PDP–11 C
Installation Guide

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This manual describes the installation and verification procedures for PDP–11 C Version 1.1.

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Preface

This manual describes the procedure for installing and verifying PDP–11 C on the following operating systems: RSX–11M, RSX–11M–PLUS, Micro/RSX, VMS, RSTS/E, and RT–11.

Intended Audience

This manual is intended for the system manager or the privileged user responsible for installing PDP–11 C.

Associated Documents

Other manuals in the PDP–11 C documentation set are as follows:

- *Guide to PDP–11 C*—For programmers who want to learn PDP–11 C, or who want to determine the differences between PDP–11 C and other implementations of the C language.
- *PDP–11 C Run-Time Library Reference Manual*—For programmers who need reference information on the functions and macros in the PDP–11 C Run-Time Library.

Conventions

The following conventions are used in this manual:

Conventions	Meaning
CTRL/*x*	This symbol tells you to press the CTRL (Control) key and hold it down while pressing a letter key.
RETURN	A symbol indicating that you press a key on the keyboard; for example, RETURN indicates that you press the RETURN key, and TAB indicates that you press the TAB key.
. . .	Horizontal ellipsis indicates that you can enter additional parameters, values, or other information.
[ ]	Brackets usually indicate optional syntax. However, brackets that are part of directory names do not indicate optional syntax. In addition, certain MCR directives use brackets as part of their required syntax.
UPPERCASE WORDS	Uppercase words and letters in examples indicate that you type the word or letter exactly as shown.
lowercase words	Lowercase words or letters in examples indicate that you substitute a word or value of your choice.
Color	Color is used to show user input. For online versions, user input is shown in bold.

Chapter 1

Introduction to Installing PDP–11 C

This guide provides information on how to install PDP–11 C on your system. Keep this documentation with your distribution kit, as you may need it to reinstall PDP–11 C.

On RSX–11M, RSX–11M–PLUS, Micro/RSX, RSTS/E, and VMS operating systems, PDP–11 C is installed with an automatic installation procedure. The procedure prompts you for information that you must supply to complete the installation. However, on RT–11 operating systems, PDP–11 C can be installed with a single RT–11 command.

The installation procedures are:

- VMSINSTAL for a VMS operating system
- OPTION for a Micro/RSX operating system
- Auto-Install for RSX–11M, RSX–11M–PLUS, and RSTS/E operating systems

Once you have installed PDP–11 C, you may want to link your programs on a different operating system than you compiled on. To do so necessitates moving certain files from one operating system to another. Refer to Chapter 7 for the locations and descriptions of the files on the different systems.

Chapter 2

Installing PDP–11 C on RSX–11M and RSX–11M–PLUS Operating Systems

This chapter explains how to install PDP–11 C on an RSX–11 operating system. Please note that in this chapter the term *RSX–11* refers to the RSX–11M and RSX–11M–PLUS operating systems.

2.1 Preparing for the Installation

To prepare for the installation, perform the following initial steps:

1. Read the PDP–11 C Release Notes, which describe special features and known problems for this version of PDP–11 C. For information on how to access the Release Notes, see Section 2.1.1.
2. Ensure that the RSX–11 operating system is installed and functioning properly.
3. Ensure that the system meets the minimum software and hardware requirements for PDP–11 C. See the Software Product Description (SPD) in your distribution kit for a list of these requirements.

A PDP–11 C installation requires between 20 and 30 minutes to complete.

The following sections describe how to access the Release Notes and how to prepare the operating system for the installation of PDP–11 C.

2.1.1 Accessing the Release Notes

The PDP–11 C Release Notes describe special features and known problems for this version of PDP–11 C. To copy the Release Notes file from the distribution medium prior to installing PDP–11 C, log in to a privileged account, allocate and mount your distribution device, and enter one of the following commands according to the type of distribution medium in your kit:

DCL:

For Disks:

```
$  BACKUP/NOI/DIR/NEW/IMAGE:RESTORE/SAV:CCCREL.BCK indev: outdev:
```

For Tapes:

```
$  BACKUP/DENS:dens/SAV:CCCREL.BCK/REW/NOI/DIR/NEW indev: outdev:
```

MCR:

For Disks:

```
> BRU/NOI/UFD/NEW/IMAGE:RESTORE/BAC:CCCREL.BCK indev: outdev:
```

For Tapes:

```
> BRU/DENS:dens/BAC:CCCREL.BCK/REW/NOI/UFD/NEW indev: outdev:
```

Replace *indev:* with the name of the device on which your distribution medium is loaded. Replace *outdev:* with the name of the destination device. Replace *dens* with the density value indicated on your distribution medium. See the *RSX–11M/M–PLUS Utilities Manual* for more information on the Backup and Restore Utility (BRU). This command copies the Release Notes to *outdev:*[367,100]CCCREL.DOC. After you enter this command, you can use the PRINT command to print the Release Notes:

DCL:

```
$  PRINT outdev:[367,100]CCCREL.DOC
```

MCR:

```
> PRI = outdev:[367,100]CCCREL.DOC
```

During the installation, Auto-Install copies the Release Notes file from the distribution medium to directory LB:[1,2] on your system disk and names it CCCREL.DOC. If you answer YES to the question during the installation dialogue ‘‘Print the release notes?’’ Auto-Install prints the file for you.

2.1.2 Preparing the Operating System

To prepare the operating system for the installation, perform the following steps:

1. Log in to a privileged account. The installation procedure generates a log file, which will remain in your default login directory after you complete the installation. Therefore, it is not necessary to use a hard-copy terminal to produce a record of your installation session.
2. Verify that no one else on your system is using Auto-Install to perform an installation.
3. Verify that no one else on your system is using a previously installed version of PDP–11 C.
4. If Auto-Install is not already installed on your system, verify that you have 800 free blocks of contiguous storage space available for Auto-Install on the system device (specified by *sysdev* in the installation procedure.) See Section 2.1.3 for instructions on how to install Auto-Install.
5. Verify that 1100 free blocks of contiguous storage space are available on the device on which you install the PDP–11 C task. This location is a customization option (see Section 2.2.2 for further information). On the system device, 2900 free blocks must be available for the remaining PDP–11 C files. On the login device, 8,000 free blocks of storage space must be available during the installation for use as a temporary work area.
6. Place your distribution medium in the drive.

   If your distribution medium is a disk, insert the disk in the drive, and set the switch to the RUN position. Make certain that the READY light is on.

   If your distribution medium is a tape, load the tape according to the instructions for your drive. Set the ONLINE/OFFLINE indicator to ONLINE, and make certain that the READY light is on.

   If your distribution medium is a TK50 tape cartridge, insert the tape into the drive according to the instructions for the drive, and close the cartridge-release handle on the drive. Press the LOAD button, and make certain the LOAD light comes on. For further information on loading devices, see the manual accompanying your hardware.
7. Allocate and mount your distribution device. Disks and tapes must be mounted with the /FOREIGN switch, as follows:

DCL:

```
$  ALLOCATE indev:
$  MOUNT/FOREIGN indev:
```

MCR:

```
> ALLOCATE indev:
> MOUNT/FOREIGN indev:
```

Replace *indev:* with the name of the device on which your distribution medium is loaded. For more information about allocating and mounting devices, see the *RSX–11M/M–PLUS Command Manual* and the *RSX–11M/M–PLUS MCR Operations Manual*.

2.1.3 Installing Auto-Install

Overview of Auto-Install

The Auto-Install command procedure functions as follows:

- Checks the installation files automatically for a new or updated version of Auto-Install. If a new version or update is found, Auto-Install asks if you still want to install it . If you answer YES, Auto-Install displays the commands needed to perform the installation or update. If you answer NO, Auto-Install issues a warning that this could cause installations to fail and reprompts you to perform the installation or update.
- Combines the installation and update procedures for all products. Auto-Install checks the update area and applies any updates to the product's installation files prior to performing the installation. However, PDP–11 C will be updated in the form of point releases, which are installed using the distribution kit.
- Creates the following installation log files in the user's login directory:

  AUTOIN.LOG, which contains the main installation procedure's dialogue

  CCCCCC.LOG, which contains the PDP–11 C portion of the dialogue
- Auto-Install sets your default device and directory to your login device and directory. It then creates a temporary work area in directory [367,100] on your login device and deletes it before the installation completes. If the temporary work area remains after an installation, you may delete it.

- Creates temporary files in the user's login directory and deletes them before the installation completes. If any files remain after an installation, you may delete them. The names of the temporary files are:

CUSTOM.DAT	INSTAL.TMP	CCCCCC.SAV
UPDATE.DAT	AUTUPD.DAT	CCCCCC.TMP
ISTAT.DAT	CCCCCC.CFG	

- Allows Auto-Install installation files to remain on the system after installing them in the system directory [367,367].

  The Auto-Install files are needed to reinstall PDP–11 C and other products and should not be deleted. If you accidentally delete them, you can reinstall Auto-Install from the distribution kit.

  The names and functions of the installation files are:

AUTOIN.CMD	Controls installation processes
CUSTOM.CMD	Controls customization processes
DEFUPD.TSK	Updates the status of the configuration data file
INSTAL.DAT	Lists products installed by Auto-Install
PRODIN.CMD	Installs individual layered products
PRDTBL.DAT	Lists products Auto-Install may support
UPDATE.CMD	Controls the updating of the configuration data file
UPDATE.TSK	Updates the configuration data file

- Handles error messages as follows:
  - Ignores WARNING messages.
  - Aborts the installation of a product if FATAL messages are received during the installation of the product.
  - Aborts Auto-Install if FATAL messages are received during Auto-Install's installation dialogue.
  - Aborts the installation of a product if ERROR messages are received during the installation of the product.
- Uses a configuration data file, which contains the parameters and values used to determine which features of PDP–11 C are supported by default.
- Provides a procedure that assists you in customizing your configuration data file to indicate which PDP–11 C features your compiler uses by default.
- Attempts to restore the system to its prior state if an installation fails.

How To Install Auto-Install

To install Auto-Install, invoke the Backup and Restore Utility. You can do so by using one of the following commands, according to the type of distribution medium in your kit.

DCL:

For Disks:

```
$  BACKUP/DIR/NOI/NEW/IMAGE:RESTORE/SAV:AUT101.A indev: sysdev:
```

For Tapes:

```
$  BACKUP/REW/DIR/NOI/NEW/DENS:dens/SAV:AUT101.A indev: sysdev:
```

MCR:

For Disks:

```
> BRU/UFD/NOI/NEW/IMAGE:RESTORE/BAC:AUT101.A indev: sysdev:
```

For Tapes:

```
> BRU/REW/UFD/NOI/NEW/DENS:dens/BAC:AUT101.A indev: sysdev:
```

Replace *indev:* with the name of the device on which you loaded your distribution medium. Replace *sysdev:* with the name of your system device. Replace *dens* with the density value indicated on your distribution medium. See the *RSX–11M/M–PLUS Utilities Manual* for more information on the Backup and Restore Utility.

2.2 Installing and Verifying That the Installation Is Successful

The next three sections describe how to install PDP–11 C using Auto-Install, step you through the installation questions, and explains the Installation Verification Procedure (IVP).

2.2.1 Invoking Auto-Install

You can invoke Auto-Install with any one of the following commands:

1. @sysdev:[367,367]AUTOIN.CMD
2. @sysdev:[367,367]AUTOIN.CMD CCC
3. @sysdev:[367,367]AUTOIN.CMD indev:CCC

Replace *sysdev:* with the name of your system device. Replace *indev:* with the name of the device on which you loaded your distribution medium.

If you use command 1, the installation dialogue begins with question 1 in the following section. The questions are listed and described in Section 2.2.2.

If you use command 2, the installation dialogue begins with question 2.

If you use command 3, the installation dialogue begins with question 2 and skips to question 4.

2.2.2 Answering Installation Questions

The online installation procedure asks questions about how you want to install PDP–11 C. This section describes these questions and explains their answers. The explanations do not appear in the installation procedure.

The default answer appears in angle brackets (< >) at the end of the question text in the installation procedure. You can accept the default answer by typing it or by pressing RETURN. Press CTRL/Z to exit from Auto-Install at any point in the dialogue.

Depending on how you invoked Auto-Install, you will enter the dialogue at question 1 or question 2.

1. `Which product(s) do you want to install?`

   In response to this question, type the task name for PDP–11 C:

   ```
   CCC
   ```

2. `Where are the update files located <sysdev:>?`

   This Auto-Install question is not applicable to PDP–11 C. Updates to PDP–11 C will be shipped as point releases. Press RETURN to continue the procedure. At this point, you receive two warning messages, which you can ignore. The text of the messages is as follows:

   ```
   WARNING  -  No updates for configuration data file;
               procedure continuing

   WARNING  -  Update file CCC101.DAT not found at
               SY0:[362,200]. Kit files not updated;
               procedure continuing
   ```

3. `Which device are the distribution files for CCC (CCC) located on (include colon)?`

   Specify the drive on which you loaded the distribution disk or tape.

4. `Do you want to customize CCC (CCC) (Y/N) <N>?`

   To answer NO, type N or press RETURN. To answer YES, type Y.

If you answer NO, the procedure asks no further questions and installs PDP–11 C with the customization options corresponding to the default answers to the customization questions.

If you choose to customize, you are asked further questions. You can either press RETURN to accept the default answer; press CTRL/Z once to exit from customization, retain any changes made so far, and continue the procedure; or type a new value. To exit from Auto-Install, press CTRL/Z a second time.

```
Suppress use of I/D space feature even if present <N>?
```

The installation procedure automatically determines if your system supports the instruction and data space (I/D) feature. To answer NO, type N or press RETURN. To answer YES, type Y.

If your system supports the I/D space feature and you answer NO, PDP–11 C can use this feature to provide enhanced compiler performance. The I/D space feature provides tasks with a 64K-byte address space for instructions and a separate 64K-byte address space for data. Without this feature, a single 64K-byte address space is shared by both instructions and data. The enhanced performance is attributable to a lower requirement for overlays and support of the /MEMORY qualifier to the CCC command. (See the *Guide to PDP–11 C* for an explanation of the /MEMORY qualifier.) To use this feature, PDP–11 C requires at least 128K bytes of memory.

If you answer YES, PDP–11 C performs more slowly because of the need for additional overlays; does not support the /MEMORY qualifier; but requires only 64K bytes of memory.

If your system does not support the I/D space feature, this question does not apply to you. Press RETURN to continue the procedure.

NOTE

> The code that PDP–11 C generates is always compatible with, but never requires, the instruction/data space feature. The I/D space option has no effect on PDP–11 C's generation of code.

```
Task directory <[3,54]>?
```

Specify the directory where the compiler task should be placed. If you press RETURN, Auto-Install copies the PDP–11 C task image file the default directory shown. The directory shown in this example is the default directory for RSX–11M–PLUS. The default directory for RSX–11M is [1,54].

```
Target device <LB:>?
```

Specify the device where the compiler task should be placed. If you press RETURN, Auto-Install installs the PDP–11 C compiler on LB:.

```
Print release notes <NO>?
```

If you do not want to print the Release Notes, press RETURN. To print them, type Y.

```
Print log file <NO>?
```

If you do not want to print the log file, press RETURN. To print it, type Y.

```
Do you want to customize CCC again (Y/N) <NO>?
```

If you type Y the customization questions are repeated, and you can change your answers if you wish. If you type N or press RETURN, the procedure continues.

At this point, Auto-Install installs PDP–11 C. Throughout the installation process, Auto-Install displays several informational messages. Following the installation, Auto-Install runs the Installation Verification Procedure (IVP) for PDP–11 C.

Refer to Chapter 7 for descriptions of the files and their locations after installation.

2.2.3 Verifying That the Installation Is Successful

The Installation Verification Procedure (IVP) checks to ensure that the installation has been successful. When the IVP is complete and the installation is successful, the following messages are displayed on your terminal:

```
CCC has passed.
Installation of CCC (CCC) successful.
```

If these messages are not displayed, an error has occurred in your installation. In such a case, verify that your system meets the requisite conditions listed in Section 2.1.2, and retry the installation from the beginning. If it fails again, contact your Digital Customer Services representative. If necessary thereafter, please submit a Software Performance Report (SPR) on one of the forms included in your distribution kit. See Appendix A for further information on reporting problems.

2.3 Invoking PDP–11 C

After installing PDP–11 C, you can invoke it using either the CC command in DCL or the CCC command in MCR.

The installation procedure defines the CC DCL command and the CCC MCR command to invoke PDP–11 C. To redefine the CCC command each time the system is rebooted, enter the following command in your operating system's start-up control file (STARTUP.CMD).

```
@LB:[1,2]PDP11C.INS
```

If you want to compile and link on different systems, refer to Chapter 7.

2.4 Reinstalling

The distribution media is the only means by which PDP–11 C can be reinstalled. For this reason, it is wise to keep either the distribution medium or a copy in a safe place.

Chapter 3

Installing PDP–11 C on a Micro/RSX System

This chapter explains how to install PDP–11 C on the Micro/RSX operating system.

3.1 Preparing for the Installation

To prepare for the installation, perform the following initial steps:

1. Read the PDP–11 C Release Notes, which describe special features and known problems for this version of PDP–11 C. For information on how to access the Release Notes, see Section 3.1.1.
2. Ensure that the Micro/RSX operating system is installed and functioning properly.
3. Ensure that the system meets the minimum software and hardware requirements for PDP–11 C. See the Software Product Description (SPD) in your distribution kit for a list of these requirements.

The following sections describe how to access the Release Notes and how to prepare the operating system for the installation of PDP–11 C.

3.1.1 Accessing the Release Notes

The PDP–11 C Release Notes describe special features and known problems for this version of PDP–11 C. The Release Notes are included on your distribution kit in the file [1,2]CCCREL.DOC. This file is copied to LB:[1,2] during the installation procedure. Hence, you can access this documentation by printing the file after completing the installation. You can also access the Release Notes prior to installing this version of PDP–11 C. To do so, perform the following steps:

1. Log in to a privileged account.
2. Insert your diskette or tape cartridge into the drive. If your software is on diskettes, insert the diskette labeled PDP11CREL into the drive.
3. Mount the diskette or tape cartridge. Enter the following command line, in which *ddnn:* represents the name and number of the tape or diskette drive you are using:

   ```
   $ MOUNT/FOREIGN ddnn:
   ```

4. Copy the Release Notes to the [1,2] directory.
   - If your software is on diskettes, enter the following command line, in which *ddnn:* represents the name and number of the diskette drive and *ssnn:* represents the name and number of your system disk drive:

     ```
     $ BACKUP/SAVE_SET:PDP11CREL/NOINI/IM:RES/NEW_VERSION ddnn: ssnn:
     ```

     The following message appears on the terminal:

     ```
     BAC -- Mount Disk 1 on DUx: Press "RETURN" when done
     ```

     You must press RETURN to begin the copy procedure.
   - If you are using TK50 cartridge tape, enter the following command line, in which *mmnn:* represents the name and number of the tape cartridge drive and *ssnn:* represents the name and number of your system disk drive:

     ```
     $ BACKUP/SAVE_SET:PDP11CREL/NOINI/NEW_VERSION/REWIND mmnn: ssnn:
     ```

Once you have copied the release notes file to the directory, you can use the PRINT command to print it.

3.1.2 Preparing the Operating System

Micro/RSX PDP–11 C is distributed on 11 RX50 diskettes or 1 TK50 tape cartridge. The media contains the PDP–11 C compiler and other files necessary for PDP–11 C program development. To install the software correctly, you must be familiar with the Micro/PDP–11 hardware and the Micro/RSX software.

If you need more information on using Micro/RSX, consult the *Micro/PDP–11 Base Kit Installation Guide* and the *Micro/RSX User's Guide*.

The PDP–11 C installation requires approximately 30 minutes to complete. If you should make a mistake, instructions on correcting the error will be displayed on your terminal screen. To avoid damaging the hardware and software, observe the following precautions:

1. Open a TK50 drive door only if the green READY light on the drive is on and the red light on the LOAD button is off. Do not open the drive door while either light is flashing.
2. Do not turn the power off when the drives are in use.
3. Do not press the RESTART button on the Micro/PDP–11 during the installation procedure.
4. Do not attempt to modify the contents of the distribution tape or diskettes.
5. Store the distribution tape cartridge or diskettes in a safe place when you have completed the installation, as you made need to reuse them.

   For more information on loading the media, consult the *Micro/RSX Installation Guide for Tape* or the *Micro/RSX Installation Guide for Diskettes*.

3.2 Installing and Verifying That the Installation Is Successful

PDP–11 C is installed by means of an automatic installation procedure. The procedure asks you for the information it requires to perform the installation, instructs you to press RETURN after entering your answer, and informs you when each step is successfully completed.

The next two sections describe the following:

- How to install PDP–11 C from diskettes (see Section 3.2.1) and verify that the installation was successful.
- How to install PDP–11 C from a tape cartridge (see Section 3.2.2) and verify that the installation was seccessful.

3.2.1 Installing from Diskettes

The 11 diskettes on which you receive PDP–11 C are labeled:

PDP11CINS 1/1
PDP11CREL 1/1
PDP11CID 1/2
PDP11CID 2/2
PDP11CNID 1/2

PDP11CNID 2/2
PDP11C 1/5
PDP11C 2/5
PDP11C 3/5
PDP11C 4/5
PDP11C 5/5

To install PDP–11 C, perform the following steps:

1. Log in to a privileged account. You can use any terminal available on your system. If you are unfamiliar with logging in, consult the *Micro/RSX User's Guide*.
2. Type the following command:

   ```
   $  @OPTION
   ```

   The menu and question that follow appear on your terminal:

   ```
   You can use this procedure to:

   I --- Install a new software option
   R --- Remove an installed software option
   C --- Customize an installed software option
   V --- Verify the operation of an installed software option
   L --- List all installed software options
   S --- Stop and exit

   Which do you want to do?
   ```

3. Type L and press RETURN.

   A list of the optional products installed on your system appears on your terminal. If this version or an earlier version of PDP–11 C is installed, you must remove it before performing this installation. Press RETURN to redisplay the menu.

4. If you need to remove a previous installation of PDP–11 C or an optional product, type R and press RETURN. Otherwise, go to the next step.

   If you typed R, the system asks for the name of the product you want to remove. Type the product name and press RETURN.

   Once the option is removed, the command line interpreter (CLI) prompt reappears. Type the @OPTION command again to display the menu.

5. Type I and press RETURN to invoke the installation procedure. At this point, the system asks if your distribution medium is a diskette or a tape cartridge:

   ```
   If you have a diskette kit, type D, then press the RETURN key.

   If you have a tape cartridge kit, type T, then press the RETURN key.

   What type of kit do you have?
   ```

Type D and press RETURN. The procedure then prompts you to load the first diskette.

6. Insert the diskette labeled PDP11CINS into the drive as instructed, and press RETURN.

   After the procedure has read the first diskette, it asks you to remove it. Insert the diskette labeled PDP11CREL, and press RETURN.

7. The next set of two diskettes that you need to copy are the diskettes labeled PDP11CID or PDP11CNID.

   - If your system supports the I/D space feature, you will not use the two diskettes labeled PDP11CNID.
   - If your system does not support the I/D space feature, you will not use the two diskettes labeled PDP11CID.

   For each diskette, the procedure prompts you with the following message:

   ```
   BAC -- Mount Disk 1 in DUx:  .  Press "RETURN" when done
   ```

   Mount the diskette into the appropriate drive and press RETURN to begin the copy. After the diskette is copied, the procedure displays this message:

   ```
   BAC -- End of Disk 1 on DUx:
   ```

   Remove the diskette, insert the next one, and press RETURN.

8. The final set of five diskettes are labeled PDP11C. The procedure repeats the request to mount a diskette until all five of the PDP11C diskettes have been copied (refer to previous step).

9. Once you have copied all the diskettes, the system prompts you to press RETURN.

   After PDP–11 C is installed, the procedure runs the Installation Verification Procedure (IVP) to ensure that the software is properly installed. The IVP ends with the following message:

   ```
   Verifying operation of PDP-11 C

   Verifying presence of PDP-11 C product files

   CCC has passed
   ```

10. Upon successful completion of the IVP, the system prompts you to press RETURN. The following message then appears on your screen:

    ```
    End of Micro/RSX optional software installation procedure
    Procedure successfully completed.
    ```

The installation procedure copies files from the PDP–11 C software diskettes to the fixed disk. These files are necessary for the proper functioning of the PDP–11 C compiler and should not be deleted. Chapter 7 lists the files, their functions, and the directories in which they are located.

3.2.2 Installing from a TK50 Tape Cartridge

Your PDP–11 C software consists of one TK50 tape cartridge. To install the software, perform the following steps:

1. Log in to a privileged account. You can use any terminal available on your system. If you are unfamiliar with logging in, consult the *Micro/RSX User's Guide*.
2. Type the following command:

   ```
   $  @OPTION
   ```

   The following menu and question appear on your terminal:

   ```
   You can use this procedure to:

   I --- Install a new software option
   R --- Remove an installed software option
   C --- Customize an installed software option
   V --- Verify the operation of an installed software option
   L --- List all installed software options
   S --- Stop and exit

   Which do you want to do?
   ```

3. Type L and press RETURN.

   A list of the optional products installed on your system appears on your terminal. If this version or an earlier version of PDP–11 C is installed, you must remove it before performing this installation. Press RETURN to redisplay the menu.

4. If you need to remove a previous installation of PDP–11 C or an optional product, type R and press RETURN. Otherwise, go to the next step.

   If you typed R, the system asks for the name of the product you want to remove. Type the product name and press RETURN.

   Once the option is removed, the command line interpreter (CLI) prompt reappears. Type the @OPTION command again to display the menu.

5. Type I and press RETURN to invoke the installation procedure. At this point, the system asks if your distribution medium is a diskette or a tape cartridge:

```
If you have a diskette kit, type D, then press the RETURN key.

If you have a tape cartridge kit, type T, then press the
RETURN key.

What type of kit do you have?
```

Type T and press RETURN. The procedure then prompts you to load the tape cartridge.

6. Insert the tape cartridge into the drive as instructed and push the WRITE-PROTECT switch on the cartridge to the left. An orange panel appears when the WRITE-PROTECT switch is in the on position. Push down the cartridge-release handle and press the LOAD button. Check to ensure that the green READY light and the red light on the LOAD button are on. Then press RETURN.

   Once you have loaded the tape cartridge, the system displays a message indicating that it is reading the tape. After the system has read the tape and installed PDP–11 C, it runs the Installation Verification Procedure (IVP) to ensure that the software is properly installed. The IVP ends with the following message:

```
Verifying operation of PDP-11 C

Verifying presence of PDP-11 C product files

CCC has passed
```

   Upon successful completion of the installation, the procedure asks you to unload the tape cartridge and to press RETURN. After you have done so, the following message:

```
Procedure successfully completed.
```

7. When the green light stops blinking and the red light goes off, press the LOAD button to the out (unload) position. The red light comes on and the green light goes off while the tape cartridge is unloading. When the tape cartridge is completely unloaded, the red light goes off and the green light comes on. At this point, lift the cartridge-release handle and remove the tape cartridge from the drive. Note that the green indicator light remains on after the cartridge has been removed from the drive.

During the installation procedure, files are copied from the PDP–11 C tape cartridge to the fixed disk. These files are necessary for the proper functioning of the PDP–11 C compiler and should not be deleted. Chapter 7 lists the file names, their functions, and the directories in which they reside.

3.2.3 Error Conditions

During the installation, an error can occur if one or more of the following conditions exist:

- The Micro/RSX operating system version is incorrect.
- Quotas necessary for successful installation are insufficient (see the Software Product Description (SPD) in your distribution kit for a list of these quota requirements.
- You are not logged into a privileged account.
- You have not removed a previous installation of PDP–11 C.
- You have not inserted the PDP–11 C diskettes in the order requested by the installation procedure. Please, make sure that you insert the diskettes in the correct order.
- You have not read the PDP–11 C Release Notes which may provide additional restrictions for your type of hardware.

For a description of additional error messages generated by the installation procedure, see the *Correcting Possible Errors* section found in the appendicies of the *Micro/RSX Guide to Advanced Programming*.

If you are notified that any of these conditions exist, you should take the appropriate action as described in the message. You may need to increase your quotas, or log into a privileged account.

If the installation fails, you must restart the installation procedure. If the installation fails because of an IVP failure, contact a Digital Customer Services representative. See Appendix A for further information on reporting problems.

3.3 Invoking PDP–11 C

After installing, you can invoke PDP–11 C with the CC command in DCL.

If you want to compile and link on different systems, refer to Chapter 7.

3.4 Reinstalling

The distribution media is the only means by which PDP–11 C can be reinstalled. For this reason, it is wise to keep either the distribution medium or a copy in a safe place.

3.5 Differences Between PDP–11 C on Micro/RSX and PDP–11 C on Other RSX Systems

Micro/RSX PDP–11 C is a modified version of the RSX–11M/M–PLUS PDP–11 C compiler and the run-time system libraries. Therefore, you can consult the PDP–11 C RSX–11M/M–PLUS documentation supplied with your software package for information on using Micro/RSX PDP–11 C. Any differences between RSX–11M/M–PLUS PDP–11 C and Micro/RSX PDP–11 C are documented in the *Guide to PDP–11 C*.

Chapter 4

Installing PDP–11 C on a VMS Operating System

Your bill of materials (BOM) and indented bills report (BIL) specify the number and contents of your media. It is wise to check the contents of your kit against this information. If your kit is damaged, or if you find that parts of it are missing, contact your Digital Customer Services representative.

Digital recommends that you read the letter entitled *Read Before Installing or Using PDP–11 C*, in order to be aware of last-minute changes to the installation procedure that may not be covered in this guide.

The installation procedure is described step-by-step and is, for the most part, self-explanatory. It prompts you to answer questions and to change volumes, and it waits for you to tell it to continue. Default answers to questions appear in brackets ([]) throughout the installation procedure.

Distribution media must be loaded in numerical order. The installation procedure prompts you to load the volumes. For more information on how to load distribution media, see the manual that accompanied your hardware.

The installation requires approximately 25 to 35 minutes to complete, depending on the type of media you purchased and your system configuration.

4.1 Preparing for the Installation

Before you begin the installation procedure, you must ensure that your system meets certain requirements. The following sections discuss these requirements.

4.1.1 VMS Tailoring Classes

For VMS systems, the following VMS tailoring classes are required to enable the product to function at full capacity:

- VMS required save set
- Utilities

For more information on VMS tailoring classes, consult the latest VMS Operating System Software Product Description (SPD 25.01).

4.1.2 VMS License Management Facility

Before installing PDP–11 C on VMS, you must register your PDP–11 C software license. During the installation, you are asked if you have registered the PDP–11 C license and loaded the appropriate authorization key. The license registration information you need is contained in the Product Authorization Key (PAK) that is shipped with PDP–11 C. The PAK is a paper certificate that contains information about the license you have to run a particular piece of software.

To register a license, first log in to the system manager's account, SYSTEM. You have a choice of two ways to perform the registration, as follows:

- Invoke the SYS$UPDATE:VMSLICENSE.COM procedure. When it prompts you for information, respond with data from your PAK.
- Enter the LICENSE REGISTER command with the appropriate qualifiers that correspond to information on the PAK.

For complete information on using LMF, see the *VMS License Management Utility Manual*.

4.1.3 Privileges and Resources

Before installing PDP–11 C, your account must have the following privileges and resources:

- SETPRV, or CMKRNL, WORLD, and SYSPRV privileges
- At least 6500 blocks of free disk space during the PDP–11 C installation; of these, 3500 blocks remain in use after the installation is complete
- At least 512K bytes of physical memory

- At least 400 free global pages plus the size (in number of disk blocks) of the file SYS$LIBRARY:DCLTABLES.EXE at installation
- At least 2 free global sections at installation

To use the Installation Verification Procedure (IVP) as part of the installation, ensure that your account also has the privileges and resources listed in Section 4.1.4. For more information on the IVP, see Step 7 in Section 4.2.2.

NOTE

You must ensure that your system has the necessary global page and global section SYSGEN quotas for the installation. Failure to do so could cause the DCL tables to be corrupted in some situations.

To determine the number of available global pages on your system, invoke the VMS Install Utility by typing the following commands:

```
$  INSTALL :== $INSTALL/COMMAND_MODE  RETURN
$  INSTALL  RETURN

INSTALL>  LIST/GLOBAL/SUMMARY  RETURN

        Summary of Local Memory Global Sections

309 Global Sections Used,  28866/13134 Global Pages Used/Unused

INSTALL>  EXIT  RETURN
```

When you enter these commands, the system displays a summary of the number of global sections used, the number of global pages used, and the number of global pages unused. To exit from the VMS Install Utility, type the EXIT command.

PDP–11 C requires approximately 400 contiguous global pages. If sufficient pages are not available, you can delete an existing known image with the VMS Install Utility, or you can increase the GBLPAGES system parameter with the VMS System Generation Utility (SYSGEN) by editing the file SYS$SYSTEM:MODPARAMS.DAT and then invoking the AUTOGEN command procedure, SYS$UPDATE:AUTOGEN.COM. For more information on the AUTOGEN command procedure, see your processor-specific installation /operations guide.

You can determine the number of available global sections by invoking SYSGEN as follows:

```
$  RUN SYS$SYSTEM:SYSGEN RETURN
SYSGEN>  USE CURRENT RETURN
SYSGEN>  SHOW GBLSECTIONS RETURN

    Parameter Name     Current   Default   Minimum   Maximum Unit  Dynamic
    --------------     -------   -------   -------   ------- ----  -------
    GBLSECTIONS            550       250        20      4095 Sections

SYSGEN>  EXIT RETURN
```

The last number displayed is the maximum number of global sections. Compare this number to the number of global sections in use as displayed by the VMS Install Utility. PDP–11 C requires 2 global sections. Therefore, if the number of global sections used plus 2 exceeds the maximum number of global sections, you must increase the number of available global sections before you can install PDP–11 C. To increase the number, you must increase the GBLSECTIONS system parameter with SYSGEN by editing the file SYS$SYSTEM:MODPARAMS.DAT and then invoking the SYS$UPDATE:AUTOGEN.COM procedure. For more information on the AUTOGEN.COM procedure, see your processor-specific installation /operations guide.

If the number of global sections used plus 2 is less than the maximum number of global sections, you can exit from SYSGEN and continue.

4.1.4 User Account Quotas and Privileges

To use PDP–11 C and the IVP during the installation, ensure that each account has TMPMBX and NETMBX privileges and the following resources:

- AST limit (ASTLM) 20 (minimum)
- Buffered I/O quota (BIOLM) 20 (minimum)
- Buffered I/O byte count quota (BYTLM) 20480 (minimum)
- Direct I/O quota (DIOLM) 12 (minimum)
- Enqueue quota (ENQLM) 20 (minimum)
- Open file limit (FILLM) 16 (minimum)
- Paging file quota (PGFLQUOTA) 1500 pages (minimum)
- Subprocess creation quota (PRCLM) by user requirement (minimum)
- Working set size (WSDEF) 300 pages (minimum); 500 to 700 pages (optimum)

Use the VMS Authorize Utility (AUTHORIZE) to compare the current values of these quotas with the requirements for PDP–11 C. For example, the account used in the following example is the SYSTEM account:

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

Username: SYSTEM                          Owner:  System Manager
Account:  SYSTEM                          UIC:    [1,6] ([SYSTEM])
CLI:      DCL                             Tables: DCLTABLES
Default:  SYS$SYSROOT:[SYSMGR]
LGICMD:   SYS$COMMON:[SYSMGR]SYLOGIN
Login Flags:
Primary days:   Mon Tue Wed Thu Fri
Secondary days:                    Sat Sun
No access restrictions
Expiration:            (none)    Pwdminimum: 12   Login Fails:    0
Pwdlifetime:         60 00:00    Pwdchange:  16-OCT-1990 15:53
Last Login: 10-NOV-1990 13:56 (interactive), 10-NOV-1990 02:24 (non-interactive)
Maxjobs:         0  Fillm:        60  Bytlm:        20480
Maxacctjobs:     0  Shrfillm:      0  Pbytlm:           0
Maxdetach:       0  BIOlm:        20  JTquota:       8192
Prclm:          10  DIOlm:        20  WSdef:          512
Prio:            4  ASTlm:        30  WSquo:         1280
Queprio:         0  TQElm:        20  WSextent:     65500
CPU:        (none)  Enqlm:       200  Pgflquo:      25000
Authorized Privileges:
  CMKRNL CMEXEC SYSNAM GRPNAM ALLSPOOL DETACH DIAGNOSE LOG_IO
  GROUP ACNT PRMCEB PRMMBX PSWAPM ALTPRI SETPRV TMPMBX WORLD
  OPER EXQUOTA NETMBX VOLPRO PHY_IO BUGCHK PRMGBL SYSGBL MOUNT
  PFNMAP SHMEM SYSPRV BYPASS SYSLCK SHARE GRPPRV READALL
  SECURITY
Default Privileges:
  CMKRNL CMEXEC SYSNAM GRPNAM ALLSPOOL DETACH DIAGNOSE LOG_IO
  GROUP ACNT PRMCEB PRMMBX PSWAPM ALTPRI SETPRV TMPMBX WORLD
  OPER EXQUOTA NETMBX VOLPRO PHY_IO BUGCHK PRMGBL SYSGBL MOUNT
  PFNMAP SHMEM SYSPRV BYPASS SYSLCK SHARE GRPPRV READALL
  SECURITY
```

To change the values of these quotas, use the VMS Authorize Utility's MODIFY command. For more information, see the *VMS Authorize Utility Reference Manual*.

4.2 Installing and Verifying That the Installation Is Successful

The next four sections describe how to install PDP–11 C using VMSINSTAL, step you through the installation questions, explains the Installation Verification Procedure (IVP), and describes possible error messages that might result.

4.2.1 Invoking VMSINSTAL

After you log in to a privileged account to install PDP–11 C, invoke VMSINSTAL, the command procedure that installs this product. An example of this procedure is shown in steps 1 and 2 of Section 4.2.2.

To invoke VMSINSTAL, use the following command:

```
$ @SYS$UPDATE:VMSINSTAL PDP11C011 ddcu: [OPTIONS N]
```

Replace *ddcu:* with the name of the device on which the distribution volume will be mounted for the PDP–11 C installation media, where *dd* is the device code, *c* is the controller code, and *u* is the unit number. It is not necessary to use the console drive to install PDP–11 C. If you do use it, you should replace any media you removed from the drive when you are done installing PDP–11 C.

OPTIONS N is an optional parameter you should provide if you want to be prompted to display or print the release notes. VMSINSTAL permits the use of several other options. For more information on the other options, see your processor-specific installation/operations guide.

When you invoke VMSINSTAL, it checks your system to obtain the following information:

- The type of account you logged in to. Digital recommends that you install software from the system manager's account with your default device and directory set to SYS$UPDATE.
- The process quotas for installation. VMSINSTAL checks for the following minimum quotas:

  ASTLM = 24
  BIOLM = 18
  BYTLM = 18000
  DIOLM = 18
  ENQLM = 30
  FILLM = 20

- The status of DECnet. VMSINSTAL determines whether DECnet is installed and running.
- User activity. VMSINSTAL determines whether users are logged in to the system.

If VMSINSTAL detects that DECnet is installed and running or that users are logged in to the system, it asks whether you want to continue the installation. To continue, type YES. To stop the installation, press RETURN.

4.2.2 Answering the Installation Questions

This section contains excerpts from the installation procedure and explains each step. Default answers to questions appear in brackets throughout the procedure.

To abort the installation procedure at any time, press CTRL/Y. When you press CTRL/Y, the installation procedure deletes the files it has created up to that point and then returns you to DCL level. To retry the installation after pressing CTRL/Y, proceed from step 2.

Step 1: Log in to a privileged account and set your default device and directory to SYS$UPDATE.

```
RETURN
Username:  SYSTEM  RETURN
Password:          RETURN
$  SET DEFAULT SYS$UPDATE  RETURN
```

Step 2: Invoke VMSINSTAL.

```
$  @SYS$UPDATE:VMSINSTAL PDP11C011 ddcu: OPTIONS N  RETURN

      VAX/VMS Software Product Installation Procedure V5.3


It is 11-OCT-1990 at 17:00.
Enter a question mark (?) at any time for help.

* Are you satisfied with the backup of your system disk [YES]?
RETURN
* Where will the distribution volumes be mounted?  ddnn:  RETURN
```

Step 3: Insert the first installation kit volume.

```
Please mount the first volume of the set on CSA1:.
* Are you ready?  YES  RETURN
The following products will be processed:

  PDP11C V1.1


    Beginning installation of PDP11C V1.1 at 17:03

%VMSINSTAL-I-RESTORE, Restoring product saveset A...
```

To continue the installation and mount volume 1, type YES, and press RETURN.

Step 4: Insert the subsequent installation kit volumes.

```
%BACKUP-I-READYREAD, mount volume 2 on _CSA1: for reading

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

VMSINSTAL prompts you to insert the next volume and waits for you to type YES after inserting it. If you type NO, VMSINSTAL displays the prompt again. This prompt is displayed only if your installation kit contains more than one volume.

Step 5: Select a release notes option.

This step applies only if you specified OPTIONS N in step 2.

```
Release Notes Options:

    1. Display release notes
    2. Print release notes
    3. Both 1 and 2
    4. None of the above


* Select option [2]:  RETURN
```

If you select option 1, VMSINSTAL displays the PDP–11 C Release Notes online immediately. You can terminate the display at any time by pressing CTRL/C. After you view them, VMSINSTAL copies the Release Notes to SYS$HELP.

If you select option 2, VMSINSTAL prompts you for a queue name. Either type a queue name or press RETURN to send the file to the default printer. After you print them, VMSINSTAL copies the Release Notes to SYS$HELP.

```
* Queue name [SYS$PRINT]:  RETURN
```

If you select option 3, VMSINSTAL displays the PDP–11 C Release Notes online immediately. You can terminate the display at any time by pressing CTRL/C. VMSINSTAL then prompts you for a queue name. Either type a queue name or press RETURN to send the file to the default print device. The PDP–11 C Release Notes are then copied to SYS$HELP.

If you select option 4, VMSINSTAL does not display or print the Release Notes. However, VMSINSTAL copies the Release Notes to SYS$HELP.

Next, VMSINSTAL displays the following prompt:

```
* Do you want to continue the installation [N]?:  Y RETURN

%VMSINSTAL-I-RELMOVED, The product's release notes have been successfully
    moved to SYS$HELP.
        PDP-11 C V1.1-001 Installation is commencing ...
```

To continue the installation, type YES and press RETURN. If you type NO or press RETURN, VMSINSTAL discontinues the installation.

Step 6: Respond to License Registration Queries.

PDP–11 C supports the VMS License Management Facility (LMF). The installation procedure displays license information about your product and then asks if you have registered and loaded your product authorization key (PAK) for PDP–11 C. The following is an example of such information:

```
Product:       PDP-11 C
Producer:      DEC
Version:       1.1
Release Date:  09-NOV-1990

* Does this product have an authorization key registered and loaded?
```

If you have registered and loaded your PAK, answer YES. If you have not registered and loaded your PAK, answer NO. The installation procedure stops if you have not registered and loaded your PAK before beginning the installation. See Section 4.1.2 for information on registering and loading the PAK. After the PAK is registered and loaded, it is necessary to restart the installation at Step 2.

Step 7: Select installation options.

Your distribution kit contains the Installation Verification Procedure (IVP), which checks to ensure that the PDP–11 C compiler has been installed correctly. After the installation, the IVP has the following file specification: SYS$COMMON:[SYSTEST]PDP11C$IVP.COM. You can invoke it at any time to reverify that PDP–11 C is installed and working properly.

```
* Do you want to run the IVP after the installation [YES]?  RETURN
```

To run the IVP after the installation, press RETURN. If you do not want to run the IVP, type NO.

```
* Do you want to purge files replaced by this installation [YES]?  RETURN
```

The directories LB:[1,1], SYS$HELP, SYS$MESSAGE, SYS$LIBRARY, and SYS$SYSTEM may contain previous versions of PDP–11 C files. These files are replaced during the installation with new files, but the old files are not automatically purged. Purging is recommended. In response to the purging prompt, press RETURN to purge the files or type NO to keep them.

Step 8: Read informational messages.

The PDP–11 C installation procedure produces a number of informational messages that report on the progress of the installation.

The success of the installation is indicated by the following message:

```
%VMSINSTAL-I-MOVEFILES, files will now be moved to their target
directories...
```

If the installation procedure is successful, the new or modified files are moved to their target directories.

Step 9: Observe the Installation Verification Procedure.

If you chose to run the IVP in step 7, VMSINSTAL now calls the IVP to verify that PDP–11 C was successfully installed.

```
   Start of PDP-11 C Installation Verification Procedure

Checking compiler and supplied header and C files.

Checking for the presence of PDP-11 C RTL files.


        PDP-11 C Installation Verification Passed
           Installation of PDP11C V1.1 completed at 15:02

        VMSINSTAL procedure done at 15:02
```

Step 10: End the installation procedure.

```
   Installation of PDP-11 C 1.1 completed at 17:32

   VMSINSTAL procedure done at 17:33

$  LOGOUT  RETURN
SYSTEM     logged out at 11-NOV-1990 17:34:00.00
```

After the installation, your system manager must add the following line to your system start-up file: @SYS$STARTUP:PDP11C$STARTUP.COM. This ensures that the logicals LB: and SY: are defined at system start-up.

When the product installation procedure is complete, you can choose to install more products or to log out (as shown here). If you removed any media from the console drive before beginning the installation, you should replace it now.

VMSINSTAL deletes or changes entries in the process symbol tables during the installation. Therefore, if you are going to continue using the system manager's account and you want to restore these symbols, you should log out and log in again.

Refer to Chapter 7 for descriptions of the files and their locations after installation.

4.2.3 Verifying That the Installation Is Successful

The Installation Verification Procedure (IVP) is usually run at the end of the installation procedure. If system problems occur and you want to run the IVP separately to verify the integrity of installed files, execute the following command procedure:

```
$  @SYS$COMMON:[SYSTEST]PDP11C$IVP.COM   RETURN
```

If the IVP is successful, the following message is displayed:

```
   Start of PDP-11 C Installation Verification Procedure

Checking compiler and supplied header and C files.

Checking for the presence of PDP-11 C RTL files.

        PDP-11 C Installation Verification Passed
           Installation of PDP11C V1.1 completed at 15:02

        VMSINSTAL procedure done at 15:02
```

4.2.4 Error Conditions

During the installation, an error can occur if one or more of the following conditions exist:

- The operating system version is incorrect.
- Quotas necessary for successful installation are insufficient (see Section 4.1.3 and Section 4.1.4).
- Process quotas required by VMSINSTAL are incorrect (see Section 4.2.1).
- The VMS HELP library is currently in use.
- The PAK for PDP–11 C was not registered, was registered incorrectly, or was unloaded.

For descriptions of the error messages generated by these conditions, see the *VMS Error Messages and Recovery Procedures Reference Manual*, your processor-specific installation/operations guide, or the *VMS License Management Utility Manual*.

If you are notified that any of these conditions exist, you should take the appropriate action as described in the message. You may need to change a system parameter or increase an authorized quota value.

If the installation fails, you must restart the installation procedure from step 2. If the installation fails because of an IVP failure, contact a Digital Customer Services representative. See Appendix A for further information on reporting problems.

4.3 Invoking PDP–11 C

To invoke PDP–11 C, the user types the DCL command PDPCC. The installation procedure modifies the DCL command table so that the PDPCC command is recognized and processed. However, the previous command table is still in effect for those users who are currently logged in. All logged-in users who want to use the PDPCC command for the newly installed product must log out of the system and log in again.

If you want to compile and link on different systems, refer to Chapter 7.

4.4 After Installing

There are two other ways that you can install PDP–11 C besides the way described in Section 4.2. You can install PDP–11 C:

- on a VAXcluster
- as a shared image

The next sections describe these alternative installations.

4.4.1 Installing PDP–11 C on a VAXcluster

To run PDP–11 C on multiple nodes of a VAXcluster, first check to see that you have the appropriate software license. Then perform the following steps after installing PDP–11 C:

1. Enter the LICENSE LOAD command (as described in the *VMS License Management Utility Manual*) to activate the license on each node in the cluster on which PDP–11 C is to be executed.
2. To use the product on other nodes in the VAXcluster, you must replace the version of the DCL tables that is installed on the other nodes in the cluster. To do this, perform the following steps:
   a. Log in to a node on the cluster.

b. Invoke the VMS Install Utility and replace the tables with the following commands:

```
$  RUN SYS$SYSTEM:INSTALL   RETURN

INSTALL>  REPLACE SYS$LIBRARY:DCLTABLES.EXE   RETURN
INSTALL>  EXIT  RETURN
```

c. Repeat steps 2a and 2b for each node of the cluster.

3. To ensure that the logical LB: is defined on all nodes on the cluster, use the following command on all nodes in the cluster to invoke the PDP–11 C start-up command file:

```
$  @SYS$STARTUP:PDP11C$STARTUP.COM
```

4.4.2 Installing PDP–11 C as a Shared Image

If PDP–11 C will be used extensively on your system, you can reduce system overhead and memory requirements by installing it as a shared image. If you want to perform the installation on a system that is currently running, use the VMS Install Utility while you are logged in to a privileged account. If errors occur, see the *VMS System Messages and Recovery Procedures Reference Manual*.

1. Determine the number of available global pages and global sections on your system. See Section 4.1.3 for information on how to do this.
2. Invoke the VMS Install Utility and install PDP–11 C as a shared image, as follows:

```
$  RUN SYS$SYSTEM:INSTALL   RETURN

INSTALL>  ADD SYS$SYSTEM:PDP11C$COMPILER.EXE/OPEN/SHARED  RETURN
INSTALL>  EXIT  RETURN
```

3. Update the system start-up file to install PDP–11 C.

   To ensure that PDP–11 C is installed as a shared image each time the system is bootstrapped, include the following lines in the site-specific start-up file SYS$MANAGER:SYSTARTUP_V5.COM:

```
$ INSTALL :== $INSTALL/COMMAND_MODE
$ INSTALL
ADD SYS$SYSTEM:PDP11C$COMPILER.EXE/OPEN/SHARED
```

4.5 Sample Installation

This section contains a sample installation of PDP–11 C. Note that this is only a sample. For information on changes in the installation that may cause the procedure to vary from this sample, read the *Read Before Installing or Using PDP–11 C* letter.

Sample PDP–11 C Installation:

```
  Welcome to VAX/VMS V5.3

Username: SYSTEM
Password:
        Welcome to VAX/VMS version V5.3 on node ELEVEN

$ @SYS$UPDATE:VMSINSTAL PDP11C011 MU1: OPTIONS N [RETURN]

       VAX/VMS Software Product Installation Procedure V5.3

It is 9-JUL-1991 at 14:53.

Enter a question mark (?) at any time for help.

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

The following products will be processed:
  PDP11C V1.1

Beginning installation of PDP11C V1.1 at 14:53

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

    Release notes included with this kit are always copied to SYS$HELP.

    Additional Release Notes Options:

        1.  Display release notes
        2.  Print release notes
        3.  Both 1 and 2
        4.  None of the above

* Select option [2]: 4 [RETURN]
* Do you want to continue the installation [NO]? Y [RETURN]
%VMSINSTAL-I-RELMOVED , The product's release notes have been successfully moved
to SYS$HELP.

       Product:      PDP11C
       Producer:     DEC
       Version:      1.1
       Release Date: 09-NOV-1990

* Does this product have an authorization key registered and loaded? Y [RETURN]
* Do you want to run the IVP after the installation [YES]? [RETURN]
* Do you want to purge files replaced by this installation [YES]? [RETURN]
%VMSINSTAL-I-SYSDIR, This product creates system disk directory
VMI$ROOT:[SYSTEST.PDP11C$IVP].
%VMSINSTAL-I-SYSDIR, This product creates system disk directory VMI$ROOT:[1,1].

******************************************************************************
```

```
        If this installation is being done on a cluster, you must
        do @SYS$STARTUP:PDP11C$STARTUP.COM on all other nodes.  In
        addition, be sure to have your system manager add
        @SYS$STARTUP:PDP11C$STARTUP.COM to your system startup file.
******************************************************************************

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...

Start of PDP-11 C Installation Verification Procedure

Checking compiler and supplied header and C files.

Checking for the presence of PDP-11 C RTL files.


     PDP-11 C Installation Verification Passed
        Installation of PDP11C V1.1 completed at 15:02

        VMSINSTAL procedure done at 15:02
```

4.6 Reinstalling

The distribution media is the only means by which PDP–11 C can be reinstalled. For this reason, it is wise to keep either the distribution medium or a copy in a safe place.

Chapter 5

Installing PDP–11 C on a RSTS/E Operating System

This chapter explains how to install PDP–11 C on the RSTS/E operating system.

5.1 Preparing for the Installation

To prepare for the installation, perform the following steps:

1. Read the PDP–11 C Release Notes, which describe special features and known problems for this version of PDP–11 C. For information on how to access the Release Notes, see Section 5.1.1.
2. Ensure that Version 10.0 of the RSTS/E operating system is installed and working properly. Attempting to install PDP–11 C Version 1.1 on an earlier version of RSTS/E could result in a failure of PDP–11 C to install properly.
3. Ensure that your system meets the minimum software and hardware requirements for PDP–11 C. See the Software Product Description (SPD) in your distribution kit for a list of these requirements.

A PDP–11 C installation requires approximately 20 to 30 minutes to complete.

The following sections describe how to access the Release Notes and how to prepare the operating system for the installation of PDP–11 C.

5.1.1 Accessing the Release Notes

The PDP–11 C Release Notes describe special features and known problems for this version of PDP–11 C. To copy the Release Notes file from the distribution medium prior to installing PDP–11 C, log in to a privileged account, place the distribution device in the drive, and enter the following command:

```
$  RESTORE/REPLACE/END=NODISMOUNT indev:CCCREL.BCK _SY:[directory]
```

Replace *indev:* with the name of the device on which your distribution medium is loaded, and replace *directory* with the directory name to which you want to copy the Release Notes.

Once you have copied the Release Notes file to your directory, you can use the PRINT command to print it:

```
$  PRINT _SY:[directory]CCCREL.DOC
```

As part of the installation procedure, Auto-Install copies the Release Notes file from the distribution medium to the CC$: directory and names it CCCREL.DOC.

If you answer YES to the question in the customization portion of the installation dialogue ‘‘Print the release notes?’’ Auto-Install also prints the Release Notes.

5.1.2 Preparing the Operating System

To prepare the operating system, perform the following steps:

1. Log in to a privileged account. The installation procedure generates a log file, which will remain in your default login area after you complete the installation. Therefore, it is not necessary to use a hard-copy terminal to produce a record of your installation session.
2. Verify that no one else on your system is using Auto-Install to perform an installation.
3. Verify that no one on your system is using a previously installed version of PDP–11 C.
4. If Auto-Install is not already installed on your system, verify that you have 750 free blocks of contiguous storage space available on your system device for Auto-Install files (see Section 5.1.3 for instructions on how to install Auto-Install).

5. Verify that sufficient space is available on your system device for the PDP–11 C files: the PDP–11 C task requires 1100 free blocks of contiguous storage space; the remaining PDP–11 C files require 2900 free blocks; and the temporary work area for the installation requires 8,000 free blocks.
6. Place your distribution medium in the drive.

   If your distribution medium is a disk, insert the disk in the drive and set the switch to the RUN position. Ensure that the READY light is on.

   If your distribution medium is tape, load the tape according to the instructions for the drive. Set the ONLINE/OFFLINE indicator to ONLINE, and ensure that the READY light is on.

   If your distribution medium is a TK50 tape cartridge, insert the tape into the drive according to the instructions for the drive, and push down the cartridge-release handle on the drive. Press the LOAD button and ensure that the LOAD light is on. For further information on loading devices, see the manual accompanying your hardware.

NOTE

It is unnecessary to mount the distribution volume, as Auto-Install performs this function for you in the first RESTORE command that you enter, either to print the release notes or to install Auto-Install.

5.1.3 Installing Auto-Install

Overview of Auto-Install

Auto-Install command procedure functions as follows:

- Checks the installation files automatically for a new or updated version of Auto-Install. If a new version or update is found, Auto-Install asks if you want to install it . If you answer YES, Auto-Install displays the commands needed to perform the installation or update. If you answer NO, Auto-Install issues a warning that this could cause installations to fail and reprompts you to perform the installation or update.
- Combines the installation and update procedures for all products. Auto-Install checks the update area and applies any updates to the product's installation files prior to performing the installation. However, PDP–11 C will be updated in the form of point releases, which are installed using the distribution kit.

- Creates the following installation log files in the user's login directory:

  AUTOIN.LOG, which contains the main installation procedure's dialogue

  CCCCCC.LOG, which contains the PDP–11 C portion of the dialogue

- Auto-Install creates a temporary work area in directory [0,81] on your system device and deletes it before the installation completes. If the temporary work area remains after an installation, you may delete it. RSTS/E automatically assigns the logical names AUTWRK$ to system directory [0,81] and AUTOIN$ to system directory [0,80] (which you created earlier). These directories respectively contain the Auto-Install work and the Auto-Install utility areas.
- Creates temporary files in the user's login directory and deletes them before the installation completes. If any temporary files remain after an installation, you may delete them. The names of the temporary files are:

CUSTOM.DAT	INSTAL.TMP	CCCCCC.SAV
UPDATE.DAT	AUTUPD.DAT	CCCCCC.TMP
ISTAT.DAT	CCCCCC.CFG	

- Allows Auto-Install installation files to remain on the system after installing in system directory [0,80]. The RSTS/E directory has the logical name AUTOIN$.

  The Auto-Install files are needed to reinstall PDP–11 C and other products and should not be deleted. If you accidentally delete them, you can reinstall Auto-Install from the distribution kit.

  The names and functions of the installation files are:

AUTOIN.COM	Controls installations
CUSTOM.COM	Controls customization processes
DEFUPD.TSK	Updates the status of the configuration data file
INSTAL.DAT	Lists products installed by Auto-Install
PRODIN.COM	Installs individual layered products
PRDTBL.DAT	Lists products Auto-Install may support
UPDATE.COM	Controls the updating of the configuration data file
UPDATE.TSK	Updates the configuration data file

- Handles error messages as follows:
  - Ignores WARNING messages.
  - Aborts the installation of a product if FATAL messages are received during the installation of the product.

- Aborts Auto-Install if FATAL messages are received during Auto-Install's installation dialogue.
- Aborts the installation of a product if ERROR messages are received during the installation of the product.

- Uses a configuration data file, which contains the parameters and values used to determine which features of PDP–11 C are supported by default.
- Provides a procedure that assists you in customizing your configuration data file to indicate which PDP–11 C features your compiler uses by default.
- Attempts to restore the system to its prior state if an installation fails.

Before you can install Auto-Install, make sure that a work directory has been created. If it does not exist, enter the following command before beginning the Auto-Install installation:

```
$  CREATE/ACCOUNT/NOUSER/NOLOG/CLUSTERSIZE=16 AUTOIN$:
```

The [0,82] directory contains many of the PDP–11 C files after installation.

How To Install Auto-Install

To install Auto-Install, enter the following command:

```
$  RESTORE/REPLACE/ACCOUNT/END=NODISMOUNT indev:[1,2]AUT101.A AUTOIN$:*.*
```

Replace *indev:* with the name of the drive on which you loaded your distribution medium.

5.2 Installing and Verifying That the Installation Is Successful

The next three sections describe how to install PDP–11 C using Auto-Install, step you through the installation questions, and explains the Installation Verification Procedure (IVP).

5.2.1 Invoking Auto-Install

You can invoke Auto-Install with any one of the following commands:

1. @AUTOIN$:AUTOIN.COM
2. @AUTOIN$:AUTOIN.COM CCC
3. @AUTOIN$:AUTOIN.COM indev:CCC

Replace *indev:* with the name of the drive on which you loaded your distribution medium.

If you use command 1, the installation dialogue begins with question 1 in the following section. The questions are listed and described in Section 5.2.2.

If you use command 2, the installation dialogue begins with question 2.

If you use command 3, the installation dialogue begins with question 2 and skips to question 4.

5.2.2 Answering Installation Questions

The online installation procedure asks questions about how you want to install PDP–11 C. This section describes these questions and explains their answers. The explanations do not appear in the installation procedure.

The default answer appears at the end of the question text in the installation procedure, enclosed in angle brackets (< >). You can accept the default answer by typing it or by pressing RETURN. Press CTRL/Z to exit from Auto-Install at any point.

Depending on how you invoked Auto-Install, you will enter the dialogue at question 1 or question 2.

1. `Which product(s) do you want to install?`

   In response to this prompt, type the task name for PDP–11 C:

   ```
   CCC
   ```

2. `Where are the update files located <PATCH$:>?`

   This Auto-Install question is not applicable to PDP–11 C. Updates to PDP–C will be shipped as point releases. Press RETURN to continue the procedure. At this point, you may receive three warning messages, which you can ignore. The text of the messages is as follows:

   ```
   WARNING  -  No updates for configuration data file;
               procedure continuing

   WARNING  -  Update file CCC101.DAT not found at
               PATCH$.  Kit files not updated;
               procedure continuing

               Account _SY:[0,82] already exists
   ```

3. `Which device are the distribution files for CCC (CCC) located on (include colon)?`

   Specify the drive on which you loaded the distribution disk or tape.

4. `Do you want to customize CCC (CCC) (Y/N) <N>?`

   To answer NO, type N or press RETURN. To answer YES, type Y.

If you answer NO, the procedure asks no further questions and installs PDP–11 C with the customization options corresponding to the default answers to the customization questions.

If you choose to customize, you are asked further questions. You can either press RETURN to accept the default answer; press CTRL/Z to exit from customization, retain any changes made so far, and continue the procedure; or type a new value. To exit from Auto-Install, press CTRL/Z a second time.

```
Suppress use of I/D space feature even if present <N>?
```

The installation procedure automatically determines if your system supports the instruction/data space (I/D) feature. To answer NO, type N or press RETURN. To answer YES, type Y.

If your system supports the I/D space feature and you answer NO, PDP–11 C can use this feature to provide enhanced compiler performance. The I/D space feature provides tasks with a 64K-byte address space for instructions and a separate 64K-byte address space for data. (Without this feature, a single 64K-byte address space is shared by both instructions and data.) The enhanced performance is attributable to a lower requirement for overlays and support of the /MEMORY qualifier to the CCC command. (See the *Guide to PDP–11 C* for an explanation of the /MEMORY qualifier.) To use this feature, PDP–11 C requires at least 128K bytes of memory.

If you answer YES, PDP–11 C performs more slowly because of the need for additional overlays; does not support the /MEMORY qualifier; but requires only 64K bytes of memory.

If your system does not support the I/D space feature, this question does not apply to you. Press RETURN to continue the procedure.

NOTE

> The code that PDP–11 C generates is always compatible with, but never requires, the instruction/data space feature. The I/D space option has no effect on PDP–11 C's generation of code.

```
Print release notes <NO>?
```

If you do not want to print the Release Notes, press RETURN. To print them, type Y.

```
Print log file <NO>?
```

If you do not want to print the log file, press RETURN. To print it, type Y.

```
Do you want to customize CCC again (Y/N) <NO>?
```

If you type Y, the customization questions are repeated, and you can change your answers if you wish. If you type N or press RETURN, the procedure continues.

Throughout the installation process, Auto-Install displays several informational messages. Following the installation, Auto-Install runs the Installation Verification Procedure (IVP) for PDP–11 C.

Refer to Chapter 7 for descriptions of the files and their locations after installation.

5.2.3 Verifying That the Installation Is Successful

The Installation Verification Procedure (IVP) checks to ensure that the installation has been successful. If the installation and IVP are successful, the following messages are displayed on your terminal at the end of the installation procedure:

```
CCC has passed.
Installation of CCC (CCC) successful.
```

If these messages are not displayed, an error has occurred in your installation. In such a case, verify that your system meets the requisite conditions listed in Section 5.1.2, and retry the installation from the beginning. If it fails again, contact your Digital Customer Services representative. If necessary thereafter, please submit a Software Performance Report (SPR) on one of the forms included in your distribution kit. See Appendix A for further information on reporting problems.

5.3 Invoking PDP–11 C

After installing PDP–11 C, you can invoke it using either the CC command in DCL or the CCC command in CCL.

The installation procedure defines CCC as a CCL command to invoke PDP–11 C. To redefine the CCC command each time the system is rebooted, enter the following command in your operating system's start-up control file (START.COM).

```
@CC$:PDP11C.INS
```

If you want to compile and link on different systems, refer to Chapter 7.

5.4 Reinstalling

The distribution media is the only means by which PDP–11 C can be reinstalled. For this reason, it is wise to keep either the distribution medium or a copy in a safe place.

Chapter 6

Installing PDP–11 C on a RT–11 Operating System

The RT–11/XM host kit for PDP–11 C consists of one of the following media sets:

- One (1) RL02 removable hard disk cartridge
- One (1) 1600 bpi magtape
- One (1) TK50 tape cartridge
- Six (6) RX50 diskettes
- Nine (9) RX01 diskettes

The standard installation of PDP11 C installs all PDP–11 C files on the system disk (SY:). However, you may specify an alternate installation device. This device can be any supported RT–11 random-access, file-structured device, including a logical device which is accessed with the LD logical device handler. In addition, after installation you may tailor your installation to place some or all of the PDP–11 C files on another or other devices, including logical devices (see Section 6.2.4).

6.1 Preparing for the Installation

To prepare for the installation, perform the following initial steps:

1. Read the PDP–11 C Release Notes, which describe special features and known problems for this version of PDP–11 C. For information on how to access the Release Notes, see Section 6.1.1.
2. Ensure that the RT–11 operating system is installed and functioning properly.

3. Ensure that the system meets the minimum software and hardware requirements for PDP–11 C. See the Software Product Description (SPD) in your distribution kit for a list of these requirements.

The following sections describe how to access the Release Notes and how to prepare the operating system for the installation of PDP–11 C.

6.1.1 Accessing the Release Notes

Please take time to read the on-line Release Notes before installing PDP–11 C, as they contain the most recent information for this release. If you have an RL02 kit, you can extract the Release Notes from your distribution kit using the following command:

```
. COPY DLn:CCCREL.DOC outdev: RETURN
```

Replace *DLn:* with the device name where you mounted the distribution medium. Replace *outdev:* with the device name to which you wish to copy the Release Notes. For all other distribution kits, you can extract the Release Notes from your distribution kit using the following command:

```
. BACKUP/RESTORE indev:PDP11C/SAVESET,CCCREL.DOC outdev: RETURN
```

Replace *indev:* with the device name where you mounted the first distribution medium. Replace *outdev:* with the device name to which you wish to copy the Release Notes.

With a diskette kit, you may be prompted to mount one or more additional diskettes from the kit. Mount each diskette as instructed, type Y, and press RETURN.

6.1.2 Preparing the Operating System

The installation of PDP–11 C requires an RT–11/XM system with at least 256K bytes of memory, a drive of the appropriate type for the distribution media, and a random-access, file-structured installation device with approximately 4000 blocks of available storage. A standard installation from an RL02 drive or a magnetic tape device requires approximately 10 minutes to complete. A standard installation from a diskette device requires approximately 20 minutes to complete.

Installation from an RL02 kit requires COPY (PIP) to be present on your RT–11/XM system; installation from all other kit media requires BACKUP (BUP) to be present on your RT–11/XM system.

Before you install PDP–11 C, you should first verify that none of the PDP–11 C installation files will overwrite existing files on the installation device. If the installation device is empty, there is no possibility of conflict. However, if you perform a standard installation to the system disk or if you perform an installation to an alternate, non-empty device, you should verify the contents of the installation device directory (using the DIRECTORY command) against the PDP–11 C installation files described in Chapter 7. If a file name conflict exists, either rename the existing file on the installation device prior to installing PDP–11 C, or install PDP–11 C on a different device.

If you are re-installing PDP–11 C on the same device as a previous installation, you must remove the protection from the PDP–11 C files from the first installation using the UNPROTECT command (see Chapter 7 for a list of PDP–11 C files).

If desired, after installation you can remove some of PDP–11 C's optional files or move some or all of PDP–11 C's installation files to different devices (see Chapter 7).

6.2 Installing and Verifying That the Installation Is Successful

The next sections describe the following:

- How to install PDP–11 C from an RL02 kit, tape, and diskette.
- How to tailor your installation by placing files in alternate locations removing optional files, and improving compile-time performance.
- How to verify that the installation is successful.

6.2.1 Installing from an RL02 Kit

To install PDP–11 C from an RL02 kit, place the PDP–11 C RL02 distribution disk cartridge in the drive. Then issue the following DCL command:

```
. COPY/SYS DLn:*.* outdev: RETURN
```

Replace *DLn:* with the device name where you mounted the PDP–11 C distribution disk cartridge. Replace *outdev:* with the installation device name (the device where you wish to install PDP–11 C). If you desire a standard installation of PDP–11 C, specify *SY:* as the installation device.

Refer to Chapter 7 for descriptions of the files and their locations after installation.

6.2.2 Installing from Tape

To install PDP–11 C from a 1600 bpi magtape kit or TK50 tape cartridge, place the PDP–11 C distribution medium in the drive and then issue the following DCL command:

```
. BACKUP/RESTORE/SYS indev:PDP11C/SAVESET,*.* outdev: RETURN
```

Replace *indev:* with the device name where you mounted the PDP–11 C distribution medium. Replace *outdev:* with the installation device name (the device where you wish to install PDP–11 C). If you desire a standard installation of PDP–11 C, specify *SY:* as the installation device.

Refer to Chapter 7 for descriptions of the files and their locations after installation.

6.2.3 Installing from Diskette

To install PDP–11 C from an RX50 diskette kit or an RX01 diskette kit, place the PDP–11 C distribution diskette labeled PDP11C 1/n in the drive (where *n* is the total number of diskettes in the kit) and then issue the following DCL command:

```
. BACKUP/RESTORE/SYS indev:PDP11C/SAVESET,*.* outdev: RETURN
```

Replace *indev:* with the device name where you mounted the first PDP–11 C distribution diskette. Replace *outdev:* with the installation device name (the device where you wish to install PDP–11 C). If you desire a standard installation of PDP–11 C, specify *SY:* as the installation device. After entering this command, BACKUP prompts you as follows:

```
Mount input volume 1 in indev; Continue?
```

Where *indev* is the device where the first PDP–11 C distribution diskette was mounted. Type Y and press RETURN.

After the required information has been copied from the first diskette to the specified installation device, BACKUP will prompt for the next diskette as follows:

```
Mount input volume 2 in indev; Continue?
```

Where *indev* is the device where you mounted the previous PDP–11 C distribution diskette. Place the diskette labeled PDP11C 2/n (where *n* is the total number of diskettes in the kit) in the drive, type Y and press RETURN. BACKUP will issue similar prompts after the second and subsequent diskettes until the information on all the diskettes has been copied to the

specified installation device. When the information on all the diskettes has been copied to the specified installation device, BACKUP issues the following message:

```
?BUP-I-Restore operation is complete
```

Refer to Chapter 7 for descriptions of the files and their locations after installation.

6.2.4 Tailoring the Installation

You can tailor the installation of PDP–11 C to specify alternate placement of PDP–11 C files, to remove files that you do not need for your application, and to improve compile-time performance. If you specified a device other than the system disk (SY:) as the installation device, you must perform the tailoring steps described in the following sections on the Alternate Placement of the PDP–11 C Compiler, Alternate Placement of PDP–11 C Header Files, and Alternate Placement of the PDP–11 C Message File.

If you specified the system disk (SY:) as the installation device, tailoring of the PDP–11 C installation is optional. Regardless of whether you installed PDP–11 C on the system disk or on an alternate device, the tailoring steps described in the following sections on Alternate Placement of the PDP–11 C Work File, Alternate Placement of the Run-Time Libraries, Removing Optional Files, and Improving Compile-Time Performance are optional.

6.2.4.1 Alternate Placement of the PDP–11 C Compiler

If you specified the system disk (SY:) as the installation device, the CC.SAV compiler save image now resides on the system disk. As such, the CC Concise Command Language (CCL) verb is automatically defined. If you specified an alternate installation device or if you wish to copy the CC.SAV compiler image to another device and remove it from the system disk, you can define the CC command verb by creating a User-Command-Linkage (UCL) definition using the UCL.SAV Utility distributed with RT–11 Version 5. To do so, issue the following command at the KMON dot (.) prompt:

```
. CC :== RUN CC:CC ^ RETURN
```

In this example, *CC:* is a logical name assigned to the device where the CC.SAV compiler image is installed.

You can also define the CC verb by using a self-developed UCL.SAV Utility or the User-Command-First (UCF) Utility. For more information on UCF and UCL, refer to the section on Defining Commands with Distributed UCL.SAV in the *RT–11 System User's Guide*, and the KMON section of the *RT–11 Software Support Manual*.

NOTE

The Installation Verification Procedure requires the CC.SAV compiler image to be installed in either the current directory (DK:), the system disk (SY:), or the device designated by the logical name CC:.

6.2.4.2 Alternate Placement of PDP–11 C Header Files

At compile time, PDP–11 C searches for header files supplied with PDP–11 C (indicated by the angle bracket (<>) notation in the #include preprocessing directive) in the following order and locations:

1. The directory or list of directories specified with the /INCLUDE_DIRECTORY command line qualifier.
2. The directory specified by the logical name CLB, if defined.
3. The system disk (SY:).

If you specified the system disk (SY:) as the installation device, the PDP–11 C header files now reside on the system disk and you need not take any further action to enable the PDP–11 C compiler to find them. However, if you specified an alternate device as the installation device or if you wish to copy the PDP–11 C header files (*.H) to an alternate device and remove them from the system disk, you must define the CLB logical name to indicate the location of the PDP–11 C header files. To do so, use an ASSIGN command similar to the following example in your STARTX.COM system startup command procedure.

```
. ASSIGN LD1 CLB
```

You may install a subset of the supplied header files on an alternate device if you install the remaining supplied header files on the system disk (SY:). You can use this flexibility to install the most frequently used header files on the VM (Virtual Memory) pseudo-device. Refer to the section on Improving Compile-Time Performance for more information.

6.2.4.3 Alternate Placement of the PDP–11 C Message File

PDP–11 C stores most of its compiler messages in the file PDP11C.MSG. At compile time, PDP–11 C looks for this file in the following order and locations:

- DK:PDP11C.MSG
- CC:PDP11C.MSG
- SY:PDP11C.MSG

If you specified the system disk (SY:) as the installation device, the PDP–11 C message file now resides on the system disk and you need not take any further action to enable the PDP–11 C compiler to find it. However, if you specified an alternate device as the installation device or if you wish to copy PDP11C.MSG to an alternate device and remove it from the system disk, you must define the CC logical name to indicate the location of the PDP–11 C message file. To do so, use an ASSIGN command similar to the following in your STARTX.COM system startup command procedure.

```
. ASSIGN LD1 CC
```

6.2.4.4 Alternate Placement of the PDP–11 C Work File

The PDP–11 C Work File is a temporary file used for data storage during compilation. It is created when PDP–11 C is invoked and is discarded when PDP–11 C exits.

There are no required tailoring actions for the PDP–11 C Work File regardless of how PDP–11 C is installed; however, its optimal placement can significantly affect compile-time performance. For the fastest compile-time performance, place the work file on the fastest device with sufficient free space that is available. The VM pseudo-device is the best choice if there is sufficient extended memory. For further information on its installation, refer to the section on Improving Compile-Time Performance.

To specify the size of the work file, use the command line qualifier /WORK_FILE_SIZE. The default size is 2048 512 byte blocks. If you wish to specify a different, default work file size, you may include the /WORK_FILE_SIZE qualifier in your UCL definition of the CC command verb. PDP–11 C attempts to open the work file in the following locations and in the following order:

- WF:CC.TMP
- DK:CC.TMP

- SY:CC.TMP

PDP–11 C uses the first location where the work file is successfully opened. PDP–11 C issues a diagnostic and aborts if the work file cannot be opened in any of the above locations.

To place the work file on an alternate device, assign the logical name WF to point to the alternate device. Consider the following example:

```
. ASSIGN VM WF
```

If the work file cannot be opened on WK: (perhaps because there is insuffient free space available on that device), PDP–11 C opens the work file on DK: or SY: without issuing a diagnostic.

6.2.4.5 Alternate Placement of Run-Time Libraries

The PDP–11 C run-time library files are placed on the specified installation device. The names of the RT–11 run-time libraries are CEISRT.OBJ and CFPURT.OBJ. If you wish, you may optionally copy the run-time libraries to another device and remove them from the installation device. The PDP–11 C Installation Verification Procedure (IVP) requires either CEISRT.OBJ or CFPURT.OBJ to be present in one of the following locations: DK:, CC:, or SY:. If they are both present, the IVP uses CEISRT.OBJ.

You must specify the final location of the run-time library to the LINK Utility when you link PDP–11 C programs. Four additional run-time libraries, provided for cross development, are described in the section on Removing Optional Files.

6.2.4.6 Alternate Locations for Installation Files

As described in the above sections, PDP–11 C allows you to install selected components in alternate locations. PDP–11 C does this by searching for specific components in specific locations or lists of locations. Table 6–1 summarizes the locations PDP–11 C uses.

Table 6–1: Alternate Installation Locations

File	Component Description	Search Location
*.H	Supplied header files	/INCLUDE_ DIRECTORY CLB: SY:
CC.SAV	Compiler save image	DK: CC: SY: As defined in the UCL or UCF definition
CC.TMP	Compiler temporary work file	WF: DK: SY:
CCCFIL.DAT	Definition of installation files and locations	DK:
CCCFIL.SAV	Verifies installation of files	DK:
CCCIVP.C	IVP source file	DK:
CCCIVP.COM	Installation Verification Procedure (IVP)	DK:
CCCREL.DOC	Release Notes	DK: CC: SY:
PDP11C.MSG	Compiler message file	DK: CC: SY:
CEISRT.OBJ†	RT–11 run-time library for EIS hardware	DK: CC: SY:
CFPURT.OBJ†	RT–11 run-time library for FPU hardware	DK: CC: SY:

†The PDP–11 C Installation Verification Procedure (IVP) requires only one of the CEISRT.OBJ or CFPURT.OBJ files to be present in one of the indicated locations.

6.2.4.7 Removing Optional Files

You may wish to remove optional object libraries as well as other files which you do not need.

If you want to compile and link on different systems, Chapter 7 describes how to do this. You can delete any object libraries that you will not use.

The following files are provided for cross development to RSX–11 and RSTS/E systems. Because these files are optional, you may remove them if your application does not require them. For a description of each file, refer to Chapter 7.

CLINK.OBJ	CC.LNK	FAB.H
FAB.C	FCS.H	FCSFHB.H
FCSIFF.H	NAM.H	NAM.C
RAB.H	RAB.C	RMS.H
RMSDEF.H	RMSOPS.H	RMSORG.H
RMSORG.C	RMSPOO.H	RMSPOO.C
RSTSYS.H	RSXSYS.H	XAB.H
XAB.C		

6.2.5 Improving Compile-Time Performance

Compile-time performance on RT–11 host systems can be improved by enabling PDP–11 C V1.1's virtual overlay feature and by installing selected components of PDP–11 C in the virtual memory.

6.2.5.1 Enabling Virtual Overlays

For improved compile-time performance, the PDP–11 C V1.1 compiler optionally operates using virtual overlays. To use virtual overlays, PDP–11 C attempts to create a 192Kb extended memory region. If this operation fails for any reason, PDP–11 C issues the following message and uses disk overlays instead:

```
%PDP11C-I-OVL_NOVIRT, Cannot enable virtual overlays
- see release notes for a potential performance improvement
```

NOTE

The %PDP11C-I-OVL_NOVIRT message cannot be disabled with PDP–11 C'S /NOWARNINGS command-line qualifier. This

condition is determined before the PDP–11 C command line is processed. See below to disable this message.

This message may appear for a number of reasons. The most common reasons are:

- The VM handler is using most of extended memory.
- Your system does not have Program Logical Address Space (PLAS) support enabled.
- You have handlers, foreground jobs, or system jobs loaded that are using extended memory.
- Your system does not have sufficient extended memory.

As indicated by the message, refer to the Release Notes for more information on enabling the compiler's virtual overlay feature.

You can use the SETCC Utility supplied with PDP–11 C to enable or disable the compiler's virtual overlay feature at any time. Virtual overlays are enabled by default. To disable virtual overlays and the %PDP11C-I-OVL_NOVIRT message, enter the following command:

```
. RUN outdev:SETCC /NOVIRTUAL_OVERLAYS RETURN
%SETCC-I-DISABLED, VIRTUAL_OVERLAYS disabled
```

Replace *outdev:* with the device where you installed PDP–11 C.

To enable virtual overlays, enter the following command:

```
. RUN outdev:SETCC /VIRTUAL_OVERLAYS RETURN
%SETCC-I-ENABLED, VIRTUAL_OVERLAYS enabled
```

6.2.5.2 Installing Selected Components in Virtual Memory

To improve compile time performance, selected components of PDP–11 C may be installed in virtual memory using the VM handler supplied with RT–11/XM. In order to do this, you must have virtual memory available beyond the 256K bytes used by RT–11/XM and PDP–11 C when the PDP–11 C compiler is executing.

To install selected components in virtual memory, you can use the VM pseudo-device as an alternate installation device (as described in previous sections) but with the following requirement: since the contents of the VM pseudo-device are not retained if the system is powered down, you must reinstall all components in virtual memory when the system is powered up.

To install the PDP–11 C work file and frequently used header files in virtual memory, add the following commands to the STARTX.COM system startup command procedure:

```
LOAD VM                    ! Make VM pseudo-device available and ready
INIT VM
ASSIGN VM WF               ! Place PDP-11 C's work file on VM
CC :== RUN CC:CC /WORK=1000 ^ ! Define CC command using a smaller work file
ASSIGN VM CLB              ! First look on VM for header files
COPY SY:STDIO.H VM:        ! Install most frequently used headers on VM
COPY SY:STDLIB.H VM:
COPY SY:STDDEF.H VM:
COPY SY:STRING.H VM:
```

The UCL definition of the CC command verb is shown in the STARTX.COM startup command procedure in order to group related definitions together. However, UCL command definitions are retained even when your system is powered-down.

NOTE

The PDP–11 C V1.0 Installation Guide advised installing the compiler image on the VM: pseudo-device for improved performance. With the introduction of virtual overlays in the PDP–11 C V1.1 compiler, there is no longer a performance advantage in doing so.

6.2.6 Verifying That the Installation Is Successful

PDP–11 C provides an automatic Installation Verification Procedure (IVP) that verifies the installation of PDP–11 C. You may run the IVP at any time after installation with the following commands:

```
. ASSIGN outdev: DK: RETURN
. $@CCCIVP RETURN
```

Where outdev: is the device where you have installed PDP–11 C.

The IVP issues several messages indicating the progress of the verification. If the installation is successful, the following message will appear when the IVP completes:

```
CCC has passed.
```

If this message is not displayed on your terminal, an error has occurred in your installation. If you installed PDP–11 C on a device other than SY: or you customized the installation, verify that the CC and CLB logical names are correctly defined (refer to Table 6–1). Also, verify that the CC command verb is correctly defined. If the problem persists, verify that your system meets the requisite conditions described in Section 6.1.2 and retry

the installation from the beginning. If it fails again, contact your customer representative. If necessary, please submit a Software Problem Report (SPR) on one of the forms included in your distribution kit.

6.3 Invoking PDP–11 C

After installation, you can invoke PDP–11 C with the CC command.

The following command line restrictions apply on RT–11 systems:

- Put a space between the CC command and the first qualifier or file specification.
- If you specify a PDP–11 C indirect file on the KMON command line, it will be captured by KMON rather than by PDP–11 C and generally will not produce the results you want. You can use the /COMMAND qualifier to avoid this problem.
- KMON performs command factoring on lines that contain left and right parentheses. KMON command factoring is incompatible with PDP–11 C command syntax. As a work-around, PDP–11 C accepts left and right curly braces ({ and }) in lieu of left and right parentheses on KMON command lines. Remember that this work-around applies *only* to KMON command lines. It does not apply to PDP–11 C interactive prompting mode, PDP–11 C indirect command files, or any other supported host system.

The following commands are invalid:

```
. CC/LIST MYPROG RETURN
. CC @BUILD RETURN
. CC MYPROG/ENVIRONMENT=(NOFPU, PIC) RETURN
```

The following commands are valid:

```
. CC /LIST MYPROG RETURN
. CC /COMMAND=BUILD RETURN
. CC MYPROG/ENVIRONMENT={NOFPU, PIC} RETURN
```

If you want to compile and link on different systems, refer to Chapter 7.

Refer to the *Guide to PDP–11 C* for more information on PDP–11 C indirect file processing. Refer to *Guide to PDP–11 C* for a description of the /COMMAND qualifier, as well as for more details on the use of left and right curly braces in KMON command lines.

6.4 Reinstalling

The distribution media is the only means by which PDP–11 C can be reinstalled. For this reason, it is wise to keep either the distribution medium or a copy in a safe place.

Chapter 7

Compiling and Linking on Different Systems

To link programs on a system other than on the one where you compile them, you must move the PDP–11 C Run-Time Library (RTL) files to the appropriate location on the other system. For example, if the target system is RSX–11, you must copy the files to LB:[1,1] on your RSX–11 system.

The names of the RTL files are:

CEISRSX.OLB*
CFPURSX.OLB*
CEISRE.OLB
CFPURE.OLB
CEISRT.OBJ
CFPURT.OBJ

* Please note that on RSTS/E and RT–11 host systems, these files are CEISRS.OLB and CFPURS.OLB.

You can refer to Table 7–1 for the locations of the files that are installed on each host operating system and to Table 7–2 for descriptions of these files.

Table 7–1: Kit Files and Their Locations

File	VAX/VMS	RSX–11M RSX–11M+ Micro/RSX	RSTS/E	RT–11
CEISRE.OLB[1]	LB:[1,1]	LB:[1,1]	LB:	DK:+CC:+SY:
CFPURE.OLB[1]	LB:[1,1]	LB:[1,1]	LB:	DK:+CC:+SY:
CEISRSX.OLB[1]	LB:[1,1]	LB:[1,1]	–	–
CFPURSX.OLB[1]	LB:[1,1]	LB:[1,1]	–	–
CEISRS.OLB[1]	–	–	LB:	DK:+CC:+SY:
CFPURS.OLB[1]	–	–	LB:	DK:+CC:+SY:
CEISRT.OBJ[1]	LB:[1,1]	LB:[1,1]	LB:	DK:+CC:+SY:
CFPURT.OBJ[1]	LB:[1,1]	LB:[1,1]	LB:	DK:+CC:+SY:
CLINK.OBJ[1]	LB:[1,1]	LB:[1,1]	LB:	DK:+CC:+SY:
CC.LNK[1]	LB:[1,1]	LB:[1,1]	LB:	DK:+CC:+SY:
ASSERT.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
CTYPE.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
ERRNO.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
FLOAT.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
LIMITS.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
LOCALE.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
MATH.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
SETJMP.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
SIGNAL.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
STDARG.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
STDDEF.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
STDIO.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
STDLIB.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
STRING.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
TIME.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
FAB.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
FAB.C[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:

[1]May not be necessary on all systems.

(continued on next page)

Table 7–1 (Cont.): Kit Files and Their Locations

File	VAX/VMS	RSX–11M RSX–11M+ Micro/RSX	RSTS/E	RT–11
FCS.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
FCSFHB.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
FCSIFF.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
NAM.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
NAM.C[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RAB.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RAB.C[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RMS.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RMSDEF.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RMSOPS.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RMSORG.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RMSORG.C[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RMSPOO.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RMSPOO.C[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RSTSYS.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RSXSYS.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
RTSYS.H	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
XAB.H[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
XAB.C[1]	LB:[1,1]	LB:[1,1]	CC$:	CLB:+SY:
PDP11C$011.RELEASE_NOTES	SYS$HELP:	–	–	–
CCCREL.DOC	–	LB:[1,2]	CC$:	DK:+CC:+SY:
PDP11C$COMPILER.EXE	SYS$SYSTEM:	–	–	–
PDP11C.TSK	–	LB:[3,54][2]	CC$:	–
CC.SAV	–	–	–	DK:+CC:+SY:
PDP11C$ENGLISH_MSG.MSG	SYS$MESSAGE:	–	–	–
PDP11C.MSG	–	LB:[1,2]	CC$:	DK:+CC:+SY:

[1]May not be necessary on all systems.

[2]The installation location for PDP11C.TSK is a customization option on RSX–11M and RSX–11M–PLUS. The default is LB:[1,54] on RSX–11M and LB:[3,54] on RSX–11M–PLUS. PDP11C.TSK is installed in LB:[3,54] on Micro/RSX.

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Table 7–1 (Cont.): Kit Files and Their Locations

File	VAX/VMS	RSX–11M RSX–11M+ Micro/RSX	RSTS/E	RT–11
DCLCCC.HLP	–	LB:[1,2]	HELP$:	–
MCRCCC.HLP	–	LB:[1,2]	–	–
PDP11C$HELP.HLP	SYS$HELP:	–	–	–
PDP11C$IVP.COM	SYS$TEST:	–	–	–
CCCIVP.CMD	–	LB:[1,2]	–	–
CCCIVP.COM	–	–	CC$:	DK:
PDP11C$TEST_IVP.C	SYS$COMMON: [SYSTEST.PDP11C$IVP]	–	–	–
PDP11C$TEST_IVP.MAC	SYS$COMMON: [SYSTEST.PDP11C$IVP]	–	–	–
PDP11C$FAB_IVP.MAC	SYS$COMMON: [SYSTEST.PDP11C$IVP]	–	–	–
PDP11C$NAM_IVP.MAC	SYS$COMMON: [SYSTEST.PDP11C$IVP]	–	–	–
PDP11C$RAB_IVP.MAC	SYS$COMMON: [SYSTEST.PDP11C$IVP]	–	–	–
PDP11C$RMSORG_IVP.MAC	SYS$COMMON: [SYSTEST.PDP11C$IVP]	–	–	–
PDP11C$XAB_IVP.MAC	SYS$COMMON: [SYSTEST.PDP11C$IVP]	–	–	–
CCCIVP.C	–	LB:[1,2]	CC$:	DK:
PDP11C$STARTUP.COM	SYS$STARTUP:	–	–	–
PDP11C.INS	–	LB:[1,2]	CC$:	–
CCCFIL.DAT	–	LB:[1,2]	CC$:	DK:
CCCFIL.SAV	–	–	–	DK:
Auto-Install Files[3]				
AUTOIN.CMD	–	LB:[367,367][4]	–	–
AUTOIN.COM	–	–	AUTOIN$:	–
AUTVER.DAT	–	LB:[367,367][4]	AUTOIN$:	–

[3] After installing, you may delete these files; however, subsequent installations will require that Auto-Install be reinstalled.
[4] You do not install these files on Micro/RSX.

(continued on next page)

Table 7–1 (Cont.): Kit Files and Their Locations

File	VAX/VMS	RSX–11M RSX–11M+ Micro/RSX	RSTS/E	RT–11
		Auto-Install Files[3]		
CUSTOM.CMD	–	LB:[367,367][4]	–	–
CUSTOM.COM	–	–	AUTOIN$:	–
CUSTOM.TSK	–	LB:[367,367][4]	AUTOIN$:	–
DEFUPD.TSK	–	LB:[367,367][4]	AUTOIN$:	–
PRODIN.CMD	–	LB:[367,367][4]	–	–
PRODIN.COM	–	–	AUTOIN$:	–
PRDTBL.DAT	–	LB:[367,367][4]	AUTOIN$:	–
UPDATE.CMD	–	LB:[367,367][4]	–	–
UPDATE.COM	–	–	AUTOIN$:	–
UPDATE.TSK	–	LB:[367,367][4]	AUTOIN$:	–

[3] After installing, you may delete these files; however, subsequent installations will require that Auto-Install be reinstalled.
[4] You do not install these files on Micro/RSX.

Table 7–2 describes files that are installed on your system depending on the type of operating system you have.

Table 7–2: Descriptions of Kit Files

File	Description
CEISRE.OLB	Object library that provides run-time support for RSTS/E target systems without a requirement for the FPU feature in the target RSTS/E system. This library is provided for processing under the Task Builder (TKB) on RSTS/E.
CFPURE.OLB	Object library that provides run-time support for RSTS/E target systems that support the FPU feature. This library is provided for processing under the Task Builder (TKB) on RSTS/E.
CEISRSX.OLB	Object library that provides run-time support for RSX target systems without a requirement for the FPU feature in the target RSX–11 system. This library is provided for processing under the Task Builder (TKB) on RSX.
CFPURSX.OLB	Object library that provides run-time support for RSX target systems that support the FPU feature. This library is provided for processing under the Task Builder (TKB) on RSX.
CEISRT.OBJ	Object library that provides run-time support for RT–11 target systems without a requirement for the FPU feature in the target RT–11 system. This library is provided for processing by the RT–11 linker on RT–11.
CFPURT.OBJ	Object library that provides run-time support for RT–11 target systems that support the FPU feature. This library is provided for processing by the RT–11 linker on RT–11.
CC.LNK	Link file for RSTS/E
CLINK.OBJ	RT–11 SYSLIB Routines for use with the RT–11 Linker on RSTS/E
ASSERT.H	Defines a macro for placing diagnostics into programs
CTYPE.H	Defines functions used for testing and mapping characters
ERRNO.H	Defines the errno and error values
FLOAT.H	Defines the macros that expand to various limits and parameters
LIMITS.H	Defines the macros that expand to various limits and parameters
LOCALE.H	Defines the functions, macros, and one type used for setting locale-dependent formatting and collating items

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Table 7–2 (Cont.): Descriptions of Kit Files

File	Description
MATH.H	Declares the functions and macros used for mathematical computations
SETJMP.H	Defines the macro and declares the function for bypassing the normal function call
SIGNAL.H	Declares a type and several functions and defines the macros that report conditions during program execution
STDARG.H	Declares a type and defines the macros used by a called function while reading a list of arguments whose number and types are not known
STDDEF.H	Provides definitions of several types and macros used with the library
STDIO.H	Declares types, macros, and functions for performing input and output
STDLIB.H	Declares additional types, functions of general utility, and defines macros
STRING.H	Declares the type and the functions and defines the macro used for manipulating arrays of characters
TIME.H	Defines the macros and declares the functions used for time manipulation
FAB.C	Defines a default Record Management Services (RMS) FAB control block on RSX and RSTS/E
FAB.H	Defines RMS file access block on RSX and RSTS/E
FCS.H	Defines values used by File Control Services (FCS) on RSX
FCSFHB.H	Defines FCS file header blocks on RSX
FCSIFF.H	Defines FCS index file format on RSX
NAM.C	Defines RMS NAM control block on RSX and RSTS/E
NAM.H	Defines RMS NAM structure on RSX and RSTS/E
RAB.C	Defines RMS RAB control block on RSX and RSTS/E
RAB.H	Defines RMS RAB structure on RSX and RSTS/E
RMS.H	Includes all files supplied by the RMS extension library except RMSORG.H and RMSPOO.H on RSX and RSTS/E
RMSDEF.H	Defines and declares values used by RMS on RSX and RSTS/E

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Table 7–2 (Cont.): Descriptions of Kit Files

File	Description
RMSOPS.H	Provides functional prototyping of each RMS operation routine on RSX and RSTS/E
RMSORG.C	Template for defining the RMS organization on RSX and RSTS/E
RMSORG.H	Defines the macros and data structures for the RMS–11 ORG declarations on RSX and RSTS/E
RMSPOO.C	Template for defining RMS pool space on RSX and RSTS/E
RMSPOO.H	Defines macros for declaring RMS pool areas on RSX and RSTS/E
RSTSYS.H	Contains RSTS/E system directive definitions
RSXSYS.H	Contains RSX executive directive definitions
RTSYS.H	Contains RT–11 SYSLIB routine definitions
XAB.C	Defines RMS XAB control block on RSX and RSTS/E
XAB.H	Defines RMS XAB structures on RSX and RSTS/E
PDP11C$011.RELEASE_ NOTES	Release Notes for PDP–11 C Version 1.1 on VAX/VMS host systems
CCCREL.DOC	Release Notes for PDP–11 C Version 1.1 on PDP–11 host systems
PDP11C$COMPILER.EXE	The PDP–11 C compiler in VAX/VMS host systems
PDP11C.TSK	The PDP–11 C compiler on RSX–11M/M–Plus, Micro/RSX, and RSTS/E host systems
CC.SAV	PDP–11 C compiler on RT–11 host systems
PDP11C$ENGLISH_ MSG.MSG	Contains compiler messages on VAX/VMS host systems
PDP11C.MSG	Contains compiler messages on PDP–11 host systems
DCLCCC.HLP	DCL Help file for PDP–11 C on RSX–11M/M–Plus, Micro/RSX, and RSTS/E host systems
MCRCCC.HLP	MCR Help file for PDP–11 C on RSX–11M/M–Plus and Micro/RSX host systems
PDP11C$HELP.HLP	Help file for PDP–11 C on VAX/VMS host systems
PDP11C$IVP.COM	The Installation Verification Procedure (IVP) on VAX/VMS host systems
CCCIVP.C	IVP source file

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Table 7–2 (Cont.): Descriptions of Kit Files

File	Description
CCCIVP.COM	The Installation Verification Procedure (IVP) on RSTS/E and RT–11 host systems
PDP11C$TEST_IVP.C	Used by the IVP on VAX/VMS host systems
PDP11C$TEST_IVP.MAC	Used by the IVP on VAX/VMS host systems
PDP11C$FAB_IVP.MAC	Used by the IVP on VAX/VMS host systems
PDP11C$NAM_IVP.MAC	Used by the IVP on VAX/VMS host systems
PDP11C$RAB_IVP.MAC	Used by the IVP on VAX/VMS host systems
PDP11C$RMSORG_ IVP.MAC	Used by the IVP on VAX/VMS host systems
PDP11C$XAB_IVP.MAC	Used by the IVP on VAX/VMS host systems
PDP11C$STARTUP.COM	VAX/VMS command procedure to install PDP–11 C after the system reboots
PDP11C.INS	Command procedure to reinstall PDP–11 C after system reboots on RSX–11M/M–Plus, Micro/RSX, and RSTS/E host systems
CCCFIL.DAT	Defines PDP–11 C installation files and their installation locations on PDP–11 host systems
CCCFIL.SAV	Verifies correct installation of PDP–11 C files on RT–11 host systems
	Auto-Install Files
AUTOIN.CMD	Controls installations on RSX–11M/M–Plus systems
AUTOIN.COM	Controls installation on RSTS/E systems
AUTVER.DAT	Contains Auto-Install version number on RSX–11M/M–Plus and RSTS/E systems
CUSTOM.CMD	Controls modification of configuration data file on RSX–11M/M–Plus systems
CUSTOM.COM	Controls modification of configuration data file on RSTS/E systems
CUSTOM.TSK	Modifies configuration data file on RSX–11M/M–Plus and RSTS/E systems
DEFUPD.TSK	Updates status of configuration data file on RSX–11M/M–Plus and RSTS/E systems
PRODIN.CMD	Installs individual layered products on RSX–11M/M–Plus systems

(continued on next page)

Table 7–2 (Cont.): Descriptions of Kit Files

File	Description
	Auto-Install Files
PRODIN.COM	Installs individual layered products on RSTS/E systems
PRDTBL.DAT	Lists products Auto-Install may support on RSX–11M/M–Plus and RSTS/E systems
UPDATE.CMD	Controls update of configuration data file on RSX–11M/M–Plus systems
UPDATE.COM	Controls update of configuration data file on RSTS/E systems
UPDATE.TSK	Updates configuration data file on RSX–11M/M–Plus and RSTS/E systems

Appendix A

Reporting Problems

If an error occurs while you are using PDP–11 C and you believe that the error is caused by a problem in PDP–11 C, please take one of the following actions:

- If you purchased PDP–11 C within the past 90 days and you think the problem is caused by a software error, please submit a Software Performance Report (SPR).
- If you have a Basic or DECsupport Software Agreement, please call your Customer Support Center. With these services, you receive telephone support that provides high-level advisory and remedial assistance. For more information, contact your local Digital Customer Services representative.
- If you have a Self-Maintenance Software Agreement, please submit a Software Performance Report (SPR).

If you find an error in the PDP–11 C documentation, please submit a Reader's Comments form from the back of the document in which the error was found. Please include the number of the page containing the error.