files, operator logs, and all files in the [SYSERR] directory.
5. The upgrade procedure merges all the miscellaneous user files that exist in the old system directories into the new set of system directories, temporarily called [SYSF.SYS*]. The amount of time this takes depends on the number of user files. Ignore any "file not found" error messages.
6. The procedure deletes the system directory [SYS0] containing the old version of the system files.

3.2.4 Upgrade Phase 4

This section describes the fourth phase of the upgrade procedure.

1. The following system message is displayed on your terminal screen:

```
Continuing with MicroVMS V4.5B Upgrade Procedure.
    Upgrade Phase 4  25-APR-1987  15:47
```

2. The upgrade procedure corrects the back links for the system directories. This step requires only a few seconds, and the procedure displays a message when it has completed.
3. The upgrade procedure gives you instructions on how to reboot the system using normal system startup procedures, and then shuts down the system so that you can reboot the new version of the operating system.

When the system shutdown has completed, halt the system by pressing the halt button. Then, reboot the system by entering the following command at the console-mode prompt (> > >):

```
>>> B ddcu
```

where:

ddcu is either DUA0 or DUA1, the physical device name of the system disk.

3.2.5 Upgrade Phase 5

This section describes the fifth phase of the upgrade procedure.

1. The following system message is displayed on your terminal screen:

   ```
   MicroVMS Version 4.5B  25-APR-1987 16:11
   ```

2. You may be prompted for the current date and time.

   ```
   PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
   ```

   Enter the date and time in the format requested.

   You must be exact in the value of the date and time. Otherwise, subsequent file activity, security-related events, and accounting data will not be recorded properly.

3. The following system message is displayed:

   ```
   Continuing with MicroVMS V4.5B Upgrade Procedure.
        Upgrade Phase 5  25-APR-1987  16:28
   ```

4. The upgrade procedure deletes the temporary [SYSF] directory tree.

5. The procedure purges files that were used only during the upgrade procedure.

6. The procedure displays the following messages on your terminal screen:

```
After the upgrade finishes, there are several things that you may wish
to do:

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

- EDIT SYSTEM SPECIFIC FILES - The system specific files in SYS$MANAGER,
SYSTARTUP.COM, SYSHUTDOWN.COM, and SYCONFIG.COM have all been
superseded by blank files.  Your copies of these files still exist in
SYS$MANAGER as the next lower version number.
```

- Purge unnecessary files - There are a number of files that may be purged after the upgrade is complete to free up space on your system disk. First, you may purge the lower-numbered versions of the following files from the previous version of the operating system:

```
[SYSEXE]SHUTDOWN.COM
[SYSEXE]STARTUP.COM
[SYSLIB]DCLTABLES.EXE
[SYSLIB]IMAGELIB.OLB
[SYSLIB]STARLET.OLB
[SYSLIB]LBRSHR.EXE
[SYSLIB]*RTL*.EXE
[SYSMGR]EDTINI.EDT
[SYSMGR]WELCOME.TXT
```

Second, you may purge the lower-numbered versions of the following files from the new version of the operating system. These files may be purged since they are the same as those shipped in the last version of the operating system.

```
[SYSEXE]SYSALF.DAT
[SYSLIB]CDDSHR.EXE
[SYSMGR]LOGIN.COM
```

- Delete SYS$SYSTEM:STARTUP.UP5 and UPGRADE.KIT - These files are left by the upgrade should this phase fail for some reason. You may delete them when the upgrade has completed.

NOTE: Because many of the libraries are contained in the MicroVMS options, do not decompress the libraries until you have installed all the options you require.

The decompressed libraries require approximately 2700 additional blocks of disk space. A general guideline for decompressing individual library files is that HELP libraries increase by 50 percent and OBJECT libraries increase by 25 percent when decompressed.

7. The procedure autoconfigures all devices on the system. If you have devices whose drivers reside in a MicroVMS option, an error message (which you can ignore) similar to the following appears:

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

8. The procedure runs AUTOGEN to determine the new SYSGEN parameters. (This step takes approximately 5 to 10 minutes.)

9. The procedure shuts down the system so that you can reboot it with the new parameters.

10. After the shutdown has completed, reboot the system by entering the following command at the console-mode prompt (> > >):

    ```
    >>> B ddcu
    ```

    where:

    ddcu is either DUA0 or DUA1, the device name of the system disk.

11. You may be prompted to enter the date and time.

12. When your system reboots, the following message is displayed on your screen:

    ```
    You have successfully installed and started
    the MicroVMS base kit.  The system is now
    ready for you to login.
    ```

Follow the instructions provided in Section 2.5.1 to reinstall any MicroVMS options and optional software products that you want to use. To run DECnet, you must reinstall the DECnet optional software product and license key.

3.3 Restarting the Upgrade if it Terminates Abnormally

If the upgrade terminates abnormally, you can restart it as follows:

1. During Phase 1: Restart the system normally, and start the upgrade from step 1.

2. During Phases 2, 3, or 4: Enter the following boot command:

    ```
    >>> B/F0000000 ddcu
    ```

    where:

    ddcu is either DUA0 or DUA1, the physical device name of your system disk.

3. During Phase 5: Enter the following boot command:

    ```
    >>> B ddcu
    ```

    where:

    ddcu is either DUA0 or DUA1, the physical device name of your system disk.

    To allow the upgrade procedure to resume at any point, the procedure places the new system files in an alternate disk directory, [SYSF]; your old system's files are located in [SYS0]. Having two sets of system files ensures that you have at least one set of bootable system files at all times. During Phase 5, the upgrade procedure moves the new files to [SYS0], and deletes old system files.

Chapter 4

Installing MicroVMS from a Tape Cartridge

This chapter describes how to install the MicroVMS base system on a VAXstation 2000 or MicroVAX 2000 from a tape cartridge. The base system is the first piece of software that you install on your system. After the base system is installed, you may install the MicroVMS options and optional software products, and then start up the network.

4.1 Preparing for Installation on a New System

The MicroVMS Workstation Software legend strip should be inserted into the slot at the top of the keyboard.

Make sure you are familiar with the hardware and the startup/shutdown procedures in Chapters 1 and 2 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*.

You are now ready to prepare your system for the MicroVMS base system installation. Proceed to Section 4.3.

4.2 Preparing for Installation on a System Already Running MicroVMS

Preparing for the base system installation on a system that is currently running MicroVMS is a two-step procedure.

1. Perform a backup procedure to save all files on the system disk and to provide a means of returning to the previous version, if necessary. If you want to discard the entire contents of the system disk, and choose not to save a copy of your old system, follow the steps for installing MicroVMS on a new processor.
2. Prepare the system for the MicroVMS base system installation.

Backup procedures are described in the following subsections. Section 4.3 describes the steps required to prepare the processor for the MicroVMS base system installation.

Make sure you are familiar with the hardware and the startup/shutdown procedures in Chapters 1 and 2 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*.

4.2.1 Backup Procedures Prior to Installation

During the installation, all the files on your system disk are deleted. Because of this, you must perform *two* separate backup procedures.

1. You must back up the complete system disk, in case you want to return to the earlier version at a later date.
2. You must use a separate procedure to back up any files you want to retain for use with the new version of the operating system. Typically, you keep user files and certain system files that have been customized to your site. After the new version of the operating system is installed, you can restore these files.

The following sections describe both backup procedures in detail.

4.2.1.1 Backing Up the Complete System Disk

Before you can install the MicroVMS operating system, you must back up all system and user files on the system disk. You should back up your system disk to preserve a copy of the preinstallation system. If, for any reason, the installation fails or if you want to return to the old version of the operating system, you can then restore this complete disk backup.

Before you back up the complete system disk, perform these preparatory steps:

1. Shut down the system, unless it is already shut down. Use the procedure in Section 2.5 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*.
2. Boot standalone BACKUP. Insert the MicroVMS distribution tape cartridge labeled *MicroVMS V4.5B BIN TK50* into the tape drive.
3. At the console-mode prompt (> > >), enter the following command:

   ```
   >>> B MUA0
   ```

4. Approximately 13 minutes later, a message is displayed indicating the current version of the operating system. After approximately 20 seconds, you may be prompted for the current date and time.

   ```
   PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
   ```

Enter the date and time in exactly the format shown. For example, March 22, 1987, at 3:30 P.M. is typed as follows:

```
22-MAR-1987 15:30
```

You must be exact in the value of the date and time; otherwise, subsequent file activity, security-related events, and accounting data will not be recorded properly. If you will be performing incremental backups, starting up the system with the correct time is essential. For information regarding incremental backups, see the *MicroVMS User's Manual.*

When you receive the following message, you have successfully booted standalone BACKUP:

```
%BACKUP-I-INDENT, Standalone BACKUP V4.5; the date is <dd-mmm-yyyy hh:mm>
$
```

5. Remove the tape cartridge labeled *MicroVMS V4.5B BIN TK50* from the drive.

To back up the contents of the system disk to tape cartridge, follow these steps:

1. Insert a scratch tape cartridge that is write-enabled into the tape drive. (To write-enable a tape cartridge, slide the write-protect switch away from the tape cartridge label.) Enter the following command at the dollar sign ($) prompt:

   ```
   $ BACKUP/IMAGE/BUFFER_COUNT=5/VERIFY ddcu: MUA0:saveset.BCK/SAVE_SET
   ```

   where:

   ddcu: is the physical device name of the system disk that you want to back up, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.

   saveset.BCK is the name of the save set, which you choose, with the recommended file type BCK. The save-set name is a file specification that identifies a file containing data in BACKUP format. Use a meaningful save-set name (not to exceed 17 characters), such as MARCH_15_1987.BCK. Label your tape cartridge with this save-set name.

   You should receive a message telling you that the verification pass is starting.

   If your system disk contains more data than the tape cartridge can store, you receive the following messages:

   ```
   %BACKUP-I-RESUME, Resuming operation on volume 2
   %BACKUP-I-READYWRITE, Mount volume 2 on $TAPE1: for writing
   Enter "YES" when ready.
   ```

2. Remove the first backup tape cartridge from the drive. Label it *Complete System Backup, Tape 1,* and include today's date. Write-protect the tape cartridge.

3. If needed, insert another scratch tape cartridge into the drive, type Y (uppercase or lowercase), and press RETURN. You again receive a message stating that the verification pass is starting.

   Repeat this step each time you receive a mount request, labeling, numbering, and write-protecting each tape in the sequence.

4. When the backup is complete, you receive the following messages and prompt:

```
Operation completed.  Processing finished at <dd-mmm-yyy hh:mm>.

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:
```

5. Halt the system by pressing the halt button. Then, reboot the system from the system disk.

6. Remove the backup tape cartridge from the drive. Label it *Complete System Backup,* and include the number of the tape cartridge in the backup sequence (if you used more than one tape) and today's date. Write-protect the tape cartridge.

   If you restore the backup of your complete system disk after installation, you will be restoring the *old* version of the operating system. Chapter 5 describes the restore procedure.

4.2.1.2 Backing Up Files Using BACKUSER.COM

Certain files on the system disk that you typically want to save across versions of the operating system are as follows:

- All user files
- All system files in the SYS$MANAGER directory
- Certain system files in the SYS$SYSTEM directory

The system files that you should save are ones that have been modified to custom-fit your site. For example, save the SYS$SYSTEM:SYSUAF.DAT file so that you do not have to reenter all the user account information.

DIGITAL provides the BACKUSER.COM command procedure to assist you in backing up these files. This command procedure backs up your user files (using User Identification Codes), all versions of all system files in the SYS$MANAGER directory, and the following system files in the SYS$SYSTEM directory:

SYSUAF.DAT
RIGHTSLIST.DAT
VAXVMSSYS.PAR
NET*.DAT
NOTICE.TXT
MODPARAMS.DAT
VMSMAIL.DAT

If you want to back up any other system files, copy them to a user-file directory before invoking the BACKUSER.COM command procedure.

After you install the new version of the MicroVMS operating system, you can restore the files that you backed up with BACKUSER.COM by using the RESTUSER.COM command procedure (also provided by DIGITAL). Section 4.4.1 describes how to restore files using RESTUSER.COM.

The BACKUSER.COM command procedure puts each user-file save set in a separate file, and names the files as follows:

`nnn_nnn.SAV`

where:

nnn,nnn is the UIC of the files.

To back up user files and selected system files using BACKUSER.COM, follow these steps:

1. **Start up the system, unless it is already running.** See Section 2.3 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide.*
2. **Log in to the system manager's account from the console terminal.** See Section 2.4 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide.*
3. **Exit to DCL.** Select option 1 of the system manager menu.

   If the system manager menu is not available, you are already at the DCL prompt ($).
4. **Define the logical name RIGHTSLIST.** Enter the following DCL command:

   ```
   $ DEFINE/SYSTEM/EXEC RIGHTSLIST NL:
   ```
5. **Invoke the BACKUSER.COM command procedure.** Enter the following command:

   ```
   $ @SYS$UPDATE:BACKUSER
   ```

The procedure prompts for the media to be backed up.

```
Media to be backed up (SYS$SYSDEVICE:):
```

6. **Press RETURN.** This indicates that the media to be backed up is the system disk.

   The procedure prompts for the scratch media to which the files are to be backed up.

   ```
   Scratch backup media (ddcu:):
   ```

7. You may have a choice of backing up across the network or to removable media.

   - If DECnet is installed on your system and you want to back up the files over the network, respond to the prompt with the node name and directory you are backing up to, using the following format:
     node::disk:[directory]

     To include an access-control string, specify the following format:
     node"""username password"""::disk:[directory]

     NOTE: The node you specify must be running Version 4.0 or higher of the MicroVMS operating system.

     If you are backing up files over the network, the procedure continues automatically until completion.

   - If you want to back up the disk to tape cartridges, type $TAPE1: and press RETURN. The system prompts you to mount the media to which the system files are to be backed up. (The BACKUSER.COM command procedure backs up the system files before the user files.)

     ```
     Mount backup media on $TAPE1:
     * Are you ready:
     ```

     Insert a scratch magnetic tape cartridge that is not write-protected in the tape drive, type YES after the prompt, and press RETURN. A scratch magnetic tape cartridge contains no data that you want to save.

     Be sure to label the tape cartridge appropriately (*System and User Files*, and today's date, for example), because you will use it to restore the files to the system disk after the installation. The procedure continues automatically until completion. Backing up user files may require more than one tape cartridge. If necessary, the system prompts you to insert another tape cartridge.

8. **When the backup is complete**, the following message appears on the terminal screen:

   ```
   ***** user backup is now complete *****
   ```

9. **Deassign the logical name RIGHTSLIST.** Enter the following DCL command:

```
$ DEASSIGN/SYSTEM/EXEC RIGHTSLIST
```

You are now ready to prepare your system for the MicroVMS base system installation. Proceed with the steps in Section 4.3.

4.3 Preparing the System for the Software Installation

To prepare your system for the MicroVMS base system installation, follow these steps:

1. **Turn on the console terminal, unless it is already on.** During the software installation, enter all commands from the console terminal.

   Your console terminal must be set to 8 bits, no parity transmit, and no parity receive. This is the default for most terminals, except the LA120. For instructions on checking these settings, see the owner's manual provided with your LA120 terminal.

2. **Turn on the system, unless it is already on.** Push the system power switch on the front of the system box and any expansion boxes to the 1 (on) position. You should be able to feel the breeze from the fan at the back of the box.

   When you turn on a VAXstation 2000/MicroVAX 2000, you should receive a verification message similar to the following:

```
KA410-A V1.0

F...E...D...C...B...A...9...8...7...6...5...4...3...2...1...


 83 BOOT SYS

>>>
```

   If the system does not power up properly—for example, if you receive the message ?84 FAIL—refer to the troubleshooting section of your VAXstation 2000 or MicroVAX 2000 owner's manual.

   At this point, your system should be running with the console terminal in console mode. The console-mode prompt (> > >) should be showing on the screen. If the console-mode prompt does not appear on the screen, press the halt button.

You are now ready to begin the MicroVMS base system installation procedure. Proceed to Section 4.4.

NOTE: If your VAXstation 2000 or MicroVAX 2000 has not run MicroVMS previously, you *must* format the fixed disk(s) before installing MicroVMS. For instructions on formatting fixed disks, refer to the *VAXstation 2000 Hardware*

Installation Guide or the *MicroVAX 2000 Hardware Installation Guide*. After you have formatted your fixed disk(s), you may continue with the software installation.

Do not reformat a fixed disk after installing software, as the formatting procedure erases the disk.

4.4 Installing the MicroVMS Base System

This section describes the procedure for installing the MicroVMS V4.5B base system.

Before you can install the base system, you must load standalone BACKUP in memory. Standalone BACKUP is the component of the Backup Utility that is used to copy the base system from the tape cartridge to the system disk. Standalone BACKUP and the base system are located on *one* tape cartridge. This tape is labeled *MicroVMS V4.5B BIN TK50*. Locate this tape.

NOTE: You may abort the installation at any time during this procedure by pressing CTRL/Y. If the installation of the base system fails for any reason, you must reinstall standalone BACKUP and start the installation from the beginning.

To install the MicroVMS base system, follow these steps:

1. **Determine the physical device names of the system disk(s) and tape drive for your system configuration.** If your VAXstation 2000 or MicroVAX 2000 system has more than one hard disk, you can choose which disk is to be the system disk.
   - DUA0—disk drive in the system box
   - DUA1—disk drive in the expansion box
   - MUA0—tape drive
2. **Boot standalone BACKUP.**
   a. **Insert the MicroVMS distribution tape cartridge labeled *MicroVMS Version 4.5B BIN TK50* into the tape drive.** For instructions on how to use tape cartridges and the tape drive, see Chapter 1 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide*.
   b. **Boot standalone BACKUP.** Enter the following command at the console-mode prompt (> > >):

      ```
      >>> B MUA0
      ```

      Approximately 13 minutes later, a message indicating the current version of standalone BACKUP is displayed. Then, you are prompted for the current date and time.

      ```
      PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
      ```

c. **Enter the date and time** in the format requested.

For example, March 25, 1987, 3:30 P.M. is typed as follows:

```
25-MAR-1987 15:30
```

You must be exact in the value of the date and time. Otherwise, subsequent file activity, security-related events, and accounting data will not be recorded properly.

You receive a message stating the version of standalone BACKUP that is running and the current date and time. Then the DCL prompt ($) appears. You have now successfully booted standalone BACKUP.

3. **Start the base system installation.** Enter the following command at the DCL prompt:

```
$ BACKUP/VERIFY/INITIALIZE MUA0:MICROVMS/SAVE_SET ddcu:
```

where:

ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

This step takes approximately 45 minutes, during which you see the green tape-activity light blinking. After the base system is installed, you receive the following messages:

```
%BACKUP-I-PROCDONE, operation completed.  Processing finished at 15-Mar-1987
16:39:29.34
To perform another operation, ensure the standalone application disk is
online and ready.
Otherwise, use the console to halt the system.
Enter "YES" when ready:
```

NOTE: Do *not* respond YES to this prompt.

You have now successfully installed the base system.

4. **Halt the system.** Press the halt button located on the rear of the system box. The console-mode prompt (> > >) appears on the terminal screen.

5. **Boot the newly installed base system.** To start up the system, enter the following command:

```
>>> B ddcu
```

where:

ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

A message indicating the current version of MicroVMS appears on your screen.

NOTE: When you boot the MicroVMS base system, the System Generation Utility (SYSGEN) may report errors while trying to load certain drivers for special pieces of hardware. Later in the installation procedure, after you have

installed the MicroVMS option or optional software products that include the driver, you must reboot your system to load that driver correctly.

After you have installed the Version 4.5B base system and started up the system, the AUTOGEN command procedure starts automatically and displays the following messages:

```
AUTOGEN computes the SYSGEN parameters for your configuration and then
reboots the system with the new parameters.

The system will be rebooted after AUTOGEN has finished running.

Running AUTOGEN -- Please wait.
```

The AUTOGEN command procedure shuts down the system and displays several informational messages. This step takes approximately 5 minutes. Then AUTOGEN displays the following message:

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

6. **Halt the system.** Press the halt button. The console-mode prompt (> > >) appears on your terminal screen.
7. **Reboot the system.** Enter the following command:

```
>>> B ddcu
```

where:

ddcu is either DUA0 or DUA1, the disk you chose to be your system disk.

After the system has booted, you should receive the following message:

```
You have successfully installed and started
the MicroVMS base kit. The system is now
ready for you to login.

%SET-I-INTSET, login interactive limit = 64, current interactive value = 0
```

If you backed up files using BACKUSER.COM, restore them using RESTUSER.COM before installing MicroVMS options. Proceed to Section 4.4.1.

If you did not back up files, you may proceed to Section 4.5 to install the MicroVMS options.

4.4.1 Restoring Files Using RESTUSER.COM

DIGITAL provides the RESTUSER.COM command procedure to assist you in restoring the files that you backed up using the BACKUSER.COM command procedure. The RESTUSER.COM command procedure restores your user files (using User Identification Codes), all versions of all system files in the SYS$MANAGER directory, and the following system files in the SYS$SYSTEM directory:

SYSUAF.DAT
RIGHTSLIST.DAT
VAXVMSSYS.PAR
NET*.DAT
NOTICE.TXT
MODPARAMS.DAT
VMSMAIL.DAT

You must reinstall the DECnet layered product and license, and reconfigure and turn on the DECnet network before you can use the RESTUSER.COM command procedure to restore your files.

To restore files that were backed up to the system disk using the BACKUSER.COM command procedure, follow these steps:

1. **Log in to the system manager's account.**
2. **Exit to DCL.** Select option 1 of the system manager menu.

   If the system manager menu is not available, you are already at the DCL prompt ($).
3. **Define the logical name RIGHTSLIST.** Enter the following DCL command:

   ```
   $ DEFINE/SYSTEM/EXEC RIGHTSLIST -
   _$ SYS$SYSDEVICE:[SYSO.SYSEXE.OLD]RIGHTSLIST
   ```
4. **If you backed up over the network, determine the User Identification Codes (UICs) of the user files that you are going to restore.** Enter the following commands:

   ```
   $ SET DEFAULT node"""username password""""::disk:[directory]
   $ DIRECTORY *.SAV
   ```

   where:

   node"""username password""""::disk:[directory] is the access control string that you entered during the BACKUSER.COM command procedure.

The user file save sets are of the following form:

```
nnn_nnn.SAV
```

where:

nnn,nnn is the UIC of the save set.

5. **If you backed up to tape cartridge(s), determine the User Identification Codes (UICs) of the user files that you are going to restore.** Enter the following commands:

```
$ MOUNT/OVERRIDE=IDENTIFICATION $TAPE1
$ DIRECTORY *.SAV
```

The user file save sets are of the following form:

```
nnn_nnn.SAV
```

where:

nnn,nnn is the UIC of the save set.

6. **Invoke the RESTUSER command procedure.** Enter the following command:

```
$ @SYS$UPDATE:RESTUSER
```

The procedure prompts you for the name of the device on which you want to place the user files.

```
Device to restore files to (SYS$SYSDEVICE:):
```

7. **Indicate that the device to which files are going to be restored is the system disk.** Press RETURN.

Next, the procedure prompts you for the name of the device on which the backup media is to be mounted.

```
Drive containing Backup media (ddcu:):
```

8. **Respond to the prompt with the location of the backup save sets created with the BACKUSER.COM command procedure.** How you backed up the files determines how you respond to this prompt.

- If you created the save sets over the network, specify the network node, disk, and directory where the save sets are stored, using the following format:

```
node::disk:[directory]
```

To include an access-control string, specify the following format:

```
node"""username password""""::disk:[directory]
```

- Specify $TAPE1: if you are restoring from magnetic tape cartridges.

  The following prompt appears:

  ```
  Mount save media on drive $TAPE1:
  * Are you ready:
  ```

  Insert the tape cartridge that you created using the BACKUSER.COM command procedure into the drive. Type Y and press RETURN.

The saved *system* files are now restored to the system disk.

NOTE: Only the following files in the SYS$SYSTEM directory are saved: SYSUAF.DAT, RIGHTSLIST.DAT, VAXVMSSYS.PAR, NET*.DAT, NOTICE.TXT, MODPARAMS.DAT, and VMSMAIL.DAT. Every version of every file in the SYS$MANAGER directory is saved. No other files owned by the system UIC in other directories are saved, unless you move them to user directories prior to backing up with the BACKUSER.COM command procedure.

After you restore the system files to the system disk, the procedure prompts for any user-file save sets, as follows:

```
Are there any user save sets:
```

9. **Restore the user files.** Type Y and press RETURN. The procedure prompts for the UIC of a save set containing user files to be restored. You determined the UICs of the user files before you invoked the RESTUSER.COM command procedure.

   ```
   UIC for the saveset ([nnn,nnn]):
   ```

10. **Specify a user UIC.** Enter one of the user UICs you determined before restoring the files. Be sure to include the comma but not the brackets (the system supplies the brackets automatically).

    The procedure processes all files associated with the specified UIC, and then prompts for the next save set, as follows:

    ```
    Are there any user save sets:
    ```

11. **Repeat steps 9 and 10 until there are no more user save sets to restore.** If you are using more than one tape cartridge, the procedure processes everything on the first tape cartridge, then prompts you for the additional media, as follows:

    ```
    Please place the next tape cartridge for user [nnn,nnn] in drive $TAPE1
    * Are you ready:
    ```

    Insert the tape cartridge, type Y, and press RETURN.

12. **Stop the restore procedure.**When you have no more user save sets to process, type N and press RETURN in response to the following prompt:

    ```
    Are there any user save sets:
    ```

    This exits the procedure successfully. The following message indicates successful completion:

    ```
    ***** User Restore complete *****
    ```

13. **Deassign the logical name RIGHTSLIST.** Enter the following DCL command:

    ```
    $ DEASSIGN/SYSTEM/EXEC RIGHTSLIST
    ```

14. **Customize the restored system files.** When you are restoring files using the RESTUSER.COM command procedure, files that were saved from the system directories (SYS$SYSTEM and SYS$MANAGER) are placed in a subdirectory [.OLD] below their respective directories ([SYSEXE.OLD] and [SYSMGR.OLD]). You may choose to handle these files in either of the following ways:

    - You may copy any files you want to keep to the appropriate directory ([SYS0.SYSEXE] or [SYS0.SYSMGR]) and then delete the [.OLD] subdirectory.

      To do this, use the following commands:

      ```
      $ RENAME/LOG SYS$SYSROOT:[SYSEXE.OLD]file-spec -
      _$ SYS$SYSROOT:[SYSEXE]
      $ RENAME/LOG SYS$SYSROOT:[SYSMGR.OLD]file-spec -
      _$ SYS$SYSROOT:[SYSMGR]
      $ DELETE SYS$SYSROOT:[SYSEXE]OLD.DIR;1
      $ DELETE SYS$SYSROOT:[SYSMGR]OLD.DIR;1
      ```

    - You may define logical names for search lists in SYS$MANAGER:SYSTARTUP.COM, as follows:

      ```
      $ DEFINE/SYSTEM/EXEC SYS$SYSTEM SYS$SYSROOT:[SYSEXE],-
      _$ SYS$SYSROOT:[SYSEXE.OLD]
      $ DEFINE/SYSTEM/EXEC SYS$MANAGER SYS$SYSROOT:[SYSMGR],-
      _$ SYS$SYSROOT:[SYSMGR.OLD]
      ```

      This allows users to access any files in the SYS$SYSTEM or SYS$MANAGER directories—either old or new. If the file has been re-created for MicroVMS Version 4.5B, all users can access the new file; if the file does not exist in MicroVMS Version 4.5B, users have access only to the saved version of the file.

After you restore the system and user files, you may install the MicroVMS options and layered products. Proceed to Section 4.5.

4.5 Installing and Removing MicroVMS Options

The MicroVMS base system includes standalone BACKUP and the MicroVMS options and suboptions. The following subsections describe how to install and remove MicroVMS options and suboptions.

4.5.1 Installing MicroVMS Options

The MicroVMS distribution kit is divided into four options: PROG, SYSP, USER, and UTIL, which are distributed on the same tape cartridge as the MicroVMS base system. Each MicroVMS option is further divided into a number of suboptions. (For a description of the contents of each MicroVMS option and suboption, see Appendix A.) Although you are not required to install all the MicroVMS options and suboptions, DIGITAL suggests that you do unless you need to conserve disk space.

If you are installing an optional software product that requires a MicroVMS option, you *must* install the MicroVMS option first. For example, the Program Development option must be installed before any language kit such as FORTRAN.

NOTE: You can abort the MicroVMS option installation by pressing CTRL/Y at any time during this procedure. If you abort the installation or if it fails for any other reason, you must install the option again from the beginning. If a subsequent installation procedure fails, software already installed is not affected.

To install MicroVMS options, follow these steps:

1. **Start up the system, unless it is already running.** Enter the following command at the console-mode prompt (> > >):

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

2. **Log in to the system manager's account (SYSTEM) from the console terminal.** Press RETURN and enter the user name SYSTEM.

When you log in, the following system manager menu is displayed on the terminal screen:

```
          Welcome to MicroVMS V4.5B

------------------------------------------------------------

Main Menu
          1 - Exit to DCL
          2 - Log out of the SYSTEM account
          3 - Invoke the MAIL utility
          4 - Invoke the PHONE utility
          5 - Add a user account to the system
          6 - Install optional software
          7 - Add or Delete a MicroVMS component
          8 - Create or Modify an Autologin Terminal
          9 - Back up or Restore the user files on a disk
         10 - Build a Standalone BACKUP kit
         11 - Set the maximum number of interactive logins
         12 - Configure the network
         13 - Shut down or start up the network
         14 - SHUT DOWN the system

Enter a number (? or ?# for HELP):
```

The system manager menu appears on the terminal screen each time you log in to the SYSTEM account.

3. **Exit to DCL.** Select option 1 of the system manager menu. The DCL prompt ($) appears on your terminal screen.

   If the system manager menu is not available, you are already at the DCL prompt.

4. **Invoke the VMSINSTAL command procedure to install the MicroVMS options.** You may install the MicroVMS options using either VMSINSTAL alone or VMSINSTAL with auto-answer capabilities.

   - **Installing the MicroVMS options using VMSINSTAL**

     When installing MicroVMS options from a magnetic tape cartridge, you must invoke the VMSINSTAL command procedure specifying exactly which options you want to install. For example, to install all the options, enter the following command:

     ```
     $ @SYS$UPDATE:VMSINSTAL PROG,SYSP,USER,UTIL $TAPE1:
     ```

     When typing this command, leave no spaces between the option names. If you type a space between the option names, the VMSINSTAL command procedure displays an error message and exits immediately.

You are prompted as follows:

```
Are you satisfied with the backup of your system disk [YES]?
```

Press RETURN for the default answer, YES. You are prompted as follows:

```
Please mount the first volume of the set on $TAPE1:.
*Are you ready?
```

Type Y and press RETURN.

If you are not using the auto-answer capability, in approximately 30 seconds you are asked whether you want to install the entire option. Reply by entering Y or N.

If you respond with Y, all suboptions are installed. If you respond with N, you are prompted for each suboption; respond with Y to install the suboption or with N to avoid installing it.

Although you are not required to install all options and suboptions, DIGITAL suggests that you do unless you need to conserve disk space. For a description of the options and suboptions, refer to Appendix A.

As the installation proceeds, you receive messages telling you that items are being processed.

- **Installing the MicroVMS options using VMSINSTAL with auto-answer capability**

  You may use the auto-answer capability of the VMSINSTAL procedure to automate installation of a MicroVMS suboption. The auto-answer files allow you to install a MicroVMS suboption from magnetic tape cartridges on an unattended processor by responding automatically to the prompts displayed during the installation procedure.

  Auto-answer files containing the answers to VMSINSTAL prompts are supplied with the MicroVMS Version 4.5B BASE kit. The files are in the directory SYS$UPDATE and are called PROG045.ANS, SYSP045.ANS, USER045.ANS, and UTIL045.ANS (corresponding to the options PROG, SYSP, USER, and UTIL).

  By default, all suboptions are installed. You may edit these files so that VMSINSTAL installs only those suboptions you want. After the base kit has been installed, but before any options are installed, edit the ANS file corresponding to the option you are installing. Change the Y to an N for the suboptions you do not want to install. Do not change the text of the prompts; it causes the VMSINSTAL procedure to fail.

To automatically install the options and suboptions you have selected, enter the following DCL commands:

```
$ SET DEFAULT SYS$UPDATE:
$ @VMSINSTAL PROG,SYSP,USER,UTIL $TAPE1: OPTIONS A
```

Reply to the command procedure prompts. You are prompted as follows:

```
Are you satisfied with the backup of your system disk [YES]?
```

Press RETURN for the default answer, YES. You are prompted as follows:

```
Please mount the first volume of the set on $TAPE1:.
*Are you ready?
```

Type Y and press RETURN.

As the installation proceeds, you receive messages telling you that items are being processed. If you use the auto-answer capability, the installation should run automatically to completion. If all the options are selected, the installation takes approximately one hour.

5. **VMSINSTAL terminates automatically, and the DCL prompt ($) appears.** When you receive the DCL prompt ($), you have successfully installed the MicroVMS options. Remove the tape cartridge from the drive.

6. **Log out and reinitialize your process environment.** Log out by selecting option 2 of the system manager menu. If the system manager menu is not available, enter the command LOGOUT. Then, log back in to the SYSTEM account to reinitialize your process environment.

   NOTE: After installing certain options (for example, queues from the Secure User option) you may need to remove comment characters from the appropriate commands in the template command procedure SYS$MANAGER:SYSTARTUP.COM. All command procedures are internally documented. Use a text editor to edit this command procedure.

7. **Shut down the system.** Follow the instructions in Section 2.5 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide.*

8. **Reboot the system.** Enter the following command at the console-mode prompt (>>>):

   ```
   >>>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

9. **Determine how to proceed.** After the MicroVMS options are successfully installed, you may choose to remove an option or suboption. If so, proceed to Section 4.5.2. If you do not want to remove options or suboptions, see Section 1.4 to determine how to proceed with the software installation.

4.5.2 Removing a MicroVMS Option or Suboption

To remove previously installed MicroVMS options or suboptions, use option 7 of the system manager menu. You should not attempt to remove options or suboptions by directly deleting system files. Deleting a required system file can damage your operating system and prevent reboots and normal system operation.

To remove a MicroVMS option or suboption, follow these steps:

1. **Start up the system, unless it is already running.** Enter the following command at the console-mode prompt (> > >):

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

2. **Log in to the system manager's account (SYSTEM) from the console terminal.** Press RETURN and enter the user name SYSTEM.

3. **Select option 7 of the system manager menu.** You are asked if you want to add or delete a MicroVMS option. Choose DELETE; the system then invokes the command procedure that removes MicroVMS options and suboptions.

   If the system manager menu is not available, enter the following command at the DCL prompt ($):

   ```
   $ @SYS$UPDATE:REMOVE
   ```

   This procedure prompts you for the name of the option or suboption you want to remove. You cannot remove a suboption without first specifying the option in which it is contained. You may need to use CTRL/S (stops screen scroll) and CTRL/Q (resumes screen scroll) to control the rate of the screen scroll. Depending on the size of the option or suboption you want to remove, the procedure may take several minutes.

4.6 Installing Optional Software Products

The following steps explain how to install optional software products. In addition to these steps, you may receive special installation instructions with the update or product. If so, read and follow those special installation instructions. Note that if you install an optional software product at a later date than the rest of the system, you should back up the system disk before the installation.

You can abort the installation at any time during the procedure by pressing CTRL/Y. If you abort the installation, or if it fails for any other reason, you must perform the installation again from the beginning.

1. **Start up the system, unless it is already running.**

2. **Log in to the system manager's account (SYSTEM) from the console terminal.**

3. **Notify users to log out.** Select option 11 of the system manager menu and respond to the prompt by entering the numeral 0.

   If the system manager menu is not available, enter the following command at the DCL prompt ($):

   ```
   $ SET LOGINS/INTERACTIVE=0
   ```

4. **Shut down the network if it is running.** Select option 13 of the system manager menu. Enter the command SHUTDOWN at the prompt.

   If the system manager menu is not available, enter the following commands:

   ```
   $ RUN SYS$SYSTEM:NCP
   NCP> SET EXEC STATE SHUT
   ```

5. **Invoke the installation command procedure.** Select option 6 of the system manager menu.

   If the system manager menu is not available, enter the following command at the DCL prompt ($):

   ```
   $ @SYS$UPDATE:VMSINSTAL
   ```

6. **Reply to the installation command procedure prompts.** You are prompted as follows:

   ```
   Are you satisfied with the backup of your system disk [YES]?
   ```

   Press RETURN for the default response YES. You are prompted as follows:

   ```
   * Where will the distribution volumes be mounted:
   ```

   Type $TAPE1 (the logical device name of the tape drive) and press RETURN.

   Depending on the item being installed, you may be asked other questions. Usually a default reply appears in brackets at the end of the question; enter the default reply by pressing RETURN. Otherwise, type your reply after each question and press RETURN.

   The system prompts as follows:

   ```
   Please mount the first volume of the set on $TAPE1:
   Are you ready?
   ```

7. **Insert the tape cartridge containing the optional software product in the drive.** The tape cartridge is labeled with the name of the item and its version number. Type Y and press RETURN.

   As the installation proceeds, you receive messages telling you that items are being processed.

8. **Terminate the command procedure.** At the end of the installation, you receive the following prompt:

```
Enter the products to be processed from the next distribution volume set.
* Products:
```

Unless the optional software product includes instructions to the contrary, press CTRL/Z to terminate the command procedure.

Note that, for some installations, the command procedure terminates directly or reboots the system rather than displaying the message and prompt.

When the DCL prompt ($) appears, you have successfully installed the optional software products. Remove the tape cartridge from the drive.

9. **Reinitialize your process environment.** Log out by selecting option 2 of the system manager menu. If the system manager menu is not available, enter the following command:

```
$ LOGOUT
```

Then, log back in to reinitialize your process environment.

10. **Restore interactive logins.** Select option 11 of the system manager menu and respond to the prompt by entering the maximum number of users that you want to use the system (64 is the system maximum).

If the system manager menu is not available, enter the following command at the DCL prompt ($):

```
$ SET LOGINS/INTERACTIVE=n
```

where:

n is the number of users you want to permit to use the system.

11. **Restart the network if you previously shut it down.** Select option 13 of the system manager menu and respond to the prompt by entering the command STARTUP.

If the system manager menu is not available, enter the following command at the DCL prompt ($):

```
$ @SYS$MANAGER:STARTNET
```

If you have just installed the MicroVMS DECnet optional software product, proceed to Chapter 6 to install the DECnet license key.

Chapter 5

Upgrading the MicroVMS Base System Using a Tape Cartridge

If you are currently running the MicroVMS operating system and want to save the user files on your system disk, you may upgrade your system to the new version of MicroVMS. Before attempting the upgrade procedure, be sure that you are aware of all the requirements and you have read this entire chapter. To determine whether you can upgrade your MicroVMS operating system, see Chapter 1.

5.1 System Upgrade Preliminaries

Before you attempt to upgrade your system, you should be aware of the following contingencies:

- If you have changed the names of system directories in your current operating system or if you have deleted MicroVMS files from them, the upgrade procedure may not work correctly. You must restore your operating system to a standard system before you can begin the upgrade.
- The upgrade procedure does *NOT* work across the network.
- The system disk cannot be moved from one device to another during the upgrade procedure.
- The page, swap, dump, and authorization files are purged to one version each as part of the upgrade procedure.
- All files in the [SYSERR] directory are deleted.
- All operator and accounting logs are deleted.

If you want to keep any of these files, copy them to a user directory before starting the upgrade.

To complete the upgrade procedure, you need the tape cartridge labeled *MicroVMS V4.5B BIN TK50*. Locate this tape cartridge.

The following conditions must also be met:

- The system disk must contain a minimum of 16,000 free blocks. To confirm the free-block count of the system disk, enter the following DCL command:

  ```
  $ SHOW DEVICES SYS$SYSDEVICE
  ```

- The system page file must contain at least 4604 blocks.

  Confirm the number of blocks in the system page file by entering the following DCL command:

  ```
  $ @SYS$UPDATE:SWAPFILES
  ```

  The SWAPFILES.COM command procedure displays the current size of the paging file, system dump file, and swapping file and prompts you to enter new values. Press RETURN to retain the current values. You are then prompted as follows:

  ```
  Enter new size for paging file:
  ```

  If the page file does not contain at least 4604 blocks, enter the value 4604.

  You are prompted as follows:

  ```
  Enter new size for system dump file:
  Enter new size for swapping file:
  ```

  Press RETURN in response to both prompts.

  If you change the size of the page file, you must shut down and reboot your system before you proceed.

- The SYSGEN parameter SCSNODE must be null on your system. To determine the current value of SCSNODE and (if necessary) to set the value to null, invoke SYSGEN as follows:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> USE CURRENT
SYSGEN> SHOW SCSNODE
Parameter Name              Current   Default   Minimum   Maximum Unit  Dynamic
--------------              -------   -------   -------   ------- ----  -------
SCSNODE                  "SALONE  "    "    "    "    "    "ZZZZ" Ascii
SYSGEN> SET SCSNODE ""
SYSGEN> WRITE CURRENT
SYSGEN> SHOW SCSNODE
Parameter Name              Current   Default   Minimum   Maximum Unit  Dynamic
--------------              -------   -------   -------   ------- ----  -------
SCSNODE                  "         "    "    "    "    "    "ZZZZ" Ascii
SYSGEN> EXIT
```

- The following UAF parameters for the SYSTEM account must be greater than or equal to these values:

  ASTlm—24
  BIOlm—18
  Bytlm—20480
  DIOlm—18
  Enqlm—30
  Fillm—20

  Run the Authorize Utility to check the values of these parameters by entering the following commands:

```
$ SET DEFAULT SYS$SYSTEM
$ RUN AUTHORIZE
UAF> SHOW SYSTEM
```

  If any parameter is less than the recommended value, modify the value of the parameter. For example, if ASTlm is equal to 22, enter the following AUTHORIZE command to increase its value to 24:

```
UAF> MODIFY SYSTEM/ASTLM=24
```

  After you modify the necessary UAF parameters, exit from the Authorize Utility by entering the EXIT command.

If you have met these conditions, you can begin backing up the entire system disk to a tape cartridge, as described in Section 5.1.1.

If you do not have enough free space on your system disk, you must delete enough user files to acquire the free space you need before performing the upgrade. If you are able to create enough free space on your system disk by deleting user files, you can begin the backup procedure.

If you cannot create enough free space on your system disk by deleting user files, you must *install* MicroVMS Version 4.5B (see Chapter 4).

5.1.1 Backing Up and Restoring the Complete System Disk

Before you can upgrade the MicroVMS operating system, you must back up and restore all system and user files on the system disk. You should back up your system disk to preserve a copy of the preupgrade system. If, for any reason, the upgrade fails or if you want to return to the old version of the operating system, you can then restore this complete disk backup.

Restore the backup of the system disk to eliminate disk fragmentation problems. If your disk is too fragmented when you perform the upgrade procedure, you will be unable to boot the system and the upgrade will not complete successfully.

Before you back up the complete system disk, perform these preparatory steps:

1. Shut down the system, unless it is already shut down. Use the procedure in Section 2.5 of the *MicroVMS VAXstation 2000/MicroVAX 2000 Operations Guide.*
2. Boot standalone BACKUP. Insert the MicroVMS distribution tape cartridge labeled *MicroVMS V4.5B BIN TK50* into the tape drive (make sure this tape cartridge is write-protected).
3. At the console-mode prompt (> > >), enter the following command:

   ```
   >>> B MUA0
   ```

4. Approximately 13 minutes later, a message is displayed indicating the current version of the operating system. After approximately 20 seconds, you may be prompted for the current date and time.

   ```
   PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
   ```

   Enter the date and time in exactly the format shown. For example, March 22, 1987, at 3:30 P.M. is typed as follows:

   ```
   22-MAR-1987 15:30
   ```

   You must be exact in the value of the date and time; otherwise, subsequent file activity, security-related events, and accounting data will not be recorded properly. If you will be performing incremental backups, starting up the system with the correct time is essential. For information about incremental backups, see the *MicroVMS User's Manual.*

   When you receive the following message, you have successfully booted standalone BACKUP:

   ```
   %BACKUP-I-INDENT, Standalone BACKUP V4.5; the date is <dd-mmm-yyyy hh:mm>
   $
   ```

5. Wait a few moments until all tape drive activity ceases. Then remove the tape cartridge labeled *MicroVMS V4.5B BIN TK50* from the drive.

To back up the contents of the system disk to tape cartridge, follow these steps:

1. Insert a scratch tape cartridge that is write-enabled into the tape drive. (To write-enable a tape cartridge, slide the write-protect switch away from the tape cartridge label.)

Enter the following command at the dollar sign ($) prompt:

```
$ BACKUP/IMAGE/BUFFER_COUNT=5/VERIFY ddcu: MUA0:saveset.BCK/SAVE_SET
```

where:

ddcu: is the physical device name of the system disk that you want to back up, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.

saveset.BCK is the name of the save set, which you choose, with the recommended file type BCK. The save-set name is a file specification that identifies a file containing data in BACKUP format. Use a meaningful save-set name (not to exceed 17 characters), such as MARCH_15_1987.BCK. Label your tape cartridge with this save-set name.

You should receive a message telling you that the verification pass is starting.

If your system disk contains more data than the tape cartridge can store, you receive the following messages and prompt:

```
%BACKUP-I-RESUME, Resuming operation on volume 2
%BACKUP-I-READYWRITE, Mount volume 2 on $MUA0: for writing
Enter "YES" when ready.
```

2. Remove the first backup tape cartridge from the drive. Label it *Complete System Backup, Tape 1*, and include today's date. Write-protect the tape cartridge.

3. If needed, insert another scratch tape cartridge into the drive, type Y (uppercase or lowercase), and press RETURN. You again receive a message stating that the verification pass is starting.

   Repeat this step each time you receive a mount request, labeling, numbering, and write-protecting each tape in the sequence.

4. When the backup is complete, you receive the following messages and prompt:

   ```
   Operation completed.  Processing finished at <dd-mmm-yyy hh:mm>.

   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:
   ```

5. Remove the backup tape cartridge from the drive. Label it *Complete System Backup*, and include the number of the tape cartridge in the backup sequence (if you used more than one tape) and today's date. Write-protect the tape cartridge.

6. Type YES and press RETURN.

   NOTE: You do not need to insert the tape labeled *MicroVMS V4.5B BIN TK50* (which contains the standalone application volume) into the tape drive.

You must now restore the backup to the system disk by copying the backup kit you built onto the system disk. Complete the following steps:

1. Insert the first tape cartridge containing the backup of the complete system disk in the tape drive.
2. To restore the system disk, enter the following command at the dollar sign ($) prompt:

   ```
   $ BACKUP/IMAGE/BUFFER_COUNT=5/VERIFY MUA0:saveset.BCK/SAVE_SET ddcu:
   ```

   where:

ddcu:	is the physical device name of the system disk to which you restore the backup, either DUA0, the system disk in the system box, or DUA1, the system disk in the expansion box.
saveset.BCK	is the name of the save set, which you chose as part of the backup procedure.

   A message is displayed telling you that the verification pass is starting.
3. If the save set contains more than one volume, you receive the following message and prompt:

   ```
   %BACKUP-I-RESUME, Resuming operation on volume 2
   %BACKUP-I-READYREAD, Mount volume 2 on MUA0: for reading
   Enter "YES" when ready.
   ```
4. Remove the first tape of the backup save set. Insert the next tape cartridge of the backup save set into the drive, type Y, and press RETURN. You again receive a message stating that the verification pass is starting.

   Repeat this step each time you receive a mount request.

   When the restore is complete, you receive the following messages and prompt:

   ```
   Operation completed.  Processing finished at <dd-mmm-yyy hh:mm>.

   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:
   ```
5. Halt the system by pressing the halt button. Then, reboot the system from the system disk.
6. Remove the last tape cartridge from the tape drive.

You have successfully backed up and restored the entire contents of the system disk. Proceed to Section 5.1.2.

5.1.2 Preparing to Upgrade the MicroVMS Operating System

Determine the physical device name of the system disk for your system configuration. If your VAXstation 2000/MicroVAX 2000 system has more than one hard disk, you can choose which disk is to be the system disk.

- DUA0—disk in the system box
- DUA1—disk in the expansion box

Next, boot the restored version of your system, as follows:

1. Shut down the system by entering the following command:

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

2. After the system shuts down, you are prompted to halt the system. Press the halt button. At the console-mode prompt (> > >), enter the following command:

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the physical device name of your system disk.

   In approximately 20 seconds, a message appears stating the version number of the operating system.

3. You may be prompted for the current date and time.

   ```
   PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
   ```

   Enter the date and time in exactly the format shown. Otherwise, subsequent file activity, security-related events, and accounting data will not be recorded properly.

   Startup takes several minutes. Several MicroVMS messages appear, ending with the following:

   ```
   SYSTEM      Job terminated at dd-mmm-yyyy hh:mm:ss.ss
   ```

4. After the restored system boots, log in to the system manager's account (SYSTEM) from the console terminal.

5. Exit to DCL. Select option 1 of the system manager menu.

   If the system manager menu is not available, you are already at the DCL prompt.

6. Make sure that no users are logged in to the system. Prevent any users from logging in to the system by entering the following DCL command:

   ```
   $ SET LOGINS/INTERACTIVE=0
   ```

7. If you are running the network, shut it down by invoking NCP as follows:

```
$ RUN SYS$SYSTEM:NCP
NCP> SET EXECUTOR STATE SHUT
NCP> EXIT
```

8. Stop all batch queues by entering the following DCL command once for each batch queue that is set up for your system:

```
$ STOP/QUEUE/NEXT queue-name
```

where:

queue-name is the name of a queue that is set up on your system. The /NEXT qualifier allows the current job to complete before stopping the queue.

5.2 Performing the Upgrade

Now that you have checked the requirements for an upgrade, determined if it is possible to upgrade your system, and performed the required backup and restore procedures, you are ready to begin the upgrade procedure.

NOTE: If the upgrade terminates abnormally, see Section 5.3.

To perform the upgrade, follow these steps:

1. Invoke the VMSINSTAL command procedure by entering the following command:

```
$ @SYS$UPDATE:VMSINSTAL
```

If DECnet is running on your system, you receive the following message and prompt:

```
%VMSINSTAL-W-DECNET, Your DECnet is up and running.
* Do you want to continue anyway [NO]?
```

Because you must shut down the network before continuing with the upgrade procedure, press RETURN; the system exits from the upgrade procedure. After you shut down the network, as described in Section 5.1.2, you can restart the upgrade procedure by reinvoking the VMSINSTAL command procedure.

VMSINSTAL prompts as follows:

```
Are you satisfied with the backup of your system disk [YES]?
```

If you completed the backup and restore procedures described in Section 5.1.1, press RETURN. If not, type N and press RETURN to exit from VMSINSTAL; back up and restore the system disk and then restart the upgrade procedure by invoking VMSINSTAL.

2. VMSINSTAL prompts as follows:

```
* Where will the distribution volumes be mounted:
```

Respond by typing **MUA0:** (the physical device name of the tape drive).

Note that if you specify the logical name, $TAPE1, VMSINSTAL does not display an error message, but the upgrade fails in Phase 2 (see Section 5.2.2).

If you specify a nonexistent device or a device that is not connected to the system, an "invalid device" error message is displayed and the upgrade procedure terminates. If this happens, press CTRL/Y to exit from VMSINSTAL, and use the DCL command SHOW DEVICES to verify device status. (If you exit from VMSINSTAL, you must restart this procedure from step 1.)

3. VMSINSTAL prompts you for the name of the product you want to install. Respond by entering VMS as in the following example:

```
Enter the products to be processed from the next distribution volume set.
* Products: VMS
```

If you want to exit from the upgrade procedure, press CTRL/Z in response to this prompt.

4. You receive the following message and prompt:

```
Please mount the first volume of the set on MUA0:
Are you ready?
```

Insert the tape cartridge labeled *MicroVMS Version 4.5B* in the drive, type Y, and press RETURN.

The following messages appear on your terminal screen:

```
%MOUNT-I-MOUNTED, SYSTEM mounted on _MUA0:

The following products will be processed:

  MicroVMS    V4.5B

       Beginning installation of VMS V4.5B at 14:27

%VMSINSTAL-I-RESTORE, Restoring product save set A...
```

This step takes approximately 30 minutes.

5. VMSINSTAL displays a series of messages that describe cautions and requirements related to completing the upgrade. After the messages are displayed, you are prompted as follows:

   ```
   Do you want to continue? (Y/N):
   ```

   - To interrupt the upgrade to comply with any of the conditions listed, type N and press RETURN. The procedure displays the following prompt:

     ```
     Enter the products to be processed from the next distribution volume set.
     * Products:
     ```

   - To terminate the procedure and return to the DCL prompt ($), press CTRL/Z. If you terminate the upgrade at this point, you must reinvoke VMSINSTAL when you are ready to resume the upgrade.
   - To proceed with Phase 1 of the upgrade procedure (see Section 5.2.1) , type Y and press RETURN.

5.2.1 Upgrade Phase 1

The remainder of the upgrade consists of five phases. This section describes the first phase of the upgrade procedure.

1. The upgrade procedure turns off disk quotas on the system disk. Ignore any error messages about disk quotas being disabled.
2. The procedure stops the job controller, OPCOM, and the error formatter. Ignore any "nonexistent process" error messages.
3. The procedure purges directories and removes installed images.
4. The procedure purges all accounting data files, operator logs, and the directory [SYSERR]; ignore any error messages about files not being purged.
5. The procedure deletes all JNL files in the directory [SYS0] and in all of its subdirectories. Ignore any "file not found" error messages.
6. The procedure builds the directory tree [SYSF] and deletes all the old operating system files that will not be needed if the system needs to be rebooted during the upgrade. This step takes approximately 10 to 15 minutes.

   NOTE: The files deleted include all files installed from optional MicroVMS kits such as the Common Utilities option and the Secure User Environment option.
7. The upgrade procedure restores the Version 4.5B BASE kit. The entire base system is located on one magnetic tape cartridge. This step takes approximately 20 minutes.

8. When the procedure displays the following message, remove the tape cartridge containing MicroVMS V4.5B from the tape drive:

   ```
   You may now remove the kit from MUA0:.
   ```

9. The procedure purges the page, swap, dump, and authorization files and puts the most current version in the new directory tree.

10. The procedure uses AUTOGEN to save your old SYSGEN parameters and sets up the system to continue with Phase 2 of the upgrade procedure.

11. The procedure announces that it is shutting down the system, that the system disk must not be moved during the upgrade, and that SYSGEN parameters must not be changed while the system reboots.

    When the system shutdown has completed, halt the system by pressing the halt button on the processor control panel. Then, reboot the system by entering the following command at the console-mode prompt (> > >):

    ```
    >>> B/F0000000 ddcu
    ```

    where:

    ddcu is either DUA0 or DUA1, the name of the system disk.

12. The system prompts you to enter the date and time, and continues automatically with Phase 2 of the upgrade procedure.

5.2.2 Upgrade Phase 2

This section describes the second phase of the upgrade procedure.

1. The following system messages are displayed on your terminal screen:

   ```
   MicroVMS Version 4.5B    25-APR-1987 15:26

   Continuing with MicroVMS V4.5B Upgrade Procedure.

        Upgrade Phase 2  25-APR-1987  15:32
   ```

2. The upgrade procedure removes the remaining files from the old version of the MicroVMS operating system. (This step takes approximately 10 to 15 minutes.)

5.2.3 Upgrade Phase 3

This section describes the third phase of the upgrade procedure.

1. The following system message is displayed on your terminal screen:

```
Continuing with MicroVMS V4.5B Upgrade Procedure.

    Upgrade Phase 3  25-APR-1987  15:35
```

2. The upgrade procedure merges new versions of the MicroVMS system files (files that are commonly edited by system managers) with existing files. This step takes approximately 10 to 15 minutes.
3. The procedure removes the directory entries for page, swap, dump, and authorization files from the old directory tree.
4. The procedure deletes all the remaining accounting data files, operator logs, and all files in the [SYSERR] directory.
5. The upgrade procedure merges all the miscellaneous user files that exist in the old system directories into the new set of system directories, temporarily called [SYSF.SYS*]. The amount of time this takes depends on the number of user files. Ignore any "file not found" error messages.
6. The procedure deletes the system directory [SYS0] containing the old version of the system files.

5.2.4 Upgrade Phase 4

This section describes the fourth phase of the upgrade procedure.

1. The following system message is displayed on your terminal screen:

```
Continuing with MicroVMS V4.5B Upgrade Procedure.
    Upgrade Phase 4  25-APR-1987  15:47
```

2. The upgrade procedure corrects the back links for the system directories. This step requires only a few seconds, and the procedure displays a message when it has completed.
3. The upgrade procedure gives you instructions on how to reboot the system using normal system startup procedures, and then shuts down the system so that you can reboot the new version of the operating system.

   When the system shutdown has completed, halt the system by pressing the halt button. Then, reboot the system by entering the following command at the console-mode prompt (> > >):

```
>>> B ddcu
```

where:

ddcu is either DUA0 or DUA1, the physical device name of the system disk.

5.2.5 Upgrade Phase 5

This section describes the fifth phase of the upgrade procedure.

1. The following system messages are displayed on your terminal screen:

```
MicroVMS Version 4.5B  25-APR-1987 16:11

Continuing with MicroVMS V4.5B Upgrade Procedure.
      Upgrade Phase 5  25-APR-1987  16:28
```

2. The upgrade procedure deletes the temporary [SYSF] directory tree.
3. The procedure purges files that were used only during the upgrade procedure.
4. The procedure displays the following messages on your terminal screen:

```
After the upgrade finishes, there are several things that you may wish
to do:

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

- EDIT SYSTEM SPECIFIC FILES - The system specific files in SYS$MANAGER,
SYSTARTUP.COM, SYSHUTDOWN.COM, and SYCONFIG.COM have all been
superseded by blank files.  Your copies of these files still exist in
SYS$MANAGER as the next lower version number.

- Purge unnecessary files - There are a number of files that may be purged
after the upgrade is complete to free up space on your system disk.  First,
you may purge the lower-numbered versions of the following files from the
previous version of the operating system:

        [SYSEXE]SHUTDOWN.COM
        [SYSEXE]STARTUP.COM
        [SYSLIB]DCLTABLES.EXE
        [SYSLIB]IMAGELIB.OLB
        [SYSLIB]STARLET.OLB
        [SYSLIB]LBRSHR.EXE
        [SYSLIB]*RTL*.EXE
        [SYSMGR]EDTINI.EDT
        [SYSMGR]WELCOME.TXT
```

```
Second, you may purge the lower-numbered versions of the following
files from the new version of the operating system.  These files may be
purged since they are the same as those shipped in the last version of
the operating system.

        [SYSEXE]SYSALF.DAT
        [SYSLIB]CDDSHR.EXE
        [SYSMGR]LOGIN.COM

- Delete SYS$SYSTEM:STARTUP.UP5 and UPGRADE.KIT - These files are left
by the upgrade should this phase fail for some reason.  You may delete
them when the upgrade has completed.
```

NOTE: Because many of the libraries are contained in the MicroVMS options, do not decompress the libraries until you have installed all the options you require.

The decompressed libraries require approximately 2700 additional blocks of disk space. A general guideline for decompressing individual library files is that HELP libraries increase by 50 percent and OBJECT libraries increase by 25 percent when decompressed.

5. The procedure autoconfigures all devices on the system. If you have devices whose drivers reside in a MicroVMS option, an error message (which you can ignore) similar to the following appears:

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

6. The procedure runs AUTOGEN to determine the new SYSGEN parameters. (This step takes approximately 5 to 10 minutes.)
7. The procedure shuts down the system so that you can reboot it with the new parameters.
8. After the shutdown has completed, reboot the system by entering the following command at the console-mode prompt (> > >):

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the physical device name of the system disk.

9. You may be prompted to enter the date and time.
10. When your system reboots, the following message is displayed on your screen:

    ```
    You have successfully installed and started
    the MicroVMS base kit.  The system is now
    ready for you to login.
    ```

Follow the instructions provided in Section 4.5.1 to reinstall any MicroVMS options and optional software products that you want to use. To run DECnet, you must reinstall the DECnet optional software product and license key.

5.3 Restarting the Upgrade if it Terminates Abnormally

If the upgrade terminates abnormally, you can restart it as follows:

1. During Phase 1: Restart the system normally, and start the upgrade from step 1.
2. During Phases 2, 3, or 4: Enter the following boot command:

   ```
   >>> B/F0000000 ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the disk you chose to be your system disk.
3. During Phase 5: Enter the following boot command:

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the disk you chose to be your system disk.

   To allow the upgrade procedure to resume at any point, the procedure places the new system files in an alternate disk directory, [SYSF]; your old system's files are located in [SYS0]. Having two sets of system files ensures that you have at least one set of bootable system files at all times. During Phase 5, the upgrade procedure moves the new files to [SYS0], and deletes old system files.

Chapter 6

Starting Up the Network

Requires the VMS DECnet Optional Software Product.

This chapter describes how to install the MicroVMS DECnet license key from a diskette or a tape cartridge.

To start up the DECnet network, follow these steps:

1. Purchase the MicroVMS DECnet optional software product and install it following the steps in Section 2.6 or Section 4.6, depending upon your installation media.
2. Purchase the DECnet license key and install it following the steps in Section 6.1.
3. Determine whether you will use asynchronous DECnet. Asychronous DECnet uses the DIGITAL Data Communications Message Protocol (DDCMP). Asynchronous transmissions occur most commonly over terminal lines and telephone lines.

   If you *will not* use asynchronous DECnet, do the following:

   a. Configure the network and define the remote node names following the steps in Section 6.2.

   b. Start up the network as described in Section 6.4.

   If you *will* use asynchronous DECnet, do the following:

   a. Configure the network and define the remote node names following the steps in Section 6.2. Do not start the network at this time.

   b. Follow the steps in Section 6.3 to enable the appropriate asynchronous connection.

   c. Turn on the network as described in Section 6.4.
4. Secure your network from outside access following the suggestions in Section 6.8.

For more information about using the DECnet option, refer to the *MicroVMS User's Manual.*

6.1 Installing the DECnet License Key

To install the DECnet license key, follow these steps:

1. **Determine which DECnet license key you have purchased.** There are two DECnet license keys:

   - The DECnet-VAX End Node Key
   - The DECnet-VAX Full Function Key

   These keys are on the same tape cartridge as the DECnet-VAX optional software products. If you have purchased the DECnet-VAX End Node to Full Function Upgrade Kit, your kit contains the DECnet-VAX Full Function Key.

   The procedure for installing either DECnet license key is the same. If your node will operate as a routing node (see Section 6.2), you must purchase and install the DECnet-VAX Full Function Key.

2. **Log in to the system manager's account (SYSTEM) from the console terminal.** Press RETURN and enter the user name SYSTEM.

3. **Install the DECnet license key.** Select option 6 of the system manager menu.

   If the system manager menu is not available, enter the following command at the DCL prompt ($):

   ```
   $ @SYS$UPDATE:VMSINSTAL
   ```

   The following messages appear on your screen:

   ```
            VAX/VMS Software Product Installation Procedure V4.5B

   It is dd-mmm-yyyy at hh:mm
   Enter a question mark (?) at any time for help.
   ```

4. **Reply to the installation command procedure prompts.** You are prompted as follows:

   ```
   * Are you satisfied with the backup of your system disk [YES]?
   ```

   Press RETURN (the installation of the DECnet license key does not modify the disk in any way that would require restoration of the disk).

5. **Reply to the command procedure prompts.**

   - **Installing your DECnet license key from diskettes**

     If you are installing your DECnet license key from diskettes, you are prompted as follows:

     ```
     * Where will the distribution volumes be mounted:
     ```

     Type $FLOPPY1 (the logical device name of the diskette drive) and press RETURN.

The following message and prompt are displayed:

```
Enter the products to be processed from the first distribution volume set.
* Products:
```

Type an asterisk (*) and press RETURN.

The following message and prompt is displayed:

```
Please mount the first volume of the set on $FLOPPY1:

* Are you ready?
```

Insert the diskette containing the DECnet-VAX license key in the disk drive, type Y, and press RETURN.

- **Installing your DECnet license key from a tape cartridge**

  If you are installing your DECnet license key from a tape cartridge, you are prompted as follows:

  ```
  * Where will the distribution volumes be mounted:
  ```

  Type $TAPE1 (the logical device name of the tape drive) and press RETURN.

  The following message and prompt are displayed:

  ```
  Enter the products to be processed from the first distribution volume set.

  * Products:
  ```

  If you are installing the DECnet-VAX End Node Key, enter NETEND. If you are installing the DECnet-VAX Full Function Key, enter NETRTG.

  The following message and prompt is displayed:

  ```
  Please mount the first volume of the set on $TAPE1:

  * Are you ready?
  ```

  Insert the tape cartridge containing the DECnet-VAX license key in the tape drive, type Y, and press RETURN.

6. **The following messages are displayed if your key is for a DECnet End Node license.** The display varies slightly according to which key you are installing.

   ```
   %MOUNT-I-MOUNTED, NETENDO1      mounted on _DUA1:
                  .
                  .
                  .
   ```

```
The following products will be installed:

NETEND V4.5B

Beginning installation of NETEND V4.5B at hh:mm

%VMSINSTAL-I-RESTORE, Restoring product saveset A...

        DECnet-VAX Endnode Key installation
```

As the installation proceeds, you receive the following informational patch messages:

```
%PATCH-I-NOGBL, some or all global symbols not accessible
%PATCH-I-WRTFIL, updating image file VMI$ROOT:[SYSUPD.NETEND045B]NETACP.EXE;1
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...
```

Ignore these informational patch messages and similar messages as the installation proceeds.

7. **The software installation procedure terminates automatically.** After the DECnet license key is installed, the following message is displayed:

   ```
   Installation of NETEND V4.5B completed at hh:mm
   ```

8. **Shut down the system.** Select option 14 of the system manager menu.

   If the system manager menu is not available, enter the following command at the DCL prompt ($):

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

   Press RETURN in response to all command procedure prompts.

9. **Restart the system.** Enter the following command:

   ```
   >>> B ddcu
   ```

   where:

   ddcu is either DUA0 or DUA1, the disk you chose to be the system disk.

You have successfully installed the DECnet license key. Proceed to Section 6.2 to configure your DECnet-VAX system.

6.2 Configuring the Network

Before you configure the network, you need to perform the following tasks:

- Contact your network manager and request a unique node name and node address.
- Contact the network managers of the other nodes on your network. The system manager for each remote node that you want to define must provide you with the correct name and address.

You are now ready to configure your DECnet-VAX system. Follow these steps:

1. **Log in to the system manager's account (SYSTEM) from the console terminal.** Press RETURN and enter SYSTEM.
2. **Invoke NETCONFIG.COM, the network configuration command procedure.** Select option 12 of the system manager menu.

   If the system manager menu is not available, enter the following command at the DCL prompt ($):

   ```
   $ @SYS$MANAGER:NETCONFIG
   ```

   The following message is displayed:

   ```
   DECnet-VAX network configuration procedure

This procedure will help you define the parameters needed to get DECnet
running on this machine.  You will be shown the changes before they are
executed, in case you wish to perform them manually.
   ```

3. **Provide the node name.** You are prompted as follows:

   ```
   What do you want your DECnet node name to be?
   ```

   Enter the node name supplied by your network manager. Your node name must be six alphanumeric characters or less, and must be unique among all node names in the network.

4. **Provide the node address.** You are prompted as follows:

   ```
   What do you want your DECnet address to be?
   ```

Enter the node address provided by your network manager. The node address is a numeric value in the following format:

`area-number.node-number`

where:

area-number (1 to 63)	designates the area in which the node is grouped.
node-number (1 to 1023)	designates the node's unique address within the area. If the network is not divided into areas, the system supplies a default area number.

5. **Specify router or nonrouter status.** You are prompted as follows:

   `Do you want to operate as a router? [NO (nonrouting)]`

   Press RETURN to operate as a nonrouter. If you have the DECnet Full Function license and want your system to be a router, type YES and press RETURN.

   NOTE: Operating as a router is not recommended except under special circumstances, for example, if your system is required as a router for other nodes to access each other.

6. **Set up the nonprivileged account.** You are prompted as follows:

   `Do you want a default DECnet account? [YES]`

   To set up the nonprivileged account, press RETURN. If you do not want to set up the nonprivileged account, type N and press RETURN.

   The nonprivileged account permits users on other nodes to receive electronic mail without supplying a name and password. The nonprivileged account means outside users cannot read or write user files on the system unless the file protection has been changed to allow WORLD access.

   The procedure outputs the list of commands necessary to start up your network and prompts you to press RETURN to continue.

7. **Apply the configuration.** You are prompted as follows:

   `Do you want to go ahead and do it? [YES]`

   To configure the network, press RETURN. To cancel the configuration operation, type NO and press RETURN. If you choose to configure the network, the procedure outputs a number of informational messages, ending with the following:

   ```
   The changes have been made.

   If you have not already installed the DECnet-VAX license, then do so now.
   ```

   After the license is installed, start up DECnet-VAX to include these changes by entering the following command:

   ```
   $ @SYS$MANAGER:STARTNET
   ```

8. **Turn on the network.** You are prompted as follows:

   `(If the license is already installed) Do you want DECnet started? [YES]:`

If you do not plan to enable asynchronous DECnet, press RETURN. The procedure turns on the network and displays the identification number of the created process. When the DCL prompt ($) appears, you have successfully configured and turned on the MicroVMS DECnet-VAX network.

If you plan to enable asynchronous DECnet, type NO and press RETURN. When the DCL prompt ($) appears, you have successfully configured (but not turned on) the MicroVMS DECnet-VAX network.

9. **Define the other node names.** At the DCL prompt ($), invoke the Network Control Program (NCP) by entering the following command:

   ```
   $ RUN SYS$SYSTEM:NCP
   ```

   For each remote node in the network, enter the following command:

   ```
   NCP> DEFINE NODE address NAME name
   ```

   where:

   address is the existing node address.

   name is the node name.

   The system manager of the system whose remote node you want to define can provide you with the correct name and address. Then, enter the following commands:

   ```
   NCP> SET KNOWN NODES ALL
   NCP> EXIT
   ```

   The other nodes on the network should define your node name and node address in their network databases. The network manager must assign a unique node name and address to your node and must define your node name in the overall network database.

10. **Determine how to proceed.** If you did not enable asynchronous DECnet and plan to connect your MicroVMS system to the Ethernet, you have completed the network startup procedure. If you enabled asynchronous DECnet, continue on to Section 6.3 to install the asynchronous connections.

6.3 Installing Asynchronous Connections

If your VAXstation 2000/MicroVAX 2000 system will be connected to another member of the VAX or MicroVAX family through an asynchronous line, follow the steps provided in Sections 6.3.1 and 6.3.2 to turn on asynchronous DECnet.

There are two types of asynchronous DECnet links you can establish:

- You can use static asynchronous DECnet to create a permanent DECnet link to a single remote node. See Section 6.3.1.
- You can use dynamic asynchronous DECnet to create temporary DECnet links to different remote nodes at different times. See Section 6.3.2.

6.3.1 Installing Static Asynchronous DECnet

There are two types of static asynchronous DECnet links you can establish:

- You can use a static asynchronous DECnet link to create a permanent link between two nodes that are connected by terminal lines.
- You can use a dial-up static asynchronous DECnet link to create a permanently enabled connection between your MicroVMS system and a remote node over a telephone line.

6.3.1.1 Static Asynchronous DECnet

Follow the steps outlined in this section to turn on and run your static asynchronous link. For the link to be established, the node with which you are creating a DECnet link must also support asynchronous DECnet.

1. Invoke a text editor to add the following commands to your SYSTARTUP.COM file:

```
$ RUN SYS$SYSTEM:SYSGEN.COM
CONNECT NOA0/NOADAPTER
EXIT
$ SET TERMINAL/EIGHTBIT/PROTOCOL=DDCMP/PERM device-name
```

   where:

   device-name is the name of the terminal port that is connected to the line that you want to make a static asynchronous DECnet line. All references to a device in this section refer to this terminal port.

   The SET TERMINAL command switches the terminal line to static asynchronous DECnet. If more than one terminal is attached to your MicroVMS system, you must add a SET TERMINAL command for each terminal that will be used for static asynchronous DECnet.

For example, to switch a device named TTA2 to static asynchronous DECnet, enter the following command:

```
$ SET TERMINAL/EIGHTBIT/PROTOCOL=DDCMP/PERM TTA2:
```

2. Execute the SYSTARTUP.COM command procedure by entering the following command:

```
$ @SYS$MANAGER:SYSTARTUP
```

If you type an error in one of the commands in step 1, SYSGEN does not connect the NOA0/NOADAPTER and you see the following error message when you execute the SYSTARTUP.COM command procedure:

```
%SYSTEM-W-NOSUCHDEV, no such device available
```

3. After running the NETCONFIG.COM command procedure described in Section 6.2 and before starting the network, run the Network Control Program (NCP) by entering the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP> DEFINE LINE dev-c-u STATE ON RECEIVE BUFFERS 4 -
     _ LINE SPEED  baud-rate
NCP> DEFINE CIRCUIT dev-c-u STATE ON
NCP> EXIT
```

where:

dev	is the first two letters of the device name. Possible values for **dev** are TT and TX.
c	is a decimal number (0 or a positive integer) designating a device's hardware controller. If the third letter of the device name is A, **c** equals 0. If the third letter of the device name is B, **c** equals 1, and so on.
u	is the unit number of the device name; **u** is always equal to 0 or a positive integer.
baud-rate	is the speed at which the line sends and receives data.

For example, to use a device named TTA2 at 9600 baud, run NCP and enter the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP> DEFINE LINE TT-0-2 STATE ON RECEIVE BUFFERS 4 -
     _ LINE SPEED  9600
NCP> DEFINE CIRCUIT TT-0-2 STATE ON
NCP> EXIT
```

If the lines have not been switched to static asynchronous DECnet, the following error message appears when you start up the network:

```
%NCP-I-NMLRSP, LISTENER RESPONSE - Operation failure
```

If you do not want to turn on the asynchronous lines when you start up your network, or if you want to turn off the asynchronous lines for a short time, run NCP and enter the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP> SET LINE dev-c-u STATE OFF
NCP> SET CIRCUIT dev-c-u STATE OFF
NCP> CLEAR LINE dev-c-u ALL
NCP> CLEAR CIRCUIT dev-c-u ALL
NCP> EXIT
```

To turn static asynchronous DECnet back on, run NCP and enter the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP> SET LINE dev-c-u STATE ON RECEIVE BUFFERS 4 -
    _ LINE SPEED baud-rate
NCP> SET CIRCUIT dev-c-u STATE ON
NCP> EXIT
```

4. Proceed to Section 6.4 for instructions on how to turn on the network.

6.3.1.2 Dial-Up Static Asynchronous DECnet

To install your permanently enabled dial-up static asynchronous DECnet link, follow the steps outlined in this section. For the link to be established, the remote node with which you are enabling a DECnet link must also support asynchronous DECnet.

1. Invoke a text editor to add the following commands to your SYSTARTUP.COM file:

```
$ RUN SYS$SYSTEM:SYSGEN
CONNECT NOAO/NOADAPTER
EXIT
$ SET TERMINAL/EIGHTBIT/PERMANENT/MODEM/NOHANGUP/NOAUTOBAUD -
 _$ /PROTOCOL=DDCMP device-name
```

where:

device-name is the name of the terminal port with which you connect the line that you want to make a static asynchronous DECnet line. All references to a device in this section refer to this terminal port.

The SET TERMINAL command creates a permanent static asynchronous DECnet link through a dial-up line. For example, to switch a device named TTA2 to local static asynchronous DECnet, enter the following command:

```
$ SET TERMINAL/DIALUP/EIGHTBIT/PROTOCOL=DDCMP/PERM TTA2:
```

2. Execute the SYSTARTUP.COM command procedure by entering the following command:

```
$ @SYS$MANAGER:SYSTARTUP
```

3. To turn on the static asynchronous lines for dial-up sessions, run the Network Control Program (NCP) and enter the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP> DEFINE LINE dev-c-u STATE ON RECEIVE BUFFERS 4 -
     _ LINE SPEED baud-rate
NCP> DEFINE CIRCUIT dev-c-u STATE ON
NCP> EXIT
```

   where:

   dev is the first two letters of the device name. Possible values for **dev** are TT and TX.

   c is a decimal number (0 or a positive integer) designating a device's hardware controller. If the third letter of the device name is A, **c** equals 0. If the third letter of the device name is B, **c** equals 1, and so on.

   u is the fourth character of the device name; **u** is always equal to 0 or a positive integer.

   baud-rate is the speed at which the line sends and receives data.

4. Run NCP to establish the optional transmit and receive passwords for the local end of the static asynchronous dial-up link. Although transmit and receive passwords are not required for static asynchronous dial-up links, they are essential for the security of your DECnet link. Passwords can be from one to eight alphanumeric characters and cannot contain spaces. For example:

```
$ RUN SYS$SYSTEM:NCP
NCP> DEFINE NODE remote TRANSMIT PASSWORD pass_1 -
     _ RECEIVE PASSWORD pass_2
NCP> EXIT
```

   where:

   remote is the name of the remote node.

   pass_1 is the name of the transmit password.

   pass_2 is the name of the receive password.

   Note that if you define passwords for the local end of the link, the security manager of the remote node must also run NCP to establish transmit and receive passwords for the remote end of the static asynchronous DECnet dial-up link, as follows:

```
$ RUN SYS$SYSTEM:NCP
NCP> DEFINE NODE local TRANSMIT PASSWORD pass_2 -
     _ RECEIVE PASSWORD pass_1
NCP> EXIT
```

where:

local is the name of the local node.

pass_2 is the name of the receive password.

pass_1 is the name of the transmit password.

5. For instructions on how to turn on the network, proceed to Section 6.4. After you turn on the network, see the *MicroVMS User's Manual* for instructions on how to use static asynchronous DECnet.

6.3.2 Installing Dynamic Asynchronous DECnet

A dynamic asynchronous DECnet link is a temporary connection between two nodes, generally over a modem and a telephone line. The terminal lines at each end of the connection can be switched to dynamic asynchronous DECnet.

To install dynamic asynchronous DECnet, follow the steps outlined in this section. The *MicroVMS User's Manual* describes how to establish a dynamic asynchronous DECnet link over a telephone line.

1. Enter the following commands interactively from the system manager's account (SYSTEM):

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> CONNECT NOA0/NOADAPTER
SYSGEN> EXIT
$ INSTALL:= $SYS$SYSTEM:INSTALL/COMMAND_MODE
$ INSTALL
INSTALL> CREATE SYS$LIBRARY:DYNSWITCH/SHARE -
_/PROTECT/HEADER/OPEN
INSTALL> EXIT
```

   Note that the system manager of the remote node must also enter these commands for a successful dynamic asynchronous DECnet link to be established.

2. To establish the required transmit password for your end of the dynamic asynchronous dial-up link, run the Network Control Program (NCP). The password can be from one to eight alphanumeric characters and cannot contain spaces, as is shown in the following examples:

```
$ RUN SYS$SYSTEM:NCP
NCP> DEFINE NODE remote TRANSMIT PASSWORD pass_1
NCP> EXIT
```

   where:

remote is the name of the remote node.

pass_1 is the name of the transmit password.

Note that the security manager of the remote node must also run NCP to configure the dynamic asynchronous connection and to establish the receive password (your transmit password) for the remote end of the static asynchronous DECnet dial-up link.

```
$ RUN SYS$SYSTEM:NCP
NCP> DEFINE NODE local RECEIVE PASSWORD pass_1 INBOUND ENDNODE
NCP> EXIT
```

where:

local is the name of the local node.

pass_1 is the name of the transmit password.

You must define a transmit password for each remote node with which you create a dynamic asynchronous DECnet dial-up link, and you must ensure that the security manager of each remote node defines the same password as the receive password.

To enable the remote system to establish a DECnet link and to set terminal characteristics for the terminal line, the system manager at the remote node must also enter the following commands:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> CONNECT VTA0/NOADAPTER/DRIVER=TTDRIVER
SYSGEN> CONNECT NOA0/NOADAPTER
SYSGEN> EXIT
$ SET TERMINAL/EIGHTBIT/PERMANENT/DISCONNECT device-name
$ INSTALL:= $SYS$SYSTEM:INSTALL/COMMAND_MODE
$ INSTALL
INSTALL> CREATE SYS$LIBRARY:DYNSWITCH/SHARE -
_/PROTECT/HEADER/OPEN
INSTALL> EXIT
```

where:

device-name is the name of the terminal port to which you will make the dynamic asynchronous connection.

Note that the system manager of the remote node must also enter these commands for a successful dynamic asynchronous DECnet link to be established.

For instructions on how to turn on the network, proceed to Section 6.4.

6.4 Turning on the Network

To turn on the network, enter the following command:

```
$ @SYS$MANAGER:STARTNET
```

You do not have to turn on the network again unless you reconfigure the hardware, explicitly shut down the network (for example, while installing an option), or remove the network startup invocation from the site-specific startup command procedure. The network turns on automatically as part of the system startup executed by the SYS$MANAGER:SYSTARTUP.COM command procedure.

6.5 Shutting Down the Network

To shut down the network while the system is running, enter the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP> SET EXECUTOR STATE OFF
NCP> EXIT
```

The network shuts down automatically as part of the normal system shutdown procedure.

6.6 Displaying and Deleting Nodes

To list the permanent name and address of a node, enter the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP> LIST NODE node-id
NCP> EXIT
```

where:

node-id is either the node name or the node address.

To delete a node, enter the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP> PURGE NODE node-id ALL
NCP> EXIT
```

NOTE: Because the PURGE command does not affect the volatile (memory-resident) copy of the DECnet database, you can access a node deleted with the PURGE command until DECnet is started again. To show the volatile copy of a node's name and address, use the SHOW command. To delete a node from the volatile copy of the DECnet database, use the CLEAR command.

Normally the NETCONFIG.COM command procedure enables the network logging monitor, which starts a detached process called EVL. If the OPCOM process is created (see the SYS$MANAGER:SYSTARTUP.COM command procedure), the EVL process logs network events on the system console terminal.

To disable the creation of the EVL process, enter the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP> PURGE LOGGING MONITOR ALL
NCP> EXIT
```

Note that you must have configured the network already before you can enter these commands.

6.7 Installing the Mail Utility

To use the Mail Utility to communicate with other users on the network, follow these steps:

1. Make certain you have installed the UTIL option.
2. Edit the SYS$MANAGER:SYSTARTUP command procedure to modify the following command lines:

   ```
   $!RUN SYS$SYSTEM:INSTALL
   $!sys$system analimdmp       /priv=(cmexec,cmkrnl)
   $!sys$system mail            /open/header/priv=(sysprv,oper,world,netmbx)
   ```

   Delete the comment character (!) before the RUN command. Delete the dollar sign, and the comment character (!) before the line that begins *$!sys$system mail* and move this line directly under the RUN command. The command lines should look like this when you are finished:

   ```
   $RUN SYS$SYSTEM:INSTALL
   sys$system mail              /open/header/priv=(sysprv,oper,world,netmbx)
   $!sys$system analimdmp         /priv=(cmexec,cmkrnl)
   ```

3. Shut down and reboot the system to reinitialize your process environment.

6.8 Network Security

To secure your system from outside access, you must set passwords for the SYSTEM, USERP, and USER accounts that the system created, and for any accounts you create. Otherwise, users on other nodes can gain full access to your system by setting host and logging in to one of the accounts. For additional suggestions for protecting your system, see the *MicroVMS User's Manual*.

If you do not want outside users reading or executing from your node, do not create a nonprivileged account when you configure the network. You can permit selected outside users to access your node by creating proxy accounts for them with AUTHORIZE. For more information, see the *MicroVMS User's Manual*.

6.9 Creating User Accounts

You can create individual user accounts for logging in to and using the MicroVMS operating system. Read Chapter 2 of the *MicroVMS User's Manual* to learn about user accounts.

To create user accounts, you can use option 5 of the system manager menu. If the system manager menu is not available, use the command procedure ADDUSER.COM (see Section 2.2.4.9 of the *MicroVMS User's Manual*), which supplies prompts and several default values for the new accounts.

6.10 Network Tuning

Your system may require some tuning if the network configuration is not in the average range, for example, if a node in the network contains an address that is larger than 255. Enter the following commands:

```
$ RUN SYS$SYSTEM:NCP
NCP> SET EXECUTOR MAXIMUM ADDRESS max-address
NCP> EXIT
```

where:

max-address is an integer greater than 255 that represents the largest node number in your network.

If you encounter other problems like this, refer to the VMS DECnet-VAX documentation listed in the MicroVMS cover letter.

Appendix A

Components of the MicroVMS Full Kit

The following table lists the components of the MicroVMS Full Kit. The full kit includes the SABKUP (standalone BACKUP) and BASE (Base System) subkits that you must install to run MicroVMS, as well as other options that you can install as you need them. The following table lists the components of the MicroVMS base kit and the MicroVMS options (USER, UTIL, PROG, and SYSP).

Name	Description
SABKUP	Standalone BACKUP: used to install the base system.
BASE	Base System: boots MicroVMS, installs optional products, executes nonprivileged, native-mode VMS user programs, supports drivers for network communication devices for users doing nonnetwork I/O over the Ethernet or DMV11, and includes some standard facilities needed on all systems (such as EDT, DIRECTORY, COPY, AUTHORIZE, BACKUP, and LINK).
USER	Secure User Environment Option includes the following: Security Utilities Utilities, such as the Access Control List Utility and Security Auditing that help the user to maintain a secure file system. Disk Quota Utility A utility to monitor and control users' consumption of disk space on a per-volume basis. Batch and print queues Queues that allow you to execute command procedures without user interaction and to print files. Input queue symbiont A routine for reading input from a spooled device to an intermediate device. Accounting log report generator A utility that generates accounting reports from records in the accounting log file.

Name	Description
UTIL	Common Utilities Option includes the following: Mail Utility A utility for sending and receiving electronic mail. Search Utility A utility for searching files for specified strings. Differences Utility A utility for comparing files. Dump Utility A utility for displaying the contents of a file in decimal, hexadecimal, or octal format. DIGITAL Standard Runoff A utility for formatting text files. Error Log Utility A utility for examining the error log files created by the operating system. Intermediate VMB Boots MicroVAX I from a disk that is not attached to the first MSCP controller. Phone Utility A utility for interactive communication between users. The MicroVMS HELP library Remote terminal support Allows user to issue the SET HOST/DTE command. Foreign terminal support LAT-11 terminal server support via Ethernet Standalone BACKUP A command procedure for building standalone BACKUP kits on RX50 diskettes, on TK50 tape cartridges, or on a system disk. VAXTPU Text Processing Utility A text-processing utility that includes a compiler, an interpreter, a high-level procedural language, and two editing interfaces.
PROG	Program Development Tools Option includes the following: Debugger Utility A utility for monitoring the execution of user programs to locate suspected errors. Image Dump Analyzer A utility for debugging programs after they exit rather than while they are running.

Name	Description
PROG (Cont.)	ANALYZE/RMS_FILE Command for examining the structure of an RMS file.
	EDIT/FDL Utility A utility for editing FDL files, which are used to define the characteristics of any RMS file.
	FDL Utilities A package of utilities for examining and modifying file characteristics using the File Definition Language.
	Message Utility A utility for creating messages similar to those used by the MicroVMS operating system.
	Object and shareable image libraries The libraries that define system procedures and symbolic names.
	MACRO libraries Libraries that provide macros for the system-defined symbolic names.
	MACRO assembler The program that processes MACRO source files; required for MACRO programming.
	SDL intermediate format of STARLET definitions Used by some programming languages to create symbol definitions in their syntax.
	FORTRAN system definition files A library that provides FORTRAN programs easy access to the system-defined symbolic names.
SYSP	System Programming Option includes the following:
	Files-11 On Disk Structure Access Control Program and EXCHANGE Utilities to create RX50 diskettes for transporting files to PDP-11 operating systems.
	Monitor Utility A utility for examining system performance.
	ANALYZE/IMAGE and ANALYZE/OBJECT Commands for examining the structure of an image or object file.
	Delta debugger A utility for debugging the execution of kernel-mode programs to locate suspected errors.
	System Dump Analyzer Utility A utility for examining crash dumps and debugging kernel-mode code.

Name	Description
SYSP (Cont.)	System symbol table The symbol table for the MicroVMS executive, created when the operating system is linked. Miscellaneous symbol tables Files containing definitions for system structures that are useful in analyzing crash dumps. System map The image map created when the operating system is linked. Connect-to-interrupt driver A driver useful to programmers with real-time devices. DRV11-WA driver A driver (for MicroVAX II only) useful to programmers with real-time devices.

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