RSTS/E

**RSTS/E V7.2
Release Notes**

Order No. AA–5246E–TC

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June 1982

The Release Notes describe new features on the RSTS/E system and explain differences between this version and previous versions. System managers and system maintainers should read this document prior to system installation.

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Preface

The RSTS/E V7.2 Release Notes describe new features in RSTS/E for this
release, as well as differences between this and the previous release, RSTS/E
V7.1.

Anyone who is about to generate a RSTS/E V7.2 system should be thoroughly
familiar with the information presented in these Release Notes. In addition,
users and programmers familiar with earlier versions of RSTS/E should read
this manual to learn about changes and new features.

NOTE

DECnet/E V2.0 is the ONLY version of DECnet/E supported on
RSTS/E V7.2. Refer to section 1.7.2 for additional details.

1.0 NEW FEATURES OF RSTS/E V7.2

1.1 Cluster Library Support **

The "cluster library" feature can allow you to write larger programs than you
would otherwise be able to. At present it is available only to COBOL-81 V1.1
programs that use FMS-11/RSTS V1.5 (Forms Management System), and to
user-written libraries.

Though there is a very small performance penalty for the use of clustering,
programs that use cluster libraries are still substantially faster than their
disk-overlaid counterparts.

Prior to RSTS/E V7.2, a program had to reserve a range of addresses for each
resident library that it used. These ranges could not overlap. The "cluster
library" feature lets two or more resident libraries begin at the same address
in a program. Of course, only one library in each cluster can be mapped at
any given moment. But a cluster library is automatically mapped whenever the
program calls a subroutine in the library. The task-builder's auto-load
facility provides this automatic mapping.

Note that there are certain requirements upon a library that will belong to a
cluster. Currently, the COBOL-81 V1.1 and FMS-11/RSTS V1.5 resident libraries
are the only Digital-supplied libraries that can belong to a cluster.

Prior to RSTS/E V7.2, a COBOL-81 program using FMS-11/RSTS required 8K words
of address space for the COBOL-81 library, and 4K words for the FMS resident
library. This left 20K words for RMS and the COBOL-81 program itself. Using
COBOL-81 V1.1 and FMS-11/RSTS V1.5 as cluster libraries, the same 8K words of
address space are used for both the COBOL-81 and the FMS resident libraries.
In this case, there are 24K words left for the COBOL-81 program to share with
RMS (the user has 4K words more).

The RSTS/E Task Builder Reference Manual describes the cluster library feature
in detail.

                              IMPORTANT

     If you combine the version of TKB supplied with RSTS/E V7.2 with an
     old RMSRES resident library, you will probably get some "Multiply
     defined P-sect" errors. These can be ignored. Re-installing RMS
     will eliminate these errors.

     In order for the DCL LINK command to be able to build the cluster
     library feature, you must apply the feature patch described in
     article 20.4.1 F in the RSTS/E V7.2 Maintenance Notebook to
     PRELIN.BAS.

1.2 Changes to DCL   **

NOTE

For DCL to work properly, all of the standard CUSPs and certain
layered products (DECnet/E, COBOL-81, DIBOL, FORTRAN/FOR,
FORTRAN/F4P, and FORTRAN/F77) must be installed in account
SY:[1,2]. Refer to Chapter 6 of the System Generation Manual for
for addtional details.

Refer to article Seq 20.1.4 N in the RSTS/E V7.2 Maintenance Notebook for a
description of some of the differences between DCL and BASIC-PLUS.

1.2.1 LINK with DIBOL/DMS Support

A DIBOL program can be linked with either of two I/O packages: RMS (Record
Management Services) or DMS (Data Management Services).

Under RSTS/E V7.2, the DCL LINK command has a /DMS qualifier. If you link
with DIBOL, the /DMS qualifier causes the LINK command to include DMS rather
than RMS in the executable file. (You can link with DIBOL by using the /DIBOL
qualifier, or you can make DIBOL the default language for the LINK command by
installing a feature patch described in article Seq 20.2.9 F in the RSTS/E
V7.2 Maintenance Notebook). Do not use /DMS when linking with languages other
than DIBOL.

If DIBOL programmers at your installation use DMS the majority of the time,
you may find it convenient to apply the feature patch described in article Seq
20.2.10 F in the RSTS/E V7.2 Maintenance Notebook to the DCL run-time system.
This patch makes /DMS the default for links done with DIBOL. If the patch is
installed and you want to use RMS for a particular program, then specify
/NODMS.

1.2.2 **New Qualifier for COPY**

A new qualifier, /BLOCKSIZE, is available for the DCL COPY command. This
qualifier allows you to specify a blocksize for output to magnetic tape.

For example:

       $ COPY MYFILE.TXT MM0:MYFILE.TXT/BLOCKSIZE=2048

The argument of the /BLOCKSIZE qualifier must be an even integer in the range
of 18 to 4096 bytes. The default if you do not specify the qualifier is 512
bytes. If you are copying a large file, a larger blocksize can be useful
since it reduces the number of interblock gaps that are needed, and can
thereby allow you to fit more data onto a tape. On the other hand, a small
blocksize is often preferable for a small file, since it can reduce the amount
of space wasted at the end of the file.

If you specify an illegal value for n, the COPY command prints the "?Bad
blocksize" error message.

The /BLOCKSIZE qualifier is subject to the following restrictions:

    1. The qualifier can only be used for magnetic tape. Its use on disk is
       ignored.

    2. The qualifier applies to output files. The COPY command
       automatically handles input magnetic tape files with blocksizes other
       than 512 bytes.

    3. If the output tape is in ANSI format and is intended for interchange
       with another operating system, the blocksize must be an even integer
       between 18 and 2048 bytes. Tapes having blocksizes greater than 2048
       bytes cannot be read by other operating systems.

    4. If the output tape is intended for use on the RT-11 operating system,
       the blocksize must be 512 bytes.

    5. If both the input and output files are on magnetic tape, and both have
       large blocksizes, the COPY command may fail because of insufficient
       buffer space. If this happens, transfer the file to disk as an
       intermediate step.

This information will be added to the RSTS/E DCL User's Guide in its next
revision.

1.2.3 New Error Messages

DCL under RSTS/E V7.2 can produce the following new error messages. All of
them diagnose problems in file specifications.

?Wildcard PPN not allowed.
    You used a wildcard PPN (project-programmer number, or directory) with
    the PRINT or SUBMIT command. Wildcard filenames and types are permitted
    with these commands, but not wildcard PPNs.

?File name needed.
    You omitted the file name from a file specification, and one is needed.
    For example, this message would appear if you said "DELETE [1,2]". If you
    wish to specify all files, use a wildcard file name. (This message
    replaces "?Missing part of file specification.")

?Do not specify file name or type.
    This message can appear with the first parameter of the ASSIGN command.
    Remember to use a space between the first parameter (the string to
    assign) and the second parameter (the name to assign it to):

                      "ASSIGN DR3: X"
                            not
                      "ASSIGN DR3:X"

?Wildcards not allowed.
    You used a wildcard file specification where it is illegal to do so.

These changes will be reflected in the RSTS/E DCL User's Guide in its next
revision.

1.3 New Device Support **

1.3.1 UDA50 AND RA80

The RA80 is a 121MB (formatted) fixed media disk drive using the same
Winchester fixed-media disk technology as the RM80. The UDA50 is an
intelligent disk controller for use with the RA80 UNIBUS systems.

For RSTS/E V7.2 the RA80 and UDA50 are supported on the 11/44 and 11/24
processors. The UDA50 controller uses Digital's new Mass Storage Control
Protocol (MSCP) to isolate disk dependent requirements, such as disk geometry
and error recovery strategies, from the host software. The RSTS/E RA80/UDA50
disk driver was designed to take advantage of MSCP so future disk drives
supported by the UDA50 can be supported by RSTS/E with little, if any,
development effort. The driver also implements bad block replacement to
preserve the logical disk space of the RA80. Bad block replacement is
transparent to the user.

CONFIGURING RSTS/E FOR UDA50 AND RA80

During system generation, the SYSGEN dialogue asks for the number of UDA50's
to be built into the RSTS SIL. The number entered specifies the number of
UDA50 controllers to be generated into your system (unlike previous disk
questions that ask for the number of disk units). Each UDA50 controller can
provide support for up to 4 RA80 disk units. RSTS allows you to configure a
maximum of 2 UDA50 controllers. Thus, specifying 2 UDA50s during system
generation will provide support for 8 RA80 disk drives. Specifying UDA50/RA80
support in your RSTS system increases the RSTS/E monitor by 4.5K words for one
controller, 5K words for two controllers.

NOTE

> Refer to section 2.1 of this manual, under Initialization Code,
> for additional information on how to install more than one UDA50
> controller.

MORE ABOUT THE UDA50 AND RA80

The two character device designator for all UDA50 devices is "DU".

Because the UDA50 is a more sophisticated controller than other disk
controllers, the initialization process requires more time to execute internal
diagnostics and to bring the controller "online" to the host processor. This
initialization process takes approximately 4 seconds. The bootstrap of an
RA80 disk and RSTS startup on an RA80 system disk are slower due to this
initialization process.

The HARDWR LIST option of INIT.SYS lists all UDA50 controllers configured on a
system as RU0: through RU1:. The media type of each drive unit connected to a
controller is listed beside the controller in the same format as with disk
controllers.   If the media type cannot be determined due to a drive or media
related error, the HARDWR LIST suboption lists the error in place of the media
type.   For example, "RU0:   <CSR>   <VECTOR> Units 0(format   error)"
indicates that the RA80 medium was not properly formatted.

The HARDWR UNITS suboption is not necessary for RA80 drives that are powered
off, or taken offline for diagnostics. The RSTS DU driver will make the drive
available to the RSTS timesharing environment when it is powered on or put
online to the controller.

1.3.2 Q22: LSI-11 Bus and 22-bit Addressing

Addresses in the full 22-bit range of the LSI-11 bus are now supported by
RSTS/E V7.2 for the PDP 11/23-PLUS processor when using the RLV12 disk
controller. If the PDP 11/23-PLUS has physical memory greater than 256KB, the
RLV12 must be strapped for 22-bit addresses. If the controller is not
strapped for 22-bit addresses, INIT.SYS will print a message stating the disk
controller must be so strapped, and INIT will return to the OPTION prompt.

1.3.3 Restrictions

The following hardware will be supported on RSTS/E V7.2 only for systems
upgrading from RSTS/E V7.1. RSTS/E support for these devices will cease in
October, 1983.

Device	Suggested Replacement
RF11	RK07 or RM02
RS03	RK07 or RM02
RS04	RM03 on 11/70; RM02 otherwise
RK05J (as a system disk)	RL02
RK05F (as a system disk)	RL02
LT33	LA34 or LA38
VT05	VT100 series
VT50	VT100 series
IBM 2741-compatible terminals	LA38 or LA120
DP11 synchronous line interface	DUP11

The TU58 will be supported on RSTS/E V7.2 only for systems upgrading from
RSTS/E V7.1. RSTS/E support for the TU58 will be stopped in January, 1984.

1.4 System Generation (SYSGEN) ***

Due to differences between RSTS/E V7.0, RSTS/E V7.1 and RSTS/E V7.2, Digital
strongly recommends that the first RSTS/E V7.2 system generated, be generated
OFF-LINE, on a newly initialized disk. The on-line SYSGEN feature of RSTS/E
V7.1 cannot be used. See section 2.11 of this manual for additional
information on upgrading.

A question has been added to prompt for the number of UDA50 controllers to be
configured. A maximum of 2 controllers can be specified. Each controller can
support up to 4 RA80 disk drives. Please note that this prompt, unlike other
disk configuration prompts, is requesting the number of UDA50 controllers -
not the number of RA80 disk drives. See the NOTE in section 2.1 of this
manual for more information on installing multiple controllers.

A question has been added to distinguish between the 8-line DZ11 Unibus
multiplexer, and the 4-line DZV11 LSI-11 multiplexer. Respond with DZ11 if
you are generating a monitor to be run on a Unibus system, or DZV11 for a Qbus
system.

Prior to RSTS/E V7.2, the default response for DECnet/E support was based on
the existence of any network links (DMC11/DMR11 or DMP11/DMV11) on the system
on which the SYSGEN dialog was taking place. For RSTS/E V7.2, no default
response (#??#) will be accepted unless a "same system" SYSGEN is being
performed.

Prior to RSTS/E V7.2, the default response for the "LP for SYSGEN" prompt was
YES if a "same system" SYSGEN was being performed on a system that included a
LP controller. For RSTS/E V7.2, the default is always NO. DIGITAL does not
recommend printing assembly listings and link maps during the SYSGEN
operation, because it tends to significantly slow the process.

Due to a limit on the maximum number of phases permitted in a monitor SIL,
coupled with some internal conflicts within the older RJ2780 phase and the new
MSCP phase (supporting the UDA50 controller), RSTS/E V7.2 does not support any
monitor SIL which includes both the RJ2780 option and any UDA50 controllers.
Consequently, if you answer the UDA50's prompt with a non-zero response, you
will NOT be prompted for the RJ2780 option. If you do not select any UDA50
controllers, then the RJ2780 prompt will appear as it has in the past.

This restriction does NOT affect support for the RSTS/E High Performance
2780/3780 Emulator.

1.5 Terminal Service **

1.5.1 DETACH: SYS(CHR$(6%)+CHR$(7%)+ . . .) or UU.DET

Prior to RSTS/E V7.2, this call always implicitly deassigned a detaching job's
console keyboard.   Any job wishing to detach and still maintain ownership of
its console keyboard could do so only by opening it on a non-zero channel and
then executing a DETACH/NO CLOSE call.

For RSTS/E V7.2, the same deassignment will occur ONLY when a DETACH/CLOSE is
performed. A DETACH/NO CLOSE will retain any assignment of the calling job's
console keyboard.   This eliminates the need for a job to open its console
keyboard on a non-zero channel for the sole purpose of maintaining ownership
of the device across a detach operation.

1.5.2 ATTACH/REATTACH: SYS(CHR$(6%)+CHR$(6%)+ . . .) or UU.ATT

Prior to RSTS/E V7.2, a job could not reattach to any keyboard that was in use
(assigned or open), even if the keyboard was owned by the calling job itself.
This restriction forced a job to give up ownership of a keyboard before
reattaching to it, leaving a window of time during which another job could
gain ownership.

For RSTS/E V7.2, a job may reattach to any keyboard that is either free or
already owned by the calling job. This closes the window described above, and
allows a detached job to maintain continuous ownership of its keyboard across
a reattach operation.

1.6 New Documentation **

1.6.1 RSTS/E Task Builder Reference Manual (update)

The V7.2 update to this manual describes cluster libraries and other new Task Builder features. The update package also contains corrections and clarifications to the V7.1 manual.

1.6.2 RSTS/E Programmer's Utilities Manual (update)

The V7.2 update to this manual contains new information on the use of the RSX-based MACRO assembler available on RSTS/E.

1.6.3 RSTS/E System Generation Manual (revision)

This manual is revised for V7.2 to include information on new hardware, including the UDA50 controller and RA80 disk. The manual also contains corrections to the V7.1 update.

For a more detailed list of changes to the manual, see the summary of technical changes that appears after the manual's preface.

1.7 Things That You Should Know **

1.7.1 SEND/RECEIVE: SYS(CHR$(6%)+CHR$(18%)+ . . .)

RSTS/E V7.2 supports both of the SEND/RECEIVE SYS calls, 18 and 22. Future
releases of RSTS/E will support only the newer version, SYS call 22.
SYS call 22 has been available on RSTS/E for several releases.

Article Seq 4.1.9 F of the RSTS/E V7.2 Maintenance Notebook contains a patch
which causes BASIC-PLUS to make note of all occurrences of the obsolete
SYS call. You may wish to use this patch to track down and alter all
instances of SYS call 18 in your programs only, not in the DIGITAL supplied
programs.

1.7.2 DECnet/E V2.0 Support

DECnet/E V2.0 is supported on both RSTS/E V7.1 and RSTS/E V7.2.

DECnet/E V2.0 is a major upgrade from DECnet/E V1.1. It supplies Phase III
DECnet capabilities that include automatic routing (allowing non-adjacent
nodes to communicate easily), multipoint, event logging, network management,
and remote file access enhancements. DECnet/E V2.0 is the first Phase III
release for RSTS/E, and will provide extensive enhancements to the existing
DECnet/E V1.1 offering.

> NOTE
>
> DECnet/E V1.1 is not supported on RSTS/E V7.1 or V7.2 because of
> internal structural changes in the monitor and new CUSP and
> INIT.SYS dependencies. DECnet/E V2.0 runs on RSTS/E V7.1 and
> V7.2, and replaces DECnet/E V1.1. DECnet/E V2.0 is not supported
> on RSTS/E V7.0.

1.7.3 RMS V1.8

Because RMS has not changed since RSTS/E V7.0, it is NOT included in the "W"
Distribution Kits. See section 3.1 of this manual for additional details.

1.7.4 FMS-11/RSTS V1.5

When installing FMS V1.5 on RSTS/E V7.2, do not use the FMS patch entitled
"FMSTIO" which is described in the FMS-11/RSTS Installation Guide and Release
Notes, March 1982, AA-L324A-TC. It is in the FMS distribution kit, but is not
in the RSTS/E V7.2 patch kit.

This patch is not necessary when installing FMS with RSTS/E V7.2, but is still
needed if using RSTS/E V7.1.

2.0 DIFFERENCES BETWEEN RSTS/E V7.2 AND V7.1

2.1 Initialization Code: DEFAULT Option: Memory Table Suboption ************

Under RSTS/E V7.2, if you change the size of your monitor by using the BUFFERS
suboption, INIT repositions the primary run-time system and XBUF. It places
them as close to the beginning of memory as possible. Under RSTS/E V7.1 you
had to reposition them manually.

If you add memory to or remove memory from your system, INIT no longer
entirely resets the table. Instead it unlocks any locked memory, and then
positions the primary run-time system and XBUF as close to the beginning of
memory as possible. Under RSTS/E V7.1 you had to type in the address and
length of XBUF again.

If you select a different primary run-time system, INIT repositions the
run-time system and XBUF, as described above. Under RSTS/E V7.1 you had to
reposition manually.

The positions in memory that INIT assigns are satisfactory for most
installations. However, if you have a mixture of CORE and MOS memory, you may
wish to adjust the positions of XBUF and the run-time system to take advantage
of it.

Note that you may have to change your startup control files to realign the
Resident Library/Run-Time Systems so they will not fail when placed into
memory already allocated by XBUF or the primary Run-Time System.

                                    NOTE

        While RSTS V7.2 will support more than one UDA50 controller,
        INIT.SYS will only recognize the first UDA50 controller. When
        multiple UDA50 controllers are installed on a system, the first
        has a fixed address, while the second is placed in the floating
        address range as described in the System Generation Manual
        Appendix C. In order for INIT to properly locate the second
        UDA50 controller, the HARDWARE CSR option will have to be used
        to specify its floating address.

        This problem was discovered too late to be corrected in
        RSTS/E V7.2. It will be corrected in the next release of RSTS.

2.2 RSTS/E Commonly Used System Programs **************************************

This section describes the changes made to the RSTS/E CUSPs (Commonly Used
System Programs) for RSTS/E V7.2.

All BASIC-PLUS CUSPs, with the exception of the CPEXER program in the DEVTST
package, can be compiled with any of the three variants of BASIC: BASIC-PLUS,
BASIC-PLUS-2, or CSPCOM (which is described below). The CPEXER program is
compatible with BASIC-PLUS (provided the TRIG and LOG math functions are
generated into BASIC-PLUS) and BASIC-PLUS-2, but not with CSPCOM.

As in RSTS/E V7.1, CSPCOM (the CUSP Compiler) generates object modules from
the BASIC-PLUS system library programs (CUSPs) that can be task built to run
under the RSX run-time system. This eliminates the need for the BASIC-PLUS
run-time system on those systems which would not otherwise use BASIC-PLUS or
BASIC-PLUS-2.

                                    NOTE

        CSPCOM is included in the RSTS/E kit as a maintenance tool only.
        CSPCOM is not supported for any use other than the compilation
        of Digital-supplied utility programs that are included with the
        RSTS/E distribution kit.

        The use of CSPCOM is not supported for the compilation of the
        utility programs supplied with any optional RSTS/E software
        product   unless   the   installation   guide   for   that   product
        specifically states that the software is compatible with CSPCOM.

        The version of CSPCOM included on the V7.2 distribution kit
        includes all patches previously published for V7.1.

ANALYS

ANALYS has been enhanced to annotate some of the DECnet/E queue lists and data
buffers as well as support for the UDA devices (i.e., RA80).

On systems which have UDA devices, ANALYS will annotate the UDA tables found
in the permanently mapped portion of the monitor as well as dump and annotate
a new segment called the MSCP region. The MSCP region contains the BBR (bad
block replacement) work area as well as the controller work areas for each of
the possible 2 controllers.

ANALYS has also been modified to display the memory allocation table in the
SYSTAT-like portion of the dump.

ATPK

No changes.

Automated Patching Facility Package

No changes.

BACKUP

No changes.

BATCH

No changes.

BPCREF

No changes.

BUILD

No changes.

COPY

No changes.

DEVTST - Device Exerciser Package

No changes.

DIRECT

No changes.

Display Programs (VT50PY/VT5DPY)

No changes.

DSKINT

No changes.

Error Package

The SUMMARY REPORT displays a new heading, CONTROLLER ERRORS, as part of the
report to indicate the number of those errors. Not all error types have
controller errors logged, and thus are indicated with a N/A. All systems with
UDA devices will have the count of UDA controller errors in this column.

The FULL REPORT will display extra output for what is known as the MSCP region
if there is a UDA error.

NOTE

See section 2.11 of this manual for updating procedures that
must be followed for the Error Package to function correctly.

FILCOM

No changes.

FIT

No changes.

FLINT

No changes.

GRIPE

No changes.

HELP

No changes.

INIT

No changes.

LOGIN

No changes.

LOGOUT

No changes.

MAKSIL

The MAKSIL program has been upgraded to allow the creation of Run-Time Systems
greater than 16K words.

MONEY

No changes.

ODT

No changes.

Operator Services Package

No changes.

PIP

No changes.

PMDUMP

PMDUMP now prints information about all the libraries used in the program
being dumped.   PMDUMP can read input from .TSK and MAKSIL type .SIL's as well
as .PMD files. Several new switches have also been added to PMDUMP:

             /TSK   - Treat input file as a .TSK (or .SIL) regardless
                         of file type.

             /WIDE   - During octal portion of the dump, also print
                         the ASCII characters.

             /START:nn - Starting address of octal dump (does not print
                         the header portion of the dump).

             /END:nn   - Ending address of the octal dump (does not
                         print the header portion of the dump).

QUE

No changes.

QUEMAN

No changes.

QUOLST

No changes.

REACT

No changes.

REORDR

No changes.

RUNOFF

No changes.
However, as in earlier releases, the PRINT INDEX feature, which requires an
obsolete SORT package, is not supported.

SAVE/RESTORE

No changes.

SPOOLING PACKAGE

No changes.

SHUTUP

No changes.

SWITCH

No changes.

SYSGEN

See section 1.4 of this manual for details of the changes.

SYSTAT

No changes.

TALK

No changes.

TTYSET

No changes.

UMOUNT

No changes.

UTILTY

The "SEND KBnn: (message)" command will now return the message "KBnn: is busy" if KBnn is GAGged.

2.3 RSX Emulator and Utilities Package ************************************

In RSTS/E V7.2, all of the RSX utilities and libraries have been upgraded to
be compatible with the corresponding utilities in RSX-11M V4.0.

The RSX Emulator and Utilities Package contains the following changed
components:

RSX.RTS - Error message change:
          When a program is TKB'ed using the "RESLIB=" option, and that
          library has not been added, the RSX Run-Time System will issue the
          message "?Resident library not found", instead of the message
          "?Can't find file or account".   This message is issued only by
          RSX.RTS.

SYSLIB - Support for cluster libraries.

TKB   - New error message: "Only one HISEG may be specified"
          is printed if the HISEG option is entered more than once.

        - Cluster library support added by the option:
          "CLSTR=cls1,cls2,cls3:access:apr".

        - New cluster library error messages.

        - Output text has been changed from upper case only to
          upper/lower case.

2.4 Distribution Media ***

RSTS/E V7.2 is distributed on the following media:

     9-Track Magnetic Tape - 800 BPI (TU10/TE10/TS03/TU16/TE16/TU45/TU77)
     9-Track Magnetic Tape - 1600 BPI (TS11/TE16/TU77)
     RK05 Disk Cartridge
     RK06 Disk Cartridge
     RK07 Disk Cartridge
     RL01 Disk Cartridge
     RL02 Disk Cartridge

Please refer to Section 3.0 of these Release Notes for more information on the
distribution kits.

2.5 Optional Software ***

Optional software supported by RSTS/E V7.2 includes the following:

        BASIC-PLUS-2 V1.6
        COBOL-11 V4.1/V4.4
        COBOL-81 V1.0/V1.1
        DATATRIEVE V2.4
        DECAL V02
        DECnet/E V2.0
        DECWORD/DP V1.0/V1.1
        DIBOL V4.5
        DMS-500 V02/V2.1
        FMS-11 V1.5
        FORTRAN IV V2.5
        FORTRAN IV-PLUS V3.0
        FORTRAN-77 V4.0
        INDENT V1.1
        RSTS/E 3271 Protocol Emulator V2.1
        RSTS/E High Performance 2780/3780 Protocol Emulator V1.1

                                NOTE

    Earlier versions of the above products are _not_ supported on
    RSTS/E V7.2. In particular, DECnet/E V1.1 is _not_ supported on
    RSTS/E V7.2

Prior to installing the supported optional software products listed
immediately below, please refer to related articles published in the RSTS/E
V7.2 Software Dispatch Review.

        DECAL V02   Seq 37
        DMS-500 V02   Seq 24

The following software is customer supported:

        DX/RSTS V3.1   (No DEC support services)

2.6 Proposed Changes for BASIC-PLUS in Future Releases of RSTS/E ***********

NOEXTEND/EXTEND - BASIC-PLUS will change its default from NOEXTEND mode to
EXTEND mode in a future release of RSTS/E. This will make BASIC-PLUS
compatible with BASIC-PLUS-2 and allow the use of long variable names in
programs, possibly requiring less documentation within the program. Feature
patch Seq 4.1.4 F of the RSTS/E V7.2 Maintenance Notebook allows you to change
the default to EXTEND mode on RSTS/E V7.2, so that you may prepare your users
for the transition. In that future release, a feature patch will be published
to allow users to change the default from EXTEND mode to NOEXTEND mode, and
users will still be able to specify these modes within their programs.

IMMEDIATE MODE - In a future release of RSTS/E, BASIC-PLUS will not allow, as
the default, immediate mode statements to be executed from a program file
being read by BASIC-PLUS as a result of execution of the "OLD" or "APPEND"
commands. Since this feature is not compatible with other Digital Equipment
Corporation products, no immediate mode from .BAS files will become the
default. Feature patch Seq 4.1.5 F of the RSTS/E V7.2 Maintenance Notebook
allows you to change the default to no immediate mode on RSTS/E V7.2, so that
you may prepare your users for the transition. In that future release, a
feature patch will be published to allow the user to continue using immediate
mode from .BAS files.

SEND/RECEIVE: SYS(CHR$(6%)+CHR$(18%)+ . . .) RSTS/E V7.2 will support both
SYS call 18 and SYS call 22. Future releases of RSTS/E will support only the
newer version, SYS call 22. SYS call 22 has been available on RSTS/E for
several releases.

Article Seq 4.1.9 F of the RSTS/E V7.2 Maintenance Notebook contains a patch
which causes BASIC-PLUS to make note of all occurrences of the obsolete SYS
call. You may wish to utilize this patch in order to track down and alter all
instances of SYS call 18 in your programs only, not in the DIGITAL supplied
programs.

2.7 SORT-11 ***

SORT-11 V2.0 is distributed as a part of RSTS/E V7.2. Note that as in RSTS/E
V7.1, all output files will be made non-contiguous by default. (Contiguous
input files by default will produce non-contiguous output files, unless the
/CO switch is specified for the output file.)

2.8 EDT V2.0 ***

EDT V2.0 is included as part of RSTS/E V7.2. This version of EDT must be
built by each site, since you have a choice of 3 configurations of the editor.
Refer to Chapter 6 of the RSTS/E System Generation Manual for installation
instructions.

2.9 Unsupported Components ***

NOTE

The following modules are <u>NOT</u> released products supported by
DIGITAL for use on RSTS/E, and their inclusion on the
distribution kit does not imply recommendation or endorsement by
DIGITAL regarding their use. There is no commitment by DIGITAL
to continue to include any of these modules in future
distributions of RSTS/E. Each of these modules is to be
considered "user supported".

The RSTS/E Development Group would like to be informed of any
problems with or suggestions concerning these components, as
supplied with RSTS/E V7.2. A reasonable effort will be made to
respond to such feedback, although problem fixes cannot be
guaranteed. If you choose to provide reports on unsupported
components via the SPR mechanism, please check Priority 5,
"Documentation/Suggestion."

2.9.1 RNO

RNO has been available from the DECUS library and is widely used by many users
of RSTS/E. It is included on the distribution kit for the convenience of those
users who wish access to this program.

RNO is a variant of the RUNOFF program (which is part of the RSTS/E library of
system programs). RNO is written in MACRO-11 and generally executes much
faster than RUNOFF, which is written in BASIC-PLUS. However, RNO is not
completely compatible with RUNOFF, and may sometimes produce different
results. This version of RNO was originally developed on RSX-11M and was
distributed with the V3 release of that system.

For those users wishing to make their own modifications to RNO, sources have
been included with this distribution. The RSTS/E Development Group would
appreciate hearing from any user making modifications in the hope that such
feedback will help to improve the program for future releases.

2.9.2 TECO

TECO is a character-oriented text editor which has been implemented on all
major DIGITAL operating systems. TECO has many powerful features as a text
editor, and is especially popular among programmers. Many users, however,
find TECO's set of commands rather cryptic, while others prefer line-oriented
editors. For these users, an editor like the DEC standard editor, EDT, is
more appropriate.

A copy of the <u>PDP-11 TECO User's Guide</u> is included in the documentation set
and a document file is included on the distribution kit explaining the use of
the TECO Video Terminal Editor (VTEDIT). For installation instructions, see
Section 3.3 of these notes.

2.9.3 SRCCOM.SAV and DUMP.SAV

RSTS/E users who are also users of RT11 may find SRCCOM.SAV (a text comparison program) and DUMP.SAV (a file dump/display program) useful on RSTS/E, although such use is not supported by DIGITAL.

The SRCCOM.SAV and DUMP.SAV files on the RSTS/E V7.2 distribution kits are identical to the SRCCOM.SAV and DUMP.SAV supplied with RT11 V4.0. Installation of each program would consist of copying it from the distribution kit with PIP and insuring that it is named to the RT11 run-time system. This would have to be done manually, as no control file for automatic installation is provided.

2.10 Old Problems Corrected **

Various system problems found after the release of RSTS/E V7.1 have been fixed in RSTS/E V7.2. All applicable mandatory RSTS/E Software Dispatch articles published through June 1982 have been incorporated into RSTS/E V7.2.

2.11 Upgrading From RSTS/E V7.1 to RSTS/E V7.2 *****************************

When upgrading from RSTS/E V7.0 or RSTS/E V7.1 to RSTS/E V7.2, the on-line SYSGEN feature of RSTS/E V7.1 cannot be used. Due to differences between RSTS/E V7.0, RSTS/E V7.1, and RSTS/E V7.2, Digital strongly recommends that the first RSTS/E V7.2 system generated be generated OFF-LINE, on a newly initialized disk.

Because of changes to the RSTS/E V7.2 ERRLOG.FIL file required due to the increased function of the error-logging programs, the RSTS/E V7.0 or RSTS/E V7.1 version of ERRLOG.FIL must be deleted prior to the initial running of the RSTS/E V7.2 ERRINT/ERRCPY. ERRCPY will create and initialize a new ERRLOG.FIL when it determines that the file is not present.

Because of changes to the RSTS/E V7.2 ERRDAT.FIL file, it MUST be updated by running RSTS/E V7.2 ERRBLD prior to the initial running of the RSTS/E V7.2 ERRINT.

These procedures will avoid any conflict that may be caused by inconsistencies between the two versions.

2.12 Support for RSTS/E V7.1 **

RSTS/E V7.1 will be supported for 6 months after the release of RSTS/E V7.2.

                3.0 Contents of RSTS/E V7.2 Distribution Kits

3.1 Introduction **

There are three types of Distribution Kits: "A", "H", and "W":

     A Kit: For new purchases of RSTS/E. Contains full documentation
            and all contracted software.

     H Kit: For those whose Service Contract or Warranty has expired
            or for additional CPU purchases. Contains full documentation and
            all contracted software.

     W Kit: For those under warranty or Software Product Service Contract.
            Contains changes or additions to the documentation and software.
            Because RMS V1.8 has not changed since RSTS/E V7.0, it is not
            included in the "W" kit. If you received a "W" kit, the medium
            that contains RMS V1.8 received with either your RSTS/E V7.0 or
            RSTS/E V7.1 can be used when installing RSTS/E V7.2.

Pack IDs for disk patch kits are always in the form "PATCHz", where "z"
reflects the version of the patch kit, e.g., "PATCHA" for Patch Kit "A". Be
sure to use only a RSTS/E V7.2 patch kit on a RSTS/E V7.2 system.

Note that the RSTS/E V7.2 RL02 and RK06 distribution kits contain one
fewer disks than in earlier kits, because the System Generation and System
Library media have been combined.

3.2 Magnetic Tape Distribution Kits **

DEC Order No.	Density BPI	Contents

9-Track   **800**   (600-foot reel)

AP-2773J-BC		System Generation
AP-2753I-BC		System Library I (CSP172)
AP-C725I-BC		System Library II (CSP272)
AP-L930B-BC		System Library III (CSP372)
AP-C883D-BC		RSX Run-Time System and Library
AP-5226D-BC *		RMS Run-Time System and Library
AP-M794A-BC		RSTS/E V7.2 Patch Kit "A"

9-Track   **1600**   (2400-foot reel)

BB-H751J-BC		System Generation, System Library I-II-III, RSX Run-Time System and Library
BB-H752G-BC *		RMS Run-Time System and Library
BB-M797A-BC		RSTS/E V7.2 Patch Kit "A"

* Not included in the "W" kit, see section 3.1 of this manual for explanation.

3.3 Disk Distribution Kits **

DEC Order No.	Pack ID	Contents

RK05

AN-2771J-BC	SYSGNJ	System Generation
AN-2751I-BC	CSP172	System Library I
AN-5444I-BC	CSP272	System Library II
AN-M276B-BC	CSP372	System Library III
AN-C885D-BC	RSXLBB	RSX Run-Time System and Library
AN-5227D-BC *	RMSKIT	RMS Run-Time System and Library
AN-M795A-BC	PATCHA	RSTS/E V7.2 Patch Kit "A"

RK06

AM-2774J-BC	SYSGNJ	System Generation, RSX Run-Time System and Library, and System Library I-II-III
AM-5228D-BC *	RMSKIT	RMS Run-Time System and Library
AM-M799A-BC	PATCHA	RSTS/E V7.2 Patch Kit "A"

RK07

AY-D526J-BC	SYSGNJ	System Generation, RSX Run-Time System and Library, and System Library I-II-III
AY-D946C-BC *	RMSKIT	RMS Run-Time System and Library
AY-M800A-BC	PATCHA	RSTS/E V7.2 Patch Kit "A"

RL01

AX-D527J-BC	SYSGNJ	System Generation, RSX Run-Time System and Library
AX-D528I-BC	CSP172	System Library I, II, and III
AX-D945C-BC *	RMSKIT	RMS Run-Time System and Library
AX-M798A-BC	PATCHA	RSTS/E V7.2 Patch Kit "A"

RL02

BC-J026D-BC	SYSGNJ	System Generation, RSX Run-Time System and Library, and System Library I, II, and III
BC-J028A-BC *	RMSKIT	RMS Run-Time System and Library
BC-M796A-BC	PATCHA	RSTS/E V7.2 Patch Kit "A"

* Not included in the "W" kit, see section 3.1 of this manual for explanation.

3.4 Build Control Files ***

3.4.1 Location of Build Control Files

The control files that are used to build the system library and program
packages are listed on the next page.

The name immediately above each list reflects the Pack ID, e.g., SYSGNJ for
the system generation media.

For 800 BPI 9-track magnetic tape system library media, the name indicates
which of the three CUSP tapes contains specific packages, e.g., CSP272
indicates the second system library tape for RSTS/E V7.2.

In the case of magnetic tape distribution media, the control files have been
arranged to limit the number of times that the tape must rewind if the control
files are specified in the order in which they are listed on the next page.

Note that if more than one control file is used, the files must be specified
in the order listed on the next page. For example, if you are building the
Help Package, the Spooling and Operator Services Package, the Backup Package,
and EDT V2.0, the order of the specified control files should be HELP.CTL,
SPLER.CTL, BACKUP.CTL, and EDT.CTL.

9-Track Magnetic Tape (800 BPI) or RK05 Disk Cartridge:

RSXLBB:	CSP172:	CSP272:	CSP372:	RMSKIT:
------	------	------	------	--------
RSX .CTL	BUILD .CTL	HELP .CTL	DEVTST.CTL	RMS11 .CTL
TECO .CTL	DCL .CTL	SPLER .CTL	UNSUPP.CTL	
	BIGPRG.CTL	BACKUP.CTL	SORT .CTL	
		EDT .CTL		

RL01 Disk Cartridge:

SYSGNJ:	CSP172:	RMSKIT:
------	------	------
RSX .CTL	BUILD .CTL	RMS11 CTL
SORT .CTL	DCL .CTL	
TECO .CTL	BIGPRG.CTL	
	HELP .CTL	
	SPLER .CTL	
	BACKUP.CTL	
	EDT .CTL	
	DEVTST.CTL	
	UNSUPP.CTL	

9-Track Magnetic Tape (1600 BPI) or RL02 Disk Cartridge or RK07 Disk Cartridge or RK06 Disk Cartridge:

SYSGNJ:	RMSKIT:
------	------
RSX .CTL	RMS11 .CTL
BUILD .CTL	
DCL .CTL	
BIGPRG.CTL	
HELP .CTL	
SPLER .CTL	
BACKUP.CTL	
EDT .CTL	
DEVTST.CTL	
UNSUPP.CTL	
RSX .CTL	
SORT .CTL	
TECO .CTL	

3.4.2 Contents of Build Control Files

RSX .CTL

> Contains the commands necessary to build the RSX Run-Time System and
> support utilities. Note that RSX must be installed before installing EDT
> V2.0 and many optional layered products that use the RSX Run-Time System
> and utilities.

SORT .CTL

> Contains the commands necessary to build the PDP-11 SORT package. RMS
> must already be patched and installed when SORT-11 is <u>patched</u>. For
> autopatching of SORT-11 to work, you must install and patch RSX, then
> install and patch RMS, and finally, install and patch SORT-11. The
> correct procedure is:
>
> o Mount the RSX medium and install and patch RSX
> o Mount the RMS kit and install and patch RMS
> o Mount the media containing SORT and install and patch SORT.
>   (You may wish to install and patch other components included on the
>   SORT media at the same time.)
>
> Note that all patches published for SORT-11 through June 1982 have
> <u>already</u> been applied to the version of SORT-11 included on the
> distribution media. As of this date, you do not need to install and
> patch RMS before installing SORT.

DCL .CTL

> Contains the commands necessary to build DCL and its associated programs
> and files.

HELP .CTL

> Contains the commands necessary to build the HELP system program and its
> associated data files.

EDT .CTL

> Contains the commands necessary to build EDT V2.0. Note that the EDT
> installation uses the RSX Run-Time System and utilities, so RSX must be
> installed before EDT can be installed.

BUILD .CTL, BACKUP.CTL, BIGPRG.CTL, SPLER .CTL, DEVTST.CTL

     Contain the commands necessary to build the standard RSTS/E system
     library. The exact contents of these files are described in Appendix D
     of the RSTS/E System Generation Manual.

TECO .CTL

     Contains the commands necessary to build a number of TECO programs. The
     BUILD program should be used with this file if you plan to install TECO
     on your system.   In addition to the TECO Run-Time System, this command
     file will install several TECO programs which we have found to be
     generally useful.

     For documentation on the new features of TECO, the new TECO programs, and
     instructions for tailoring the TECO Run-Time System for your system, see
     the file TECORN.DOC on the distribution kit.

UNSUPP.CTL

     Contains the commands necessary to build a number of programs which,
     though unsupported, are used extensively by the RSTS/E development group.
     They are included because you may find these programs, or modified
     versions of them, to be useful on your system.

4.0 RSTS/E V7.2 Sample Installation Procedure

The following list of tasks is an outline of the steps performed to accomplish the complete installation of a new RSTS/E V7.2 operating system. Once these steps have been performed, the system is ready for time sharing.

The time estimates given are for a RSTS/E V7.2 system on an 11/70 with 2 RP06 disks, using BASIC-PLUS as the primary run-time system and IMAGE copying the system RP06 to the non-system RP06. They do not include time for troubleshooting hardware or for pattern checking large disks. The use of a smaller processor will, of course, increase the time required.

1. **System Generation**   2 - 4 Hours

    Bootstrap the distribution medium, tailor the SYSGEN system, generate the TARGET system, tailor the TARGET system, start the TARGET system, compile and patch, if necessary, the CUSPs, and install and patch optional software included on the RSTS/E distribution kit.

    (For a complete overview of the system generation process, refer to Chapter 1 of the RSTS/E System Generation Manual.)

    The monitor/CUSP system generation demonstrates that the hardware supports RSTS/E; that MACRO programs can be assembled, linked, patched, and executed; that the primary run-time system is operational; that the standard library programs can be compiled (and patched, if necessary); and that certain library programs, especially file transfer utilities, are operational.

2. **Install Optional Software**   (Installation Dependent)

    If optional software (e.g., COBOL) needs to be installed (and if DIGITAL is responsible for the installation) it should be installed and patched at this time. Sample procedures for optional software products should be run at this time to indicate that the hardware supports the product and that the installation is complete and correct.

3. **Configure Control Files and Re-start the System**   1 - 4 Hours

    Configure the standard start control files, START.CTL and CRASH.CTL, set up the standard account file, ACCT.SYS, establish the system message file, NOTICE.TXT, shut down the system, use the INIT HARDWR LIST suboption to print a System Configuration List, use the INIT SET MODEM suboption to enable dial-up lines, and restart the system.

    This demonstrates that the system can be started, shut down, and re-started. At this time it can be demonstrated that all local terminals are accessible and, if feasible, dial-up lines can be checked. The System Configuration List should be posted on the system for future reference.

4. **Save and Restore the System Using SAVE/RESTORE**   30 - 40 Minutes

Save the system disk using the SAVE or IMAGE option of SAVE/RESTORE,
boot the saved media, and, if SAVE was used, restore to another disk,
boot the new system disk, re-install the monitor SIL, and start the
system.

This demonstrates SAVE/RESTORE's ability to backup and restore the
system and exercises the disk I/O capability of the system. It also
leaves you with a full, bootable, system backup.

Note that you must supply the additional media needed to perform
SAVE/RESTORE. If additional media are not available to perform this
step, it may be omitted, but it is strongly recommended that this
procedure be followed.

5. **Test Hardware Devices With DEVTST**   (Configuration Dependent)

Run DEVTST exercisers for the console terminal and any other devices
configured for the system. Refer to the System Configuration List
created in Step 3, above, and the RSTS/E System Manager's Guide.

This demonstrates that the devices configured for the system are
functional.

At the conclusion of the above procedure, the installation is complete and
most hardware will have been exercised sufficiently to determine that it
operates within the system environment. Note, however, that the sample
procedure is not designed to be a hardware exerciser or a test of system
performance.

It is recommended that all steps be performed from a hard-copy terminal and
that the terminal printout be saved for future reference.

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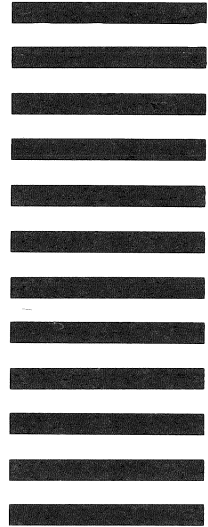
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