

RSTS/E Release Notes

Order No. AA-HJ88A-TC

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

OPERATING SYSTEM AND VERSION:	RSTS/E	V9.2
SOFTWARE VERSION:	RSTS/E	V9.2

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PREFACE

The RSTS/E V9.2 Release Notes describe new features in RSTS/E for this release as well as differences between this and the previous release, RSTS/E V9.1.

In V9.0 of RSTS/E, the installation process was changed considerably from previous releases of RSTS/E. That process was used to install both V9.0 and V9.1.

For RSTS/E V9.2, the installation and update procedure follows that same general process to either install a new RSTS/E V9.2 system, or to upgrade an existing RSTS/E system to V9.2. Because of the V9.0 changes to the installation process, users of earlier versions of RSTS/E should read the RSTS/E System Installation and Update Guide prior to attempting an installation of RSTS/E V9.2. See also section 2.2 of these notes for more information.

If you are installing a new RSTS/E V9.2 system, refer to PART I of the RSTS/E System Installation and Update Guide.

If you are upgrading a pre-V9.0 system to V9.2, refer to PART II of the RSTS/E System Installation and Update Guide.

If you are updating a RSTS/E V9.0 or V9.1 system to V9.2, refer to PART IV of the RSTS/E System Installation and Update Guide.

In addition, users and programmers familiar with RSTS/E V9.1 should read these notes to learn about changes and new features of RSTS/E V9.2. The V9.2 Release notes are divided into five sections:

1. New Features of RSTS/E V9.2
2. Differences Between RSTS/E V9.1 and RSTS/E V9.2
3. Restrictions on RSTS/E V9.2
4. Documentation Changes in RSTS/E V9.2
5. RSTS/E V9.2 Distribution Kit

NOTE

If you are a new RSTS/E site or if you are upgrading a system older than V9.0, you should also read the RSTS/E V9.0 and V9.1 Release Notes. Copies of these notes are included in your RSTS/E documentation set.

1 New Features Of RSTS/E V9.2

1.1 New Device Support

1.1.1 TU81 Streaming Tape Drive

RSTS/E V9.2 contains support for the TU81 streaming tape drive, one of the new TMSCP (Tape Mass Storage Control Protocol) class tape drives. Note that the TU81 uses the device type MU: and streams at a density of either 1600 or 6250 BPI when used with the DCL BACKUP and RESTORE commands. The TU81 does not stream with the COPY command.

Although the TU81 is not listed throughout the documentation, you can generally assume that commands which support a density setting will accept the new higher density (6250).

1.1.2 TUK50 Streaming Tape Drive

The TUK50 is the unibus version of the TK50. It offers streaming with the DCL BACKUP and RESTORE commands. Its device designator is MU:. Although the TUK50 is not specifically listed throughout the documentation, all references to the TK50 also apply to the TUK50.

1.1.3 DF224 Scholar Modem

RSTS/E V9.2 supports the DF224 Scholar modem. The Scholar modem:

- o Can transmit and receive data at 300 baud asynchronously and at 1200 or 2400 baud asynchronously or synchronously.
- o Adjusts itself to the speed of the remote modem.
- o Lets you change modem options via internal switches located on the module or by "soft select," which is menu driven.
- o Lets you select the DF03 or the DF224 autodial protocol. Selecting the DF03 autodial mode allows you to use the modem with existing DF03 auto-call software.

To use the Scholar modem on a RSTS/E system, you must set the Modem Response option to Abbreviated. If you do not set the response option to Abbreviated, you may have speed selection problems with modems connected to a terminal line set to auto-baud.

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We recommend that you disable the Input Character Echo option when you use the DF224 autodial feature. Disabling this feature prevents text intended for the modem (telephone numbers, for instance) from echoing to the program.

You can control the settings for Modem Response and Input Character Echo options by the switchpack inside the module or through the Soft Select menu. If you use the menu, then you must do so each time you turn on the modem, since the settings return to their default values when you turn off the modem. Therefore, we recommend that you use the internal switchpack.

- o Set the S1 switch in the OFF position to disable the Input Character Echoing.
- o Set the S3 switch to the OFF position to set the Modem Response to abbreviated.

See the Scholar 2400 Modem Owner's Manual (EK-DF224-OM-PRE), page A-3 for a diagram of the switchpack and its factory default settings.

When you use the autodial feature, you do not need to raise CTS (Clear to Send). The modem raises the CTS signal when DTR (Data Terminal Ready) is raised.

NOTE

RSTS/E only supports Scholar modems of rev level B1 or later. To determine the rev level of your modem, look for a small white sticker on the underside of the enclosure. This sticker should read "C.S. REV. B1 ECO." Older versions of the DF224 may have over-speed problems, causing intermittent loss of characters. This problem is corrected in rev level B1.

The Scholar modem also sends random characters to the terminal just before sending the "disconnect" message after the remote modem drops carrier. This is the way the Scholar modem operates and not a problem with RSTS/E. Please do not submit SPRs to RSTS engineering on this problem.

Please note that the Scholar 2400 Modem Owner's Manual states that the Scholar modem is capable of operating at 600 baud. The Scholar modem with rev level B1 does not support 600 baud.

1.2 Initialization Code (INIT.SYS)

1.2.1 New INIT.SYS Message

INIT.SYS now determines which type of DMCs are installed in your system. During this determination, the ECO status of the DMCs is also checked. If a DMC is not at the latest level, the following message will be printed:

XMn: is missing ECO's, but will still function.

This message indicates that you should contact DIGITAL Field Service to update the microcode in the DMC, but that the DMC can still be used until the update happens.

1.2.2 Changes To The DEFAULT Option

The help text for the BUFFERS suboption of DEFAULT now reports a table showing the number of small buffers for each possible monitor size change. This table replaces the one displayed during installation.

1.2.3 New Hardware List Comments

The comment section for the RK controller now lists all the drives that have been found, not just the RK05Fs. This list indicates either RK05 or RK05F for each drive found. This list is similar to the list for other disks.

The comment section for the XM controller now lists the device as a remote DMC, local DMC, or DMR. The comment section lists DMRs as in DMC compatible mode or in DMR mode. This helps to ensure proper installation of network systems.

The comment section for the RP controller now lists all the drives that have been found. INIT.SYS can find drives if they are either spinning, have their write protect button pushed, or are RP03s. INIT.SYS passes this information on to the SYSGEN process, so appropriate defaults are now shown for RP02/3 drives. For this reason, we recommend that you give all RP02 drives lower unit numbers than RP03 drives. If the system has only non-write protected, non-spinning RP02 drives, then the default in SYSGEN will continue to be 8. This maintains backward compatability.

The comment section for the RX controller (RX01 and RX02 drives) now lists both drives with their type, and their RSTS unit number.

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1.2.4 Clock Changes For The J-11 CPU

The clock determination code within INIT now recognizes the KW11-L clock within the J-11 CPU as a full function KW11-L rather than a write-only clock. With this change INIT also determines the proper line frequency (60Hz or 50 Hz) for all J-11 based systems (11/73/83/84 CPUs).

INIT also verifies that the J-11 800Hz clock is not being used, and resets the clock to line frequency if the user has set the clock to 800Hz. If INIT finds that the user has turned the clock off entirely and there is no KW11-P in the system, then INIT will turn the KW11-L clock back on, and issue a warning message that this action was taken.

1.3 Monitor

1.3.1 Changes To Monitor Data Structures

Several monitor data structures have been changed for RSTS/E V9.2. These changes allow a significant increase in the number of small buffers on all systems. In addition, fewer small buffers are used by the system, and some structures which previously used the general small buffer pool may now use both the FIP small buffer pool and the general small buffer pool.

This change affects the internal job tables JDB and JDB2. Programs that PEEK to read data in these tables may no longer work properly. Instead, use the UU.SYS monitor directive (Return Job Status system call) to obtain information about jobs on the system.

To minimize the impact of this change, the following PEEK sequences continue to work as before:

<u>Name</u>	<u>Address</u>	<u>Name</u>	<u>Address</u>
IDATE	PEEK(36%)	JOB	PEEK(518%)
ITIME	PEEK(38%)	JOBDA	PEEK(520%)
DATE	PEEK(512%)	JOBF	PEEK(522%)
TIME	PEEK(514%)	IOSTS	PEEK(524%)
PPN	PEEK(PEEK(PEEK(520%)+8%)+24%)		

See Table 7-9 in the RSTS/E Programming Manual for descriptions of the PEEK sequences.

You should avoid using the PEEK function to obtain system information that can be obtained using a monitor directive or SYS call. If there are certain system values that you cannot obtain using a monitor directive or SYS call, please submit a priority 5 SPR. We will review such SPRs when considering ways to reduce the need for PEEKs in a user program.

1.3.2 Improved Bad Block Replacement

The MSCP Bad Block Replacement (BBR) module now more efficiently handles repeated bad block replacements and bad block replacement after system crashes.

1.4 DCL

1.4.1 MOUNT/OVERRIDE For ANSI Tapes

You can now use the /OVERRIDE qualifier on MOUNT commands for ANSI format tapes. No privilege is needed. The format is:

/OVERRIDE or /OVERRIDE=IDENTIFICATION

When you specify /OVERRIDE, MOUNT ignores the tape label. Use the longer form of the qualifier for compatibility with VMS command files; RSTS/E accepts either form. DCL ignores /OVERRIDE on DOS format tapes.

1.4.2 DCL And Certain CUSPs Now Use Error Files

In order to reduce the memory size of DCL, most DCL error messages have been removed from DCL.RTS and relocated in the two disk files:

_SY0:[0,1]PKG001.MSG
_SY0:[0,1]PKG002.MSG

These files are fairly small (15 blocks total); they result in a small net savings of disk space (3 blocks) between DCL and all of the CUSPs involved.

You may notice a small delay during the printing of an error message on a heavily loaded V9.2 system. This is because DCL, or one of the CUSPs which handle DCL commands, is accessing the disk to look up the error message. DCL attempts to minimize the disk access time by keeping the message files open at all times.

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1.4.3 Default Filespecs For INSTALL Commands

The `INSTALL/ERROR_FILE`, `INSTALL/SWAP_FILE` and `INSTALL/OVERLAY_FILE` commands now provide default filespecs for the filespec parameter. You can enter the command without any file parameter to accept the full default, or you can enter a partial filespec; DCL will fill in the missing parts. For example, to install the swap file `SWAP3.SYS` on the system disk, enter the following command:

```
$ INSTALL/SWAP_FILE=3
```

The default filespecs for these three commands are:

<u>Command</u>	<u>Default Filespec</u>
<code>INSTALL/ERROR_FILE</code>	<code>_SY0:[0,1]ERR.SYS</code>
<code>INSTALL/OVERLAY_FILE</code>	<code>_SY0:[0,1]OVR.SYS</code>
<code>INSTALL/SWAP_FILE</code>	<code>_SY0:[0,1]SWAPn.SYS (n = 0,1,3)</code>

You can choose any disk device for these files. However, you must use the file type `.SYS`, and the account `[0,1]`. Although you can use any filename, you should always use the standard (default) filename to avoid confusion.

See the on-line help files for examples illustrating the use of default filespecs with the `INSTALL` commands.

1.4.4 /DEVICE Qualifier Added

The `INSTALL/SWAP_FILE` command is normally used to install a single file as a swap file. However, it can also be used to dedicate a disk as a swapping disk. Doing so causes the disk to be read and written as a non-file-structured device; any data or structure on the disk will be destroyed when jobs are swapped there.

Prior to V9.2, if you issued the `INSTALL/SWAP_FILE` command and included only a disk device name as the filespec parameter, DCL would attempt to install the disk as a non-file-structured swapping disk. This was dangerous since you might not be aware of, or expect, this action.

In V9.2, a new qualifier, `/DEVICE`, has been added to the `INSTALL/SWAP_FILE` command. You must use this qualifier, with the name of a disk device as its argument, to install the disk as a non-file-structured swapping disk. If you do not specify `/DEVICE`, DCL assumes you are installing a swapping file, not a swapping disk.

The format of the new qualifier is:

`/DEVICE=disk-name[:]`

Specifies the disk to be used as a non-file-structured swapping disk. Any data or structure on the device will be destroyed when jobs are swapped to it. DCL displays an error if the disk you specify is mounted.

If you include the `/DEVICE` qualifier, then you cannot include the `swap-filespec` parameter or the `/POSITION` or `/SIZE` qualifiers.

Note that this change is not backward compatible for those sites that currently install entire disks as non-file-structured swapping devices. Such sites will have to modify their `INSTALL/SWAP_FILE` commands to include the new `/DEVICE` qualifier.

See the `INSTALL/SWAP_FILE` help file for more information on the new `/DEVICE` qualifier, including an example illustrating its use.

1.4.5 `/LOG` Qualifier Added To DCL Commands

The following commands now support the `/LOG` (`/NOLOG`) qualifier to enable (disable) printing of a confirmation message when the command has been processed:

<code>INSTALL/ERROR_FILE</code>	<code>REMOVE/ERROR_FILE</code>
<code>INSTALL/OVERLAY_FILE</code>	<code>REMOVE/OVERLAY_FILE</code>
<code>INSTALL/SWAP_FILE</code>	<code>REMOVE/SWAP_FILE</code>

As in all other commands, the default is `/LOG`. This change is reflected in the on-line help files for the commands listed above.

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1.5 Print/Batch Services (PBS)

1.5.1 Trailer Pages

PBS now supports the printing of trailer pages after each file copy. Trailer pages provide a way to certify that a listing or document printed on continuous forms is complete. Trailer pages are similar in format to file header pages, and include the text FILE END in large block letters. When enabled, one trailer page is printed at the end of each file copy.

Trailer pages are optional for each form defined in the Forms Definition File PBS\$:FORMS.SYS. To enable them for a form, you must modify that form definition to include the new keyword TRAILER_PAGES. You can include the NOTRAILER_PAGES keyword in a form definition to explicitly disable the trailer pages feature on that form. If a form definition does not include TRAILER_PAGES or NOTRAILER_PAGES, then NOTRAILER_PAGES is assumed.

Please note that whenever you modify a form definition, you must reinstall that form in order for the new definition to take effect. For example, if you modify the definition of forms NORMAL to include TRAILER_PAGES, trailer pages would not be printed until you reinstalled forms NORMAL on those print servers currently using forms NORMAL.

To reinstall a form on a print server, issue the command:

```
SET SERVER/FORMS=form-name server-name
```

Note that restarting Print/Batch Services (START/QUEUE/MANAGER) does not reinstall forms on print servers; you must explicitly issue the SET SERVER command to do so.

The following sample definition for forms NORMAL includes the new TRAILER_PAGES keyword:

```
NORMAL=_LP*:      - !Define forms NORMAL for LP servers:
  LENGTH=66       - ! 66 lines per page
  WIDTH=132       - ! 132 columns per line
  BOTTOM_MARGIN=6 - ! 6-line bottom margin
  JOB_PAGES=2     - ! 2 job header pages
  FLAG_PAGES=2    - ! 2 file header pages
  TRAILER_PAGES   - ! Trailer pages
  NOSIMULATE      ! No simulated <ff>
```

1.5.2 START/QUEUE/MANAGER Command

The START/QUEUE/MANAGER command no longer enforces job and detached-job quotas when starting Print/Batch Services. Users with PBSCTL and SWCFG privilege can now start up PBS even if they exceed their account's job or detached-job quotas. Note that only one copy of PBS can be started; if a user issues the START/QUEUE/MANAGER command after that user has already started PBS, PBSMGR returns the error message "?Print/Batch Services already started."

Be careful when starting up PBS from an account where job or detached job quotas are important. Since START/QUEUE/MANAGER does not enforce quotas, that account may end up over its job or detached job quota. Once you log out, you may not be able to log back into that account unless you attach to PBS or some other detached job.

1.6 Commonly Used System Programs (CUSPs)

1.6.1 DSKCVT

The DSKCVT utility has been updated to allow you to convert passwords to NOLOOKUP on your system disk. Previously, you could only use the password conversion option of DSKCVT by mounting your system disk as a private disk.

Now, if you run DSKCVT and specify your system disk as the disk to convert, you will be asked if you want to convert passwords to NOLOOKUP. If you answer YES, DSKCVT will convert all account passwords on the disk to NOLOOKUP without requiring you to manually re-enter passwords.

See the RSTS/E System Installation and Update Guide for more information on how to use the DSKCVT program.

2 Differences Between V9.2 And V9.1

2.1 Monitor

2.1.1 Monitor Size

RSTS/E V9.2 monitors are slightly larger than comparable RSTS/E V9.1 monitors, depending on the total number of jobs supported by the monitor. This size increase can be compensated for by reducing your small buffer count by one small buffer for each job on the system. This is because a data structure which was previously in a small buffer has become a permanent structure. A system with 63 jobs will notice a size increase of 1K words.

2.1.2 Removal Of The Null Job "Lights"

Because of monitor structure changes, the unsupported null job that rotates address and data lights has been removed from RSTS.

2.1.3 Caution - Examining Monitor Job Tables

Because of the changes to the monitor's job tables for RSTS/E V9.2, examining or modifying locations in these tables with the PEEK or POKE function, front panel switches, ODT, etc. may cause unpredictable results.

2.1.4 Caution - Non-standard Device Drivers

Because of the data structure changes for RSTS/E V9.2, user-written device drivers may require modification. Be sure to reassemble any such drivers with the V9.2 prefix files. If they fail to assemble, they will not work. If they do assemble, be sure to check over the driver thoroughly before declaring it "safe".

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2.1.5 Default Powerfail Delay

The default value for the power fail delay has increased to 300 seconds. To change this value, use the SET SYSTEM/POWERFAIL_DELAY command.

2.1.6 Corrections

The following problems have been corrected in the monitor:

- o Logged-out jobs could not declare themselves as message receivers.
- o The monitor ignored requests to use Open Mode 8% when it opened disk files.
- o The "Create Logged-Out Job" SYS call always passed a creator's job number of zero instead of the correct number.
- o The monitor positioned tapes incorrectly after it had determined if the ANSI labels were for end of file or end of volume. An extra read after the end of file or volume would succeed, but a second extra read would fail.
- o When the non-overlapped seek driver was included, the RP02/3 device driver did not allow access to RP03s used as non-system disks. RP02s, all system disks, and the overlapped seek driver worked properly.
- o If a logged out terminal was connected to a line set to auto-baud, pushing the BREAK key several times set the speed to 600 baud permanently. This made the line appear to be disabled.

2.2 Installation

2.2.1 Building CUSPs From The SOURCE Logical Package

Section 2.11.1 of the RSTS/E V9.0 Release Notes lists those sources included with RSTS/E, and describes how to install them on your system.

To create executable programs from these sources, you must have BASIC-PLUS-2 available on your system. To ensure that these programs are created correctly, be sure to compile the sources with the following BASIC-PLUS-2 attributes in effect:

```
          Data type : REAL
          Real size  : SINGLE
          Integer size : WORD
          Scale factor : 0
          Variant    : 0
          Chain with line #
```

Once you have compiled a source module, use the DCL LINK command or run the Task Builder (RUN \$TKB) to create the executable program.

The following example illustrates how to correctly build the LOGIN program located in the SOURCE\$ account. It assumes that your BASIC-PLUS-2 compiler is installed with the defaults shown above:

```
$ BASIC/BP2

PDP-11 BASIC-PLUS-2 V2.3-00

BASIC2

OLD SOURCE$:LOGIN.BAS

BASIC2

COMPILE
LOGIN  11:55 AM          24-May-86

BASIC2

EXIT

$ RUN $TKB
TKB>LOGIN.TSK=LOGIN.OBJ, LB:BP2OTS/LB
TKB>/
Enter Options:
TKB>UNITS=13
```

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```
TKB>ASG=SY:5:6:7:8:9:10:11:12
TKB>EXTTSK=512
TKB>LIBR=CSPLIB:RO
TKB>//

$ COPY/REPL/PROT=232 LOGIN.TSK _SY0:$LOGIN.TSK
[File LOGIN .TSK copied to [1,2]LOGIN .TSK]

$ DELETE LOGIN.OBJ,LOGIN.TSK
LOGIN .OBJ deleted
LOGIN .TSK deleted
```

The TKB "LIBR=CSPLIB:RO" option causes the resultant task to use the CSPLIB resident library, reducing the overall memory requirements of CUSPs running on your system. You should Task Build all of the components included in the SOURCE package, using the CSPLIB resident library.

Be sure to assign the proper protection code to any CUSP program that you create. See Article 0.1.1 of the RSTS/E Maintenance Notebook (June 1985) for a complete list of the software components included with RSTS/E and their associated locations and protection codes.

Note that DIGITAL does not support any CUSPs that have been modified. If you do encounter problems with a CUSP that you modify, please confirm that the problem occurs with the standard supplied CUSP before submitting an SPR. If you have suggestions or ideas that might improve any of the CUSPs on RSTS, please submit a priority 5 (suggestion) SPR.

2.2.2 Installation Small Buffer Table Removed

Because of various monitor structure changes, it was necessary to remove the small buffer table displayed during system installation. This table is now displayed by the help text for the BUFFERS suboption of the DEFAULT option of INIT.SYS.

2.2.3 MSCP Installation

The question that asked for the number of MSCP disks has been changed to ask if MSCP support is wanted or not. If the answer is yes, then the resultant monitor supports four MSCP controllers. Each controller still supports up to four MSCP disks, for a total of sixteen MSCP disks.

2.2.4 Caution - "On-Line" Upgrades

If you are upgrading from RSTS/E V9.0 or V9.1 to V9.2, you should not try to install V9.2 while running on V9.0 or V9.1 timesharing systems. You must shut down timesharing and boot the V9.2 Installation kit to properly upgrade your system. Otherwise, you will get an incomplete installation, even though the system may appear complete at first.

See Part IV of the RSTS/E System Installation and Update Guide for complete information on how to upgrade your existing RSTS/E system to Version 9.2.

2.2.5 Caution - Changing Devices During Installation

Installation of RSTS/E V9.2 uses RESTORE to copy files from backup sets on the distribution kit to your system disk or to a target system disk. In cases where a backup set continues on a next volume, RESTORE asks you to mount the next volume and allows you to specify a different device with the prompt:

Where can this volume be located <current device>?

While this feature is useful for general file restores, it is not supported during installation. Changing devices causes no problems restoring the remainder of a backup file, but it will cause the rest of the installation procedure to fail, since the installation command procedure does not know that the distribution device changed during the restore.

This problem will be corrected in the future by not permitting device changes during installation. For now, please do not specify a different device in response to the prompt shown above; instead, press RETURN to continue the RESTORE using the same distribution device.

2.2.6 Correction

The following problem has been corrected in the installation procedure:

- o During an upgrade to a target disk, certain files marked "NODELETABLE" caused protection violations. As a result, the upgrade failed.

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2.3 Commonly Used System Programs (CUSPs)

2.3.1 Changes To Job PEEK Sequences

Several programs have been modified to remove any PEEK sequences because of the job table changes described in Section 1.3.1.

2.3.2 DCL

DCL Size Change

The memory requirements for DCL have dropped from 25K words to 24K words for its read-only (high segment) memory. DCL still uses only 4K words of read/write memory (low segment) for its symbol tables and other command processor context. The change in size will allow DCL to use up to 8K words of read/write memory in the future, providing for more symbols than can be defined currently.

Corrections

The following problems have been corrected in DCL for V9.2:

- o If you used the LOGIN command to log into several accounts during a single session, DCL would eventually display the message, "?No channels available."
- o The LOGIN/TERMINAL command displayed incorrect information about the last login on the destination terminal.
- o The LOGIN/TERMINAL command produced an unexpected error on the destination terminal when it was used to enter an account without RDMEM privilege.
- o DCL did not display any error message if it executed a GOTO command with a nonexistent label.
- o The DCL commands FORCE, BROADCAST, SET TERMINAL, and SHOW TERMINAL did not print out appropriate messages when referencing a disabled terminal.
- o Using the /DEVICE_TYPE or /INQUIRE qualifiers of SET TERMINAL changed the terminal's parity setting.
- o The DCL command, SET JOB, did not handle non-existent jobs properly. Now an error message is printed.

- o For the SHOW JOB/PRIVILEGES and DETACH commands, the error messages for nonexistent jobs were inconsistent with other DCL error messages. The SHOW JOB/PRIVILEGES command now displays "?Job does not exist". The DETACH command now displays "?Job already detached or does not exist"
- o The SET FILE command did not modify all the requested files when you used a wildcard PPN.
- o The CREATE/ACCOUNT command prompted for a password for the template account feature, even though the template account was set to NOPASSWORD_PROMPT.
- o The DCL command SET PRINTER/DEVICE=LN01/BACKSPACE=CONTROL did not set the backspace attribute correctly.

2.3.3 BACKUP

Corrections

The following problems have been corrected in BACKUP for V9.2:

- o In some cases, BACKUP would go into an infinite sleep state when it reached the end of a tape volume. This problem typically occurred only on very fast CPUs with TU80 tape drives.
- o BACKUP would go into an infinite sleep state after initializing an RX50 diskette during multi-volume backups.
- o BACKUP no longer attempts to backup files to which the user does not have read access. Previously, this created protection violations and, in some cases, memory management errors. Such files are now skipped.
- o BACKUP did not rewind the tape before initializing it. This sometimes resulted in the incorrect density being set.
- o BACKUP did not correctly preserve the attributes of files with undefined organization.
- o RESTORE/VERIFY did not rewind the tape before the verify pass of a single volume tape backup.
- o The defaults for the /END qualifier did not match the documentation. They are now as documented: /END=DISMOUNT for disks and /END=NOREWIND for tapes.

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Differences

2.3.4 MOUNT

Correction

The following problem has been corrected in MOUNT for V9.2:

- o Previously, MOUNT returned inappropriate error messages when a MOUNT/NOWRITE was issued for an already mounted disk. MOUNT now returns the error message "?Disk pack is already mounted."

2.3.5 INITIALIZE

Correction

The following problem has been corrected in INITIALIZE for V9.2:

- o The INITIALIZE command for disks ignored the factory bad block data. (NOTE: Running \$DSKINT.TSK was not affected.)

2.3.6 Print/Batch Services

Corrections

The following problems have been corrected in PBS, the Print/Batch Services, for V9.2:

- o PBS went into an infinite loop if there were no free blocks on the system disk and a \$SUBMIT command was issued.
- o The print services portion of PBS did not perform the \$START/SERVER/PAGE=[+-]n qualifiers correctly.
- o PBS would print a blank line at the beginning of every page for certain files with implied carriage control.
- o PBS would set the default for the SIMULATE keyword in the forms definition file to have the same value as the last explicit setting in a form used. This is now corrected to use SIMULATE for the default.

- o In some cases, the START/QUEUE/MANAGER operation did not work when issued from certain accounts.
- o PBS would pause for long periods between the completion of a print job and the beginning of the next print job.
- o In some cases, if you used the SET ENTRY command to lower an entry's priority, the entry would get modified twice. This occurred only if you specified an entry name, not an entry number.
- o PBS did not honor the CRFill parameter of terminals or the Fill parameter of printers.

2.3.7 ANALYS

The ANALYS package has been modified so that the Disk Structure section includes the comment "LDX" for any disk that has its storage allocation index loaded in memory.

2.3.8 OPSER Package

Corrections

The following problems have been corrected in the OPSER spooling package:

- o The QUMRUN program did not process the /DE (delete) file qualifier unless the account where QUMRUN was running had WWRITE privilege. This problem has been corrected; the privileges of the account running QUMRUN no longer affect processing of the /DE qualifier.
- o The QUMRUN program corrupted QUEUE.SYS if there was only one free entry and the /AFTER switch was used. This has been corrected. Also, if you use the QUE program in this case, it now returns the "?QUEUE Full" error message.
- o The BATDEC program would hibernate if it read the privileges of an account that had no privileges attribute blockette. Now it treats such accounts as having no privileges and does not hibernate.

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Differences

2.3.9 DSKCVT

Corrections

The following problem has been corrected in DSKCVT for V9.2:

- o In certain cases, DSKCVT would fail during conversion of passwords to NOLOOKUP if it encountered a [0,*] account other than [0,1] that contained a password blockette.

All [0,*] accounts are, by definition, NOUSER accounts, and do not normally contain a password blockette. Account [0,1] is an exception, since its password blockette is used as the system password. In V9.2, during its conversion of passwords, DSKCVT deletes the password blockette of any [0,*] account other than [0,1].

2.3.10 DISPLY

Corrections

The following problems have been corrected in DISPLY for V9.2:

- o The /KBn: switch was inadvertently left out for V9.0 and V9.1. For more information, see Table 14-2 in the RSTS/E System Manager's Guide.
- o The S option in V9.1 exited DISPLY and sent you back to the monitor prompt.

2.3.11 PIP

Corrections

The following problems have been corrected in PIP for V9.2:

- o The help files reported /RETAIN as the default for disk-to-disk copies. The correct default is /NEW.
- o The help files for PIP did not specify the full spelling of PIP's qualifiers.

2.4 SORT/MERGE

Corrections

The following problems have been corrected in SORT/MERGE for V9.2:

- o The SORT/MERGE command qualifier `/COLLATING_SEQUENCE=`
`MULTINATIONAL` was not translated correctly.
- o SORT did not abort properly if a device with insufficient
disk space was used for all the work files. Frequently, SORT
indicated an "odd address trap" or continued the sort,
thereby corrupting the workfiles.
- o SORT ignored decimal constants included in the `/CONDITION`
qualifier when `/CONDITION` was used in a specification file
with a `BINARY` data type specified in the `/FIELD` qualifier.

We have added a new syntax, `%D`, which will immediately
precede the test value, indicating a `DECIMAL-DIGIT`. Example:

```
/FIELD=(NAME=THEKEY,POSITION:1,SIZE:2, BINARY UNSIGNED)
/CONDITION=(NAME=KEYTEST,TEST=(THEKEY GE %D100))
```

- o SORT over-allocated workfiles when it encountered input files
of size greater than 32767 blocks.

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2.5 RMS-11

2.5.1 RMS-11 Access Methods

Corrections

Several changes have been made to correct problems relating to RMS-11 record accesses. Remember to rebuild all in-task RMS applications that require these corrections.

The following problems have been corrected in RMSLIB.OLB and the appropriate RMS-11 resident libraries:

- o RMS-11 did not use locate mode in a sequential file with fixed-length records, if a sequential access involved the last record in a block and that record ended exactly on the block boundary. This caused needless transfer of that record into the user buffer. This correction was in R1GBLD in RMSLIB.OLB as well as the resident library.

NOTE

Macro programs doing \$GETs should always test the record size before attempting an access on the record buffer. In the case of locate mode, you can advance the pointer into the I/O buffer beyond the end of the buffer, if the current record is a null record that coincidentally terminates on the block boundary. Ignoring a zero length record size could cause the application to access incorrect data or cause an abort due to memory protection violation.

- o In sequential files with fixed-length records, keyed (relative record number) or RFA access could require excessive I/O. In cases where the target record existed in the currently held RMS I/O buffer, RMS-11 did not use it. Instead RMS-11 read the block from disk again. This correction involved R1GET in RMSLIB.OLB as well as the resident library.
- o RMS-11 deadlocked if several programs accessed the same multi-keyed indexed file and one of them performed a delete operation. The programs never returned from their most recent RMS record operation and alternated between sleep and run time. This problem has been fixed in R3DLSI in both RMSLIB.OLB and the Resident library segment RMSLBE.LIB.

- o RMS-11 did not correctly update INDEX files with variable length records. This correction has been made in R3IUDR and R3IUDL both in the RMSLIB.OLB library and in the resident library.
- o RMS-11 corrupted some sequential fixed files and some very large relative files because of an error in the access methods. This correction has been made in ROACBB in both the RMSLIB.OLB and the resident library.
- o When doing \$PUT operations to a terminal, RMS-11 failed to do a line feed before printing the "\$" prompt. This caused the next command line to overwrite the last line. This correction was made in R1PUNR and R0RWBF of RMSLIB.OLB and the corresponding resident libraries.

2.5.2 RMS-11 Parsing

Corrections

The following problems have been corrected in the ROPRFN routine in RMSLIB.OLB, and in the resident library:

- o RMS-11 did not correctly parse a file specification containing a logical with a translation that did not yield a device. This would result in an incorrect expanded string and cause \$OPEN or \$CREATE to fail.
- o RMS-11 did not correctly parse when the public structure (SY:) was intended as the target device. ER\$PRV (protection violation) was returned on a \$OPEN or \$CREATE.
- o RMS-11 did not allow OPEN by FID on a magtape file that was located by \$SEARCH.

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2.5.3 RMS-11 Utilities

Corrections

The following problems have been corrected in the RMSIFL utility:

- o /DE did not handle logicals correctly - modifications were made to allow for new-style logicals.
- o Multiple commands within one IFL session - if an exception record failure was reported in the first command and /NOER was in effect, the next command would fail with ER\$ISI. This was due to failure to terminate SORT correctly.
- o Default extensions during loading - IFL used to check the area XAB to determine if the user had set up an area DEQ in the output file. If one was found, it was used. If this field was defaulted, then IFL used an RMSIFL default of approximately 50 blocks (adjusted to align with bucket size). IFL now checks the FAB DEQ field when the area XAB DEQ has been defaulted before applying the RMSIFL default. If both the area XAB DEQ and the FAB DEQ have been defaulted then IFL uses its 50 block default. For best results we recommend that users provide multiple areas with separate DEQ values. This is documented in the RMS-11 User's Guide, Section 6.3.
- o An extremely large number of alternate keys could result in the RMS error ER\$DME (dynamic memory exhausted). This problem has been fixed.
- o Corruption in output file - IFL would corrupt the alternate key root bucket when:
 - the output file allowed duplicates on an alternate key, and
 - the record header for the duplicate array was situated such that the duplicate count field occurred on a block boundary.

This meant that once the file was loaded, any applications attempting alternate key access would fail with ER\$CHK (check byte error in bucket). This problem has been fixed.

The following problem has been corrected in the RMSCNV utility:

- o RMSCNV did not work correctly when invoked via an indirect command file containing the /ER switch. It failed to create the exception file and reported RSTS/E error code 7 "I/O channel already open".

2.5.4 RMS-11 Documentation Changes

The following information should be included in the RMS-11 MACRO Programmer's Guide:

- o Appendix A-2. Add the following text to the description of error ER\$BKZ:

Or, the sum of the fixed length recordsize and the record overhead exceeds the bucketsize.

- o Appendix A-9. Add the following text to the description of error ER\$MRS:

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

- o Appendix A-10. Add the following error message and description:

```
ER$NOD Bad Node Name          Octal:  175550
                                Decimal: -1176
```

There are three possible reasons:

- o The specified node name is invalid, or
- o The remote node rejected the operation (For the meaning of the reason code, see DECnet/E Network Programming in MACRO-11, Appendix B.)
- o For the RENAME operation, the two node names are different

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- o Appendix D. Add the following text to both D.1.1 and D.3.1:

- o FILE SHARING

- If you open a file for READ/WRITE access with READ-only sharing, no other access will be allowed. If you want to share, you must open with READ/WRITE sharing specified.

2.6 DECnet

2.6.1 Correction

The following problem has been corrected in DECnet:

- o If an inbound connection request was rejected because there were no more logical links available, RSTS crashed with an odd address trap.

2.7 COBOL-81

2.7.1 COBOL-81 Compiler In A New Location

The COBOL-81 compiler has been moved from [1,2] to the system logical C81\$. The DCL COBOL command now uses this location to reference the compiler. Make sure to change your system commands to use the new location, C81\$.

The V9.2 installation/update procedure automatically moves the required files (C81.TSK and C81ODL.TSK) to their new location if they are not already there. PRELIN.TSK has also been updated to reflect the new location of C81ODL.TSK.

If you install COBOL-81 V2.3 after you install RSTS/E V9.2, then the files C81.TSK and C81ODL.TSK will be incorrectly located in the [1,2] account. To correct this, perform the following steps:

1. Create the C81\$ account if it does not already exist:

```
$ CREATE/ACCOUNT C81$:
```

2. Manually move the two files mentioned above from the [1,2] account to the C81\$ account:

```
$ COPY $C81.TSK      C81$:  
$ COPY $C81ODL.TSK  C81$:
```

3. Delete the same two files from the [1,2] account:

```
$ DELETE $C81.TSK  
$ DELETE $C81ODL.TSK
```

2.7.2 /CONDITIONALS Qualifier Added

A new qualifier has been added to the DCL COBOL command, in anticipation of the conditional compilation features of COBOL-81 Version 2.4.

The format of the new qualifier is:

```
/[NO]CONDITIONALS[=(A,B,C...)]
```

/CONDITIONALS compiles all conditional compilation lines.

/CONDITIONALS=(A,B,C...) compiles lines conditioned with letter labels A through Z. The comma (,) list separator is optional.

/NOCONDITIONALS does not compile conditional compilation lines.

3 Restrictions On RSTS/E V9.2

3.1 INIT.SYS

3.1.1 Booting Different Versions Of RSTS/E

The BOOT option code in INIT.SYS was changed in V9.1 to support new tapes and disks. These same changes are retained in V9.2. These changes are not compatible with RSTS/E V9.0 and earlier. Therefore, you cannot use the BOOT option of INIT.SYS on RSTS/E V9.0 or earlier to boot RSTS/E V9.1 or later on any of the following devices:

- o DU disks
- o DB disks
- o DR disks
- o All magtapes (MT, MM, MS, MU)

Both Version 9.2 and Version 9.1 can boot any version of RSTS/E. Version 9.0 can boot itself and any earlier version of RSTS/E. Version 9.0 cannot boot Versions 9.2 and 9.1.

If you do not have compatible software to boot RSTS/E Versions 9.1 or later, use a hardware bootstrap.

3.1.2 Using TK50 Tapes On PDP-11/23 Systems

If you use a TK50 to perform a BACKUP or RESTORE operation on a PDP-11/23, memory can become corrupted under certain conditions. This is a hardware problem that you can correct by an ECO to the TK50 drive and controller.

To prevent memory corruption, INIT.SYS in V9.2 looks for TK50 controllers that lack this ECO. If it finds any, INIT displays:

MUx: is missing the following ECO:
Module M7546: ECO #6

where x is the unit number of the TK50 device. If you have more than one TK50 device, then the message repeats for each unit lacking the required ECO.

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Restrictions

You can go on using your TK50 within INIT.SYS (for example, to run the SAVRES option to save or restore your disk), but you cannot start timesharing with the TK50 present under this condition. If you try to do so, INIT.SYS displays the error message:

Timesharing cannot be started due to problems discovered during the boot/authorize process.

and return you to its Option: prompt.

Use the HARDWARE DISABLE option if INIT to disable your TK50 controller(s) until you have installed the necessary ECO to correct this problem.

3.2 Monitor

3.2.1 File Processor Performance

If the free space on a disk is highly fragmented, the process responsible for allocating disk space may use larger amounts of CPU time than do previous versions of RSTS/E. This problem generally occurs on system disks with large pack cluster sizes, where there are many files which use a small number of pack clusters.

3.2.2 ERRINT Job

Avoid using the /LOCK qualifier on ERRINT. Using it can cause the system to hang.

On systems that have jobs locked in memory, fragmentation may increase until there is not enough contiguous memory available to run any swapped-out jobs. Normally, the monitor would then swap ERRINT out, and would schedule and swap in another job to run in its place. However, if ERRINT is locked in memory by the /LOCK qualifier, the monitor can not swap it out. Sometimes no further jobs can be scheduled to run, and the system appears to hang.

Note that jobs can be locked in memory either explicitly (through the use of the LOCK SYS call) or implicitly (for instance, any job using asynchronous I/O is implicitly locked).

3.3 Terminal Service

3.3.1 Problem With Setting Parity On A DHU11/DHV11

When you change the permanent speed and parity setting of a DHU11/DHV11 interface, use two separate SET TERMINAL commands and change the speed first. Otherwise, the monitor will set the parity to the wrong setting, even though a SHOW TERMINAL command displays the right setting.

For example, if you attempt to change the speed and set parity to EVEN in a single request, or if you set the parity to EVEN with one command and then change the speed with a second command, the parity will really be set to ODD, even though it displays as EVEN. Always change the speed first.

The Set Terminal Characteristics sys call (FIP SYS call +16) has the same problem. Always change speed and parity with two separate sys calls, and change the speed first.

3.4 RMS-11 Access Methods

3.4.1 Shared Update

Do not try to open a temporary relative or indexed file with shared update. Programs opening such a file hang in RMS-11.

3.4.2 Illegal Combinations Of Characteristics

Do not access indexed files that have the characteristics NODUPLICATES and CHANGES on an alternate key. This combination of characteristics is an error, even though RMS-11 mistakenly allows it to happen. (See the RMS-11 User's Guide, section 6.2.5.) You may corrupt your files if you use NODUPLICATES and CHANGES.

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3.5 DECnet/E Utilities

3.5.1 NFT SUBMIT Command

When you submit a batch control file on a remote node to that node's batch processor, DO NOT use the SUBMIT command in the form:

```
NFT> SUBMIT [node]::[file].CTL
```

That form deletes the batch control file and never executes it. Instead, use the form:

```
NFT> SUBMIT [node]::[file].TMP=[node]::[file].CTL
```

where [node] is the name of the remote node and [file] is the batch control file name.

3.5.2 NFT COPY Command

When you move an Index file from a RSTS/E node to a VMS node, you must be logged onto the VMS node and copy the file from RSTS/E to VMS. If you try to copy an Index file to VMS while logged onto the RSTS/E node, the operation fails with DAP Error 040356.

3.6 PIP

3.6.1 NEWFILE Default

All PIP copy operations use the /NEWFILE switch by default. If you want to use the /RETAIN qualifier as your default, define a new DCL symbol for a command procedure. Have the command procedure create a PIP command line that uses the /RETAIN switch. Then use the new symbol to copy files.

4 Documentation Changes In RSTS/E V9.2

Because of the small number of changes in V9.2, there are no update pages to the RSTS/E documentation.

Note that the following documentation errors will be corrected in a future release of RSTS/E:

- o In the RSTS/E Quick Reference Guide, page 21, the format for the /EXCLUDE switch should read:

/EXCLUDE=(filespec-list)

- o In the RSTS/E Guide to Writing Command Procedures, page 4-40, the second line of the example should read:

\$ IF F\$TYPE(COUNT) .EQS. "" THEN COUNT == 0

5 RSTS/E V9.2 Distribution Kit

The RSTS/E V9.2 distribution kit consists of the tapes or disks that contain the programs and files you need to perform an installation. This section lists the order numbers for the RSTS/E V9.2 distribution kits. You should compare the numbers on the tapes or disks that make up your kit to the numbers shown here, when you are instructed to do so in the RSTS/E System Installation and Update Guide.

DEC Order Number	Pack ID	Label Title
9-Track Magnetic Tape (800 bpi)		
AP-2753K-BC	SYS090	RSTS/E V9 LIBRARY 8MT9
AP-C883H-BC	UPD092	RSTS/E V9.2 INSTALLATION 8MT9
9-Track Magnetic Tape (1600 bpi)		
BB-H751M-BC	SYS090	RSTS/E V9 LIBRARY 16MT9
BB-P016J-BC	UPD092	RSTS/E V9.2 INSTALLATION 16MT9
TK50 Cartridge Tape		
AQ-FW57A-BC	SYS090	RSTS/E V9 LIBRARY TK50
AQ-FW58B-BC	UPD092	RSTS/E V9.2 INSTALLATION TK50
RK07 Disk Cartridge		
AY-D526M-BC	SYS090	RSTS/E V9 LIBRARY RK7
AY-P019J-BC	UPD092	RSTS/E V9.2 INSTALLATION RK7
RL02 Disk Cartridge		
BC-J026G-BC	SYS090	RSTS/E V9 LIBRARY RL2 1/2
BC-FR62A-BC	BACKUP	RSTS/E V9 LIBRARY RL2 2/2
BC-P015J-BC	UPD092	RSTS/E V9.2 INSTALLATION RL2 1/2
BC-GW55B-BC	BACKUP	RSTS/E V9.2 INSTALLATION RL2 2/2

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