

# RSX-11M-PLUS Release Notes

Order No. AA-H427G-TC

## RSX-11M-PLUS Version 4.2

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## Preface

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### Manual Objectives

The *RSX-11M-PLUS Release Notes* contains important information for using the RSX-11M-PLUS Version 4.2 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 to existing software features
- Descriptions of software and hardware restrictions
- Supplementary information, which appeared in previous release notes but is still applicable
- Corrections to documentation errors
- Software modifications, restrictions, and supplementary information for RMS-11 Version 2.0
- Correction files and restrictions for layered products

### Intended Audience

This manual is intended for all users of the RSX-11M-PLUS Version 4.2 operating system.

### Document Structure

Chapter 1 describes software features, software and hardware restrictions, and supplementary information for the RSX-11M-PLUS Version 4.2 operating system.

Chapter 2 corrects errors and omissions in the RSX-11M-PLUS documentation set.

Chapter 3 describes software modifications, restrictions, and supplementary information for RMS-11 Version 2.0.

Chapter 4 contains correction files and restrictions for layered products.

Appendix A describes the Digital Equipment Computer Users Society (DECUS).

Appendix B describes the procedure for submitting a Software Performance Report (SPR).

Appendix C describes the procedure for applying corrections to source files.

## Conventions

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.
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.

Convention	Meaning
[g,m] [directory]	<p>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.</p> <p>This may also signify a User File Directory (UFD), commonly called a directory. A directory is the location of files.</p> <p>Other notations for directories are: [ggg,mmm], [gggmmm], [ufd], [name], and [directory].</p> <p>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.</p> <p>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]]).</p>
.	<p>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.</p>
KEYNAME	<p>This typeface denotes one of the keys on the terminal keyboard; for example, the RETURN key.</p>
"print" and "type"	<p>As these words are used in the text, the system prints and the user types.</p>
red ink	<p>In interactive examples, what the user types is printed in red. System responses appear in black.</p>



## Chapter 1

---

# New Features, Restrictions, and Supplementary Information

This chapter describes the new software features, lists software and hardware restrictions, and provides supplementary information for the RSX-11M-PLUS Version 4.2 operating system.

### 1.1 Summary of New Features

The RSX-11M-PLUS Version 4.2 operating system supports the following new features:

- Modifications to the Bad Block Replacement Control Task (RCT)
- Enhancements to the MCR commands ASSIGN and DEFINE LOGICALS
- Enhancements to the DCL commands SHOW ASSIGNMENTS and SHOW LOGICALS
- Enhancement to the Resource Monitoring Display (RMD) memory display
- Enhancement to the Backup and Restore Utility (BRU) qualifier /ERRORS
- Enhancement to the BACKUP command qualifier /ERROR\_LIMIT
- Digital Storage Architecture (DSA) driver modifications
- Enhancements to the DU driver to return information used by RCT in the IO.RSN function code
- Modification to the BYE task priority
- Modification to baseline system crash dumps
- Corrections to crash drivers on systems with 4Mb of memory
- Enhancement and correction to a full-duplex driver
- Correction to the I/O function IO.KIL
- Data caching enhancement supports write loads for temporary files
- New switch for TKB options RESSUP and SUPLIB

- Enhancement to the Account File Maintenance Program (ACNT) commands ADD and MODIFY
- New Task Builder option code parameter

## 1.2 Hardware Restrictions and Supplementary Information

The following sections describe hardware restrictions and supplementary information that appeared in previous release notes but is still applicable.

### 1.2.1 Device Restrictions

The following sections describe restrictions to hardware.

#### 1.2.1.1 VT300 Terminals Function in VT200 Mode

The RSX-11M-PLUS operating system only supports VT300 terminals as VT200-series terminals.

#### 1.2.1.2 Large Disks

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 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 Supplementary Hardware Information

RSX-11M-PLUS Version 4.2 supports the following devices:

- MicroPDP-11/53 processor
- RX33 diskette drive
- RA82 disk 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
- LA210 printer
- LA75 serial matrix printer
- LCG01 graphics printer
- LG01/LG02 line matrix printers
- DFA01, DF112, and DF224 modems
- CXA16 and CXB16 16-line multiplexers

- CXY08 8-line multiplexer
- DHF11 32-line terminal interface

### 1.3 Bad Block Replacement Control Task Modifications

This section describes modifications to the Bad Block Replacement Control Task (RCT).

RCT has been modified to support the latest Mass Storage Control Protocol (MSCP) disk storage architecture specification. RCT is used with MSCP controllers, such as the UDA-50 and the RC25, which do not perform automatic revectoring of bad blocks. Instead, these controllers call the RCT task, which performs revectoring for them. Revectoring is the redirection of data from a dysfunctional block to a block that is functional.

A controller that performs its own revectoring creates a complete error log report on the I/O it handles and sends the report to the device driver. The device driver, in turn, sends a report to the Error Logger. In this way, all messages on bad blocks appear in the error log file generated when you enter an ANALYZE/ERROR\_LOG command.

When RCT performs revectoring, it creates the error log report and sends it to the Error Logger. In Version 4.2, the number of bad block replacement messages that appear in the RCT-generated error log file has been reduced, and the existing messages contain more information. In addition, a new error message is issued by the Task Termination Notification program (TKTN), whose function is to send the following message to the console terminal whenever a nonrecoverable hardware error occurs:

```
*** ddnn: -- Replace command failure
```

If you receive this message, it is recommended that you back up the media and note any errors that are reported during the backup operation. You can use the error information to determine if files are corrupted.

In addition, RCT will not produce error log packets if a device is write-protected and RCT is unable to write to the device.

### 1.4 Enhancement to ASSIGN and DEFINE LOGICALS Commands

For the RSX-11M-PLUS Version 4.2 operating system, the MCR commands ASSIGN (ASN) and DEFINE LOGICALS (DFL) have a new functionality and a new display format. The commands can now display at your terminal all logical assignments for a specific logical name.

#### Formats

```
> ASN [logicalname][/keyword]
```

and

```
> DFL [logicalname][/keyword]
```

### Parameter

#### logicalname

Specifies the logical name. You can also specify a portion of a logical name and either the generic wildcard character asterisk (\*) or the specific wildcard character percent sign (%). The asterisk can represent any number of characters. The percent sign can only represent one character.

If you specify quotation marks around the logical name, the ASN command interprets the quotation marks literally, while the DFL command removes the quotation marks.

### Keywords

```
/ALL  
/GBL  
/GR[=n]  
/SYSTEM  
/TERM[=ddnn:]
```

Refer to the *RSX-11M-PLUS MCR Operations Manual* for information on keywords.

The display format of logical assignments has been modified to be more readable. The display specifies the logical name table and then lists the logical name assignments for the issuing terminal.

### Examples

```
>ASN RET  
  
(Session Login Logical Table for VT2:)  
  
"DCM"      = "DU:[CACHE]"  
"ER"       = "EDT/RO "  
"GO"       = "SET /DEF="  
"HOME"     = "SYS$LOGIN"  
"MAP"      = "LB:[1,54]RSX11M.MAP"  
"R"        = "RECALL"  
"REVIEW"   = "DU1:[REVIEWS]"  
"SYS$LOGIN" = "DU:[KAUFFMAN]" [Final]  
"SYS$PROMPT" = "Jeem>"  
  
(Session Local Logical Table for VT2:)  
  
"SYS$CLI" = "DCL"
```

Displays all the login and local assignments for the issuing terminal.

```
>ASN S* [RET]
(Session Login Logical Table for VT2:)
  "SYS$LOGIN" = "DU:[KAUFFMAN]" [Final]
  "SYS$PROMPT" = "Jeem>"

(Session Local Logical Table for VT2:)
  "SYS$CLI" = "DCL"
```

Displays the login and local assignments that begin with letter S for the issuing terminal.

```
>DFL "SYS$CLI" [RET]
(Session Local Logical Table for VT2:)
  "SYS$CLI" = "DCL"
```

Displays the login and local assignments that match the string SYS\$CLI for the issuing terminal.

```
>ASN "SYS$CLI" [RET]
```

Displays no matching login and local assignments that match the string "SYS\$CLI" for the issuing terminal.

```
>ASN /ALL [RET]
(System Logical Table)
  "LI" = "LB:" [Final]
  "SS" = "LB:" [Final]
  "WK" = "LB:" [Final]

(Group 7 Logical Table)
  "GROUP" = "DR5:[7,43]"

(Session Login Logical Table for VT2:)
  "DCM" = "DU:[CACHE]"
  "ER" = "EDT/RO "
  "GO" = "SET /DEF="
  "HOME" = "SYS$LOGIN"
  "MAP" = "LB:[1,54]RSX11M.MAP"
  "R" = "RECALL"
  "REVIEW" = "DU1:[REVIEWS] "
  "SYS$LOGIN" = "DU:[KAUFFMAN]" [Final]
  "SYS$PROMPT" = "Jeem>"

(Session Local Logical Table for VT2:)
  "SYS$CLI" = "DCL"
```

Displays all the system, group, login, and local assignments for the issuing terminal.

```

>DFL S*/ALL REF

(System Logical Table)

    "SS"          =    "LB:" [Final]

(Session Login Logical Table for VT2: )

    "SYS$LOGIN"   =    "DU:[KAUFFMAN]" [Final]
    "SYS$PROMPT"  =    "Jeem>"

(Session Local Logical Table for VT2:)

    "SYS$CLI"     =    "DCL"

```

Displays the system, group, login, and local assignments that begin with the letter S for the issuing terminal.

## 1.5 Enhancement to SHOW ASSIGNMENTS and SHOW LOGICALS Commands

The DCL commands SHOW ASSIGNMENTS and SHOW LOGICALS have a new functionality and a new display format for the RSX-11M-PLUS Version 4.2 operating system. The commands can now display at your terminal all logical assignments for a specific logical name.

### Formats

```
$ SHOW ASSIGNMENTS [logicalname][qualifier]
```

and

```
$ SHOW LOGICALS [logicalname][qualifier]
```

### Parameter

logicalname

Specifies the logical name. You can also specify a portion of a logical name and either the generic wildcard character asterisk (\*) or the specific wildcard character percent sign (%). The asterisk can represent any number of characters. The percent sign can only represent one character.

If you specify quotation marks around the logical name, the SHOW ASSIGNMENTS command interprets the quotation marks literally, while the SHOW LOGICALS command removes the quotation marks.

### Qualifiers

```

/ALL
/GLOBAL
/GROUP[:nG]
/LOCAL
/LOGIN
/SYSTEM
/TERMINAL[:ttnn:]

```

Refer to the *RSX-11M-PLUS Command Language Manual* for information on qualifiers.

The display format of logical assignments has been modified to be more readable. The display specifies the logical name table and then lists the logical name assignments for the issuing terminal.

### Examples

```
$ SHOW ASSIGNMENTS RET
(Session Login Logical Table for VT2:)
"DCM"      = "DU:[CACHE]"
"ER"       = "EDT/RO "
"GO"       = "SET /DEF="
"HOME"     = "SYS$LOGIN"
"MAP"      = "LB:[1,54]RSX11M.MAP1"
"R"        = "RECALL"
"REVIEW"   = "DUI:[REVIEWS]"
"SYS$LOGIN" = "DU:[KAUFFMAN] " [Final]
"SYS$PROMPT" = "Jeem>"

(Session Local Logical Table for VT2:)
"SYS$CLI" = "DCL"
```

Displays all the login and local assignments for the issuing terminal.

```
$ SHOW ASSIGNMENTS S* RET
(Session Login Logical Table for VT2:)
"SYS$LOGIN" = "DU:[KAUFFMAN] " [Final]
"SYS$PROMPT" = "Jeem>"

(Session Local Logical Table for VT2:)
"SYS$CLI" = "DCL"
```

Displays the login and local assignments that begin with the letter S for the issuing terminal.

```
$ SHOW LOGICALS "SYS$CLI" RET
(Session Local Logical Table for VT2:)
"SYS$CLI" = "DCL"
```

Displays the login and local assignments that match the string SYS\$CLI for the issuing terminal.

```
$ SHOW ASSIGNMENTS "SYS$CLI" RET
```

Displays no matching login and local assignments for the string "SYS\$CLI" for the issuing terminal.

```

$ SHOW ASSIGNMENTS ALL RET

(System Logical Table)

"LI"      = "LB:" [Final]
"SS"      = "LB:" [Final]
"WK"      = "LB:" [Final]

(Group 7 Logical Table)

"GROUP"   = "DR5:[7,43]"

(Session Login Logical Table for VT2:)

"DCM"     = "DU:[CACHE]"
"ER"      = "EDT/RO  "
"GO"      = "SET /DEF="
"HOME"    = "SYS$LOGIN"
"MAP"     = "LB:[1,54]RSX11M.MAP"
"R"       = "RECALL"
"REVIEW"  = "DU1: [REVIEWS] "
"SYS$LOGIN" = "DU:[KAUFFMAN]" [Final]
"SYS$PROMPT" = "Jeem>"

(Session Local Logical Table for VT2:)

"SYS$CLI" = "DCL"

```

Displays all the system, group, login, and local assignments for the issuing terminal.

```

$ SHOW LOGICALS S*/ALL RET

(System Logical Table)

"SS"      = "LB:" [Final]

(Session Login Logical Table for VT2:)

"SYS$LOGIN" = "DU:[KAUFFMAN]" [Final]
"SYS$PROMPT" = "Jeem>"

(Session Local Logical Table for VT2:)

"SYS$CLI" = "DCL"

```

Displays the system, group, login, and local assignments that begin with the letter S for the issuing terminal.

## 1.6 Enhancements to Resource Monitoring Display Memory Display

The Resource Monitoring Display (RMD) memory display supports the following two new setup commands:

TOP=n            Specifies the upper limit of the memory display, where n is the limit value in K words.

BOTTOM=n        Specifies the lower limit of the memory display, where n is the limit value in K words.

The commands allow you to examine a specific portion of system memory and will display details of system memory, including tasks and shared regions, that do not appear in a full display of system memory.

You can enter the commands as part of the MCR command line, or you can enter the commands after you access the setup page. If you specify values for *n* that are invalid, RMD will default to a full display of system memory.

## 1.7 Backup and Restore Utility

The following sections describe an enhancement, list a restriction, and provide supplementary information for the Backup and Restore Utility (BRU).

### 1.7.1 Enhancement to BRU Qualifier /ERRORS

Prior to Version 4.2 of the RSX-11M-PLUS operating system, the /ERRORS:*n* qualifier terminated a restore operation after the specified number of errors was reached. The default number of errors was 25. The qualifier could not be used on backup operations.

For Version 4.2 of the RSX-11M-PLUS operating system, the behavior with restore operations is unchanged. However, the qualifier can now be used with double-buffered compare and verify operations on data backed up from a disk to an MU-type device. The default number of errors is 25.

### 1.7.2 /LENGTH Qualifier Restriction

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

### 1.7.3 Supplementary BRU Information

The information in the following sections appeared in previous release notes but is still applicable.

#### 1.7.3.1 Options for BRU Qualifiers /COMPARE and /VERIFY

The BRU qualifiers /COMPARE and /VERIFY have two options: DOUBLEBUFFER and SINGLEBUFFER. The options can only be used with MU-type devices when verifying or comparing information from a disk to a tape. The input device must be a disk and the output device must be a tape or tapes.

#### Notes

1. BRU does not support the /COMPARE:DOUBLEBUFFER qualifier for backup sets that contain more than one tape. Specify the /COMPARE:SINGLEBUFFER qualifier if you must compare a backup set that consists of more than one tape.
2. During a verify operation with both MU-type and non-MU-type output devices, you must use the /VERIFY:SINGLEBUFFER qualifier.

Specifying the DOUBLEBUFFER option may improve the performance of streaming tape devices such as the TK50 cartridge tape device by double buffering I/O operations. Specifying the SINGLEBUFFER option will cause BRU to single buffer I/O operations, which was the default action for versions of BRU prior to Version 4.1.

The formats of the /COMPARE qualifier and the /VERIFY qualifier are shown next.

## Formats

/COMPARE[: option]

and

/VERIFY[: option]

## Parameter

option

Specifies one of the following two options:

SINGLEBUFFER	If you use the SINGLEBUFFER option for a compare or a verify operation from a disk to a tape, descriptive error messages will be reported. The SINGLEBUFFER option is the default for devices that are not MU-type devices.
DOUBLEBUFFER	For most system configurations, a compare or verify operation from disk to tape will be more efficient if you use the DOUBLEBUFFER option. However, the error messages that are reported when you use the DOUBLEBUFFER option are less descriptive than the messages reported when you use the SINGLEBUFFER option. You must use an MU-type device drive that supports the compare host-data function. The DOUBLEBUFFER option is the default for MU-type devices.

## Examples

```
BRU> /COMPARE:SINGLEBUFFER DU0: MU0: [RET]
```

Specifies a compare operation with descriptive error messages reported.

```
BRU> /COMPARE:DOUBLEBUFFER DU0: MU1: [RET]
```

Specifies a compare operation with improved performance, but with less descriptive error messages reported.

```
BRU> /VERIFY:SINGLEBUFFER DU0: MU0: [RET]
```

Specifies a verify operation with descriptive error messages reported.

```
BRU> /VERIFY:DOUBLEBUFFER DU0: MU1: [RET]
```

### 1.1.3.2 BRU Utility Error Messages

The following error messages may be displayed during a backup operation:

#### BRU-FATAL-Device conflict

*Explanation:* This error message can be caused by the following problems:

- You specified the /COMPARE: DOUBLE BUFFER or /VERIFY: DOUBLEBUFFER qualifier without all MU-type output devices.

- You specified both tape and disk drives as part of either the input device specification (for a restore operation) or the output device specification (for a backup operation).

*User Action:* If you wish to mix types of output magnetic tapes (non-MU with MU), you must specify either the /COMPARE:SINGLEBUFFER qualifier or the /VERIFY:SINGLEBUFFER qualifier.

**BRU—WARNING—Error verifying data record**

*Explanation:* A data block on the input disk device did not match a data block on the output tape device.

*User Action:* Repeat the backup operation. If the backup operation fails again, repeat the operation with a different disk or tape device.

To obtain a more descriptive error message (for example, one with the file ID), repeat the compare operation, specifying the /COMPARE:SINGLEBUFFER qualifier.

**BRU—WARNING—Error verifying header record**

*Explanation:* A header record on the input disk device did not match a header record on the output tape device.

*User Action:* Repeat the backup operation. If the backup operation fails again, repeat the operation with a different disk or tape device.

To obtain a more descriptive error message (for example, one with the file ID), repeat the verify operation, specifying the /COMPARE:SINGLEBUFFER qualifier.

**BRU—FATAL—Continuation volumes cannot be double buffered**

*Explanation:* BRU does not support the /COMPARE:DOUBLEBUFFER qualifier for backup sets that contain more than one tape.

*User Action:* Specify the /COMPARE:SINGLEBUFFER qualifier if you must compare a backup set that consists of more than one tape.

**BRU—WARNING—Double buffered compare or verify not supported**

*Explanation:* The tape driver does not support the /COMPARE:DOUBLEBUFFER or /VERIFY:DOUBLEBUFFER qualifier.

*User Action:* No user action is required. BRU continues the verify or compare operation in the single buffer mode.

## 1.8 BACKUP Command

The following sections describe an enhancement, list restrictions, and provide supplementary information for the DCL command BACKUP.

### 1.8.1 Enhancement to BACKUP Command Qualifier /ERROR\_LIMIT

Prior to Version 4.2 of the RSX-11M-PLUS operating system, the /ERROR\_LIMIT:n qualifier terminated a restore operation after the specified number of errors was reached. The default number of errors was 25. The qualifier could not be used on backup operations.

For Version 4.2 of the RSX-11M-PLUS operating system, the behavior with restore operations is unchanged. However, the qualifier can now be used with double-buffered compare and verify operations on data backed up from a disk to an MU-type device. The default number of errors is 25.

### 1.8.2 BACKUP Command Restrictions

The BACKUP command has the following restrictions:

- The /LENGTH qualifier does not apply to cartridge tape devices, such as the TK25 and .TK50, and does not function properly if used on those devices.
- The /NEW\_VERSION and /VERIFY qualifiers are mutually exclusive. They cannot be specified together in the same command line.
- You must specify /REWIND/APPEND when placing the first backup set on a magnetic tape that contains a bootable system image.
- The /TAPE\_LABEL qualifier is ignored during a restore operation if there is a bootable system image at the beginning of the tape.

### 1.8.3 BACKUP Command Supplementary Information

The following sections contain supplementary BACKUP command information.

#### 1.8.3.1 Library Device Online Backup

Online backups on library (LB-type) pseudo devices are supported by RSX-11M-PLUS. However, certain files that are subject to modification will not be backed up. The following system files will not be backed up:

- [1,4]CONSOLE.LOG
- [1,6]ACNTRN.SYS
- [1,6]SYSSCAN.TMP
- [1,6]LOG.ERR
- [1,6]ERRORS.LOG
- [1,6]ERRORS.ACC

### 1.8.3.2 Terminating Network Operations

If any active network operation is found, the system backup procedure issues the following question:

Do you wish to terminate network operations?

To ensure the integrity of a full backup operation, Digital recommends that all network operations be terminated. Network operations will automatically be reactivated when the backup operation is completed.

### 1.8.3.3 Bad Block Checking on Target Diskettes

You must check all backup target diskettes for bad blocks. You must also ensure that you have a sufficient number of checked diskettes before the backup operation begins. For guidelines, you will need one RX50 diskette for approximately every 650 blocks of material to be backed up or one RX33 diskette for approximately every 1920 blocks of material to be backed up. Digital recommends that you have some extras because you cannot check any diskettes for bad blocks after the backup operation begins.

During the operation, the system backup procedure issues the following question:

How many diskettes do you want to check?

Respond with the number of diskettes to be checked. If you have already checked the diskettes that you need, type 0 or press the RETURN key.

The following instruction is then displayed:

Please insert the first diskette to be checked in ddnn:

Insert the first diskette into the drive that will contain the backup copy.

The system backup procedure then prompts you for any remaining diskettes to be checked for bad blocks.

After all the target diskettes have been checked for bad blocks, the following instruction is displayed:

Please insert the first diskette for the backup in ddnn:

Insert the first diskette into the target drive.

### 1.8.3.4 Options for BACKUP Command Qualifiers /COMPARE and /VERIFY

The BACKUP command qualifiers /COMPARE and /VERIFY now have two options: DOUBLE\_BUFFER and SINGLE\_BUFFER. The options can only be used with MU-type devices when verifying or comparing information from a disk to a tape. The input device must be a disk and the output device must be a tape or tapes.

#### Notes

1. The BACKUP command does not support the /COMPARE:DOUBLE\_BUFFER qualifier for backup sets that contain more than one tape. Specify the /COMPARE:SINGLE\_BUFFER qualifier if you must compare a backup set that consists of more than one tape.

2. During a verify operation with both MU-type and non-MU-type output devices, you must use the `/VERIFY: SINGLE-BUFFER` qualifier.

Specifying the `DOUBLE-BUFFER` option may improve the performance of streaming tape devices such as the TK50 cartridge tape by double buffering I/O operations. Specifying the `SINGLE_BUFFER` option causes BRU to single buffer I/O operations, which was the default action for versions of BRU prior to Version 4.1.

The formats of the `/COMPARE` qualifier and the `/VERIFY` qualifier are shown next.

### Formats

`/COMPARE[: option]`

and

`/VERIFY[: option]`

### Parameter

#### option

Specifies one of the following two options:

`SINGLE-BUFFER` If you use the `SINGLE-BUFFER` option for a compare or verify operation from a disk to a tape, descriptive error messages will be reported.

The `SINGLE-BUFFER` option is the default for devices that are not MU-type devices.

`DOUBLE-BUFFER` For most system configurations, a compare or verify operation from disk to tape will be more efficient if you use the `DOUBLE-BUFFER` option. However, the error messages that are reported when you use the `DOUBLE-BUFFER` option are less descriptive than the messages reported when you use the `SINGLE-BUFFER` option.

You must use an MU-type device drive that supports the compare host-data function. The `DOUBLE-BUFFER` option is the default for MU-type devices.

### Examples

```
BACKUP>/COMPARE:SINGLE_BUFFER DU0: MU0: [RET]
```

Specifies a compare operation with descriptive error messages reported.

```
BACKUP>/COMPARE:DOUBLE_BUFFER DU0: MU1: [RET]
```

Specifies a compare operation with improved performance, but with less descriptive error messages reported.

```
BACKUP>/VERIFY:SINGLE_BUFFER DU0: MU0: [RET]
```

Specifies a verify operation with descriptive error messages reported.

```
BACKUP>/VERIFY:DOUBLE_BUFFER DU0: MU1: [RET]
```

Specifies a verify operation with improved performance, but with less descriptive error messages reported.

### 1.8.3.5 BACKUP Command Messages

The following error messages for the BACKUP command may be displayed during a backup operation:

#### BACKUP—FATAL—Device conflict

*Explanation:* This error message can be caused by the following problems:

- You specified the /COMPARE:DOUBLE\_BUFFER or /VERIFY:DOUBLE\_BUFFER qualifier without all MU-type output devices.
- You specified both tape and disk drives as part of either the input device specification (for a restore operation) or the output device specification (for a backup operation).

*User Action:* If you wish to mix types of output magnetic tapes (non-MU and MU), you must specify /COMPARE:SINGLE\_BUFFER or /VERIFY:SINGLE\_BUFFER.

#### BACKUP—WARNING—Error verifying data record

*Explanation:* A data block on the input disk device did not match a data block on the output tape device.

*User Action:* Repeat the backup operation. If the backup operation fails again, repeat the operation with a different disk or tape device.

To obtain a more descriptive error message (for example, one with the file ID), repeat the compare operation, specifying the /COMPARE:SINGLE\_BUFFER qualifier.

#### BACKUP—WARNING—Error verifying header record

*Explanation:* A header record on the input disk device did not match a header record on the output tape device.

*User Action:* Repeat the backup operation. If the backup operation fails again, repeat the operation with a different disk or tape device.

#### BACKUP—FATAL—Continuation volumes cannot be double buffered

*Explanation:* The BACKUP command does not support the /COMPARE:DOUBLE\_BUFFER qualifier for backup sets that contain more than one tape.

*User Action:* Specify the /COMPARE:SINGLE\_BUFFER qualifier if you must compare a backup set that consists of more than one tape.

#### BACKUP—WARNING—Double buffered compare or verify not supported

*Explanation:* The tape driver does not support the /COMPARE:DOUBLE\_BUFFER or /VERIFY:DOUBLE\_BUFFER qualifier.

*User Action:* No user action is required. The system backup procedure continues the verify or compare operation in the single buffer mode.

## 1.9 I/O Device Drivers

The following sections describe enhancements, modifications, and corrections to I/O device drivers for the RSX-11M-PLUS Version 4.2 operating system.

### 1.9.1 DU Driver Enhancements

The DU-type device driver has been enhanced to return more information in the IO.RSN (Read Serial Number) function. The added information is used by the Bad Block Replacement Control Task (RCT). In addition to the volume serial number, the information returned now includes the controller identification number, the hardware and software version numbers of the controller, the unit identifier (device identification number), and the hardware and software version numbers of the device. RCT sends this information to the Error Logger.

A new subfunction, IQ.SEL (Suppress Error Logging), allows you to prevent error messages from being sent to the Error Logger.

In addition, DUDRV has been modified so that it does not request RCT unless the driver is set volume valid.

### 1.9.2 Modifications to DSA Drivers

The Digital Storage Architecture (DSA) drivers were modified as follows:

- The DSA drivers MUDRV, DUDRV, and PUCOM have been modified so that the I/O sequence number is controller specific.

The sequence number ensures that the DSA command reference number is unique, and it is useful in debugging problems related to DSA drivers.

- Because of the information RCT now puts in the system error log file, the DSA drivers MUDRV, DUDRV, and PUCOM have been modified to save information about controller identification in their internal data structures. The IO.RSN (Read Serial Number) function now returns the controller identification number.

- The DSA driver DUDRV has been modified so that there is a time delay before it requests the unit status of RA81 devices following a powerfail. Previously, RA81 devices did not always spin up because they requested the unit status from the controller too quickly.

The time delay is defined in the module DSAPRE.MAC.

- The DSA drivers DUDRV and MUDRV have been modified to ensure that error logs are not requested from the DSA controller if error log support was not generated in the system. The modification will reduce the number of response packets that the drivers must process on systems without error log support.
- Information from internal data structures in the DSA driver PUCOM is passed to RCT because of the information now logged by RCT in the system error log file. The information is returned by the IO.RSN (Read Volume Serial Number) function code. The format of the information is found in the DSAPRE.MAC module.
- The DSA drivers DUDRV and MUDRV have been modified to correctly determine on entry into the powerfail recovery routine if the recovery was for a controller or a unit.
- Offset P.SEQ has been added to the UDADF.MAC module. Offset P.SEQ points to a controller-supplied sequence number and is used for RCT processing.

- A bit definition (UU.SEL) has been added to the UCDF.MAC module. The DSA driver DUDRV uses the definition to determine if error packets should be logged during bad block replacement by RCT. In addition, the submodifier IQ.SEL has been added to module QIOMAC.MAC, which RCT uses to set and reset UU.SEL. The IQ.SEL submodifier only is supported by DUDRV.

### 1.9.3 Corrections to Crash Drivers

For RSX-11M-PLUS Version 4.2, the following corrections have been made to crash drivers on systems with 4Mb of memory:

- Previously, the MU and DU crash drivers behaved incorrectly. The MU crash driver wrapped around to the beginning of memory and repeated the process until the tape was full; it then asked for another tape. The DU crash driver detected the I/O page addresses and reported an I/O error before it issued a prompt for the next dump.

For Version 4.2, the MU and DU crash drivers on 4Mb systems have been modified to keep track of the amount of memory dumped and to terminate the dump when 2044K words of memory have been dumped.

- Previously, the DL crash driver behaved incorrectly. The DL crash driver dumped only 1920K words of memory.

For Version 4.2, the DL crash driver on 4Mb systems has been modified to dump 2044K words of memory.

### 1.9.4 Full-Duplex Terminal Driver Enhancement

For the RSX-11M-PLUS Version 4.2 operating system, you can change the behavior that occurs when the full-duplex terminal driver (TTDRV) processes the unsolicited input characters of slaved terminals. The new behavior of TTDRV is the equivalent of the behavior of TTDRV for versions of the RSX-11M-PLUS operating system prior to Version 2.1.

You use the special bit 2 in the \$TTPRM word from [11,10]SYSCM.MAC to change the behavior of TTDRV. If the bit is not set, TTDRV discards unsolicited input for slaved terminals, which is the default behavior. If the bit is set, TTDRV stores the unsolicited input in a type-ahead buffer, which is the behavior that occurred before Version 2.1 of the RSX-11M-PLUS operating system.

In order to modify the \$TTPRM location, you can use the [12,10]MDM.MAC routine, which is present on your kit. This routine is used for customizing the terminal modem support for the pregenerated RL02 kit. The MDM.COR file accepts the new \$TTPRM value, but you must install MDM.TSK and specify the command "MDM n" to change the \$TTPRM location. The task is vectored and can be moved from one system to another without reassembling and rebuilding the task.

For example, in the \$TTPRM word from the file [11,10]SYSCM.MAC that is supplied by Digital, bit 0 is not set, bit 1 is set, and bit 2 is not set; therefore, the command "MDM 6" will set bit 2. If you have modified the bits in the \$TTPRM word, you must use the command "MDM n" to set bit 2, where n is equal to 4 plus the decimal value represented by bits 0 and 1 of the \$TTPRM word.

### 1.9.5 Full-Duplex Terminal Driver Correction

In previous versions of the RSX-11M-PLUS operating system, TTDRV crashed the operating system when sending the XON/XOFF characters to the terminal because the SNDXON and SNDXOF routines did not save the R4 register before they called the port driver.

This problem has been corrected in Version 4.2.

### 1.9.6 IO.KIL Correction

The RSX-11M-PLUS Version 4.1 operating system would hang when the standard I/O function IO.KIL was issued to an unbuffered IO.RPR operation while the macro was sending a prompt to the terminal.

This problem has been corrected in Version 4.2.

### 1.10 Error Logging Enhancement

The Bad Block Replacement algorithm of the error logging system has been modified to support the latest Mass Storage Control Protocol (MSCP) disk storage architecture specification.

The number of bad block replacement messages that appear in the error log files has been reduced. Also, the existing messages contain more information pertaining to the hardware and the block replacement status.

### 1.11 Data Caching Enhancement

For the RSX-11M-PLUS Version 4.2 operating system, data caching supports write loading for temporary files.

Prior to Version 4.2, creating data blocks in a cache only occurred during read operations. Each block had to be read from the disk at least one time before the defer feature was activated. Because most temporary files that can be deferred are task work files that are written to the disk and then read from the disk, the effectiveness of the defer feature was reduced.

For Version 4.2, I/O requests that can be deferred will result, if necessary, in a write load, which creates a new cache extent. Blocks in a temporary file that have the potential to be deferred will no longer have to be read before a deferred-write operation can occur. This feature will increase the number of blocks that are deferred for a task, and it will increase the performance of the deferred-write support.

### 1.12 Enhancement to ACNT Commands ADD and MODIFY

The Account File Maintenance Program (ACNT) commands ADD and MODIFY have been enhanced for RSX-11M-PLUS Version 4.2. The ADD and MODIFY commands now prompt you for confirmation when you press the RETURN key in response to the password field prompt or the last name (that is, Username) field prompt. Because blank values for account passwords or user names may result in security problems, it is recommended that you do not create accounts with blank values in these fields. However, when you add or modify account fields, you may inadvertently create blank values for fields if you press the RETURN key in response to the field prompt instead of the ESCAPE key which leaves a field unchanged.

Also, the password encryption routine has been enhanced to improve the handling of accounts with blank values in the user-name field or in the password field. The routine was enhanced because the encryption routine uses the user-name field and the password field to encrypt the password. Previously, the routine produced deficient results for accounts with a blank value either in the user-name field or in the password field.

The enhancement will improve security, but you will be unable to log in to accounts with blank user names until you modify the user-name field, which will re-encrypt the password.

## 1.13 Executive

The following sections describe an Executive modification, list a restriction, and provide supplementary information.

### 1.13.1 Modification to the IOSUB.MAC Module

A modification was made to the IOSUB.MAC module to prohibit UNIBUS Mapping Registers (UMRs) and error logging for IO.ATT and IO.DET functions.

### 1.13.2 Shared Region Restriction

You cannot build a shared region that contains I- and D-space. Shared regions that are built with the /ID switch will not operate correctly. As stated in Section 10.19 of the *RSX-11M-PLUS and Micro/RSX Task Builder Manual*, you cannot use the /-HD switch and /ID switch in the same build.

### 1.13.3 Supplementary Information

The following sections describe Executive supplementary information that appeared in previous release notes but is still applicable to RSX-11M-PLUS Version 4.2.

#### 1.13.3.1 Extend Task Directive

The Extend Task directive with the Active Page Register (APR) protection mask enhancement instructs the system to modify the size of the issuing task by a positive or negative increment of 32-word blocks. If the directive does not specify an increment value or if it specifies an increment value of zero, the Executive makes the issuing task's size equal to its installed size. The issuing task must be running in a system-controlled partition and cannot have any outstanding I/O when it issues the directive. The task must also be checkpointable to increase its size; if necessary, the Executive checkpoints the task and then returns the task to memory with its size modified as directed.

In a system that supports the memory management directives, the Executive does not change any current mapping assignments if the task has memory-resident overlays. However, if the task does not have memory-resident overlays, the Executive attempts to modify, by the specified number of 32-word blocks, the mapping of the task to its task region.

If the issuing task is checkpointable but has no preallocated checkpoint space available, a positive increment may require dynamic memory and extra space in a checkpoint file sufficient to contain the task.

The Extend Task directive with the APR protection mask enhancement enables you to specify a mask parameter that will prevent the extension from changing the default mapping of the task's APR mapping. This enables you to extend the data-space window of a task without changing the mapping of APRs that default to overmapping a library in instruction space.

There are several constraints on the size to which a task can extend itself using the Extend Task directive enhancement. These constraints are as follows:

- No task can extend itself beyond the maximum size set by the MCR command SET /MAXEXT or the DCL command SET EXTENSION\_LIMIT or the size of the partition in which it is running. (See the *RSX-11M-PLUS MCR Operations Manual* or the *RSX-11M-PLUS Command Language Manual*.)
- A task that does not have memory-resident overlays cannot extend itself beyond 32K minus 32 words.
- A task that has preallocated checkpoint space in its task image file cannot extend itself beyond its installed size.
- A task that has memory-resident overlays cannot reduce its size below the highest window in the task partition.

#### Format

EXTM\$ [inc],mask

#### Parameters

##### inc

Specifies a positive or negative number equal to the number of 32-word blocks by which the task size is to be extended or reduced.

##### mask

Specifies a mask of APRs to be protected. Bit 0 represents APR0 and bit 1 represents APR1. For example, if you specify 340, then APRs 7, 6, and 5 are protected.

#### Macro Expansion

```
EXTM$ 40,340
.BYTE 89.,3          ;EXTK$ MACRO DIC, DPB SIZE = 3 WORDS
.WORD 40             ;EXTEND INCREMENT, 40(8) BLOCKS (1K WORDS)
.WORD 340            ;APR PROTECTION MASK
```

#### Local Symbol Definition

E.XTIN      Extend increment (2)

## DSW Return Codes

IS.SUC	Successful completion.
IE.UPN	Insufficient dynamic memory or insufficient space in a checkpoint file.
IE.ITS	The issuing task is not running in a system-controlled partition.
IE.ALG	The issuing task attempted to reduce its size to less than the size of its task header; the task tried to increase its size beyond 32K words or beyond the maximum set by the MCR command SET /MAXEXT or DCL command SET EXTENSION_LIMIT; the task tried to increase its size to the extent that one virtual address window would overlap another; the task has memory-resident overlays and it attempted to reduce its size below the highest window mapped to the task partition; or the extend would unmap a protected APR.
IE.RSU	Other tasks are attached to this task partition.
IE.IOP	I/O is in progress for this task partition.
IE.CKP	The issuing task is not checkpointable and specified a positive integer.
IE.NSW	The task attempted to extend itself to larger than the installed size (when checkpoint space is allocated in the task).
IE.ADP	Part of the Directive Parameter Block (DPB) is out of the issuing task's address space.
IE.SDP	Directive Identification Code (DIC) or DPB size is invalid.

### 1.13.3.2 General Information Directive

The general information directive function Get Device Information Junior (GI.DVJ) returns information about a particular device. The device on which information is returned is determined by first performing a logical assignment (if required) and then following any redirection assignments. Device assignments are checked if the high bit in the flag's byte is clear; otherwise, no check of device assignments is made.

#### Format

GIN\$ GI.DVJ, buf, siz, dev, unt

#### Parameters

GI.DVJ

Specifies GIN\$ function code (18).

buf

Specifies address of buffer to receive the unit information.

siz

Specifies size of buffer. Buffer size is 1 word.

**dev**

Specifies device name (if blank, use task's TI:).

**unt**

Specifies device unit number (if high bit clear, follow assignments).

### Buffer Format

- 1 Device is not a mass-storage and mountable device.
- 2 Device is not mounted for issuer.
- Bit 0 READ access is prohibited.
- Bit 1 WRITE access is prohibited.
- Bit 2 CREATE access is prohibited.
- Bit 3 DELETE access is prohibited.
- Bit 4 Device is mounted public.
- Bit 5 Device is mounted private (allocated).
- Bit 6 Device is mounted foreign.
- Bit 7 Foreign device has ACP.

### Macro Expansion

```
GIN$    GI.DEV, DVBUF, DVSIZ, "TT, 1
.BYTE   169., 6
.WORD   GI.DEV
.WORD   DVBUF
.WORD   DVSIZ
.WORD   "TT
.WORD   1
```

### DSW Return Codes

- IS.SUC Successful completion.
- IE.ADP Part of Directive Parameter Block (DPB) is out of task's address space.
- IE.IDU The specified device does not exist, or device is a virtual terminal and issuing task is not parent or offspring.
- IE.SDP Invalid function code or the DPB size is invalid.

### Notes

1. If the task has the "slave" attribute, logical assignments are not checked regardless of the setting of the high bit in the fourth parameter word.
2. If bit 4 and bit 5 are off, the device may be mounted semiprivate; that is, the device may be mounted by the user but not allocated.

### 1.13.3.3 Creating Region Names

A compatibility problem between RSX-11M and RSX-11M-PLUS was fixed for Version 4.1. RSX-11M-PLUS Version 4.1 allows a region to create a region with the name GEN. In addition, RSX-11M-PLUS allows regions in region GEN to be created even if a common named GEN is installed in any main partition.

The changes were made in subroutine \$SRNAM, which is used by many parts of the executive to look up region and partition names. The Get Partition Parameters directive (GPRT\$) uses this routine. Previously, the GRPT\$ directive could get the address and length of an installed common or created region, even though the documentation implied that the directive would only search for a main partition. Now, GPRT\$ looks at the main partition list first; then it looks at the common block directory. This is the reverse of the search order in Version 4.0.

The reason for the change in search order follows. The TKB command shown next performs a GPRT\$ directive for the main partition GEN.

```
>TKB task=object
```

If a region named GEN exists and if the common block directory is scanned first, as it was in Version 4.0, then TKB uses the region's length to test the task image size. This action may produce undesirable results. However, any application that used GPRT\$ to get the parameters of a named common region now gets the parameters of a main partition if the name of the common is not unique with respect to the main partition name. All applications that use \$SRNAM must be changed to attach to the region by name and then to use the Get Region Parameters directive (GREG\$) to obtain the region parameters.

## 1.14 System Generation

The following sections describe system generation modifications, list a restriction, and provide supplementary information for RSX-11M-PLUS Version 4.2.

## 1.15 System Generation Modifications

The following sections describe system generation modifications.

### 1.15.1 Modification to the BYE Task Priority

The system logout task BYE that Digital supplies uses the default scheduling priority of 50. You can increase the priority to process user logouts more efficiently and to quickly free system resources.

You should be careful when you increase the BYE task priority because this may cause scheduling conflicts with tasks that run during user logout processing. If you want to increase the BYE task priority, Digital recommends that you only increase the priority a small amount in order to avoid any scheduling conflicts.

If BYE has a priority value that is slightly greater than 50, BYE will be scheduled before tasks that run at the default priority. However, scheduling conflicts are unlikely to occur with system tasks that have a priority higher than 50 and that are required for logout processing and system processing.

You can modify the BYE task's priority by using one of the following methods:

- You can rebuild the BYE task by using the Rebuilding the Supplied System Tasks section of SYSGEN. You must first edit the task-build command file [1,24]BYEBLD.COMD and specify the option `PRI=n`.
- You can edit the VMR file [1,54]SYSVMR.COMD during the Creating the System Image File section of SYSGEN. Specify the priority you want in the command that installs the BYE task.
- You can install the BYE task by using the MCR command `INSTALL` and specifying the `/PRI=n` keyword.
- You can modify the BYE task priority by using the MCR command `ALT` and specifying the `/PRI=n` keyword.

You must either save the system after you modify the BYE task priority or use the VMR command `INSTALL` to make the BYE task and its new priority recognizable to the system and to retain the new priority when the system is rebooted.

### 1.15.2 Loadable Crash Dump Drivers on the Baseline System

The baseline system that Digital supplies in the distribution kit has been modified to use a loadable crash dump driver. This allows baseline system crash dumps on all configurations, including devices supported by loadable crash dump drivers.

Previously, the baseline system had crash dump support for MM-type devices and could only produce crash dumps on configurations that included MM-type devices. The baseline system now has loadable crash dump support for MM-type devices, but you can change the crash dump driver by using the DCL command `SET SYSTEM /CRASH_DEVICE=ddnn:` or the MCR commands `SET /CRASHDEV=ddnn:` or `SET /CRASH_DEVICE=ddnn:`. Refer to the *RSX-11M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual* for more information on loading crash dump drivers.

To enable a crash dump of the baseline system, you must have previously loaded the appropriate crash dump driver for the crash dump device that you want. Digital recommends that you load the appropriate crash dump driver immediately after booting the baseline system because the crash dump driver cannot be loaded after the system crash occurs.

### 1.15.3 Supplied System Tasks Restriction

If you want to rebuild the DTE and MFT supplied system tasks during the Rebuilding the Supplied System Tasks (BN) section of SYSGEN, you must first install RMS-11. Refer to Chapter 3 for information on installing RMS-11.

### 1.15.4 Supplementary System Generation Information

The following sections provide system generation information that was described in previous release notes but is still applicable.

### 1.15.4.1 Performing a System Generation on a VAX-11 Host

Because physical device names on VMS systems are longer than those on RSX systems, the complete physical device name is not recognized by the RSX SYSGEN procedure or the RSX utilities such as the Backup and Restore Utility (BRU). This limitation is overcome by using what is known as a \$\$n logical name to refer to the device.

The \$\$n logical names for the devices on your VMS system or VAXcluster by VAX-11 RSX are defined during the startup procedure. Please see the VAX-11 RSX *Installation Guide* and *VAX-11 RSX Release Notes* for additional information on how the \$\$n names for your system are defined. Section 2.7 of the VAX-11 *RSX Compatibility Mode Reference Manual* provides more detailed information on \$\$n logical names.

The \$\$n logical name for a device should be used in place of the VMS physical device name wherever a device specification is required. You can determine which \$\$n logical names correspond to the devices you are using with the following command:

```
>SHOW LOGICAL $$* [RET]
```

The following example illustrates how \$\$n names are used to copy a magnetic tape distribution kit and to prepare to invoke SYSGEN on a VAXcluster. The tape used is a TU78 on a HSC controller and the disk used is a local RK07 on controller B.

```
> SHOW LOGICAL $$* [RET]
(LNM$PROCESS_TABLE)
(LNM$JOB_803299A0)
(LNM$GROUP_000301)
(LNM$SYSTEM_TABLE)
  "$$0" = "ALEX$DMA0:"
  "$$1" = "ALEX$DMB1:"
  "$$10" = "BLKHOL$MUA0:"
  "$$11" = "BLKHOL$MUA1:"
  "$$12" = "CSA1:"
  "$$13" = "SYSS$SPECIFIC:"
  "$$14" = "SYSS$COMMON:"
  "$$2" = "ALEX$MMA0:"
  "$$3" = "BLKHOL$DUA0:"
  "$$4" = "BLKHOL$DUA4:"
  "$$5" = "BLKHOL$DUA5:"
  "$$6" = "BLKHOL$DUA6:"
  "$$7" = "BLKHOL$DUA7:"
> MOU $$10:/FOR [RET]
> MOU $$1:/FOR [RET]
> BAD $$1:/LIST [RET]
>BRU [RET]
BRU> /DENSITY:1600/VERIFY/INITIALIZE/MAX:3308/HEADERS:1654 [RET]
From: $$10: [RET]
To: $$1: [RET]
BRU - Starting Tape 1 on $$10:
BRU - End of Tape 1 on $$10:
BRU - Starting verify pass Tape 1 on $$10:
BRU - End of Tape 1 on $$10:
BRU - Completed
BRU> [CTRL/Z]
>SET DEF $$1: [RET]
```

Although using the \$\$n logical name is recommended, because it allows the use of any device on the system, using \$\$n logical names is not necessary in all cases.

If the devices you are using to copy the distribution kit and perform the SYSGEN are on "controller A" (the first controller for that device type) and they are local to the system you are using (not on another system or HSC controller in a VAXcluster), you may simply use an abbreviated form of the device name that omits the controller letter and node name. For example, the devices that appear in the SHOW LOGICAL display above as ALEX\$MMA0: and ALEX\$DMA0: may be referred to as MM0: and DM0: respectively.

#### 1.15.4.2 Startup Procedure Message for Pregenerated Systems

For pregenerated systems, if the startup procedure uses the existing ACFPAR.DAT file to identify the devices in your peripheral configuration, the following message is issued during startup:

```
The existing device configuration information will be used
```

If the startup procedure does not find an existing ACFPAR.DAT, it does not issue the message; instead, the startup procedure runs Autoconfigure to determine the current configuration information and records the information in ACFPAR.DAT, which is used for subsequent system startup procedures.

#### 1.15.4.3 System Task Cleanups

Some system tasks are no longer built to link to the FCSFSL supervisor-mode library. This occurs when tasks do not benefit from being linked to this library. If the task does not make use of the extra Active Page Register (APR) that is gained by using supervisor mode, then supervisor mode may be slower than the standard resident library.

Prior to RSX-11M-PLUS Version 3.0, FCSRES and FCSFSL were different images. It was necessary to build all tasks to use supervisor mode on a system that used the FCSFSL library. For RSX-11M-PLUS Version 3.0, FCSRES and FCSFSL were merged so that one memory image could be linked to either resident mode or supervisor mode. Therefore, it is no longer necessary to build a supervisor-mode version of every task. A task built to use resident mode uses the same FCSRES image as a task built to use supervisor mode.

The following tasks no longer have a supervisor-mode version:

ACC	ELI	PAT	SLP
ACS	HEL	PMD	SYL
CDA	IPP	PSW	UNL
COT	LPP	QMG	ZAP

These tasks are only built to link to FCSRES in resident mode. If you are using a SYSVMR.CMD file that includes supervisor-mode versions of the previous tasks, you must edit SYSVMR.CMD to install the correct versions of the tasks.

You should also manually delete any FSL versions of these tasks that exist in your system library directory after you have installed the new version of the task.

#### 1.15.4.4 Loadable Crash Dump Support

Loadable crash dump support is available for RSX-11M-PLUS operating systems that are not pregenerated. Crash dump devices can be DU-, DL-, MU-, MS-, and MM-type devices. Loadable crash dump support allows you to specify the crash device, to change the crash device, and to turn off crash dump support while the system is operating. Refer to the *RSX-11M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual* for information on crash dump support.

If you want loadable crash dump support for generated RSX-11M-PLUS operating systems, you must enter XX: in response to Question CE290 in the Executive Options section of SYSGEN.

If you want to use the saved answer file SYSGENSA1.CMD as input to the SYSGEN procedure and you want to include loadable crash dump support in your system, you must delete the saved answer to Question CE290. (Refer to the *RSX-11M-PLUS System Generation and Installation Guide* for more information.)

If you have included loadable crash dump support in your system, you can use the DCL command SET SYSTEM/CRASH\_DEVICE (see the *RSX-11M-PLUS Command Language Manual*) or the MCR command SET /CRASHDEV (see the *RSX-11M-PLUS MCR Operations Manual*) to load a specific crash driver into a main memory partition or to specify the crash device to be used by the Crash Dump Analyzer (CDA).

#### Note

The DCL command SET SYSTEM/CRASH\_DEVICE and the MCR command SET /CRASHDEV are now valid for all RSX-11M-PLUS operating systems.

### 1.16 File Control Services Changes Supplementary Information

File Control Services (FCS) has been modified to support VMS ancillary control process (ACP) functions that are needed for compatibility with future RSX products and versions of VAX-11 RSX. These modifications increase the size of the FCS code that is included in the task image. Because the increase in FCS code size may affect the building of some large tasks, FCS routine versions that do not have VMS ACP support are included in the object library [1,1]NOVACPLIB.OLB and in the concatenated object module [1,1]FCSNOVACP.OBS.

Some large tasks that have a complicated Overlay Description Language (ODL) may be affected by the internal reorganization of specific FCS modules. This situation is indicated by "multiply defined symbol" errors occurring in ODL structures that were previously valid. You must correct the situation by revising the ODL structure.

The object library [1,1]NOVACPLIB.OLB can be used to build individual tasks that do not have VMS ACP support. The default routines in the system library remain unchanged. If you replace the routines in the system library (SYSLIB) with the routines from the concatenated object module [1,1]FCSNOVACP.OBS, you will affect all the tasks that are built using the system library, and you will be unable to build tasks with VMS ACP support.

If this support is not desired, it can be removed from the system library. The concatenated object module [1,1]FCSNOVACP.OBS is included on the kits and contains the affected modules with the support removed. To remove this support from your system, replace [1,1]FCSNOVACP.OBS in the system library by using the following Librarian Utility Program (LBR) command:

```
LBR>[1,1]SYSLIB/RP=[1,1]FCSNOVACP.OBS 
```

If you also want to remove extended logical name support from the system library by replacing [1,1]FCSNOLOG.OBS in the system library you must first replace FCSNOVACP.OBS. Some of the same modules are affected by both extended logical name support and VMS ACP support, and the modules are included in both of the concatenated object modules. If FCSNOLOG.OBS is replaced first, some modules in the system library will contain extended logical name support when FCSNOVACP is replaced because the modules in FCSNOVACP.OBS contain extended logical name support.

## 1.17 New FMS Library for Indirect Supplementary Information

The .FORM directive in the Indirect Command Processor (Indirect) has been enhanced to include support for VT200-series terminals in VT200 mode. There is a small reduction in the space available for symbol definition and storage as a result of this enhancement.

## 1.18 Task Builder

The following sections describe a Task Builder (TKB) feature, list restrictions, and provide supplementary information.

### 1.18.1 New Parameter Code for RESSUP and SUPLIB Options

The RESSUP and SUPLIB options have a new parameter code /SW that allows you to write to data space in a supervisor-mode library when mapped to supervisor D-space with the MSDS\$ directive. Use the /SW parameter code to specify read-write access when you build a task that links to a supervisor-mode library. You should use the parameter code /SV to specify read-only access.

Note that, for the /SW parameter code, the supervisor-mode library must be installed with the /RON=NO switch.

The formats of the /SW parameter code are shown next.

#### Formats

RESSUP file-specification/[-]SW[apr]

and

SUPLIB file-specification/[-]SW[apr]

In addition, the library flag word parameter R\$LFLG has a new flag in label block 0. The definition of the flag is shown next.

Mask	Bit	Flag	Meaning
010000	12	LD\$SMV	Include supervisor-mode vectors (1=NO)

## 1.18.2 TKB Restrictions

The following sections describe TKB restrictions.

### 1.18.2.1 OTS Fast Map Restriction

The Object Time System (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 TKB and the system library supplied for your system to ensure that the correct OTS modules are incorporated in your task. If you use the Version 4.1 TKB with an incompatible (older) version of the system library to build an autoloaded overlaid task, the following new fatal error message is issued:

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

Conversely, if you use the Version 4.1 system library with an older version of TKB, the OTS module FSTMAP is automatically included in any task built, but the module will not be accessible. The FSTMP module will not affect the execution or performance of your task.

### 1.18.2.2 VSECT Option Restriction

For an I- and D-space task build, the task builder automatically assumes the program section specified in the VSECT option is a data program section.

## 1.18.3 TKB Supplementary Information

TKB now allocates both data space APRs and instruction space APRs for libraries. At offset 404, label block 0 contains the additional field L\$BAPR, which contains the data space APRs that the task or library requires. (Instruction space APR allocation information is stored in field \$APRMP in psect \$\$TSKP. For more information on psect \$\$TSKP, refer to Appendix E in the *RSX-11M-PLUS and Micro/RSX Task Builder Manual*.)

When you build a library by using the TKB switch /LI, the default action is to allocate the corresponding instruction and data space APRs for the library. However, you can reserve specific data space APRs by using the new /LI subswitch /LI[:bitmask]. The appropriate bits in the bit mask should be set to specify the data space APRs that you want.

If you build a task that links to a library that was built with an earlier version of TKB, only the instruction space APRs are allocated for the library. Tasks that link to libraries built with TKB Version 4.1 have the specified library data space APRs reserved. However, you can override the library data space APR reservations by using the new bit mask option with the LIBR, RESLIB, and CLSTR options.

The formats for these options are shown next.

## Formats

LIBR =name:accesscode[:baseAPR[:bitmask]]

and

RESLIB =file/accesscode[:baseAPR[:bitmask]]

and

CLSTR =lib1,lib2 . . . libn:accesscode[:baseAPR[:bitmask]]

The appropriate bits in the bit mask should be set to reserve the desired data space APRs. If you do not want to reserve data space APRs for your library, you should specify a bit mask of 000. Note that for clusters any data space APR reservation applies to all the libraries in the cluster. The bit mask for a position-independent code (PIC) library is shifted the same amount as the library. For example, if the bit mask for a 2-APR PIC library is 200 and the library is placed in APR 5 and APR 6, the bit mask is changed to 100.

The bit mask uses the same format as the mask for the new EXTM\$ directive: bit 0 represents APR0 and bit 1 represents APR1 (refer to Section 1.13.3.1) For example, if you specify 340, the APRs 7, 6, and 5 are reserved.

## 1.19 Peripheral Interchange Program Restriction

The Peripheral Interchange Program (PIP) qualifier /DD must be used with the ampersand (&) character.

## 1.20 MACRO-11 Version 5.5 Supplementary Information

RSX-11M-PLUS supports the MACRO-11 Version 5.5 software. Refer to *PDP-11 MACRO-11 Language Reference Manual* for information on MACRO-11 Version 5.5.

## Chapter 2

---

### Corrections to Documentation

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

#### 2.1 RSX-11M-PLUS and Micro/RSX Debugging Reference Manual

In the *RSX-11M-PLUS and Micro/RSX Debugging Reference Manual*, Section 1.2.3.3, please remove the second paragraph. For information on how to write to supervisor-mode libraries, refer to the *RSX-11M-PLUS Release Notes*, Section 1.17.1.

#### 2.2 RSX-11M-PLUS Command Language Manual

Please add the following information to the *RSX-11M-PLUS Command Language Manual*:

- In Section 3.8.1, page 3-41, please note that the DCL command SET TERMINAL/INQUIRE supports the VT300-series terminals in VT200 mode only.
- In Section 3.8.1, page 3-42, please note that the DCL command SET TERMINAL/*model* supports the VT300-series terminals in VT200 mode only. You cannot specify VT3xx—SERIES as a terminal type.
- In Section 5.12.5.1, Section 5.12.5.2, and Chapter 9, pages 5-94, 5-96, and 9-6, the formats of the BACKUP qualifiers /CREATED and /MODIFIED are incorrect. The correct formats are shown next.

##### Formats

BACKUP/CREATED/*arg*

and

BACKUP/MODIFIED/*arg*

Where *arg* can be specified as either BEFORE:(dd-mmm-yy hh:mm[:ss]) or AFTER:(dd-mmm-yy hh:mm[:ss]).

- In Section 5.12.6, page 5-104, the second example is incorrect. The correct example is shown next.

`$BACKUP/MODIFIED/AFTER:(14-MAY-87 17:00)/VERIFY DU0: MS0: [RE]`

This example backs up all files on the fixed disk that were modified after 5:00 P.M. on May 14, 1987. After all the files have been copied onto the tape, BACKUP verifies the tape. If files on the tape do not verify, BACKUP returns an error message.

- Section 8.1.3, page 8-5, states that the DCL command SET SYSTEM/CRASH \_DEVICE is valid only for pregenerated operating systems. This is no longer true; the command is now valid for all RSX-11M-PLUS operating systems.

## 2.3 RSX-11 M-PLUS and Micro/RSX Error Logging Manual

Please make the following corrections to the *RSX-11M-PLUS and Micro/RSX Error Logging Manual*:

- In Table 2-2, page 2-8, the following change must be made to the device entry for the control file module ETSV05:

TSV05 /TK25            ETSV05

- In Example A-1, page A-4, the following change must be made to the list of acceptable device names:

;            TSV05 or TK25

## 2.4 RSX-11 M-PLUS Batch and Queue Manual

In Section 2.6.1, page 2-15 of the *RSX-11M-PLUS Batch and Queue Operations Manual*, please add the following description of the /ALL qualifier to the SHOW QUEUE command:

/ALL

Displays information on all entries in all queues.

## 2.5 RSX-11 M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual

Please make the following correction to the *RSX-11M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual*:

- Section 1.1.1 specifies that, for RSX-11M-PLUS operating systems that are not pregenerated, you must select the crash dump driver during system generation. This is no longer true; RSX-11M-PLUS now supports loadable crash dump drivers.

You can select loadable crash dump support during system generation and choose a loadable crash driver during the system startup procedure. Crash dump devices can be DU-, DL-, MU-, MS-, and MM-type devices. Refer to the *RSX-11M-PLUS System Generation and Installation Guide* for more information on including loadable crash support in your system if it is not pregenerated.

In addition, for systems that have loadable crash dump support included, you no longer must perform another SYSGEN to change the crash dump or crash notification devices; you can use either the DCL command SET SYSTEM/CRASH\_DEVICE or the MCR command SET /CRASHDEV. The previous commands are now valid for all RSX-11M-PLUS operating systems. Refer to the *RSX-11M-PLUS Command Language Manual* and the *RSX-11M-PLUS MCR Operations Manual* for more information on the commands.

- Section 1.1.2.1 specifies an incorrect format for the MCR command SET /CRASHDEV (or SET /CRASH\_DEVICE). The correct format is shown next.

#### Format

```
SET /CRASHDEV=ddnn[:CSRaddr]
```

or

```
SET /CRASH_DEVICE=ddnn[:CSRaddr]
```

- Section 1.2.1 specifies that, for systems that are not pregenerated, transferring processor control to the crash dump driver depends on whether you built the Executive Debugging Tool (XDT) into your system during system generation. The information in this section is generally incorrect because RSX-11M-PLUS Version 4.0 included loadable XDT support for all RSX-11M-PLUS systems and RSX-11M-PLUS Version 4.1 included loadable crash dump support for all RSX-11M-PLUS operating systems.

Loadable XDT support enables you to load XDT when you want to use it for debugging. System performance is improved when XDT is not part of the system. Features such as instruction decoding and automated searching of symbol addresses listed in the Executive map are included in the loadable version of XDT. Refer to the *RSX-11M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual* for more information on loadable XDT support.

## 2.6 RSX-11M-PLUS and Micro/RSX Executive Reference Manual

Please make the following corrections to the *RSX-11M-PLUS and Micro/RSX Executive Reference Manual*:

- In Section 5.64, page 5-188, The macro expansion for the RLO\$ and RLOG\$ directives is incorrect. The correct macro expansion is shown next.

```

RLO$ MOD, TBMSK, STATUS, LNS, LNSSZ, ENS, ENSSZ, RSIZE, RTBMOD
.BYTE 207., 10. ;RLO$ MACRO DIC, DPB SIZE = 10(10) WORDS
.BYTE 14. ;SUBFUCTION VALUE (RLOG$ = 10(10))

.BYTE MOD ;LOGICAL NAME MODIFIER
.WORD TBMSK ;LOGICAL NAME TABLE INHIBIT MASK

.WORD LNS ;LOGICAL NAME STRING ARRAY
.WORD LNSSZ ;SIZE (IN BYTES) OF LOGICAL NAME STRING

.WORD ENS ;RETURNED EQUIVALENCE NAME ARRAY
.WORD ENSSZ ;SIZE (IN BYTES) OF EQUIVALENCE NAME

.WORD RSIZE ;LOCATION OF SIZE FOR RETURNED EQUIVALENCE NAME

.WORD RTBMOD ;LOCATION OF LOGICAL TABLE NUMBER (LOWER BYTE) AND
;MODIFIER VALUE OF LOCATED LOGICAL NAME (HIGHER BYTE)

.WORD STATUS ;LOCATION OF LOGICAL NAME STATUS

```

- In Section 5.100, page 5-288, The macro expansion for the TLON\$ and TLOG\$ directives is incorrect. The correct macro expansion is shown next.

```

TLON$ MOD, TBMSK, STATUS, LNS, LNSSZ, ENS, ENSSZ, RSIZE, RTBMOD
.BYTE 207., 10. ;TLON$ MACRO DIC, DPB SIZE = 10(10) WORDS
.BYTE 13. ;SUBFUCTION VALUE (TLOG$ = 9(10))

.BYTE MOD ;LOGICAL NAME MODIFIER
.WORD TBMSK ;LOGICAL NAME TABLE INHIBIT MASK

.WORD LNS ;LOGICAL NAME STRING ARRAY
.WORD LNSSZ ;SIZE (IN BYTES) OF LOGICAL NAME STRING

.WORD ENS ;RETURNED EQUIVALENCE NAME ARRAY
.WORD ENSSZ ;SIZE (IN BYTES) OF EQUIVALENCE NAME

.WORD RSIZE ;LOCATION OF SIZE FOR RETURNED EQUIVALENCE NAME

.WORD RTBMOD ;LOCATION OF LOGICAL TABLE NUMBER (LOWER BYTE) AND
;MODIFIER VALUE OF LOCATED LOGICAL NAME (HIGHER BYTE)

.WORD STATUS ;LOCATION OF LOGICAL NAME STATUS

```

- In Sections 5.104, 5.105, and 5.106, the definition of the FORTRAN subroutine call parameter bufadr is incorrect. The correct definition is as follows:

**bufadr**

Specifies an array containing data to be sent (must be word aligned (INTEGER\*2)).

Please note that the definition of the macro call parameter bufadr is correct and should not be changed.

## 2.7 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]
>;
AT.>.parse a "," b c [RET]
AT.>:'b' [RET]
>;1
AT.>:'c' [RET]
>;2,
AT.> [CTRL/Z]
>@ <EOF>

```

## 2.8 RSX-11 M-PLUS and Micro/RSX Guide to Writing an I/O Driver

Please make the following corrections to the *RSX-11M-PLUS and Micro/RSX Guide to Writing an I/O Driver*:

- Section 1.5.5, page 1-21, illustrates how to create an executive entry point vector table. It does not indicate that there are any differences between creating a vector table for a driver and creating a vector table for a privileged task. However, the length is calculated differently in each case. Use the following statement when determining the length of the vector table for a privileged task:

```
EXEVCL=<<<. -EXEVEC>/2>
```

Use the following statement when determining the length of the vector table for a driver:

```
EXEVCL=<<<. -EXEVEC>/2>-1>
```

- In Section 1.5.6, page 1-22, the table entitled Callable Routine for Converting Executive References in a Driver is incorrect. The correct table is as follows:

```

MOV    KINAR6,-(SP)      ; SAVE KINAR6
MOV    @#112,R0         ; GET ADDRESS OF TABLE OF ENTRIES
MOV    (R0),R0         ; GET ADDRESS OF APR BIAS -- FIRST WORD IN TABLE
MOV    (R0),KINAR6     ; MAP COMMON THROUGH I-SPACE APR 6
MOV    #EXEVEC,R3      ; POINT TO VECTOR
MOV    #EXEVCL,R2      ; SPECIFY LENGTH OF VECTOR
CALL   @#140004        ; TRANSLATE THE VECTOR
MOV    (SP)+,KINAR6    ; RESTORE KINAR6

```

- Please add the following information to Section 7.4.16 of the manual:

If you build a vectored driver for the system macro call GTPKT\$, the following symbol must be defined in the driver code:

```
VC$xx = 0
```

The parameter xx represents the 2-character device mnemonic.

- Please add the following information to Section 7.4.19 of the manual:

If you build a vectored driver for the system macro call INTSV\$, the following symbol must be defined in the driver code:

```
VC$xx = 0
```

The parameter xx represents the 2-character device mnemonic.

- Please make the following correction to Section 8.3, page 8-24 and 8-25:

The example of the sample driver BMDRV.MAC is incorrect because the offset I.PRM+16 must be cleared if you cannot do buffered I/O. Replace the section of code in the example with the following code:

```

:          *****
:          *
:          *   CONVERT TO BUFFERED I/O REQUEST   *
:          *
:          *****
MOV   R5,R3          ; COPY I/O PACKET ADDRESS BACK
:          +-----+
:          |
:          |   THE INPUT PARAMETERS FOR $INIBF ARE:
:          |
:          |   R3 = ADDRESS OF THE I/O PACKET TO BUFFER
:          |
:          |   NO OUTPUT PARAMETERS.
:          |
:          +-----+
:          CALL  $INIBF          ; INITIALIZE BUFFERED I/O
:          BR   45$             ; SKIP CLEARING OF BUFFER ADDRESS
40$:  CLR   I.PRM+16(R3)        ; INDICATE NO BUFFERED I/O
:
:          *****
:          *
:          *   QUEUE THE CLOCK BLOCK           *
:          *
:          *****
45$:  MOV   I.PRM+14(R3),R0    ; GET ADDRESS OF CLOCK BLOCK

```

## 2.9 RSX-11M-PLUS MCR Operations Manual

Please make the following corrections to the *RSX-11M-PLUS MCR Operations Manual*:

- In Section 3.6, page 3-12, the descriptions of the ALT keywords /RPRI and /TERM are incorrect. Delete the second paragraph, which is in parentheses, of the /RPRI keyword description. Also, the first sentence of the /TERM keyword description should read as follows:  
 "Alters the priority of a task not initiated from the issuing terminal."
- In Section 3.31, page 3-103, the description and format of the MCR command LOAD is incomplete. Please add the following sentence to the end of the second paragraph:

"The Load command also loads the extended Executive partitions into memory."

The correct formats of the Load command are shown next.

### Formats

LOA[D] dd:[/keyword(s)]

and

LOA[D] /EXP=expname[/keyword(s)]

- In Section 3.34, page 3-128, the formats of the OPE keywords /TASKD and /TASKI are incorrect. The correct formats are shown next.

### Formats

/TASKD=taskname

and

/TASKI=taskname

- In Section 3.34, the second sentence in the first paragraph on page 3-129 is incorrect; it should read as follows:

"You are limited to the specified memory region (TASK or REG)."

Also, the second, third, and fourth examples on page 3-129 are incorrect. The correct examples are shown next.

```
>OPE O/REG=TSTREG RET
00000000/50712
```

This command opens the region TSTREG at location 0 and displays in octal the current value at the location.

```
>OPE O/REG=TSTREG RET
00000000/50712 % ESC MCR
```

This command opens location 0 of TSTREG, displays the current value in octal, and then displays the Radix-50 value in ASCII format.

```
>OPE O/REG=TSTREG RET
00000000/50712 % ESC MCR %DCL RET
00000002/00000 RET
00000004/14604
```

This command sequence displays the current value at location 0 in octal and then Radix-50 format, and then changes the value. The new value is also in Radix-50 format. Pressing the RETURN key enters the new value into location 0 and displays it in octal, then opens the next location in memory and displays its contents in octal.

- In Section 3.42, page 3-197, the description of the sixth example is incorrect. The correct example is shown next.

```
>SEC /SECPOL RET
SECPOL=285.:640.:44',
```

Displays the amount of available secondary pool.

- In Section 4.40, pages 3-138, 3-140, and 3-141, the format of the RUN keyword /UIC is incorrect in Format 3 and Format 4. The correct format is shown next.

**Format**

/UIC=[g,m]

- In Section 3.40, page 3-139, the definition of the keyword /UIC is incorrect. The correct definition is shown next.

**/UIC**

(Privileged keyword.) The User Identification Code (UIC) under which the task will be requested to run. This UIC also determines which files the task can access.

The UIC has the format [g,m], where the variables *g* and *m* specify octal numbers between 1 and 377 that represent the group and member numbers, respectively. The square brackets are required syntax.

When you specify /UIC, the UIC that you specify becomes the default and protection UICs for the task.

When you do not specify /UIC, the terminal's UIC becomes the default and protection UICs for the task. This is the default.

- In Section 3.40, page 3-139, the definitions of the parameters *taskname* and *dtime* are incorrect. The correct definitions are shown next.

**taskname**

Specifies a 1- to 6-character name of an installed task.

**dtime**

Specifies a delta time. Delta time is an increment from the current time.

- In Section 3.40, pages 3-140 and 3-141, the definition of the parameter *taskname* is incorrect. The correct definition is shown next.

**taskname**

Specifies a 1- to 6-character name of an installed task.

- In Section 3.40, page 3-142, the definition of the parameter \$ is incorrect. The correct definition is shown next.

**\$**

When you specify a dollar sign (\$) in the command line, the parameter *dev* defaults to LB:, and [g,m] defaults to the current library UIC (usually, [3,54]). If the task cannot be found in the library UIC, INSTALL searches the system UIC on device LB: (usually, [1,54]).

If you do not specify a dollar sign (\$), RUN searches for the task image file in the UIC (on device SY) to which the terminal requesting the task is set.

## Note

If LB has been reassigned to another device and the system UIC for that device contains privileged tasks built for another system, your system will fail.

- In Section 3.40, pages 3-144 and 3-145, the descriptions of the RUN command keywords `/PRI=number` and `/UIC` are incorrect. The correct description is shown next.

### `/PRI=number`

Specifies the priority of the task. The value range is 1 to 250<sub>10</sub>, where 250 is the highest priority. Standard number conventions apply: octal by default, decimal if followed by a period.

If a nonprivileged user specifies a priority that is greater than 50<sub>10</sub>, the priority is set to 50<sub>10</sub>.

The default is `/PRI=50`.

### `/UIC=[g,m]`

(Privileged keyword.) Specifies the User Identification Code (UIC) under which the task will be requested to run. The square brackets are required syntax.

If you specify a UIC, the UIC becomes the default UIC and protection UIC for the task. If you do not specify a UIC, your default UIC and protection UIC become the default UIC and protection UIC for the task.

The default is the UIC of the terminal that issues the RUN command.

- In Section 3.42, page 3-154 and page 3-169, the format of the MCR command `SET /INQUIRE` is incorrect. The correct format is shown next.

### Format

`/INQUIRE=term`

- In Section 3.42, page 3-163 and page 3-164, the description of the MCR command `SET /DPRO` is incorrect. The text incorrectly states that the parameter *protection-spec* has two formats. The parameter *protection-spec* can only be specified in the format shown next.

### Format

`[RWED,RWED,RWED,RWED]`

In Section 3.42, page 3-164, the first paragraph under the bulleted items is incorrect. The paragraph should read as follows:

The `/DPRO` keyword establishes a default file protection for your current session at the terminal. When you start a new terminal session, it resets your file protection to the system default protection (or to the default protection in your account file if one was specified when your account was created). To establish a default protection code for all of your future sessions at the terminal, specify the code as a command in your login command file (LOGIN.COM).

- In Section 3.42, page 3-161, the format of the MCR command `SET /CRASHDEV` is incorrect. The correct format is shown next.

## Format

SET /CRASHDEV=ddnn:[CSRaddr]

or

SET /CRASH\_DEVICE=ddnn:[CSRaddr]

Also, the section states that the MCR commands SET /CRASHDEV and SET /CRASH-DEVICE are valid only for pregenerated operating systems. This is no longer true; the commands are now valid for all RSX-11M-PLUS operating systems.

- In Section 3.42, page 3-169, add the following information:

The MCR command SET/INQUIRE supports the VT300-series terminals in VT200 mode only.

- In Section 3.42, page 3-185, add the following information:

The MCR command SET/TERM supports the VT300-series terminals in VT200 mode only. You cannot specify VT3xx as a terminal type.

## 2.10 RSX-11 M-PLUS and Micro/RSX Task Builder Manual

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

- 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.
- Add the following note to Section 5.2.9.2:

### Caution

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

- 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>WWDWS=1 [RET]
TKB>VSECT=MARRAY:160000:20000:200 [RET]
TKB> // [RET]
>
```

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

```
$ LINK/TAS/MAP:VSECT/NOPRINT/OPT VSECT,LB:[1,1]F77FCS/LIB [RET]
Option? WWDWS=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.

- In Section 11.26, page 11-36, the format of the /INCLUDE qualifier is incorrect. The correct format is shown next,

**Format**

\$ LINK/TAS/MAP/SYM inputfile/INCLUDE:(MOD1,MOD2,...MOD8)

Also, please remove note number 3. It is no longer applicable.

In note number 5, the example of the /INCLUDE qualifier is incorrect. The correct example is as follows:

\$ LINK/TAS/MAP/SYM INLIB1/INCLUDE:(MOD1,MOD2),-  
->inputfile2,INLIB1/LIBRARY REF

- In Section 11.39, page 11-55, the description of the /SAVE qualifier is incorrect. All references to the file ATLINK.CMD should be changed to ATLINK.TMP.

Also, please remove the clause "and it contains legitimate TKB command syntax" from the second paragraph.

- In Section 12.4, page 12-8, the definitions of the device-name and unit-num8 parameters are incorrect. The correct definitions are shown next.

**device-name**

Specifies a 2-character alphabetic device name followed by a 1- to 3-digit octal unit number.

**unit-num8**

Specifies decimal numbers indicating the logical unit numbers (LUNs). If your task uses more than six logical units, you should use the UNITS option to specify the number of logical units that your task will use.

Also, the note is no longer applicable; please remove it.

- In Appendix B, page B-6, the description of the Label Block Group is incorrect. Please remove the last sentence in the second paragraph, which states the following: "The LBLDF\$ macro on your system will have the correct offsets."

Also, remove the third paragraph and replace it with the following paragraph:

The LBLDF\$ macro defines the label block offsets for a task that is built on a RSX-11 M operating system. Tasks that are built on RSX-11M-PLUS systems have an additional eight library entries that are inserted in the label block after the entries at offset L\$BLIB. Because of this, the label block offsets from L\$BPRI to L\$BDMZ must be adjusted by the size of the additional entries. Label block offset LBLDF\$ defines the symbol \$LBXL (label block extra length), which determines the size of the additional entries. Therefore, for tasks built on RSX-11M-PLUS operating systems (L\$BSYS=4), you must add \$LBXL to the offsets from L\$BPRI to L\$BDMZ in order to determine the true offset.

- In Appendix B, Figure B-5: Table Block 0-Task and Resident Library Data is incorrect. The correct figure is shown next.

Label	Offset	
LSBTSK	0	Task
	2	Name
LSBPAR	4	Task
	6	Partition
LSBSA	10	Base Address of Task
LSBHGV	12	Highest Window 0 Virtual Address
LSBMXV	14	Highest Virtual Address in Task
LSBLDZ	16	Load Size in 64-Byte Blocks
LSBMXZ	20	Maximum Size in 64-Byte Blocks
LSBOFF	22	Task Offset into Partition
LSBWND/LSBSYS	24	System I.D.   Number of Window Blocks*
LSBSEG	26	Size of Overlay Segment Descriptors
LSBFLG	30	Task Flag Word
LSBDAT	32	Task Creation Date - Year
	34	- Month
	36	- Day
LSBLIB	40	Library/Common
	42	Name
	44	Base Address of Library
	46	Highest Address in First Library Window
	50	Highest Address in Library
	52	Library Load Size (64-Byte Blocks)
	54	Library Maximum Size (64-Byte Blocks)
	56	Library Offset into Region
	60	Number of Library Window Blocks
	62	Size of Library Segment Descriptors
	64	Library Flag Word
	66	Library Creation Date - Year
	70	- Month
	72	- Day
	⋮	⋮
	344	0
LSBPRI**	346	Task Priority
LSBXFR**	350	Task Transfer Address
LSBEXT**	352	Task Extension (64-Byte Blocks)
LSBSGL**	354	Block Number of Segment Load List
LSBHRB**	356	Block Number of Header
LSBBLK**	360	Number of Blocks in Label
LSBLUN**	362	Number of Logical Units
LSBROB**	364	Relative Block of R-O Image
LSBROL**	366	R/O Load Size
LSBRDL**	370	R/O Data Size in 32-Word Blocks
LSBHDB**	372	Relative Block Number of Data Header
LSBDHV**	374	High Virtual Address of Data Window 1
LSBDMV**	376	High Virtual Address of Data
LSBDLZ**	400	Load Size of Data
LSBDMZ**	402	Maximum Size of Data
	⋮	⋮
LSBFL2	772	Second Task Flags Word
LSBLRL	774	Label Block Revision Number
	776	AME (Must Be 0)

Library Entry	Offset	
	0	
	2	R\$LNAM
	4	R\$LSA
	6	R\$LHGV
	10	R\$LMXV
	12	R\$LLDZ
	14	R\$LMXZ
	16	R\$LOFF
	20	R\$LWND
	22	R\$LSEG
	24	R\$FLG
	26	R\$LDAT
	30	
	32	

Library Request (Maximum of Seven 14-Word Entries in RSX-11M Systems and Maximum of Fifteen 14-Word Entries in RSX-11M-PLUS Systems)

\*Less library window blocks.

\*\*If parameter LSBSYS is 4, you must add \$LBXL(340) to the offset to determine the true offset.



Label            Offset

H.CSP	0	Current Stack Pointer (R6)	
H.HDLN	2	Header Length	
H.SMAP/H.DMAP	4	User D-Space Mask	Super D-Space Mask
H.FMAP	6	Pointer to Fast Map Section	
H.CUIC	10	Current UIC	
H.DUIC	12	Default UIC	
H.IPS	14	Initial PS	
H.IPC	16	Initial PC (R7)	
H.ISP	20	Initial Stack Pointer (R6)	
H.ODVA	22	ODT SST Vector Address	
H.ODVL	24	ODT SST Vector Length	
H.TKVA	26	Task SST Vector Address	
H.TKVL	30	Task SST Vector Length	
H.PFVA	32	Power-Fail AST Control Block	
H.FPVA	34	Floating-Point AST Control Block	
H.RCVA	36	Receive AST Control Block	
H.EFSV	40	Address of Event Flag Context	
H.FPSA	42	Address of Floating-Point Context	
H.WND	44	Pointer to Number of Window Blocks	
H.DSW	46	Directive Status Word	
H.FCS	50	Address of FCS Impure Storage	
H.FORT	52	Address of FORTRAN Impure Storage	
H.OVLY	54	Address of Overlay Impure Storage	
H.VEXT	56	Address of Impure Vectors	
H.SPRI/H.NML	60	Mailbox LUN	Swapping Priority
H.RRVA	62	Receive by Reference AST Control Block	
	64	Reserved	H.X25
	66	Reserved	
H.LUTE	70	Pointer to LUT Extension	
H.GARD	72	Header Guard Word Pointer	
H.NLUN	74	Number of LUNs	

} Low-Core Context

ZK-7910-HC

- In Appendix H, page H-2, the explanation for the "Illegal APR reservation" is not complete. Please make the following correction:

#### **Illegal APR reservation**

*Explanation:* An Active Page Register (APR) specified either with the /LI switch or in a COMMON, LIBR, RESCOM, or RESLIB option is outside the range 0 to 7.

## **2.11 RSX-11M-PLUS and Micro/RSX I/O Drivers Reference Manual**

Information on message-oriented communication drivers was inadvertently removed from the *RSX-11M-PLUS and Micro/RSX I/O Drivers Reference Manual*. This information is applicable only to RSX-11M-PLUS operating systems. Refer to Appendix B, Section B.3.10 for information on message-oriented I/O function codes.

The information shown next should be added to the manual.

### **Introduction to Message-Oriented Communication Drivers**

Message-oriented communication line interfaces usually link two separate but complementary computer systems. One system must serve as the transmitting device and the other as the receiving device. Message-oriented communication line interfaces are used to transfer large blocks of data.

While character-oriented interfaces can only be accessed indirectly through the terminal driver, the DMC11 and DUP11 synchronous line interfaces allow I/O requests to be queued directly for them. These devices have drivers of their own and can be accessed by means of logical device names. You can use these names in assigning logical unit numbers (LUNs) with the Assign LUN system directive at task build or with the MCR command REASSIGN.

### **DMC11 Synchronous Line Interface**

The DMC11 synchronous line interface provides a direct memory access interface between two PDP-11 computer systems using the DDCMP line protocol, thus delivering high throughput and reliability while simplifying programming. The DMC11 supports nonprocessor request (NPR) data transfers of up to 8K words at rates of 1,000,000 baud for local operation (over coaxial cable) and 19,200 baud for remote operation (using modems). Both full- and half-duplex modes are supported. The DMC11 synchronous line interface also implements remote load detect, allowing it to reinitialize a halted computer system.

### **DUP11 Synchronous Line Interface**

The DUP11 synchronous line interface is a single-line communications device that provides a program-controlled interface between the PDP-11 and a serial synchronous line. The PDP-11 can be interfaced with a high-speed line to perform remote batch processing, remote data collection, and remote concentration applications. Modem control is a standard feature of the DUP11 and allows using the device in a switched or dedicated configuration. The DUP11 transmits data at a maximum rate of 9600 baud; this rate is limited by modem and data set interface level converters.

The DUP11 can be programmed to accept any sync character that you define. The DUP11 incorporates hardware to perform a cyclic redundancy check (CRC).

## Get LUN Information Macro

Word 2 of the buffer filled by the Get LUN Information system directive (the first characteristics word) contains the following information for message-oriented communication interfaces. A bit setting of 1 indicates that the described characteristic is true for the interfaces described in this section.

Bit	Setting	Meaning
0	0	Record-oriented device
1	0	Carriage-control device
2	0	Terminal device
3	0	File-structured device
4	0	Single-directory device
5	0	Sequential device
6	0	Mass-storage device
7	0	User-mode diagnostics supported
8	0	Device supports 22-bit direct addressing
9	0	Unit software write locked
10	0	Input spooled device
11	0	Output spooled device
12	0	Pseudo device
13	1	Device mountable as a communications channel
14	0	Device mountable as a Files-11 volume
15	1	Device mountable

Words 3 and 4 are undefined, and word 5 has a special meaning for the DUP11 interface. Byte 0 of word 5 contains the number of sync characters to be transmitted before a synching message (for example, after line turn-around in a half-duplex operation), and byte 1 is a sync counter.

## QIO\$ Macro

The following sections summarize the standard and device-specific functions of the QIO\$ macro that are valid for the communication interfaces.

## Standard QIO\$ Functions

The standard functions of the QIO\$ macro that are valid for the communication devices are shown next.

Format	Function
QIO\$C IO.ATT,...	Attach device
QIO\$C IO.DET,...	Detach device
QIO\$C IO.KIL,...	Cancel I/O requests
QIO\$C IO.RLB,...., <stadd,size>	Read logical block (stripping sync)
QIO\$C IO.WLB,...., <stadd,size>	Write logical block (preceded by syncs)

### stadd

Specifies the starting address of the data buffer (may be on a byte boundary).

### size

Specifies the data buffer size in bytes (must be greater than 0).

## Device-Specific QIO\$ Functions

The specific functions of the QIO\$ macro that are valid for the communication line interfaces are shown next.

Format	Function
QIO\$C IO.FDX	Set device to full-duplex mode
QIO\$C IO.HDX,...., <stat,mode>	Set device to half-duplex mode
QIO\$C IO.INL,...	Initialize device and set device characteristics
QIO\$C IO.RNS,...., <stadd,size>	Read logical block, without stripping sync characters (transparent mode); for DMC11, treated like IO.RLB. Not supported on DUP11.
QIO\$C IO.SYN,...., <syn>	Specify sync character; not applicable to DMC11
QIO\$C IO.TRM,...	Terminate communication, disconnecting from physical channel
QIO\$C IO.WNS,...., <stadd,size>	Write logical block without preceding sync characters (transparent mode); for DMC11, treated like IO.WLB

### stat

Specifies the station assignment (primary or secondary).

### mode

Specifies the transmission mode (normal or maintenance).

**stadd**

Specifies the starting address of the data buffer (may be on a byte boundary).

**size**

Specifies the data buffer size in bytes (must be greater than 0).

**syn**

Specifies the sync character, expressed as an octal value.

The device-specific QIO\$ functions are described in the following sections.

**IO.FDX Function**

The QIO\$ function IO.FDX sets the mode on a DUP11 or DMC11 unit to full duplex. The IO.FDX function code can be combined (ORed) with the IO.SYN function code, if desired, to set the operational characteristics of the physical device unit.

**IO.HDX Function**

The QIO\$ function IO.HDX sets the mode on a DUP11 or DMC11 unit to half duplex. The IO.HDX function code can be combined (ORed together) with the IO.SYN function code, if desired, to set the operational characteristics of the physical device unit.

Setting half-duplex mode on the DMC11 also involves setting the station assignment (primary/secondary) and may include selecting maintenance mode (MOP) as opposed to normal mode. The station assignment is included in the optional QIO\$ parameter p1. A 0 indicates a primary station and a nonzero indicates a secondary station. The DMC11 works properly if both ends are primary stations or if there is one primary and one secondary station. It does not work if both ends are secondary stations. The optional QIO\$ parameter p2 selects the mode. A 0 selects normal mode and a nonzero selects MOP mode. A DMC11 in MOP mode cannot communicate with a DMC11 in normal mode.

**IO.INL and IO.TRM Functions**

The QIO\$ functions IO.INL and IO.TRM have the same function code but different modifier bits.

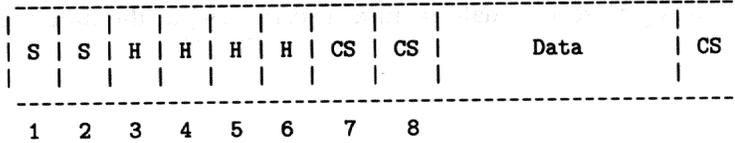
IO.INL initializes a physical device unit for use as a communications link. It turns the device on line, sets device characteristics, and ensures that the appropriate data terminal is ready.

IO.TRM disconnects the device. If the device has a dial-up interface, it also hangs up the line.

**IO.RNS Function**

The IO.RNS QIO\$ function reads a logical block of data without stripping the sync characters that may precede the data.

IO.RLB is a similar function, which is nontransparent, in that it causes the sync characters that precede the data message to be stripped. Use IO.RLB at the start of a segmented data request, in which the block might have the following layout:



S

Specifies a sync character.

H

Specifies a header character.

CS

Specifies a validity check character.

You must strip sync characters from the beginning of a data block in this way. Stripping only at the beginning of a read operation allows a later character that happens to have the same binary value as a sync character to be read without stripping. Use IO.RLB to read a logical block with leading sync characters stripped; use IO.RNS to read the block without stripping leading sync characters.

#### IO.SYN Function

This QIO\$ function allows the programmer to specify the sync character to be recognized when an IO.RLB or IO.WLB function is performed. IO.SYN can be combined (ORed together) with IO.HDX or with IO.FDX to set the characteristics of the physical device unit.

#### IO.WNS Function

This QIO\$ function causes a logical block to be written with no preceding sync characters. To ensure that the two systems involved in a communication are synchronized, two or more sync characters are transmitted by one system and received by the other before any other message can be sent.

Use IO.WLB to write a block of data preceded by sync characters.

Use IO.WNS to perform a block transfer without sending sync characters first.

#### Programming Hints

The following sections contain important information about programming the message-oriented communication interfaces.

#### Transmission Validation

Because there is no way for the transmitting device to verify that the data block has successfully arrived at the receiving device unless the receiver responds, the transmitter assumes that any message that is clocked out on the line (without line or device outage) has been successfully transmitted. As soon as the receiver is able to satisfy a read request, it returns a successful status code (IS.SUC) in the I/O status block. Of course, only the task receiving the message can determine whether the message has actually been transmitted accurately.

The receiving device should be ready to receive data (with a read request) at the time the transmission is sent.

### **Redundancy Checking**

By the nature of message-oriented communications, only the task that receives a communication can determine whether the message was received successfully. The transmitter simply transfers data, without validation of any kind. It is therefore the responsibility of the communicating tasks that use the device to check the accuracy of the transmission. A simple validity check is a checksum-type longitudinal redundancy check. A better approach to validating data is the use of a cyclic redundancy check (CRC). A CRC can be computed in software or with a hardware device, such as the KG-11 communications arithmetic option.

The DUP11 incorporates hardware to compute a CRC.

### **Half-Duplex and Full-Duplex Considerations**

Because there is a single I/O request queue, only one QIO\$ request can be performed at a time. It is therefore not possible, through QIO\$s, for a device to send and receive data at the same time. Also, because timeouts are not set for receive functions, a receive QIO\$ is terminated only by receiving a message from the remote system, or by issuing an IO.KIL QIO\$ for the device. Therefore, if no message is transmitted by the remote system, a receive does not terminate, and no further I/O can be performed on that device until the receive is killed by issuing an IO.KIL QIO\$.

You can use both half-duplex and full-duplex lines with the DMC11 and DUP11. The mode is settable by using IO.FDX for full-duplex mode and IO.HDX for half-duplex mode. In half-duplex mode, the modem signal RTS (Request To Send) is cleared after each "transmit message." In full-duplex mode, this signal is always left on. Using full-duplex mode eliminates modem delays in transmission, but requires full-duplex hardware and communication links.

The DMC11 Driver maintains both transmit operations and receive operations separately in its own internal queues. Thus, it is a full-duplex driver. There is no limit on the number of outstanding I/O requests that can be active at any given time. The DMC11 hardware, however, allows a maximum of only seven transmit operations and seven receive operations to be active at any time. The driver gives the first seven transmit operations (or receive operations) directly to the DMC11 and queues the eighth and subsequent transmit operations (or receive operations) internally until the DMC11 acknowledges a successful I/O request. When running on a MicroPDP-11/70, the driver gives only two transmit operations (or receive operations) to the DMC11 because each request requires a UNIBUS mapping register (UMR). The DMC11 driver is assigned five UMRs: one for base table(s), two for active transmit operations, and two for active receive operations.

### **Low-Traffic Sync Character Considerations**

If message traffic on a line is low, each message sent from a communications device should be preceded by a sync train. This enables the controller to resynchronize if a message is "broken" (that is, part or all of it is lost in transmission). Correspondingly, every message received by a communications device under low-traffic conditions, when messages are not contiguous (back-to-back), should be read with an IO.RLB (read, strip sync) function. This requires that the first character in the data message itself not have the binary value of the sync character.

## Powerfail with DMC11

The DMC11 currently cannot recover after a power failure because the random-access memory (RAM) in its internal microprocessor is erased when power fails. Any I/O requests outstanding at the time of a power failure return the IE.ABO status. These requests must be reissued after initializing the DMC11(IO.INL).

## Importance of IO.INL

After the type of communication line has been determined, and after IO.SYN has specified the sync character, it is extremely important that IO.INL be issued before any transfers occur. This ensures that appropriate parameters are initialized and that the interface is properly conditioned. Note that IO.INL provides the only means of setting device characteristics, such as sync character. For this reason, you should always use IO.INL immediately prior to the first transfer over a newly activated link.

Tasks sending messages to the DMC11 should begin by terminating and reinitializing the device (IO.TRM, IO.INL). Note that this causes the error IE.CNR to be returned on any I/O outstanding on the other end of the line. IO.INL must be issued after each IO.KIL (which effectively kills the DMC11), after power fail, and upon receipt of any error code.

## Programming Example

The following example illustrates the initialization, the setting of device parameters, and the transmission of a block of data on a message-oriented communication device.

```
. MCALL ALUN$$,QIO$$

ALUN$$  1,"XP,0                ; USE LUN1 FOR DP11
QIO$$   IO.HDX!IO.SYN,<1,,,, 226> ; SET DEVICE PARAMETERS
QIO$$   IO.INL,1              ; PUT DEVICE ON LINE
QIO$$   IO.WLB,1 , , ,<TXSTS,TXAST,TXBUF,100> ; SEND A BLOCK

TXAST:  CMPB IS.SUC_&377,@(SP)+ ; WAS DATA CLOCKED OUT
; SUCCESSFULLY?
; IF SO, SET UP FOR NEXT
BEQ 10$ ; BLOCK
```

## 2.12 RSX-11 M-PLUS and Micro/RSX System Management Guide

In Section 5.5.16, page 5-74, of the *RSX-11M-PLUS and Micro/RSX System Management Guide*, the third example is incorrect. The correct example is as follows:

```
VMR> SET /SECPOL [RET]
SECPOL=285.:640.:44%,
```

Displays the amount of available secondary pool.

## 2.13 RSX-11M/M-PLUS RMS-11 User's Guide

Please add the following corrections to the *RSX-11M/M-PLUS RMS-11 User's Guide*:

- 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.
- 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 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 multiarea file; however, RMS-11 cannot determine if those areas remain contiguous. Consequently, RMSDSP and RMSDES 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.

## 2.14 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 Table 6-2, page 6-14, the value for the symbol XB\$DAT is incorrectly given as 000003. The correct value is 000002.

- 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 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 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 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.

## 2.15 RSX-11M/M-PLUS RMS-11 Utilities

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

- In Table 2-1, add the following RMSDES 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 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 RMSDES 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 DES. If you do not want to supersede an existing description file, use the EXIT command.
- In 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 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, RMSDES 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 DES. 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 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 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 RMSDES to define areas for an indexed file by default, RMSDES 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 RMSDES to define areas for an indexed file by default, RMSDES 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 RMSDES to define areas for an indexed file by default, RMSDES 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 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 RMSDES. If the value was not within the legal range, the error message is followed by a display of the incorrect value.

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

`/NV` Creates a new version of the output file.

- In Section 6.2, 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 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 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

In the event of a change in the following information, the sponsor of the BAPC should

notify the BAPC of the change in writing. The BAPC will then update the BAPC database with the new information. The BAPC will also update the BAPC database with the new information. The BAPC will also update the BAPC database with the new information.

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## Chapter 3

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# RMS-11 Version 2.0 Software Modifications, Restrictions, and Supplementary Information

This chapter describes RMS-11 software modifications, lists restrictions, and provides supplementary information for RSX-11M-PLUS Version 4.2.

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 RMS-11 Modifications

The following sections describe modifications for RMS-11.

#### 3.1.1 Access Methods Modification

The RMS-11 Macro library LB:[1,1]RMSMAC.MLB has been modified so that it adds the symbol NB\$NOD to the NAM\$BT macro. The modification allows you to easily check for a node name in the NAM block file specification mask field.

#### 3.1.2 Remote Access Methods Modification

The file specification extended access control string can now contain a maximum of 39 characters as allowed by the Data Access Protocol (DAP). Previously, the RMS-11 remote access would fail if the password contained more than 8 characters. The correction involved modules R0NFLR and R0NFRT in LB:[1,1]RMSDAP.OLB and in the DAPRES Resident Library.

### 3.2 Software Restrictions

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

### 3.2.1 RMS-11 Access Methods

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 by setting your terminal to named directory mode. If that is not possible, you should rebuild those tasks by using the new version of RMS-11.

### 3.2.2 RMS-11 Remote Access Methods

RMSDAP does not interpret the keysize field value correctly if it is zero. This causes keyed access to a remote indexed file to fail. The application passes the value zero in the keysize field for access to a non-string key and the following error message is issued:

```
Record not found
```

This error occurs with F77, and it may also occur with other languages.

### 3.2.3 RMS-11 Utilities

This section describes restrictions to the RMS-11 utilities for Version 2.0.

#### 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.

#### 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.COM file:

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

## 3.3 RMS-11 Supplementary Information

The following sections describe information that has been documented in the previous release notes, but is still applicable.

### 3.3.1 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.

### 3.3.2 RMS-11 Installation

The following sections describe information for installing RMS-11 on an RSX-11M-PLUS Version 4.2 operating system.

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

#### 3.3.2.1 Location of RMS-11 Files on the Distribution Kit

Table 3–1 describes the location of RMS-11 Version 2.0 files on the RSX-11M-PLUS Version 4.2 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-11 Files on RSX-11M-PLUS 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 the system library
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 MSRESAB.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

(continued on next page)

**Table 3-1 (Cont.): RMS-11 Files on RSX-11M-PLUS Distribution Kit**

File Name	Destination	Comments
RMSDEF.TSK	LB:[3,54]	RMSDEF utility; uses RMSRES
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
RMSLX.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; <i>not</i> 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* RMSLBM.MAP* DAPRES.MAP*	LB:[1,34]	Maps for segmented library
RMSRES.TSK	LB:[3,54]	Task image for linking in supervisor mode; <i>not</i> to be installed as the root of the library
RMSRES.STB	LB:[3,54]	STB file for linking supervisor-mode tasks

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**Table 3-1 (Cont.): RMS-11 Files on RSX-11M-PLUS Distribution Kit**

File Name	Destination	Comments
RMSLBL.CMD* RMSLBL.ODL*	LB:[1,24]	For rebuilding RMSLBL
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
DSPNON.CMD* DSPNON.ODL*	LB:[1,24]	For rebuilding the overlaid version of RMSDSP

(continued on next page)

**Table 3-1 (Cont.): RMS-11 Files on RSX-11M-PLUS 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.

**3.3.2.2 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, RMSRESAB, must be the task image contained in `LB:[1,1]`. The `[1,1]RMSRES.TSK` should never be installed in the system; it is only used when tasks are 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 may cause the error codes `ER$LIB` or `ER$ENV`, or 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 the RSX-11M-PLUS operating system; 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 (RMSDAP), you must edit the startup command file, which contains template commands (comments) that you can edit to install these facilities.

### 3.3.2.3 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.

### 3.3.2.4 Utility Command and ODL Files

For each utility, a command file and one or more ODL files 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 file 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	DSPNRN.CMD and DSPNRN.ODL
RMSDESAB	DESNRN.CMD and DESNRN.ODL
RMSDEF	DEFNRN.CMD and DEFNRN.ODL
RMSIFL	IFLNRN.CMD and IFLNRN.ODL

Finally, a command file 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 files and ODL files are not supplied with the RL02 and RC25 kits.

**3.3.2.5 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.



# Chapter 4

## Layered Product Support

### 4.1 Correction Files

Table 4-1 lists the layered products and correction files for the RSX-11M-PLUS Version 4.2 operating system. The layered products that have updated correction files for this release are marked with an asterisk (\*). The application of the updated correction files 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.

**Table 4-1: Layered Product Correction File References**

Layered Product	Directories Used	Backup Set	Documentation File Name
BASIC-PLUS-2 Version 2.5	[211,200]	BP2	[211,200]BP2.DOC
COBOL-81/RSX Version 2.4	[216,200]	COBOL81	[216,200]C81.DOC
DECmail-11 Version 3.1	[321,200]	DECMail	[321,200]DECMail.DOC
DECnet-11M-PLUS Version 4.0	[230,200] [225,40] [230,20] [230,40]	DECNET	[230,200]DECNET.DOC
DPM-PLUS Version 1.1	[236,200]	DPM	[236,200]DPMP.DOC
DATATRIEVE-11 * Version 3.2	[222,200]	DTR	[222,200]DTR.DOC

(continued on next page)

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

<b>Layered Product</b>	<b>Directories Used</b>	<b>Backup Set</b>	<b>Documentation File Name</b>
IP-11 Industrial I/O Subsystem Software Driver Version 4.1	[340,200]	IP11	[340,200]IPUPINST11.DOC
MIRA Version 1.0 *	[370,200]	MIRA	[370,200]MIRA.DOC
PDP-11 FORTRAN-77/R SX Version 5.2	[246,200]	F77	[246,200]F77.DOC
PDP-11 FORTRAN IV Version 2.6	[245,200]	FORTIV	[245,200]FORTIV.DOC
PDP-11 Pascal/R SX * Version 1.2	[262,200]	PASCAL	[262,200]PASCAL.DOC
PDP-11 SORT/MERGE Version 3.0	[311,200]	SORT	[311,200]SORT.DOC
PDP-11 Symbolic Debugger Version 2.0	[247,200]	PDPDBG	[247,200]PDPDBG.DOC
RSX-11 2780/3780 Protocol Emulator Version 4.1	[301,200] [301,25]	2780	[301,200]2780.DOC
RSX-11 3271 * Version 3.1	[345,200] [345,25]	3271	[354,200]3271.DOC
WPS-PLUS/R SX Version 1.0	[323,200]	WPS	[323,200]WPS.DOC

## 4.2 Installing 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

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### 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 nonprofit 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 Pre-Symposium Seminars, and conduct demonstrations for the benefit of other members.

United States DECUS Symposia are held twice per year, in the Spring and Fall, in varying locations around the country. Events which are currently scheduled include the following:

Spring DECUS	May 8-12, 1989	Atlanta, GA
Fall DECUS	November 6-10, 1989	Anaheim, CA
Spring DECUS	May 7-11, 1990	New Orleans, LA
Fall DECUS	December 10-14, 1990	Las Vegas, NV

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, including the RSX SIG, in the United States alone. Many of the SIGs print newsletters and disseminate valuable technical information to members.

### A.3 DECUS Membership

To obtain a membership form for DECUS, contact a Digital sales representative or the nearest DECUS chapter office. Membership information may be obtained directly from U.S. DECUS Headquarters by calling telephone number 508-480-3446.

## Appendix B

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### 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 Comments 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 the problem 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 to 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 are supplied.
  - Errors in documentation are noted.

You can submit the following categories of SPRs:

- **Problem/Error SPR**

This type of SPR contains a software problem. It is assigned a priority of 1 to 5. You receive an answer to this report.
- **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.
- **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**—Supply 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—Supply controller/device information, software options, error log output, a copy of device registers, and a sample program.
- UTILITIES—Supply a copy of your terminal output, showing setup commands, before and after effects, and relevant file information.
- TASK BUILDER—Supply 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—For a corrupted volume, supply output from the verification utility and dump of the volume. For improper results, supply the error code, a file header dump, and a sample program.
- ERROR LOG REPORT GENERATOR (RPT)—Supply 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, the DECnet package), 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 the RSX-11M-PLUS operating system, which includes changes and problems other people have found and solved.

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the integrity of the financial system and for the ability to detect and prevent fraud. The document outlines the various methods used to collect and analyze data, including the use of computerized systems and manual audits. It also discusses the challenges of data collection and the need for standardized procedures to ensure consistency and reliability of the information.

The second part of the document focuses on the role of the auditor in the financial reporting process. It describes the various types of audits, including internal, external, and forensic audits, and the specific responsibilities of each. The document also discusses the importance of the auditor's independence and objectivity, and the need for the auditor to maintain a high level of professional skepticism and to adhere to the highest standards of ethical conduct.

The third part of the document discusses the various factors that can influence the quality of financial reporting. It identifies the key areas of concern, such as the quality of the underlying data, the effectiveness of the internal control system, and the influence of external factors such as market conditions and regulatory changes. The document also discusses the role of the auditor in assessing the quality of the financial reporting process and the need for the auditor to communicate the results of their audit to the appropriate stakeholders.

# 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 have 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 the availability of the original sources.

### C.1 Updating an Executive Source Module

To update an Executive source file (ABCDERMAC, for example), mount the disk on which you performed your system generation and create a SLP correction file named ABCDERCOR in the directory [11,40]. (All the following instructions assume that you are working on the disk on which you performed your system generation.) Then, while your system is running under User Identification Code (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 the Librarian Utility Program (LBR) to replace the old version of the module in the RSX11M.OLB file 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 file of your target system. For example, assume that [11,10] contains the RSXMC.MAC file resulting from your system generation and 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.COM 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 the Virtual Monitor Console Routine (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.

For example:

```
>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 with 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:

1. 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]
```

2. Assume that directory [11,10] contains the RSXMC.MAC file resulting from your target system generation and 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, which must be assigned to NL or another device to avoid a diagnostic error message from the Task Builder.

3. If it was necessary to modify the MCR Task Builder command file (MCRBLD.COM) 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 to replace the module MCRDIS, use the following procedure:

```
>SET /UIC=[1,24] [RET]
>LBR MCR/RP/N0EP=[12,24]MCRDIS [RET]
>PIP MCRDIS.OBJ;*/DE [RET]
>ASN SY:=MP: [RET]
>ASN SY:=IN: [RET]
>TKB @MCDBLD [RET]
>VMR [RET]
Enterfilename: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]
```

4. 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]
Enterfilename: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] on your distribution kit. If you are not sure whether a module belongs in the root or the overlay library, use the Librarian Utility Program (LBR) to scan the module names in the libraries. For instance, to view the module names in DCLO.OLB, enter the MCR or DCL command shown next.

```
>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, located in directory [23,24] on 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 file directly, you must copy various files into directory [23,24] and appropriately modify any directories that they reference. File 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 the DCL.CMD command procedure for details on rebuilding COMMAND.

If your command line interpreter (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. 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 for 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 for MCR only, and it must be put in your system's startup file (if it is not there already).

## C.4 Applying Corrections to the File Systems (F 11 ACP)

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 to a privileged account, as follows:

```
>HELLO SYSTEM [RET]
Password: <PASSWORD> [RET]
```

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 file control processor (FCP) library, as follows:

```
>SET /UIC=[1,24] [RET]
>LBR FCP/FP=[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 by using the updated library as follows:

```
>ASN NL:=MP: [RET]
>TKB @FCPxxxBLD [RET]
```

2. Install the updated FCP in the system image as follows:

```
>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 DBO.
- The distribution tape is mounted foreign on MMO.

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 as follows:

```
>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]CNPRES.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 as follows:

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

5. Assemble the corrected CNCMR module by 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 HRPRES.MAC, if assembling an HRC module.

For example:

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

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

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

7. Task build CON by using the updated library as follows:

```
>ASN DB0:=IN: [RET]
>ASN DB0:=0U: [RET]
>ASN NL:=MP: [RET]
>TKB @CONBLD [RET]
```

### Note

If you do not have the task-build command files [1,24]CONBLD.COM and [1,24]CONBLD.ODL, or [1,24]HRCBLD.COM 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 as follows:

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 as follows:

```
>RUN $SHUTUP [RET]
```

- b. Reboot the system.

## C.6 Applying FCS Corrections

Correcting the File Control Services (FCS) modules on an RSX-11M-PLUS system can be done by updating the source files, by assembling them, and by 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 CLOSEMAC contains conditional assembly directives that can produce three different CLOSE objects, depending on the global symbols defined when CLOSEMAC is assembled. These three different CLOSE objects correspond to the three kinds of FCS. Other FCS source files, like DELETEMAC, have no such conditional assembly directives. They are only assembled one way; that is, only one DELETE object exists.

The SYSLIB.OLB file 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 by 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, is mentioned only in FCSBOTH.CMD.

2. FCSANSI.CMD assembles source files that contain ANSI tape, big buffer, or multibuffering 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 among the three kinds of CLOSE objects.

3. FCSNOANSI.CMD also assembles source files that contain ANSI tape, big buffer, or multibuffering 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 multibuffering 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 multibuffering 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 multibuffered) 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 PUTMAC, 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 asynchronous system trap (AST) completion routines, which may be specified for FCS READ\$ and WRITE\$ functions. This is the line from FCSANSI.CMD that 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 the 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.

## 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]
```

If you use NOANSLIB.OLB, also use the following procedure:

```
>PIP /NY=NOANSLID.OLD [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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AA-H427G-TC

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# Reader's Comments

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