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This document describes the kit and procedure
for installing RMS-11K V1 and on-line and library
patch facilities on PDP-11 computers using the
RSTS/E V6B operating system.

RSTS/E RMS-11

Release Notes

Order No. AA-5185A-TC
Including AD-5185A-T1

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1.0 INTRODUCTION

This RMS-11K installation:

1. Adds the indexed (key-accessed) file facility to the user's current system or updates the current version of the facility.

2. Includes a required RSTS/E monitor patch. (The user may have already made this patch to the block interlocking code, since it was included in the previous release of this document and in the Software Dispatch (Sequence Number 3.1.6). The patch is necessary because an unmodified RSTS/E monitor fails to find interlock errors in certain cases. This failure allows a job to read and lock a block that is already locked by another job.)

3. Includes a required change to the SORT-11 V2 facility. (This version of RMS-11K is slightly larger than the previous version. To accommodate this difference, the person installing RMS-11K must make an internal SORT buffer smaller.)

4. Makes available new patching utilities.

These notes are a guide to the installation of RMS-11K software on the RSTS/E V6B system. They do not supersede the system generation procedures that currently exist for that operating system. Rather, they contain an additional procedure required for the user to install the RMS-11K facility. These notes should be used in conjunction with the section entitled "Building Optional Software" in the RSTS/E System Generation Manual (Order No. DEC-11-ORGNA-B-D).

2.0 SYSTEM REQUIREMENTS

2.1 Software

This RMS-11K installation requires the following software:

1. RSTS/E Version 6B

2. BASIC-PLUS (default run-time system)

3. RSX.RTS (RSX run-time system)

4. SYSLIB.OLB (RSX system library)

5. TKB.TSK (Task Builder)

6. The following BASIC-PLUS system programs:

- UTILTY

- BUILD

- PIP

- EDIT

2.2 Configuration

The PDP-11 system should have the minimum configuration specified in the Software Product Description for RMS-11K.

2.3 Disk Storage Requirements

The user should have at least 2500 blocks available on the system disk for use by the installation control file.

3.0 INSTALLATION KIT CONTENTS

The RMS-11K installation kit contains:

1. A cover letter

2. Introduction to RMS-11 (Order No. AA-0001A-TC)

3. RSTS/E Utilities User's Guide (Order No. AA-0003A-TC)

4. RSTS/E RMS-11 Release Notes (Order No. AA-5185A-TC)

5. RSTS/E RMS-11 Release Notes UPDATE NOTICE #1 (Order No. AD-5185A-T1)

6. One of the following installation media:

- An RK05 disk (Order No. DEC-11-ARMRA-B-HC)

- An RK06 disk (Order No. DEC-11-ARMRA-B-BC)

- A nine-track magnetic tape (Order No. DEC-11-ARMRA-B-MC9)

    DIGITAL sends magnetic tapes to user sites with both tape and disk devices and appropriate disk packs to sites without tape capability.

    Each installation medium contains the files shown in Table 1.

Table 1
RMS-11K Installation Medium Contents

Filename	Size	Date	Prot.	UIC
RMS11 .CTL	4	21-SEP-77	40/155[1]	1,1
RMS11 .ODL	26	21-SEP-77	40/155[1]	1,1
RMS11 .TSK	18	21-SEP-77	40/155[1]	1,1
RMS11 .STB	2	21-SEP-77	40/155[1]	1,1
RMS11 .RTS	19	21-SEP-77	40/155[1]	1,1
RMSFUN.OBJ	9	21-SEP-77	40/155[1]	1,1
RMSMAC.MLB	163	21-SEP-77	40/155[1]	1,1
RMSLIB.OLB	263	21-SEP-77	40/155[1]	1,1
BACUTL.ODL	4	21-SEP-77	40/155[1]	1,1
RESUTL.ODL	6	21-SEP-77	40/155[1]	1,1
DEFUTL.ODL	2	21-SEP-77	40/155[1]	1,1
DISUTL.ODL	1	21-SEP-77	40/155[1]	1,1
CNVUTL.ODL	4	21-SEP-77	40/155[1]	1,1
UTL .ODL	4	21-SEP-77	40/155[1]	1,1
RMSUTL.ODL	23	21-SEP-77	40/155[1]	1,1
RMSCNV.ODL	22	21-SEP-77	40/155[1]	1,1
UTLLIB.OLB	382	21-SEP-77	40/155[1]	1,1
PAT.TSK	45	21-SEP-77	104/155[1]	1,1
ONLPAT.SAV	49	21-SEP-77	104/155[1]	1,1

[1]Only magtape files have a protection code of 155;
other codes apply to disk files.

4.0 THE INSTALLATION PROCEDURE

4.1 Summary

The RMS-11K installation procedure consists of four stages:

1. The installation of RMS-11K itself (steps 1-7 and 18-21).
    This stage involves the use of a control file named
    RMS11.CTL. This file generates messages that fully document
    installation actions as they are automatically initiated.

2. The Block Interlock Check Failure patch to the RSTS/E
    monitor, if the patch was not already accomplished (steps
    8-11). Refer to Section 1.0.

3. The restructuring of the SORT task, if SORT-11 V2 is part of
    the system software (steps 12-13).

4. The copying of two new patching utilities onto the system
    disk (steps 14-17). This stage may be accomplished at a
    later date when the utilities are actually required.

4.2 Instructions

The following instructions describe the complete installation
procedure for the RMS-11K facility.

The following conventions are used.

Symbol	Represents

    ^X   The CTRL key and another key pressed simultaneously, for instance ^Z for CTRL/Z.

   (RET)   The RETURN key (carriage-return/line feed).

   (LF)   The LINE FEED key.

Red and Black Where the procedures contain both user input and
  colors   system output, you type the characters in RED; the system prints the characters in BLACK.

1. Physically mount the RMS-11K installation medium on the appropriate device; see procedures in the manual covering the unit. Ensure that the medium is write-protected, i.e., the write-enable ring is removed from the tape reel or the WRITE PROTECT switch/indicator is lit on the disk drive.

   This precaution ensures that the installation files will not be inadvertently destroyed.

2. Log into the system under any privileged account.

3. If you received the RMS-11K installation files on magtape, go on to step 4; otherwise, logically mount the installation volume on a disk drive, using the command:

      MOUNT dvn: RMSKIT/RO

   where dvn: specifies the physical name and number of the drive carrying the installation disk.

   For example, if you mounted the installation disk on the first RK05 drive on your system, enter the command:

      MOUNT DK0: RMSKIT/RO

4. Ensure that the RSXLIB run-time system is installed as part of the RSTS/E V6B system by issuing the following commands:

      RUN $UTILTY
      #ADD RSX
      #^Z

   If RSXLIB has already been installed, a message to that effect will be printed.

5. Perform the following sequence of entries:

   ```
   RUN $BUILD
   BUILD    (revision level)        RSTS    (revision level)
   SYSTEM BUILD?                     (RET)
   SOURCE INPUT DEVICE?             Enter the physical name and
                                    number of the device carrying
                                    the RMS-11K installation medium
                                    (see step 3).
   LIBRARY OUTPUT DEVICE <SY:>?     (RET)
   LIBRARY ACCOUNT <[1,2]>?         (RET)
   CONTROL FILE IS ?                [1,1]RMS11.CTL
   ```

6. The terminal on which you entered the above commands displays the installation process (see Appendix B for a copy of the normal output).

   The control file terminates after displaying the line:

   ! RMS-11 SYSTEM INSTALLATION IS NOW COMPLETE

7. Modify your system start up control file(s) to contain the following commands:

   ```
   FORCE KB0: ADD RMS11
   FORCE KB0: ADD CCL BCK-=$RMSBCK.TSK;
   FORCE KB0: ADD CCL RST-=$RMSRST.TSK;
   FORCE KB0: ADD CCL DFN-=$RMSDFN.TSK;
   FORCE KB0: ADD CCL DSP-=$RMSDSP.TSK;
   FORCE KB0: ADD CCL CNV-=$RMSCNV.TSK;
   ```

   This modification ensures that RMS-11K facilities are available to system users and RMS-11 utilities are designated as CCL commands.

   NOTE

   If your system does not use CCL commands, omit the last five of the lines above: only FORCE KB0: ADD RMS11 is required.

8. If you have already made the Block Interlock Check Failure patch, go to step 12; otherwise, advise all other users (if any) that you are stopping time sharing. Then use SHUTUP to effect system shutdown.

9. When the terminal displays:

   Option:

   enter:

   PATCH

10. Perform the following sequence of entries:

    ```
    File to patch?     (LF)
    Module name?       RSTS
    Base address?      UPDCHK
    Offset address?    172

     Base    Offset  Old       New?
    ??????  000172  005316   ? 137
    ??????  000174  000415   ? PATCH+74
    ??????  000176  032715   ? ^Z        (CTRL/Z for new offset)
    Offset address?    ^Z                (CTRL/Z for new base)
    Base address?   PATCH
    Offset address?    74
     Base    Offset  Old       New?
    ??????  000074  000000   ? 5316
    ??????  000076  000000   ? 16305
    ??????  000100  000000   ? 177776
    ??????  000102  000000   ? 137
    ??????  000104  000000   ? UPDCHK+230
    ??????  000106  ??????   ? ^C        (CTRL/C to exit)

    Option: START
    ```

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11. When the terminal displays:

```
INIT V06B-03 RSTS V06B-2 TIME SHARING
COMMAND FILE NAME?
```

enter the name of your start up control file.

12. If you do not use SORT-11, go to step 14; otherwise, modify your SORT Task Builder command file as follows:

NOTE

If you are already using RMS-11K, the command file name is SRTRIM.CMD or SRTEIM.CMD. If you are installing RMS-11K for the first time, you need to start using one of these two files. See the PDP-11 SORT Reference Manual (Order No. AA-3341C-TC), in particular Appendix E.

a. Locate the line that starts with the characters:

```
EXTSCT=AAAAAA:
```

b. Subtract 400 (octal) from the octal number to the right of the colon (:).

c. Replace the number with the result of the subtraction.

For example,

```
EXTSCT=AAAAAA:113200
```

should be changed to:

```
EXTSCT=AAAAAA:112600
```

13. Rebuild your SORT task and make the task image executable by all users:

```
RUN $TKB.TSK
TKB>@SRTRIM
TKB>//

Ready
RUN $PIP
#$SORT.TSK<104>/RE
#^Z
```

14. Transfer the two patch utilities, ONLPAT.SAV and PAT.TSK, to your system disk, using block mode:

```
RUN $PIP
#[1,2]*.*=dvn:[1,1]ONLPAT.SAV/BL
#[1,2]*.*=dvn:[1,1]PAT.TSK/BL
```

where dvn: is the physical name and number of the device carrying the RMS-11K installation medium (see step 3).

Do not terminate PIP yet.

15. Set the proper protection codes (with PIP):

```
#$ONLPAT.SAV<104>/RE
#$PAT.TSK<104>/RE
#^Z
```

16. Name each utility to the proper run-time system:

```
RUN $UTILTY
#NAME RT11=$ONLPAT.SAV
#NAME RSX=$PAT.TSK
```

Do not terminate UTILTY yet.

17. Ensure that the proper run-time systems have been installed (with UTILTY):

```
#ADD RSX
#ADD RT11
#^Z
```

These two patch utilities are now ready for use.

18. If you are using the RMS-11K installation files on magtape, go on to step 19; otherwise, logically dismount the installation volume, using the commands:

```
RUN $UTILTY
#DISMOUNT dvn:  RMSKIT
#^Z
```

where dvn: is the physical name and number of the disk drive specified in step 3.

To finish the example started in step 3, enter:

```
RUN $UTILTY
#DISMOUNT DK0:  RMSKIT
#^Z
```

19. Physically dismount the installation medium from the device; see procedures in the manual covering the unit.

20. Rebuild all tasks using RMS-11 facilities, that is, BASIC+2 programs and any other software using RMS-11 routines.

21. Store the installation medium in a safe place.

5.0 **KNOWN RESTRICTIONS**

The installation of the RMS facility places the following restrictions on subsequent use of the RSTS/E operating system:

1. RMS treats the device name SY0: as equivalent to SY:. This requires a user who wants to designate the bootstrap device to use the real name of the device, for example, DB0: or DK0:.

2. Do not use the switch BD (restore files based on date of backup) with the RMS-11 RESTORE utility. The utility cannot access the creation date of a magnetic tape file. If BD is appended to a magnetic tape input specification, the message:

       ILLOGICAL USE OF OPTION - /BD

will be displayed on the terminal.

3. A cluster size of 256 cannot be specified directly. RMS-11 creates a cluster 256 blocks long when 255 is specified as the cluster size.

4. RMS-11 processes all RSTS/E files having no specific attributes as if they were STREAM ASCII files. If the files contain embedded binary data, RMS-11 processing will produce unspecified results.

5. RMS-11 utilities may display error messages, including two status codes in octal. Appendix A contains the meanings of these codes.

Table A-2
Error Completion Status Codes

Symbolic Value	Octal Value	Decimal Value	STV	Description
ER$ABO	177760	-16	ER$STK or ER$MAP	Operation aborted: out of stack save area or in core data structures corrupted.
ER$ACC	177740	-32	ACP error code	Files-11 ACP could not access the file.
ER$ACT	177720	-48		File activity precludes action (e.g., attempting to close a file with outstanding asynchronous record operation).
ER$AID	177700	-64	XAB address	Bad area identification number (AID) field in allocation XAB (i.e., out of sequence).
ER$ALN	177660	-80	XAB address	Illegal value in alignment boundary type (ALN) field of allocation XAB.
ER$ALQ	177640	-96	(XAB address)	Value in allocation quantity (ALQ) field in FAB (or allocation XAB) exceeds maximum.
ER$ANI	177620	-112		Records in a file on ANSI labeled magnetic tape are variable length but not in ANSI D format.
ER$AOP	177600	-128	XAB address	Illegal value in allocation options (AOP) field in allocation XAB.
ER$AST	177560	-144		Invalid operation at AST level: attempting to issue a synchronous operation from an asynchronous record operation completion routine.
ER$ATR	177540	-160	ACP error code	Read error on file header attributes.
ER$ATW	177520	-176	ACP error code	Write error on file header attributes.
ER$BKS	177500	-192		Bucket size (BKS) field in FAB contains value exceeding maximum.
ER$BKZ	177460	-208	XAB address	Bucket size (BKZ) field in allocation XAB contains value exceeding maximum.

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Table A-2 (Cont.)
Error Completion Status Codes

Symbolic Value	Octal Value	Decimal Value	STV	Description
ER$BLN	177440	-224		Block length (BLN) field in a FAB or RAB is incorrect.
ER$BOF	177430	-232		Beginning of file detected on $SPACE operation to magnetic tape file.
ER$BPA	177420	-240		Private buffer pool address not a double word boundary.
ER$BPS	177400	-256		Private buffer pool size not a multiple of 4.
ER$BUG	177360	-272		Internal error detected in RMS-11; no recovery possible; contact a Software Specialist.
ER$CCR	177340	-288		Can't connect RAB (i.e., only one record access stream permitted for sequential files).
ER$CHG	177320	-304		$UPDATE attempting to change a key field that does not have the change attribute.
ER$CHK	177300	-320		Index file bucket format check failure.
ER$CLS	177260	-336	RSTS/E error code	Close function failed (RSTS/E operating system only).
ER$COD	177240	-352	XAB address	Invalid COD field in XAB.
ER$CRE	177220	-368	ACP error code	Files-11 ACP could not create file.
ER$CUR	177200	-384		No current record: operation not immediately preceded by a successful $GET or $FIND.
ER$DAC	177160	-400	ACP error code	Files-11 ACP deaccess error during $CLOSE
ER$DAN	177140	-416	XAB address	Invalid area number in DAN field of key definition XAB.
ER$DEL	177120	-432		Record accessed by RFA access mode has been deleted.

Table A-2 (Cont.)
Error Completion Status Codes

Symbolic Value	Octal Value	Decimal Value	STV	Description
ER$DEV	177100	-448		1. Syntax error in device name. 2. No such device. 3. Inappropriate device for operation (e.g., attempting to create an indexed file on magnetic tape).
ER$DIR	177060	-464		Syntax error in directory name.
ER$DME	177040	-480		Dynamic memory exhausted: insufficient space in central space pool or private buffer pool.
ER$DNF	177020	-496		Directory not found.
ER$DNR	177000	-512		Device not ready.
ER$DPE	176770	-520	ACP error code	Device positioning error.
ER$DUP	176740	-544		Duplicate key detected, duplicates allowed attribute not set for one or more key fields.
ER$ENT	176720	-560	ACP error code	Files-11 ACP enter function failed.
ER$ENV	176700	-576		Environment error: operation not selected in $ORG macro.
ER$EOF	176660	-592		End of file.
ER$ESS	176640	-608		Expanded string area in NAM block too short.
ER$EXP	176630	-616		File expiration date not reached.
ER$EXT	176620	-624	ACP error code	File extend failure.
ER$FAB	176600	-640		Not a valid FAB: BID field incorrect.
ER$FAC	176560	-656		1. Record operation attempted was not declared in FAC field of FAB at open time. 2. Invalid contents in FAC field. 3. FB$PUT not present in FAC for $CREATE operation.

Table A-2 (Cont.)
Error Completion Status Codes

Symbolic Value	Octal Value	Decimal Value	STV	Description
ER$FEX	176540	-672		File already exists (attempted $CREATE operation).
ER$FID	177530	-680		Invalid file id.
ER$FLG	176520	-688	XAB address	Invalid combination of values in FLG field of key definition XAB (e.g., no duplicates and keys can change).
ER$FLK	176500	-704		File locked by another user -- your program cannot access the file because its sharing specification cannot be met.
ER$FND	176460	-720	ACP error code	Files-11 ACP Find function failed.
ER$FNF	176440	-736		File not found.
ER$FNM	176420	-752		Syntax error in file name.
ER$FOP	176400	-768		Invalid file options.
ER$FUL	176360	-784		Device full: can't create or extend file.
ER$IAN	176340	-800	XAB address	Invalid area number in IAN field of key definition XAB.
ER$IDX	176320	-816		Index not initialized (this code can only occur in the STV field when STS contains ER$RNF).
ER$IFI	176300	-832		Invalid IFI field in FAB.
ER$IMX	176260	-848	XAB address	Maximum number (254) of key definition or allocation XABs exceeded.
ER$INI	176240	-864		$INIT or $INITIF macro call never issued.
ER$IOP	176220	-880		Illegal operation; examples include: 1. Attempting a $TRUNCATE operation to a non-sequential file. 2. Attempting an $ERASE or $EXTEND operation to a magnetic tape file.

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Table A-2 (Cont.)
Error Completion Status Codes

Symbolic Value	Octal Value	Decimal Value	STV	Description
				3. Issuing a block mode operation (e.g., $READ or $WRITE) to a stream not connected for block operations. 4. Issuing a record operation (e.g., $GET, $PUT) to a stream connected for block mode operations.
ER$IRC	176200	-896		Illegal record encountered in sequential file: invalid count field.
ER$ISI	176160	-912		Invalid internal stream identifier (ISI) field in RAB (field may have been altered by user) or $CONNECT never issued for stream.
ER$KBF	176140	-928		Key buffer address (KBF) field equals 0.
ER$KEY	176120	-944		Record identifier (KBF/KSZ) for random operation to relative file is 0 or negative.
ER$KRF	176100	-960		Invalid key of reference (KRF) in RAB: 1) As input to random $GET or $FIND operation, or 2) As input to $CONNECT or $REWIND (in this case, ER$KRF is returned for the first record operation following the $CONNECT or $REWIND.
ER$KSZ	176060	-976		Key size too large (indexed file) or not equal to 4 (relative file).
ER$LAN	176040	-992	XAB address	Invalid area number in LAN field of key definition XAB.
ER$LBL	176020	-1008		Magnetic tape is not ANSI labeled.
ER$LBY	176000	-1024		Logical channel busy.
ER$LCH	175760	-1040		Invalid value in logical channel number (LCH) field of FAB.

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Table A-2 (Cont.)
Error Completion Status Codes

Symbolic Value	Octal Value	Decimal Value	STV	Description
ER$LEX	175750	-1048	XAB address	Attempt to extend an area containing an unused extent.
ER$LOC	175740	-1056	XAB address	Invalid value in LOC field of allocation XAB.
ER$MAP	175720	-1072		In core data structures (e.g., I/O buffers) corrupted (this code can only occur in the STV field when STS contains ER$ABO).
ER$MKD	175700	-1088	ACP error code	Files-11 ACP could not mark file for deletion.
ER$MRN	175660	-1104		1. Maximum record number field contains a negative value during $CREATE of relative file. 2. Record identifier (KBF/KSZ) for random operation to relative file exceeds maximum record number specified when file created.
ER$MRS	175640	-1120		Maximum record size (MRS) field contains 0 during $CREATE operation and: 1. Record Format is fixed, or 2. File organization is relative.
ER$NAM	175620	-1136		Odd address in Name Block address (NAM) field in FAB on $OPEN, $CREATE, or $ERASE.
ER$NEF	175600	-1152		Not at end-of-file: attempting a $PUT operation to a sequential file when stream is not positioned to EOF.
ER$NID	175560	-1168		Can't allocate internal index descriptor: insufficient room in space pool while attempting to open an indexed file.
ER$NPK	175540	-1184		No primary key definition XAB present during $CREATE of indexed file.

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Table A-2 (Cont.)
Error Completion Status Codes

Symbolic Value	Octal Value	Decimal Value	STV	Description
ER$OPN	175520	-1200	RSTS/E error code	Open function failed (RSTS/E operating system only).
ER$ORD	175500	-1216	XAB address	XABs in chain not in correct order: 1. Allocation or key definition XABs not in ascending (or densely ascending order). 2. XAB of another type intervenes in key definition or allocation XAB sub-chain.
ER$ORG	175460	-1232		Invalid value in file organization (ORG) field of FAB.
ER$PLG	175440	-1248		Error in file's prologue: file is corrupted and must be reconstructed.
ER$POS	175420	-1264	XAB address	Key position (POS) field in key definition XAB contains a value exceeding maximum record size.
ER$PRM	175400	-1280	XAB address	File header contains bad date and time information (retrieved by RMS-11 because a date and time XAB is present during a $OPEN or $DISPLAY operation); file may be corrupted.
ER$PRV	175360	-1296		Privilege violation: access to the file denied by the operating system.
ER$RAB	175340	-1312		Not a valid RAB: BID field not correct.
ER$RAC	175320	-1328		1. Illegal values in record access mode (RAC) field of RAB. 2. Illogical value in RAC field (e.g., RB$KEY with a sequential file).

Table A-2 (Cont.)
Error Completion Status Codes

Symbolic Value	Octal Value	Decimal Value	STV	Description
ER$RAT	175300	-1344		1. Illegal values in record attributes (RAT) field of FAB during $CREATE. 2. Illogical combination of attributes (e.g., FB$CR and FB$FTN) in RAC field during $CREATE.
ER$RBF	175260	-1360		Record address (RBF) field in RAB contains an odd address (block mode access only).
ER$RER	175240	-1376	ACP error code	File read error.
ER$REX	175220	-1392		Record already exists: during a $PUT operation in random mode to a relative file, an existing record found in the target record position.
ER$RFA	175200	-1408		Invalid RFA in RFA field of RAB during RFA access.
ER$RFM	175160	-1424		1. Invalid record format in RFM field of FAB during $CREATE. 2. Specified record format is illegal for file organization.
ER$RLK	175140	-1440		Target bucket locked by another stream.
ER$RMV	175120	-1456	ACP error code	Files-11 ACP Remove function failed.
ER$RNF	175100	-1472	(ER$IDX)	Record identified by KBF/KSZ fields of RAB for random $GET or $FIND operation does not exist in relative or indexed file (for indexed files only, STV may contain ER$IDX). Record may never have been written or may have been deleted.
ER$RNL	175060	-1488		$FREE operation issued but no bucket was locked by stream.
ER$ROP	175040	-1504		Record options (ROP) field contains illegal values or illogical combination of values.

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Table A-2 (Cont.)
Error Completion Status Codes

Symbolic Value	Octal Value	Decimal Value	STV	Description
ER$RPL	175020	-1520	ACP error code	Error while reading prologue.
ER$RRV	175000	-1536		Invalid RRV record encountered in indexed file; file may be corrupted.
ER$RSA	174760	-1552		Record stream active, i.e., in asynchronous environment, attempting to issue a record operation to a stream that has a request outstanding.
ER$RSZ	174740	-1568		Record size specified in RSZ of RAB during $PUT or $UPDATE is invalid: 1. RSZ equals zero. 2. RSZ exceeds maximum record size (MRS) specified when file created. 3. RSZ not equal to size of Current Record for $UPDATE operation to a sequential file on disk. 4. RSZ does not equal MRS (for fixed format records).
ER$RTB	174720	-1584	Actual record size	Record too big for user's buffer: RMS-11 could not move record retrieved by $GET operation to user work area (UBF/USZ).
ER$SEQ	174700	-1600		During $PUT operation, key of record to be written is out of sequence with key of previous record (and RAC field contains RB$SEQ).
ER$SHR	174660	-1616		Illogical value in SHR field of FAB (e.g., FB$WRI specified for sequential file).
ER$SIZ	174640	-1632	XAB address	Invalid SIZ field in key definition XAB during $CREATE (e.g., specified size exceeds maximum record size).
ER$STK	174620	-1648		During asynchronous record operation, RMS-11 has found that the stack is too big to be saved (this code can only occur in the STV field when STS contains ER$ABO).

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Table A-2 (Cont.)
Error Completion Status Codes

Symbolic Value	Octal Value	Decimal Value	STV	Description
ER$SYS	174600	-1664	Directive or QIO status code	System directive error.
ER$TRE	174560	-1680		Index tree error: indexed file is corrupted.
ER$TYP	174540	-1696		Syntax error in file type.
ER$UBF	174520	-1712		Invalid address in UBF field of RAB: 1. UBF contains 0, or 2. UBF not word aligned (for block mode access only).
ER$USZ	174500	-1728		Invalid USZ field in RAB (i.e., USZ contains 0).
ER$VER	174460	-1744		Syntax error in file version number.
ER$VOL	174440	-1760	XAB address	Invalid VOL field in allocation XAB (i.e., VOL does not contain 0).
ER$WER	174420	-1776	ACP error code	File write error.
ER$WLK	174410	-1784		Device is write locked.
ER$WPL	174400	-1792	ACP error code	Error while writing prologue.
ER$XAB	174360	-1808	(XAB address)	XAB field in FAB (or NXT field in XAB) contains an odd address.

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APPENDIX B

SAMPLE RMS11.CTL FILE DISPLAY

```
!
! RMS-11 INSTALLATION
!
ASSIGN <40>

Ready


!
! REMOVE CURRENT RMS11 RUN-TIME SYSTEM IF ANY
!       ERRORS CAN BE IGNORED
!
RUN $UTILTY.BAC
UTILTY   V06B-03 RSTS V06B-02 TS/1 9327 (9FE)
#REMOVE RMS11
#CCL BCK=
#CCL RST=
#CCL DFN=
#CCL DSP=
#CCL CNV=
#^C


Ready


!
! GET ALL SYSTEM COMPONENTS INTO THEIR CORRECT PLACES
!
RUN $PIP.BAC
PIP      V06B-03 RSTS V06B-02 TS/1 9327 (9FE)
#SY:[1,1]=dvn:[1,1]RMS11.ODL
#SY:[1,1]=dvn:[1,1]RMS11.TSK/CO
#SY:[1,1]=dvn:[1,1]RMS11.STB/CO
#SY:[0,1]=dvn:[1,1]RMS11.RTS/CO/CL:32
#SY:[1,1]=dvn:[1,1]RMSFUN.OBJ/CO
#SY:[1,1]=dvn:[1,1]RMSMAC.MLB/CO
#SY:[1,1]=dvn:[1,1]RMSLIB.OLB/CO
#SY:=dvn:[1,1]BACUTL.ODL
#SY:=dvn:[1,1]RESUTL.ODL
#SY:=dvn:[1,1]DEFUTL.ODL
#SY:=dvn:[1,1]DISUTL.ODL
#SY:=dvn:[1,1]CNVUTL.ODL
#SY:=dvn:[1,1]UTL.ODL
#SY:=dvn:[1,1]RMSUTL.ODL
#SY:=dvn:[1,1]RMSCNV.ODL
#SY:=dvn:[1,1]UTLLIB.OLB/CO
#SY:$RMSBCK.TSK/DE
```

```
#SY:$RMSRST.TSK/DE
#SY:$RMSDFN.TSK/DE
#SY:$RMSDSP.TSK/DE
#SY:$RMSCNV.TSK/DE
#^C


Ready

!
! INSTALL THE HIGH LEVEL RMS-11 ROUTINES IN SYSLIB.OLB
!
RUN $LBR.TSK
LBR>SY:[1,1]SYSLIB.OLB/RP=SY:[1,1]RMSFUN.OBJ

MODULE "ROOPEN" REPLACED

MODULE "ROCREA" REPLACED

MODULE "ROCLOS" REPLACED

MODULE "ROCONN" REPLACED

MODULE "RODISC" REPLACED

MODULE "ROGET " REPLACED

MODULE "ROPUT " REPLACED

MODULE "ROFIND" REPLACED

MODULE "ROUPDA" REPLACED

MODULE "RODELE" REPLACED

MODULE "RORWBL" REPLACED

MODULE "ROERAS" REPLACED

MODULE "ROEXTE" REPLACED

MODULE "RODISP" REPLACED

MODULE "ROINIT" REPLACED

MODULE "ROWAIT" REPLACED

MODULE "ROREWI" REPLACED

MODULE "ROTRUN" REPLACED

MODULE "ROFBDB" REPLACED
LBR>^C


Ready

!
! BUILD UTILITIES
!
RUN $TKB.TSK
TKB>$RMSBCK/CP,=BACUTL/MP
ENTER OPTIONS:
TKB>UNITS=9
TKB>TASK=...BCK
```

```
TKB>/
TKB>$RMSRST/CP,=RESUTL/MP
ENTER OPTIONS:
TKB>UNITS=9
TKB>TASK=...RST
TKB>/
TKB>$RMSDFN/CP,=DEFUTL/MP
ENTER OPTIONS:
TKB>TASK=...DFN
TKB>/
TKB>$RMSDSP/CP,=DISUTL/MP
ENTER OPTIONS:
TKB>TASK=...DSP
TKB>/
TKB>$RMSCNV/CP,=CNVUTL/MP
ENTER OPTIONS:
TKB>TASK=...CNV
TKB>/
TKB>^C


Ready

!
! DELETE THE RMSFUN.OBJ FILE SINCE IT IS NO LONGER NEEDED
! RENAME RMSRST.TSK SO IT IS PRIVILEGE
!
RUN $PIP.BAC
PIP     V06B-03 RSTS V06B-02 TS/1 9327 ((FE)
#SY:[1,1]RMSFUN.OBJ/DE
#SY:$RMSRST.TSK<232>=SY:$RMSRST.TSK/RE
#^C


Ready

!
! ADD THE RMS11 RUN-TIME SYSTEM TO THE SYSTEM
!
!         THE FOLLOWING COMMANDS SHOULD BE ADDED
!         TO THE START.CTL FILE FOR THE SYSTEM
!         TO INSURE THAT THE RMS11 RUN-TIME SYSTEM
!         IS AVALIABLE AFTER A SYSTEM BOOTSTRAP
!         AND UTILITIES ARE DESIGNATED AS CCL COMMANDS
!
RUN $UTILTY.BAC
UTILTY  V06B-03 RSTS V06B-02 TS/1 9327 (9FE)
#ADD RMS11
#CCL BCK-=$RMSBCK.TSK;
#CCL RST-=$RMSRST.TSK;
#CCL DFN-=$RMSDFN.TSK;
#CCL DSP-=$RMSDSP.TSK;
#CCL CNV-=$RMSCNV.TSK;
^C


Ready

!
! RMS-11 SYSTEM INSTALLATION IS NOW COMPLETE
!
^C
```

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