RSX-11M-PLUS Release Notes

Order No. AA-H427E-TC

RSX-11M-PLUS Version 4.0

Digital Equipment Corporation Maynard, Massachusetts

First Printing, October 1979
Revised, April 1982
Revised, April 1983
Revised, July 1985
Revised, September 1987

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This document was prepared using an in-house documentation production system. All page composition and make-up was performed by TEX, the typesetting system developed by Donald E. Knuth at Stanford University. TEX is a trademark of the American Mathematical Society.

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Preface

Manual Objectives

The *RSX-11M-PLUS Release Notes* contain vital information for using the RSX-11M-PLUS Version 4.0 operating system. Read this document before generating and using your system.

This manual contains the following categories of information:

- Descriptions of new software features as well as changes in existing software features
- Descriptions of software restrictions as well as incompatibilities with previous versions
- Supplementary information from previous release notes that is still valid and has not yet been incorporated into the appropriate manuals
- Corrections to documentation errors and omissions, and references to new locations of information that has been moved

Intended Audience

This manual is intended for all users of the RSX-11M-PLUS Version 4.0 operating system.

Structure of This Document

Chapter 1 describes the major new features developed for this release. The chapter sections are devoted to the major components of the RSX-11M-PLUS operating system. Each component's section contains a description of new software features, restrictions, and supplementary release note information for that system component. This chapter also includes references to new locations of documentation that has been moved.

Chapter 2 contains corrections to omissions and errors in your RSX-11M-PLUS documentation set. Section titles in this chapter are the titles of manuals that require correction. Section numbers and page numbers for corrections are supplied.

Chapter 3 describes new features and restrictions for RMS-11 Version 2.0. Although the RMS-11 version number has not changed since the last release, new features have been added.

Chapter 4 lists the layered products that have been updated for this release and their corresponding directories and documentation files.

Appendix A briefly describes the DIGITAL Equipment Computer Users Society (DECUS). The goals and activities of DECUS are described, and information is provided about becoming a member.

Appendix B describes the Software Performance Report (SPR) and tells you how to fill one out.

Appendix C describes procedures for applying corrections to files on the source disk.

Conventions Used in This Document

The following conventions are used in this manual:

Convention	Meaning
>	A right angle bracket is the default prompt for the Monitor Console Routine (MCR), which is one of the command interfaces used on RSX–11M–PLUS systems. All systems include MCR.
$	A dollar sign followed by a space is the default prompt of the DIGITAL Command Language (DCL), which is one of the command interfaces used on RSX–11M–PLUS and Micro/RSX systems. Many systems include DCL.
xxx>	Three characters followed by a right angle bracket indicate the explicit prompt for a task, utility, or program on the system.
UPPERCASE	Uppercase letters in a command line indicate letters that must be entered as they are shown. For example, utility switches must always be entered as they are shown in format specifications.
command abbreviations	Where short forms of commands are allowed, the shortest form acceptable is represented by uppercase letters. The following example shows the minimum abbreviation allowed for the DCL command DIRECTORY: `$ DIR`
lowercase	Any command in lowercase must be substituted for. Usually the lowercase word identifies the kind of substitution expected, such as a filespec, which indicates that you should fill in a file specification. For example: `filename.filetype;version` This command indicates the values that comprise a file specification; values are substituted for each of these variables as appropriate.
/keyword, /qualifier, or /switch	A command element preceded by a slash (/) is an MCR keyword; a DCL qualifier; or a task, utility, or program switch. Keywords, qualifiers, and switches alter the action of the command they follow.

Convention	Meaning
parameter	Required command fields are generally called parameters. The most common parameters are file specifications. Commas are used as separators for command line parameters and to indicate positional entries on a command line. Positional entries are those elements that must be in a certain place in the command line. Although you might omit elements that come before the desired element, the commas that separate them must still be included.
[g,m] [directory]	The convention [g,m] signifies a User Identification Code (UIC). The g is a group number and the m is a member number. The UIC identifies a user and is used mainly for controlling access to files and privileged system functions. This may also signify a User File Directory (UFD), commonly called a directory. A directory is the location of files. Other notations for directories are: [ggg,mmm], [gggmmm], [ufd], [name], and [directory]. The convention [directory] signifies a directory. Most directories have 1- to 9-character names, but some are in the same [g,m] form as the UIC. Where a UIC, UFD, or directory is required, only one set of brackets is shown (for example, [g,m]). Where the UIC, UFD, or directory is optional, two sets of brackets are shown (for example, [[g,m]]).
. . .	A vertical ellipsis shows where elements of command input or statements in an example or figure have been omitted because they are irrelevant to the point being discussed.
KEYNAME	This typeface denotes one of the keys on the terminal keyboard; for example, the RETURN key.
"print" and "type"	As these words are used in the text, the system prints and the user types.
red ink	In interactive examples, what the user types is printed in red. System responses appear in black.

Chapter 1

RSX-11M-PLUS Software Features and Restrictions

This chapter describes the new software features, restrictions, and supplementary information for the various components of RSX-11M-PLUS.

1.1 Major New Features for RSX-11M-PLUS Version 4.0

RSX-11M-PLUS Version 4.0 supports the following new software features:

- New error logging control file modules
- New General Information (GIN$) Executive directive
- Enhancements to Indirect Command Processor (Indirect)
- Enhancements to terminal driver
- Vectoring for privileged tasks
- Loadable XDT support on all RSX-11M-PLUS systems
- Enhancements to data caching
- New VMR keywords
- Enhanced overlay mapping
- Enhancements to Backup and Restore Utility (BRU)
- Data Terminal Emulation (DTE) and File Transfer (MFT) support for all RSX-11M-PLUS systems

1.2 New Device Support

RSX-11M-PLUS Version 4.0 includes new hardware support for the following devices:

- MicroPDP-11/53 processor
- RX33 diskette drive
- RD31, RD32, and RD54 fixed disk drives
- TU81 and TU81-E magnetic tape drives
- TUK50 magnetic tape drive
- DELUA UNIBUS synchronous communications controller
- DHQ11 8-line multiplexer
- LA75 serial matrix printer
- LCG01 graphics printer
- DFA01, DF112, and DF224 modems
- CXA16 and CXB16 16-line multiplexers
- CXY08 8-line multiplexer
- CXF32/DHF11 32-line terminal interface

Note

Digital Equipment Corporation (DIGITAL) may announce support for new hardware devices on certain processors. However, only devices listed in the Software Product Description (SPD) are guaranteed to be supported by DIGITAL.

1.2.1 Large Disk Support Restrictions

Large disks exceed the previous Files-11 Structure Level 1 restriction on the maximum number of logical blocks. The new restriction allows a maximum of approximately 16 megablocks.

Please note that even though the RSX-11M-PLUS Version 4.0 operating system supports a larger number of logical blocks, support for a larger maximum number of files has not been included. The maximum number of files allowed on a disk is still limited to 65,500.

1.2.2 VT300 Terminals Function in VT200 Mode

In RSX-11M-PLUS Version 4.0, VT300 terminals are supported in VT200 mode only.

To set VT200 mode for your terminal, press the SET-UP key. Then press the ENTER key until the display indicates "VT300 mode."

Use the right arrow key to light up the panel indicating "VT300 mode." Then press the ENTER key again until the panel indicates "VT200 mode."

Next, use the right arrow key to light up the panel indicating "SAVE" and press the ENTER key. This will preserve the setting when you log out. To exit from SET-UP, press the SET-UP key again.

1.2.3 CXF32/DHF11 Module Support

The CXF32/DHF11 32-line serial line unit is a supported device under RSX–11M–PLUS Version 4.0. The device is a quad-height asynchronous terminal interface using fiber-optic technology to link the computer to the terminal concentrator boxes.

The CXF32/DHF11 appears to the system as two separate 16-line devices, each emulating a CXA16. The device has two switchpacks that enable you to select the starting CSR and interrupt vector addresses. The second set of CSR and vector addresses is automatically set by the device logic.

For example, if the CSR address is set to 160500 for the first 16 lines, the second 16 lines' CSR address is automatically set to 160520. The same principle applies to the vector addresses: if the first 16 lines have the interrupt vector set to 300, then the second 16 lines will have an interrupt vector address of 310.

For the pregenerated RSX–11M–PLUS systems, the Autoconfigure task will report that it has found two 'YV'-type devices, each device having 16 lines for each CXF32/DHF11 module in the system configuration. During an online system generation, the peripherals section will ask for the number of 'YV' type devices. The correct response is calculated by taking the total number of CXF32/DHF11 modules in the system configuration and multiplying by two.

For example, if you are generating a system with two CXF32/DHF11 modules, the correct response would be 4. You will then be required to supply the CSR and vector address for all four devices, even though you refer to only two physical devices.

1.3 Distribution Media and File Locations

This section describes changes in the kit formats and the locations of files for RSX–11M–PLUS Version 4.0.

1.3.1 Distribution Media

For all RSX–11M–PLUS Version 4.0 magnetic tape kits, one tape has been removed from the distribution kit. The correction files for layered products have been moved from a separate tape to the tape that contains the BRUSYS standalone copy system. The bootable image is at the front of the tape. BRU is able to skip over the bootable BRUSYS image and read the layered product backup sets, which are placed on the tape after the BRUSYS image.

1.3.2 Location of Files

The components listed in the following sections have been moved to different directories on the RSX–11M–PLUS kits.

1.3.2.1 Shared MCR Components

Vectored versions of the following routines, used by MCR and other MCR tasks, are in the library PRL.OLB:

```
ACTFIL    COT2B     FILBN     FMTDV     GETNUM    GNBLK     GTMNM
GTTSK     KEYWD     MGCML     TISET     BLKSUB    LKLST
```

The sources for these routines are located in directory [76,10]. The unvectored versions are still located in [12,10].

1.3.2.2 Multiuser Utilities

The multiuser utilities are now located together in directory [16,10]. They include the following utilities:

```
BYE     HELLO     ACNT     BRO     PSW     SHUTUP
```

1.3.2.3 File System Utilities

The Files–11 external MCR tasks are now located in their own directory, [20,10]. They include the following tasks:

```
MOU     DMO     INI     UFD
```

1.3.2.4 Executive Utilities

The Executive utilities now all reside in directory [15,10]. Previously, only TKTN was not in this directory.

1.3.2.5 Vectored Tasks

All vectored tasks have been moved from the system UIC to the library UIC. In the kits, all distributed vectored tasks are located in directory [3,54].

1.3.2.6 Command Files

All of the assembly command files are now located in [x,24] directories. They have been modified to place the resulting object files into the [x,24] directories for all components. There is a new assembly command file, XMCASM.CMD (in directory [12,24]), which assembles all of the external MCR components.

1.3.2.7 Listing Files

The assembly command files have been modified to place the resulting listing files into the [x,34] directories for all components.

1.3.3 New Source Kit Restore Procedure

A new backup set, README, has been added to the source kit tape.

Note

The source kit is available as a separate option and is not part of the standard RSX–11M–PLUS distribution kit.

README contains a command procedure, a text file, and a data file. The command procedure restores the backup sets onto a disk. Invoke the command procedure as follows:

1. Restore the README backup set to your disk, which will become your output disk, by entering the following BRU command:

   ```
   BRU /REW/NOINI/UFD/SUPER/BAC:README/VER source destination
   ```

   In this command line, source is the source tape and destination is your output disk.

2. Refer to the file [KITBUILD]README.TXT for help in completing the restore command procedure.

1.4 Crash Dump Analyzer

This section describes the new or modified features documented in the *RSX-11M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual.*

1.4.1 Cache Memory Information

The following new CDA switch displays information on cache memory at the time of a system failure:

/CACHE[:region]

The /CACHE switch produces a listing of information about cache memory at the time of a system failure.

The /CACHE switch is added to the crash input file specification on the CDA command line.

The following command line displays a listing of the cache region named DEMO:

```
CDA>LISTING.LST=INPUT.CDA/CACHE:DEMO
```

The default specification (if you do not specify a region) is /CACHE:CACHE.

1.4.2 Error Messages

The Crash Dump Analyzer produces the following new or modified error messages:

- Cache region is not in memory.
- Cache region was not found.
- Loop found in cache extent descriptors at nnnnn.
- Loop found in cache statistics blocks at nnnnn.
- Loop found in linked list in pool at nnnnn.
- No devices have caching associated with this region.
- Requested partition is not a cache region.

1.4.3 Changes in Documentation

Chapter 1 of the *RSX-11M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual* has been reorganized to reflect the steps you need to take before you can request crash dumps: loading a crash dump driver, obtaining a crash dump after the system fails, and running the CDA program to obtain listings of memory at the time of the system failure.

1.5 DCL

The *RSX-11M-PLUS Command Language Manual* documents the following DCL command:

CLEAR HOST

You can now break and reestablish a connection to a remote terminal that has been established with the SET HOST command. You can break the connection to the remote node by pressing CTRL \ (the control key and a backslash) and then pressing RETURN. The local node responds with a prompt, and you can then enter a CLEAR HOST command to return your terminal session to your local node. If you wish to continue your terminal session on the remote node, you can enter a CONTINUE command after pressing CTRL \.

1.6 MCR

This section describes the new features, keywords, and options for the Monitor Console Routine (MCR) that are documented in the *RSX-11M-PLUS MCR Operations Manual.*

1.6.1 INSTALL Command Search Sequence

If you precede a file name with a dollar sign ($) in the INSTALL command line, INSTALL first searches for the file in default library directory [3,54] and then in the default system directory [1,54]. In that way, the vectored version of a task residing in the library directory is installed.

In addition, when you enter an INS $xxx command (where xxx represents a 1- to 6-character task name), INSTALL first searches for the supervisor-mode version (xxxFSL.TSK) if supervisor mode is supported on the system. INSTALL next searches for the memory-resident version (xxxRES.TSK), and then the "plain" version of the task image file (xxx.TSK). For each type of task, the library directory is searched first, then the system directory. Consequently, the most efficient version of the task is installed.

1.6.2 LOAD Command Search Sequence

The LOAD command searches for device drivers in default library directory [3,54] and then in default system directory [1,54]. In this way, the vectored version of the driver is loaded by default.

1.6.3 Larger Extent Sizes

The maximum size of an I/O request for data caching has been increased from 15 blocks to 127 blocks. The following options support the larger extent size:

- DIRECTORY
- LOGICAL
- OVERLAY
- READ_AHEAD
- VIRTUAL

Note that extent sizes can be modified for cached devices using the SET or MOUNT commands.

1.6.4 New and Modified Keywords

MCR has the following new or modified keywords:

- SET /CACHE=[NO]DEFER_WRITES
- MOUNT /CACHE=[NO]DEFER_WRITES
- SET /CHAR_LENGTH=ttnn:{7 or 8}
- INS /DFB=option
- LOA /FLAGS=word
- SET /[NO]VTLOGON

In addition, the SET /CACHE command now sets the default values for the data caching options at the time the cache is activated for a device. Subsequent commands change only the options specified in the command line; all other options retain the values established when the cache was activated.

SET or MOUNT /CACHE=[NO]DEFER_WRITES

The SET /CACHE and MOUNT /CACHE keywords have been modified to include the DEFER_WRITES option. The DEFER_WRITES option enables data caching of deferred disk write requests. It applies only to temporary files that are insensitive to a system crash, such as the work files used by EDT, MAC, and TKB.

The NODEFER_WRITES option disables data caching of deferred disk write requests.

SET /CHAR_LENGTH=ttnn:{7 or 8}

The SET command keyword /CHAR_LENGTH establishes the length of characters transmitted and received by terminals attached to the system through variable-speed multiplexers. You can specify the character length as either 7 or 8. If you do not specify a length, the system displays the current setting. The default value for transmission is 8-bit characters.

INSTALL /DFB=option

The INSTALL command keyword /DFB=YES allows the binding of Executive data structures to be deferred until a task is loaded into memory. The /DFB=NO keyword allows binding to occur only at the time the task is installed.

The default is /DFB=YES.

LOAD /FLAGS=word

The LOAD command keyword /FLAGS specifies a value (in octal) for the flag word to be passed to an extended Executive partition (EXP) if the EXP supports a flag word. (The Executive Debugging Tool (XDT) is an example of an EXP that supports a flag word. For a description of how XDT interprets the word, see the *RSX-11M-PLUS and Micro/RSX XDT Reference Manual.*)

The /FLAGS keyword is valid only when used with the /EXP keyword.

SET /[NO]VTLOGON

The SET command keyword /[NO]VTLOGON enables or disables logging in to the system on a virtual terminal without affecting physical terminals. Thus, you can use virtual terminals while logins to physical terminals are disabled.

Note

The SET /VTLOGON command has an effect on the system only when logins to physical terminals are disabled.

1.6.5 Changes to the Document

A change in the organization of MCR and TKTN error messages is included in this revision of the *RSX-11M-PLUS MCR Operations Manual.*

Previously, Chapter 3 included error messages specific to a command as part of that command's description. Error messages that were common to more than one command were listed in Appendix A. Now, a complete list of all the error messages returned by MCR and TKTN appears in Appendix A.

1.7 Error Logging

This section describes the new features documented in the *RSX-11M-PLUS and Micro/RSX Error Logging Manual.*

1.7.1 New Control File Modules

The error logging system contains the following new control file modules:

- The DSP8P1 dispatcher module for CPU-detected errors
- The E118x CPU-level module to process memory-parity errors for the PDP-11/73, PDP-11/83, and PDP-11/84 processors

1.7.2 New Error Messages

The Report Generator task (RPT) produces the following new error messages:

- Illegal packet specification
- Format error – invalid character in string in !DP directive

1.8 New Executive Directive GIN$

The General Information (GIN$) directive is documented in the *RSX-11M-PLUS and Micro/RSX Executive Reference Manual.* The GIN$ directive provides general information for user tasks. It instructs the system to perform the function found in the Directive Parameter Block (DPB). The functions in the DPB either set parameters or get information.

1.9 Executive Debugging Tool

The loadable Executive Debugging Tool (XDT) is now available on all RSX–11M–PLUS systems. Previously, loadable XDT was available on pregenerated RSX–11M–PLUS systems only.

Note

When XDT is loaded, the LOAD task displays a message warning that the size of the XDT task is greater than 4K words in size. This is an informational message only, and should be ignored.

Loadable XDT has the following new or modified features in the RSX–11M–PLUS Version 4.0 operating system:

- Entry display has been expanded for loadable XDT.
- Automated searching of symbol addresses listed in the Executive map.

Expanded Entry Display

The expanded entry display shows the contents of the Executive's registers, the kernel stack, and the addresses of the kernel APR 5 and APR 6 mapping registers at the time the system crashes.

Automated Searching of Symbol Addresses

The automated searching of symbol addresses listed in the Executive map requires only that you specify a supported symbol name instead of its address to display the contents at that address.

For more information on loadable XDT, see the *RSX–11M–PLUS and Micro/RSX XDT Reference Manual.*

1.10 Indirect

This section describes the changes and additions to Indirect documented in the *RSX–11M–PLUS Indirect Command Processor Manual.*

1.10.1 Indirect Enhancements

The following enhancements have been made to Indirect:

- It is now possible to delete individual local symbols with the .ERASE SYMBOL directive.
- In using the .TRANSLATE directive, if the optional [num] parameter exceeds the number of translation iterations performed, <EXSTRI> contains the results of the final translation.
- Previously, string symbol values were stored with the symbol descriptor in the symbol table area. Whenever the length of a string symbol value changed, the symbol table area was shuffled to accommodate the new length.

  For Version 4.0, string symbol values are stored in a special internal region that is not shuffled every time a variable is deleted or its value is changed. This new feature is designed to improve performance. To help manage the string symbol storage region, Indirect supports the following special numeric symbols:

<REGSEG> Assigned the number, in octal, of groups of free bytes in the internal string symbol storage region. This symbol can be used to detect severe fragmentation in the region, which occurs because the region is not shuffled after each addition or deletion of a variable.

<REGSIZ> Assigned the number, in octal, of free bytes in the internal string storage region.

1.10.2 The Indirect Pre-Processor

A new utility, the Indirect Pre-Processor (IPP), reads an indirect command file, changes all directives and special symbol notations to a shortened form, and writes a new file that has the shortened command lines in it. The file has the type CMF.

Replacing the multicharacter directives and symbols with a 2-character short form reduces the size of command files. In addition to reducing disk space requirements, the short forms improve performance. Fewer disk accesses are required to read the command files when they are shorter, and more command lines can be memory resident at any one time in the internal command file block buffers.

In general, indirect command files that are executed frequently (for example, LOGIN.CMD) benefit the most from preprocessing. Files that are subject to frequent change do not benefit as much.

1.10.3 Error Messages

The following error messages are new or have not been documented before:

- .EXIT without .END
- File attributes not available

1.11 I/O Drivers

This section describes the new features and enhancements documented in the *RSX-11M-PLUS and Micro/RSX I/O Drivers Reference Manual.*

1.11.1 Terminal Driver

The full-duplex terminal driver (TTDRV) includes the following enhancements:

- Support for the following terminal characteristics:

Characteristic	Function
TC.SXL	Printer supports sixel graphics
TC.MAP	Local Area Terminal (LAT) mapping
TC.QDP	Connect/disconnect/queue-depth of LAT application terminal
TC.CLN	Define character length for terminals

- Nonprivileged tasks can now issue the breakthrough-write subfunction (IO.WBT) to the task's terminal. However, nonprivileged tasks cannot issue IO.WBT to other terminals.

- To improve task performance, TTDRV no longer uses intermediate buffers when performing Q-bus direct memory access (DMA) using the I/O function for writing a logical block and passing all characters (IO.WAL).
- It is now possible to set the terminal characteristics TC.OOB, TC.ICS, TC.MHU, and TC.SCA if the terminal is attached by the task and regardless of whether the terminal is attached with asynchronous system trap notification (IO.ATA).
- The terminal driver now contains a new hardware 7- or 8-bit characteristic, TC.CLN, that defines character length. This characteristic is defined in the TTSYM module. The characteristic can be set using the DCL command SET TERMINAL/CHARACTER_LENGTH:n or the MCR command SET /CHAR_LENGTH=TTnn:, as shown in Section 1.11.2.
- Control characters that are declared out-of-band (OOB), using the TC.OOB characteristic, no longer perform any special functions.

1.11.2 Setting Character Length for Terminals

The /CHARACTER_LENGTH command qualifier sets the length of characters transmitted and received by terminals attached to the system through a variable-speed multiplexer. The qualifier is not valid for DL11 serial line units. You can specify the character length as either 7 or 8. The default value for transmission is 8-bit characters. The DCL and MCR command lines are as follows:

$ SET TERMINAL [ttnn:]/CHARACTER_LENGTH:{7 or 8}
> SET /CHAR_LENGTH=TTnn:[7/8]

A nonprivileged user can set the length only for TI. A privileged user can set the length for any terminal.

$ SHOW TERMINAL [ttnn:]/CHARACTER_LENGTH
> SET /CHAR_LENGTH=TTnn:

Displays the length of characters transmitted and received by terminals attached to the system through a DH11, DHU11, DHV11, DZ11, DZQ11, or DZV11 variable-speed multiplexer. Note, however, that the command is not valid for DL11 multiplexers.

A nonprivileged user can display the character length setting for any terminal.

1.12 Guide to Writing an I/O Driver

Appendix A, "System Data Structures and Symbolic Definitions," has been moved to the *RSX-11M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual.*

1.13 The Queue Manager

This section describes the new or modified features documented in the *RSX-11M-PLUS Batch and Queue Operations Manual.*

It is now possible to inhibit the automatic issuance of form feeds prior to starting a print job by using the /ADJACENT qualifier to the PRINT command.

Previously, the procedure for printing a file included sending an automatic form feed to the printer. This ensured that the new file would not start printing on the last page of the preceding file and that it would be aligned at the top of a new page. In addition, if the printer was an LA50/LA100-type device, an extra blank page was created as a by-product of the escape sequences that initialized the printer for each job.

Inhibiting form feeds is fully compatible with the previous PRINT operation in which the /ADJACENT qualifier was not specified.

This qualifier causes a print job to start at the point at which the preceding job finished. For example, if the preceding job finished in midpage, the new one commences on the next line. In print jobs that specify multiple files, each file starts at the point at which the preceding file finished. The default is /NOADJACENT.

Note

The page length of some printers (for example, the LA50, LA100, and LA120 printers) is established by an escape sequence prior to printing. These printers start a print job at the top of a new page if the /FORMS:n qualifier specified differs from that specified for the preceding job.

Other printers (for example, LN01 and LN03) require a form feed at the end of each print job to eject the last sheet from the printer. These printers always begin a print job at the top of a new page and are unaffected by the /ADJACENT qualifier.

1.14 System Generation and Installation

This section describes the new features documented in the *RSX-11M-PLUS System Generation and Installation Guide.*

1.14.1 New Features for RSX-11M-PLUS SYSGEN

The following sections describe new features for generated RSX-11M-PLUS systems.

1.14.1.1 Update Procedure

The Update procedure is no longer required or supported for RSX-11M-PLUS. DIGITAL will now issue maintenance releases consisting of completely remastered kits at regular intervals. Relevant documentation will be included in these releases.

1.14.1.2 New SYSGEN Questions

The following new SYSGEN questions have been added:

- A new Rebuilding the System Supplied Tasks question has been added that concerns tasks linked to the FCSRES and FCSFSL libraries.
- A new Peripheral Configuration question has been added concerning remote lines for YV-type multiplexers.

1.14.1.3 Vectored Privileged Tasks

The RSX-11M-PLUS operating system includes support for vectoring privileged tasks. Previously, privileged tasks had to be built each time the system was generated. Only nonprivileged tasks could be executed without being rebuilt.

Now, certain privileged tasks do not need to be rebuilt. These vectored tasks are supplied separately as task images. As a result, the system generation procedure Building Privileged Tasks (BP) no longer includes them. Instead, you have a choice: you can use the current task images, or you can have them rebuilt. If you decide to rebuild the tasks, they are built during the Rebuilding the System Supplied Tasks procedure (BN), which was previously for nonprivileged tasks only.

Vectoring privileged tasks saves time during system generation because fewer tasks need to be rebuilt. Vectoring also improves the portability of privileged tasks. Tasks that were previously "system specific" (that is, bound to the Executive for which they were built) are now system independent. They can be used with any RSX-11M-PLUS Version 4.0 (or later) Executive. Any task that was vectored on a previous version of RSX-11M-PLUS will run on subsequent versions.

1.14.2 Pregenerated Kit Installation

This section describes the changes for Version 4.0 that are specific to the pregenerated RSX-11M-PLUS systems.

1.14.2.1 New and Modified SYSPARAM.DAT Statements

This section describes new and modified statements, in alphabetical order, for the configuration data file, LB:[1,2]SYSPARAM.DAT. Following the descriptions is a listing of the statements as they appear in the configuration file supplied with your pregenerated RSX-11M-PLUS system. See the listing for the default arguments of the statements described in this section.

The steps for the startup procedure have also been changed to include these new statements.

CACHE=(CREATE=CACHE)

If you wish to enable data caching on the system device, enable or modify this option.

COMM_EXEC=yes/no

If you do not have DECnet, but require the Communications Executive for products such as RSX/PSI, enable this option.

CRASH_DEVICE=none/ddnn:

The default is none. If you wish to have a crash driver loaded at STARTUP time, change the "none" to the device name for the crash device (for example, DU3:).

MODEM_PARAMETER=n

The modem parameter determines the terminal driver characteristics for handling remote ("dial-up") terminal lines. The value of argument n determines when the Data Terminal Ready (DTR) signal is enabled and whether or not the system disconnects the remote line immediately upon loss of the carrier signal.

Specify one of the following values for n:

0 The DTR signal is enabled when the modem detects a signal on the remote line. The system disconnects the line 2 seconds after loss of the carrier signal.

1 The DTR signal is enabled when the modem detects a signal on the remote line. The system disconnects the line immediately upon loss of the carrier signal.

2 The DTR signal is enabled when the terminal line is set to remote. The system disconnects the line 2 seconds after loss of the carrier signal.

3 The DTR signal is enabled when the terminal line is set to remote. The system disconnects the line immediately upon loss of the carrier signal.

Note

For most European telephone systems, the correct value of this parameter is 1. The value provided in the configuration file for this parameter (2) is generally correct for the United States telephone system.

SECONDARY_POOL=n

The SECONDARY_POOL statement in LB:[1,2]SYSPARAM.DAT, the configuration data file, has been modified to accept values for n in 32-word blocks (in octal). Previously, values for n were specified in octal words.

For more information on the SECONDARY_POOL statement, see the *RSX-11M-PLUS System Generation and Installation Guide.*

XDT=yes/no/n

If you wish to have loadable XDT loaded at startup time, specify YES or a value n. A value of 1 or 3 will enable the extended display of registers for XDT upon unexpected entry. A value of 2 or 3 will disable the display of XDT's startup messages.

Note

When XDT is loaded, the LOAD task displays a message warning that the size of the XDT task is greater than 4K words in size. This is an informational message only, and should be ignored.

Optional SYSPARAM.DAT Statement

MOUNT=ddnn:[label[/keyword...]

If you want to have additional disk volumes mounted during STARTUP, you may insert the MCR MOUNT command in the SYSPARAM.DAT file.

SYSPARAM.DAT Statements

This section lists the statements contained in the configuration file ([1,2]SYSPARAM.DAT) that is supplied with your pregenerated RSX-11M-PLUS system.

The statements preceded by a semicolon (;) are ignored by the system startup procedure. You can edit the configuration data file to remove the semicolons and to activate these statements, or to change their arguments.

```
;DECNET=option
;COMM_EXEC=YES
;CACHE=(CREATE=CACHE)
DAPRES=NO
CONFIGURE=NONE
CON_ONLINE_ALL=YES
CHECKPOINT_SPACE=512.
SECONDARY_POOL=0
QUEUE_MANAGER=YES
BATCH_PROCESSORS=1.
STEP_DISPLAY=YES
LONG_TEXT=NO
COMMANDS=NO
PARAMETERS=YES
ERROR_LOG=YES
ERROR_SIZE=100
ERROR_LIMIT=3
ERROR_DISPLAY=NO
ACCOUNT_FILES=2
STARTFILE=NONE
XDT=NO
CRASH_DEVICE=NONE
;MOUNT=DU1:OTHERDISK/PROC=UNIQUE/SYS
;DRIVER=LP:
;PRINTER=LP0,FORM:0,FLAG:1
;TERMINAL=TT1,LA50,Fixed,LOWER
;SET=TT1,/FORMFEED/NOBROADCAST
;PRINTER=TT1,FORM:0,FLAG:1
;SET=TT2,/SLAVE
MODEM_PARAMETER=2
CLI=MCR
LOGOUT=YES
```

1.14.2.2 Autoconfigure Clock Change

RL02 pregenerated kits have additional information in the parameter file ACFPAR.DAT. The processor type and the clock frequency are now included as the first two entries in the file.

The format of the parameter file is as follows:

```
CPU=11/83
LIN=60
CON=DUA,CSR=172150,VEC=154,UNI=(4,0)
CON=YLA,CSR=177560,VEC=60,UNI=(1,0)
CON=YVA,CSR=160440,VEC=300,UNI=(8,0)
```

1.14.3 Changes to the Document

The following changes in organization are included in this revision of the *RSX-11M-PLUS System Generation and Installation Guide*:

- The section previously named Building the Nonprivileged Tasks has been changed to Rebuilding the System Supplied Tasks.
- Information on general features and system tuning that was previously included in Appendix C of this manual has been moved to the *RSX-11M-PLUS and Micro/RSX System Management Guide*.

1.15 System Management

The following new system management features are supported on RSX-11M-PLUS Version 4.0 operating systems and documented in the *RSX-11M-PLUS and Micro/RSX System Management Guide*:

- Data caching enhancements
- New VMR keywords

1.15.1 Data Caching Enhancements

This section describes data caching enhancements for the RSX-11M-PLUS Version 4.0 operating system.

1.15.1.1 Data Caching Default Values

Prior to this release, the MCR command SET /CACHE used default values for any of the options not explicitly called out in the command line. Now, the SET command sets the default values for the data caching options at the time the cache is activated for a device. Subsequent commands change only the options specified in the command line; all other options retain the values established when the cache was activated.

1.15.1.2 Deferred Disk Write Requests

Deferred disk write requests (DFRs) are now a data caching option. If data caching is selected at system generation, you can enable DFRs for temporary files when you mount a disk or when you set device characteristics. DFRs are a useful way of speeding up I/O operations for temporary files on your system disk or on disks that are relatively slow writing data. The option can be used only for temporary files that are insensitive to a system crash.

You can select the option by using one of the following commands:

```
>SET /CACHE=ddnn:(DEFER)

>MOU ddnn:volumelabel/CACHE:(DEFER)

$ SET DEVICE ddnn:/CACHE:(DEFER_WRITES)

$ MOUNT ddnn:volumelabel/CACHE:(DEFER_WRITES)
```

1.15.1.3 Read Requests to Extents with the DFR Attribute

Previously, the Data Cache Manager (DCM) ensured that the data within the cache extents matched the data on the disk. If a single cache extent contained the entire area to be read by a request, DCM used the data from the extent. However, if a single extent did not contain the request, or if the request overlapped only part of an extent, DCM transferred the data from the disk without using the data or structures within the cache.

Now, if you do not specify the NODEFER_WRITES option, deferred write request (DFR) support is enabled. DCM processing remains the same for requests to areas contained completely within one cache extent. However, processing is modified for read requests that overlap part of one or several extents with the DFR attribute. When a read request is not contained within one extent, DCM processes the read request, as follows:

1. DCM reads the entire area (including unrevised, or "old," data) from the disk into the user's buffer.
2. DCM overlays "new," or modified, data from the extent (which contained part of the read request) into the buffer. The new data from the extent supersedes the old data from the disk.

Before an extent with the DFR attribute can be used to service a write request, DCM must complete both steps.

1.15.1.4 Write Requests to Extents with the DFR Attribute

Previously, cache support for write operations extended only to areas that were loaded into the cache by a prior read operation. If a write request mapped completely into a cache extent, DCM updated the cache and wrote the data out to the disk. If only part of a current disk extent covered the request, DCM deleted the extent and passed the original request to the disk driver.

Now, if DFR support is enabled and a file is marked for deletion, DCM does not write data out to the disk. If a write request maps completely into a cache extent, DCM updates the cache only. Because data is not written out to the disk, the disk contains old data. To prevent the loss of new data, DCM labels the cache extent with the DFR attribute. Then, it stalls any subsequent I/O requests to the extent until the DFR extent is written to the disk.

An I/O stall must occur to prevent the new data from the latest request from being superseded by the old data in the cache extent. If the I/O request is not stalled, the timing or selection of the device drivers could result in the loss of new data.

1.15.1.5 Larger Extent Sizes for Data Caching

The maximum size of an I/O request for data caching has been increased from 15 blocks to 127 blocks. The following options support the larger extent size:

- [NO]DIRECTORY
- [NO]LOGICAL
- [NO]OVERLAY
- [NO]READ_AHEAD
- [NO]VIRTUAL

Note that extent sizes can be modified for cached devices using the SET command.

1.15.2 New VMR Keywords

This section describes two new keywords for the Virtual Monitor Console Routine (VMR) task.

INSTALL Command Keyword /DFB

The INSTALL command keyword /DFB=YES allows the binding of Executive device logical unit number (LUN) assignments to be deferred until a task is loaded into memory. The /DFB=NO keyword allows binding to occur only at the time the task is installed.

The default is /DFB=YES.

SET Command Keyword /CHAR_LENGTH

The SET command keyword /CHAR_LENGTH establishes the length of characters transmitted and received by terminals attached to the system through variable-speed multiplexers.

You can specify the character length as either 7 or 8 bits. If you do not specify a length, VMR displays the current setting. The default value for transmission is 8-bit characters.

This keyword is not valid for serial line units.

1.15.3 Changes to the Document

The following changes in organization are included in the *RSX-11M-PLUS and Micro/RSX System Management Guide*:

- Shuffler task (moved)
- Secondary pool (new addition)
- Catchall task (new addition)

Shuffler Task

Previously, the Shuffler (SHF) task was described in its own chapter. Information on the Shuffler is now contained in Chapter 8.

Secondary Pool

Information on secondary pool support is now provided in Chapter 8.

Catchall Task

Information on the catchall task (TDX) is now provided in Chapter 19.

1.16 Task Builder

This section describes the new features documented in the *RSX-11M-PLUS and Micro/RSX Task Builder Manual.*

1.16.1 RNDSEG Option

The RNDSEG option causes the Task Builder (TKB) to round the size of a named segment up to the nearest APR boundary while building a resident library.

1.16.2 The OTS Fast Map Routine

The Object Time System (OTS) is a set of routines that is automatically included in any overlaid task built by TKB. One of these routines, MARKS, controls the unloading of overlays as the task executes. The OTS Fast Map routine can be called by versions of MARKS used for memory-resident overlays. The OTS Fast Map routine uses the RSX-11M-PLUS fast-mapping facility to map windows for autoloaded memory-resident overlays.

The OTS Fast Map routine enables you to use fast mapping for autoloaded memory-resident overlays, thereby increasing the speed of overlay mapping by approximately 10 times. It saves time by using fast mapping whenever possible instead of the mapping directives CRAW$ and ELAW$ after the initial loading and mapping of an overlay.

1.16.2.1 OTS Fast Map Restrictions

The OTS Fast Map routine uses the RSX-11M-PLUS fast-mapping facility, which means that the task must not use the IOT instruction for any purpose except fast mapping. (For more information on the fast-mapping facility, see the *RSX-11M-PLUS and Micro/RSX Executive Reference Manual.*)

Caution

Be sure to use both the Task Builder and system library supplied for your system to ensure that the correct OTS modules are incorporated in your task. If you use the Version 4.0 Task Builder with an incompatible (older) version of SYSLIB to build an autoloaded overlaid task, you will be issued the following new fatal error message:

```
TKB -- *FATAL* -- Incompatible OTS module
```

Conversely, if you use the Version 4.0 SYSLIB with an older version of the Task Builder, the OTS module FSTMAP will be automatically included in any task built, but the module will not be accessible. However, the FSTMP module will not affect the execution or performance of your task.

1.16.3 New Switch and Qualifier

/FO

The /FO switch causes the Task Builder to include the overlay run-time system (OTS) fast-mapping module FSTMAP in the task image.

/CODE:OTS_FAST

The /CODE:OTS_FAST qualifier specifies that the overlay run-time system (OTS) fast-mapping module FSTMAP be included in the task.

1.16.4 New Error Messages

TKB produces the following new error messages:

- Cluster library element, element-name, is not resident overlaid
- Incompatible OTS module

1.17 Utilities

The *RSX-11M-PLUS Utilities Manual* documents new and modified features for the RSX-11M-PLUS utilities.

1.17.1 Backup and Restore Utility

This section describes a new qualifier, new features, and new messages for the Backup and Restore Utility (BRU).

New BRU Qualifier

BRU has the following new qualifier:

/IDENTIFICATION

Directs BRU to identify itself by displaying its version number. This qualifier may be specified on a command line alone or in combination with other qualifiers.

New BRU Features

BRU has the following new or modified features:

- Files are restored to mounted volumes faster. The overlay description used to build BRU has been modified. Overlay loads are no longer necessary for creating a file on a mounted output volume.
- Backup sets cannot be appended to continuation volumes. Previously, if you used the /APPEND qualifier for a volume other than the first, the backup set could not be restored. BRU now restricts the use of /APPEND to the first volume.
- Output volumes that are allocated and mounted by another user cannot be initialized. Previously, the /INITIALIZE qualifier could be used to initialize any output volume. BRU no longer initializes an output volume allocated and mounted by another user. This feature prevents users from corrupting volumes other than their own.

- Access to a device allocated and mounted by another user is no longer allowed.
- BRU displays descriptive messages when a device is not mounted properly. BRU requires certain combinations of qualifiers to determine the volume type and mount status of a device. If you specify a combination of BRU qualifiers that is inconsistent with the mount status of a device, BRU displays one of the following two messages:
  - BRU—*FATAL*—Device not mounted files 11 on ddnn:
  - BRU—*FATAL*—Device not mounted foreign on ddnn:

BRU Messages

The following messages are also new for RSX–11M–PLUS:

- BRU—*FATAL*—Cannot append on continuation volume
- BRU—BRU version xx.xx

1.17.1.1 BRU Restriction

The /LENGTH qualifier should not be used with cartridge tape devices such as the TK25 and TK50.

1.17.2 Terminal Emulation for All RSX Systems

RSX–11M–PLUS and all other RSX operating systems now support the Data Terminal Emulator (DTE) and the File Transfer Utility (MFT).

To establish terminal emulation between a local RSX–11M–PLUS system and a host system, you can use the DCL command SET HOST/DTE or the MCR command DTE. The options for the MCR command perform the same functions as the options for the DCL command. However, to display the version of the DTE task, MCR supports the /IDENTIFICATION (/ID) option (instead of the DCL option /VERSION).

DTE now supports the DFA01 modem.

1.17.3 New DTE Message

The following new message has been added to DTE:

- ? DTE-F-MODERR, Unable to determine modem type

1.17.4 Modifications to the File Transfer Utility

MFT has superseded the Professional Series File Transfer Utility (PFT). The command syntax used to perform file operations with MFT depends on the command line interpreter (CLI) used by the host operating system. If your local terminal is a Professional 300-series computer, you may want to use the Professional Forms Interface or the PFT Command Line Format (CFT) instead of MFT.

To use the forms interface, enter the command MFT /FORM or install MFT as an MCR spawnable task with the task name ...PFT. To use CFT, substitute the command MFT for the command PFT on all command lines shown in the *PRO/Communications User's Guide*. (For a complete description of PFT and CFT command lines, see the *PRO/Communications User's Guide*.)

1.17.5 File Dump Utility

The new File Dump Utility (DMP) switch, /LIM:n:m, specifies the range of bytes n to m of each record or block to be dumped.

1.17.6 Librarian Utility Program

The Librarian Utility Program (LBR) now recognizes lowercase and uppercase letters in macro directives.

1.17.7 Disk Volume Formatter

The FMT /DENS switch and the DCL INITIALIZE/FORMAT command qualifier /DENSITY now allow formatting of an RX33 diskette. To format an RX33 diskette as an RX33, the unit must be mounted foreign. The /DENS switch is the only applicable switch for formatting an RX33, and HIGH is the only valid density.

1.17.8 Changes to the Document

The following changes in organization and additions to the *RSX-11M-PLUS Utilities Manual* have been made:

- The chapters on the utilities have been alphabetized according to the 3-character utility names. Chapter 1 is an introductory chapter.
- Appendix C, which describes the Data Terminal Emulator (DTE) and the File Transfer Utility (MFT), has been added.

1.18 MACRO-11

This section describes information from the previous version that applies to MACRO-11. Although this information is not new for RSX-11M-PLUS Version 4.0, it is still valid.

The following MACRO-11 features are supported:

- Support for logical names
- Supplementary MACRO-11 information

1.18.1 Support for Logical Names

MACRO-11 fully supports RSX-11M-PLUS logical names by calling the .CSI4 SYSLIB parsing routine.

1.18.2 Supplementary MACRO-11 Information

This section describes the following features of MACRO-11:

- RSX-11M-PLUS changes for Version 5.4
- Use of colon in .ASCII and .ASCIZ strings
- MCS support
- Corrections to the Version 5.1 assembler
- Corrections to the Version 5.0 assembler

1.18.2.1 RSX-11M-PLUS Changes for Version 5.4

There were no specific changes made to MACRO-11 V5.4 for RSX-11M-PLUS.

1.18.2.2 Use of Colon in .ASCII and .ASCIZ Strings

MACRO-11 does not allow the colon (:) as a delimiter for .ASCII or .ASCIZ strings. This is documented in Chapter 6 of the *PDP-11 MACRO-11 Language Reference Manual*.

1.18.2.3 MCS Support

MACRO-11 Version 5.2 provided support for the 8-bit DEC Multinational Character Set (MCS). See Appendix A of the *PDP-11 MACRO-11 Language Reference Manual* for a table on MCS.

The following table lists the directives that support the MCS. The corresponding section numbers are locations in the *PDP-11 MACRO-11 Language Reference Manual* where you can find information about each directive.

Macro	Section
.ASCII directive	6.3.4
.ASCIZ directive	6.3.5
.ERROR directive	7.5
.IF directive	6.9.1
.IF DIF	
.IF IDN	
.IFF directive	6.9.2
.IFF DIF	
.IFF IDN	
.IRP directive	7.6.1
.IRPC directive	7.6.2
.NCHR directive	7.4.2
.PRINT directive	7.5
.REM directive	6.1.6
.SBTTL directive	6.1.3
.TITLE directive	6.1.2

See the *PDP-11 MACRO-11 Language Reference Manual* for further information on the 8-bit DEC Multinational Character Set.

1.18.2.4 Corrections to the Version 5.1 Assembler

MACRO–11 set bit 3, an unused bit, in all .PSECT object records. MACRO–11 no longer sets bit 3. That change makes object files created with the new version of MACRO–11 different from object files created with previous versions of MACRO–11. As a result, they will have different PAT checksums, and a binary comparison of the files will show differences. However, the resulting task or SAV image files will be the same.

1.18.2.5 Corrections to the Version 5.0 Assembler

- The op code CALLR addr (Call-Return) has been added to the permanent symbol table (PST). This op code is equivalent to the JMP addr op code. The CALLR addr op code was added to complement the CALL addr op code, which is equivalent to the JSR PC,addr op code.
- The previous version of MACRO–11 used a range of 64$ to 127$ for automatic local-symbol generation. Now, MACRO–11 uses a range of 30000$ to 65535$ when generating local symbols.
- Most assembler-generated listing text is now in upper- and lowercase. This change was made to make MACRO–11 code more readable. Lines of code that include the .SBTTL or the .TITLE directive are not converted to uppercase.
- Lines of code that include the .SBTTL directive are listed in the table of contents of an assembly listing, even if an .NLIST statement is in effect at the time the .SBTTL lines are encountered. You may specify the .NLIST directive with the TOC argument to prevent the table of contents from being printed.
- The symbol table is printed at the end of an assembly, even if the .NLIST directive is in effect. You may specify the .NLIST directive with the SYM argument to prevent the symbol table from being printed.
- All page headers include the day of the week.
- The assembler statistics information that appears at the end of the assembly listing file has been updated to include the following additional information:
  - Total number of virtual work-file reads
  - Total number of virtual work-file writes
  - Maximum amount of virtual memory used (in words and pages)
  - Size of physical memory free space (in words and pages)
  - Operating system and environment that the assembler is running under
  - Total elapsed assembly time
  - MACRO–11 command line
- The .PSECT synopsis that is printed in the listing file, after the symbol table, includes the program section attributes.
- The maximum number of relocatable terms in a complex expression has been changed. The maximum size of an OBJ record that MACRO–11 can produce was increased from 42_{10} bytes to 128_{10} bytes.

Do not compare OBJ files that have been created by different versions of MACRO-11 when verifying whether your code generation is correct. Changes that have been made for this version of MACRO-11 (mentioned above) will invalidate a direct comparison of assembler OBJ output. Verify code generation by linking or task building the OBJ files involved and then comparing the SAV or the TSK image files.

Note

Because the OBJ files produced by this version of MACRO-11 are different, users of PAT (Object Module Patch Utility) are warned that checksums must be recomputed on any object patches assembled with this version of MACRO-11.

- The default for the LC argument has been changed from .DSABL LC to .ENABL LC.
- The following .ENABL/.DSABL options have been added:
  - .ENABL LCM/.DSABL LCM
  - .ENABL MCL/.DSABL MCL
- The following directives have been added to MACRO-11. These directives are documented in the *PDP-11 MACRO-11 Language Reference Manual*:
  - .CROSS
  - .INCLUDE
  - .LIBRARY
  - .MDELETE
  - .NOCROSS
  - .REM
  - .WEAK

1.19 DECmail-11

This section describes information from the previous version that applies to DECmail-11. Although this information is not new for RSX-11M-PLUS Version 4.0, it is still valid.

1.19.1 Named Directory Support

DECmail-11 supports the use of named directories in addition to UICs for folder names, distribution lists, batch control files, and other file specifications. UICs will still be required in the user name file (NAMES.DAT), used as input to NAMES.TSK, which controls the registration of mail users on your system.

1.19.2 DECmail-11 Restriction

DECmail-11 Version 2.0 does not support the use of extended logical names in file specifications. While using logical names will work in some cases, you should avoid using them, especially in cases where the logical name is longer than the corresponding physical name. Using the underscore character (_) to indicate a physical device rather than a logical device of the same name also will not work; the logical name will be used instead of the physical device name.

Chapter 2
Corrections to Documentation

This chapter corrects errors and omissions in the RSX–11M–PLUS documentation. The section titles in this chapter are the titles of manuals that require correction.

2.1 RSX–11M–PLUS Indirect Command Processor Manual

Please make the following changes to Chapter 2 of the *RSX–11M–PLUS Indirect Command Processor Manual*:

- Change the final sentence in Section 2.4.2 to read as follows:

  See Section 2.4.6.1 for more information.

- Delete the following text in Section 2.6.22:

  Task not installed in system (.XQT, .WAIT)

- Replace the example in Section 2.6.26 with the following:

  The following example is from an interactive terminal session:

```
> @ti: RET
AT.> .enable substitution RET
AT.> .sets a "1,2," RET
AT.> .parse a "," b c d RET
AT.> ;'b' RET
>;1
AT.> ;'c' RET
>;2
AT.> ;'d' RET
>;                                  (null substring)
AT.> .parse a "," b c RET
AT.> ;'b' RET
>;1
AT.> ;'c' RET
>;2,
AT.> CTRL/Z
>@ <EOF>
>
```

2.2 RSX-11M-PLUS and Micro/RSX Task Builder Manual

Please make the following changes to Chapter 5 of the *RSX-11M-PLUS and Micro/RSX Task Builder Manual*:

- Add the following note to Section 5.2.9.2:

  Caution

  This command file example will only work for FMS Version 2.0.

- Change all references to FORTRAN IV-PLUS in Chapter 5 to FORTRAN-77. FORTRAN IV-PLUS is no longer supported.
- Change all references to F4PRES in Chapter 5 to F7FRES.
- Change all references to F4P in Chapter 5 to F77.
- Replace the TKB command sequence in Section 5.4.2 with the following:

```
TKB> VSECT,VSECT/-SP=VSECT,LB:[1,1]F77FCS/LB [RET]
TKB> / [RET]
Enter Options:
TKB> WNDWS=1 [RET]
TKB> VSECT=MARRAY:160000:20000:200 [RET]
TKB> // [RET]
>
```

  Or, if you use LINK, use the following command sequence:

```
$ LINK/TAS/MAP:VSECT/NOPRINT/OPT VSECT,LB:[1,1]F77FCS/LIB [RET]
Option? WNDWS=1 [RET]
Option? VSECT=MARRAY:160000:20000:200 [RET]
Option? [RET]
$
```

- Replace FOROTS.OLB with F77FCS.OLB in the second paragraph under the command sequence in Section 5.4.2.

Chapter 3
RMS–11 Version 2.0 Release Notes

This chapter describes new features, restrictions, corrections to the software, and supplementary information for RSX–11M–PLUS Version 4.0.

RMS–11 Version 2.0 has not changed version numbers for this release of RSX–11M–PLUS. Information in this chapter has not been incorporated into the RMS–11 manuals.

3.1 New Features

This section describes new features that have been added to RMS–11 for RSX–11M–PLUS Version 4.0.

3.1.1 Enhancements to RMSDES Utility

The following enhancements have been made to the RMSDES utility:

- There are two new RMSDES commands: SAVE_S[UPERSEDE] and EXIT_S[UPERSEDE].
- RMSDES issues the warning message "%DES-W-CBK, Continuation buckets will be allocated for this key" when continuation buckets are required. (Continuation buckets may result in decreased performance; see the *RSX–11M/M–PLUS RMS–11 User's Guide*.)
- The informational message "?DES-F-VOR, Value out of legal range" is issued if overflow occurs during calculations of indexed file area allocations. Also, the "number of duplicates:" prompt has been expanded to "number of duplicates per record on this key:" for clarity.
- The error message "%DES-F-NHF, Help file is not available. Check release notes for the location of RMSDES.IDX on your installation media." is issued if the help file LB:[1,2]RMSDES.IDX is not found.

  This is a feature for small systems that have limited disk space.

3.2 Software Restrictions

This section describes software restrictions that apply to RMS–11 Version 2.0.

3.2.1 Restrictions to RMS–11 Access Methods

- RMS–11-based applications that use block I/O and attempt partial block writes to an RP03 drive fail when the data length is not doubleword aligned. RMS–11 returns ER$WER (write error) as primary status (STS) and IE.BYT (illegal byte count for I/O) as secondary status (STV).

  The RMS–11-based applications will perform partial writes on the last block of a file in order to have RMS–11 properly record the end-of-file attribute. This affects the DECnet file transfer programs Network File Transfer (NFT) and File Access Listener (FAL), as well as the RMS–11 utilities.

  This problem can be solved in the following manner:

  Do not use RMS–11-based programs for simple local copy operations. Because remote copy operations cause DCL to invoke NFT on the user's behalf, you should perform these transfers in two steps: Use NFT to transfer the file to a non-RP03 disk, and then use the COPY command to transfer it to the RP03. Do not use a file that was closed after an IE.BYT error was reported, because the file will be incomplete.

- RMS–11 tasks built prior to Version 3.0 of RSX–11M–PLUS will return the error message "Directory not found" (ER$DNF) on certain file operations that are executed from an account set to nonamed directory mode. This will occur if one or both of the following conditions are true:

  — The tasks were not built against the RMS–11 resident library.

  — A directory is not provided in either the file specification or the default file specification.

  You can resolve this problem by first providing a directory in the file specification, or setting your terminal to named directory mode. If that is not possible, you should rebuild those tasks using the new version of RMS–11.

3.2.2 Restrictions to RMS–11 Utilities

The following sections describe restrictions to the RMS–11 utilities for Version 2.0.

3.2.2.1 RMSBCK Restriction

RMSBCK produces unreliable tape container files when the date switches are in effect. The /CD (Creation Date) switch and the /RV (Revision Date) switch, in conjunction with the :A (after) and :B (before) suffix characters, are restricted for this release. While the summary messages claim that the correct number of blocks were copied to tape, and RMSDSP reports (using the /BP switch) that the correct number of blocks are in each file of the tape container, the backup is not complete.

For performance reasons, RMSDSP consults only the header information for each file in the tape container. When a restore is attempted, only the first file in the container is restored with

data; the other files are restored as zero-length files. Because of the incorrect logic involving the date switches, RMSBCK fails to back up the remaining data.

Do not use the date switches until this problem is corrected.

3.2.2.2 RMSDES Restriction

RMSDES handles default devices incorrectly when the GET and SAVE commands are issued. The default device is initialized by TKB to the device that RMSDES is installed from. If a HELP command is issued, the default device is reset to LB:. The CREATE command resets the default device to the file specification passed with that command, or to SY: if no explicit device is present in the design buffer. The GET and SAVE commands will use whichever of these defaults has occurred most recently.

To avoid this problem, use explicit device names (logicals are permitted) in file specifications in the design buffer or in the GET and SAVE commands.

3.2.2.3 RMSDEF Restriction

The DCL command DEFINE defines logical names; therefore, when you invoke RMSDEF, you need to either invoke MCR before typing DEF (to use the MCR mode of DEF instead of the default DCL mode), or insert the following in the LB:[1,2]STARTUP.CMD file:

```
INSTALL LB:[3,54]RMSDEF/TASK=...DFN (or a task name of your choice)
```

3.2.2.4 RMSIFL Restrictions

- RMSIFL uses a sort algorithm that, when called upon to sort on a key, does not preserve the first-in/first-out (FIFO) ordering of duplicates. For alternate keys, it is necessary to deal with this problem by using RMSCNV. If the only concern is ordering of duplicates in the primary key, then as long as your input file is an indexed file or a file sorted on the primary key, you can use RMSIFL/NOSO.
- RMSIFL fails to correctly report exit status when errors occur while loading a file that has more than one alternate key. If the first alternate key has been loaded without errors, the internal exit status is incorrectly set permanently to success. Any recoverable errors reported on subsequent keys are not reflected in the task's final exit status. This can cause command files or batch jobs to function incorrectly.

  To avoid problems that may be caused by this condition, check your command procedures to make certain that input files are not automatically deleted.

3.2.2.5 RMSCNV Restriction

RMSCNV ignores user-provided area extension quantities when loading a file. The values that it uses are large enough to reduce the number of file extensions in most cases.

3.3 Corrections to Documentation

The RMS Version 2.0 manuals have not been revised for this release. This section describes documentation corrections and new information that should be added to the manuals.

3.3.1 RSX-11M/M-PLUS RMS-11 User's Guide

Please add the following corrections to the manual:

- According to the *RSX-11M/M-PLUS Macro Programmer's Guide*, RMS-11 cannot perform an UPDATE operation on an alternate key with the key characteristics CHANGES and NODUPLICATES. This description is misleading. To clarify the description, please add the following information to Chapter 6, Section 6.2.5.2:

  Although RMS-11 does not support the CHANGES and NODUPLICATES combination, it does not prevent you from performing an UPDATE operation on an alternate key with these characteristics. When an update causes a duplicate of an alternate key, RMS-11 returns the completion code ER$DUP. However, it does not terminate the UPDATE operation. Instead, RMS-11 updates the primary data level for the record without updating the alternate index. As a result, the file contains duplicates of the alternate key.

  To prevent RMS-11 from creating duplicates when you make changes on alternate keys, modify your application as follows:

  1. Create the file with the key characteristics DUPLICATES and CHANGES.
  2. To disallow duplicates, perform a FIND operation on each alternate key. Then, perform an UPDATE operation on the modified record.

- In Section 2.2.3.3, please add the following information to the discussion of deadlock:

  An application should use multistream rather than multichannel access to write to the same indexed file. When RMS-11 updates an RRV in a bucket that is currently locked, it must wait for that lock to be released. Control will not be returned to the program until this release occurs. Deadlock will occur when the lock is held on another channel within the same program; however, RMS-11 can update an RRV in a bucket that is locked on another stream within the same program. See your programming language documentation for details on the implementation of multistreaming.

- In Section 6.2.4, please add the following note to the discussion of writing a record:

  In the event that the record includes a partial alternate key but is not large enough to include space for the full alternate key field, RMS-11 will act as follows:

  RMS-11 will treat the alternate key as if it were not present in the record, making no entry in the alternate key index structure.

- In Section 6.3, please add the following information to the discussion of contiguous areas:

  You will gain a small benefit by setting areas to contiguous on a noncontiguous multi-area file; however, RMS-11 cannot determine if those areas remain contiguous. Consequently, RMSDSP and RMSDESAB will display them as noncontiguous. As long as the areas are preallocated, they will behave like contiguous areas; as soon as they need to be extended, they will behave like noncontiguous areas.

- In Section 8.1.2.1, in the discussion of task building against the RMS–11 resident library, incorrect syntax is documented for the cluster option in the Task Builder command file. The correct syntax is as follows:

  ```
  CLSTR = RMSRES,DAPRES:RO
  ```

- In Appendix B, in the discussion of remote file and record access using the DECnet package, the documentation states that the RSTS/E file access listener (FAL) does not support remote record access to indexed files. This is no longer true.

3.3.2 RSX–11M/M–PLUS RMS–11 Macro Programmer's Guide

Please make the following corrections to the *RSX–11M/M–PLUS RMS–11 Macro Programmer's Guide*:

- In Section 2.3, the argument for P$BUF is incorrectly given as "bufcount". The correct argument is "iopoolsize", as discussed in Section 2.3.4.
- In Section 5.19, the last paragraph incorrectly describes the use of the FID field in the NAM block. It should read as follows:

  "If this value is nonzero..."

- In Appendix A, page A-8, please add the following sentence:

  An attempt to insert a record that is too small to contain the whole primary key field may also cause the error ER$KEY.

- In Appendix A, Section A.1, add the following text to the description of the error ER$MRS:

  Or, the sum of the fixed-length record size and the record overhead exceeds the bucket size. Or, No Span Blocks has been selected with an invalid total record size.

- In Appendix A, Section A.1, add the following text to the description of the error ER$NOD:

  Or, the remote node rejected the operation. (STV contains the Network Services Protocol (NSP) code and can be found in Appendix C of the *DECnet-RSX Programmer's Reference Manual.*)

- In Appendix A, Section A.1, add the following text to the description of the error ER$FUL:

  ER$FUL, Device or File Allocation Failure

  ```
  Octal: 176360
  Decimal: -784
  ```

  Explanation: The specified device or directory does not have enough room for file creation or extension. In the case of a contiguous request, it is also possible that there is not enough contiguous space on the device.

3.3.3 RSX-11M/M-PLUS RMS-11 Utilities

Please make the following corrections to the *RSX-11M/M-PLUS RMS-11 Utilities* manual:

- In Chapter 2, Table 2-1, add the following commands:

Command	Format and Function
EXIT_SUPERSEDE	EXIT_S[UPERSEDE] filename[.typ] Names the description file in which the file design is stored.
SAVE_SUPERSEDE	SAVE_S[UPERSEDE] filename[.typ] Names the description file in which the file design is saved.

- In Chapter 2, Section 2.2.5, add the new command EXIT_SUPERSEDE, as follows:

  The EXIT_SUPERSEDE command stores the file design in the description file specified in the command string, superseding any existing file by the same name. EXIT_SUPERSEDE then terminates RMSDESAB and returns the system prompt.

  The format for the EXIT_SUPERSEDE command is as follows:

  ```
  EXIT_S[UPERSEDE] filename[.typ]
  ```

  EXIT_SUPERSEDE names the description file in which the file design is stored. The default file type is DE. If you do not want to supersede an existing description file, use the EXIT command.

- In Chapter 2, Section 2.2.5, add the following statement to the description of the EXIT command:

  To supersede an existing description file, use the EXIT_SUPERSEDE command.

- In Chapter 2, Section 2.2.9, add the new command SAVE_SUPERSEDE, as follows:

  The SAVE_SUPERSEDE command stores the file design in the description file specified in the command string, superseding any existing file by the same name. If you do not define areas when you issue the SAVE command, RMSDESAB prompts you for the areas.

  The format for the SAVE_SUPERSEDE command is as follows:

  ```
  SAVE_S[UPERSEDE] filename[.typ]
  ```

  SAVE_SUPERSEDE names the description file in which the file design is saved. The default file type is DE. If you do not want to supersede an existing description file, use the SAVE command.

  If you want to design another file, issue a CLEAR ALL command to restore the attribute values in the design buffer to their defaults.

- In Chapter 2, Section 2.2.9, add the following statement to the discussion of the SAVE command:

  To supersede an already existing description file, use the SAVE_SUPERSEDE command.

- In Chapter 2, Section 2.6.2, add the following corrections:

  — Modify paragraph 3 of the ALLOCATION field discussion to read as follows:

If you intend to create a single-area indexed file and do not require RSX positioning, RMS–11 uses the allocation from the file section if no area section exists in your design buffer. If you are allowing RMSDESAB to define areas for an indexed file by default, RMSDESAB will automatically calculate an allocation value for each area it defines.

— Modify paragraph 4 of the EXTENSION field discussion to read as follows:

If you intend to create a single-area indexed file and do not require RSX positioning, RMS–11 uses the extension from the file section if no area section exists in your design buffer. If you are allowing RMSDESAB to define areas for an indexed file by default, RMSDESAB will automatically calculate an extension value for each area it defines.

— Modify paragraph 5 of the BUCKETSIZE field discussion to read as follows:

If you intend to create a single-area indexed file and do not require RSX positioning, RMS–11 will use the bucket size from the file section if no area section exists in your design buffer. If you are allowing RMSDESAB to define areas for an indexed file by default, RMSDESAB will assign a bucket size value for each area it defines. However, if you choose to define areas explicitly and specify a bucket size value for each area, you should accept the default for the file section and set the bucket size value in each area section.

- In Chapter 2, Section 2.8, add the following correction to the explanation of the error message ?DES-F-VOR:

  You entered a value in response to an attribute prompt that was not in the legal range of values for that attribute, or the values you entered resulted in a calculation that caused an overflow for RMSDESAB. If the value was not within the legal range, the error message is followed by a display of the incorrect value.

- In Chapter 4, Table 4-1, add the following switch and description to the table of RMSCNV switches:

  /ER[:filespec] Continue processing after encountering an exception record. If a file specification is provided, then write the primary keys of exception records into the specified file. If no file specification is provided, then output the exception records to the terminal.

  Default: Stop processing and report RMS error code.

- In Section 4.3, add the following information to the description of RMSCNV switches:

  /ER[:filespec]

  Directs RMSCNV to continue processing when it encounters an exception record in the input file that cannot be written to the output file (see section 3.4). If you specify a file specification, the exception records will be written to that file. If you do not specify a file specification, the primary key of each exception record will be issued to the terminal. RMSCNV also issues exception record codes (see RMSIFL exception codes, Section 3.3.2).

  If you specify an exception file specification, RMSCNV will create the file as an RMS–11 Variable Fixed Control (VFC) sequential file upon encountering the first exception record. RMSCNV will then write the exception record with a 4-byte exception code to the fixed-control area of the record.

By default, if you do not specify the /ER switch, RMSCNV will stop processing upon encountering the first exception record and will issue an error message indicating the type of exception record.

- In Table 5-1, add the following information to the description of RMSDSP switches:

/BR	Briefly displays attributes.
/SU	Supersedes existing output file.

- In Section 5.2, include the asterisk (*) and percent sign (%) in the description of wildcard characters permitted in the input file specification.
- In Section 5.3, add the following information to the discussion of RMSDSP commands:

/BR

Directs RMSDSP to issue basic displays for indexed files (see Section 5.4, Example 5-3) and container files (see Section 5.4, Example 5-6).

/SU

Directs RMSDSP to supersede any existing output file with the same name and version number as the output file specification. If this switch is not supplied and the version numbers are the same, RMSDSP will issue the following error message:

```
?DSP-F_OPNINP, Error opening DDnn:file.dat as output
-RMS-E-ER$FEX, File already exists
```

- In Chapter 6, Table 6-1, add the following information to the table of RMSBCK switches:

/NV	Creates a new version of the output file.

- In Section 6.3.2, add the following information to the description of RMSBCK output switches:

/NV

Directs RMSBCK to create a new version of the disk output file if a file currently exists with the same version number as the input file. The current file is not deleted. If you do not specify this switch and a file currently exists with the same file name and version number as the input file specification, RMSBCK will issue the following fatal error message:

```
?BCK-F-CREOUT, Error opening ddnn:file.dat;n as output
-RMS-E-ER$FEX, File already exists
```

- In Section 6.2, in the discussion of RMSBCK command line format, include the asterisk (*) and percent sign (%) in the description of wildcard characters permitted in the input file specification.
- In Table 7-1, add the following information to the table of RMSRST switches:

/NV	Creates a new version of output file.

- In Section 7.2, in the discussion of the RMSRST command line format, include the asterisk (*) and percent sign (%) in the description of wildcard characters permitted in the input file specification.

- In Section 7.3.2, add the following information to the discussion of RMSRST commands:

/NV

Directs RMSRST to create the next higher version number if the expanded input file has the same version number as an existing output file. If this switch is not used and the file name and version number are the same, RMSRST will issue the following error message:

```
?RST-F-CREOUT, Error opening ddnn:file.dat;n as output
-RMS-E-ER$FEX, File already exists
```

3.4 Files and Their Placement on the Distribution Kit

Table 3–1 describes the contents of the RMS–11 Version 2.0 distribution kit.

Note

Some file names are marked with an asterisk. This indicates that the files are not included on RL02 and RC25 distribution kits. They are excluded because of space reasons on the kit, and because they are used only to rebuild components of RMS–11 Version 2.0.

Table 3–1: RMS File Placement on Distribution Kit

File Name	Destination	Comments
RMSMAC.MLB	LB:[1,1]	Can be deleted if you are not using MACRO–11 RMS–11 programs
RMSLIB.OLB	LB:[1,1]	Object library for RMS–11 local access
RMSDAP.OLB	LB:[1,1]	Object library for RMS–11 remote access (can be deleted if you do not need remote access)
RMSFUN.OBJ	LB:[1,1]	RMS function routines for SYSLIB
RMSRESAB.MAP	LB:[1,34]	Map for library root
RMSRESAB.TSK	LB:[1,1]	Installed as the root of the resident library
RMSFAKAB.CMD RMSROTAB.STB	LB:[1,24]	For rebuilding RMSLBL and RMSLBM
RMSRESAB.CMD RMSRESAB.ODL	LB:[1,24]	For rebuilding RMSRESAB
RMSBCK.TSK	LB:[3,54]	RMSBCK utility; uses RMSRES
RMSRST.TSK	LB:[3,54]	RMSRST utility; uses RMSRES
RMSDEF.TSK	LB:[3,54]	RMSDEF utility; uses RMSRES

Table 3–1 (Cont.): RMS File Placement on Distribution Kit

File Name	Destination	Comments
RMSDSP.TSK	LB:[3,54]	RMSDSP utility; uses RMSRES
RMSCNV.TSK	LB:[3,54]	RMSCNV utility; uses RMSRES
RMSDES.TSK	LB:[3,54]	RMSDES utility; uses RMSRES
RMSIFL.TSK	LB:[3,54]	RMSIFL utility; uses RMSRES
RMSDES.IDX	LB:[1,2]	Indexed help file used by RMSDES
RMS11.ODL	LB:[1,1]	Prototype ODL file
R0RMS1.MAC	LB:[1,1]	For use with the prototype ODL
RMS11S.ODL	LB:[1,1]	ODL file for sequential access
RMS12S.ODL	LB:[1,1]	ODL file for sequential access
RMS11X.ODL	LB:[1,1]	Standard indexed file ODL
RMS12X.ODL	LB:[1,1]	Indexed file ODL
RMSRLX.ODL	LB:[1,1]	ODL for use with RMSRES
RMSSLX.ODL	LB:[1,1]	ODL for use with RMSRES in supervisor mode
DAP11X.ODL	LB:[1,1]	ODL for use with overlaid RMSDAP
DAPRLX.ODL	LB:[1,1]	ODL for use with DAPRES
RMSRES.TSK	LB:[1,1]	Task image for linking in nonsupervisor mode; *not* to be installed as the root of the library
RMSLBL.TSK	LB:[1,1]	Task image for RMSRES segment
RMSLBM.TSK	LB:[1,1]	Task image for RMSRES segment
RMSRES.STB	LB:[1,1]	STB file for RMSRES
DAPRES.TSK	LB:[1,1]	Task image for RMSDAP resident library
DAPRES.STB	LB:[1,1]	STB file for DAPRES
RMSLBL.MAP*	LB:[1,34]	Maps for segmented library
RMSLBM.MAP*	LB:[1,34]	
DAPRES.MAP*	LB:[1,34]	
RMSRES.TSK	LB:[3,54]	Task image for linking in supervisor mode; *not* to be installed as the root of the library
RMSRES.STB	LB:[3,54]	STB file for linking supervisor-mode tasks
RMSLBL.CMD* RMSLBL.ODL*	LB:[1,24]	For rebuilding RMSLBL

Table 3–1 (Cont.): RMS File Placement on Distribution Kit

File Name	Destination	Comments
RMSLBM.CMD* RMSLBM.ODL*	LB:[1,24]	For rebuilding RMSLBM
DAPRES.CMD* DAPRES.ODL*	LB:[1,24]	For rebuilding DAPRES
BCKNON.CMD* BCKNON.ODL*	LB:[1,24]	For rebuilding the overlaid version of RMSBCK
BCKNRN.CMD* BCKNRN.ODL*	LB:[1,24]	For rebuilding the resident-library version of RMSBCK
BCKNSN.CMD* BCKNSN.ODL*	LB:[1,24]	For rebuilding the supervisor-mode version of RMSBCK
CNVNON.CMD* CNVNON.ODL*	LB:[1,24]	For rebuilding the overlaid version of RMSCNV
CNVNRN.CMD* CNVNRN.ODL*	LB:[1,24]	For rebuilding the resident-library version of RMSCNV
CNVNOO.CMD* CNVNOO.ODL*	LB:[1,24]	For rebuilding the overlaid version of RMSCNV with RMSDAP
CNVNRR.CMD* CNVNRR.ODL*	LB:[1,24]	For rebuilding the resident-library version of RMSCNV with RMSDAP
CNVNSN.CMD* CNVNSN.ODL*	LB:[1,24]	For rebuilding the supervisor-mode version of RMSCNV
DEFNON.CMD* DEFNON.ODL*	LB:[1,24]	For rebuilding the overlaid version of RMSDEF
DEFNRN.CMD* DEFNRN.ODL*	LB:[1,24]	For rebuilding the resident-library version of RMSDEF
DEFNSN.CMD* DEFNSN.ODL*	LB:[1,24]	For rebuilding the supervisor-mode version of RMSDEF
DESNON.CMD* DESNON.ODL*	LB:[1,24]	For rebuilding the overlaid version of RMSDES
DESNRN.CMD* DESNRN.ODL*	LB:[1,24]	For rebuilding the resident-library version of RMSDES
DESNSN.CMD* DESNSN.ODL*	LB:[1,24]	For rebuilding the supervisor-mode version of RMSDES
RMSDES.ODL*	LB:[1,24]	
DSPNON.CMD* DSPNON.ODL*	LB:[1,24]	For rebuilding the overlaid version of RMSDSP

Table 3–1 (Cont.): RMS File Placement on Distribution Kit

File Name	Destination	Comments
DSPNON.CMD* DSPNON.ODL*	LB:[1,24]	For rebuilding the resident-library version of RMSDSP
DSPNSN.CMD* DSPNSN.ODL*	LB:[1,24]	For rebuilding the supervisor-mode version of RMSDSP
IFLNON.CMD* IFLNON.ODL*	LB:[1,24]	For rebuilding the overlaid version of RMSIFL
IFLNRN.CMD* IFLNRN.ODL*	LB:[1,24]	For rebuilding the resident-library version of RMSIFL
IFLNSN.CMD* IFLNSN.ODL*	LB:[1,24]	For rebuilding the supervisor-mode version of RMSIFL
RSTNON.CMD* RSTNON.ODL*	LB:[1,24]	For rebuilding the overlaid version of RMSRST
RSTNRN.CMD* RSTNRN.ODL*	LB:[1,24]	For rebuilding the resident-library version of RMSRST
RSTNSN.CMD* RSTNSN.ODL*	LB:[1,24]	For rebuilding the supervisor-mode version of RMSRST
RMSUTL.OLB* RMSODL.ODL*	LB:[1,24]	For rebuilding the utilities
GSA.MAC	LB:[USER]	Demonstration program included as an illustration of how to extend an RMS–11 task in the event of pool exhaustion
PARSE.MAC SEARCH.MAC RENAME.MAC ERASE.MAC PARSE.TSK SEARCH.TSK RENAME.TSK ERASE.TSK	LB:[USER]	Demonstration programs for the directory and wildcarding facilities

Note

All RMSDAP files can be deleted if you are not using RMS–11 to access files on remote nodes.

3.5 RMS–11 Supplementary Information

This section describes information that has been documented in the previous release notes.

3.5.1 RMS-11 Version 2.0 Installation

On RSX-11M-PLUS systems, all RMS-11 files are automatically on your system.

3.5.1.1 Startup Command Procedures

To install RMS-11, install the resident libraries and RMS-11 utilities at system startup. To aid you in the installation process, the file LB:[1,2]STARTUP.CMD contains commands and sample comments that can be edited to become system startup commands. Please note the following items:

- On RL02 and RC25 pregenerated systems, the RMS-11 segmented library (RMSRES, RMSLBL, RMSLBM) and all the RMS-11 utilities are already installed in the system image. For these kits, the only installation that is needed is the optional installation of the DAPRES resident library if the system has DECnet support and if RMS-11 remote-access facilities are to be used.
- On systems other than RL02 and RC25, the startup file contains commands that install the segmented resident library in the system image. Note that these are commands, not comments; if you do not want to install the library, you should edit the file to change these commands to comments. Please note the following items:
  - All resident libraries should be installed using the option /RON=YES.
  - The root of the library, RMSRES, must be the task image LB:[1,1]RMSRESAB.TSK. The LB:[1,1]RMSRES.TSK file should never be installed; it is used when tasks are being linked to use the non-supervisor-mode version of RMSRES.
  - Failure to install the root segment RMSRES will cause the error "INS—Common block not loaded RMSRES" when a referencing task or utility is invoked. Failure to install any of the remaining resident-library segments will not give an error at invocation. However, it will cause a BPT trap (with R0 containing ER$LIB) when the missing segment is needed by RMS-11.
  - There are several circumstances involving "inconsistent or incomplete resident libraries" that can cause a BPT trap to be generated with R0 containing the error code ER$LIB. This can occur if not all the segments of the library are installed or if the version numbers of one or more segments do not match the root segment, the RMSDAP code, or the task itself. In particular, this can happen to the RMS-11 utilities if they are built to use the segmented resident library and the segments are installed incorrectly.
  - The resident libraries have been built with the PAR=parname option in the TKB command file, where parname is the name of the resident library. This feature was included for compatibility with RSX-11M systems. You should install the resident libraries in the GEN partition. Do not generate individual partitions for the libraries on RSX-11M-PLUS; doing so would negate much of the benefit of having a "demand-paged" segmented library.
- If you are using RMSRES in supervisor mode, you do not need to install a different task. You simply need to link your task.
- If you want to use the RMS-11 utilities or the RMSDAP resident library, you must edit the startup command file, which contains template commands (comments) that you can edit to install these facilities.

3.5.2 Utility Configurations

The RMS–11 utilities that are provided on the distribution kit are built to use the segmented resident library. Consequently, RMSRES, RMSLBL, and RMSLBM should be installed before you use any of the RMS–11 utilities.

3.5.2.1 Utility Command and ODL Files

For each utility, a command and ODL file are provided to build the utility using disk-overlaid RMS–11. The names of the files are as follows:

Utility	Files
RMSBCK	BCKNON.CMD, BCKNON.ODL, and RMSODL.ODL
RMSRST	RSTNON.CMD, RSTNON.ODL, and RMSODL.ODL
RMSCNV	CNVNON.CMD and CNVNON.ODL
RMSDSP	DSPNON.CMD, DSPNON.ODL, and RMSODL.ODL
RMSDESAB	DESNON.CMD, DESNON.ODL, and RMSDESAB.ODL
RMSDEF	DEFNON.CMD, DEFNON.ODL, and RMSODL.ODL
RMSIFL	IFLNON.CMD and IFLNON.ODL

In addition, a command and ODL file are provided to build each utility with the resident library RMSRES. The names of the files are as follows:

Utility	Files
RMSBCK	BCKNRN.CMD and BCKNRN.ODL
RMSRST	RSTNRN.CMD and RSTNRN.ODL
RMSCNV	CNVNRN.CMD and CNVNRN.ODL
RMSDSP	DSPNON.CMD and DSPNON.ODL
RMSDESAB	DESNRN.CMD and DESNRN.ODL
RMSDEF	DEFNRN.CMD and DEFNRN.ODL
RMSIFL	IFLNRN.CMD and IFLNRN.ODL

Finally, a command and ODL file are provided to build each utility using the supervisor-mode library RMSRES. The names of the files are as follows:

Utility	Files
RMSBCK	BCKNSN.CMD and BCKNSN.ODL
RMSRST	RSTNSN.CMD and RSTNSN.ODL
RMSCNV	CNVNSN.CMD and CNVNSN.ODL
RMSDSP	DSPNSN.CMD and DSPNSN.ODL
RMSDES	DESNSN.CMD and DESNSN.ODL
RMSDEF	DEFNSN.CMD and DEFNSN.ODL
RMSIFL	IFLNSN.CMD and IFLNSN.ODL

For RMSCNV, two additional configurations are available if you want to use RMSCNV to access files on remote nodes. To build RMSCNV using the clustered RMS–11 and RMSDAP resident libraries, use the files CNVNRR.CMD and CNVNRR.ODL. To build RMSCNV using disk-overlaid RMS–11 and RMSDAP, use the files CNVNOO.CMD and CNVNOO.ODL.

Note

These command and ODL files are not supplied with the RL02 and RC25 kits.

3.5.2.2 Rebuilding the Utilities

To rebuild the utilities, perform the following steps:

1. Log in to a privileged account.
2. Set your default account to directory [1,24] on the system disk.
3. Use the Task Builder (TKB) to build the utility or utilities.

The utilities and the corresponding map files will be built in the current account. You may then want to put the utility in the system account ([3,54]).

Each command file for a particular utility creates a utility of the correct name. For example, CNVNRN.CMD and CNVNON.CMD both produce task images called RMSCNV.TSK. One is built to use the resident library and one is built with disk-overlaid RMS–11.

3.5.3 Reporting Problems

Software Performance Reports (SPRs) allow you to report any software problems directly to DIGITAL. Appendix B of this manual includes the general procedures for filling out Software Performance Reports.

The following additional information should be submitted with SPRs for RMS–11 software:

- Include the version number and patch level of the RMS–11 that you are using.
- Indicate whether you are using a programming language to process the file or files and, if so, include the version number and patch level of the language.
- Include a postmortem dump and a map of the task involved, if RMS–11 aborts (or if some other task crashes and RMS–11 appears to be the cause).
- Include a copy or copies of the file or files involved, in RMSBCK format.

- Include copies of the files that can cause the error if the errors are reproducible. If the problem is not reproducible, include a copy of the corrupt file if possible.
- Include a description of the command line or lines or interactive session that led to the error (for RMS–11 utilities).
- Include a listing of the actual error, if possible.

Chapter 4
Layered Product Support

4.1 Correction Files

Table 4–1 lists the layered products that have been updated for RSX–11M–PLUS Version 4.0. Applying the correction files in this release to each layered product will result in improved software performance. Table 4–1 also includes the corresponding directories and documentation files for the layered products. The documentation files describe the procedure for applying corrections to the specific layered product.

An asterisk (*) after the product name indicates that a file has been changed since Version 3.0 Update E.

Table 4–1: Layered Product Correction File References

Layered Product	Directories Used	Backup Set	Documentation File Name
BASIC-PLUS-2 Version 2.3	[211,200]	BP2	[211,200]BP2E.DOC
COBOL–81/RSX Version 2.4[1]	[216,200]	C81	[216,200]C81.DOC
DATATRIEVE–11 Version 3.1	[222,200]	DR	[222,200]DR.DOC
DCX KMV11-A Development Tools Version 1.0	[224,200]	DCX	[224,200]DCX.DOC
KMV11-A HDLC Framing Software Version 1.0	[253,200]	KMV11	[253,200]KMV11.DOC
KMV11 X25 Link Level Version 1.0	[322,200]	KXI	[322,200]KXI.DOC

[1] Prior to Update D, RSX–11M–PLUS Version 3.0 Update revisions included corrections for Version 2.3 of COBOL–81.

Table 4–1 (Cont.): Layered Product Correction File References

Layered Product	Directories Used	Backup Set	Documentation File Name
IP-11 Industrial I/O Subsystem Software Driver * Version 4.1	[340,200]	IP11	[340,200]IP11.DOC
WPSPLUS/RSX * Version 1.0	[323,200]	WPSPLUS	[323,200]WPS.DOC
DECmail-11 * Version 3.0	[321,200]	DECMAIL	[321,200]DECMAIL.DOC
DECnet–11M–PLUS * Version 3.0	[230,200] [225,20] [225,40] [230,20] [230,40]	DECNET	[230,200]DECNET.DOC
DPM–PLUS * Version 1.1	[236,200]	DPM	[236,200]DPM.TXT
PDP–11 SORT/MERGE Version 3.0	[311,200]	SORT	[311,200]SORT.DOC
PDP–11 COBOL Version 4.4	[215,200]	C11	[215,200]C11.DOC
PDP–11 Symbolic Debugger * Version 2.0	[247,200]	PDPDBG	[247,200]PDPDBG.DOC
PDP–11 FORTRAN–77/RSX Version 5.0	[246,200]	F77	[246,200]F77.DOC
PDP–11 FORTRAN IV Version 2.6	[245,200]	FORTIV	[245,200]FORTIV.DOC
PDP–11 PASCAL/RSX Version 1.2	[262,200]	PASCAL	[262,200]PASCAL.DOC
RSX–11 2780/3780 Protocol Emulator * Version 4.1	[301,200] [301,24] [301,26]	2780	[301,200]2780.DOC

4.2 Layered Products Restriction

Because of support for named directories, the MCR command SET /NONAMED or the DCL command SET DEFAULT/NONAMED should be used before installing layered products.

Appendix A

The DIGITAL Equipment Computer Users Society (DECUS)

DECUS, the DIGITAL Equipment Computer Users Society, is one of the largest and most active user groups in the computer industry. It is a not-for-profit association, supported and administered by DIGITAL, but actively controlled by its members. DECUS headquarters, located in Marlborough, Massachusetts, administers all international policies and activities. Members include individuals who have purchased, leased, ordered, or used a DIGITAL computer, or anyone who has a genuine interest in DECUS. Membership is free and voluntary.

A.1 DECUS Goals

The primary goals of DECUS are as follows:

- To advance the art of computation through mutual education and exchange of ideas and information
- To establish standards and to provide channels to facilitate the exchange of computer programs
- To provide feedback to DIGITAL regarding hardware and software customer needs
- To advance the effective use of DIGITAL computers, peripherals, and software by promoting the interchange of information

To further these goals, DECUS serves its members by holding symposia; by maintaining a program library; by publishing an association newsletter, technical newsletters, and books; and by supporting a number of Special Interest Groups (SIGs).

A.2 DECUS Activities

Local, regional, and national DECUS organizations give members the opportunity to meet other DIGITAL customers and employees in an informal setting. At local monthly meetings and national symposia, members can discuss their ideas, learn what others are doing, and give DIGITAL valuable feedback for future product development.

Often the national meetings in various countries also provide the stage for major new product announcements as well as a showplace for interesting developments in both hardware and software technology. At any meeting, members might describe ideas and programs they have implemented or the fine-tuning of a particular feature or application. Members present papers, participate in panel discussions, lead workshops, and conduct demonstrations for the benefit of other members.

Many of the technical papers and presentations from each symposium are published as a book, the *DECUS Proceedings*. Copies of the *DECUS Proceedings* are supplied to symposia attendees and can be purchased by DECUS members. DECUS also publishes newsletters focusing on special interests and a society newsletter.

DECUS has a Program Library, which contains over 1700 software packages that are written and submitted by users. A wide range of software is offered, including languages, editors, numerical functions, utilities, display routines, games, and other types of application software. Also available are library catalogs, which contain program descriptions and ordering information. The programs are available for a nominal service charge that covers the cost of reproduction and media.

Many DECUS members derive additional benefits from joining a DECUS Special Interest Group (SIG). SIGs often hold smaller meetings while attending regional and national meetings. They may also meet informally to discuss their special fields, such as operating systems, languages, processors, and applications. There are at least 25 SIGs in the United States alone. Many of the SIGs print newsletters and disseminate valuable technical information to members.

To obtain a membership form for DECUS, contact a DIGITAL sales representative or the nearest DECUS chapter office.

Appendix B
Reporting Problems

This appendix describes the procedure for submitting a Software Performance Report (SPR). An SPR allows you to report any problems with or questions about your system directly to DIGITAL.

An SPR can be used for:

- Software errors
- Documentation errors (when the reader's comment form is not appropriate)
- Follow-up on a previous SPR
- Questions
- Suggestions

An SPR cannot be used for:

- Software license and price policies
- Obvious hardware problems
- Logistical or clerical problems with kits, such as blank media, or failure to receive the *Software Dispatch*
- Problems with user-written software

In general, when you complete an SPR use the following guidelines:

- Describe only one problem per form. This will facilitate a more rapid response because it allows the person answering it to concentrate more fully on that particular problem. One problem per form also helps simplify record-keeping.
- Define as accurately as possible the state of the system and circumstances when the problem occurred.
- Illustrate the problem with specific examples.
- If you report a documentation error, specify the title of the manual, and include the section and page number where the error occurred. Include a table or figure number if appropriate.

SPRs are assigned a priority of 1 through 5. An SPR that is assigned a priority of 1 receives the highest priority. Priorities are described as follows:

1. Most production work cannot be run.
   - Major system functions are unusable.
   - You cannot boot the system.
   - Necessary peripherals cannot be used.
2. Some production work cannot be run.
   - Certain functions are unusable.
   - System performance has declined.
   - Installation does not have excess capacity.
3. All production work can be run with some user impact.
   - Significant manual intervention is required.
   - System performance has declined.
   - Installation has excess capacity.
4. All production work can be run with no significant impact on user.
   - Problem can be patched or easily bypassed.
5. No system modifications are needed to return to normal production.
   - Suggestions, consultations, or errors in documentation.

You can submit the following categories of SPRs:

1. Problem/Error SPR

   This type of SPR contains a software problem. It is assigned a priority of 1 through 5. You receive an answer to this report.

2. Suggested Enhancement

   This type of SPR contains a suggestion. It is assigned a priority of 5. You do not receive an answer to this report.

3. Other

   This type of SPR contains a question or suggestion. It is assigned a priority of 5. You may or may not receive an answer to this report.

Please supply the following information (in machine-readable form where applicable) when you report a problem:

- CRASH—A copy of the Executive task-build map, output from the console terminal, the SYSGEN saved-answer file, the Executive STB file, and the crash dump. If the crash is reproducible, accurately describe the details and supply a hard copy or user source code when necessary.

- DRIVERS—Controller/device information, software options, error log output, copy of device registers, and a sample program.
- UTILITIES—A copy of your terminal output, showing setup commands, before and after effects, and relevant file information.
- TASK BUILDER—A copy of your terminal output command files, the task map, and a dump of the first few blocks of the task image.
- FILE SYSTEM—Corrupted volume: output from verification utility and dump of the volume. Improper results: error code, file header dump, sample program.
- ERROR LOG REPORT GENERATOR (RPT)—A copy of the report file generated by RPT, either on a hardcopy listing or on machine-readable media.

If a failure occurs when you are running privileged, add-on software (for example, DECnet), try to reproduce the failure without the additional software. Then, when you write the SPR, indicate how the system operated with and without the add-on software.

The SPR process is sometimes lengthy. Therefore, if you have a critical problem, contact your local DIGITAL office. In the meantime, read the *Software Dispatch* for news on RSX-11M-PLUS, which includes changes and problems other people have found and solved.

Appendix C
Applying Corrections to Source Files

Interim changes to the Executive, MCR, and device drivers are made by creating correction files that are processed by the Source Language Input Program (SLP). SLP generates a new copy of the modules that contain the errors by applying the corrections to the source file on the distribution kit. (See the *RSX-11M-PLUS Utilities Manual* for complete information on SLP.)

After you have applied the corrections and obtained a new version of the file, DO NOT delete the original source file. Interim changes that may be distributed later are cumulative and depend on having the original sources available.

C.1 Updating an Executive Source Module

To update an Executive source file (ABCDEF.MAC, for example), mount the disk on which you performed your system generation and create a SLP correction file named ABCDEF.COR in the directory [11,40]. (All instructions below assume that you are working on the disk on which you performed your system generation.) Then, running under UIC [11,10], submit the correction file to SLP. For example, you could follow this sequence to create REQSB.MAC:

```
>SET /UIC=[11,40] RET
>EDI REQSB.COR RET
[Creating new file]
Input
REQSB.MAC;2/AU/-BF=REQSB.MAC;1
.
.
.
*EX RET
[Exit]

>SET /UIC=[11,10] RET
>SLP @[11,40]REQSB.COR RET
```

If the updated Executive module in your system is not a loadable driver, use the following procedure:

1. Assemble the new module, using the RSXMC.MAC file for the target system. For example, type the following commands:

```
>SET /UIC=[11,24] RET
>MAC REQSB,[11,34]REQSB/-SP=[1,1]EXEMC/ML,[11,10]RSXMC/PA:1,REQSB RET
```

2. Use LBR to replace the old version of the module in RSX11M.OLB on the target system. For example:

```
>SET /UIC=[1,24] RET
>LBR RSX11M/RP/-EP=[11,24]REQSB RET
```

3. Perform the following sections of SYSGEN:
   - Building the Executive and Drivers
   - Building the Privileged Tasks
   - Creating the System Image File

If the modified file in your system is a loadable device driver (ZZDRV.MAC, for example), the updated module can be replaced without rebuilding the Executive. Assemble the updated module and replace the resulting object file in the RSX11M.OLB of your target system. For example, assuming that [11,10] contains the RSXMC.MAC file resulting from your system generation, do the following:

```
>SET /UIC=[11,24] RET
>MAC ZZDRV=[1,1]EXEMC/ML,[11,10]RSXMC/PA:1,ZZDRV RET
>SET /UIC=[1,24] RET
>LBR RSX11M/RP/-EP=[11,24]ZZDRV RET
```

Use [200,200]ZZDRVBLD.CMD to rebuild the driver. If necessary, copy ZZDRV.TSK and ZZDRV.STB into the directory that corresponds to the system UIC, or the library UIC if the driver is vectored.

For example:

```
>ASN SY:=OU: RET
>TKB @[200,200]ZZDRVBLD RET
>SET /SYSUIC RET
SYSUIC=[g,m]
>SET /UIC=[g,m] RET
>PIP /NV=[1,54]ZZDRV.TSK,ZZDRV.STB RET
```

Use VMR to unload the old device driver and to load the new one. If the new driver is larger than the old one, it may not fit into the same locations as the old one. It may be necessary to unload and reload all of the loadable drivers in that partition to create enough room.

```
>VMR RET
Enter filename:RSX11M RET
VMR>UNL ZZ: RET
VMR>LOA ZZ: RET
VMR> CTRL/Z
>RUN $SHUTUP RET
```

If the driver is vectored, you must use the /VEC switch on the UNL and LOA commands. In the preceding example, you would substitute the following VMR commands:

```
VMR>UNL ZZ:/VEC RET
VMR>LOA ZZ:/VEC RET
VMR> CTRL/Z
```

Hardware-boot the modified system.

C.2 Updating an MCR Source Module

To update the MCR source file SETOV.MAC, use the following procedure:

Create the SLP correction file [12,40]SETOV.COR and use it to update [12,10]SETOV.MAC. Assemble SETOV for the target system, as follows:

```
>SET /UIC=[12,40] RET
>EDI SETOV.COR RET
[Creating new file]
Input
SETOV.MAC;2/AU/-BF=SETOV.MAC;1
.
.
.
*EX RET
[Exit]

>SET /UIC=[12,10] RET
>SLP @[12,40]SETOV.COR RET
```

Assuming [11,10] contains the RSXMC.MAC file resulting from your target system generation, do the following:

```
>SET /UIC=[12,24] RET
>MAC SETOV=[1,1]EXEMC/ML,[11,10]RSXMC/PA:1,[12,10]SETOV RET
```

All of the Task Builder command files output a map to the logical device MP:. MP: must be assigned to NL: or another device to avoid a diagnostic error message from the Task Builder.

If it was necessary to modify the MCR Task Builder command file (MCRBLD.CMD) during the last system generation, it may now be necessary to repeat those changes. To rebuild the secondary portion of MCR (...MCR) and replace the module SETOV, use the following procedure:

```
>SET /UIC=[1,24] RET
>LBR MCR/RP/NOEP=[12,24]SETOV RET
>PIP SETOV.OBJ;*/DE RET
>ASN SY:=MP: RET
>ASN SY:=IN: RET
>TKB @MCRBLD RET
>VMR RET
Enter filename:RSX11M RET
VMR>REM ...MCR RET
VMR>INS [3,54]MCR RET
VMR> CTRL/Z
```

To rebuild the MCR dispatcher (MCR...) and replace the module MCRDIS, use the following procedure:

```
>SET /UIC=[1,24] RET
>LBR MCR/RP/NOEP=[12,24]MCRDIS RET
>PIP MCRDIS.OBJ;*/DE RET
>ASN SY:=MP: RET
>ASN SY:=IN: RET
>TKB @MCDBLD RET
>VMR RET
Enter filename: RSX11M RET
VMR>REM MCR... RET
VMR>INS [3,54]MCD/XHR=NO RET
VMR> CTRL/Z
>RUN $SHUTUP RET
```

There is only one procedure for replacing an external MCR task. It involves the following steps:

1. Create the SLP file, apply it, and create the object file.
2. Incorporate the updated module into the task's object library.
3. Rebuild the task and install it in the system, using MCR or VMR. Before using VMR, you must assign SY: and LB: to the disk containing the target system.

The following example replaces the module INSLB of the external MCR task INSTALL:

```
>SET /UIC=[1,24] RET
>LBR INS/RP=[12,24]INSLB RET
```

If it was necessary to modify the external task's Task Builder command file during the last system generation, it may be necessary at this time to repeat those changes:

```
>SET /UIC=[1,24] RET
>ASN SY:=MP: RET
>TKB @INSBLD RET
>VMR RET
Enter filename: RSX11M RET
VMR>REM ...INS RET
VMR>INS [3,54]INS/IOP=NO RET
VMR> CTRL/Z
>RUN $SHUTUP RET
```

Hardware-boot the system.

C.3 Updating a DCL Source Module

The procedure is different for the DCL task. There are two DCL object libraries: DCLR.OLB for modules in the root segment of the DCL task, and DCLO.OLB for modules in DCL's overlay segments. (One module, COMMAND, has versions in both the root and overlay libraries.) These libraries are located in directory [1,24] of your distribution kit. If you are not sure

whether a module belongs in the root or the overlay library, use the Librarian Utility to scan the module names in the libraries. For instance, to view the module names in DCLO.OLB, enter the following MCR or DCL command:

```
>LBR [1,24]DCLO/LI RET
```

```
$ LIBRARY/LIST [1,24]DCLO RET
```

The modules you are most likely to need to modify are the DCL syntax tables which are in DCLO.OLB. (All DCL syntax tables are in overlay segments.) See the *RSX-11M-PLUS and Micro/RSX System Management Guide* for more information on the structure of the DCL task and on the DCL task-building process.

File DCL.CMD, in directory [23,24] of your distribution kit, can be used either to assemble DCL overlay modules and to rebuild DCL, or as a template for your own commands. The file contains its own instructions. Note that to use this command directly, you must copy various files into its directory and appropriately modify any directories that they reference. DCL.CMD also shows how to assemble the special module COMMAND.

The following process shows how to reassemble a DCL overlay module and rebuild DCL. The process is similar for root modules; simply specify DCLR rather than DCLO. See DCL.CMD for details on rebuilding COMMAND.

If your CLI is MCR, use the following commands:

```
>SET /UIC=[23,24] RET
>MAC xxx=[11,10]RSXMC/PA:1,[23,10]DCLMAC/PA:1,xxx RET
>SET /UIC=[1,24] RET
>LBR DCLO/RP=[23,24]xxx RET
>TKB @DCLBLD RET
```

If your CLI is DCL, use the following commands:

```
$ SET DEFAULT [23,34] RET
$ MACRO [11,10]RSXMC/PASS:1,[23,10]DCLMAC/PASS:1,xxx RET
$ SET DEFAULT [1,24] RET
$ LIBRARY/REPLACE DCLO [23,24]xxx RET
$ LINK @DCLBLD RET
```

When you have built a new version of DCL.TSK, you must replace the old copy of DCL as a system CLI. This is done as follows: First, any terminals whose CLI is DCL must be logged out or set to another CLI. Then, the following commands must be executed (note that these commands are MCR only):

```
>CLI /ELIM=DCL RET
>REM DCL RET
>INS $DCL/CLI=YES RET
>CLI /INIT=DCL RET
```

The REMOVE and INSTALL commands are also valid VMR commands and can be used to modify your system's image on disk. However, the CLI /INIT command is MCR only, and must be put in your system's startup file (if it is not there already).

C.4 Applying Corrections to the File Systems (F11ACP)

All F11ACP updates begin by creating a SLP correction file in directory [13,40]. The following example patches a module called WTRN1.

1. Boot your system and log in on a privileged account, as follows:

```
>HELLO SYSTEM RET
Password:
```

2. If necessary, restore the required files from the distribution tape (the following example assumes that the files in [13,10] have been deleted, but the files in [1,24] have not):

```
>UFD DB0:[13,10] RET
>UFD DB0:[13,40] RET
>BRU RET
BRU>/NOINITIALIZE/SUPERSEDE/NOPRESERVE/BACKUP_SET:MPBL40SRC RET
From: MM0:[13,10]F11PRE.MAC,WTRN1.MAC RET
To: DB0: RET
BRU--Completed
BRU> CTRL/Z
```

3. Create the correction file, as follows:

```
>SET /UIC=[13,40] RET
>EDT WTRN1.COR RET
```

4. Apply the correction, as follows:

```
>SET /UIC=[13,10] RET
>SLP @[13,40]WTRN1.COR RET
```

5. Assemble the corrected module with the Executive macro library, the Executive prefix file RSXMC.MAC, and the prefix file F11PRE.MAC, as follows:

```
>SET /UIC=[13,24] RET
>MAC WTRN1=[1,1]EXEMC/ML,[11,10]RSXMC,[13,10]F11PRE,WTRN1 RET
```

6. Replace the defective module in the FCP library, as follows:

```
>SET /UIC=[1,24] RET
>LBR FCP/RP=[13,24]WTRN1 RET
Modules replaced
WTRN1
```

All of the task-build command files require that the logical device MP: be assigned to the appropriate device.

In the following example, xxx must be replaced by the 3-character designation for your desired FCP, that is, MDL or LRG.

1. Task build the new FCP using the updated library as follows:

```
>ASN NL:=MP: RET

>TKB @FCPxxxBLD
```

2. Install the updated FCP in the system image:

```
>RUN $VMR RET
Enter filename: RSX11M RET
VMR>REM F11ACP RET
VMR>INS [3,54]FCPxxx/PAR=GEN/IOP=NO/CKP=NO RET
VMR> CTRL/Z
>RUN $SHUTUP RET
```

3. Reboot the system to place the new FCP in use.

C.5 Applying Corrections to the Reconfiguration Tasks CON and HRC

The following example illustrates how to patch module CNCMR for the CON task. Unless indicated otherwise, use a similar command sequence for correcting module HRONL for the HRC task.

This example assumes that:

- You have deleted the source files in [27,10].
- You have not deleted the object libraries and command files in [1,24] and [1,20].
- The object library for both CON and HRC is [1,24]OLR.OLB.
- The disk to which you will apply the patches is mounted Files–11 on drive DB0:.
- The distribution tape is mounted foreign on MM0:.

Perform the following steps to patch CNCMR:

1. Boot your system, and log in to a privileged account.
2. If necessary, restore the required files from the distribution tape:

```
>UFD DB0:[27,10] RET
>UFD DB0:[27,40] RET
>UFD DB0:[27,24] RET

>BRU RET
BRU>/NOINITIALIZE/SUPERSEDE/NOPRESERVE/BACKUPSET:MPBL40SRC RET
From:MM0:[27,10]CNPRE.MAC,CNCMR.MAC RET
To:DB0: RET
BRU -- Completed
BRU> CTRL/Z
```

If you were correcting module HRONL, you would substitute the following for the From: line in the previous command sequence:

```
From:MM0:[27,10]HRPRE.MAC,HRONL.MAC RET
```

3. Create the SLP correction file in UIC [27,40], as follows:

```
>SET /UIC=[27,40] RET
>EDT CNCMR.COR RET
```

4. Apply the SLP correction file to CNCMR:

```
>SET /UIC=[27,10] RET
>SLP @[27,40]CNCMR.COR RET
```

5. Assemble the corrected CNCMR module using the Executive macro library and the Executive prefix file RSXMC.MAC; you also use these when assembling a corrected HRC module. In addition, use either the prefix file CNPRE.MAC if assembling a CON module or HRPRE.MAC if assembling an HRC module.

```
>SET /UIC=[27,24] RET
>MAC CNCMR=[1,1]EXEMC/ML,[11,10]RSXMC/PA:1,[27,10]CNPRE,CNCMR RET
```

6. Replace the CNCMR object module in the OLR library:

```
>SET /UIC=[1,24] RET
>LBR OLR/RP/NOEP=[27,24]CNCMR.OBJ RET
```

7. Task build CON using the updated library:

```
>ASN DBO:=IN: RET
>ASN DBO:=OU: RET
>ASN NL:=MP: RET

>TKB @CONBLD RET
```

Note

If you do not have the task-build command files [1,24]CONBLD.CMD and [1,24]CONBLD.ODL, or [1,24]HRCBLD.CMD and [1,24]HRCBLD.ODL, you must use the section of SYSGEN that rebuilds system-supplied tasks.

8. Install the updated reconfiguration utility in the system image:

For CON, type:

```
>RUN $VMR RET
Enter filename:RSX11M RET
VMR>REM ...CON RET
VMR>INS [3,54]CON RET
VMR> CTRL/Z
```

For HRC, type:

```
>RUN $VMR RET
Enter filename:RSX11M RET
VMR>REM HRC... RET
VMR>INS [3,54]HRC/IOP=NO RET
VMR> CTRL/Z
```

9. In order to use the new reconfiguration tasks, follow these steps:

   a. Shut the system down using the SHUTUP utility:

   ```
   >RUN $SHUTUP RET
   ```

   b. Reboot the system.

C.6 Applying FCS Corrections

Correcting the FCS modules on an RSX-11M-PLUS system can be done by updating the source files, assembling them, and replacing modules in the system library, usually LB:[1,1]SYSLIB.OLB.

This process is complicated by the fact that there are three kinds of FCS, as follows:

- ANSI—Supports ANSI-format magnetic tape and big buffers
- Non-ANSI—Does not support ANSI tape or big buffers
- Multibuffered—Supports ANSI tape, big buffers, and multiple buffers

An FCS source file like CLOSE.MAC contains conditional assembly directives that can produce three different CLOSE objects, depending on the global symbols defined when CLOSE.MAC is assembled. These three different CLOSE objects correspond to the three kinds of FCS. Other FCS source files, like DELETE.MAC, have no such conditional assembly directives. They are only assembled one way; that is, only one DELETE object exists.

The SYSLIB.OLB provided on the kits contains the ANSI FCS. Thus, this system library contains modules like CLOSE, assembled with the ANSI tape conditionals and big buffer conditionals enabled, and modules like DELETE, which have no such conditionals and are the same in any FCS.

An alternate system library called NOANSLIB.OLB is also provided. It contains an FCS that does not support ANSI tape, big buffers, or multiple buffers. Be sure that you know whether the system library on your system contains the ANSI FCS, or if it has been replaced with the non-ANSI or multibuffered FCS.

Details of the correcting procedure follow. MCR syntax is used throughout.

C.7 Updating the FCS Sources

The FCS source files are found in [50,10] on the kits. Updating a source is done by entering the correction file into [50,10], and entering "SLP @filename" to apply the correction.

C.8 Assembling FCS

Assembling the updated source or sources can be done in either of two ways. One way is simple and time-consuming; the other is quick, but it must be done with great care. The simple way is to set your UIC to [50,24] and enter MAC @FCSASM. This will assemble every FCS variant properly, producing over 100 object files.

The other choice is to assemble only the sources that have been updated. This is not as simple, but it saves machine time. To assemble only a particular file, look at the five *.CMD files in [50,24] on the kit. Search the command files for all references to the file you want to assemble. A description follows of each command file and what you do with its contents.

1. FCSBOTH.CMD assembles files like DELETE.MAC, which contain no code specifically written to support or deny support to ANSI tape, big buffers, or multiple buffers. If the source file you have updated is mentioned in FCSBOTH.CMD, then it is assembled the same way regardless of which kind of FCS is in your system library. For example, the following lines assemble DELETE:

   ```
   [50,24]DELETE,[50,34]DELETE/-SP=-
   [50,10]FCSPRE,DELETE
   ```

   (FCSPRE.MAC defines necessary macros and global symbols.)

To assemble DELETE.MAC, you should set your UIC to [50,24] and enter the following command line:

```
>MAC [50,24]DELETE,[50,34]DELETE/-SP=[50,10]FCSPRE,DELETE RET
```

As an alternative, you could put the command line in a file and enter "MAC @filename". A file like DELETE.MAC, which has no conditional assembly directives, will be mentioned only in FCSBOTH.CMD.

2. FCSANSI.CMD assembles source files that contain ANSI tape, big buffer, or multiple-buffering conditionals. It produces objects for the ANSI kind of FCS. If your system library contains the ANSI FCS, and the source file you have updated is mentioned in FCSANSI.CMD, then you should use the command line you found in FCSANSI.CMD to assemble the source file. For example, the following lines from FCSANSI.CMD assemble CLOSE.MAC:

```
[50,24]CLOSE.MTA,[50,34]CLOSE.MTA/-SP=-
[50,10]FCSANSI/PA:1,FCSBIGBUF/PA:1,FCSPRE,CLOSE
```

FCSANSI.MAC enables the ANSI tape conditional assembly directives, and FCSBIGBUF.MAC enables the big buffer conditionals. Note the sequence of input file names. It is absolutely imperative that the source file is the last file name specified, and that FCSPRE is next to it, in every FCS assembly. Otherwise, the proper conditionals will not be enabled, with potentially confusing and dangerous results. Any file that is assembled by FCSANSI.CMD is also assembled by FCSNOANSI.CMD and FCSMULBUF.CMD. Note the MTA file types above, which distinguish between the three kinds of CLOSE objects.

3. FCSNOANSI.CMD also assembles source files that contain ANSI tape, big buffer, or multiple-buffering conditionals. It produces objects for the non-ANSI kind of FCS. If your system library contains the non-ANSI FCS, and the source file you have updated is mentioned in FCSNOANSI.CMD, then you should use the command line you found in FCSNOANSI.CMD to assemble the source file. For example, this command line from FCSNOANSI.CMD assembles CLOSE.MAC:

```
[50,24]CLOSE.NMT,[50,34]CLOSE.NMT/-SP=-
[50,10]FCSPRE,CLOSE
```

4. FCSMULBUF.CMD assembles source files that contain ANSI tape, big buffer, or multiple-buffering conditionals. It produces objects that support all of these features. For example, this command line from FCSMULBUF.CMD assembles CLOSE.MAC:

```
[50,24]CLOSE.MBF,[50,34]CLOSE.MBF/-SP=-
[50,10]FCSANSI/PA:1,FCSMULBUF/PA:1,FCSBIGBUF/PA:1,FCSPRE,CLOSE
```

FCSMULBUF.MAC enables the multiple-buffering conditionals.

5. FCSASM.CMD simply causes the other command files to be executed, to assemble FCS in all ways. If you are assembling single sources, ignore FCSASM.CMD.

More information is necessary to correctly assemble a few FCS sources that require additional prefix files. These sources are GET.MAC, PUT.MAC, OPEN.MAC, FINIT.MAC, and RDWRIT.MAC. GET.MAC can be assembled in the normal way (ANSI, non-ANSI, or multi-buffered) to produce GET.MTA, GET.NMT, or GET.MBF. An additional file, GPSEQ.MAC, will enable conditional assembly directives in GET.MAC to produce GETSQ, the sequential GET

module, for each kind of FCS. For example, this is the command line from FCSANSI.CMD, which produces GETSQ.MTA:

```
[50,24]GETSQ.MTA,[50,34]GETSQ.MTA/-SP=-
[50,10]GPSEQ/PA:1,FCSANSI/PA:1,FCSBIGBUF/PA:1,FCSPRE,GET
```

If you correct GET.MAC, be sure that you assemble it to produce objects GET and GETSQ, for whatever kind of FCS your system library contains.

Similarly, GPSEQ.MAC will produce PUTSQ, the sequential PUT module, for each kind of FCS. This is the command line from FCSNOANSI.CMD, which produces PUTSQ.NMT:

```
[50,24]PUTSQ.NMT,[50,34]PUTSQ.NMT/-SP=-
[50,10]GPSEQ/PA:1,FCSPRE,PUT
```

If you correct PUT.MAC, be sure that you assemble it to produce objects named PUT and PUTSQ.

OPEN.MAC can be assembled in the normal way (ANSI, non-ANSI, or multibuffered) to produce OPEN.MTA, OPEN.NMT, or OPEN.MBF. Three additional prefix files exist: OPFID.MTA, OPFNB.NMT, AND OPENR.MAC.

OPFID.MAC produces the open-by-file-id module, OPFID. This is the command line from FCSANSI.CMD, which produces OPFID.MTA:

```
[50,24]OPFID.MTA,[50,34]OPFID.MTA/-SP=-
[50,10]OPFID/PA:1,FCSANSI/PA:1,FCSBIGBUF/PA:1,FCSPRE,OPEN
```

OPFNB.MAC produces the open-by-file-name block module, OPFNB. This is the command line from FCSANSI.CMD, which produces OPFNB.NMT:

```
[50,24]OPFNB.NMT,[50,34]OPFNB.NMT/-SP=-
[50,10]OPFNB/PA:1,FCSPRE,OPEN
```

OPENR.MAC produces the open module for resident libraries, OPENR. This is the command line from FCSMULBUF.CMD, which produces OPENR.MBF:

```
[50,24]OPENR.MBF,[50,34]OPENR.MBF/-SP=-
[50,10]OPENR/PA:1,FCSANSI/PA:1,FCSMULBUF/PA:1,FCSBIGBUF/PA:1,FCSPRE,OPEN
```

If you correct OPEN.MAC, be sure that you assemble it to produce objects OPEN, OPFID, OPFNB, and OPENR, for whatever kind of FCS your system library contains.

FINIT.MAC and RDWRIT.MAC can be assembled to produce FINIT.OBJ and RDWRIT.OBJ. The prefix file FCSSUP.MAC enables conditionals to produce objects FINTSL.SUP and RDWRSL.SUP to be used in supervisor-mode libraries. These objects are necessary for correct execution of the user AST completion routines, which may be specified for FCS READ$ and WRITE$ functions. This is the line from FCSANSI.CMD, which produces FINTSL.SUP:

```
[50,24]FINTSL.SUP,[50,34]FINTSL.SUP/-SP=[50,10]FCSSUP/PA:1,FCSPRE,FINIT
```

Object files FINTSL.SUP and RDWRSL.SUP contain the same entry point names as FINIT.OBJ and RDWRIT.OBJ. Therefore, they must be replaced in system library with their entry points deleted so that they are only used when they are explicitly called when a supervisor-mode library is task-built. See the example in Section C.9.

C.9 Replacing the FCS Object Modules

Set your UIC to [1,1], make a backup copy of the libraries, and use LBR to replace the corrected FCS objects that you have assembled. For example, suppose you have updated and assembled DELETE, PUT, and FINIT on a system with an ANSI FCS in the system library. You would then use the following procedure:

```
>SET /UIC=[1,1] RET
>PIP /NV=SYSLIB.OLB RET
>LBR SYSLIB/RP=[50,24]DELETE.OBJ,PUT.MTA,PUTSQ.MTA RET
>LBR SYSLIB/RP=[50,24]FINIT.OBJ,FINTSL.SUP/-EP RET
```

Suppose you also use NOANSLIB.OLB:

```
>PIP /NV=NOANSLIB.OLB RET
>LBR NOANSLIB/RP=[50,24]DELETE.OBJ,PUT.NMT,PUTSQ.NMT RET
>LBR NOANSLIB/RP=[50,24]FINIT.OBJ,FINTSL.SUP/-EP RET
```

If you want to incorporate the corrected modules into an FCSRES resident library or FCSFSL supervisor-mode library, first rebuild the library, and then rebuild every task that links to it with SYSGEN. If you rebuild and install a resident library and run a task that linked to the old resident library, then the task will call routines in the resident library at the wrong addresses. The results will be uncertain and potentially damaging, especially for privileged tasks.

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