

**RSTS/E
Release Notes**

Order No. AA-KW28A-TC

November 1987

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 V9.5

SOFTWARE VERSION: RSTS/E V9.5

digital equipment corporation, maynard, massachusetts

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Preface

The *RSTS/E V9.5 Release Notes* describe new features in *RSTS/E* for this release as well as differences between this and the previous release, *RSTS/E V9.4*.

The procedure to install a new *RSTS/E V9.5* system or to upgrade an existing *RSTS/E* system to *V9.5* follows the same general process developed for *V9.0*.

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 V9.5*.

If you are installing a new *RSTS/E V9.5* system, refer to PART I of the *RSTS/E System Installation and Update Guide*.

If you are upgrading a pre-*V9.0* system to *V9.5*, refer to PART II of the *RSTS/E System Installation and Update Guide*.

If you are updating a *RSTS/E V9.0* or later system to *V9.5*, refer to PART IV of the *RSTS/E System Installation and Update Guide*.

In addition, users and programmers familiar with *RSTS/E V9.4* should read these notes to learn about changes and new features in *RSTS/E V9.5*. The *V9.5 Release Notes* are divided into four sections:

1. *RSTS/E V9.5 New Features*
2. *Differences Between RSTS/E V9.5 and RSTS/E V9.4*
3. *RSTS/E V9.5 Documentation Changes*
4. *Known Problems and Restrictions with RSTS/E V9.5*

NOTE

If you last used a version of *RSTS/E* older than *V9.4*, you should read the release notes for any intermediate versions.



1 New Features of RSTS/E V9.5

1.1 New Hardware Support

1.1.1 VT320

The VT320 is a 24 line, low cost, conversational text-only terminal featuring VT220 compatibility. Its features are:

- o Designed to provide high quality human interface and long term reliability at low cost
- o 25th line status display can be used to display local state indicators, or be written from host
- o Level 3 terminal
- o Supports Terminal State Interrogation (TSI)
- o Supports 8-bit Architecture
- o The printer port is bidirectional and supports the 8-bit architecture
- o DEC423 local direct connect
- o Set-up option allows Compose Key to be disabled

The DCL command SET TERMINAL/INQUIRE properly sets the software characteristics of this new terminal.

The SET TERMINAL command qualifier /DEVICE_TYPE now accepts the keyword argument VT320.

The SHOW TERMINAL command displays the new terminal type VT320.

The terminal type code for the VT320 is 50.

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1.1.2 RA82

The RA82 is the newest member of the Digital Storage Architecture. It is a 625 megabyte disk drive that connects to the UDA50 or KDA50 series controller.

1.2 Monitor

1.2.1 Future Changes to Terminal Service

Several changes will be made in the next version of RSTS/E that will impact terminal service. These changes are required to enable additional enhancements to the terminal driver. The first of these changes involves several features which are currently optional. The following features will be automatically included in all systems in the next version of RSTS/E:

- Multi-Terminal Service
- Echo control
- Control/T support
- Multiple private delimiters

Since the default has been to include these features in every monitor, we believe that there will be no impact on most sites. For sites that previously did not include any of these features, the size of the monitor will be increased by 1K word. For sites that selected some, but not all of these features, the increase will be less than 1K word, and may not have any impact at all.

In addition, the terminal service device driver will no longer need to be assembled during the installation procedure. This will result in a small reduction in the time required to build a monitor (the exact reduction will depend on the CPU being used). Due to assembly no longer being needed at installation time, the source for terminal service will not be distributed on the binary kit. Customers who require sources to the terminal driver will need to purchase the source kit for the release after V9.5. Order numbers for the source kit are:

QR430-EM	1600 BPI media
QR430-FR	Fiche

1.2.2 Terminal Service

The terminal driver has been modified to send a BELL character to the terminal when the speed of a line set to auto-baud has been detected. This will make users on systems with slow response times aware that the speed has been determined and no further carriage returns are required.

1.2.3 Extended Cluster Size Support

The monitor has been modified to allow access to a disk with a cluster size of 32 or 64. This allows RSTS/E to use a disk as a single volume containing up to 4,096,000 blocks. RSTS/E now supports these disks as data or system disk devices. See section 4.1 for recommendations and restrictions on using extended cluster-size disks. An extended cluster-size disk is still considered a Level 1.2 disk, as the directory structure has not changed. However, an extended cluster-size disk created by a RSTS/E V9.5 or later system will not be usable on previous versions of RSTS/E because its cluster size was not valid. Any attempt to "MOUNT" an extended cluster-size disk under a previous version will result in the following error:

"?Disk pack mount error"

Note that when using extended cluster-size disks with device cluster sizes greater than 16 (RA82), the default buffer size to access the disk in cluster mode will be larger than other disks. This may cause user programs to receive a "?Maximum memory exceeded" error when using cluster mode I/O on the extended disks. This is not the case for small disks initialized with pack cluster sizes greater than 16, but only for disks with device cluster sizes greater than 16.

Since RSTS uses an MFD/GFD/UFD cluster size of 16 on disks with a pack cluster size greater than 16, a user program that accesses directory structures directly might have to be modified. Any program that does calculations of the MFD/GFD/UFD cluster size divided by the pack cluster size to obtain a cluster ratio will have to be modified, as this ratio will be less than 1. If a cluster ratio is obtained that is less than 1, the program should set it to 1.

Extended cluster-size disks are supported everywhere except in SAVRES. See section 2.10.8 for more details on SAVRES and extended cluster-size disks.

1.2.4 Fast-Mapping Facility

A new mapping facility has been added as an alternative to the MAPFQ subfunction of the .PLAS directive, providing greatly enhanced performance and compatibility with the fast-mapping facility of RSX-11M-PLUS. Applications that are dependent on re-mapping of libraries in the normal course of execution could see significant speed improvements.

However, the fast-mapping facility has the following restrictions:

1. Only the offset to the map field (FQSIZE) and, optionally, the length to the map field (FQBUFL), may be modified by the fast-mapping facility.
2. The interface to the fast-mapping facility is designed for speed, not for ease of programming. Debugging a task using fast-mapping may be more difficult than using the .PLAS directive. Specifically, protecting the operating system and its data structures is the only validation of parameters that is done.
3. The interface uses the PDP-11 IOT instruction. Tasks may use IOT for internal communications and other functions, but tasks that use fast-mapping cannot use the IOT instruction for any purpose other than fast-mapping.
4. The interface uses registers for passing parameters rather than using a FIRQB, a savings of significant instructions over the .PLAS directive. This means that the MACRO-11 programmer must be careful about register usage when using fast-mapping.

These restrictions (particularly number 2) should not deter the use of fast-mapping in high performance applications. However, we recommend that you first get the application running with the .PLAS directive, varying only the FQSIZE and FQBUFL fields, and then replace the directive with fast-mapping.

See section 1.5 of these notes for information about TKB and Fast Map.

Programming considerations

Before issuing a fast-mapping call, the task must create and map the window by using the Create Address Window (CRAFQ) and MAPFQ subfunctions of the .PLAS directive. The FIRQB+12(octal) in the CRAFQ directive must be at least as large as the largest FQBUFL to be requested in fast-mapping.

Three parameters are required for the fast-mapping call. The first parameter is the base APR times 10 (octal) plus the I/D space flag (0= I-space and 100 (octal)= D-space).

NOTE

Resident libraries are always mapped in both I and D space on RSTS. However, programs should not rely on this continuing, and should specify the proper space instead.

The second parameter is the offset field to map from the start of the library to the base of the window. The third parameter is an optional length to map. If the length to map is given, the high bit of the first parameter (the APR times 10 (octal)) must be set.

The following is a table of first parameter values:

Space	Base APR	If No Length Given	With Length Given
User-I	0	APR I-0 cannot be changed	
User-I	1	000010	100010
User-I	2	000020	100020
User-I	3	000030	100030
User-I	4	000040	100040
User-I	5	000050	100050
User-I	6	000060	100060
User-I	7	000070	100070
User-D	0	APR D-0 cannot be changed	
User-D	1	000110	100110
User-D	2	000120	100120
User-D	3	000130	100130
User-D	4	000140	100140
User-D	5	000150	100150
User-D	6	000160	100160
User-D	7	000170	100170

The offset field (second parameter) is specified in 32-word slivers, in the same way it would be for the FQSIZE value in the MAPFQ subfunction of the .PLAS directive, and has the same meaning.

If the length to map (FQBUFL) is not specified (high bit a 0) the length is assumed to be FIRQB+12(octal) from the last CRAFQ directive executed. If it is specified (high bit set), then that length is mapped unless the value is zero. If it is zero, then either the CRAFQ size (FIRQB+12(octal)) or the size of the library minus the offset size, whichever is smaller, is used. R2 on return will contain the length mapped in slivers. This handling is identical to that for FQBUFL in the .PLAS directive.

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Note the difference between the RSTS and RSX versions in that User D space must remain mapped to user's low core (APR0) at all times in RSTS. RSX does not have such a restriction.

Note that the speed of fast-mapping is affected by the parameter values. Not specifying the length to map is the fastest and specifying a length equal to zero is the slowest. The improvement over the .PLAS directive is in the range of six to twelve times faster. The amount of improvement depends on the amount of re-mapping done by the task.

Calling Sequence

R0	parameter 1	see table above
R1	parameter 2	offset field
R2	parameter 3	optional length specification

Returned data

R0	Status	IS.SUC if successful IE.ITS or IE.ALG if failure
R2	length mapped	if successful length actually mapped in slivers
R1 & R3		indeterminate

Programming examples:

1) Changing only window offset in I space:

```
MOV    #40,R0           ;window at APR 4 in I-space
MOV    #200,R1          ;offset from base of library is 4K words
                        ;200 slivers * 32 words/sliver
                        ;R2 is not needed
IOT                    ;issue fast map call
TST     R0              ;successful?
BMI     ERROR          ;no
```

2) Changing window offset and actual length specified:

```
MOV    #100150,R0       ;window at APR 5 in D-space
MOV    #100,R1          ;offset 2K words from library base
MOV    #500,R2          ;specified length = 10K words
                        ;this will use APR's 5,6 & 7
IOT                    ;issue fast map call
TST     R0              ;successful?
BMI     ERROR          ;no
```


3) Changing window offset and defaulted length specified:

```
MOV    #100140,R0      ;window base at APR 4 in D-space
CLR     R1              ;offset=0, window begins at library base
CLR     R2              ;force calculation to FIRQB+12(octal) or
                        ;remaining size of library
IOT                      ;issue fast map call
TST     R0              ;successful?
BMI     ERROR           ;no
MOV     R2,MAPLEN       ;copy of size actually mapped, in slivers
```

In the above text and examples the term "LIBRARY" means a resident library or dynamic data region.

1.3 DCL

1.3.1 SHOW QUOTA Command

A SHOW QUOTA command has been added to DCL. The format is:

```
$ SHOW QUOTA
```

The SHOW QUOTA command displays disk quotas for all mounted disks for the account currently in use. See the DCL help files for more information.

1.3.2 New INSTALL Qualifier Argument

A new INSTALL qualifier argument has been defined to allow installation of unrestricted floating libraries. The new qualifier argument is used as follows:

```
INSTALL/LIBRARY/NOAD[DRESS]=UNRE[STRICED] name.lib
```

Refer to section 2.7 for a description of unrestricted floating libraries.

The method of installing size-restricted floating libraries is as follows:

```
INSTALL/LIBRARY/NOAD[DRESS=RESTRICTED] name.lib
```

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New Features

1.4 BACKUP

RSTS/E V9.5 provides a new feature for BACKUP to list files within BACKUP savesets. The syntax is as follows:

```
$ BACKUP/DIRECTORY dev:[p,pn]filnam.typ
- or -
$ RESTORE/DIRECTORY dev:[p,pn]filnam.typ
```

For example:

```
$.backup/dir x:savset
```

Please mount volume 1 of Backup set SAVSET.BCK

Where can this volume be located? <DR0:>

Account	Name	.Typ	Size	Prot	Accessed	Date	Time	Clu	RTS
[195,0	]MYDCL	.COM	4	< 60>	04-Oct-85	04-Oct-85	04:06 PM	4	DCL
[195,0	]LOGOUT	.COM	1C	<124>	04-Oct-85	04-Oct-85	04:06 PM	4	DCL
[195,0	]ERROR	.COM	1	< 60>	04-Oct-85	04-Oct-85	04:06 PM	4	DCL
[195,0	]DONE	.TXT	1	< 60>	04-Oct-85	04-Oct-85	04:06 PM	4	...RSX
[195,0	]JOB2	.COM	1	< 60>	04-Oct-85	04-Oct-85	04:06 PM	4	DCL
[195,0	]LOGIN2	.COM	1	< 60>	04-Oct-85	04-Oct-85	04:06 PM	4	DCL
[195,0	]SPWNJ2	.LOG	9	< 60>	09-Jun-87	09-Jun-87	03:16 PM	4	DCL
[195,0	]ASSEM	.COM	2	< 60>	19-Jun-87	19-Jun-87	12:19 PM	4	DCL
[195,0	]LOGIN	.BAK	2	< 60>	14-Jul-87	14-Jul-87	09:30 AM	4	DCL

Please dismount volume 1 of Backup set SAVSET.BCK

```
$.backup/dir/full x:savst3
```

Please mount volume 1 of Backup set SAVST3.BCK

Where can this volume be located? <DR0:>

```
[ 0,10]RMSBCK.TSK
```

Size:	92/92	Run time system:	RSX
Created:	04-Oct-85 03:29 PM	Last accessed:	04-Oct-85
Protection:	<104> (Executable, Owner:RWE, Group:E, World:E)		
Organization:	Sequential		
Attributes:	Clustersize= 16, Contiguous		
Record format:	Fixed length		
Record attributes:	None		

```
[ 0,10]RMSRST.TSK
Size:          110/110                Run time system:  RSX
Created:       04-Oct-85  03:29 PM    Last accessed:  04-Oct-85
Protection:    <232> (Privileged, Executable, Owner:RWE, Group:E, World:E)
Organization:  Sequential
Attributes:    Clustersize= 16, Contiguous
Record format: Fixed length
Record attributes:  None
```

```
[ 0,10]RMSDEF.TSK
Size:          77/77                Run time system:  RSX
Created:       04-Oct-85  03:29 PM    Last accessed:  04-Oct-85
Protection:    <104> (Executable, Owner:RWE, Group:E, World:E)
Organization:  Sequential
Attributes:    Clustersize= 16, Contiguous
Record format: Fixed length
Record attributes:  None
Record attributes:  None
```

Please dismount volume 1 of Backup set SAVST3.BCK

Two additional new qualifiers that may be specified only with /DIRECTORY are /BRIEF and /FULL. The /BRIEF qualifier is the default and is similar to the DCL full directory format (minus file attributes). The /FULL qualifier is optional and gives information for each file on multiple lines, similar to the VMS DIRECTORY/FULL command.

The qualifier /OUTPUT has been added to the BACKUP and RESTORE commands and is a synonym for /LIST_FILE.

Qualifiers to select files, such as /SELECT, /EXCLUDE, etc., can be used with /DIRECTORY.

The DCL help files for BACKUP and RESTORE now include the additional qualifiers /BRIEF, /FULL, /DIRECTORY, and /OUTPUT.

1.5 Task Builder (TKB)

1.5.1 New RNDSEG Option

You use the RNDSEG option to cause TKB to round the size of a named segment up to the nearest APR boundary while building a resident library.

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Syntax:

RNDSEG=seg-name

seg-name:

The 1- to 6-character Radix-50 name of the segment.

Default:

None

Notes:

1. The RNDSEG option operates only during a library build. Attempting to use the option while building any other form of task will result in the following diagnostic error message:

TKB -- *DIAG* - Library build not requested - ignoring option

RNDSEG=SEGL

2. If you attempt to specify a nonexistent segment name, the following diagnostic error will be generated and the build will continue:

TKB -- *DIAG* - Segment not found to address round

RNDSEG=NOSEG

1.5.2 New Switches

/FM

The /FM qualifier tells TKB to set the proper bits in the task header to enable the fast-mapping feature of the executive.

The following command line shows the proper placement of the /FM switch:

TKB>file.tsk/FM,,=file.obj

The default is fast-mapping disabled (/FM).

/SB

The /SB qualifier causes the task to be built with the slow mode of the Task Builder.

The following command line shows the proper placement of the /SB switch:

```
TKB>file.tsk/SB,,=file.obj
```

NOTE

The slow task builder STK.TSK will be removed in a future release of RSTS/E.

The default in TKB is /-SB. The default in STK is /SB.

1.5.3 New Error Messages

CLUSTER LIBRARY ELEMENT, element-name, IS NOT RESIDENT OVERLAID

This message occurs when the listed cluster element has been built without memory-resident overlays. This kind of element cannot be used as a cluster library element. Cluster libraries 2-6 must be memory-resident and overlaid.

INCOMPATIBLE OTS MODULE

This message occurs when the OTS (Overlay Run-Time System) module requested by TKB has not been found. The OTS modules are part of the system library. This error occurs if you are using an incompatible version of the system library (SYSLIB.OLB).

2 Differences Between V9.5 and V9.4

2.1 Installation

2.1.1 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, you must 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
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. All of the components included in the SOURCE package, except for SHUTUP.BAS, should be task-built using the CSPLIB resident library. SHUTUP.TSK cannot be built with any resident libraries because it removes all resident libraries when shutting down the system. Remove the TKB "LIBR=CSPLIB:RO" option when task-building SHUTUP.BAS.

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 encounter problems with a CUSP that you have modified, 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.

2.1.2 Corrections

The following problems have been fixed in the installation procedure:

- o Prior to RSTS/E V9.5, the installation procedure would abort if it was restarted with the installation tape not at BOT. In RSTS/E V9.5, the installation procedure ensures that the installation tape is rewound before proceeding.

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Differences Between V9.5 and V9.4

- o When configuring the monitor, the SYSGEN program would not use the template monitor's configuration for the number of DHV11 lines to enable as the default. RSTS/E V9.5 uses the template monitor's DHV11 configuration as the default.
- o SYSGEN was giving erroneous and variable prompts at the "template monitor's name" question. When you pressed the return key at the <??> prompt, the default would change to <?>. This problem has been corrected.
- o Prior to RSTS/E V9.5, you were not able to install the SORT package if you said "YES" to I&D space tasks and the currently installed monitor still had a swap max of 32K. You would get a "?Not enough available memory" error when the installation procedure tried to run the I&D space version of MAC.TSK or TKB.TSK. In RSTS/E V9.5, the SORT package includes the non-I&D space version of MAC.TSK and TKB.TSK and the installation procedure uses these tasks instead of the ones in the system library. These tasks are deleted by the installation procedure after SORT has been successfully installed.

2.2 Start-up Procedures

Two changes have been made to the START.COM file. If you are updating a V9.* system, this file will be restored to [0,1] with the filename START.095. Compare the differences between this file and your START.COM file and make the appropriate changes to your file.

- o The EDT resident library is now installed using the new /NOADDRESS=UNRESTRICTED qualifier on the INSTALL/LIBRARY command.
- o The comments about using the /LOCK qualifier when running ERRINT have been removed. Using the /LOCK qualifier can cause memory fragmentation and possible system lock-up.

2.3 Initialization Code (INIT.SYS)

INIT has been modified to allow access to extended cluster-size disks:

- o The DSKINT option has been modified to allow initializing extended cluster-size disks. A disk initialized with a pack cluster size of 32 or 64 will require MFD, GFD, and UFD

cluster sizes of 16. See section 4.1 for recommendations and restrictions on using extended cluster-size disks.

- o The COPY option has been enhanced to allow copying system files to a disk with a cluster size greater than 16.
- o REFRESH has been modified to allow file manipulation on extended disks, as well as rebuilding them off-line.
- o The SAVRES option of INIT has been modified and does not allow access to disks with a cluster size of 32 or 64. If this is attempted, the following error message is displayed:

"SAVRES cannot be used with disks of clustersize greater than 16"

The operation will then be aborted and a new command prompt issued.

Corrections

- o In previous versions of RSTS/E, if you booted INIT.SYS from a device that was connected to a non-primary controller (that is, a controller that is not at the primary CSR address), INIT would display the message "Warning - Booted device is at a non-standard CSR address" but would still allow you to proceed normally. If you then attempted to start a monitor SIL using the non-primary controller as the system disk controller, the system would sometimes crash during start-up.

In V9.5, INIT.SYS has been enhanced in two ways to remedy that problem. First, if INIT sees that it has been booted from a non-primary controller, it displays an expanded warning message which reads:

Warning - Booted device is at a non-standard CSR address
You must use the CSR suboption of the HARDWR option to
set the CSR address before timesharing can be started.

Second, INIT will not allow timesharing to be started until the CSR option has been used to identify the non-primary controller's address to INIT.

- o INIT.SYS now looks at the attributes for account SY0:[1,2] before attempting system start-up to ensure that it is a USER account that is set to be INTERACTIVE. If either of these conditions is not met, an error message is displayed and start-up is aborted.

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Note that account [1,2] is automatically set up correctly on disks that are initialized as SYSTEM disks.

- o A problem existed in previous versions of RSTS/E with the INSTAL option of INIT.SYS. If the INSTAL option was used to install a monitor, and the installation process aborted or was stopped for any reason, invalid information was left in the configuration tables but INIT still thought that a SIL was currently installed. If you then attempted to start timesharing, several random error messages would display and the start-up would abort.

This problem has been fixed in V9.5. If an INSTAL aborts (or is aborted) during certain critical phases, the currently installed monitor is deinstalled and the message "Please install a valid monitor SIL" is displayed. You must correct the cause of the abort, if necessary, and then install a valid SIL before timesharing can be started.

- o In versions of RSTS/E since V9.3, the PARITY suboption of DEFAULT would cause an "Unexpected trap through 4" error if the system had more than 1920K words of memory. This problem has been fixed for V9.5.

2.4 Monitor

2.4.1 Corrections

Previously, the system would crash when dismounting a disk volume, if the drive had been hardware write-protected after being mounted as a Read/Write device, and a user then attempted to delete an account from the disk. This problem has been corrected in V9.5.

2.4.2 EMT Logging Correction

A problem existed in the EMT Logger Receive Call where random data was being returned in bytes 3 through 40, rather than the information described on pages G-5 and G-6 of the *RSTS/E Programming Manual*. This problem has been corrected in V9.5.

2.4.3 Terminal Service Corrections

- o A problem existed in V9.4 where opening a log file with the /TIMESTAMP qualifier would cause a time stamp to be written after each character written to the logfile. This problem also caused multiple time stamps to be written at the end of a logfile produced by PBS. A dispatch article (Seq. 3.3.14M) published in the September Software Dispatch provides a correction to the problem for V9.4. This problem has been corrected for V9.5.
- o In V9.3 and V9.4, a problem existed where C1 control characters 129 through 132 were not converted to C0 control characters, when not using Transparent Controls Mode (Mode 16384%), as in previous versions of RSTS/E. This problem has been corrected in V9.5.
- o A problem in terminal service existed where the last record was not read from certain files when issuing the DCL READ command. This problem occurred when reading files with implied carriage control attributes, but was dependent upon where the record was situated in the file. Problems generally occurred when the last byte of a record was the last byte of a block. This problem has been fixed in V9.5.

2.4.4 Set Terminal Characteristics Part I

A problem existed in the UU.TRM Part I directive where issuing the call to permanently enable/disable CTRL/R and CTRL/T would have no effect. This problem has been fixed in V9.5.

2.4.5 Device Drivers

MS Tape Driver Corrections

- o The job hang experienced when using new tapes in TK25 drives has been fixed in V9.5.
- o On ANSI tapes that were created by methods other than the DCL COPY command or the PIP system utility, the block count field of the ANSI EOF1 trailer record for a file would contain an incorrect count if any soft tape errors occurred while writing that file. This problem has been fixed for V9.5.

XEDVR Enhancements

The device driver for the DEUNA and DELUA devices has been enhanced in several minor ways for V9.5. Sites using this driver are likely to notice a reduction in superfluous errors being logged by the driver, and may notice that some changes have been made to Circuit Counter computations, correcting the Bytes Sent and Bytes Received fields in the circuit counters.

2.5 LOGIN

- o An announcement message now prints when a user logs in, before any prompting begins. This feature is similar to the SYS\$ANNOUNCE logical on VMS systems. The message is placed in the file [0,1]LOGIN.TXT and must be a Stream-ASCII file, similar to [1,2]NOTICE.TXT. This file can be created, edited, or removed by the system manager or anyone with sufficient privileges to change files in [0,1].

NOTE

Do not put escape sequences in [0,1]LOGIN.TXT. They will not be displayed properly.

Also, we recommend that you place this file, along with LOGIN.COM, at the beginning of the [0,1] directory for better performance. You can use the command:

```
PIP [0,1]/MO:1536=[0,1]LOGIN.TXT/LO
```

- o The [0,1]LOGIN.COM file has been changed to use the GOSUB and RETURN commands that were introduced in RSTS/E V9.4. If you are updating a V9.* system, then this file will be restored to [0,1] with the filename LOGIN.095. Compare the differences between this file and your LOGIN.COM file and make the appropriate changes to your file.

NOTE

If you do change [0,1]LOGIN.COM, we recommend that you place the file at the beginning of the [0,1] directory for better performance. You can use the command:

PIP [0,1]/MO:1536=[0,1]LOGIN.COM/LO

2.6 Error Logging Package

The following enhancements have been made to the error logging package:

- o The ability to recall a prompt.

By typing "^" at any of the prompts, you can recall the previous prompt. For example:

```
Input File <ERROR$:ERRLOG.FIL>? <CR>
Output File <KB:ERRDIS.OUT>? <CR>
He[lp], Ba[d blocks], Su[mmary], Fu[ll] Report or Ze[ro]
File <Summary>? ^
```

```
Output File <KB:ERRDIS.OUT>? ^
```

```
Input File <ERROR$:ERRLOG.FIL>? ^
```

```
Input File <ERROR$:ERRLOG.FIL>?
```

- o The ability to handle AM/PM format times.

You can now enter times in AM/PM format as well as 24-hour format. For example, either of these times are now acceptable to ERRDIS:

```
Starting Time <First Error>? 23:17
```

or

```
Starting Time <First Error>? 11:17 PM
```

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- o The ability to handle numeric date formats, and the YESTERDAY and TODAY keywords.

In addition to the alphanumeric date format (dd-mmm-yy), you can now enter a date in the numeric date format (yy.mm.dd). In this format, yy is the year in the range 70 to 99, mm is the month in the range 01 to 12, and dd is the day in the range 01 to 31. For example, you can enter the date August 5, 1987 as follows:

Starting Date <First Error>? 87.08.05

In addition to the above-mentioned formats, you can also use the keywords YESTERDAY and TODAY. For example:

Starting Date <First Error>? YESTERDAY

- o Selective zeroing option.

You now have the option of zeroing the entire file or just a specific error type without first receiving a Summary Report. When you type "ZE" at the selection prompt, you will be prompted to zero the entire error file (ALL, which is the default), or only a specific error type, indicated by a two-letter code (i.e., KT, DU, DM). The following example demonstrates this new feature:

```
He[lp], Ba[d blocks], Su[mmary], Fu[ll] Report or Ze[ro]
File <Summary>? ZE
Zero Which Error Type <All>? <CR>
```

Completion results in a zeroed error file and returns you to the "Input File <ERRLOG.FIL>?" prompt.

```
He[lp], Ba[d blocks], Su[mmary], Fu[ll] Report or Ze[ro]
File <Summary>? ZE
Zero Which Error Type <All>? KT
```

Completion results in all KT errors being zeroed from the error file and returns you to the "Input File <ERRLOG.FIL>?" prompt.

Previously, you could ask to see errors of a specific type, and still have the option of zeroing the entire error file.

Now if you ask to see all errors, you can zero the entire error file. If you ask to see errors of a specific type, you can only zero errors of that type.

The following examples show this change:

```
Input File <ERROR$:ERRLOG.FIL>? <CR>
Output File <KB:ERRDIS.OUT>? <CR>
He[lp], Ba[d blocks], Su[mmary], Fu[ll] Report or Ze[ro]
  File <Summary>? FU
Specific Error Type <All>? <CR>
Starting Date <First Error>? <CR>
Ending Date <Last Error>? <CR>
Zero Error File upon completion (Yes/No) <No>?
```

```
Input File <ERROR$:ERRLOG.FIL>? <CR>
Output File <KB:ERRDIS.OUT>? <CR>
He[lp], Ba[d blocks], Su[mmary], Fu[ll] Report or Ze[ro]
  File <Summary>? FU
Specific Error Type <All>? KT
Starting Date <First Error>? <CR>
Ending Date <Last Error>? <CR>
Zero KT Errors upon completion (Yes/No) <No>?
```

Corrections

The error display program ERRDET.TSK would sometimes abort with a "?Subscript out of range" error if a corrupted error log packet was encountered while displaying a FULL report of MSCP or TMSCP errors. This problem has been fixed for V9.5.

2.7 Floating Library Facility

Prior to RSTS/E V9.5, there were two classes of resident libraries: fixed address (added with INSTALL/ADDRESS) and floating address (added with INSTALL/NOADDRESS) libraries. There are no programming restrictions associated with fixed address libraries, but you must have physical memory available for each individual fixed address library added to the system. Floating libraries, on the other hand, have significant programming restrictions (documented in the *RSTS/E Programming Manual*), but do not require available physical memory over that of the memory needed for user jobs.

In V9.5, a new type of resident library, the unrestricted floating library, has been added to RSTS/E. The old floating libraries are now referred to as restricted floating libraries.

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The major advantage with this new class is in memory utilization; as long as there is adequate memory for the largest floating library installed on the system, the user can have any number of floating libraries installed and is free to use them in any order, one at a time. These libraries will overlay each other probably using the same physical memory. It is now possible to have the sum total of library sizes greater than the total physical memory in the system.

The only difference between unrestricted floating libraries and fixed libraries is that a user program can only map one floating library at a time. It is not valid to map to more than one unrestricted floating library, nor is it valid to map to a restricted and an unrestricted floating library. It is valid to map any number of fixed libraries in combination with the single floating library.

To install the new class of floating library a new DCL qualifier has been added. The installation command is as follows:

```
INSTALL/LIBRARY/NOADDRESS=UNRESTRICTED name.lib
```

2.8 DCL

2.8.1 DCL Expression Handler

Previously, at the interactive level, if a label was specified followed by a non-string assignment statement (i.e., an assignment that did not use the := or ::= format), string assignment was performed. This problem has been fixed in V9.5.

2.8.2 DCL Logfiles

Under certain conditions, the carriage return and line feed characters were omitted from logfiles. This occurred if the last character of an RMS error message was the last character of a block in a logfile. This problem has been fixed in V9.5.

2.8.3 DCL Symbol Table Management

Several problems were fixed in the symbol table management routines. These problems generally occurred when the symbol table was at or near its size limit. A dispatch article (20.1.7) published in the September Software Dispatch provides a correction to these problems for pre-V9.5 systems.

2.8.4 ASSIGN command

Previously, when using the ASSIGN command, if you specified a user logical name ending with a dollar sign (\$), and the device to which the logical name was being assigned did not contain a PPN, the "\$" would be treated as part of the device name. For example, the command:

```
$ ASSIGN DR0: DISK$:
```

resulted in the assignment of of DISK: to DR0:[1,2].

In V9.5, the error "?Invalid user logical name" is reported if the logical name contains a dollar sign. Dollar signs are only valid in system logical names.

2.8.5 BACKUP command

- o The range for the /GROUP_SIZE qualifier has been changed to 0 to 100 to be compatible with the VMS BACKUP command. A value of 0 is equivalent to /NOGROUP_SIZE, indicating no XOR blocks will be written to the backup file.
- o Default Buffer size for MS and MU Device Types

The default buffersize for MS and MU devices has been changed from 3 to 55. This change will allow the MS and MU device drivers to stream data to the TU80, TU81 and TK50. This change will reduce the time it takes to back up disks to these devices.

We do not recommend that you lower the buffersize below 20 when writing savesets to the TK50. Also, using the qualifier /BUFFER_SIZE=MAX is not recommended for streaming or non-streaming tape drives.

2.8.6 BASIC command

Support has been added for BASIC-PLUS-2 V2.4 (BP2) command lines. Previously the BASIC command would only allow you to switch into a BASIC environment. Now when using BP2 (the default), you can issue a complete BASIC-PLUS-2 command directly from DCL. The command line format is as follows:

```
$ BASIC [commandline]
```

```
commandline = { [/qualifiers] [[@]file-name[/qualifiers]] }
```

```
qualifiers =  
    /([NO]BUILD  
    /([NO]CHAIN  
    /([NO]CROSS[:([NO]KEYWORDS]  
    /([NO]DEBUG  
    /([NO]FLAG[:([NO]DECLINING]  
    /([NO]LINES  
    /([NO]LIST[:lst-file]  
    /([NO]MACRO[:mac-file]  
    /([NO]OBJECT[:obj-file]  
    /SCALE:int-const  
    /VARIANT:int-const  
    /([NO]WARNINGS
```

Example:

```
$ BASIC/BP2/LIST foo.b2s/OBJECT:foo.out  
$ BASIC/Bad_Qual/LIST file  
BASIC/Bad_Qual/LIST file  
^  
BASIC -- Illegal Qualifier
```

2.8.7 /CONFIRM qualifier

The /CONFIRM qualifier has been added to many DCL commands, and is synonymous with /QUERY. This change has been added to be more compatible with other operating systems that use /CONFIRM. The commands which accept the /CONFIRM qualifier are:

```
APPEND  
COPY  
DELETE
```

RENAME
SET PROTECTION
TYPE

2.8.8 CREATE/ACCOUNT Command

Prior to RSTS/E V9.5, the CREATE/ACCOUNT command would print the newly-created account's UFD cluster numbers only when the /POSITION qualifier was specified together with the /SIZE qualifier. Now, the UFD cluster numbers are displayed regardless of the /POSITION qualifier.

2.8.9 INITIALIZE command

The /MFD_CLUSTER_SIZE and /CLUSTER_SIZE qualifiers now accept only integer arguments that are a power of two. If an integer is specified which is in the valid range for that qualifier but is not a power of two, the DCL error message "?Number not a power of 2" displays.

The /CLUSTER_SIZE qualifier to the INITIALIZE command has been modified to accept arguments in the range 1 to 64. For more detailed information on this difference see section 2.3 of these notes.

2.8.10 ON severity THEN command

When switching back and forth from DCL to another run-time system, DCL would occasionally ignore warnings, errors, and severe errors, and not take the ON severity THEN condition. Upon entry back into DCL, DCL now gets the most severe error since it was last entered, and acts upon the severity condition if ON severity THEN is in effect.

2.8.11 WRITE command

Previously, DCL could fail with "??Program failure in DCL" if an attempt was made to write to a data file that was opened with the OPEN/WRITE command and the currently allocated symbol table memory was near full. A dispatch article (20.1.8) published in the October Software Dispatch provides a correction to this problem for pre-V9.5 systems. This problem has been fixed for V9.5.

2.9 Help Files

The following list represents all of the technical changes made to the RSTS/E help files for V9.5:

DCL

APPEND command

/CONFIRM and /NOCONFIRM have been added to APPEND.

BACKUP command

New qualifiers (/BRIEF /DIRECTORY /FULL /OUTPUT) have been added to the subtopics list.

/ACCOUNT_DATA replaces /NOACCOUNT_DATA as the default.

BASIC PLUS command

This command no longer appears in the master list, but is a subtopic of the BASIC keyword.

COPY command

/CONFIRM and /NOCONFIRM have been added to COPY.

DELETE command

/CONFIRM and /NOCONFIRM have been added to DELETE.

INSTAL /LIBRARY command

/NOADDRESS=RESTRICTED and /NOADDRESS=UNRESTRICTED have been added to subtopics list.

RENAME command

/CONFIRM and /NOCONFIRM qualifiers have been added to subtopics list.

RESTORE command

New qualifiers (/BRIEF /DIRECTORY /FULL /OUTPUT) have been added to the subtopics list.

SET PROTECTION command

/CONFIRM and /NOCONFIRM qualifiers have been added to the subtopics list.

SHOW QUOTA command

This is a new command in V9.5.

TYPE command

/CONFIRM and /NOCONFIRM qualifiers have been added to the subtopics list.

2.10 Commonly Used System Programs (CUSPs)

2.10.1 DSKINT

Enhancements

DSKINT has been modified to allow initializing a disk with a pack cluster size of 32 or 64. An extended disk requiring a device cluster size of 32 or 64 is also allowed. When initializing a disk with a pack cluster size of 32 or 64, DSKINT uses MFD, GFD, and UFD cluster sizes of 16.

Corrections

Previous versions of DSKINT would sometimes fail with spurious error messages. This problem has been corrected in V9.5.

2.10.2 LOGIN.TSK

The following problems have been fixed in LOGIN.TSK:

- o Prior to RSTS/E V9.5, if you did not have the appropriate GACNT or WACNT privilege, you could not attach to a detached job that was running out of another account. You would always get a "?Failure to attach to job" message and be logged-out. Now, if you don't have the appropriate privilege, LOGIN prompts you for the password. If the password is correct, you will be attached to the job. If it is incorrect, you will be logged back into your account.
- o Prior to RSTS/E V9.5, LOGIN would not allow you to attach to a detached job whose job number was greater than the current job maximum. This has been fixed for RSTS/E V9.5.

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- o Prior to RSTS/E V9.5, if you attempted to log into another account and you exceeded your disk quota on a disk whose unit number was greater than 9, LOGIN would display the disk number incorrectly. This has been fixed for RSTS/E V9.5.

2.10.3 SHUTUP.TSK

- o SHUTUP.BAS, the source to SHUTUP.TSK, is now included in the System Program Package, SOURCES. It can be retrieved from the RSTS/E distribution kit with the command "@[0,1]INSTALL SYSTEM_PROGRAM SOURCES". See section 2.1.1 of these notes for information on rebuilding SHUTUP.BAS.
- o Prior to V9.5, it was possible to get illegal system usage errors when running SHUTUP. This condition has been corrected.

2.10.4 LOGOUT.TSK

Prior to RSTS/E V9.5, LOGOUT would not terminate the message it broadcasts to KB0: with a <CR><LF> sequence; it would leave the cursor at the end of the message. For RSTS/E V9.5, LOGOUT will append a <CR><LF> sequence to the end of the message.

2.10.5 ODT.TSK

Prior to RSTS/E V9.5, the ODT.TSK program did not have the arithmetic precision it needed to access addresses above 400000(8). For RSTS/E V9.5, ODT.TSK now uses double-precision.

2.10.6 ONLCLN Enhancements

ONLCLN and MOUNT have been modified to support disks with cluster sizes greater than 16.

2.10.7 HOOK Enhancements

HOOK has been modified to allow HOOKing an extended cluster-size disk.

2.10.8 SAVRES

SAVRES has been modified to display an error message if you attempt to use it on extended cluster-size disks (disks with a pack cluster size greater than 16). If you attempt this, SAVRES displays the following error message:

"SAVRES cannot be used with disks of clustersize greater than 16"

The operation will then be aborted, and a new command prompt issued.

2.10.9 PIP

The PIP /RENAME command now checks the input and output DEVICE and PPN to make sure they match before attempting to rename a file. A PIP /RENAME command will be legal if the OUTPUT device and PPN match the input DEVICE and PPN. If an input DEVICE or PPN is specified, then a matching output DEVICE or PPN must also be specified.

If an output DEVICE or PPN does not match the input DEVICE and PPN, you will get one of two new error messages:

?Output/Input device mismatch on RENAME

or

?Output/Input PPN mismatch on RENAME

NOTE

Under DCL, no output device is required because DCL supplies a ":" if the device is not specified.

Corrections

The following PIP problems have been fixed for V9.5:

- o If you changed both the name and protection code of a file with the RENAME command, the confirmation message would incorrectly say that the new file name was renamed to the new file name, rather than that the old file name was renamed to the new file name. PIP now gives the correct message.

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Differences Between V9.5 and V9.4

- o A PIP/ZE of an account with protected files would not delete the files and would not notify the user that there were files left. PIP now notifies the user if there are any undeleted files after a /ZE command.
- o PIP incorrectly printed the Fixed Control Field in RMS VFC files with no Carriage Control or Implied Carriage Control. PIP now suppresses printing of the Fixed Control Field.
- o The restriction that caused the error "?Illegal RMS organization" when attempting to transfer RMS INDEXED or RELATIVE files from disk to tape, has been lifted. The original problem of infinite looping, which the restriction was meant to prevent, has been fixed by allowing PIP to handle record sizes greater than 4095.

NOTE

You can only copy RMS files to ANSI magtape.
See section 4.6.5 of these notes for
additional information.

2.10.10 OPSER BATCH PACKAGE

BATCH jobs since V9.0 have run under the RT11 run-time system, and have not executed LOGIN.TSK. That represents two incompatibilities with OPSER BATCH prior to V9.0. Therefore, OPSER BATCH has been changed in two ways:

- o Every BATCH job will now execute [0,1]LOGIN.COM before executing the .CTL file.
- o After the spawned job executes the LOGIN.COM files, BATRUN sets the job's keyboard monitor (KBM) according to the following conditions:

\$JOB followed by "/DCL" ?	Job's KBM after LOGIN.COM ?	Is RSX.RTS installed ?	Job's KBM set to ?
YES	N/A	N/A	DCL
NO	DCL	NO	RT11
NO	DCL	YES	RSX
NO	NOT DCL	N/A	No change

Everything works as before, except that you can now have OPSER BATCH jobs run under any installed keyboard monitor by altering your LOGIN.COM files appropriately.

2.10.11 Print/Batch Services (PBS)

Corrections

The following problems have been fixed for V9.5:

- o PBS now waits for characters in system buffers to be sent to a keyboard device before a job is completed. Previously, a job was completed as soon as the system had buffered all the requests, occasionally resulting in some output being lost when the system was shut down.
- o Print servers for keyboard devices that do not exist in the monitor now display properly. Previously, these devices would display with names like "KB128:", or "KB192:".

This problem usually occurred when a print server had been defined on a keyboard line, and then the controller had been replaced with a different type.

These devices now display in device controller syntax, and can be modified using that name.

- o PBSMGR would go into an infinite loop if the last line of PBS\$:FORMS.SYS ended with the continuation character. PBSMGR now displays the error message "?Error in forms definition file".
- o Simulated form servers would occasionally cause PBS to stop in the middle of a print job, or hibernate, stopping all jobs.
- o If a batch job completed at exactly 10 seconds into any minute, then the time-stamps at the end of the log-file displayed the time as "xx:xx:010" instead of "xx:xx:10".
- o PBS was incorrectly deciding which print servers understand a real backspace character, causing backspaces to be simulated on keyboard servers, and to do the wrong thing for line printer servers. PBS now handles backspaces correctly for all print servers.

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Differences Between V9.5 and V9.4

- o If the SET TIME command was used to set the time past midnight, PBS would not start jobs scheduled to run on that day. PBS now realizes when the date has changed and will start any pending jobs that are able to run.

2.10.12 SYSTAT

Prior to V9.5, SYSTAT allowed improper qualifiers to the /W: switch. Now, only a valid device is allowed in conjunction with the /W: switch.

2.10.13 Unsupported Utilities

Prior to RSTS/E V9.5, the files RSTSFL.OBJ, RSTSFL.OLB, and DSKPEK.OBJ in UNSUPP\$ have not been usable because they did not have any RMS attributes. For RSTS/E V9.5, these files will be restored to UNSUPP\$ with their RMS attributes.

2.11 MACRO-11 V5.5 (MACRO.SAV and MAC.TSK)

2.11.1 New Features

Additional Conditionals

Two new conditionals have been added, .IF P1 and .IF P2. If P1 tests true, the assembler is in pass 1. If P2 tests true, the assembler is in pass 2.

Hexadecimal Support

Hexadecimal support has been added to MACRO-11 V5.5. The support consists of:

- o ^X for temporary radix change
- o .RADIX 16 for permanent radix change
- o .ENABL HEX for hexadecimal listings

You use ^X in the same way as you use ^B, ^D, or ^O. For example, in the line

```
.WORD 6+^X1A
```

MACRO-11 would treat the quantity 1A as a two-digit hexadecimal number, but evaluate the 6 in the current radix.

.RADIX 16 works in the same manner as .RADIX 2, .RADIX 8, or .RADIX 10. .RADIX 16 sets the default radix to 16, so that all numbers are assumed to be hex.

The .ENABL HEX directive does not affect assembly of the source, but it does change the listing format. All addresses and the contents of locations are listed as hexadecimal values.

NOTE

RESTRICTION: All hexadecimal values used with ^X and .RADIX 16 must begin with a digit, which can be 0. For example, the hexadecimal value F3 must be written as 0F3. Otherwise, MACRO-11 assumes the item is a symbolic name, not a hexadecimal number.

2.11.2 Extensions and Bug Fixes

XOR Flagged With Z

XOR is one of the class of instructions that operates differently in certain addressing modes on different processors. These uses of the XOR instruction are now flagged with Z in the assembly listing.

.SBTTL Line 80 Characters

A .SBTTL line can now be 80 characters long.

Limit of 254 Psects in Symbol Table

You can now have more than 254 psects in your program; however, only the first 254 appear in the symbol table.

New and Changed Error Messages

In previous versions of MACRO-11 for RT-11, the error message "?MACRO--F--I/O error on workfile" could be caused either by a legitimate I/O error or by running out of room in the workfile. These two error conditions have been separated, and the error message "Workfile space exceeded" added for the case of running out of room. (The RSX version (MAC.TSK) of MACRO-11 does not have this error, because it can increase the size of its workfile dynamically.)

With all versions of MACRO-11, if your program requires workfile space of greater than 400_g blocks, you will get the error message "?MACRO--F--Storage limit exceeded (64K)" (MACRO.SAV), or "MAC --- Storage limit exceeded (64K)" (MAC.TSK). This limit cannot be increased.

Additional internal checks have been added to MACRO-11 to help ensure proper operation. If an unexpected condition is detected, MACRO-11 now reports the error "?MACRO--F--Internal error" (MACRO.SAV), or "MAC --- Internal error" (MAC.TSK). If you get this error, please submit an SPR to DIGITAL along with a method of duplicating the problem.

2.11.3 Permanent Direct Assignments Made Really Permanent

In previous versions of MACRO-11, it was possible to change the value of a symbol that was assigned a value using the =: operator, even though values assigned with =: are supposed to be permanent. It could be done like this:

```
SYMBOL=: 100      ;Define permanent symbol
SYMBOL= SYMBOL    ;Set permanent symbol to its current value
SYMBOL= 40        ;Now its value can be changed
```

MACRO-11 now retains a symbol's permanent attribute in all cases.

2.11.4 Clarification of \ Operator

The \ operator cannot be used with a forward reference; the symbol on which it is used must already be defined. In addition, the \ operator cannot be used with a relocatable symbol.

2.11.5 .IRPC Now Handles Argument of 124 Characters

Previous versions of MACRO-11 could not handle an .IRPC argument of more than 96 characters. In MACRO-11 V5.5, the limit has been increased to 124 characters.

2.11.6 ^R With Null Argument

If you use ^R with a null argument (^R followed by a <RET>), the ^R produces a word of zeros, as though it had been followed by three spaces.

2.11.7 Space No Longer Needed Between Macro Name and Argument List

You no longer need a space or tab between a macro name and an argument list in angle brackets. For example, if BUILD is a macro name, the line

```
BUILD<A,B,C>
```

is now valid. In previous versions of MACRO-11, the line would have had to be:

```
BUILD <A,B,C>
```

2.12 RMS-11

2.12.1 RMS-11 ACCESS METHODS

Corrections

Several changes have been made to correct problems relating to RMS-11 terminal I/O.

- o RMS-11 reported a non-attributed stream file as having embedded carriage control. Thus, a program which attempted to copy the file to the terminal would not set up the

terminal correctly. This would result in records being output without any end-of-record carriage control. To correct this behavior, these files are now reported as implied carriage control files by RMS-11. The correction was in R0OPFL in RMSLIB.OLB as well as the resident library.

- o RMS-11 did not correctly handle \$PUT to a terminal where the record length exceeded 128. bytes. Due to incorrect logic carriage returns were inserted after each record fragment. This caused inappropriate overprinting. This correction was in R1PUNR in RMSLIB.OLB and the resident libraries.

2.12.2 RMS-11 UTILITIES

Corrections

- o RMSIFL failed to correctly report exit status when errors occurred while loading a file with more than one alternate key. Once the first alternate key had been loaded without errors, internal exit status was set to success. Any errors on subsequent keys were not reflected in the task's final exit status. This could cause command files or batch jobs to function incorrectly. Now, all errors are correctly reported in the exit status.
- o Previously, RMSDES handled default devices incorrectly when the GET and SAVE commands were issued. The default device is initialized by TKB to the device from which RMSDES is run. If a HELP command was issued, the default device was reset to LB:. The CREATE command reset the default device to the file specification passed with that command, or to SY: if no explicit device was present in the design buffer. The GET and SAVE commands used whichever of these defaults occurred most recently. Now, GET and SAVE assume SY: as the default device.

2.13 Layered Products

2.13.1 DECmail-11 V3.0

Updates on RSTS/E V9.5

Transfer the DECmail-11 V3.0 update components to the PATCH account during the system upgrade to V9.5. Refer to the *RSTS/E System Installation and Update Guide*, Part IV:, Phase:3, Task:4, page 178 for more information about transferring updates for Layered Products.

If you do not transfer DECmail-11 updates during the system upgrade, you will need to mount your RSTS/E Installation media during the DECmail-11 update. The RSTS/E Layered Product Update Procedure will transfer the DECmail-11 updates.

Requirements for this update:

Privileges:

- Refer to the *DECmail-11 Installation and System Manager's Guide* for information about the privileges needed.

Programs:

- SY:[1,2]LBR.TSK
- SY:[1,2]TKB.TSK
- SY:[1,2]MAKSIL.TSK

Disk space:

- 1000 blocks for update files in PATCH\$:
- 5350 blocks for update work files in WORK\$:

NOTE

The 5350 blocks of disk space in WORK\$ will be returned to the system as free space after the update has completed.

- 1350 blocks for updated tasks in MAIL\$:

NOTE

The blocks for the tasks in MAIL\$: should be contiguous for optimum performance.

- The total number of free blocks needed to do this update is 7700 of which 1350 blocks should be contiguous. In order to reduce the need for disk space the MAIL update procedure deletes files as soon as they are no longer needed.

NOTE

Use of DECmail-11 during the update may cause unpredictable errors to occur.

Updating your DECmail-11 V3.0 software can be accomplished by invoking the RSTS/E software update procedure. The following is an example of a DECmail-11 update.

```
$ @[0,1]UPDATE LAYEREDPRODUCT MAIL
```

Deleting all global symbols

Patch account <PATCH\$:> :

The following will be updated:

MAIL

Proceed? <yes>

Please enter the name and unit number of the disk to which you want to update the software. This disk should be physically mounted and write-enabled.

Target disk? <SY:> :

Assigning system logicals

01-Dec-86 09:49 AM

01-Dec-86 09:49 AM

Please mount the MAIL Library media and enter the name and unit number of the device. Valid device types are: 'MM', 'MS', 'MT', 'MU', 'DM' or 'DL'

MAIL Library device? <MM0:> DL0:

The update procedure will complete without user intervention from this point. UPDATE.LOG is a log file of this update procedure, created in your account, and should be checked for possible update errors. Disregard multiply defined symbol errors during the task rebuild phase.

The update should take between 3 and 4.5 hours, depending on your CPU and system disk.

Corrections

The following problems have been fixed in this update:

- o Files printed within DECmail-11 with the PRINT FILE command were deleted after being printed.
- o Date and time values specified to the /AFTER qualifier were ignored when sending a message using the /EDIT qualifier, or if AUTO EDIT was enabled.
- o The From: and Subject: fields get cleared out when sending a message with /EDIT or AUTO EDIT enabled.
- o Batch Mail messages having To: and CC: lines greater than 255 characters would result in a "?Line too long" error and abort MAILQ.
- o Entering PRINT<return> with no current message aborts MAIL with an "?Arguments don't match" error.
- o DECmail-11 displays "?Integer error" when sending a message greater than 64 blocks in length via Message Router.
- o MAILQ aborts with "?No room for user on device" when it encounters zero free blocks. MAILQ will now wait for blocks to become available before re-attempting the delivery.
- o Users would sometimes receive multiple copies of the same mail message when sent via Batch Mail.

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Differences Between V9.5 and V9.4

- o Entering "NI" at the Send Menu replaces the CC: field with the To: field contents, if a CC: line had been entered.
- o Files having records with trailing carriage returns, such as RNO and DSR files, do not print correctly when sent to users on other nodes.
- o Users intermittently receive messages with an incorrect To: field when sent via Batch Mail.
- o DECmail-11 would abort with a Maximum Memory Exceeded error when attempting to send or FETCH Message Router mail to a large number of users.
- o Two errors which caused Batch Mail to send duplicate messages were corrected.
- o Mail would not be delivered to a user who had exceeded logged out quota.
- o The SELECT keyword was not properly cleared after unsuccessful SEARCH commands.

2.13.2 DECnet/E

NCP Enhancements

The DECnet/E Network Management Program (NCP.TSK) has been enhanced to provide more concise information when displaying CIRCUIT SUMMARY details for Ethernet circuits. In previous releases, the command SHOW CIRCUIT UNA-0 SUMMARY would display all known adjacent nodes when the Executor node was a router. Now, the complete display is only available when issuing the SHOW CIRCUIT UNA-0 STATUS command; on routing nodes, the SHOW CIRCUIT SUMMARY will only display adjacency information about the routing nodes that exist on the circuit.

3 Documentation Changes in RSTS/E V9.5

The documentation for RSTS/E V9.5 consists of these Release Notes.

3.1 Corrections

The following documentation errors will be corrected in a future version of RSTS/E:

- o In the *RSTS/E System Directives Manual* on page 3-131, the second paragraph states in part "Unless data passed and returned show specific values for the XRB, it should be all zeros."

The following statement will help to clarify how you should handle FIRQB and XRB:

When using SEND/RECEIVE calls, you must clear both FIRQB and XRB, even if XRB is not used.

- o In the *RSTS/E Programming Manual* on page 9-3, the description of the confirmation data received in byte 3 for a system call to PBS is incorrect. The data returned in byte 3 is CHR\$(255%).
- o In the *RSTS/E Programming Manual* on page 9-22, the documentation for the /COPIES field is incorrect. Byte 1 should be CHR\$(131%) not CHR\$(13%).

4 Known Problems and Restrictions with RSTS/E V9.5

4.1 Recommendations and Restrictions for Extended Cluster-Size Disks

4.1.1 Wasted Space

Extended cluster-size disks are recommended for use when a small number of large files needs to be placed on a single volume. These disks are NOT recommended for use as system disks, or as disks holding large numbers of accounts. Because the directories contained on these disks use cluster size 16, and the pack cluster size is 32 or 64, there will be some wasted space in each directory. With a pack cluster size of 32, there will be 16 wasted blocks per directory cluster (a maximum of $7 \times 16 = 112$ blocks per account); with a pack cluster size of 64, there will be 48 wasted blocks per directory cluster (a maximum of $7 \times 32 = 224$ blocks per account). If the number of accounts on an extended cluster-size disk is kept to a minimum, then the percentage of wasted space will be a very small percentage of total space available on the disk. As the number of accounts grow, the actual amount, and percentage amount of wasted space increases. For this reason, DIGITAL recommends that these disks be used for limited numbers of accounts, and for large data files.

4.1.2 BACKUP Strategy

Extended cluster-size disks must be backed up using the BACKUP program (or the DCL BACKUP command). SAVRES cannot be used to save, or make image copies of extended cluster-size disks.

4.2 Installation

4.2.1 Boot from TU10

RSTS/E 9.5 cannot be booted from the 'Option:' BOOT command on a TU10 magnetic tape drive. The tape can be booted on this drive using a hardware boot ROM.

4.2.2 Booting Magnetic Tape

Magnetic tape distributions of RSTS/E or any bootable recovery tapes of RSTS/E must be booted from unit zero. This problem affects MM and MT drives. This problem will be corrected in a future release of RSTS/E.

4.2.3 Flag Files

The installation or update of RSTS/E leaves several zero length flag files (files used by the installation procedure to determine what parts of the installation have been completed) in various system accounts after installation.

Deleting any of these files may cause unpredictable results. In particular, deleting the flag file [1,2]VER095.SYS may cause certain layered product installations and updates to fail.

4.3 DEUNA Ethernet Driver

Under some conditions, it is possible to hang a user job in an XE state when attempting a transmit command to a DELUA controller which was initialized successfully during system start up, but which was subsequently rendered inoperable due to a simple failure such as cable removal. The command SET DEVICE XE0:/DISABLE frees up the job to continue normal processing. The DELUA should be disabled until such time as the cabling is repaired.

4.4 Initialization Code (INIT.SYS)

- o If your installed monitor has a Virtual Disk defined (DV:), and you START a monitor that has no Virtual Disk defined, and then START your original monitor containing the Virtual Disk again, you will get "?Device unavailable" errors when you attempt to use the Virtual Disk.

The workaround is to use the DEFAULT option of INIT.SYS to remove and then redefine the Virtual Disk for your original monitor.

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Known Problems and Restrictions

- o An unnecessary error message prints when an 800 BPI magnetic tape on a TEL6 subsystem that uses a TM02 formatter is booted from the "Option:" prompt of INIT.SYS. For example:

MM0 Error	MTCS1	MTWC	MTFC	MTCS2	MTDS	MTER	MTTC
	144270	000000	001007	000100	154640	102100	102300

The error message you receive may be different. This message prints as a result of the density autosizing process that occurs on TM02 formatters, and does not represent a true hardware error.

- o While pattern checking MSCP disks during off-line INIT using the DSKINT option, an unexpected error message may be displayed by DSKINT of the form:

0 Error	000003
---------	--------

DSKINT will continue to run to completion and the error can be safely ignored. If your INIT has been booted from a magnetic tape device, a magtape error showing no errors occurred might appear instead of the error described above. As before, the occurrence of this error may be safely ignored. This problem will be corrected in a future release of RSTS/E.

4.5 Monitor

4.5.1 DB and DR Disk Drivers

The DB and DR disk drivers may count or log errors for the wrong disk unit if there is heavy DB/DR disk activity and an attempt is made to mount a unit that is spun down or off-line.

This problem will be corrected in a future release of RSTS/E.

4.5.2 MSCP Disk Driver

On systems having multiple UDA50-A MSCP controllers, a system crash may result if disk unit numbers are swapped between two drives on different UDA50-A controllers during timesharing.

The preferred workaround is to only swap drive numbers when timesharing is not up. The best method is to shut the system

down, and swap the unit numbers when the "Start timesharing" prompt appears. After swapping the unit numbers, reboot the system disk and restart timesharing.

4.5.3 Virtual Disk as Part of the Public Structure

We do not recommend that the Virtual Disk be made part of the public structure as a read/write disk. When creating a file on the public structure, the File Processor selects the disk on the public structure with the most free space. Data files and programs will be lost if they are placed on the Virtual Disk and the system is shut down or crashes. We recommend that if you plan to use or are currently using the Virtual Disk as part of the public structure, you mount it as a read-only disk. This will prevent files from being created inadvertently on the Virtual Disk and potentially lost.

NOTE

In a future release, RSTS/E development is planning to restrict the mounting of the Virtual Disk to read-only when it is mounted as a public disk.

4.5.4 TMSCP Tape Driver

If your system contains only one TMSCP tape drive (TU81 or TK50), it must be set up as unit 0. If you have two drives and unit 0 does not work, you must make the working drive unit 0 and disconnect the non-working drive. This restriction will be fixed in a future release of RSTS/E.

NOTE

The controller number must also match the drive number. For example:

Valid

Name	Address	Vector	Comments
MU0:	174500	P350	TU81 Units: 0(TU81)
MU1:	160504	P354	TK50 Units: 1(TK50)

Invalid

Name	Address	Vector	Comments
MU0:	174500	P350	TU81 Units: 1(TU81)
MU1:	160504	P354	TK50 Units: 0(TK50)

4.5.5 Terminal Service

If you have included multi-terminal service support in your monitor, then the terminal driver will not allow a job to conditionally sleep if there is any pending output on any slave terminal. These checks are done even if the job is currently not using the multi-terminal service feature. This has created a problem with the Print/Batch Services package. Under certain circumstances, the Print/Batch Services package will go into a steady run state, locking out jobs that have a lower priority.

These circumstances are:

1. A print job has been started for a keyboard server on a dial-up line that is not connected or has lost carrier.
2. Another print job starts on another keyboard server.

PBS will enter a steady RUN state until the job finishes on the second print server, or the dial-up connection is established. This will be fixed in a future release of RSTS/E.

4.6 Commonly Used System Programs (CUSPs)

4.6.1 ANALYS Package

In the monitor dump section of the ANALYS report, the "virtual disk" area of the Memory Layout is incorrectly shown as "locked out". This will be fixed in a future release of RSTS/E.

4.6.2 DSKSEK

The disk exercise utility DSKSEK has not been modified to support large cluster-size disks. Therefore, if you have a disk which has a cluster size greater than 16 you must use the DSKEXR

utility to exercise the disk. This restriction will be lifted in a future release of RSTS/E.

4.6.3 LOGIN.TSK and LOGOUT.TSK

The LOGIN and LOGOUT programs control when to drop the carrier on a dial-up line. If you access the system from a captive account over a dial-up line and the command procedure you are running aborts abnormally, the carrier will not be dropped. A workaround to this problem is to trap all possible errors within the command procedure and exit by using the LOGOUT command.

4.6.4 ODT.TSK

ODT.TSK will not display addresses greater than 177777(8) correctly. It accesses the correct location and displays the contents of the address correctly. It is just the display of the address that is incorrect.

4.6.5 PIP

The following problems have been reported and will remain as restrictions for V9.5, while they are being investigated for resolution in a future release:

- o PIP cannot access files that are on a tape created on an RT11 system. This problem will be fixed in a future release of RSTS/E.
- o There is a restriction using the Open Next directive with PIP when copying files "into themselves". If you are copying files "into themselves" on the system disk initialized as NFL (New Files Last), and you specify that disk's device name differently on the input and output side of the command line, PIP will continue copying files in an endless loop; it will not properly detect the last file in the directory. Under such circumstances, you must type CTRL/C to terminate the operation. For example, if your system disk is _DU1: and you issue the command:

```
$ PIP _SY:[1,2]=_DU1:[1,2]*.*/LOG
```

PIP will loop endlessly copying files.

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Known Problems and Restrictions

To prevent this, do not specify a device name for the system disk, or, specify the same device name on both the input and output side of the PIP command line (_SY: = _SY:, _SY0: = _SY0:, _DU1: = _DU1:, etc.).

- o If you try to copy a file with certain attributes to magtape, PIP encounters a memory management trap and exits. The attributes are: RMS Sequential, fixed length records of 512 bytes, maximum record length 512, records do NOT span blocks. This will be fixed in a future release.
- o Prior to V9.5, PIP would not attempt to copy RMS Relative or RMS Indexed files to magtape because of a known bug in the code. The bug has been fixed, and we have lifted this restriction (see section 2.10.9 of these notes). However, it is only valid to copy RMS files TO ANSI MAGTAPE. PIP will allow you to copy RMS files to DOS magtape, but if you do, the files' attributes will be lost, and the files will be unusable. In a future release we will implement safeguards to prevent inadvertent copying of untranslatable RMS files to DOS magtape.

4.6.6 Supporting Disks with Unit Numbers Greater Than 9

The following utilities will not correctly print the disk name and unit number in error messages, for disks with unit numbers greater than 9:

```
LINK.SAV  
LIBR.SAV  
MACRO.SAV
```

For example, if the source file TEST01 does not exist on DU15:

```
$ run $macro  
*DU15:TEST01=DU15:TEST01  
?MACRO-F-File not found DVE:TEST01.MAC  
DU15:TEST01=DU15:TEST01
```

This problem will be fixed in a future release of RSTS/E.

4.6.7 Log File Corruption

If the disk on which a DCL or BATCH log file is being written becomes full, then as space becomes available the resultant log file may contain one or two ending blocks of random data.

4.6.8 Print/Batch Services (PBS)

PBS will sometimes process pending entries after the queue manager has received the message telling it to shut down. The problem is related to the number of active servers assigned to the active queue when the shutdown message is received. This will be corrected in a future release of RSTS/E.

4.7 RSX and RMS Tasks

Typically you are allowed to omit one or both of the PPN (project, programmer number) fields when specifying a file or account. You are also able to use logical names longer than 6 characters, and logical names containing dollar signs. The following is a list of RSX and RMS tasks which do NOT allow you to specify one or more of these features.

Task Name	Handles Logical names longer than 6 characters	Handles Logical names containing dollar (\$) signs	Handles omitted field(s) in PPN
TKB	YES	YES	Cannot Handle
MAC	YES	YES	Cannot Handle
PAT	Cannot Handle	YES	Cannot Handle
LBR	Cannot Handle	YES	Cannot Handle
RMSDEF	YES	Cannot Handle	Cannot Handle
RMSDSP	YES	Cannot Handle	Cannot Handle

4.8 RMS-11

- o RMS-11 does not correctly parse an underscored device. The effect is to ignore the underscore.
- o Remote access to indexed files will not work correctly when a keyed \$GET is attempted with a non-string key and a keysize of zero. This is documented as a correct way to pass a

non-string key and works correctly for local operations.
This problem will be fixed in a future release of RSTS/E.

4.9 Layered Products

4.9.1 DECmail-11 V3.0

The following restrictions apply to DECmail-11 V3.0 on RSTS/E V9.5:

- o Sending a message via combined MROUTER and MRGATE pathways is not valid. For example, To: MROUTER::MRGATE::FAGEN or To: MRGATE::MROUTER::BECKER.

The workaround is to choose one method of delivery or the other (Message Router or normal DECmail-11).

- If the addressee is an ALL-IN-1 user, send the message to node::Al::username.
 - If the addressee is a VAX DECmail user, send to node::DECMAIL::name.
 - If you wish to send a message to another DECmail- 11 user via Message Router, send to node::MROUTER::username.
 - Otherwise, let DECmail-11 handle the delivery by not using any alternate delivery mode keywords (MRGATE, MROUTER, DECMAIL, or Al) in the address.
- o SET TERM/WIDTH=132 does not set the terminal hardware to wide screen mode. It only sets the software column count that determines where to wrap the header fields when reading a message.

4.9.2 DECnet/E

- o The NCP command to SET EXECUTOR SEGMENT BUFFER SIZE <n> does not work when the EXECUTOR STATE is ON. The command should fail with an appropriate error, but instead it appears to succeed without taking any action. This will be corrected in a future release of RSTS/E.
- o When attempting to issue a command such as SHOW NODE <number> COUNTERS and the node <number> isn't in your volatile database, NCP will report that the node does not exist, even though you may have an active link to it. The workaround is to ensure that all of the nodes you normally access are defined in your volatile parameter file. This will be corrected in a future release of RSTS/E.
- o DECnet/E will not successfully create a network parameter file for networks of greater than twenty-six thousand nodes. In order to successfully create a node database (NETPRM.SYS), you must specify a Maximum Nodes value smaller than 26,000. This is a restriction to the current release of DECnet/E and may be lifted in any future release or update.
- o When you SET HOST from RSTS/E to some versions of VMS, logging off the VMS system may cause the following message to display:

```
%Logical link failure to remote node xxxxxx  
NSP reason code = 0  
Control returned to node xxxxxx
```

This error message is triggered by the receipt of an unexpected message from the VMS node during disconnect. When the message displays, no actual error has occurred and the user session is not otherwise affected.

NFT and FAL

- o NFT and FAL do not preserve correct protection codes when creating files. Protection codes for the output file are computed by adding together the default system protection code and the codes for executable (64.), sensitive (128.), or executable and privileged (64.+128.) as set on the input file.

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Known Problems and Restrictions

- o NFT and FAL do not correctly report the size of extremely large files in directory operations. Where the value exceeds 65565, it requires more than 16 bits to be represented. The extra bits are ignored, therefore, the value is misrepresented. This will be fixed in a future release of RSTS/E.
- o NFT does not correctly handle the block mode switch during a wildcard copy operation. The effect is that the switch is ignored after the first copy is performed. This will be fixed in a future release of RSTS/E.

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AA-KW28A-TC

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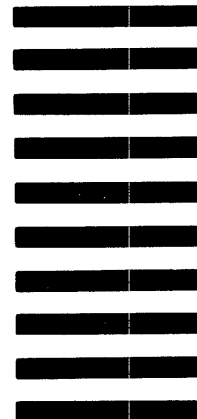
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