RSTS/E Version 10.0 Release Notes

Order Number: AA-5246H-TC

November 1990

digital software

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These Release Notes describe new features of the RSTS/E Version 10.0 system and explain the differences between this release 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 V10.0

Software Version: RSTS/E V10.0

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Contents

Chapter 6 Restrictions

Index

Tables

Preface

The *RSTS/E Version 10.0 Release Notes* describe new RSTS/E features for this release, as well as differences between this and the previous release, RSTS/E V9.7.

The procedure to install a new RSTS/E V10.0 system or to upgrade an existing RSTS/E system to V10.0 follows the same general process developed for V9.0 and later systems.

Because of the changes to the installation process starting with V9.0, 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 V10.0.

If you are installing a new RSTS/E V10.0 system, refer to Part 1 of the *RSTS/E System Installation and Update Guide.*

If you are upgrading a pre-V9.0 system to V10.0, refer to Part 2 of the *RSTS/E System Installation and Update Guide.*

If you are updating a RSTS/E V9.0 or later system to V10.0, refer to Part 4 of the *RSTS/E System Installation and Update Guide.*

In addition, users and programmers familiar with RSTS/E V9.7 should read these notes to learn about changes and new features in RSTS/E V10.0. The *RSTS/E Version 10.0 Release Notes* are divided into the following chapters:

Chapter 1	New Features
Chapter 2	Differences Between V10.0 and V9.7
Chapter 3	Documentation Changes
Chapter 4	Layered Products
Chapter 5	Corrections
Chapter 6	Restrictions

NOTE

If you last used a version of RSTS/E prior to V9.7, you should also read the *RSTS/E V9.x Release Notes* for any intermediate versions.

Unless otherwise noted, all numeric values specified in these notes are decimal.

Chapter 1

New Features

This chapter describes the new features provided with RSTS/E V10.0.

1.1 New Hardware Support

This section describes any new PDP-11 hardware supported by RSTS/E V10.0.

1.1.1 Higher performance PDP-11/93, 11/94 Processors

The 11/93 and 11/94 are Digital's newest PDP-11 processors. These processors form the basis for the highest performance PDP-11 systems available. The 11/93 is used in Q-bus systems while the 11/94 is used in UNIBUS systems. Both processors are available in either 2 megabyte or 4 megabyte onboard memory configurations. These processors do not require a separate memory cache, since the onboard memory enables the CPU to make all memory access at the same high speed that a cache would offer.

Both processors are based on the proven DCJ11 and FPJ11 CMOS Processor architecture. They provide more features than their older counterparts (the 11/73, 11/83 and 11/84) while preserving the same form and fit for backward compatibility. These new processors provide improved performance (using 70 ns cycle time memory), 7 additional serial lines (for a total of 8 DL11 compatible serial lines), and an expanded setup menu and boot ROM (with 8K bytes of customizable boot EEPROM). With the memory and serial lines all contained on the CPU module, systems will require less power and backplane space. The 11/93 and 11/94 processors also include a battery operated time of year (TOY) clock.

Support for the 11/93 and 11/94 processors was previously announced for RSTS/E V9.7 and required that patches 1.1.16F and 3.1.12F be installed. V10.0 adds full parity memory support as well as support for the TOY clock. When booted, INIT will determine the system date and time from the TOY clock, so no one needs to enter the date and time.

See the August 1990 *RSTS/E Software Dispatch* for additional information on these new PDP-11 processors.

NOTE

When you first start the KDJ11-E, the TOY clock will probably be set to the wrong time for your timezone. Since RSTS/E uses the value in the TOY clock to set the system time, Digital recommends that you set the clock to the correct local time before you bootstrap your RSTS/E medium. Please refer to the *KDJ11-E User's Guide* for instructions on how to do this.

1.1.2 RA70 and RA90 Disks

RSTS/E V10.0 supports RA70 and RA90 disks. Support for both disks was announced in the December 1989 *RSTS/E Software Dispatch*.

RA70 disks are high-performance 5-1/4 inch, 280 megabyte drives. The RA70 can be housed in the B213-A Q-bus expansion cabinet, the SA550 storage array, the SA650 storage array, or the SA705 removable storage array. Up to two RA70 drives can be housed in the B213-A for Q-bus systems. Up to eight drives can be configured in the storage array cabinets for connection to either Q-bus or UNIBUS systems. The SA550 allows for a combination of RA82 and RA70 drives in the same cabinet. The SA650 allows for a combination of RA90 and RA70 drives in the same cabinet. The SA705 storage array allows only removable RA70-RK drives.

RA90 disks are high-performance 1.2 gigabyte drives. Two RA90 drives can be configured in a 10.5 inch high portion of a standard rack — the same physical space as one RA81. Up to six drives can be configured in the RA90-C/F/H/J cabinet. Up to eight drives can be configured in the SA600 storage array, or the SA650 storage array cabinet for connection to either Q-bus or UNIBUS systems. The RA90, with a device cluster size of 64, is the largest capacity disk currently supported by RSTS/E.

Both disks feature static dual porting like other DSA family disks. The RA70 and RA90 drives connect to Q-bus systems using the KDA50 controller, and to UNIBUS systems using the UDA50 controller. RSTS/E supports a maximum of two UDA50/KDA50 type controllers. Each controller can be configured for a maximum of four drives in any combination of RA60, RA70, RA80, RA81, RA82, or RA90 disks. Where multiple systems are configured, larger numbers of drives can be configured to share the same storage array cabinet while being cabled to different systems.

1.1.3 LA324 Desktop Printer

RSTS/E V10.0 includes support for the LA324 desktop printer. The LA324 is a wide-carriage 24-wire impact dot matrix printer that replaces the DEC LA120 and LA210. It has the following features:

- Barcode printing capability
- Sixel character set support
- Bold, slant, underline, overline, double underline, strike-through, subscripting, and superscripting printing support
- Draft or letter-quality modes
- Serial and parallel interface
- Color printing capability with color ribbon
- Handling for cut sheets, fanfold paper, envelopes, labels, multipart forms
- Demand document operation which assures no wasted paper
- Paper parking feature which allows you to use single sheets without removing fanfold paper

Use the DCL command SET TERMINAL/DEVICE-TYPE=LA324 to set default characteristics for the LA324 printer.

1.2 New Software Features

This section describes the new software features included with RSTS/E V10.0.

1.2.1 Command Line Editing and Command Recall

RSTS/E V10.0 supports Command Line Editing and Command Recall. These two features significantly improve productivity by reducing the amount of keystrokes required to enter commands or correct typing errors. Because these features are implemented in the RSTS/E monitor, they are available almost everywhere in the system: at the DCL command level, within other keyboard monitors, and at the application program level.

1.2.1.1 Command Line Editing

In previous versions of RSTS/E the only two line editing functions were:

- The Delete or Rubout key to delete the previously typed character (to the left of the cursor)
- Ctrl/U to delete the entire line

This made it difficult to correct errors discovered near the beginning of a command; you could either delete all characters back to the character to be corrected, or delete the line and re-enter it. There was no way to move the cursor within the line to make corrections.

V10.0 makes such editing much easier by adding several new line editing functions. You can now:

- Move the cursor left or right one character
- Move the cursor to the beginning or end of the line
- Delete the previous word
- Delete to the beginning of the line
- Insert a new character at the cursor position
- Overstrike (replace) an existing character at the cursor position

These new functions reduce the amount of typing required to correct errors or, when coupled with the new Command Recall feature, modify and re-execute already entered commands.

1.2.1.2 Command Recall

V10.0 provides a related feature called Command Recall. This feature allows you to recall your most recently entered commands or program input lines. Command Recall extends line editing even more, since it allows you to recall and change commands or program lines *after* they have already been entered and executed. This saves significant time in re-entering the same command (such as editing the same file multiple times) or correcting a command that did not execute as expected.

RSTS/E provides three separate Command Recall buffers: one for DCL commands, one for commands entered in other keyboard monitors, and a third for program input. If there is not enough room in a recall buffer to store the current command, then one or more of the oldest commands in the buffer are erased to make room for the new one. Section 1.2.1.5 describes the use of these buffers in greater detail.

Use the standard Up Arrow and Down Arrow terminal keys to move backward or forward in the current recall buffer. (For terminals that do not have arrow keys, use Ctrl/B and Ctrl/N.)

A new DCL command, RECALL, is provided to manage your DCL Command Recall buffer. Use the RECALL command to:

- Display all of your saved commands
- Erase all of your saved commands
- Recall a saved command by index number
- Recall a saved command by text

See Section 1.2.11.15 for more details on the RECALL command.

1.2.1.3 System Changes

To accommodate the new Command Line Editing and Recall features, the following changes have been made to the system:

- By default, the Escape Sequence terminal attribute is now enabled. Previously, all terminals were initialized with the Escape Sequence attribute disabled.

  The Escape Sequence attribute must be enabled to allow Command Line Editing and Command Recall via the terminal's arrow keys within a program. The Escape Sequence setting is ignored when commands are read by DCL or other keyboard monitors.

- Several control characters now have different meanings. These keys are described in Section 1.2.1.7. Of special interest are the following:

  - Ctrl/D — When line editing is enabled, Ctrl/D moves the cursor backwards (left) one character. Otherwise, Ctrl/D continues to act as it did in previous versions.

  - Ctrl/H (BACKSPACE) — When line editing is enabled, Ctrl/H moves the cursor to the beginning of the line. Otherwise, Ctrl/H continues to act as the BACKSPACE character.

  - Ctrl/J (LINE FEED) — When line editing is enabled, Ctrl/J deletes the word to the left of the cursor. Otherwise, Ctrl/J continues to act as the LINE FEED character.

  - Ctrl/U — When line editing is enabled, Ctrl/U deletes from the beginning of the line to the cursor; characters from the cursor to the end of the line are shifted to the beginning of the line. Otherwise, Ctrl/U acts as before: it erases the entire line, echoes ^U, and repositions the cursor at the start of the next line.

- Many changes have been made to the terminal Device Data Block (DDB). These changes are documented in Chapter 13 of the new *RSTS/E V10 Internals and Data Structures Manual*.

- The locations of the terminal input buffer (TTINPT) and the echo control (typeahead) buffer (TTINEC) have been exchanged. See Section 1.2.2.1.1 for more information about this change.

1.2.1.4 Terminal Attributes

The Command Line Editing and Command Recall features are available on all terminals capable of processing and displaying ANSI escape sequences — those terminals with the ANSI terminal attribute. Command Line Editing is automatically disabled on terminals set to NOANSI. Command Recall is still available on terminals set NOANSI, but recalled commands are displayed on the next line instead of the current line.

Two new terminal attributes control the availability of Command Line Editing and Command Recall: LINE_EDITING and RECALL. These new attributes control their functions *only within an application or program*; they do not apply to commands entered at DCL or other keyboard monitors.

Command Line Editing and Command Recall are always available at the DCL level, regardless of the LINE_EDITING and RECALL terminal attributes. They are also available within most other keyboard monitors, unless the keyboard monitor opens the terminal in a mode that forces the feature to be disabled, for example, opening the terminal in binary mode. This is discussed further in Section 1.2.1.6.

The following additional terminal attributes control how characters typed within a line (where the cursor is not positioned at the end of the line) should be handled:

- OVERSTRIKE mode — indicates that each new character should replace (overstrike) the character positioned at the cursor.
- INSERT mode — indicates that each new character should be inserted at the current cursor position; characters to the right of the cursor are shifted right one character to make room for the new character.

By default, terminals are initialized with OVERSTRIKE in effect. The terminal's editing mode is in effect each time you begin editing a line. You can also type Ctrl/A at any time to switch back and forth between INSERT and OVERSTRIKE mode until you end the line with a delimiter.

All of these new terminal attributes are controlled using new SET TERMINAL qualifiers, as described in Section 1.2.11.20.

1.2.1.5 Command Recall Buffers

RSTS/E V10.0 distinguishes the following three kinds of commands for purposes of Command Recall:

- DCL commands — commands entered at the DCL prompt
- Other keyboard monitor commands — commands or lines entered at other keyboard monitors, such as BASIC-PLUS or RT-11
- Program commands — lines entered in response to a program or application

The RSTS/E monitor maintains a separate recall buffer for each of the three command types. Each job on the system is assigned its own set of buffers in a new area of memory called the *job header*. See Section 1.2.7 for more information about job headers.

Since each recall buffer is limited in size, only a certain number of commands can be stored and maintained. As newer commands are entered, the oldest commands in the buffer are deleted. Unlike the recall buffer on VMS, the recall buffers on RSTS/E are not limited to only 20 commands. Instead, RSTS/E will maintain as

many commands as will fit in the buffer. The actual number of commands saved depends on the size of the buffer and the length of each command saved.

DCL commands are stored in their own recall buffer until you log out or specifically erase them with the RECALL/ERASE command. You can use the RECALL/ALL command to list all of the commands available in the DCL recall buffer, or the RECALL command to recall a specific command either by index number or text. See Section 1.2.11.15 for more information on the new RECALL command.

If you switch from DCL to another keyboard monitor, either with the SET JOB/KEYBOARD_MONITOR command or the SWITCH system command (CCL), RSTS/E creates a second recall buffer. All commands entered at this level are stored and maintained separately from your DCL commands. Once you return to the DCL command level, all of the commands entered at the keyboard monitor level are erased and the DCL recall buffer is reactivated. This feature is especially useful for users who must occasionally switch to another keyboard monitor, such as BASIC-PLUS, to perform a task not accessible from DCL, for example, compiling a BASIC-PLUS program. The separate buffer prevents non-DCL commands from being stored in DCL's recall buffer.

A third recall buffer is provided for program input. Whenever a program initially prompts for input from the terminal, the monitor creates a third-level recall buffer. Lines entered at the program level are automatically saved and may be recalled without any special coding on the part of the program. Program lines will continue to be stored across program chains and CCLs until you return to DCL or another keyboard monitor. At that time, the program's recall buffer is erased and the DCL or other keyboard monitor's recall buffer is reactivated.

1.2.1.6 Terminal OPEN Modes

Certain programs, such as EDT and DECmail-11, use the terminal's arrow keys or other control characters for their own purposes. Some keyboard monitors may do the same. To allow these applications to continue operating as before, RSTS/E will automatically disable Command Line Editing and Command Recall if a program or keyboard monitor opens the terminal in any of the following modes:

- BINARY or ODT (MODE 1%)
- TECO (MODE 2%)
- ECHO CONTROL (MODE 8%)

In addition, the monitor will disable Command Line Editing and Command Recall in any applications that use FMS.

Note that while in ESCAPE SEQUENCE mode (mode 256), Command Line Editing and Command Recall are only available using control characters. The arrow keys and function keys are available for the application's use.

For all other terminal open modes, the availability of Command Line Editing and Command Recall is dependent on the LINE_EDITING and RECALL terminal attributes.

Some programs that do not open the terminal in a mode that automatically disables Command Line Editing or Recall can still disable one or both functions by issuing the Set Terminal Characteristics SYS call to turn off the LINE_EDITING and RECALL attributes. Such programs should save the initial state of these attributes and then restore them upon exit. See the *RSTS/E V10.0 Programming Manual* for further details.

1.2.1.7 Command Line Editing and Recall Keys

With only one exception, all Command Line Editing and Recall keys are identical to those defined on VMS. The one exception is that RSTS/E defines the Ctrl/N key to recall the next (more recent) command in the recall buffer. VMS has no such control key defined. Ctrl/N has the same effect as the Down Arrow key. RSTS/E provides the Ctrl/N key to complement the Ctrl/B (Recall Previous Command) key, so that you can move backward and forward in the recall buffer while the terminal is open in Escape Sequence mode (mode 256).

The following is a list of the special Command Line Editing and Command Recall keys. The online help topic Keys and the *RSTS/E User's Guide* also contain information about the use of these keys.

- Left Arrow or Ctrl/D — Cursor Left

  Moves the cursor left, or backward, one character position in the command line. If the cursor is already at the beginning of the command line, the key is ignored.

- Right Arrow or Ctrl/F — Cursor Right

  Moves the cursor right, or forward, one character position in the command line. If the cursor is already at the end of the command line, the key is ignored.

- Ctrl/H (BACKSPACE) or F12 — Beginning of Line

  Moves the cursor to the beginning of the command line. If the cursor is already at the beginning of the command line, the key is ignored.

- Ctrl/E — End of Line

  Moves the cursor to the end of the command line. If the cursor is already at the end of the command line, the key is ignored.

- Ctrl/A or F14 — Toggle OVERSTRIKE/INSERT Mode

  Toggles between OVERSTRIKE mode and INSERT mode. When you enter or recall a command, the initial mode is determined by your terminal's INSERT or OVERSTRIKE attribute. The mode remains in effect until you press Ctrl/A to switch modes, or press a line delimiter to end the command. Once you press a line delimiter, the mode reverts back to the default indicated by the terminal attribute.

  When in OVERSTRIKE mode, each new character you type replaces the character positioned under the cursor. When in INSERT mode, each new character you type causes all characters from the cursor to the end of the line to be shifted right one character to make room for the new character.

- Ctrl/J (LINE FEED) or F13 — Delete Word

  Deletes the word to the left of the cursor. If the cursor is already at the start of the line, then the key is ignored.

  Deleting a word will do the following:

  - Delete any consecutive spaces and tabs immediately to the left of the cursor.
  - Delete any consecutive alphanumeric characters [A-Z, a-z, 0-9] immediately to the left of the cursor.
  - If no characters are deleted, then delete a single, nonalphanumeric, character.

- Ctrl/U — Delete Line

  Erases all characters from the beginning of the line to the cursor. Remaining characters are shifted left to the beginning of the line.

  On multiline commands, Ctrl/U will only delete the portion of the command from the cursor to the left margin.

  Ctrl/U behaves the same, whether Command Line Editing is enabled or not. If the terminal is set to HARDCOPY, ^U will be displayed and the remaining portion of the command will be displayed on the next line, similar to earlier versions of RSTS/E.

- Ctrl/R — Redisplay Line

  Redisplays the current command line without changing the cursor position.

  On multiline commands, the cursor will be moved to the left hand margin, and spaces will be displayed until the cursor lines up under the start of the command. For example, if you type a command which wraps onto a second line and press Ctrl/R, the display — before and after — would look like this (vertical lines indicate terminal margins):

```
|           BEFORE ^R          |   |          AFTER ^R           |
|                              |   |                             |
|PROMPT> Command wraps here|    |PROMPT> Command wraps here|
|and continues on 2nd line.|    |         Command wraps here|
|                              |   |and continues on 2nd line.|
```

  Unlike VMS, RSTS/E does not know the current command's prompt, so it cannot re-display the prompt with the command when Ctrl/R is pressed.

- Up Arrow or Ctrl/B — Recall Previous Command

  Moves backward one command in the recall buffer, making the next previous or earlier command entered the current command; any characters on the current line are discarded. The cursor is positioned at the end of the recalled command, regardless of the position of the cursor previous to the recall. Press Return to execute the command or use one of the line editing keys to change it.

  If there are no more commands to recall, pressing the Up Arrow key erases the current command and does not recall a command.

- Down Arrow or Ctrl/N — Recall Next Command

  Moves forward one command in the recall buffer, making the next or most recently entered command the current command.

  If there are no more commands to recall, pressing the Down Arrow key erases the current command and does not recall a command.

1.2.1.8 Editing Multiline Commands

The following rules apply when editing multiline commands:

- You can only move the cursor left or right or delete characters on the last line of a multiline command. You cannot move the cursor from the last line to a previous line of the command unless you first delete all of the characters on the last line and delete the last character from the previous line (thereby making the previous line the last line of the command).

  If the cursor is positioned at the first character of the last line and you press the LEFT ARROW or Ctrl/D key to move the cursor left (to the last character of the previous line), then the key is ignored and the cursor does not move.

- Pressing Ctrl/U when the cursor is positioned on the last line of a multiline command line only erases characters to the beginning of that line, not to the beginning of the entire command. As always, any characters from the cursor to the end of that line are shifted left to the beginning of the line.
- Similarly, pressing BACKSPACE or Ctrl/H when the cursor is positioned on the last line of a multiline command only moves the cursor to the beginning of that line, not to the beginning of the first line.
- If you press LINE FEED or Ctrl/J to delete the word to the left of the cursor and that word extends back to the previous line of a multiline command (the word is split across two lines), then only those characters back to the beginning of the current line are deleted. The remainder of the word at the end of the previous line is not deleted.

Because of these limitations, you should try to avoid entering multiline commands whenever possible. In some cases you can use DCL command abbreviations or redefine frequently used long DCL command/qualifier strings to reduce the length of your command. You can also redefine your terminal width to 132 columns (on terminals that support the extended width feature) to allow for longer commands on a single line.

1.2.1.9 SET HOST Behavior

When you use SET HOST to connect to a remote system (using the NET utility), commands that you enter on your local system are sent to the remote system for processing. There are two character transfer modes available during a network connection: NORMAL mode and ODT mode. These modes are selected by typing Ctrl/P (followed by Return if the current mode is normal mode) and entering either ODT or NORMAL. The default is normal mode; characters are echoed by the local system but the command is not sent to the remote system until a line delimiter is entered. ODT mode instructs the NET program to open the local terminal in binary mode, causing all characters to be echoed and sent to the remote system as they are typed. NORMAL mode is the preferred mode as it reduces network overhead for each character typed.

If LINE_EDITING and RECALL are enabled on the local system, then these functions will also work when connected to a remote system, depending on the SET HOST transfer mode in effect. If the connection is operating in ODT mode, then the monitor will send all characters, including line editing and recall control characters and escape sequences, to the remote system. If line editing and recall are enabled on the remote system as well, assuming that the remote system is running RSTS/E V10.0 or an operating system that supports such functions, then those functions will be performed by the remote system. Otherwise, the special characters will be processed according to the rules for the remote system.

If the SET HOST connection is operating in NORMAL mode and the LINE_EDITING and RECALL terminal attributes are enabled, then the monitor on the local system handles all line editing and recall functions, treating all characters typed as data to the NET program. This means that, regardless of your current level at the remote system, DCL, Keyboard Monitor, or Program, all commands that you enter will be maintained in your local system's program recall buffer.

This behavior effectively gives you full command line editing and recall on any remote system that you connect to. However, some applications on the remote system may assign functions to keys defined in V10.0 as Command Line Editing or Command Recall function keys. For example, DECmail-11 defines the Right Arrow key as Read Next Message and the Left Arrow key as Read Previous Message. Because DECmail-11 opens the terminal in escape sequence mode,

the system automatically disables Command Line Editing (see Section 1.2.1.6), thereby giving DECmail-11 full control of the left and right arrow keys. If you attempt to run DECmail-11 on a remote system while in NORMAL transfer mode and with LINE_EDITING enabled, the left and right arrow keys will be intercepted and processed by your local system as line editing keys, effectively blocking their use by DECmail-11 on the remote system. Because there are now many more special editing keys defined than in previous versions of RSTS/E, you may encounter more remote applications that do not correctly process certain special keys.

There are two ways to overcome these problems. The easiest is to switch to ODT mode while connected to the remote system. Doing so opens your terminal in binary mode, thereby disabling local Command Line Editing and Command Recall, and allowing any special line editing and recall keys to be passed to the remote system. Alternatively, you can use the SET TERMINAL command to disable Command Line Editing (/NOLINE_EDITING) and/or Command Recall (/NORECALL) prior to issuing the SET HOST command to connect to the remote system.

Note that this does not represent an actual change in behavior compared to earlier RSTS/E versions. Prior to V10.0, arrow keys and other special function keys did not work across a network connection unless you switched to ODT transfer mode.

Thus, the behavior is different, but consistent in relation to your local system. Since all commands are read by the NET program, they are stored and recalled as program-level commands.

1.2.1.10 Software/Hardware Terminal Setup

If the [NO]EIGHT_BIT software terminal characteristic is different from the hardware setting, the arrow keys will not work for edit or recall commands. Pressing an arrow key generates either a 7-bit or an 8-bit escape sequence, depending on the terminal's *hardware* setting. The RSTS/E operating system receives and transmits either 7-bit or 8-bit escape sequences based on the terminal's *software* setting. If these two settings do not match, then the arrow keys will not behave as expected.

Other mismatches, such as different speeds or parity settings, can also cause unpredictable results.

Use the SET TERMINAL command to ensure that the software settings match the hardware characteristics of your terminal.

1.2.2 Echo On Read

A new feature of V10.0 is *Echo On Read*. Echo On Read is the processing and echoing of characters typed on a terminal only when a read occurs. In versions of RSTS/E prior to V10.0, characters were processed and echoed as soon as you typed them, even if no read was pending. In some instances, these typeahead characters would be processed incorrectly. For example, if you begin typing your password before LOGIN issues its `Password:` prompt, the characters you type are echoed, since the terminal is not yet set to NOECHO mode. Another example is the processing of escape sequences when starting the EDT text editor. On startup, EDT disables the terminal's Escape Sequence attribute. However, if you type ahead while EDT is starting up, and your terminal is set to Escape Sequence, the characters you type will not be processed correctly; they will be

processed based on your terminal's current settings and open modes rather than those established at the time of the read.

Echo On Read solves all of these problems, and more. With the addition of Command Line Editing and Recall, the position of the cursor on the command line becomes more important than before. Without Echo On Read, the position of the cursor with respect to the characters output to the terminal becomes erratic and unpredictable. Consider the case of typing ahead while a DIRECTORY command is being executed. The typeahead characters are echoed interspersed with the directory listing characters, and editing the line becomes virtually impossible. In such cases, you would need to type Ctrl/R to redisplay your current command so you know where on the command line the cursor is located. Echo On Read solves this problem as well.

As of V10.0, characters are stored in the typeahead buffer — but not processed or echoed — if there is no outstanding read request. When a read is issued, any characters in the type ahead buffer — up to the first line delimiter — are processed. This ensures that any typeahead characters are processed based on the correct terminal open mode, terminal characteristics, etc.

Echo On Read is compatible with the way VMS character processing is handled. Special interrupt characters (for example Ctrl/T and Ctrl/C) will continue to be processed immediately, regardless of whether or not a read is outstanding.

Echo On Read in V10.0 has a very different look and feel than previous versions of RSTS/E. Most noticeable is the lack of any visual cues when you type ahead (since typeahead characters are no longer echoed until a read occurs). Some inexperienced users may conclude that their terminal or the system is not functioning properly. Users should be encouraged to type Ctrl/T to see that their terminal and the system are still operating.

1.2.2.1 Programming Considerations

There have been several changes to the system to support the new Echo On Read feature. Echo On Read was designed and implemented in such a way as to not require any changes to existing RSTS/E applications. Nonetheless, certain applications that were designed to take advantage of the now obsolete Immediate Echo feature may be affected.

The following sections discuss certain aspects of Echo On Read as it relates to new or existing RSTS/E programs.

1.2.2.1.1 Use of Terminal Input Buffers

To better assist programs that examine the input buffer to determine if any characters were typed at the terminal, RSTS/E V10.0 has exchanged the terminal input buffer (TTINPT) and the echo control or typeahead buffer (TTINEC) locations. These buffers, each three words long, have simply switched locations.

The reason for this change is so that programs which examine the input buffer via the UU.FCB directive to determine if any terminal characters were typed since the last .READ will continue to work properly.

The UU.FCB system directive allows you to examine the first 14 words of the terminal's DDB. This directive can be used only on a terminal which the program currently has open. The most common use of this directive is to compare the input start pointer with the end pointer to see if any characters were typed. With Echo On Read, characters are not stored in the input buffer unless a read is pending. Since you cannot issue a UU.FCB directive and a .READ directive at the same time, the input buffer will never contain any characters. By exchanging

the locations of the input buffer and typeahead buffer, such programs will now be examining the typeahead buffer, which will contain all characters typed since the last .READ directive was satisfied.

Programs which use this method of detecting terminal input will continue to work without modification. However, programs which scan other user's terminals for input may require modification to change the buffer's address. The input and typeahead buffers are no longer at the same address as they were prior to V10.0.

See Chapter 13 of the *RSTS/E V10 Internals and Data Structures Manual* for more information about the layout and contents of the terminal DDB.

1.2.2.1.2 Conditional Reads

Conditional reads (terminal reads which include the RECORD 8192% modifier) are one exception to the Echo On Read feature. Conditional reads are used when an application does not want to stall waiting for terminal input. When issued, the monitor returns data to the program only if a line of data (a line which has been terminated with a delimiter) is available. Otherwise, the monitor returns an error to the program.

It is assumed that programs which use the conditional read feature expect that characters will still be echoed while the program continues doing other tasks between conditional reads. Echo On Read would cause terminal input in these cases to be fragmented, with only full lines echoed whenever a conditional read results in data returned. This would be unacceptable for many applications that use conditional terminal reads.

To avoid this problem, RSTS/E will, upon receipt of a conditional read request, begin echoing and processing characters as they are typed, similar to typeahead behavior prior to V10.0. Echoing of typeahead characters will stop when the next line delimiter is typed. Typeahead echoing is re-enabled each time a conditional read is issued, up to the next line delimiter.

To cancel this special conditional read state without issuing another read, close the terminal's open channel. This clears the special read pending state, indicating that typeahead characters should no longer be echoed immediately. Once the flag is cleared, typeahead characters will be echoed on the next .READ from the terminal.

1.2.3 Host Initiated LAT Connections

Host initiated LAT connections are now supported in RSTS/E V10.0. This feature provides you with the ability to establish a connection from a RSTS system to a remote device, such as a printer, modem or terminal, attached to an Ethernet terminal server. For example, if you connect an LN03 printer to your server, and set the proper characteristics of the remote port on the server according to the guidelines described in the documentation for the server, users on any RSTS system on the Ethernet could print files on that device. Host initiated LAT connections allow you to distribute some of your resources over the entire local area network rather than restricting them to individual local systems.

In general, terminals connected to terminal servers can now be used like any other terminals on your system, including multiterminal service and other special-purpose terminal uses. Once the steps to define and set up a local LAT terminal are completed (generally as part of system startup), you can use LAT terminals as you would any other terminals.

The remaining sections describe how to set up and use local LAT terminals on your system.

1.2.3.1 LAT Ports

LAT ports are different than most terminals on your system since they are not physically connected to the system using terminal interfaces. Instead, RSTS/E connects LAT ports to terminal server ports using Ethernet hardware and software.

LAT ports are like pseudo-keyboards and other dynamic keyboards in that they are not assigned a unique keyboard unit number until they are created. Dynamic keyboards are numbered sequentially, starting with the first available keyboard unit number greater than the maximum physical (static) keyboard unit number.

Like other dynamic keyboards on RSTS/E, LAT ports can be referenced using standard keyboard syntax, for example, KB45:, or device controller syntax, such as KBI3:. The controller designator *I* is used to identify LAT ports. When creating a LAT port, you can either specify the number of the port you want to create, or let the system pick the next available number.

1.2.3.2 New Commands for Host Initiated LAT Connections

Table 1–1 lists all of the new DCL commands provided to support local LAT ports for use in host-initiated LAT connections. See Section 1.2.11 or use the HELP command for a complete description of these commands.

Table 1–1: New LAT Commands

Command	Description
ASSIGN/PORT	Assigns or reassigns a LAT port to a remote port and/or service on a terminal server
CREATE/PORT	Logically creates a LAT port
DEASSIGN/PORT	Deassigns a LAT port from a remote port and/or service on a terminal server
DELETE/PORT	Logically deletes a LAT port
SET PORT	Modifies the characteristics of a LAT port
SHOW PORT	Displays the characteristics of a LAT port

1.2.3.3 Getting Started

Before you can begin using host initiated LAT connections, you must first create a local LAT terminal port and then assign it to a remote port and/or service on a terminal server. To create a local LAT terminal port, issue the DCL command CREATE/PORT. For example, the following command creates a LAT port using dynamic keyboard line KBI0: (KB47: in the example):

```
$ CREATE/PORT _KBI0:
Port KB47:   created
```

If desired, you can also assign the LAT port to a remote port and/or service on the terminal server at the the same time you create the LAT port. Use the /TERMINAL_SERVER qualifier to specify the name of the server to use; the /REMOTE_PORT qualifier to specify the name of the remote port on the server that the device is connected to; and/or the /SERVICE qualifier to specify the service on the server you want to use.

For example, the following command creates a LAT port using keyboard KB47: and assigns it to port PORT_72 on terminal server LAT890:

```
$ CREATE/PORT KB47: -
        /TERMINAL_SERVER=LAT890 -
        /REMOTE_PORT=PORT_72 -
        /SERVICE=PRINT
Port KB47:   created
Port KB47:   assigned with queueing to terminal-server LAT890
                                       remote-service  PRINT
                                       remote-port     PORT_72
```

Similarly, the following command creates a LAT port using dynamic keyboard line KBI0: and assigns it to any port on terminal server LAT890 offering the service named LN03:

```
$ CREATE/PORT/TERMINAL_SERVER=LAT890/SERVICE=LN03 _KBI0:
Port KB47:   created
Port KB47:   assigned with queueing to terminal-server LAT890
                                       remote-service  LN03
```

You can specify the name of the port to create using standard keyboard syntax (KBn:) or controller syntax (KBIn: for dynamic keyboards), or simply let the system select the next available dynamic keyboard number to use (the CREATE/PORT command displays the designator of the keyboard used to create the LAT port). In cases where you have applications that must reference a LAT port via a specific device designator (such as PBS print servers) you must be careful to ensure that the LAT port is created using the correct keyboard or controller syntax designator. Otherwise, the desired port may be unavailable or already assigned to another job or function. This problem is best avoided by creating all necessary LAT ports in the START.COM system startup command file before other users or jobs can create them.

NOTE

When adding commands to your START.COM file to create LAT ports for use as print servers in PBS, before you start PBS, you must create the required LAT ports. PBS expects any local LAT ports defined as print servers to have already been created when it initializes its print servers at startup.

Once the LAT port is created, you can set the characteristics of the port using the SET TERMINAL command as you would for any standard terminal. By default, a newly created LAT port has the settings of a hardcopy terminal. For example, if port KB60: is assigned to a port on a terminal server which has an LN03 printer connected to it, you would issue the following command to set the port's characteristics to that of an LN03:

```
$ SET TERMINAL/DEVICE=LN03/PERMANENT KB60:
```

A LAT port must be assigned to a terminal server port or service before it can be used. If you do not assign a LAT port to a terminal server at the time the port is created, or you want to reassign the port to a different terminal server, port or service, use the ASSIGN/PORT command. For example, the following command assigns LAT port KB47: to port PORT_72 on terminal server LAT890:

```
$ ASSIGN/PORT/REMOTE_PORT=PORT_72 KB47: LAT890
Port KB47:   assigned with queueing to terminal-server LAT890
                                       remote-port     PORT_72
```

Use the SET PORT command to set individual LAT port characteristics, such as queueing (see next section). For example, the following command disables queueing of all connection requests on LAT port KB47::

```
$ SET PORT/NOQUEUED KB47:
Port KB47: not queued
```

You can also use the SET PORT command to assign a port to a different remote port and/or service on a terminal server, similar to the ASSIGN/PORT command. For example, the followng command changes the service on LAT port KBI0: to PRINT_SERVICE and disassociates any remote port name from the LAT port:

```
$ SET PORT/SERVICE=PRINT_SERVICE/NOREMOTE_PORT KBI0
Port KB9:   characteristics set as requested
Port KB9:   assigned with queueing to terminal-server SERV_1
                                      remote-service  PRINT_SERVICE
```

Once a LAT port is created, it can be deleted by using the DELETE/PORT command. For example, the following command deletes LAT port KB47::

```
$ DELETE/PORT KB47
Port KB47: deleted
```

If a session is active when this command is issued, the port is not deleted until the session is finished. The session can be aborted and the port immediately deleted by specifying the /ABORT qualifier when issuing the DELETE/PORT command.

You can also use the DEASSIGN/PORT command to deassign a LAT port from a terminal server port and/or service. For example, the following command deassigns LAT port KB47: from its current remote port and/or service on a terminal server:

```
$ DEASSIGN/PORT KB47:
Port KB47: deassigned
```

Note that the DEASSIGN/PORT command is generally unnecessary since you can use the ASSIGN/PORT command to assign a LAT port to a different server, remote port, or service without first deassigning it.

1.2.3.4 LAT Queueing

One of the capabilities offered by some terminal servers is the ability to place host initiated requests that cannot immediately be processed on a queue. This will occur when the remote port is busy with another request. When the remote port becomes available, the server notifies the requesting host node that the connection can now be established. On RSTS/E, local LAT ports are created with queued access as the default. You can change the port's setting to noqueued access by including the /NOQUEUED qualifier on the CREATE/PORT command when the port is created, or the ASSIGN/PORT or SET PORT commands after the port is created. If you set the local LAT port to noqueued access, then the server will reject the connection request if the remote port is not currently available. Likewise, you can change the port's setting to queued access by including the /QUEUED qualifier on the same commands.

NOTE

Not all terminal servers provide queueing. Refer to the server's documentation to determine whether or not this feature is available.

1.2.3.5 Programming Considerations

Existing applications that perform terminal I/O will generally work without modification. Some applications may require changes, depending on how they were designed to open terminals and perform terminal I/O.

For local LAT ports, the request to initiate a connection takes place when the port is first assigned or opened. Because the connection request can be delayed for a period of time, the assign or open request always completes immediately, even though the connection is not yet established. If the connection is established when the first write request for the terminal is issued, then the write completes normally. However, if the connection is still not established when the program issues a write request for the terminal, the action taken depends on the type of write operation:

- All except NOSTALL writes:

  If a normal write request (all except NOSTALL writes) is issued and the connection is still not completed, then the user's job is stalled in a TT state until one of the following conditions occur:

  - The connection is established, at which time the write request is processed.
  - The connection is rejected or times out, in which case the error `?I/O to detached keyboard` is returned.

- NOSTALL writes:

  If the write request is a NOSTALL write, then the user's job is not stalled and one of the following events will occur:

  - The connection has been established, in which case the write request is processed.
  - The connection request is still being processed, in which case the error `?Device not available` is returned immediately.
  - The connection is rejected or times out, in which case the error `?I/O to detached keyboard` is returned immediately.

  Note that an application issuing NOSTALL writes can, if it receives the `?Device not available` error, simply reissue the write request until the connection is established.

Some application programs may need to be modified to handle these types of conditions specific to host initiated LAT ports.

A new SYS call, Return Local LAT Port Status, allows application programs to find out the current status of the port. In addition, the SYS call will also return the queue position if the request has been queued, and reject reason code if the request was rejected. With this SYS call, application programs can continually reissue the call after assigning or opening the port waiting for the establishment or rejection of the connection before attempting any I/O. This provides the application program with the flexibility of doing other tasks while waiting for the connection to be established. See the *RSTS/E Programming Manual* for further details on this SYS call.

1.2.3.6 Dial-out Modems

Applications written for dial-out modem access should work without modifications. To use this feature, first:

- Connect the modem to a port on the server following the guidelines detailed in your *Terminal Server's User Manual*.
- Create the local LAT port on a RSTS system using the CREATE/PORT command, and assign it to the remote port and/or service on the server using the ASSIGN/PORT command.
- Set the characteristics of the newly created port via the SET TERMINAL command as you would any static terminal line, except for the DIALUP characteristic. Because the server is connected directly to the modem, the server, not RSTS, handles all necessary modem signals. Therefore the /DIALUP characteristic should not be set. An error is issued if you attempt to set the /DIALUP characteristic on any LAT port.

NOTE

If a user logs in from a terminal connected to a terminal server modem, RSTS/E will correctly recognize the user's access type as DIALUP. This occurs because the server includes information with its connection request indicating that the connection is through a modem.

See Section 2.4.17 for details on the new SET NODE/LAT qualifier /ACCESS for handling LAT connections from terminal servers that do not adhere to this standard.

Once the steps outlined above have been taken, the port is ready to be used. No further action is required.

1.2.4 Extended Logicals

The following significant enhancements have been made to extend the use of system and user logicals in V10.0:

- **Longer Logicals**

  Previously, user logical names were limited to 6 characters while system logical names could be up to 9 characters long. As of V10.0, both system and user logical names can be up to 15 characters in length. Extended logical names provide for more meaningful mnemonics when defining logicals.

- **More User Logicals**

  Previously, users could only define a maximum of three logicals, (four if no account PPNs were included in any logical definition). In V10.0, users can define significantly more logicals. A 1K-word buffer is provided for each job to store a user's logical definitions. The actual number of user logicals that can be defined depends on the length of each logical name defined. Typically, as many as 100 logicals can now be defined for each job on the system.

- **Extended Logical Name Characters**

  Previously, user logical names could consist of only alphanumeric characters. System logical names also allow the use of a dollar sign character within the name. In V10.0, both user and system logicals allow the underscore character (_) as well. The underscore character makes it easy to separate words within a logical name, such as MY_DISK or TEST_FILES$. Since underscores at the

start of a device specification prevent logical translation, they are not allowed as the first character of a logical name.

NOTE

The dollar sign character ($) is only permitted in system logical names. This allows a system logical to be defined in such a way that it cannot be overridden by a user logical with the same name.

As before, system and user logicals are used to reference a device, an account, or both. User logicals can be defined to override a system logical; RSTS/E scans the user logical table before the system logical table when looking up a logical name. The DCL command ASSIGN is used to define user logicals, while the command ASSIGN/SYSTEM is used to define system logicals.

1.2.4.1 Compatibility

Previously, each job's user logicals were stored in a small region of the job's address space, usually referred to as the job's low core. This area was of fixed length, and could not be extended. In V10.0, a buffer is reserved in the job header region to store user logical assignments. Note that this change does not reduce the size of virtual memory space available to programs. (See Section 1.2.7 for more information about job headers.)

Very few applications assign, deassign or list logicals directly. Most simply accept and use logical names as part of file specs to open files or devices on the system. Such applications will continue to work as before. Applications that do manipulate logicals directly may require modifications. Of particular interest is the new List User Logicals SYS call that provides a way to list all user logicals and their definitions. See the *RSTS/E Programming Manual* for further details.

Although the monitor no longer stores logicals in the user low core logical area, the monitor will continue to search that area when translating or deassigning logicals. Logicals stored in areas other than the new job header logical area may conflict with existing logicals, leading to unpredictable results.

Changes and enhancements have been made to several monitor directives to support the new extended logicals in V10.0. These changes are summarized in Section 2.3.6.

1.2.5 Operator/Message Services (OMS)

The Operator/Message Services (OMS) package represents a significant enhancement to the overall management of RSTS/E systems. Combined with the Print/Batch Services (PBS) package, OMS functionally replaces the OPSER package.

OMS provides more powerful capabilities and an easier-to-use command interface than its OPSER predecessor. OMS provides these general system functions:

- **Operator Messages and Requests**

  Users issue the REQUEST command to send messages to operators. Users can also include the /REPLY qualifier to indicate that a reply is needed. REQUEST/REPLY causes the user's job to be stalled until an operator replies (via the new REPLY command) to the request or aborts the request, or the user types Ctrl/C to cancel the request. The REQUEST/REPLY command can be used to ask an operator to mount a disk or tape, change printer forms, or to simply carry on a dialogue with an operator. See Section 2.4.14 for more information about changes to the REQUEST command for V10.0.

- **Operator Terminals**

  A new SET TERMINAL qualifier, /OPERATOR_SERVICES, is provided to enable a terminal to receive operator messages, requests or both. Unlike the OPSER package, which only allowed one terminal to display operator information, OMS allows any number of terminals, either logged-in or logged-out, to act as operator terminals.

  Operators can include a SET TERMINAL/OPERATOR_SERVICES command in their LOGIN.COM files to begin receiving OMS messages and/or requests whenever and wherever they log into the system.

- **System Messages**

  OMS receives event information, such as LOGIN attempts or printer offline notices, from various system programs and broadcasts the messages to all defined operator terminals.

  A program interface to OMS is provided so that user programs can send messages, requests or other commands to the OMS facility.

- **Message Logging**

  If requested to do so, OMS also records all messages, requests and replies to requests in a specially-formatted OMS log file. A new command, SHOW REQUESTS, allows you to examine entries in the OMS log file. Extensive selection qualifiers are provided to allow you to display log file entries based on the following:

  - Request type (/REPLY)
  - Facility name (/FACILITY)
  - Date and time (/BEFORE and /SINCE)
  - Job number (/JOB)
  - User account (/USER)
  - Terminal number (/TERMINAL)
  - Message text (/TEXT and /EXACT)

- **Disk/Tape Mount Support**

  The REQUEST command's /REPLY qualifier accepts an optional DCL symbol name argument. For example, the following command causes the operator's reply to be stored in the global symbol DISK_NAME for further processing:

  ```
  $ REQUEST/REPLY=DISK_NAME/GLOBAL
  ```

  You can use this feature within a Batch or DCL command procedure to perform operator-assisted disk or tape mounting.

- **BACKUP and RESTORE Support**

  OMS provides support for mounting disks or tapes as part of a BACKUP or RESTORE operation. This allows backups and restores to be performed under Batch, since requests for mounting additional disk or tape volumes are issued as operator requests instead of user prompts.

For complete details on how to use the new OMS facility, refer to the *RSTS/E System Manager's Guide*.

1.2.5.1 Installing OMS

OMS is an optional package on RSTS/E, and is installed similar to other RSTS/E packages. Because OMS provides systemwide operator services, Digital recommends that you always install and use OMS on your system.

See Section 2.2 for further details on how to install OMS.

1.2.5.2 OPSER Compatibility

While OMS is functionally compatible with the older OPSER package, it operates and interfaces with the rest of the system quite differently.

If desired, you can operate OMS and OPSER concurrently. Note that all RSTS/E system programs that previously sent messages to OPSER, such as LOGIN and LOGOUT, now communicate with OMS instead.

User programs that send messages to OPSER must be modified to communicate with OMS. Refer to the LOGIN.BAS source program located in the V10.0 SOURCES package to see how to send messages to OMS from a BASIC-PLUS program.

1.2.5.3 New DCL Commands For OMS

The OMS package introduces several new DCL commands for use by users and operators. Table 1–2 lists these new commands. See the *RSTS/E System Manager's Guide*, the *RSTS/E User's Guide*, or use the HELP command for a complete description of these commands.

Table 1–2: OMS Commands

Command	Description
SET OPERATOR_SERVICES	Changes the current settings of the OMS package
SET TERMINAL/OPERATOR_SEVICES	Defines a terminal as an Operator terminal, allowing it to receive messages and/or requests
SHOW OPERATOR_SERVICES	Displays the current status and settings of the OMS package
START/OPERATOR_SERVICES	Starts the Operator/Message Services package
STOP/OPERATOR_SERVICES	Shuts down the Operator/Message Services package
Request-Related Command	**Description**
REPLY	Replies to or aborts a pending request, and stores the reply in the OMS Log file
REQUEST	Broadcasts a message or request to all operators and operator terminals on the system, and records the message or request in the OMS Log file
SHOW REQUEST	Displays messages, requests and replies to requests stored in the current OMS Log file or an archived OMS Log file

1.2.6 New File Attribute Flags

RSTS/E V10.0 supports two new file attribute flags: [NO]IGNORE and [NO]BACKUP. Both flags are used by the BACKUP command.

NOTE

These file attributes are not used by the new BACKUP/IMAGE and BACKUP/COPY commands.

The [NO]IGNORE flag indicates whether BACKUP will ignore this file during a BACKUP operation. Use this flag for files that should always be excluded from your everyday backup operations. Once a file is set to IGNORE, you do not need to use the /EXCLUDE qualifier to exclude the file from a backup operation. The default for all files is NOIGNORE, except for temporary files, that is, those created with the CRTFQ monitor directive.

The [NO]BACKUP flag indicates how BACKUP should treat the data portion of a file. If NOBACKUP is set, the file's attributes (name, type, size, and so forth) will be included in the backup operation, but the file's actual data will not. A RESTORE operation will restore such a file to its original size, although its contents will be random. Assign the NOBACKUP attribute to files whose contents are highly volatile, such as the system swap files. The default for all files is BACKUP.

Both attribute flags are maintained and displayed like any other RSTS/E file attributes. Section 1.2.11.17 describes how to use the SET FILE command to enable or disable these new file attributes.

The [NO]BACKUP file flag has the same meaning as on VMS. The [NO]IGNORE file flag is specific to RSTS/E; it has no corresponding attribute on VMS.

1.2.7 Job Headers

RSTS/E V10.0 makes use of a new in-memory job structure called a *job header* for maintaining each user's logical definitions and previously entered commands or program data for use by the new Command Recall feature. RSTS/E treats each job's header as a logical extension of the job, swapping both the job and its header in and out of memory as necessary. The new job header has no impact on a job's virtual address space, and is transparent to the job itself.

Each job running on RSTS/E V10.0 requires an additional 2K-word region of memory for its job header. As a result, the minimum SWAPMAX value for V10.0 is 34K-words, and the maximum is 66K-words, an increase of 2K-words over the SWAPMAX range defined for V9.7. If you are already using a SWAPMAX value larger than 32, then you will need to increase your system's SWAPMAX by 2K-words to account for the new job headers.

When you install V10.0, INIT.SYS will automatically rebuild the SWAP.SYS file to support the larger SWAPMAX minimum. On I & D space systems with SWAPMAX already defined to a value larger than 32, you can change the size of SWAPMAX during installation to reflect the 2K-word increase for job headers.

To increase the size of the SWAP1.SYS swap file, answer *YES* to the installation prompt:

```
Do you want _SY0:SWAP1.SYS created (at xxxx blocks)? <yes>
```

The installation procedure will create the SWAP1.SYS file at the correct size to support the same number of jobs at the new SWAPMAX size.

Use the INSTALL/SWAPFILE command to recreate the SWAP1.SYS file on a disk other than the system disk, or to recreate any other swap files (SWAP0.SYS or SWAP3.SYS) on your system.

See Task 1, Phase 5 of the *RSTS/E System Installation and Update Guide* for further information on creating swap files on your system.

1.2.8 LOGIN User Names

LOGIN has been enhanced to allow logging in using a (system) logical name instead of a PPN. You can now respond to LOGIN's `User:` prompt with a system logical name (without a trailing colon). The logical name specified must be a system logical that translates into a valid PPN. If the logical definition also includes a device, the device must be _SY: or _SY0:.

If the specified logical name is not translatable, translates to an invalid PPN, or translates to a device other than _SY: or _SY0:, then LOGIN.TSK will still prompt for a password and then display its `?Invalid entry - try again` message.

Like any system logical, those defined for use in LOGIN can also be used in a file specification. For example, the system logical name SMITH, defined as [10,30], can be used in response to LOGIN's `User:` prompt to log into account [10,30], and can also be used to reference a file in the [10,30] account on the public structure, such as SMITH:FILES.DAT. The combination of these two uses of a system logical can, in many cases, reduce or eliminate the need to know the actual PPN of a user's account.

You may want to define system logicals for all of the interactive accounts on your system, so that all users can log in using their own user names, similar to VMS. Note that system logicals use space in XBUF, so you may need to increase the size of XBUF to provide room for the additional system logicals. Also be aware that a large number of system logicals may degrade system performance.

In cases where you cannot define system logicals for all users on your system, you may still want to define logicals for certain accounts that are logged into frequently or by many users. For example, you could define a system logical DEMO for a special demonstration account on your system, so that users could log into the account by entering the user name DEMO, without needing to know the account's actual PPN.

1.2.9 New OPER Privilege

The new privilege, OPER (operator), has been added in V10.0 to control various operator functions in the new Operator/Message Services (OMS) package. With OPER privilege, a user can do the following:

- Start, stop and modify the OMS package
- Receive new operator messages and requests
- Reply to pending requests
- Display previous operator messages and requests

See Section 1.2.5 for details on the new OMS package.

Since OPER is a new privilege, the V10.0 installation procedure allows you to assign the new privilege to one or more accounts on the system. See Section 2.2 for further details.

The OPER privilege is supported like all other RSTS/E privileges. All monitor directives, DCL commands, and programs that manipulate or display privileges have been updated to include the OPER privilege.

1.2.10 Improved LOGIN Performance

Changes have been made to LOGIN.TSK and LOGIN.COM to reduce the time required to log in to a RSTS/E V10.0 system. The actual time saved is dependent on system load but should be visible to most users.

The following enhancements were made to improve overall LOGIN performance:

- LOGIN.TSK now looks up various files previously looked up via the F$SEARCH function by the system LOGIN.COM procedure. LOGIN.TSK passes information about these files to the [0,1]LOGIN.COM procedure via new bit flags in the P6 parameter.
- Because of the change described above, the system LOGIN.COM procedure has been greatly simplified. The P1-P5 parameters retain their same meanings as before but are, in some cases, superseded by bit flags in the new P6 parameter. Existing LOGIN.COM procedures that rely on those parameters will continue to work without change. Read the [0,1]LOGIN.COM file listing for an explanation of the parameters used by LOGIN.COM.
- Some of the actions performed by LOGIN after a user entered his or her password are now performed before the `Password:` prompt. While this does not actually improve overall LOGIN time, it shortens the perceived LOGIN time by reducing the delay between a user's password response and the DCL $ prompt.

NOTE

Note that using a pre-V10.0 [0,1]LOGIN.COM file with V10.0 may degrade overall login performance.

If you upgrade an existing RSTS/E system to Version 10.0, then the latest system-wide LOGIN.COM file installs as [0,1]LOGIN.00L. You must manually replace your existing [0,1]LOGIN.COM file with the newest one to gain the performance benefits described. Be sure [0,1]LOGIN.COM has a protection code of <104> and a run-time system of DCL whenever you replace an existing [0,1]LOGIN.COM file.

Use the following DCL command to ensure that [0,1]LOGIN.COM has the correct protection code and run-time system assigned:

```
SET FILE/PROTECTION=104/RUNTIME=DCL [0,1]LOGIN.COM
```

1.2.11 New DCL Commands and Qualifiers

This section describes new commands, qualifiers or features that have been added to DCL for V10.0.

1.2.11.1 New F$ENVIRONMENT Function

A new function, F$ENVIRONMENT, has been added to DCL for V10.0. This function, compatible with the VMS function of the same name, provides a way for a DCL command procedure to get information about the current DCL environment.

The format of the F$ENVIRONMENT function is:

value **= F$ENVIRONMENT(*item*)**

where *value* is the value returned by the function, and *item* is a string keyword which defines the type of information to be returned by the function. The function can be used in symbol assignments or within a DCL expression and follows the same rules as other DCL functions.

Table 1–3 lists each F$ENVIRONMENT item and its corresponding value.

Table 1–3: F$ENVIRONMENT Items and Values

Item	Value Returned
CAPTIVE	Returns the string TRUE if the user's job is running in a captive account, or FALSE otherwise.
CONTROL	When issued from a command procedure, returns the string C if SET CONTROL=C is in effect, or the null string if SET NOCONTROL=C is in effect. When issued interactively, CONTROL always returns the null string.
DATA	When issued from a command procedure, returns a string indicating the current DATA setting. Possible values are: DATA DATA/END_OF_DATA=c NODATA DATA/END_OF_DATA=c (c = end-of-data character) is returned only if an end-of-data character other than $ is in effect. When issued interactively, DATA always returns the null string.
DEFAULT	Returns as a string the user's current (logged-in) account (PPN) in the form [proj,prog].
DEPTH	Returns as an integer the current command procedure depth level. When issued interactively, DEPTH always returns 0. When issued from a command procedure, the DEPTH value returned is one greater than the level of the procedure that called it. Note: When issued from a batch job, DEPTH always returns 2 or greater.
ECHO	Returns a string indicating the current ECHO setting. Possible values are: ECHO NOECHO/WARNING NOECHO/NOWARNING
FREE_CHANNELS	Returns as an integer the number of DCL channels currently available, after taking into account any channels already in use.†
INTERACTIVE	Returns the string TRUE if the current job's access mode is *INTERACTIVE*, or FALSE otherwise.
LOG_FILE	Returns as a string the specification of the currently open log file, or a null string if no log file is open.

†DCL channels are used for the @ command (one per command procedure), the OPEN command (one per open file), and the F$SEARCH function when used with a wildcard filespec argument (one per command procedure).

(continued on next page)

Table 1–3 (Cont.): F$ENVIRONMENT Items and Values

Item	Value Returned
LOGFILE_PROMPT	Returns as a string the current DCL prompt displayed when a log file is open. LOGFILE_PROMPT returns the same string value as the DCL reserved symbol $LOGFILE_PROMPT.
MAX_DEPTH	Returns as an integer the maximum number of DCL command procedures that can be nested, without regard to any DCL channels currently in use.†
NOCONTROL	When issued from a command procedure, returns the string C if SET NOCONTROL=C is in effect, or the null string if SET CONTROL=C is in effect. When issued interactively, NOCONTROL always returns the null string.
ON_CONTROL_C	When issued from a command procedure, returns the string TRUE if an ON CONTROL_C THEN . . . command is in effect, or FALSE otherwise. When issued interactively, ON_CONTROL_C always returns the string FALSE.
ON_SEVERITY	When issued from a command procedure, returns a string indicating the severity level of the current ON <severity> THEN command. Possible values are: NONE (SET NOON) WARNING (ON WARNING THEN . . .) ERROR (ON ERROR THEN . . .) SEVERE_ERROR (ON SEVERE_ERROR THEN . . .) When issued interactively, ON_SEVERITY returns the string NONE.
PROCEDURE	Returns as a string the file specification of the command procedure currently executing. When issued interactively, PROCEDURE returns the null string.
PROMPT	Returns as a string the currently defined DCL prompt string. PROMPT returns the same string value as the DCL reserved symbol $PROMPT.
PROTECTION	Returns as an integer the user's default file protection code. If no default protection code has been specified, PROTECTION returns the system default protection code 60.
TIME_STAMP	Returns the string TRUE if log file time stamps are currently enabled, or FALSE otherwise. If a log file is not currently active, then TIME_STAMP returns the string FALSE.
VERIFY	Returns a string indicating the current VERIFY setting. Possible values are: VERIFY VERIFY/DEBUG NOVERIFY

†DCL channels are used for the @ command (one per command procedure), the OPEN command (one per open file), and the F$SEARCH function when used with a wildcard filespec argument (one per command procedure).

Many of the item values returned by F$ENVIRONMENT are designed to make it easy for a command procedure to save a current DCL setting and then restore it later. For example:

```
$ DATA_SAVE = F$ENVIRONMENT("DATA")
$ _SET NODATA
   .
   .
   .
$ SET 'DATA_SAVE'
```

For further details about the F$ENVIRONMENT function, see Chapter 3 of the *RSTS/E Quick Reference Guide*.

1.2.11.2 New ASSIGN/PORT Command

The ASSIGN/PORT command assigns a local LAT port on the RSTS/E node to a port and/or service on a remote terminal server. You must first create a local port with the CREATE/PORT command before you can assign it to a terminal server.

See Chapter 8 in the *RSTS/E System Manager's Guide* for more information about the ASSIGN/PORT command.

1.2.11.3 New CREATE/PORT Command

The CREATE/PORT command logically creates a local LAT port on the RSTS/E node. Only application ports can be created. The CREATE/PORT command can also be used to assign the new port to a terminal server, a remote service, and/or a remote port, and to specify whether or not connections will be queued. CREATE/PORT can also be used to assign a system logical or a user logical name to the new port.

See Chapter 8 in the *RSTS/E System Manager's Guide* for more information about the CREATE/PORT command.

1.2.11.4 New BACKUP/IMAGE Command

BACKUP/IMAGE is a new feature that allows the asynchronous copying of a file structured RSTS/E disk to another disk. You can use this feature to perform disk-to-disk backups or to copy a disk's data to a newer disk as part of upgrading your hardware.

BACKUP/IMAGE copies all accounts and files from the input disk to the output disk. It functions similarly to the SAVRES IMAGE option, although it operates at the file level of the disk instead of the cluster level. As a result, BACKUP/IMAGE does not require that the input and output disks be the same size and type; you can copy all of the accounts and files from any size disk to any other size disk provided, of course, that the output disk is large enough to hold all of the data from the source disk.

BACKUP/IMAGE uses the same asynchronous file copying technique used by the standard BACKUP command. As a result, BACKUP/IMAGE is very fast. For example, on an 11/83 system using a /BLOCK_SIZE value of 24576, BACKUP/IMAGE can transfer all of the accounts and files from one RD54 disk to another (approximately 293,000 blocks) in 23 minutes, an average transfer rate of 6.5 megabytes per minute.

The following example illustrates how you would use the BACKUP/IMAGE command to copy all of the data on SY: to DU1:

```
$ BACKUP/IMAGE _SY: _DU1: -
        /INITIALIZE=(ERASE,NOEXERCISE,CLUSTERSIZE=8) -
        /BUFFER_SIZE=MAXIMUM -
        /BLOCK_SIZE=MAXIMUM -
        /VERIFY
Please mount image output volume:
Press RETURN when ready:

This disk pack appears to be a RSTS/E formatted
disk with the following characteristics:

Pack ID :               IMAGE
Pack Cluster Size :     8
Pack is currently :     Private,
                        Update access on writes,
                        Level: 1.2

Proceed (Y or N)? Y
Writing accounts to image volume
Account [  0,  2] written to volume 1
Account [  0,  3] written to volume 1
   .
   .
   .
Writing placed files to image volume
File [  0,  1]RSTS96.SIL written to volume 1
File [  0,  1]RSTS97.SIL written to volume 1
   .
   .
   .
Writing non-placed files to image volume
File [  0,  1]CONFIG.SYS written to volume 1
File [  0,  1]TEST  .DCL written to volume 1
   .
   .
   .
Hooking the output volume
Account [  0,  1] verified against volume 1
File [  0,  1]RSTS96.SIL verified against volume 1
File [  0,  1]RSTS97.SIL verified against volume 1
%Verification failure for file data for file [0,1]SWAP1.SYS
File [  0,  1]SWAP1 .SYS verified against volume 1
   .
   .
   .
Please dismount image output volume
$
```

See Chapter 8 in the *RSTS/E System Manager's Guide* for more information about the BACKUP/IMAGE command.

1.2.11.5 New BACKUP/COPY Command

A new BACKUP/COPY command has been added to allow you to copy files, accounts or volumes from one disk to another using the BACKUP facility. BACKUP/COPY is a superset of the BACKUP/IMAGE command: BACKUP/IMAGE provides disk-to-disk full volume copying, while BACKUP/COPY lets you copy less than a full volume from one disk to another.

BACKUP/COPY is particularly useful when copying large amounts of data from one disk to another, or from one account to another. BACKUP/COPY offers higher performance than the standard COPY command (PIP), because of BACKUP's use of asynchronous I/O. As with the BACKUP, BACKUP/IMAGE and RESTORE

commands, BACKUP/COPY may degrade overall system performance to achieve its own high transfer rate.

For example, to transfer all of the files in the HELP$ account [0,2] on the system disk to account [0,2] on the private disk _DU1:, use the command:

```
$ BACKUP/COPY HELP$:*.* _DU1:
```

BACKUP/COPY will create the [0,2] account on _DU1:, and then transfer all of the files from HELP$ on the system disk to the new account on DU1:.

See Chapter 8 in the *RSTS/E System Manager's Guide* for more information about the BACKUP/COPY command.

1.2.11.6 New BACKUP Verify-Only Operation

The /VERIFY qualifier to the BACKUP command now accepts the argument =ONLY to perform a VERIFY operation on an existing backup set. Previously you could only perform a VERIFY operation as part of a BACKUP or RESTORE operation.

You can use the BACKUP/VERIFY=ONLY command to determine which files and/or accounts on a disk have changed since it was last backed up.

You can also use this feature to eliminate unnecessary rewinds and file searches when creating multiple backup sets on magtape. By delaying the VERIFY operation until all Backup sets have been created, you can avoid having to rewind the tape and skipping over other Backup sets.

You can use BACKUP/IMAGE/VERIFY=ONLY to verify that two disks are the same. You must do the BACKUP operation twice, first from disk A to disk B, then from disk B to disk A. One operation verifies that all the accounts and files on disk A are on disk B; the other, that all the accounts and files on disk B are on disk A.

In some cases, you may get some verification errors with the account attributes for [1,1] and [1,2] because DSKINT may have created those accounts and pre-extended them.

The actual order of files may be different on the two disks without causing any verification errors. The boot block is not verified. Also, if the two disks have different clustersizes then some account or file attributes may not verify correctly.

1.2.11.7 New /INITIALIZE Arguments for BACKUP and RESTORE

The /INITIALIZE qualifier, as part of the BACKUP or RESTORE commands, or in response to those command's volume mount prompts, will now accept the following new arguments:

=[NO]QUERY
=[NO]ERASE
=[NO]EXERCISE
=EXERCISE=n (n = 1, 2, or 3)
=CLUSTERSIZE=n (n = 1, 2, 4, 8, 16, 32, or 64)

This will allow you to have more control over the initializing of disks as part of a BACKUP or RESTORE operation, and will often eliminate having to perform these operations separately.

These arguments have the same meaning and use as the INITIALIZE command qualifiers by the same name. See the *RSTS/E System Manager's Guide* for more details.

1.2.11.8 Operator-Assisted BACKUP and RESTORE

The BACKUP/RESTORE package now provides the /ASSIST qualifier to allow operators to answer volume mount prompts during a BACKUP, RESTORE, BACKUP/IMAGE, or BACKUP/COPY operation. The /ASSIST qualifier requires that the new Operator Message Services (OMS) facility is installed and running.

This feature provides a powerful extension to the BACKUP/RESTORE package, as it now allows for Backup and Restore operations to run under Batch, with the assistance of a system operator to mount volumes as required.

The default is /NOASSIST. If you want to perform a BACKUP or RESTORE operation within a DCL command procedure running under Batch, be sure to specify /ASSIST to request operator assistance.

/ASSIST causes the normal volume mount prompt to be sent to OMS as an operator request. An operator replies to the volume mount request using the REPLY command. An operator can reply in any of the following ways:

- REPLY/ABORT terminates the operation, similar to typing Ctrl/Z in response to the mount prompt.
- REPLY/TO with text. If text is included with the reply, then the text is taken as the response to the mount prompt. An operator can reply with any valid response text to the prompt. For example, the following reply mounts the (next) backup volume on disk _DM0:, and initializes it using several initialization options:

  ```
  $ REPLY/TO=317 "_DM0:/INIT=(NOERASE,NOEXERCISE,CLUSTERSIZE=16)"
  ```

- REPLY/TO with no text. If no text is included with the reply, then the volume mount default is taken, the same as if the user had pressed Return to the mount prompt.

1.2.11.9 New /REPLACE=QUERY and /QUERY Options

By default, the RESTORE command prompts you before replacing any file it encounters on the output disk. Similarly, the /QUERY qualifier in the BACKUP and RESTORE commands prompts you for each file to select. Respond YES or NO to these prompts to indicate your choice for the file displayed.

In some instances, your response to these prompts is always the same, all YES or all NO. This can happen, for example, if you forget to include the /REPLACE or /NOREPLACE qualifier with RESTORE, causing the default /REPLACE=QUERY to force prompting for each possible file replacement encountered. In other cases, your response may become the same — all YES or all NO — after responding to a particular file prompt.

Rather than requiring you to answer each prompt, BACKUP now accepts an optional /ALL qualifier with your YES or NO reply. /ALL means apply this response to all future queries, thereby eliminating any further prompting. In the case of /REPLACE=QUERY, YES/ALL causes all remaining files to be replaced, while NO/ALL causes all remaining existing files to be skipped. In the case of /QUERY, YES/ALL causes all remaining files to be selected, while NO/ALL causes all remaining files to be skipped.

1.2.11.10 New DEASSIGN/PORT Command

The DEASSIGN/PORT command deassigns a local LAT port on the RSTS/E node from the remote terminal server to which it was assigned. Issuing the DEASSIGN/PORT command for a local port which has an active session will have no effect on that session.

See Chapter 8 in the *RSTS/E System Manager's Guide* for more information about the DEASSIGN/PORT command.

1.2.11.11 New DELETE/PORT Command

The DELETE/PORT command logically deletes a local LAT port on the RSTS/E node. If there is an active connection on the port when the DELETE/PORT command is issued, the port is marked for deletion, then deleted when the connection is over.

See Chapter 8 in the *RSTS/E System Manager's Guide* for more information about the DELETE/PORT command.

1.2.11.12 New FILE_UTILITY Overlay

The UU.FIL monitor directive is now heavily used in most file operations. To improve file performance, a new overlay called FILE_UTILITY can be loaded and unloaded from memory using the DCL commands LOAD/OVERLAY and UNLOAD/OVERLAY.

1.2.11.13 New /NOTIFY Qualifier for PRINT and SUBMIT

The /[NO]NOTIFY qualifier has been added to the PRINT and SUBMIT commands. Print or Batch entries created with the /NOTIFY qualifier will cause PBS to broadcast messages when there is a change to the entry's status. PBS will broadcast these messages to all terminals logged in under the entry's owner (PPN). Messages will be broadcast when:

- The entry starts.
- The entry completes.
- The queue deletes the entry.
- The print server processing a print entry goes offline.

By default, entries are created with /NONOTIFY.

1.2.11.14 New /[NO]OUTPUT Qualifier

The /[NO]OUTPUT qualifier has been added to most of the DCL SHOW commands (a few already supported it). This provides an easy way to direct the output of a SHOW command to a file or print device. The /NOOUTPUT format is convenient for checking a command for errors or warnings (typically within a command procedure); it suppresses all SHOW output, displaying only warning and error messages.

The following DCL SHOW commands now accept the /[NO]OUTPUT qualifier:

- SHOW CACHE
- SHOW COMMAND/SYSTEM
- SHOW DEVICE
- SHOW ENTRY
- SHOW FILE/SYSTEM
- SHOW JOB/PRIVILEGE
- SHOW LOGICAL

- SHOW PRINTER
- SHOW PORT
- SHOW QUEUE
- SHOW QUOTA
- SHOW SERVER
- SHOW SYSTEM
- SHOW TERMINAL

The following DCL SHOW commands, which already supported /OUTPUT, have been extended to support the NO prefix. Additionally, these commands no longer require a filename argument. If no filename is specified, then the information is displayed on the terminal (as if the qualifier had not been included).

- SHOW ACCOUNTS
- SHOW BUFFERS
- SHOW COUNTERS/LAT
- SHOW DEVICES/ALLOCATED
- SHOW DISKS
- SHOW FILES/OPEN
- SHOW JOBS
- SHOW LIBRARIES
- SHOW MEMORY
- SHOW NODE/LAT
- SHOW RECEIVERS
- SHOW RUNTIME_SYSTEMS
- SHOW SESSIONS/LAT
- SHOW SERVICE/LAT
- SHOW TERMINAL_SERVERS/LAT
- SHOW USERS

The following DCL SHOW commands do not support the /[NO]OUTPUT qualifier. If necessary, use the OPEN/LOG_FILE command to create a log file for saving the output of these commands:

- SHOW DATE
- SHOW DAYTIME
- SHOW SYMBOLS
- SHOW TIME

The following commands support the /OUTPUT qualifier to allow output to a file, but they do not support the NO prefix:

- DIFFERENCES
- DIRECTORY
- EDIT
- HELP

1.2.11.15 New RECALL Command

The RECALL command is used to:

- List all of the commands in the recall buffer (RECALL/ALL).
- Erase all of the commands in the recall buffer (RECALL/ERASE).
- Recall a command by its index number (RECALL n). For example, RECALL 1 recalls the most recently entered command.
- Recall a specific command by its leading text (RECALL string). For example, RECALL PRINT recalls the most recently entered PRINT command.

See the *RSTS/E V10.0 User's Guide* or use the online HELP command for complete details on use and format of the RECALL command.

1.2.11.16 New REPLY Command

The REPLY command is used by an operator to answer a pending request. The operator can complete the request, abort the request, or answer the request while keeping the request pending.

The REPLY command also supports the following VMS-compatible qualifiers:

- /ENABLE

  REPLY/ENABLE enables your terminal as an operator terminal for your current timesharing session, and displays any pending operator requests on your terminal.

- /DISABLE

  REPLY/DISABLE disables your terminal as an operator terminal. If your terminal was previously set as a permanent operator terminal (by issuing the command SET TERMINAL/OPERATOR/PERMANENT), then the terminal will become an operator terminal again as soon as you log off.

- /STATUS

  REPLY/STATUS displays the status of your terminal as an operator terminal, and displays any pending requests. If the terminal is not set to receive REQUEST/REPLY messages, then pending requests will not be displayed.

See the *RSTS/E System Manager's Guide* or the online HELP topic REPLY for more information.

1.2.11.17 New SET FILE Qualifiers

The SET FILE command now accepts the /[NO]IGNORE and /[NO]BACKUP qualifiers. These file attributes are used exclusively by the BACKUP command to ignore certain files during a backup operation, or to backup only a file's attributes (not its data). See Section 1.2.6 for more information about these new file attributes.

NOTE

These file attributes only apply to the BACKUP command, not to the BACKUP/IMAGE or BACKUP/COPY commands.

1.2.11.18 New SET OPERATOR_SERVICES Command

The SET OPERATOR_SERVICES command is used to change the current settings of the Operator/Message Services (OMS) package. See the *RSTS/E System Manager's Guide* or the online HELP topic SET OPERATOR_SERVICES for more information.

1.2.11.19 New SET PORT Command

The SET PORT command sets the characteristics of a LAT port on a RSTS/E node.

See Chapter 8 in the *RSTS/E System Manager's Guide* for more information about the SET PORT command.

1.2.11.20 New SET TERMINAL Qualifiers

Several new qualifiers and associated terminal attributes have been added to support Command Line Editing, Command Recall and the Operator/Message Services package:

- /INSERT

  Puts the terminal in INSERT mode, making it the default mode when you begin editing a line.

- /[NO]LINE_EDITING

  Enables or disables Command Line Editing at the program level.

- /OPERATOR_SERVICES

  Indicates that the terminal should receive operator messages (MESSAGES), operator requests (REQUESTS), both or neither.

- /OVERSTRIKE

  Puts the terminal in OVERSTRIKE mode, making it the default mode when you begin editing a line.

- /[NO]RECALL

  Enables or disables command line recall at the program level.

All of the above qualifiers can be specified with the /PERMANENT qualifier to maintain the attribute's setting when the terminal is not in use. You must have HWCTL privilege to specify /PERMANENT.

See Chapter 8 in the *RSTS/E System Manager's Guide* for more information about the SET TERMINAL command.

1.2.11.21 New SHOW ACCOUNT/FULL Fields

The SHOW ACCOUNT/FULL display now contains two new fields: UFD Size and UFD Used. UFD Size is the size of the account's directory in clusters. The value can range from 1 to 7 clusters, with the minimum being the value specified with the /SIZE qualifier on the CREATE/ACCOUNT command when the account was created.

The UFD Used field shows what percentage of the account's directory space is currently in use. The performance of file operations within an account will degrade as the used percentage approaches 100 percent.

1.2.11.22 New SHOW ENTRY Status: FORMS_WAIT

A new status has been added to the SHOW ENTRY display. FORMS_WAIT indicates that a Print or Batch entry cannot be started because its associated form is not currently installed on any print server assigned to the entry's queue. This new status keyword makes it easier to identify entries that require a forms change.

1.2.11.23 New SHOW ENTRY Qualifier

A new qualifier, /STATUS, has been added to the SHOW ENTRY command to allow you to select entries for display based on their current status.

The /STATUS qualifier accepts one or more status keyword arguments. If you specify multiple status keywords, then SHOW ENTRY displays those entries with any of the specified status.

See the *RSTS/E User's Guide* or use the HELP command for further information about the new /STATUS qualifier.

1.2.11.24 New SHOW OPERATOR_SERVICES Command

The SHOW OPERATOR_SERVICES command displays the current status and settings of the Operator/Message Services (OMS) package. See the *RSTS/E System Manager's Guide* or the online HELP topic SHOW OPERATOR_SERVICES for more information.

1.2.11.25 New SHOW PORT Command

The SHOW PORT command displays the characteristics of LAT ports on the RSTS/E node. By default, both interactive and application ports are displayed. The information shown includes the local port name, the port type (either interactive or application), the queued setting, the terminal server name, the remote service (if specified), the remote port (if specified), and the connection status.

If the port is not assigned to a terminal server, then only the local port name and type are displayed. If the port is assigned but not yet connected, the requested terminal server, remote service, and remote port are shown. If the port is waiting to connect, the connection status In Progress is shown. If the connection is queued, then the queue position is also displayed. If the port is connected, the terminal server, the remote service and the remote port to which it is actually connected are shown, and the job number is displayed.

See Chapter 8 in the *RSTS/E System Manager's Guide* for more information about the SHOW PORT command.

1.2.11.26 New SHOW REQUEST Command

The SHOW REQUEST command displays messages and requests stored in the Operator/Message Services (OMS) work file. You can select messages or requests for display based on a variety of selection criteria (for example, ID number, date, job or terminal number, or facility name). See the *RSTS/E System Manager's Guide* or the online HELP topic SHOW REQUEST for more information.

1.2.11.27 New START/OPERATOR_SERVICES Command

The START/OPERATOR_SERVICES command starts the Operator/Message Services (OMS) package. See the *RSTS/E System Manager's Guide* or the online HELP topic START/OPERATOR_SERVICES for more information.

1.2.11.28 New STOP/OPERATOR_SERVICES Command

The STOP/OPERATOR_SERVICES command shuts down the Operator/Message Services (OMS) package. See the *RSTS/E System Manager's Guide* or the online HELP topic STOP/OPERATOR_SERVICES for more information.

1.2.11.29 New CC Command

The CC command invokes the PDP-11 C compiler if it is installed. See the *Guide to PDP-11 C* for information.

1.2.11.30 New COPY /TRANSFER_MODE Qualifier

The COPY command now supports a new qualifier, /TRANSFER_MODE, to specify which transfer mode — block or record — should be used to copy the file to a remote node.

If the /TRANSFER_MODE qualifier is not specified, then the COPY command determines the most appropriate mode to use in transferring the file.

This qualifier only applies to network file copy operations. DCL displays an error if you include the qualifier with a local file copy command (no node name included in either the input or output file specifications).

For further details on network transfer modes, see Section 4.4.1.3.

1.2.12 New RSX Directive — MSDS$

The RSX directive Map Supervisor D-Space (MSDS$) allows a task to change the mapping of its supervisor mode D-space APRs. This directive can also provide information about the current mapping of the task's supervisor mode D-space APRs or about a library's current mode.

For further information on using the MSDS$ directive, see the *RSTS/E System Directives Manual*.

1.2.13 Easier BASIC-PLUS Installation

The installation and update of BASIC-PLUS run-time systems have been made easier in V10.0 If there are existing BASIC-PLUS run-time systems in SY:[0,1], then the BASIC-PLUS installation procedure will ask you if you want to update those run-time systems. If you do, then no further questions will be asked to update those run-time systems.

When you are creating new BASIC-PLUS run-time systems, you can use an existing BASIC-PLUS run-time system as a template, similar to the template feature used to build RSTS/E monitor SILs.

You can also create more than one BASIC-PLUS run-time system during the installation process.

See the *RSTS/E Installation and Update Guide* for further details.

1.2.14 New CUSP Resident Library

The original CSPLIB.LIB resident library, first included with RSTS/E V9.0 and used by many of the RSTS/E CUSPs, was built using BASIC-PLUS-2 V2.3. It was also shipped with the modules required for users to link their own applications against it.

For RSTS/E V10.0, there is a new CUSP resident library called CSP100.LIB. This library is built against BASIC-PLUS-2 V2.6. All of the RSTS/E CUSPs included with V10.0 that previously used the CSPLIB library have been rebuilt to use the new CSP100.LIB library.

The old CSPLIB.LIB resident library is no longer required by any of the RSTS/E V10.0 CUSPs, but is still included with RSTS/E V10.0 for any existing user programs that are linked against it. The SYSINI.COM procedure installs both CSP100.LIB and CSPLIB.LIB during system startup. The START.COM file includes a REMOVE/LIBRARY command, which has been commented out, to

remove the CSPLIB.LIB library. If you do not need the CSPLIB.LIB resident library on your system, then delete the exclamation point character from in front of the command to remove the library during start up.

The support modules to link applications against CSPLIB.LIB are no longer provided; only the support modules to link against CSP100.LIB are included with RSTS/E V10.0. Any new user programs that wish to make use of the CSP100.LIB library will have to be compiled using BASIC-PLUS-2 V2.6. Digital recommends that you do this; the CSPLIB.LIB library may not be included with future versions of RSTS/E.

1.2.15 New SORT/MERGE Release

RSTS/E V10.0 includes a new release of SORT/MERGE, SORT/MERGE V3.1. V3.1 is primarily a maintenance release, but includes substantially revised documentation. Refer to the SORT/MERGE documentation for complete information on installing and using SORT/MERGE V3.1.

Chapter 2

Differences Between V10.0 and V9.7

This chapter describes the differences between RSTS/E V10.0 and RSTS/E V9.7. For differences in layered products running on RSTS/E, see Chapter 4.

2.1 System Name

The edit level part of the system version number is now a single alphabetic character instead of a 2-digit number, for example, V10.0-L instead of V10.0-12. This change was necessary to provide room for the extra digit in the RSTS/E version number.

2.2 Installation

The following changes and enhancements have been made to the RSTS/E installation procedure for V10.0:

- Larger SWAPMAX Range

  The installation procedure has been changed to support the increased size of SWAPMAX (see Section 1.2.7). The new SWAPMAX range is 34K to 66K words.

- Improved Flag File Handling

  The installation procedure uses a new key for its flag files. The key now includes an edit level (baselevel) identifier along with the version number.

- Improved Multivolume Handling

  The installation procedure now handles multivolume media (such as 800 BPI magtapes and RL02 disks) more efficiently than before. The installation procedure will now prompt you to mount only those volumes required for the package(s) being installed.

  This improvement translates into reduced installation time, especially when selectively restoring packages from a multivolume kit.

  For RSTS/E V10.0, the RL02 and 800 BPI magtape installation media contain two volumes each; all other media types contain only one volume each. If you install a package that begins on a volume other than the currently mounted one, or if the package you are installing spans more than one volume, you will see a mount message similar to the following:

```
Please mount volume 2 on MM0:
Press RETURN to continue
```

Mount the volume indicated and press RETURN to continue the installation.

NOTE

You must still mount the first volume of your installation kit when doing an installation or upgrade. Since no RSTS/E V10.0 media requires more than two volumes, the change described above does not reduce the number of volumes you must mount. The main benefit of this change is the installation time savings resulting from not having to process all of the backup sets on a volume to locate a given package's backup file.

- Command Line Editing and Command Recall

  If you are performing an installation or an update on an ANSI Scope terminal (VT100, VT200 series, or VT300 series), then you can make full use of the new Command Line Editing and Command Recall features during the installation.

- Template Monitor Default

  Previously, when you were updating your system, the default for the `Use template monitor?` prompt was N because you were running under the SYSGEN monitor. Now, when you are running under the SYSGEN monitor, the update procedure will attempt to find the monitor you last installed on your system. If it finds a monitor other than SYSGEN.SIL, then the default for the `Use template monitor?` prompt will be Y, and that monitor's name will become the default for the `Template monitor's name?` prompt.

- BASIC-PLUS DEBUG Support

  The debugging feature of BASIC-PLUS, previously implemented by applying the feature patch described in Article 4.10.1 of the *RSTS/E V9.0 Maintenance Notebook*, is now a fully supported option of BASIC-PLUS and can be selected as a standard option during installation.

  The BASIC-PLUS installation procedure will now ask a new configuration question `Debug?`. If you answer YES to this question, then the BASIC-PLUS runtime-system created will include debugging support. Refer to Article 4.11.1 of the *RSTS/E V10.0 Maintenance Notebook* for further details on how to use the BASIC-PLUS debugging option.

  Note that including the Debug option will increase the size of your BASIC-PLUS runtime-system, and, depending on the other options selected, may cause it to grow larger than 16K words. Refer to the *RSTS/E System Installation and Update Guide* for guidelines on configuring the various BASIC-PLUS options.

- Old-Style SEND/RECEIVE Support

  The so-called old-format SEND/RECEIVE SYS( ) functions have been obsolete and their use discouraged for several releases. In V10.0, these SYS( ) functions have been removed from BASIC-PLUS to make room for other code. Users needing to include the old-format code can do so by answering `Y` to the `Old-style SEND/RECEIVE?` prompt during BASIC-PLUS installation.

  Note that including the old-format SEND/RECEIVE SYS( ) functions in a BASIC-PLUS run-time system may increase its size above the standard 16K limit. In such cases, you may need to remove other options to reduce the size under the 16K limit.

Digital recommends that you modify any programs that make use of the old-format SEND/RECEIVE SYS( ) functions to use the newer-format SEND/RECEIVE functions. See Chapter 8 of the *RSTS/E Programming Manual* for further information.

2.2.1 Support for OMS

OMS is a new installation package for RSTS/E V10.0. It is installed similarly to other optional system packages (like PBS). It is recommended that you install OMS as a standard component on your system as it provides system services for logging system events and communicating with operators. If you wish, you can continue using the OPSER package concurrent with OMS.

If you are updating a V9.*x* system and the OMS package is installed for the first time, you will be asked which accounts to assign the new OPER privilege. Answer this question with the account or list of accounts, separated by commas, to which you want to assign the OPER privilege. Wildcard accounts are accepted. You will not be asked this question if you are installing a new RSTS/E V10.0 system, because account [1,2] on the system disk will already have the OPER privilege.

NOTE

Initially, only the startup job on your system, the one created when timesharing is started, will have the OPER privilege (the startup job is always assigned all privileges). Assign the OPER privilege to any accounts you want to be able to issue privileged operator commands or perform operator functions with the OMS package.

2.2.2 START.COM File Changes

A new START.COM file is included with V10.0. The file contains new commands to:

- Start the new Operator/Message Services (OMS) package
- Define _KB0: as an Operator Terminal
- Send a message to OMS when START.COM is completed
- Load the new FILE_UTILITY monitor overlay
- Create and assign host-initiated LAT ports

If you are updating a RSTS/E V9.x system, be sure to copy these new commands from [0,1]START.00L into your existing START.COM file.

The commands to create and assign host-initiated LAT ports and to load the FILE_UTILITY overlay are optional and have been commented out. Remove the exclamation points from in front of these commands if you want to provide LAT ports or load the FILE_UTILITY overlay during startup.

NOTE

When adding commands to your START.COM file to create LAT ports for use as print servers in PBS, before you start PBS, you must create the required LAT ports. PBS expects any local LAT ports defined as print servers to have already been created when it initializes its print servers at startup.

Be aware that the commands to start up OMS are not commented out in START.COM. If you decide not to install OMS on your system, remove or comment out these commands to avoid generating errors during system startup.

2.2.3 Accounts for Optional Packages

Prior to RSTS/E V10.0, the RSTS/E installation procedure created accounts for all the RSTS/E optional packages, even those you did not select to install.

In V10.0, the installation procedure only creates accounts for the optional packages you select.

2.3 Monitor

This section describes changes to the RSTS/E monitor for V10.0.

2.3.1 Creating Temporary Files

When the CRTFQ (create temporary file) function is used, the new IGNORE attribute is set for the file. This causes those files created by the CRTFQ function to be automatically excluded from any BACKUP operations.

2.3.2 Larger Record I/O for Libraries and Regions

In previous versions of RSTS/E, when I/O was done to or from a library or a dynamic region, the entire buffer had to be mapped when the I/O operation was started. This sometimes limited the amount of data that could be read or written in a single I/O operation.

Beginning with V10.0, when doing I/O to or from a library or dynamic region, only the first word of the buffer need be mapped. The end address of the buffer must be within the bounds of the same library or region as the starting address, but does not have to be mapped. As a result, programs may now be able to read or write larger buffers in a single I/O operation.

2.3.3 Larger Magtape Recordsizes

RSTS/E V10.0 supports a new open mode (1024%) for ANSI magtape opens. This mode can be specified to use larger magtape recordsizes. When this mode is used and the recordsize value specified is 0, then the recordsize value is set equal to the specified blocksize value.

The BACKUP/RESTORE facility uses this new feature to extend its maximum magtape block size.

See the *RSTS/E Programming Manual* for further details.

2.3.4 New Local Object Type

A new single-instance Local Object Type, value 11, has been defined for use by the Operator/Message Services package.

2.3.5 MS Driver Changes

The driver for MS magtapes (TS11, TS05, TU80) has been changed in RSTS/E V10.0 to ignore records less than 14 bytes long when reading from tape. This was done to prevent the MS driver from accidentally interpreting random noise on the tape as a data record.

Note that the driver has never allowed records of less than 14 bytes to be written to tape.

2.3.6 SYS Call Changes

This section describes all of the SYS calls and monitor directives that have been changed for V10.0. See the *RSTS/E Programming Manual* and the *RSTS/E System Directives Manual* for complete details.

2.3.6.1 .LOGS

The .LOGS directive, Check for Logical Device Name, has been enhanced to support up to 15-character logical names. Logical names are now passed as five RAD50 words instead of three. The name is still passed beginning at offset XRLEN of the XRB.

In addition, three new logical and RAD50 translation subfunctions have been added to the .LOGS directive.

See the *RSTS/E System Directives Manual* for further details on the .LOGS directive.

2.3.6.2 .READA and .WRITA

In RSTS/E V10.0, the .READA (asynchronous read) and .WRITA (asynchronous write) directives no longer require TUNE privilege. If a program does not have TUNE privilege enabled, then it can only issue one .READA or .WRITA directive at a time. The monitor returns the error INUSE if a program without TUNE privilege issues an additional .READA or .WRITA directive while the first .READA or .WRITA directive has not yet completed.

Multiple .READA or .WRITA directives can still be issued from a job with TUNE privilege, as in previous versions. See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

Asynchronous I/O completions preempt the runburst of the current job if the current job has a priority below -64 or if the job issuing the asynchronous I/O has a priority above +64.

2.3.6.3 .ULOG

The .ULOG directive provides a mechanism for calling the three FIP functions UU.ASS, UU.DEA and UU.DAL without calling FIP directly or invoking any overlays. Changes to each of .ULOG's three subfunctions are summarized in the sections that follow. See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

2.3.6.3.1 UU.ASS

The UU.ASS directive, Assign User Logical, has been changed to support extended logicals. An additional subfunction to list user logicals by index number has also been added. See Chapter 3 of the *RSTS/E System Directives Manual.*

2.3.6.3.2 UU.DAL

The UU.DAL directive, Deallocate All Devices and Deassign User Logicals, has been enhanced to support extended logicals and provide a way to deassign user logicals without deallocating devices. See Chapter 3 of the *RSTS/E System Directives Manual.*

2.3.6.3.3 UU.DEA

The UU.DEA directive, Deallocate A Device or Deassign A User Logical, has been enhanced to support extended logicals. See Chapter 3 of the *RSTS/E System Directives Manual.*

2.3.6.4 UU.ATR

The UU.ATR Write Account Attributes directive now permits updating of an account's date and time of last interactive and noninteractive login field, provided they are currently null. If either field already contains a non-null value, then the field cannot be changed, as in previous versions.

This change allows BACKUP/IMAGE and RESTORE to correctly restore an account's date and time of last interactive and noninteractive login, so long as the account was just created or was never logged in to.

See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

2.3.6.5 UU.CHK

The UU.CHK directive now supports the new OPER privilege. Use UU.CHK to determine if a user has the OPER privilege enabled, or to map the OPER privilege keyword to or from its bit position in a privilege mask. See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

2.3.6.6 UU.CNV

The date and time conversion Sys call (used by TIME$( ) in BASIC-PLUS) now only recognizes time values in the range 0 to 2047, the low-order 12 bits of the time word. The high-order three bits are now ignored. Note that RSTS/E time values represent minutes until midnight, and should be in the range 0 to 1440. See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

2.3.6.7 UU.FCB

The following changes have been made to the UU.FCB directive:

- The terminal DDB (device data block) layout and contents have changed for V10.0. As a result, the UU.FCB directive, subcode 0, will return different data for a terminal open on a specified channel. See the *RSTS/E V10.0 Internals and Data Structures Manual* for further information about terminal DDBs.

- The data returned by UU.FCB subcode 1 now includes the device name, filename and filetype of the file open on the channel specified. This allows a calling program to get information about the file opened on the specified channel.

  The file's device name is returned in the standard device offsets FQDEV and FQDEVN. The file's PPN, name and type (in that order) are returned in four consecutive words starting at offset FQNAM1+2.

See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

2.3.6.8 UU.FIL

The following changes have been made to the UU.FIL directive:

- The UU.FIL directive has been enhanced to support setting and clearing the new [NO]BACKUP and [NO]IGNORE file attribute flags. These flags are described in Section 1.2.6.
- When requested, the UU.FIL directive could set the DLA/DLW of a file if the file was currently closed, but not if it was opened. This is now available as an option, and the DLA/DLW can now be set whether the file is opened or closed.

See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

2.3.6.9 UU.JOB

The UU.JOB (Create Job) directive now updates the noninteractive date/time of last login when spawning a logged-in job. See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

2.3.6.10 UU.LIN

The UU.LIN (LOGIN) directive now records both the interactive and noninteractive date and time of last login. It also updates the date and time of last interactive login for logins at a physical terminal or pseudo keyboard, and updates the date and time of last noninteractive login for Batch or Network Server logins.

See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

2.3.6.11 UU.SLN

The UU.SLN directive has been enhanced to support extended logicals up to 15 characters long. See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

2.3.6.12 UU.SWP

The UU.SWP (Remove System File) directive now returns an indicator if no overlay or error file was added, allowing the calling program to determine whether the call actually removed the requested file. See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details.

2.3.6.13 UU.TB3

The system's hardware configuration word now contains a bit which indicates whether or not the system includes FIS hardware. See the *RSTS/E System Directives Manual* or the *RSTS/E Programming Manual* for details on how to access this new bit.

2.3.6.14 UU.TRM

New terminal attributes bits are now defined to control:

- Line editing (LINE_EDITING)
- Command recall (RECALL)
- Line editing mode (INSERT or OVERSTRIKE)
- Operator requests (OPERATOR=REQUESTS)
- Operator messages (OPERATOR=MESSAGES)

Note that the new LINE_EDITING and RECALL attributes only control those features within a program.

All of the new terminal attribute bits have permanent and temporary settings. Use the SET TERMINAL command to enable or disable the new attributes, and the SHOW TERMINAL/FULL command to display their current state. See the *RSTS/E User's Guide* or use the online HELP command for more information on the use of these commands to manage the new attributes.

See the *RSTS/E Programming Manual* for information on how to set, clear, or read these new terminal attributes within a program.

2.4 DCL

This section describes changes to the DCL run-time system and its associated commands and services for V10.0.

2.4.1 ALLOCATE Command

The ALLOCATE command now accepts the qualifier /[NO]QUEUED when allocating a terminal defined as a local LAT port. This qualifier temporarily sets or clears the queueing characteristic on the local LAT port you are allocating. This queued setting remains in effect only until you deallocate the device.

The /[NO]QUEUED qualifier is only valid if the device being allocated is a local LAT port.

If /QUEUED is specified, connections initiated by this local LAT port to a terminal server will be placed on the server's queue if the server supports queueing and the remote port is currently busy. If /NOQUEUED is specified, connections will not be queued and will fail if the remote port is busy.

Use the SHOW PORT command to display the port's connection status and queued setting status. If the port is set /QUEUED, and the server is busy, a connection status of In Progress and the connection's position in the queue will be shown.

If this qualifier is not specified, the queued setting that was specified when the port was created or assigned will be used.

2.4.2 ASSIGN Command

The following qualifiers have been added to the DCL ASSIGN command for V10.0:

- /USER

  The /USER qualifier indicates a user logical assignment.

  This qualifier is provided primarily for completeness; if you do not specify /USER or /SYSTEM, then the command assigns a user logical, as it did previously. You can include the /USER qualifier in DCL command procedures to explicitly state the type of logical assignment you are making.

- /[NO]REPLACE[=QUERY]

  The /[NO]REPLACE[=QUERY] qualifier is now available for assigning user logicals.

2.4.3 CREATE/ACCOUNT Command

The CREATE/ACCOUNT command now supports the OPER and NOOPER keywords as arguments to the /PRIVILEGES qualifier.

2.4.4 DEASSIGN Command

The DEASSIGN command now accepts the /USER qualifier to indicate a user logical deassignment.

This qualifier is provided primarily for completeness; if you do not specify /USER or /SYSTEM, then the command deassigns a user logical, as it did previously. You can include the /USER qualifier in DCL command procedures to explicitly state the type of logical deassignment you are making.

Both DEASSIGN/USER and DEASSIGN/SYSTEM display the `%Logical not found` warning message if the logical name you specify is not assigned. In previous versions, DEASSIGN/SYSTEM displayed an error message.

2.4.5 DEFINE/COMMAND/SYSTEM Command

The DEFINE/COMMAND/SYSTEM command now accepts the /[NO]REPLACE=QUERY qualifier to control replacing system commands that already exist. The qualifier works the same as the /[NO]REPLACE=QUERY qualifier for other DCL commands such as COPY and RENAME. The default is /NOREPLACE, as in previous versions.

See the *RSTS/E System Manager's Guide* for details.

2.4.6 DIRECTORY Command

The DIRECTORY command has been updated for V10.0 to show the status of the new [NO]IGNORE and [NO]BACKUP file attributes when a /FULL listing is requested.

In addition, the DIRECTORY/FULL display now includes each file's open count.

2.4.7 HELP Files

All HELP files have been updated to reflect new DCL commands or qualifiers or additions to existing DCL commands. The following other changes are noted:

- The new topics Command Recall and Line Editing have been added to provide help for the new Command Line Editing and Command Recall features.
- The topic Keys has been revised to include the new key definitions related to Command Line Editing and Command Recall.
- The RA70 and RA90 disks have been added to the Advanced Disks topic, and the (unsupported) RP02 and RP03 disks have been removed.

2.4.8 INITIALIZE Command

- The INITIALIZE command for disks now sets the new IGNORE file attribute for the files [0,1]BADB.SYS and [0,1]SATT.SYS. This excludes these files from BACKUP operations.
- In previous versions, INITIALIZE would fail with a `?DSKINT` allocation failure error if you attempted to initialize a virtual disk smaller than 16 blocks. While a virtual disk this small is legal, it can only be used as a non-file-structured disk; it cannot be initialized because it is too small to hold a minimal RSTS/E file structure.

  For V10.0, if you attempt to initialize the virtual disk smaller than 16 blocks, INITIALIZE will display the following more useful error message:

```
?Disk too small to be RSTS file-structured
```

2.4.9 INQUIRE Command

If you specify INQUIRE/TIMEOUT and the command times out, DCL deletes any characters typed up to the point of timeout.

2.4.10 LINK Command

The DCL LINK command has been enhanced to add the following qualifiers in support of PDP-11 C for RSTS/E:

- /CC

  Indicates object files created by the PDP-11 C compiler

- /STACK=n

  Specifies the size of the executable program's stack space, in words. The /STACK qualifier corresponds to the STACK=n option in TKB. See the *RSTS/E Task Builder Reference Manual* for further details.

2.4.11 LOAD/OVERLAY Command

The LOAD/OVERLAY command now supports the overlay keyword FILE_UTILITY. See Section 1.2.11.12 for more details.

2.4.12 MOUNT/REBUILD Command

Error checking in the MOUNT/REBUILD command has been improved. The clustersizes of [0,1]BADB.SYS and [0,1]SATT.SYS are now verified to ensure that they are the same as the pack clustersize.

2.4.13 PRINT Command

The /[NO]NOTIFY qualifier has been added. See Section 1.2.11.13 for further details.

2.4.14 REQUEST Command

The REQUEST command has been changed for V10.0 to communicate with the new Operator/Message Services (OMS) package. REQUEST now allows you to send requests that require a reply from an operator.

When you include the new /REPLY qualifier with your request, your job is stalled until one of the following events occur:

- An operator replies to your request.
- An operator terminates your request.
- You type Ctrl/C to terminate your request.

You can also include the /TIME_OUT qualifier with /REPLY to specify the maximum time (in minutes) that the command will wait for a reply. If no response is received in the specified time, then the request is terminated. This is especially useful when issuing REQUEST/REPLY commands within a Batch job.

Note that the REQUEST command no longer communicates with the OPSER package. If you issue a REQUEST command and OMS is not running, then the following error is displayed:

```
?Operator/Message Services not running
```

Users who want the REQUEST command to continue dispatching to the OPSER package can redefine the command (in their LOGIN.COM file) as:

```
$ REQ-UEST == "CCL PLEASE"
```

See the *RSTS/E User's Guide* or the online HELP topic REQUEST for more information about the REQUEST command.

2.4.15 SET ACCOUNT Command

The SET ACCOUNT command now accepts the keywords OPER and NOOPER as arguments to the /PRIVILEGES qualifier.

2.4.16 SET JOB/PRIVILEGE Command

The SET JOB/PRIVILEGE command now accepts the keywords OPER and NOOPER.

2.4.17 SET NODE/LAT Command

The SET NODE/LAT command now accepts the qualifier /ACCESS to specify whether connections via the terminal server should be treated as LOCAL or DIALUP.

Most terminal servers send the host system their proper access type when a connection is established. However, not all terminal servers do so. For example, DECnet/DOS LAT connections do not currently supply an access type when a connection is made from an MS-DOS system. In such cases, RSTS/E by default treats the connection as DIALUP for security.

The new /ACCESS qualifier lets the system manager decide how such terminal server connections should be treated by the system.

Note that this qualifier only determines the access type for terminal servers that do not supply an access type. If a terminal server does include an access type with its connection, RSTS/E will ignore any /ACCESS setting and use the access type supplied by the server instead.

CAUTION

Setting the access type to LOCAL for a terminal server that provides access to the system via dialup lines could compromise security. For example, if your system normally requires a system password for DIALUP access, and you have ACCESS=LOCAL in effect, then any user dialing into your system through a terminal server that does not supply its own access type will be able to log in without entering the system password.

2.4.18 SET SYSTEM Command

The /SWAP_MAXIMUM qualifier argument range has been increased by two, from the current 32K to 64K words to 34K to 66K words, to account for the new job header region described in Section 1.2.7.

2.4.19 SET TERMINAL Command

The following changes have been made to the SET TERMINAL command for V10.0:

- SET TERMINAL no longer allows the qualifiers /HOST_SYNC and /RESUME=ANY to be used together. These qualifiers now conflict. A terminal that has the HOST_SYNC attribute enabled cannot be set to RESUME=ANY and vice versa.
- SET TERMINAL no longer allows the qualifiers /AUTOBAUD and /ANSWERBACK to be used together. These qualifiers now conflict. A terminal that has AUTOBAUD enabled cannot be set to ANSWERBACK and vice versa.
- The SET TERMINAL/DEVICE=terminal_type command no longer affects the terminal's ESCAPE_SEQUENCE attribute. Previously, all device macros set the terminal to NOESCAPE_SEQUENCE.
- The SET TERMINAL qualifier /BUFFER_QUOTA, used to change a terminal's character buffer quota, now requires the /PERMANENT qualifier. This limits control of a terminal's buffer quota to users with HWCTL privilege.

- The terminal input buffer quota range has been changed. Previously, a terminal's buffer quota could be set from a minimum of 180 characters to 7650 characters. The new buffer quota range is 168 to 7140 characters.
- Several new qualifiers have been added to SET TERMINAL to enable and disable the new terminal attributes defined in V10.0. See Section 1.2.11.20 for more information on the new terminal attributes.

2.4.20 SHOW ACCOUNT Command

The SHOW ACCOUNT command now lists the OPER privilege (if enabled) in its /FULL display.

Also, the /FULL display includes two new fields: UFD size and UFD used. See Section 1.2.11.21 for more details.

2.4.21 SHOW DEVICE Command

The SHOW DEVICE command now properly reports disks that were disabled by INIT during system startup.

2.4.22 SHOW JOB/PRIVILEGES Command

The SHOW JOB/PRIVILEGES command now lists the OPER privilege (if enabled).

2.4.23 SHOW LOGICALS Command

The following changes have been made to the SHOW LOGICALS command for V10.0:

- By default, the SHOW LOGICALS command now displays both user and system logicals. Previously, it displayed only user logicals.
- The /USER qualifier has been added to display only user logicals. Use /SYSTEM as before to display only system logicals.
- If you specify a logical name parameter that contains no wildcard characters, SHOW LOGICALS will display only those logicals (user or system) that exactly match the name given. Previously, SHOW LOGICALS displayed all logicals that matched the parameter up to the number of characters entered. This change was made to make the SHOW LOGICALS command more consistent with the DIRECTORY command and other DCL SHOW commands.

  For example, in V9.7 and earlier, the following command displayed all logicals beginning with the character W:

  ```
  $ SHOW LOGICALS W
  ```

  In V10.0, only the system or user logical named W is displayed. You must now include wildcard characters (? or *) in the logical name parameter to select multiple logicals for display, such as W* to display all logicals that begin with W.

2.4.24 SHOW SYSTEM Command

When changes are made, the SHOW SYSTEM command now displays a three-column listing of the changes that take effect at rebooting.

2.4.25 SHOW TERMINAL Command

In a SHOW TERMINAL/FULL listing, the new terminal attributes listed in Section 1.2.11.20 are included (in alphabetical order) in the list of terminal attributes.

In addition, since Command Line Editing requires that the terminal be set to ANSI, SHOW TERMINAL includes the following status message at the end of its display if LINE_EDITING and NOANSI are in effect:

```
Line Editing is not available (No ANSI)
```

2.4.26 SUBMIT Command

The /[NO]NOTIFY qualifier has been added to the SUBMIT command. See Section 1.2.11.13 for further details.

2.4.27 UNLOAD/OVERLAY Command

The UNLOAD/OVERLAY command now supports the overlay keyword FILE_UTILITY. See Section 1.2.11.12 for more details.

2.5 BACKUP/RESTORE Package

Besides the new BACKUP/IMAGE and BACKUP/COPY commands, several other changes and enhancements have been made to the BACKUP/RESTORE facility for V10.0:

2.5.1 Larger Block Sizes

BACKUP/RESTORE can now read and write backup sets with block sizes up to 28,672 bytes. The /BLOCK_SIZE qualifier now accepts arguments in the range 2048 to 28672. The default /BLOCK_SIZE value for tapes has been increased to 16384 for the BACKUP command. For disks, the default /BLOCK_SIZE value is 28672 for the BACKUP command. The default /BLOCK_SIZE value for the new BACKUP/IMAGE and BACKUP/COPY commands is 28672 (the maximum).

Larger block sizes provides the following key benefits:

- Reduced backup set size on both disks and tapes. Fewer block headers (data written at the beginning of each block) are required when using larger block sizes and reduced backup set size on tape.
- Larger block sizes means fewer interrecord gaps on the tape so more data can be stored on a given tape.
- Improved overall BACKUP/RESTORE performance. Larger block sizes reduces the CPU overhead required to manage blocks within a backup set.

- Improved VMS BACKUP compatibility. Backup sets created on VMS with larger block sizes (8192 is the default block size for tape backup sets on VMS) can now be successfully restored on RSTS/E.

Note that specifying a larger /BLOCK_SIZE value may require more memory (dynamic region) to complete the operation, as described below.

NOTE

When creating a backup set that will be restored on an earlier version of RSTS/E (pre-V10.0), be sure to specify a /BLOCK_SIZE value less than or equal to the maximum value permitted by that version. For example, if you create a magtape backup set to be restored on a V9.7 system, specify /BLOCK_SIZE=4080 (the maximum magtape block size allowed in V9.7).

2.5.2 Larger Buffer Sizes

The maximum /BUFFER_SIZE value has been increased from 127 to 255. The default is the minimum memory required to support the block size of the backup set.

Specifying a larger buffer size will reduce the total time required to complete a backup or restore operation and will also improve overall system performance during the operation.

2.5.3 Improved Exit Status

BACKUP now exits with status SUCCESS only if it successfully completes its operation and issues the final dismount message. BACKUP exits with status ERROR if the backup or restore operation is not completed, for example, if you type Ctrl/Z at the prompt for next disk or tape volume, or type Ctrl/C during an in-progress operation.

This change also improves the RSTS/E installation process. For example, prior to V10.0, if you mounted the wrong distribution media in response to a volume prompt (as part of a RESTORE operation), but then mounted the correct volume, the RESTORE operation would complete successfully but the installation itself would fail because RESTORE exited with an error. Now, the installation would proceed because RESTORE would exit with status SUCCESS, even though an error was generated during the volume mounting phase of the RESTORE.

2.5.4 Pre-extended Disk Files

During file transfers to small, slow disks such as the RX50 and RX33, files will be pre-extended on creation, then truncated to their proper size after the data is transferred. This saves time by eliminating the disk seeks associated with extending the files in small steps.

2.5.5 Temporary Privileges

BACKUP.TSK now requires temporary privileges. Therefore, the V10.0 installation procedure will set the protection code of the file [0,1]BACKUP.TSK to <232>.

2.5.6 LOGIN Date/Time Attribute Updated

BACKUP will now update an account's date/time of last interactive and non-interactive login, provided the account being restored on the target disk (via the RESTORE, BACKUP/IMAGE or BACKUP/COPY command) is a newly created account and has not been logged into before.

If the account being restored on the target disk already exists and has been logged into, then the target account's current date/time of last login information is not changed.

2.5.7 TUNE Privilege No Longer Required

The BACKUP and RESTORE commands no longer require TUNE privilege. Users without TUNE privilege can now execute these commands as well as the new BACKUP/IMAGE and BACKUP/COPY commands, but will not achieve the same high level of performance as those with TUNE privilege. Also, users without TUNE privilege cannot specify the /BUFFER_SIZE qualifier; instead, the minimum buffer size required for the backup set's block size is used.

BACKUP/RESTORE originally required TUNE privilege because it uses asynchronous I/O to perform all of its disk and tape I/O. The monitor required TUNE privilege to execute the .READA and .WRITA (asynchronous) I/O directives. In V10.0, the monitor permits asynchronous I/O calls from jobs without TUNE privilege, but restricts those calls to only one read/write request at a time. See Section 2.3.6.2 for further details on this monitor change.

2.5.8 INSTAL Privilege No Longer Required

If a user does not have INSTAL privilege, and the system's DYNAMIC_REGION_LIMIT is set lower than the /BUFFER_SIZE value required, BACKUP/RESTORE will automatically reduce the /BLOCK_SIZE and /BUFFER_SIZE values to the maximum allowed by the DYNAMIC_REGION_LIMIT. BACKUP/RESTORE displays an informational message. For example:

```
Not enough free memory, block size reduced to 4098
Dynamic region size is 5K-words
```

If the system's DYNAMIC_REGION_LIMIT value is too small to support the minimum buffer size required, BACKUP/RESTORE displays the following error message and exits:

```
?Not enough free memory to create dynamic region
```

See the *RSTS/E System Manager's Guide* for more information about the SET SYSTEM command's /DYNAMIC_REGION_LIMIT qualifier.

2.6 Print/Batch Services (PBS)

Several enhancements have been made to the Print/Batch Services (PBS) package for V10.0, as explained in the next few sections. See also Section 1.2.11.13.

2.6.1 SHOW ENTRY Display Format

The format of the SHOW ENTRY brief and full displays has been changed to use column headings instead of field keywords, so that more information can be displayed on the first line of each entry's display. With this change, it is no longer necessary to specify /FULL to display a print entry's form name.

This change, coupled with the new /STATUS qualifier and FORMS_WAIT entry status, lets you quickly find entries that are waiting for a forms change, and see which forms are required.

Also, the SHOW ENTRY full display format now displays /NOTIFY if the request was created with the /NOTIFY qualifier.

2.6.2 Automatic File Compression

Previously, PBS compressed its workfile only at start up. PBS now performs automatic compression of its work file, PBS$:PBS.SYS. Compression occurs periodically, based on the number of PRINT or BATCH entries deleted from the file since the last compression. Entries are deleted as they are completed, or when they are explicitly deleted with a DELETE/ENTRY command.

If you issue a PRINT or SUBMIT command while PBS is compressing its workfile, you may receive a (Waiting for acknowledgment...) message, indicating that PBS has not yet received your request. In most instances, PBS will respond to a PRINT or BATCH request in less than one minute.

With the addition of this feature, it is no longer necessary to periodically stop and restart PBS as described in article 15.1.4 of the August 1987 Software Dispatch.

2.6.3 New User Request Packet Field

A new /[NO]NOTIFY field has been added to the User Request Packet interface for PBS. See Chapter 10 of the *RSTS/E Programming Manual* for further information.

2.6.4 Batch Exit Status

Two changes have been made to the PBS Batch Processor in V10.0 that provide better control over error handling within a batch job:

- Batch jobs now exit with the same status as the exit status of the job's COM file, instead of the most severe status detected by the monitor during execution.

  For example, consider the following COM file executed in a batch job:

```
$ _Set NoOn                              ! Disable error handling
$ _Write 0 "?This is an error line"      ! Force status ERROR
$ _Exit 1                                ! Exit with status success
```

  Prior to V10.0, this batch job would exit with status ERROR, even though the COM file itself exited with status SUCCESS. This happened because the monitor returned ERROR as the most severe status seen during execution of the batch job.

- Batch jobs that execute multiple COM files will now exit whenever any of the job's COM files exit with a status of ERROR or SEVERE_ERROR. Prior to V10.0, all of the COM files included in the batch job would execute, even if one of them exited with status ERROR or SEVERE_ERROR.

  For example, consider the following COM files included in a batch job:

```
$!FILE1.COM
$ _Write 0 "?This is an error line"    ! Force exit status of ERROR
$ _Stop                                ! This command is never reached

$!FILE2.COM
$ _Write 0 "Processing FILE2.COM"      ! Say we got here
$ _Exit                                ! All done
```

  Prior to V10.0, if the above COM files were submitted with the following command, then the FILE2.COM file would be executed, even though FILE1.COM exited with status ERROR:

```
$ SUBMIT FILE1,FILE2
```

  In V10.0, the batch job exits immediately after the FILE1.COM file completes. FILE2.COM is not executed.

2.6.5 PBS Operator Messages

PBS has been enhanced to send messages to the new Operator/Message Services (OMS) package to notify operators of various events of interest. PBS will send a message to OMS when any of the following events occur:

- A Print or Batch entry starts.
- A Print or Batch entry completes.
- A Print or Batch entry is deleted.
- A print server goes off line while processing an entry.
- When one or more Print entries are waiting for a forms change (entries with status FORMS_WAIT; see Section 1.2.11.22).

For entries requiring a forms change, PBS will send a message to OMS the first time it finds an entry in a FORMS_WAIT state. PBS will continue sending reminder messages at increasing intervals, from once every 30 minutes to once every six hours, until there are no more entries waiting for a forms change.

PBS sends its messages to OMS with the facility name PBS. If messages are being saved in the OMS work file, you can display all messages sent from PBS by issuing the following command:

```
$ SHOW REQUESTS/NOREPLY/FACILITY=PBS
```

2.7 Commonly Used System Programs (CUSPs)

This section describes CUSPs that have been changed for V10.0.

2.7.1 ANALYS

The following enhancements have been made to the ANALYS program for V10.0:

- The special flag characters ! (LAT) and * (dialup) have been appended to the appropriate keyboards in the job status display.
- The system up-time display is now compatible with that used by SYSTAT.
- Locked block information is now included in the open files display.
- ANALYS now produces a list of devices similar to that created by the DCL SHOW DEVICE command.
- ANALYS now displays information about the use of cache, similar to that created by the DCL SHOW CACHE command.

2.7.2 DIRECT

Directory listings that include the symbolic attributes now also display the new [NO]IGNORE and [NO]BACKUP file attributes.

2.7.3 DSKCVT

The DSKCVT program has been updated to support the new OPER privilege:

- You must have OPER privilege enabled to run the DSKCVT program, otherwise DSKCVT displays an error message and exits.
- When assigning privileges to accounts, DSKCVT assigns the new OPER privilege to all [1,*] accounts.

2.7.4 DSKINT

- The DSKINT program has been modified to set the IGNORE file flag for the [0,1]BADB.SYS and [0,1]SATT.SYS files created during disk initialization.
- If you attempt to initialize the virtual disk smaller than 16 blocks, DSKINT will display the following error message:

```
?Disk too small to be RSTS file-structured
```

2.7.5 DSKSEK

The DSKSEK program has been updated for V10.0 to support RA90 disks.

2.7.6 Error Package

The Error package has been enhanced for V10.0 to include support for RA70 and RA90 disks.

2.7.7 LOGIN

Several changes and enhancements have been made to LOGIN for V10.0:

- LOGIN now displays both the date and time of last interactive and last noninteractive logins. All local, dialup and SET HOST logins update the date and time of last interactive login. Batch and network server logins update the date and time of last noninteractive login.
- LOGIN now accepts a system logical name in response to its `User:` prompt, allowing users to log in by name. See Section 1.2.8 for further details.
- LOGIN performance has been improved by moving some of the LOGIN tasks from the system login command file [0,1]LOGIN.COM into LOGIN.TSK. See Section 1.2.10 for further details.
- LOGIN now sends its messages to OMS instead of OPSER. If OMS is not running, LOGIN broadcasts its messages to _KB0: (the system console).

  If messages are being logged in the OMS Log file, you can display messages from LOGIN by issuing the following command:

  ```
  $ SHOW REQUEST/NOREPLY/FACILITY=LOGIN
  ```

2.7.8 LOGOUT

LOGOUT now sends messages to OMS instead of OPSER. If OMS is not running, LOGOUT broadcasts its messages to _KB0: (the system console).

If messages are being logged in the OMS Log file, you can display messages from LOGOUT by issuing the following command:

```
$ SHOW REQUEST/NOREPLY/FACILITY=LOGOUT
```

2.7.9 ODT

Several enhancements have been made to the ODT program residing in the AUXLIB$: account. The program is now built using BASIC-PLUS-2, and has a .TSK extension.

In previous releases, a user could get write access to memory or files by using LINE FEED as the delimiter. In V10.0, in addition to the LINE FEED key (or Ctrl/J), you can use a new switch, /[NO]WRITE, to specifically request read-write access or read-only access. Including the /WRITE switch in the command has the same effect as terminating the command with LINE FEED. Pressing Return to end the command has the same effect as /NOWRITE. The switch, when present, always overrides the command terminator.

The type of access granted is displayed in an informational message, for instance `Access is READ WRITE`. Occasionaly you may request write access, but for some reason can not be granted this access. In this case, you first receive a warning message giving the reason for the restricted access, followed by a second message, `Access is READ ONLY`.

You can also type HELP at the `File<MEMORY>?` prompt to get an overview of the options available at the main prompt. If you happen to have a file called HELP (with no extension) in your account and you wish to work on that file, simply include the period (.) in the file name to signify the file HELP. as distinct from the HELP command.

2.7.10 ONLCLN

The clustersizes of [0,1]BADB.SYS and [0,1]SATT.SYS are now verified to ensure that they match the pack clustersize.

2.7.11 OPSER Package

Two new OPSER commands are included with V10.0 to disable features that were previously disabled via feature patches in V8.0 and earlier. These feature patches, 14.6.1 and 14.10.1, were removed in V9.0.

- QUMRUN feature patch 14.6.1, Disabling `Job with different form name waiting` message, has been replaced by the OPSER command NOFORMS_WAIT. By default, forms waiting messages are broadcast to the Operator Services Console. Issue the NOFORMS_WAIT command to disable the forms waiting message. Issue the command FORMS_WAIT to reactivate the forms waiting message.
- SPLRUN feature patch 14.10.1, Eliminating extra form feeds on special forms, has been replaced by the OPSER command NOFORM_FEED. By default, two form feeds are printed at the beginning of each print job. Issue the NOFORM_FEED command to eliminate one of the form feeds. Issue the command FORM_FEED to reactivate the extra form feed.

If you plan to use these new commands, include them in the OPSER startup section of the system START.COM file. However, you can also issue these commands once OPSER has started (and detached), by issuing them as a qualifiers to the PLEASE utility. For example:

```
$ PLEASE/NOFORMS_WAIT
COMMAND SENT TO 'OPSER'
Forms Waiting messages DISABLED

$
```

2.7.12 PIP.SAV

The following enhancements have been made to PIP for V10.0:

- A new directory listing switch /MDELETE is now available to display files that are marked for deletion. The switch can be abbreviated to /MD.
- All file attributes are now preserved when a file is copied from disk to disk. This includes all caching flags, the NODELETABLE flag, and the new [NO]IGNORE and [NO]BACKUP flags.
- The /LI:S directory option now includes the new [NO]IGNORE and [NO]BACKUP file attributes in the directory listing.
- The /LI:S directory option now displays each file's open count in the directory listing.

2.7.13 REORDR

The REORDR utility has been enhanced to allow sorting of directories by filename or filetype. Directories sorted by filename will have their files ordered alphabetically by filename (primary key), then filetype (secondary key). Directories sorted by filetype will have their files ordered alphabetically by filetype (primary key), then filename (secondary key). Like other REORDR sort options, you can sort by filename or filetype in either forward or reverse order.

When viewing a directory sorted by REORDR, be aware that files added to the directory since it was last sorted may be out of order.

See the *RSTS/E System Manager's Guide* for details.

2.7.14 SHUTUP

SHUTUP now includes a shutdown phase for OMS. If OMS is running, SHUTUP issues an implicit STOP/OPERATOR_SERVICES/ABORT command to shut down OMS. Any pending requests are deleted as part of the OMS shutdown phase.

2.8 BASIC-PLUS

This section describes the changes that have been made to the BASIC-PLUS run-time system for V10.0.

2.8.1 BASIC-PLUS Debugging

The debugging feature of BASIC-PLUS, previously implemented by applying the feature patch described in article 4.10.1 of the *RSTS/E Maintenance Notebook*, is now a fully supported option and can be selected as a standard BASIC-PLUS option during installation. See Section 2.2 for details on how to select this option during installation.

When you select BASIC-PLUS debugging, the debug commands TRACE, UNTRACE, BREAK, UNBREAK, and DUMP become reserved keywords, and conflict with variables of the same name. Programs built against a version of BASIC-PLUS that does not include debugging can continue using the above keywords as variable names.

NOTE

Digital recommends you avoid the use of the debugging keywords as variable names, to avoid possible conflicts when using a version of BASIC-PLUS that includes the debugging option.

2.8.2 Extended Logicals Support

The BASIC-PLUS ASSIGN and DEASSIGN keyboard monitor commands have been enhanced to support the extended user logicals available in V10.0. See Section 1.2.4 for details on the new extended logicals feature.

To provide this support, BASIC-PLUS now recognizes spaces as delimiters in these commands. Support for extended logicals is only available in EXTEND mode.

The following sections describe the changes to the BASIC-PLUS ASSIGN and DEASSIGN commands in more detail.

2.8.2.1 ASSIGN Command

A command such as ASSIGN DL3:[1,2] LOGICALNAME will now be recognized as an assignment of an extended V10.0 logical. The rules that BASIC-PLUS uses to determine an extended logical assignment are:

- The string between the first and second space must not contain a filename.
- The string following the second space must contain only characters valid in a logical name.

Thus, a command such as ASSIGN DL3:[1,3]FOO BAR will produce an error in V10.0. In earlier releases, spaces were ignored and this command assigned account DL3:[1,3] the logical name FOOBAR.

Commands such as ASSIGN MM0: and ASSIGN <40> continue to work as in previous releases.

Note that a command such as ASSIGN DL3:[1,2]LOGICALNAME does not create an extended logical, because there are no spaces beween the account name and the logical name. BASIC-PLUS treats it the same as in earlier releases; the monitor truncates the logical name to LOGICA and assigns it to DL3:[1,2], as it did previously.

2.8.2.2 DEASSIGN Command

A command such as DEASSIGN LOGICALNAME will now be recognized as a deassignment of an extended V10.0 logical. The rules that BASIC-PLUS uses to determine an extended logical deassignment are:

- All embedded spaces are ignored.
- All characters in the logical name must be valid for a logical name.

Commands such as DEASSIGN MM0: or DEASSIGN <40> continue to work as in earlier releases.

2.8.3 HELLO and BYE Commands

In earlier releases, the HELLO and BYE commands were parsed and handled by the BASIC-PLUS run-time system. They have been removed from BASIC-PLUS to make room for other code in V10.0.

The standard HELLO and BYE commands can still be available from BASIC-PLUS, by installing them as system commands (CCLs).

2.8.4 Old-Format SEND/RECEIVE Calls

The so-called old-format SEND/RECEIVE SYS( ) functions, of the form:

```
SYS(CHR$(6%) + CHR$(18%) + . . . )
```

have been obsolete and their use discouraged for several releases. In V10.0, these SYS( ) functions have been removed from BASIC-PLUS to make room for other code.

Users needing to include the old-format code can do so by answering Y to the `Old-style SEND/RECEIVE?` prompt during BASIC-PLUS installation.

Note that including the old-format SEND/RECEIVE SYS( ) functions in a BASIC-PLUS run-time system may increase its size above the standard 16K limit. In such cases, you may need to remove other options to reduce the size under the 16K limit.

Digital recommends that you modify any programs that make use of the old-format SEND/RECEIVE SYS( ) functions to use the newer-format SEND/RECEIVE functions. See Chapter 8 of the *RSTS/E Programming Manual* for further information.

2.9 RSX-11

The RSX object library SYSLIB.OLB has been updated to include the PDP-11 C impure area vector and region mapping support for FORTRAN-77. This change was required to support PDP-11 C programming for the RSX environment under RSTS/E.

2.10 RT-11

The following changes have been made to the RT-11 run-time system and its associated utilities for V10.0:

- LINK.SAV has been updated to the latest version of RT-11, V5.4.
- LIBR.SAV has also been updated to the latest version of RT-11, V5.4.
- The RT-11 object library [1,2]SYSLIB.OBJ has been modified to include all of the standard RT-11 modules, along with the existing RSTS-specific modules.

2.11 RMS-11

This section describes changes that have been made to RMS-11 and its associated utilities for V10.0.

2.11.1 RMS-11 Macro Library

The RMS-11 Macro Library (RMSMAC.MLB) has been modified to add the definition NB$NOD to the NAM$BT macro. This definition is relevant to $PARSE operations, signifying the presence of a node in the file specification.

2.11.2 RMS-11 Access Methods

The module R0XPFN in the RMSLBB.OLB and RMS libraries has been enhanced to allow extension of a contiguous relative or indexed file by marking the file noncontiguous. This is especially important for improved handling of indexed files. In the past, if a $PUT resulted in a complex bucket split, it was possible for RMS-11 to use all available blocks in the file before completing the $PUT. The file would then be inconsistent in its indexed structure. To signal the incomplete state of the file, RMS-11 would breakpoint. Now, RMS-11 will mark the file noncontiguous and extend it as necessary to complete the $PUT operation.

Be aware that, once an indexed file is marked noncontiguous, RMS-11 performance on the file may degrade.

NOTE

When an RMS-11 program aborts or the system crashes during a $PUT or $UPDATE operation, the file should be reloaded to ensure data consistency on subsequent keyed or RFA access. Otherwise data inconsistency problems may surface at a later time.

The CLOSE operation now accepts a negative channel number. If a negative channel number is passed, RMS performs a reset close (CALFIP RSTFQ) function, similar to BASIC-PLUS. This causes the file to be closed without performing any of the normal clean-up operations, such as marking a tentative file permanent.

2.11.3 RMS-11 Utilities

The RMSDSP, RMSDEF, RMSBCK, and RMSRST utilities have been modified to parse file specifications in a manner more consistent with RSTS/E DCL standards. As a result, these utilities now properly handle the standard RSTS file specifications.

Chapter 3

Documentation Changes

3.1 New *RSTS/E Version 10.0 Internals and Data Structures Manual*

RSTS/E Version 10.0 includes a new manual as part of its standard documentation, the *RSTS/E Version 10.0 Internals and Data Structures Manual*. This significant addition to the RSTS/E documentation set provides technical information about the internal data structures and operation of the RSTS/E operating system. This manual will prove invaluable to RSTS/E technical support people, system programmers, or those with an interest in the inner workings of RSTS/E.

3.2 Revised Manuals

V10.0 includes new versions of the most commonly used manuals in the RSTS/E documentation set. The following manuals have been revised for V10.0:

- *RSTS/E Documentation Directory*
- *RSTS/E Maintenance Notebook*
- *RSTS/E Programming Manual*
- *RSTS/E Quick Reference Guide*
- *RSTS/E Release Notes*
- *RSTS/E System Directives Manual*
- *RSTS/E System Installation and Update Guide*
- *RSTS/E System Manager's Guide*
- *RSTS/E System User's Guide*
- *RSTS/E Task Builder Reference Manual*
- *PDP-11 SORT/MERGE User's Guide*

The following RSTS/E manuals have not been revised for V10.0:

- *BASIC-PLUS Language Manual*
- *EDT Editor Manual*
- *EDT Quick Reference Guide*
- *IAS/RSX-11 ODT Reference Manual*
- *Introduction to BASIC*
- *Introduction to the EDT Editor*
- *RSTS/E Guide to Writing Command Procedures*
- *PDP-11 MACRO-11 Language Reference Manual*
- *RSTS/E Programmer's Utilities Manual*
- *RSTS/E RMS-11: An Introduction*
- *RSTS/E RMS-11 MACRO Programmer's Guide*
- *RSTS/E RMS-11 User's Guide*
- *RSTS/E RMS-11 Utilities Manual*
- *RSTS/E RT11 Utilities Manual*

- *RSTS/E RUNOFF User's Guide*
- *PDP-11 TECO User's Guide*
- *RSTS/E Utilities Reference Manual*

3.3 New Documentation Binders

New binders and dividers are also included with V10.0 to give your RSTS/E documentation set a new look. The traditional RSTS/E Chinese Red binder color has been replaced with the Digital standard grey.

If you have purchased a complete RSTS/E V10.0 Distribution Kit, then your kit includes all RSTS/E manuals, binders, dividers and spines. Follow the directions provided with your documentation to assemble your manuals into their proper binders.

If you have purchased a RSTS/E V10.0 Update Kit, meaning you are upgrading an existing version of RSTS/E, then your kit includes new binders and only those manuals that have been revised for V10.0. Follow the directions provided with your V10.0 documentation to combine your existing (unrevised) manuals with the new manuals into the new binders. See Section 3.2 for a list of those manuals being revised and those unchanged in V10.0.

3.4 Documentation Additions

This section describes information not presently included in the RSTS/E V10.0 or related products' documentation set.

3.4.1 Maintenance Notebook

The following pages replace article 0.1.1 in the *RSTS/E Maintenance Notebook* for V10.0. Please remove the old version of article 0.1.1 and replace it with this one.

RSTS/E V10.0 Component Summary

RSTS/E V10.0
RSTS/E V10.0 General Notes
System Notes

This article is an updated list of all software components included with RSTS/E V10.0. The information in this article supersedes the information in Appendix C of the *RSTS/E System Installation and Update Guide.*

Neither Appendix C nor this article includes optional layered product components or temporary modules created during installation. Modules belonging to an optional package included with RSTS/E will only be present if you choose to install that package on your system.

Listed with each module is its standard protection code and its expected location on your system. Note that file protection codes play a critical role in the overall security of your system. You should not change the protection code of any file included with RSTS/E unless directed to do so. Changing a file's protection code to a different value may compromise security or cause the program to fail in unpredictable ways.

An asterisk (*) after the file name indicates that the file has RMS attributes.

System Files

Name .Typ	Size	Prot	Name .Typ	Size	Prot	SY:[0,1]
BADB .SYS	8 P	< 63>	SATT .SYS	14CP	< 63>	
INIT .SYS	618CP	< 60>	ERR .ERR	16CP	< 40>	
BACKUP.TSK	141C	<232>	SYSGEN.SIL	681CP	< 60>	
DCL .RTS	114C	<232>	PKG001.MSG	8C	< 40>	
PKG002.MSG	7C	< 40>	RSX .RTS	6C	< 60>	
CONFIG.SYS	1CP	< 60>	GETSYS.TSK	55C	<124>	
SWAP .SYS	136CP	< 63>	CRASH .SYS	123CP	< 63>	
RT11 .RTS	20C	< 60>	ODT .SYS	14	< 60>	
CSP100.LIB	41C	< 60>	CSPLIB.LIB	41C	< 60>	
REMESC.TSK	13C	<124>	SYSDIE.TSK	36C	<124>	
NETCHK.TSK	13C	<124>	INSTAL.COM	3C	<124>	
UPDATE.COM	3C	<124>	COPYUP.COM	2C	<124>	
SYSINI.COM	8C	<124>	RECOVR.COM	12C	<124>	
CSPHLP.COM	9C	<104>	SETPAS.COM	2C	<104>	
LPRES .COM	13C	<104>	LISTER.COM	8C	<104>	
CHECK .COM	3C	<104>	MONITR.COM	16C	<104>	
CSPLNG.COM	24C	<104>	ASSLOG.COM	13C	<104>	
MONBLD.COM	15C	<104>	VOLCHK.COM	4C	<104>	
INSPKG.COM	14C	<104>	NETDEL.COM	9C	<104>	
DELLOG.COM	4C	<104>	CSP .HLP	2C	<104>	
CSP1 .HLP	1C	<104>	CSP2 .HLP	2C	<104>	
LP .HLP	1C	<104>	LPX .HLP	1C	<104>	
LP1 .HLP	1C	<104>	LPX1 .HLP	1C	<104>	
LP2 .HLP	1C	<104>	CSPLST.DAT	2C	<104>	
MICRO .HLP	2	< 60>	CSPRES.COM	17C	<104>	
BEGIN .COM	28C	<104>	CSP .COM	35C	<104>	
LP .COM	23C	<104>	MAIN .COM	22C	<104>	
SWAP1 .SYS	3264CPL	< 60>	RSTS .SIL	672C L	< 60>	
LOGIN .COM	5C	<104>	START .COM	21C	<124>	
BASIC .RTS	69C	< 60>				

Total of 6438 blocks in 59 files in SY:[0,1]

Help Package

Name .Typ	Size	Prot	Name .Typ	Size	Prot	SY:[0,2]
DCALLO.HLP	7	< 40>	DCAPPE.HLP	8	< 40>	
DCASSI.HLP	7	< 40>	DCASPO.HLP	6	< 40>	
DCASQU.HLP	2	< 40>	DCAT .HLP	3	< 40>	
DCATTA.HLP	4	< 40>	DCBACK.HLP	35	< 40>	
DCBASI.HLP	3	< 40>	DCBCOP.HLP	29	< 40>	
DCBDIR.HLP	20	< 40>	DCBIMA.HLP	22	< 40>	
DCBP2 .HLP	3	< 40>	DCBROA.HLP	5	< 40>	
DCBYE .HLP	3	< 40>	DCLCCC.HLP	33	< 40>	
DCCCL .HLP	3	< 40>	DCCLOS.HLP	2	< 40>	
DCCLLG.HLP	2	< 40>	DCCLQU.HLP	2	< 40>	
DCCOPY.HLP	23	< 40>	DCCRAC.HLP	18	< 40>	
DCCREA.HLP	8	< 40>	DCCRPO.HLP	13	< 40>	
DCCRVI.HLP	6	< 40>	DCDAPO.HLP	2	< 40>	
DCDEAL.HLP	2	< 40>	DCDEAS.HLP	3	< 40>	
DCDEPO.HLP	3	< 40>	DCDETA.HLP	4	< 40>	
DCDSQU.HLP	3	< 40>	DCDSSY.HLP	1	< 40>	
DCDEFI.HLP	1	< 40>	DCDELE.HLP	11	< 40>	
DCDEVI.HLP	3	< 40>	DCDFCM.HLP	1	< 40>	
DCDFCS.HLP	11	< 40>	DCDIBO.HLP	2	< 40>	
DCDIFF.HLP	5	< 40>	DCDIRE.HLP	11	< 40>	
DCDISM.HLP	1	< 40>	DCDLAC.HLP	8	< 40>	
DCDLCM.HLP	1	< 40>	DCDLCS.HLP	2	< 40>	
DCDLEN.HLP	3	< 40>	DCDLQU.HLP	2	< 40>	
DCDLRQ.HLP	10	< 40>	DCDLSB.HLP	3	< 40>	
DCDLSV.HLP	2	< 40>	DCDMDK.HLP	3	< 40>	
DCDMMT.HLP	3	< 40>	DCDUMP.HLP	1	< 40>	
DCDPSY.HLP	2	< 40>	DCEDIT.HLP	9	< 40>	

DCEOD .HLP	3	< 40>	DCEXIT.HLP	3	< 40>
DCFOFO.HLP	3	< 40>	DCFORC.HLP	5	< 40>
DCFORT.HLP	2	< 40>	DCF77 .HLP	3	< 40>
DCGOSU.HLP	5	< 40>	DCGOTO.HLP	3	< 40>
DCHANG.HLP	2	< 40>	DCHELP.HLP	5	< 40>
DCIF .HLP	4	< 40>	DCINDK.HLP	15	< 40>
DCINER.HLP	6	< 40>	DCINIT.HLP	2	< 40>
DCINIQ.HLP	22	< 40>	DCINLI.HLP	9	< 40>
DCINMT.HLP	6	< 40>	DCINOV.HLP	6	< 40>
DCINQU.HLP	8	< 40>	DCINRU.HLP	11	< 40>
DCINST.HLP	2	< 40>	DCINSV.HLP	13	< 40>
DCINSW.HLP	11	< 40>	DCLINK.HLP	5	< 40>
DCLOAD.HLP	1	< 40>	DCLOGI.HLP	6	< 40>
DCLOID.HLP	3	< 40>	DCLOGO.HLP	5	< 40>
DCLOOV.HLP	4	< 40>	DCMACR.HLP	2	< 40>
DCMOUN.HLP	1	< 40>	DCMTDK.HLP	10	< 40>
DCMTMT.HLP	5	< 40>	DCON .HLP	9	< 40>
DCONCC.HLP	5	< 40>	DCOPEN.HLP	10	< 40>
DCOPLG.HLP	10	< 40>	DCOPQU.HLP	2	< 40>
DCPRIN.HLP	21	< 40>	DCREAD.HLP	5	< 40>
DCRECA.HLP	10	< 40>	DCREER.HLP	2	< 40>
DCREJO.HLP	3	< 40>	DCRELI.HLP	2	< 40>
DCREMO.HLP	2	< 40>	DCREOV.HLP	2	< 40>
DCRERU.HLP	2	< 40>	DCRENA.HLP	12	< 40>
DCREQU.HLP	8	< 40>	DCRESW.HLP	2	< 40>
DCREST.HLP	36	< 40>	DCRETU.HLP	5	< 40>
DCRPLY.HLP	7	< 40>	DCRUN .HLP	4	< 40>
DCSET .HLP	3	< 40>	DCSEAC.HLP	14	< 40>
DCSECA.HLP	8	< 40>	DCSECO.HLP	1	< 40>
DCSEDA.HLP	4	< 40>	DCSEDT.HLP	2	< 40>
DCSEDV.HLP	2	< 40>	DCSEEC.HLP	3	< 40>
DCSEEN.HLP	9	< 40>	DCSEFI.HLP	8	< 40>
DCSEHO.HLP	3	< 40>	DCSEJO.HLP	6	< 40>
DCSELG.HLP	2	< 40>	DCSENC.HLP	2	< 40>
DCSEND.HLP	3	< 40>	DCSENE.HLP	3	< 40>
DCSENO.HLP	2	< 40>	DCSENV.HLP	2	< 40>
DCSEON.HLP	1	< 40>	DCSEOS.HLP	2	< 40>
DCSEPA.HLP	3	< 40>	DCSEPN.HLP	9	< 40>
DCSEPO.HLP	8	< 40>	DCSEPR.HLP	9	< 40>
DCSEPT.HLP	4	< 40>	DCSEQU.HLP	13	< 40>
DCSESV.HLP	9	< 40>	DCSESY.HLP	19	< 40>
DCSETE.HLP	47	< 40>	DCSETI.HLP	2	< 40>
DCSEVE.HLP	3	< 40>	DCSHAC.HLP	10	< 40>
DCSHAL.HLP	3	< 40>	DCSHBU.HLP	3	< 40>
DCSHCA.HLP	7	< 40>	DCSHCM.HLP	1	< 40>
DCSHCS.HLP	2	< 40>	DCSHDA.HLP	1	< 40>
DCSHDK.HLP	6	< 40>	DCSHDT.HLP	1	< 40>
DCSHDV.HLP	3	< 40>	DCSHEN.HLP	13	< 40>
DCSHFI.HLP	1	< 40>	DCSHFO.HLP	2	< 40>
DCSHFS.HLP	5	< 40>	DCSHJO.HLP	5	< 40>
DCSHLB.HLP	2	< 40>	DCSHLO.HLP	5	< 40>
DCSHLS.HLP	1	< 40>	DCSHMY.HLP	2	< 40>
DCSHNT.HLP	1	< 40>	DCSHOS.HLP	3	< 40>
DCSHOW.HLP	3	< 40>	DCSHPO.HLP	7	< 40>
DCSHPR.HLP	2	< 40>	DCSHPV.HLP	2	< 40>
DCSHQU.HLP	12	< 40>	DCSHQT.HLP	3	< 40>
DCSHRQ.HLP	13	< 40>	DCSHRT.HLP	2	< 40>
DCSHRV.HLP	2	< 40>	DCSHSB.HLP	2	< 40>
DCSHSV.HLP	14	< 40>	DCSHSY.HLP	2	< 40>
DCSHTE.HLP	10	< 40>	DCSHTI.HLP	1	< 40>
DCSHUS.HLP	9	< 40>	DCSTAR.HLP	2	< 40>
DCSTOP.HLP	3	< 40>	DCSTOS.HLP	7	< 40>
DCSTQM.HLP	7	< 40>	DCSTQU.HLP	2	< 40>
DCSPOS.HLP	4	< 40>	DCSPQU.HLP	3	< 40>
DCSPQM.HLP	4	< 40>	DCSPSV.HLP	7	< 40>

```
DCSTSV.HLP       8   < 40>    DCSUBM.HLP      20   < 40>
DCTYPE.HLP       8   < 40>    DCUNID.HLP       2   < 40>
DCUNLI.HLP       3   < 40>    DCUNLO.HLP       2   < 40>
DCUNOV.HLP       3   < 40>    DCUNRU.HLP       2   < 40>
DCWRIT.HLP       6   < 40>    ACCNTS.HLP      30   < 40>
ADVANC.HLP      20   < 40>    BPCHLP.HLP       4   < 40>
BPCOMM.HLP      12   < 40>    BPCREF.HLP       6   < 40>
BPFUNC.HLP      14   < 40>    BPHELP.HLP       2   < 40>
BPSTAT.HLP      19   < 40>    COPHLP.HLP       4   < 40>
COMREC.HLP       8   < 40>    COPY  .HLP       3   < 40>
CTRLT .HLP       8   < 40>    DATES .HLP       7   < 40>
DCL   .HLP       2   < 40>    DCMAIL.HLP       3   < 40>
DIRECT.HLP       4   < 40>    DIRHLP.HLP       4   < 40>
DISKS .HLP      15   < 40>    ENTRYS.HLP      11   < 40>
ERRDIS.HLP       7   < 40>    ERRHLP.HLP       7   < 40>
EXPRES.HLP       6   < 40>    FILES .HLP      19   < 40>
FIT   .HLP      11   < 40>    FITHLP.HLP      11   < 40>
FORMS .HLP      18   < 40>    FUNCTN.HLP      31   < 40>
HELP  .TSK     29C  <232>    HELP  .HLP       8   < 40>
KEYS  .HLP      14   < 40>    LABELS.HLP       4   < 40>
LEVELS.HLP       6   < 40>    LINEED.HLP       7   < 40>
MAGTAP.HLP      12   < 40>    OPERAT.HLP       7   < 40>
PASSWD.HLP      10   < 40>    PRIVS .HLP      12   < 40>
PROGRM.HLP       2   < 40>    PIPHLP.HLP      31   < 40>
PIPDIR.HLP       3   < 40>    PIPSAV.HLP      31   < 40>
PLEHLP.HLP       6   < 40>    PLEBAT.HLP       4   < 40>
PLEQUE.HLP       4   < 40>    PLESPL.HLP       6   < 40>
QUEHLP.HLP       8   < 40>    QUEUES.HLP      20   < 40>
QUOTAS.HLP      11   < 40>    RSX   .HLP       3   < 40>
RT11  .HLP      13   < 40>    RUNTIM.HLP       9   < 40>
SERVRS.HLP       7   < 40>    SYMBOL.HLP      14   < 40>
SYSHLP.HLP      22   < 40>    TERMNL.HLP       4   < 40>
TIMES .HLP       7   < 40>    TECHLP.HLP       5   < 40>
TECOFL.HLP       6   < 40>    TECOMD.HLP      12   < 40>
TYPHLP.HLP       3   < 40>    UTLHLP.HLP      12   < 40>
VTEDKP.HLP       6   < 40>    VTEHLP.HLP       3   < 40>
DCSHOD.HLP       1   < 40>    DCSEOD.HLP       1   < 40>
DCCRSV.HLP       1   < 40>    DCSEVL.HLP       1   < 40>
DCSHVL.HLP       1   < 40>    DCDESV.HLP       1   < 40>
DCSHCO.HLP       1   < 40>    DCSENL.HLP       7   < 40>
DCSTLA.HLP       2   < 40>    DCSHNL.HLP       2   < 40>
DCCRSL.HLP       2   < 40>    DCSESL.HLP       2   < 40>
DCSHSL.HLP       2   < 40>    DCDESL.HLP       2   < 40>
DCSHCL.HLP       4   < 40>    DCSHTL.HLP       2   < 40>
DCSHSS.HLP       3   < 40>    DCSPLA.HLP       2   < 40>
DCWAIT.HLP       4   < 40>    DCLSRT.HLP      31   < 40>
DCLMGE.HLP      26   < 40>

Total of 1935 blocks in 277 files in  SY:[0,2]
```

Error Logging Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,3]
ERRDAT.FIL      67C   < 60>     MSCPER.FIL      97C   < 60>
ERRINT.TSK      18C   <232>     ERRCPY.TSK      15C   <232>
ERRDIS.TSK      44C   <232>     ERRDET.TSK      52C   <232>
ANALYS.TSK      58C   <124>     ANALY1.TSK      82C   <124>
ANALY2.TSK      71C   <124>     ANALY3.TSK      59C   <124>

Total of 563 blocks in 10 files in  SY:[0,3]
```

Update Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,4]
PA0401.006       1    < 60>     PA0411.003       1    < 60>
PA0401.001       2    < 60>     PA0401.002       1    < 60>
PA0401.003       1    < 60>     PA0401.004       1    < 60>
PA0401.005       1    < 60>     PA0304.001       3    < 60>
PA0304.002       2    < 60>     PATCH .BAK       1    < 60>
PATCH .DAT       1    < 60>     BUILD .TSK      59C   <124>
CPATCH.TSK      24C   <124>     AUTOED.TSK      27C   <124>
UTILTY.TSK      48C   <124>

Total of 173 blocks in 15 files in  SY:[0,4]
```

Device Testing Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,5]
DSKSEK.TSK      18C   <124>     DSKEXR.TSK      21C   <124>
LPEXER.TSK      14C   <124>     DXEXER.TSK      21C   <124>
CPEXER.TSK      28C   <124>     CPUTST.TSK      28C   <124>
KBEXER.TSK      17C   <124>     MTEXER.TSK      26C   <124>

Total of 173 blocks in 8 files in  SY:[0,5]
```

Print/Batch Services Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,6]
PBS    .TSK     196C   <232>     PBSMGR.TSK      409C  <232>
PBSERR.ERR       57   < 40>     FORMS .SYS         2   < 40>
PBS    .SYS*     32   <188>

Total of 696 blocks in 5 files in  SY:[0,6]
```

File Restore Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,7]
BACKUP.HLP       12   < 60>     RESTOR.TSK      51C   <252>
BACLST.TSK       55C  <252>     BACCON.TSK      30C   <252>
BACDIR.TSK       56C  <252>     BACMNT.TSK      61C   <252>
BACLAB.TSK       45C  <252>     BACDSK.TSK      37C   <252>
BACCOM.TSK       47C  <252>     BACLOD.TSK      51C   <252>
BACENT.TSK       41C  <252>     BACFRM.TSK      52C   <252>
BACKUP.PRM        5   < 60>

Total of 543 blocks in 13 files in  SY:[0,7]
```

OPSER-based Spooling Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,8]
CHARS .QUE        2   < 60>     BATCH .DCD      12C   < 60>
QUEMAN.TSK      61C   <232>     QUMRUN.TSK      89C   <232>
OPSER .TSK      51C   <232>     OPSRUN.TSK      87C   <232>
SPOOL .TSK      83C   <232>     SPLIDL.TSK      90C   <232>
SPLRUN.TSK      90C   <232>     BATCH .TSK      80C   <232>
BATIDL.TSK      79C   <232>     BATDEC.TSK      93C   <232>
BATRUN.TSK      88C   <232>     QUE    .TSK     87C   <232>
PLEASE.TSK      40C   <232>

Total of 1032 blocks in 15 files in  SY:[0,8]
```

Unsupported Utility Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,9]
DSKDMP.BAS       19    < 60>     STATUS.B2S       92    < 60>
QSTATS.B2S       59    < 60>     DSKPEK.OBJ*       1    < 60>
BPDA  .BAS       59    < 60>     DSKDMP.HLP       26    < 40>
LQSTAT.BAS       19    < 60>     QSTATS.DOC       32    < 60>
MEMORY.BAS       15    < 60>     FLOAT .BAS       19    < 60>
CONNEC.BAS       46    < 60>     DIALER.BAS       85    < 60>
DIALER.DOC       63    < 60>     EMTCPY.BAS      104    < 60>
RSTSFL.OBJ*      42    < 60>     RSTSFL.OLB*     102C   < 60>
RSTSFL.DOC        2    < 60>     RSTSFL.HLP        6    < 60>
MEMORY.TSK      13C   <124>     FLOAT .TSK       21C   <124>
B2CREF.TSK     113C   <104>     B2CREF.HLP       12    < 60>
B2CREF.DOC        2    < 40>     RNO   .TSK       72C   <104>
RNO   .RNO       85    < 60>     RNOBLD.CMD        6    < 60>
RNOBLD.ODL        2    < 60>     RNPRE .MAC        5    < 60>
COMND .MAC        7    < 60>     CMTAB .MAC       11    < 60>
ERMSG .MAC       10    < 60>     FMTCM .MAC       26    < 60>
HYPHEN.MAC       54    < 60>     INDEX .MAC       11    < 60>
PINDX .MAC        9    < 60>     RNCMD .MAC       22    < 60>
RNFIO .MAC        9    < 60>     RNORSX.MAC        5    < 60>
RUNOFF.MAC       71    < 60>     START .MAC        8    < 60>
EMS   .COM       6C   <104>     DUMP  .SAV       10C   <104>
DSKDMP.TSK       18C  <104>     BPDA  .TSK       37C   <104>
CONNEC.TSK       29C  <104>     DIALER.TSK       44C   <104>
EMTCPY.TSK       38C  <124>     STATUS.TSK       56C   <124>
QSTATS.TSK       24C  <124>     LQSTAT.TSK       22C   <124>
SRCCOM.SAV       17C  <104>

Total of 1666 blocks in 51 files in  SY:[0,9]
```

RMS-11 Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,10]
RMSBCK.TSK      149C  <104>     RMSRST.TSK      169C  <232>
RMSDEF.TSK      134C  <104>     RMSDSP.TSK      133C  <104>
RMSCNV.TSK      215C  <104>     RMSDES.TSK      179C  <104>
RMSIFL.TSK      141C  <104>     RMSRES.LIB       20C  < 60>
RMSLBA.LIB       18C  < 60>     RMSLBB.LIB       15C  < 60>
RMSLBC.LIB       14C  < 60>     RMSLBD.LIB       10C  < 60>
RMSLBE.LIB       14C  < 60>     RMSLBF.LIB       18C  < 60>
DAPRES.LIB       43C  < 60>     DAPENV.LIB        7C  < 60>
RMSRES.TSK*      18   < 40>     RMSRES.STB*       3   < 40>
RESLIB.00L        0   < 60>

Total of 1300 blocks in 19 files in  SY:[0,10]
```

EDT Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,11]
EDT52 .DOC        3    < 40>     EDT100.DOC        3    < 40>
EDT200.DOC        4    < 40>     EDTKIT.DOC       39    < 40>
EDT   .TSK      238C   <104>

Total of 287 blocks in 5 files in  SY:[0,11]
```

SYSGEN Components and BASIC-PLUS Package

Name .Typ	Size	Prot	Name .Typ	Size	Prot	SY:[0,12]
MONITR.CMD	2	< 60>	RJ2780.CMD	25	< 60>	
RSXRTS.CMD	1	< 60>	HOOK .SAV	28C	<124>	
CHECK .MAC	22	< 60>	TBL .MAC	120	< 60>	
KBDEF .MAC	44	< 60>	RSTS .OBJ	1076	< 60>	
CRA .OBJ	8	< 60>	DSK .OBJ	5	< 60>	
MCP .OBJ	3	< 60>	BBR .OBJ	3	< 60>	
OPN .OBJ	3	< 60>	XVR .OBJ	2	< 60>	
KVR .OBJ	3	< 60>	MVR .OBJ	3	< 60>	
XTR .OBJ	2	< 60>	EMT .OBJ	3	< 60>	
EM2 .OBJ	3	< 60>	GEN .OBJ	3	< 60>	
GRD .OBJ	3	< 60>	RSX .OBJ	2	< 60>	
FIPLRG.OBJ	2	< 60>	FMS .OBJ	3	< 60>	
NOD .OBJ	4	< 60>	DHPORT.OBJ	2	< 60>	
DLPORT.OBJ	2	< 60>	DZPORT.OBJ	2	< 60>	
VHPORT.OBJ	2	< 60>	PKPORT.OBJ	4	< 60>	
PDVVEC.OBJ	1	< 60>	TERCLS.OBJ	15	< 60>	
KBD .OBJ	4	< 60>	KBX .OBJ	2	< 60>	
KIN .OBJ	3	< 60>	LAT .OBJ	3	< 60>	
SES .OBJ	2	< 60>	NSP .OBJ	3	< 60>	
TRN .OBJ	3	< 60>	RDM .OBJ	2	< 60>	
EVL .OBJ	2	< 60>	DMP .OBJ	2	< 60>	
UNA .OBJ	4	< 60>	QNA .OBJ	4	< 60>	
OVRLRG.OBJ	4	< 60>	OV2 .OBJ	2	< 60>	
OVLHD .OBJ	1	< 40>	DEFALT.SAV	4C	<124>	
DEFALT.STB	1	< 60>	BUFCHK.TSK	21C	<124>	
SYSGEN.SAV	104C	<124>	BASIC .CMD	1	< 60>	
BPLGEN.TSK	42C	<124>	RTS .OBJ	74	< 60>	
MA2 .OBJ	16	< 60>	MA2I .OBJ	14	< 60>	
MA2F .OBJ	14	< 60>	MA4 .OBJ	19	< 60>	
MA4F .OBJ	16	< 60>	MA4D .OBJ	14	< 60>	
XL2 .OBJ	3	< 60>	XL2I .OBJ	3	< 60>	
XL2F .OBJ	2	< 60>	XL4 .OBJ	4	< 60>	
XL4F .OBJ	2	< 60>	XT2 .OBJ	3	< 60>	
XT2I .OBJ	3	< 60>	XT2F .OBJ	2	< 60>	
XT4 .OBJ	3	< 60>	XT4F .OBJ	2	< 60>	
SF .OBJ	6	< 60>	IO .OBJ	6	< 60>	
PU .OBJ	5	< 60>	MX .OBJ	8	< 60>	
SN .OBJ	2	< 60>	DBG .OBJ	2	< 60>	
VE .OBJ	2	< 60>	DI .OBJ	1	< 60>	
LA .OBJ	10	< 60>	LAD .OBJ	10	< 60>	
M18 .OBJ	1	< 60>	BASIC .COM	2C	<104>	

Total of 1864 blocks in 82 files in SY:[0,12]

TECO Package

```
 Name .Typ    Size    Prot     Name .Typ    Size    Prot     SY:[0,13]
TECO  .RTS     48C  < 60>    TECO  .TEC     10C  <104>
TYPE  .TEC      7C  <104>    VTEDIT.TEC     24C  <104>
VTEDIT.DOC    119   < 40>    TECORN.DOC    108   < 40>
TECO  .DOC    995   < 40>    TECO  .INI      8   < 40>
TECKBM.TEC     3C  <104>    LOCAL .TEC      3C  <104>
SEARCH.TEC     5C  <104>    SQU   .TEC     10C  <104>
FMTMAC.TEC     1C  <104>    TECO  .TES     28   < 40>
TYPE  .TES    17   < 40>    VTEDIT.TES     34   < 40>
FMTMAC.TES     9   < 40>    TECOIN.TES     18   < 40>
TECKBM.TES     3   < 40>    LOCAL .TES      3   < 40>
SEARCH.TES     9   < 40>    SQU   .TES     15   < 40>
TECOLB.OBJ    68   < 60>    GEXIT .OBJ      3   < 60>
SCREEN.OBJ    15   < 60>    SCRINS.OBJ      4   < 60>
SCROLL.OBJ     4   < 60>    CRTRUB.OBJ      5   < 60>
CRTRUB.MAC    65   < 60>

Total of 1641 blocks in 29 files in  SY:[0,13]
```

Auxiliary Library Package

```
 Name .Typ    Size    Prot     Name .Typ    Size    Prot     SY:[0,14]
ODT   .TSK     38C  <104>    COPY  .TSK     25C  <104>
QUOLST.TSK     50C  <232>    TALK  .TSK     12C  <232>
GRIPE .TSK     17C  <232>    DISPLY.TSK     72C  <232>
FIT   .TSK     60C  <232>    PMDUMP.TSK     52C  <104>
BPCREF.TSK     25C  <104>    BPCRF1.TSK     51C  <104>
RUNOFF.TSK     59C  <104>    DSKCVT.TSK     58C  <124>

Total of 519 blocks in 12 files in  SY:[0,14]
```

SORT/MERGE Package

```
 Name .Typ    Size    Prot     Name .Typ    Size    Prot     SY:[0,15]
V96BUG.FIX     1   < 60>    SRTLIB.OLB    216   < 60>
SRTUTL.ODL    12   < 60>    MGELIB.OLB    196   < 60>
MGEUTL.ODL    10   < 60>    SRTSHR.OLB    220   < 60>
MGESHR.OLB   201   < 60>    RELEAS.NOT     15   < 60>
SRTUTL.CMD*    4   < 60>    MGEUTL.CMD*     4   < 60>
SRTUTL.TSK*  389C  <104>    MGEUTL.TSK*   368C  <104>
SRTTRN.TSK   103C  <104>

Total of 1739 blocks in 13 files in  SY:[0,15]
```

SOURCE Package

```
 Name .Typ    Size    Prot     Name .Typ    Size    Prot     SY:[0,17]
ATPK  .BAS     97   < 60>    DIRECT.BAS    100   < 60>
DISPLY.B2S    199   < 60>    DISPLY.COM      2   < 60>
DSPMUL.MAC      4   < 60>    HELP  .BAS    101   < 60>
LOGIN .BAS     91   < 60>    LOGOUT.BAS     33   < 60>
SHUTUP.BAS    155   < 60>    SYSTAT.B2S    182   < 60>

Total of 964 blocks in 10 files in  SY:[0,17]
```

EDT Build Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,18]
EDTLIB.OLB      378    < 60>     EDTR1 .CMD        1    < 60>
EDTR1 .ODL       28    < 60>     EDTR2 .CMD        1    < 60>
EDTR2 .ODL       32    < 60>     EDTR3 .CMD        1    < 60>
EDTR3 .ODL       32    < 60>     EDTR4 .CMD        1    < 60>
EDTR4 .ODL       32    < 60>     EDTR5 .CMD        1    < 60>
EDTR5 .ODL       32    < 60>

Total of 539 blocks in 11 files in  SY:[0,18]
```

OMS Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[0,20]
OMS   .TSK       38C   <252>     OMSMGR.TSK       87C   <232>

Total of 125 blocks in 2 files in  SY:[0,20]
```

Program Development Libraries

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[1,1]
CSP100.STB*       8C   < 40>     CSP100.TSK*      34C   < 60>
SYSLIB.OLB*     280    < 40>     RSXMAC.SML*     271    < 40>
BP2   .LNK        3    < 40>     C81   .LNK        2    < 40>
F77   .LNK*       3    < 40>     RSX11 .LNK*       2    < 40>
RMSMAC.MLB*     189    < 40>     RMSLIB.OLB*     222    < 40>
RMSDAP.OLB*     102    < 40>     RMSFUN.OBJ*       9    < 60>
RMS11 .ODL*      85    < 40>     R0RMS1.MAC*      12    < 40>
RMS11S.ODL*       3    < 40>     RMS12S.ODL*       3    < 40>
RMS11X.ODL*       5    < 40>     RMS12X.ODL*       4    < 40>
RMSRLX.ODL        2    < 40>     RMSSLX.ODL*       2    < 40>
DAP11X.ODL*       5    < 40>     DAPRLX.ODL*       2    < 40>
DAPSLX.ODL*       2    < 40>     RMSRES.TSK*       6    < 40>
RMSRES.STB*       3    < 40>     DAPRES.TSK*      39    < 40>
DAPRES.STB*       2    < 40>     RMSDES.HLP*     142    < 40>
RMS   .00L        0    < 60>     ODT   .OBJ*       8    < 40>
ODTID .OBJ*      13    < 40>     EDTHEL.HLP*     223    < 40>
DCLC81.HLP        1    < 40>     SRTLIB.OLB      216    < 40>
MGELIB.OLB      197    < 40>     SRTFIL.ODL       11    < 40>
SRTREC.ODL       11    < 40>     MGEFIL.ODL       10    < 40>
MGEREC.ODL        9    < 40>     STMGFL.ODL       16    < 40>
STMGRC.ODL       15    < 40>

Total of 2172 blocks in 41 files in  SY:[1,1]
```

System Library Package

```
 Name .Typ     Size     Prot      Name .Typ     Size     Prot      SY:[1,2]
GETSYS.TMP        1    < 60>    UTLMGR.TSK     316C   <232>
DSKINT.TSK      110C   <232>    ONLCLN.TSK     111C   <232>
ACTMGR.TSK      300C   <232>    SHUTUP.TSK      72C   <232>
DCLAUX.TSK       54C   <232>    SILUS .SAV      40C   <104>
PIP    .SAV      61C   <232>    MACRO .SAV      63C   <104>
CREF   .SAV       6C   <104>    LINK  .SAV      57C   <104>
LIBR   .SAV      28C   <104>    ERR   .STB       3    < 40>
ONLPAT.SAV       71C   <104>    COMMON.MAC      39    < 40>
KERNEL.MAC      162    < 60>    DCLUTL.TSK      26C   <232>
VER00L.SYS        0    < 60>    CONFIG.MAC       5    < 60>
SYSGEN.COM       24    < 60>    GLOBAL.COM       1    < 60>
SYSLIB.OBJ       73    < 40>    LOGIN .TSK      46C   <232>
LOGOUT.TSK       22C   <232>    DIRECT.TSK      58C   <232>
SYSTAT.TSK       63C   <232>    FILCOM.TSK      48C   <104>
SWITCH.TSK       11C   <232>    ATPK  .TSK      30C   <232>
SYSMAC.SML       46    < 40>    SAVRES.SAV     209C   <124>
TERMGR.TSK      138C   <232>    LATMGR.TSK     104C   <232>
PAT    .SAV      11C   <104>    REORDR.TSK      86C   <232>
MAKSIL.TSK       52C   <104>    TKB   .TSK     221C   <104>
STK    .TSK      221C  <104>    MAC   .TSK     100C   <104>
LBR    .TSK       66C  <104>    PAT   .TSK      55C   <104>
CRF    .TSK       47C  <104>    PRELIN.TSK      46C   <232>
RSX    .00L        0   < 60>    UTILTY.TSK       5C   <124>
BUILD .TSK         5C  <124>    AUTOED.TSK       5C   <124>
CPATCH.TSK         5C  <124>    QUE   .TSK       5C   <232>
PLEASE.TSK         5C  <232>    BPLGEN.COM       3    < 60>
SMRES .CMD         1   < 60>    SRTUTL.MAP*    226    < 60>
INSTAL.LOG        66   < 60>

Total of 3629 blocks in 55 files in  SY:[1,2]
```

Article 3.4.1 in the *RSTS/E Maintenance Notebook* for V10.0 contains an incorrect base address. Please remove the old version of article 3.4.1 and replace it with this one.

Changing Special LOGIN Terminal — Terminal Service Feature Patch

RSTS/E V10.0
Executive
Terminal Service Patches

The number of jobs that can log in to a RSTS/E system is limited by the swapping space available, the JOB MAX set at system start-up time, and the login setting (set by the SET SYSTEM/[NO]LOGINS command). However, the console terminal (KB0:) is a special terminal, and can log in regardless of the login setting, provided that swapping space and JOB MAX permit.

With the following patch, one or two special keyboards can be selected, or this feature can be disabled entirely.

Procedure

1. This is a feature patch to the RSTS/E V10.0 monitor. It may be installed in any target monitor SIL.
2. Decide which terminals should be allowed to log in regardless of the login setting, and use those numbers as *m* and *n* in the patch in step 5. If you want to allow only one terminal, use its number as *m* and use -1 in place of *n*. If you want to disable this feature, use -1 in place of both *m* and *n*. Be sure you include the decimal point after the new value of *m* or *n* so that it is interpreted as a decimal number.
3. The patch described in Step 5 can be installed using the PATCH option of INIT.SYS:

```
Option: PATCH
File to patch? <CR>     (RETURN for installed monitor SIL)
```

4. This patch can be installed manually using ONLPAT, the on-line patching program:

```
RUN $ONLPAT
Command File Name? <CR> (RETURN for manual installation)
File to patch? <CR>     (RETURN for installed monitor SIL)
File found in account [0,1]
```

   This feature patch is contained in the file PA0304.001 as part of the UPDATE package. To transfer this file to the UPDATE$ account, select the package name UPDATE during the system installation or update procedure. [1]

[1] The patch file for this patch requires manual editing to include installation specific parameters before it can be successfully installed.

5. The patch is as follows:

```
Module name? KBD
Base address? ..CTZ.@OVR
Offset address? 0
 Base   Offset  Old       New?
??????  000000  000000  ? m.*2  (or -1, from step 2)
??????  000002  001407  ? ^Z    (CTRL/Z for new offset)
Offset address? ^Z              (CTRL/Z for new base)
Base address? ..CTY.@OVR
Offset address? 0
 Base   Offset  Old       New?
??????  000000  177777  ? n.*2  (or -1, from step 2)
??????  000002  001404  ? ^Z    (CTRL/Z for new offset)
Offset address? ^Z              (CTRL/Z for new base)
Base address? ^Z                (CTRL/Z for new module)
Module name? RSTS
Base address? $$0304
Offset address? 0
 Base   Offset  Old       New?
??????  000000  ??????  ? Q!1
??????  000002  ??????  ? ^C    (up-arrow/C to exit; CTRL/C for INIT)
```

The Component.Subcomponent section of the *RSTS/E Maintenance Notebook* for V10.0 accidentally left out subcomponent numbers for package corrections. To correct this problem, please remove pages 3 through 10 of the *RSTS/E Maintenance Notebook* and replace them with the following eight pages.

2 Component.Subcomponent Assignments

The component.subcomponent numbers outlined below appear on articles to be filed following the Cumulative Index in this notebook.

RSTS/E MONITOR

0.0	**RSTS/E V10.0 General Notes**
0.1	System Notes
0.2	System Management Guidelines
1.0	**Initialization**
1.1	INIT.SYS Corrections
1.2	INIT.SYS Program Notes
1.3	INIT.SYS Restrictions
2.0	**System Installation and Update**
2.1	Installation/Update Notes
2.2	Installation/Update .COM files
2.3	Installation/Update Restrictions
3.0	**Executive**
3.1	Monitor Corrections
3.2	Monitor Notes
3.3	Monitor Restrictions
3.4	Terminal Service Corrections
3.5	Terminal Service Notes
3.6	Terminal Service Restrictions
3.7	File Processor Corrections
3.8	File Processor Notes
3.9	File Processor Restrictions
3.10	Device Driver Corrections
3.11	Device Driver Notes
3.12	Device Driver Restrictions
3.13	FMS Monitor Corrections
3.14	FMS Monitor Notes
3.15	FMS Monitor Restrictions
4.0	**BASIC-PLUS**
4.1	BASIC-PLUS Corrections
4.2	BASIC-PLUS Notes

RSTS/E UTILITIES

RSTS/E DOCUMENTATION

26.18	RSTS/E Programming Manual	AA-EZ09B-TC
26.19	RSTS/E System Directives Manual	AA-EZ10B-TC
26.20	IAS/RSX-11 ODT Reference Manual	AA-M507A-TC
26.21	PDP-11 MACRO-11 Language Reference Manual	AA-KX10A-TC
	PDP-11 MACRO-11 Language Reference Manual Update	AD-KX108A-T1
26.22	RSTS/E RMS-11 MACRO Programmer's Guide	AA-P507A-TC
26.23	RSTS/E RMS-11: An Introduction	AA-P508A-TC
26.24	RSTS/E RMS-11 User's Guide	AA-P510A-TC
26.25	RSTS/E RMS-11 Utilities Manual	AA-P509A-TC
26.26	RSTS/E Quick Reference Guide	AA-EZ13C-TC
26.27	Introduction to BASIC	AA-0155B-TK
26.28	EDT Quick Reference Guide	AA-M477A-TK
26.29	RSTS/E V10.0 Internals and Data Structures Manual	AA-PB60A-TC

RUN-TIME SYSTEMS SUPPORT

27.0 **DCL Run-time System and Utilities**
- 27.1 Package Notes
- 27.2 Package Restrictions
- 27.3 Package Corrections

28.0 **RSX-11 Emulator and Utilities**
- 28.1 Package Notes
- 28.2 Package Restrictions
- 28.3 Package Corrections

29.0 **RT-11 Emulator and Utilities**
- 29.1 Package Notes
- 29.2 Package Restrictions
- 29.3 Package Corrections

30.0 **(Reserved)**

OPTIONAL SOFTWARE

31.0 **DECnet/E Utilities V4.1 (DECNET$)**
- 31.1 Package Notes
- 31.2 Package Restrictions
- 31.3 Package Corrections

32.0 **DECnet/E V4.1 Documentation**
- 32.1 DECnet/E V4.1 Release Notes AA-M269D-TC

3.4.2 System Directives Manual

On page 3-146 of the *RSTS/E System Directives Manual*, the fifth paragraph, beginning "The octal value," should have the string FIRQB+FQMODE in front of it in the left-hand column.

3.4.3 Programming Manual

The page references in tables 8-1 through 8-4 of the *RSTS/E Programming Manual* for V10.0 are incorrect. To correct this problem, please remove pages 8-3 through 8-12 of the *RSTS/E Programming Manual* and replace them with the following ten pages.

In Tables 8-1 through 8-4, the Relevant Privileges column lists the privileges associated with each SYS call. A user who attempts to call a SYS function without sufficient privilege receives the error ?Illegal SYS( ) usage (ERR=18) or the error ?Protection violation (ERR=10). To avoid repetition, this chapter describes error 18 for calls only if it has a meaning different from nonprivileged attempts to use the call.

Table 8–1: SYS System Function Calls (by Function Code)

Function Code(F)	Function Name	Relevant Privileges	Page
0	Cancel Ctrl/O effect on terminal	None	8-11
1	Enter tape mode on terminal	None	8-12
2	Enable echoing on terminal	None	8-12
3	Disable echoing on terminal	None	8-13
4	Enable ODT submode on terminal	None	8-14
5	Exit with no prompt message	None	8-15
6	SYS call to the file processor	See individual FIP call	8-15
7	Get core common string	None	8-15
8	Put core common string	None	8-16
9	Exit and clear program	None	8-16
10	Reserved for special implementations	–	–
11	Cancel all type ahead	None	8-17
12	Return information on last opened file	None	8-18
13	Reserved for special implementations	–	–
14	Execute CCL command	Execute access to file	8-19

Table 8–2: SYS System Function Calls (by Function Name)

Function Name	Function Code(F)	Relevant Privileges	Page
Cancel all type ahead	11	None	8-17
Cancel Ctrl/O effect on terminal	0	None	8-11
Disable echoing on terminal	3	None	8-13
Enable echoing on terminal	2	None	8-12
Enable ODT submode on terminal	4	None	8-14
Enter tape mode on terminal	1	None	8-12
Execute CCL command	14	Execute access to file	8-19
Exit and clear program	9	None	8-16
Exit with no prompt message	5	None	8-15
Get core common string	8	None	8-15
Put core common string	8	None	8-16

(continued on next page)

Table 8–2 (Cont.): SYS System Function Calls (by Function Name)

Function Name	Function Code(F)	Relevant Privileges	Page
Reserved for special implementations	10	–	–
Reserved for special implementations	13	–	–
Return information on last opened file	12	None	8-18
SYS call to the file processor	6	See individual FIP call	8-15

Table 8–3: FIP SYS Calls (by Subfunction Code)

Function Code(FO)	Function Name	Relevant Privileges	Page
-29	Get monitor tables - part III	None	8-35
-28	Spooling (Obsolete, use PBS request)	Read access Write access	8-37
-27	Snap shot dump	SYSIO	8-41
-26	File utility functions	Read access Write access DATES TUNE SYSIO	8-41
-25	Read/write file attributes	Read access Write access	8-47
-25	Read pack attributes	DEVICE	8-49
-25	Read/write account attributes	GACNT WACNT	8-50
-25	Delete account attributes	GACNT WACNT	8-54
-24	Add/delete CCL command	INSTAL	8-55
-23	Terminating file name string scan	None	8-27
-22	Set special run priority	TUNE	8-57
-21	Drop/regain (temporary) privileges	None	8-57
-20	Lock/unlock job in memory	TUNE	8-59
-19	Set number of logins	SWCTL	8-60
-18	Add run-time system	INSTAL	8-61
-18	Remove run-time system	INSTAL	8-63
-18	Unload run-time system	INSTAL	8-64
-18	Add resident library	INSTAL	8-65
-18	Remove resident library	INSTAL	8-68
-18	Unload resident library	INSTAL	8-69
-18	Create dynamic region	INSTAL	8-69

(continued on next page)

Table 8–3 (Cont.): FIP SYS Calls (by Subfunction Code)

Function Code(FO)	Function Name	Relevant Privileges	Page
-18	Create/Delete virtual disk	INSTAL HWCFG	8-71
-17	Name run-time system	Write access	8-73
-16	Shut down system	SHUTUP	8-73
-15	Accounting dump	GACNT WACNT	8-74
-14	Change system date/time	DATES	8-75
-13	Change priority/run burst/job size	TUNE	8-76
-12	Get monitor tables - part II	None	8-77
-11	Change file backup statistics	DATES	8-79
-10	File name string scan	None	8-27
-9	Hang up a dataset	HWCTL	8-81
-8	Get open channel statistics	None	8-81
-7	Enable Ctrl/C trap	None	8-83
-6	Poke memory	SYSMOD	8-85
-5	Broadcast to terminal	SEND	8-86
-4	Force input to terminal	SYSIO	8-87
-3	Get monitor tables - part I	None	8-88
-2	Disable logins	SWCTL	8-89
-1	Enable logins	SWCTL	8-90
0	Create user account (new format)	GACNT WACNT	8-90
0	Create user account (old format)	GACNT WACNT	8-93
1	Delete user account	GACNT WACNT	8-96
2	Reserved	–	–
3	Disk pack status	MOUNT HWCFG	8-97
4	Login	None	8-101
4	Verify password	DEVICE GACNT WACNT	8-101
5	Logout	EXQTA WACNT	8-104
6	Attach	GACNT WACNT	8-106
6	Reattach	DEVICE	8-107
6	Swap Console	None	8-109
7	Detach	JOBCTL	8-110

(continued on next page)

Table 8–3 (Cont.): FIP SYS Calls (by Subfunction Code)

Function Code(FO)	Function Name	Relevant Privileges	Page
8	Change quota (old format)/expiration date/password (old format)	GACNT WACNT	8-111
8	Change quota (new format)/expiration date/password (old format)	GACNT WACNT	8-114
8	Set password (new format)	GACNT WACNT	8-115
8	Kill job	JOBCTL	8-116
8	Disable terminal	HWCTL	8-117
9	Return error messages	None	8-118
10	Allocate/reallocate device	DEVICE HWCTL	8-119
10	Assign user logical	None	8-121
10	List user logical names	None	8-122
11	Deallocate a device or deassign user logical	None	8-123
12	Deallocate all devices	None	8-124
13	Zero a device	DEVICE Create/rename access to account	8-125
14	Read/read and reset accounting data	GACNT WACNT	8-127
15	Directory lookup on index	DEVICE Read or execute access	8-133
15	Special magnetic tape directory lookup	DEVICE	8-135
16	Set terminal characteristics - part I	HWCFG	8-140
16	Set terminal characteristics - part II	HWCFG	8-148
17	Disk directory lookup on file name	DEVICE Read or execute access	8-137
17	Disk wildcard directory lookup	DEVICE Read or execute access	8-138
18	Obsolete (use function code 22)	–	–
19	Enable/disable disk caching	TUNE	8-154
20	Convert date and time	None	8-156
21	Add new logical names	INSTAL	8-158
21	Remove logical names	INSTAL	8-160
21	Change disk logical name	INSTAL	8-161
21	List logical names	None	8-162
22	Message send/receive	JOBCTL SEND SWCFG SWCTL SYSIO	8-162
22	Send local data message with privileges	SEND	Ch. 10

(continued on next page)

Table 8–3 (Cont.): FIP SYS Calls (by Subfunction Code)

Function Code(FO)	Function Name	Relevant Privileges	Page
22	Send Print/Batch Services request	None	Ch. 10
22	Create and delete a local LAT port	SWCTL	8-165
22	Assign, deassign, and set local LAT ports	SWCFG	8-167
22	Return LAT port characteristics	None	8-173
23	Add system files	Write access INSTAL	8-177
23	Remove system files	Write access INSTAL	8-180
23	List system files	None	8-181
24	Create a job	Execute access EXQTA JOBCTL TUNE WACNT	8-182
25	Wildcard PPN lookup	DEVICE	8-188
26	Return job status	JOBCTL TUNE	8-189
27	Reserved	–	–
28	Set/clear current privileges	None	8-191
28	Read current privileges	None	8-191
29	Stall/Unstall system	HWCTL	8-193
30	Reserved	–	–
31	Third-party privilege check	None	8-194
32	Check file access rights	None	8-195
32	Convert privilege name to mask	None	8-196
32	Convert privilege mask to name	None	8-197
33	Open next disk file	DEVICE Read access Write access DATES	8-198
34	Set device characteristics	HWCFG HWCTL	8-200
34	Set line printer characteristics	HWCFG	8-203
34	Set system defaults	HWCFG SWCFG	8-205
34	Load monitor overlay code and return status/remove monitor overlay code	SWCFG	8-206
–	PEEK function	RDMEM SYSMOD	8-210

Table 8–4: FIP SYS Calls (by Function Name)

Function Name	Function Code(FO)	Relevant Privileges	Page
Accounting dump	-15	GACNT WACNT	8-74
Add/delete CCL command	-24	INSTAL	8-55
Add new logical names	21	INSTAL	8-158
Add system files	23	Write access INSTAL	8-177
Add resident library	-18	INSTAL	8-65
Add run-time system	-18	INSTAL	8-61
Allocate/reallocate device	10	DEVICE HWCTL	8-119
Assign a local LAT port	22	SWCFG	8-167
Assign user logical	10	None	8-121
Attach	6	GACNT WACNT	8-106
Broadcast to terminal	-5	SEND	8-86
Change disk logical name	21	INSTAL	8-161
Change file backup statistics	-11	DATES	8-79
Change quota/expiration date/password	8	GACNT WACNT	8-114
Change priority/run burst/job size	-13	TUNE	8-76
Change system date/time	-14	DATES	8-75
Check file access rights	32	None	8-195
Convert date and time	20	None	8-156
Convert privilege mask to name	32	None	8-197
Convert privilege name to mask	32	None	8-196
Create a job	24	Execute access EXQTA JOBCTL TUNE WACNT	8-182
Create dynamic region	-18	INSTAL	8-69
Create a local LAT port	22	SWCTL	8-165
Create user account (new format)	0	GACNT WACNT	8-90
Create user account (old format)	0	GACNT WACNT	8-93
Deallocate all devices	12	None	8-124
Deallocate a device or deassign user logical	11	None	8-123
Deassign a local LAT port	22	SWCFG	8-169
Delete account attributes	-25	GACNT WACNT	8-54
Delete a local LAT port	22	SWCTL	8-166

(continued on next page)

Table 8–4 (Cont.): FIP SYS Calls (by Function Name)

Function Name	Function Code(FO)	Relevant Privileges	Page
Delete user account	1	GACNT WACNT	8-96
Detach	7	JOBCTL	8-110
Directory lookup on index	15	DEVICE Read or execute access	8-133
Disable logins	-2	SWCTL	8-89
Disable terminal	8	HWCTL	8-117
Disk directory lookup on file name	17	DEVICE Read or execute access	8-137
Disk pack status	3	MOUNT HWCFG	8-97
Disk wildcard directory lookup	17	DEVICE Read or execute access	8-138
Drop/regain (temporary) privileges	-21	None	8-57
Enable Ctrl/C trap	-7	None	8-83
Enable logins	-1	SWCTL	8-90
Enable/disable disk caching	19	TUNE	8-154
File name string scan	-10	None	8-27
File utility functions	-26	Read access Write access DATES TUNE SYSIO	8-41
Force input to terminal	-4	SYSIO	8-87
Get monitor tables - part I	-3	None	8-88
Get monitor tables - part II	-12	None	8-77
Get monitor tables - part III	-29	None	8-35
Get open channel statistics	-8	None	8-81
Hang up a dataset	-9	HWCTL	8-81
Kill job	8	JOBCTL	8-116
Return local LAT port characteristics	22	None	8-173
List logical names	21	None	8-162
List user logical names	10	None	8-122
List system files	23	None	8-181
Load monitor overlay code and return status	34	SWCFG	8-206
Lock/unlock job in memory	-20	TUNE	8-59
Login	4	None	8-101
Logout	5	EXQTA WACNT	8-104

(continued on next page)

Table 8–4 (Cont.): FIP SYS Calls (by Function Name)

Function Name	Function Code(FO)	Relevant Privileges	Page
Message send/receive	22	JOBCTL SEND SWCFG SWCTL SYSIO	8-162
Name run-time system	-17	Write access	8-73
Open next disk file	33	DEVICE Read access Write access DATES	8-198
PEEK function	–	RDMEM SYSMOD	8-210
Poke memory	-6	SYSMOD	8-85
Read current privileges	28	None	8-191
Read pack attributes	-25	DEVICE	8-49
Read/read and reset accounting data	14	GACNT WACNT	8-127
Read/write account attributes	-25	GACNT WACNT	8-50
Read/write file attributes	-25	Read access Write access	8-47
Reattach	6	DEVICE	8-107
Remove logical names	21	INSTAL	8-160
Remove monitor overlay code	34	SWCFG	8-206
Remove resident library	-18	INSTAL	8-68
Remove run-time system	-18	INSTAL	8-63
Remove system files	23	Write access INSTAL	8-180
Return error messages	9	None	8-118
Return job status	26	JOBCTL TUNE	8-189
Send local data message with privileges	22	SEND	Ch. 10
Send Print/Batch Services request	22	None	Ch. 10
Set/clear current privileges	28	None	8-191
Set device characteristics	34	HWCFG HWCTL	8-200
Set local LAT port characteristics	22	SWCFG	8-167
Set line printer characteristics	34	HWCFG	8-203
Set system defaults	34	HWCFG SWCFG	8-205
Set number of logins	-19	SWCTL	8-60
Set password	8	GACNT WACNT	8-115

(continued on next page)

Table 8–4 (Cont.): FIP SYS Calls (by Function Name)

Function Name	Function Code(FO)	Relevant Privileges	Page
Set special run priority	-22	TUNE	8-57
Set terminal characteristics - part I	16	HWCFG	8-140
Set terminal characteristics - part II	16	HWCFG	8-148
Shut down system	-16	SHUTUP	8-73
Snap shot dump	-27	SYSIO	8-41
Special magnetic tape directory lookup	15	DEVICE	8-135
Spooling (obsolete: use PBS request)	-28	Read access Write access	8-37
Stall/Unstall system	29	HWCTL	8-193
Swap Console	6	None	8-109
Terminating file name string scan	-23	None	8-27
Third-party privilege check	31	None	8-194
Unload resident library	-18	INSTAL	8-69
Unload run-time system	-18	INSTAL	8-64
Verify password	4	DEVICE GACNT WACNT	8-101
Wildcard PPN lookup	25	DEVICE	8-188
Zero a device	13	DEVICE Create/rename access to account	8-125

8.1.2 Cancel Ctrl/O Effect on Terminal

Data Passed

Bytes	Meaning
1	CHR$(0%), the cancel Ctrl/O code.
2	CHR$(N%), where N% is the number (between 0 and 12) of the channel on which the system executes the call. If you do not specify this byte, the call uses channel 0.
3	CHR$(K%), where K% is the number (between 0 and 127) of the keyboard assigned but not open by the job. This follows the multiterminal service rule. The keyboard is the slave terminal under control of a master terminal open on the channel you specify in byte 2. If you do not specify this byte, the keyboard affected is the one open on the channel you specify in byte 2.

Data Returned

The target string is equivalent to the passed string.

Privileges Required

None.

Discussion

This call cancels the effect of a Ctrl/O typed at the specified terminal. The call selects the terminal open on the channel number you pass in byte 2. (The terminal must be open on that channel.) If you use a slave terminal, byte 2 must be a nonzero channel number on which the master terminal is open; byte 3 must contain the keyboard number of the slave terminal. See the *RSTS/E System User's Guide* for a description of Ctrl/O.

8.1.3 Enter Tape Mode on Terminal

Data Passed

Bytes	Meaning
1	CHR$(1%), the enter tape mode code.
2	CHR$(N%), where N% is the number (between 0 and 12) of the channel on which the system executes the call. If you do not specify this byte, the call uses channel 0.
3	CHR$(K%), where K% is the number (between 0 and 127) of the keyboard assigned but not open by the job. This follows the multiterminal service rule. The keyboard is the slave terminal under control of a master terminal open on the channel you specify in byte 2. If you do not specify this byte, the keyboard affected is the one open on the channel you specify in byte 2.

Data Returned

The target string is equivalent to the passed string.

Privileges Required

None

Discussion

This call is specifically for use with ASR33 terminals that have a low-speed paper tape reader. The call disables echoing on the terminal and places the terminal in tape mode so that a program can be read into the system from the low-speed reader.

The action of this call is the same as that of the TAPE command (see the *BASIC-PLUS Language Manual*). The call selects the terminal open on the channel number you pass in byte 2. (The terminal must be open on that channel.) If you use a slave terminal, byte 2 must be a nonzero channel number on which the master terminal is open; byte 3 must contain the keyboard number of the slave terminal.

Note that Ctrl/C cancels tape mode.

8.1.4 Enable Echoing on Terminal

Data Passed

Bytes	Meaning
1	CHR$(2%), the enable echoing code.

Chapter 4

Layered Products

This chapter describes the differences between V10.0 and V9.7, and the restrictions and corrections to RSTS/E layered products for V10.0. See the *RSTS/E System Installation and Update Guide* or the *Layered Product's Installation Guide* for instructions on how to update the software.

Table 4-1 lists all of the layered products supported on RSTS/E V10.0 and the method for installing each one.

NOTE

Future versions of the layered products that currently use @[0,1]INSTALL may be changed to use Auto-Install. See the *Layered Product's Installation Guide* for more details.

Table 4–1: Layered Products Installation

Layered Product	Installation method
COBOL-81/RSTS/E	Auto-Install
DATATRIEVE-11	Auto-Install
DECdx/RSTS	RUN $BUILD
DECmail-11 for RSTS/E	@[0,1]INSTALL
DECnet/E	@[0,1]INSTALL
DIBOL for RSTS/E	@[0,1]INSTALL
FMS-11/RSTS	@[0,1]INSTALL
FORTRAN IV/RSTS/E	@[0,1]INSTALL
MENU-11/RSTS	RUN $BUILD
PDP-11 BASIC-PLUS-2	@[0,1]INSTALL
PDP-11 C for RSTS/E	Auto-Install
PDP-11 FORTRAN-77/RSTS/E	Auto-Install
PDP-11 Symbolic Debugger	@[0,1]INSTALL
PLXY-11/RSTS	RUN $BUILD
WPS-PLUS/RSTS	@[0,1]INSTALL

4.1 DATATRIEVE-11

This section lists the corrections and restrictions for DATATRIEVE-11 V3.3.

4.1.1 Corrections

The following DATATRIEVE-11 problems have been corrected via updates included with the RSTS/E V10.0 software:

- DATATRIEVE-11 could not accept an ACL password on the command `READY domain (*)`. This problem was caused by corruption of the password data in the DDMF after being received from the remote host.
- When using the lexical functions in an endless loop, the error message Pool Space Exhausted was received. This was because space was not released back to pool once the function was completed.
- When an attempt was made to Ctrl/C out of a PRINT statement or SHOW operation, DTR-11 displayed the error INTERNAL DATATRIEVE ERROR, RECOVERING. This problem only occured when DTR-11 was built with Supervisor Mode RMS.
- Changes were made to the task size of the DDMF, because of a problem that happened if you have installed DTR-11 without using Supervisor Mode RMS. When running REMDTR or the DDMF task you received an error message and your network link was rejected.
- DTR-11 now recognizes the QUERY.INI file if it is renamed in a different location other than SY:, or if it is assigned to a logical name. Also if the dictionary name and location are renamed, moved to different locations other than SY:, or assigned to logical names, and the default .INI file is not found, DTR-11 searches for a system .INI file.
- The error message `[BBad Record address in RAB` now reads correctly.
- In some cases, the Report Writer printed AT BOTTOM OF PAGE twice.
- When you issued multiple consecutive PRINT ON statements, DATATRIEVE-11 displayed the following error:

```
Timeout loop counter has been exhausted
INTERNAL DATATRIEVE ERROR
SEVERE ERROR -- CANNOT CONTINUE
```

  This problem has been fixed.

NOTE

To apply updates to DATATRIEVE-11 V3.3 you must install DATATRIEVE-11 using the standard Auto-Install procedure. Before you begin the DATATRIEVE-11 update, be sure to delete DTRUPD.DON from PATCH$:. This file may be left over from a previous DATATRIEVE update; the presence of this file indicates that the update is done.

4.1.2 Restrictions

DATATRIEVE-11 has the following restrictions:

- Printing a date field together with another field does not give the correct printout. To get a correct printout just using the PRINT command (that is, not using the Report Writer), rename the other field, as in the following example:

```
DECLARE FOO PIC X(11).
FOR CURRENT BEGIN
   FOO=DATE-FIELD
   PRINT NAME-FIELD,FOO|"TESTING"
END
```

- When you use the Report Writer, explicitly specify the columns to print at, for example:

```
REPORT CURRENT
PRINT NAME_FIELD,COL 30,DATE_FIELD,COL 41,"TESTING"
END_REPORT
```

  It is not important where you place DATE_FIELD, but you must place the text string 11 columns after DATE_FIELD if you want the text string to appear directly after it.

4.2 DECdx

DECdx has the following restrictions:

- When you install DECdx, the installation control file attempts to print the DECdx Release Notes in SY:[1,2]DDXRLS.RST. It uses the OPSER package to print these notes. If OPSER is not running when you install DECdx, an error occurs and the installation aborts. As a workaround, you can start the OPSER package before installating DECdx, or simply ignore the error; by that point, DECdx has been properly installed.
- When you run DECdx, you must set up your terminal to emulate a VT52. On a DECmate, you can do this by selecting the SO menu and entering TM 52.
- When you run DECdx, you must set the terminal type attribute to VT52 and turn off the terminal attribute ESCAPE_SEQUENCE. Use the DCL commands SET TERMINAL/VT52 and SET TERMINAL/NOESCAPE.

4.3 DECmail-11

DECmail-11 help file updates used to have RMS attributes. This caused some help topics in DECmail-11 to display extraneous text. RSTS/E V10.0 contains updated help files without RMS attributes.

4.4 DECnet/E

This section describes the changes and corrections that have been made to DECnet/E V4.1.

4.4.1 Changes

This section describes changes that have been made to DECnet/E for V10.0.

4.4.1.1 Utility Library Changes

All of the DECnet utilities that previously used the CSPLIB resident library are replaced on the RSTS/E V10.0 kit to use the new CSP100 library.

4.4.1.2 Database Format Changes

The format of the files [0,1]NETPRM.SYS and [0,1]NSP0.SYS has changed for V10.0. New installations and updates of DECnet/E will automatically update these files to the new format. This update will allow future versions of DECnet/E to support additional network devices.

The RSTS/E V10.0 monitor will support both the old and new file formats. This will allow any currently installed version of DECnet/E to continue working with RSTS/E V10.0.

Optimizations have also been made to the RSTS/E V10.0 monitor which may result in slightly faster node lookup with both the old and new formats.

New versions of DECNET$:NCP.TSK and DECNET$:EVTLOG.TSK, included on the RSTS/E V10.0 kit as part of the DECnet/E update package, will only run with the new database format.

4.4.1.3 NFT/FAL

The following changes and enhancements have been made to the NFT and FAL utilities in DECnet/E:

- Default Transfer Mode

  Previously, NFT by default transferred files in record mode. This sometimes resulted in slower file transfers or errors when transferring binary files without RMS attributes. Users could include the /BL switch to direct NFT to use block mode instead.

  NFT now automatically selects the most suitable mode — record or block — for transferring files to other nodes. This provides increased performance for most file transfers, and avoids the RMS errors Record too big and Illegal Record Format.

  NFT will use block mode to transfer a file if:

  - The operation involves only remote RSTS/E nodes running the current version of RSTS/E.
  - An APPEND operation is not requested, either via the APPEND command or a COPY command that implies concatenation, such as OUT = A,B.
  - A Record mode switch is not included in the command. This includes the Variable (/VA) and Native (/NA) switches as well as the new Record (/RE) switch (see below).
  - The RSTS/E nodes are not running the current release, but the operation does not involve wildcard input.

NOTE

The DCL COPY command invokes NFT to perform network file copy operations. Therefore, this feature applies to the DCL COPY command as well. See also Section 1.2.11.30.

NFT's logging message now includes the transfer mode used. For example:

```
FILE01.BAR copied to RSTS::FILE01.BAR in block mode
```

- New /RECORD Switch

  To allow explicit selection of the file transfer mode (block or record), NFT now recognizes the /RECORD switch, as well as the existing /BLOCK switch. Previously, NFT always transferred files in record mode, unless /BLOCK was specified. Now that NFT by default selects the best transfer mode, the /RECORD switch is provided to allow users to override the default action.

- DELETE Command Mode Changes

  NFT now uses block mode whenever possible when deleting remote files, thus avoiding failures on attempts to delete RMS Sequential Undefined files.

- TYPE Command Mode Changes

  NFT now uses record mode whenever possible when typing remote files, thus avoiding cases where implied carriage control is ignored, or where indexed file prologue blocks are displayed.

- Help Files

  NFT HELP has been updated to include all of the transfer mode changes described in this section.

4.4.2 Corrections

This section describes problems that have been corrected in DECnet/E and its utilities in V10.0.

4.4.2.1 File Access Listener (FAL) Utility

- FAL has been modified to correctly report date/time of file creation. This allows VMS programs to remotely access RSTS/E files using the /SINCE and /BEFORE date qualifiers.
- FAL has been modified to correctly handle wildcarding in block mode. Previously, when a certain ordering of files existed in the user's directory, NFT would report the error ER$RSZ and the remote FAL would hang.
- If a program running on another system uses DECnet/E to create an indexed file on a RSTS/E system, and if the last I/O operation to the file is an $UPDATE or keyed $PUT using a duplicate key, then the file is deleted when it is closed. This only happens if the program creates the remote file; if the program accesses a file that was already there, the problem does not occur.

  The patch to correct this problem, described in article 31.5.2 of the November 1990 *RSTS/E Software Dispatch*, is no longer required and should not be applied.

4.4.2.2 Network File Transfer (NFT) Program

- NFT has been corrected to handle double precision file sizes when performing directory operations.
- NFT will now log local deletes when the command includes the /LOG switch.
- NFT will now correctly identify a Sequential Undefined file (with embedded carriage control) on directory operations, rather than reporting it as a nonattributed file.

4.4.2.3 Installation and Update

The DECnet/E Installation and Update procedure did not correctly handle the selection of the resident library forms of NFT and FAL. The procedure installed the non-RMS library form of NFT and FAL, even though the user elected to install the RMS libraries. The procedure will now install the RMS library form of NFT and FAL whenever the user installs the RMS libraries.

4.5 DIBOL

RSTS/E V10.0 contains the following changes for RSTS/E DIBOL V6.1:

- Online release notes are provided which document the changes made to RSTS/E DIBOL. Reinstall RSTS/E DIBOL V6.1 on RSTS/E V10.0 to update the DIBOL software.
- Prior to RSTS/E V10.0, if you specified the /[NO]OPTIMIZE and /[NO]DEBUG qualifiers together on the DCL DIBOL command, the qualifier you specified first was ignored. This has been fixed in RSTS/E V10.0.
- DIBOL programs that cluster the RMS and DIBOL resident libraries and also use I & D splitting and overlaying may fail with Reserved Instruction Trap, Odd Address Trap or Memory Management errors.

  The problem is caused by an incorrect mapping of the RMS library. It occurs when a terminal or data file is opened. To avoid this problem, avoid clustering RMS with DIBOL. If you are currently using DCL to build the program, the following command creates a clustered library program:

  ```
  LINK/DIBOL/CODE=DATA/STRUCTURE
  ```

  Modify the command as follows:

  ```
  LINK/DIBOL/CODE=DATA/RMS=SUPER/STRUCTURE
  ```

  This maps the RMS library through supervisor mode.

  If you are using a TKB command file, and your .CMD file contains a cluster option, for example:

  ```
  CLSTR = DBCOTS,FDVRES,RMSRES:RO
  ```

  Modify the .CMD file, substituting the following:

  ```
  CLSTR = DBCOTS,FDVRES:RO
  RESSUP = RMS$:RMSRES/SV:0
  ```

  In addition, you need to modify your .CMD file or .ODL file to include the supervisor mode version of the RMS Autoload module. If you currently reference RMSLIB/LB:R0AUTL, substitute RMSLIB/LB:R0AUTS. If your .ODL file references the RSTS/E ODL file LB:RMSRLX, then substitute LB:RMSSLX.

Using this workaround does not increase the size of the DIBOL program; in fact it reduces it. Also, performance is slightly better with supervisor mode RMS library than when clustering the RMS library.

4.6 FORTRAN-77

The update file for FORTRAN-77, PATCH$:F77.DOC, had incorrect RMS attributes on the RSTS/E V9.7 kit. This file is corrected in RSTS/E V10.0.

4.7 WPS-PLUS/RSTS V1.1

The following WPS-PLUS/RSTS problems have been corrected via updates included with the RSTS/E V10.0 software:

Under certain conditions, Sort Processing exceeded its stack limits. When this happened, RSTS reported a Memory Management error, displayed a register dump and issued the fatal error message `??Program lost-sorry`. For example:

```
??Memory management trap
000000 144540 000016 000014 000022 000032 177776 144644 174001
??Program lost-sorry
```

When this error occurred Sort processing stopped and WPS-PLUS returned to the Main Menu.

This problem is corrected via updates to the following files:

— WPS$:WPLSRT.TSK
— WPS$:WPLSRT.LIB
— WPS$:WPSMES.MSG
— WPS$:WPSVER.DAT

Upon completion of this update, the WPS-PLUS/RSTS version will be V1.1.1.

The changes in this update disable the WPS-PLUS/RSTS automatic release notes feature. This was done to save disk space, since this feature automatically placed a copy of the WPS-PLUS/RSTS release notes in each account initialized for WPS-PLUS.

The only effect of this change is that the release notes no longer appear as a WPS document in a newly created account. The change does not affect current users of WPS-PLUS/RSTS V1.1 unless they decide to create new WPS-PLUS accounts.

If you apply this update as part of a first-time installation of WPS-PLUS/RSTS V1.1, the release notes document mentioned in Chapter 2, "Verifying the Installation," of the *WPS-PLUS/RSTS Installation* manual does not exist.

To get a copy of the release notes, invoke WPS. Create a new document called Release_Notes. When the ruler appears, type Gold G. At the `Title:` prompt type _WPS$:RELNOT.WPL and press RETURN twice. This puts a copy of the release notes into your account.

If you are a first-time installer of WPS-PLUS/RSTS, you may want all your users to get a copy of the WPS-PLUS/RSTS release notes. To do this, edit the file WPS$:WPSVER.DAT and remove the exclamation point, !, at the beginning of the second and third lines in the file. Do this before initializing any WPS-PLUS/RSTS accounts and before any user invokes WPS-PLUS.

Chapter 5

Corrections

This chapter describes problems that have been corrected in RSTS/E V10.0. Some of the problems described were corrected in earlier RSTS/E versions by patches published in the *RSTS/E Software Dispatch*. Such articles, where noted, are no longer required and should not be applied to V10.0. For corrections to layered products running on RSTS/E, see Chapter 4.

5.1 Installation

The following corrections have been made to the installation procedures:

- In V9.7, if you answered NO to the installation prompt `Are you ready to proceed?` and then assigned a package logical name to a nonstandard location (device and/or account), the installation ignored the assignment and used the package's standard location instead.

  This problem was described in article 2.2.1 of the November 1989 *RSTS/E Software Dispatch*.

- The RSTS/E V9.7 online installation procedure incorrectly displayed an error message at the conclusion of building a new monitor SIL.

  This problem was described in article 2.2.2 of the January 1990 *RSTS/E Software Dispatch*.

- Previously, if you mounted the wrong volume in response to a volume mount prompt during installation, the installion would abort with an error even though you corrected the error by mounting the proper volume. This problem occurred because the BACKUP/RESTORE package did not exit with status SUCCESS even though the volume mount operation completed successfully. The BACKUP/RESTORE package now exits with the correct exit status.

- Previously, when doing an online monitor installation to a target disk, the installation procedure did not copy all of the necessary monitor modules to the target disk. This problem has been corrected.

- Prior to V10.0, if you selected the prebuilt monitor, the installation procedure would create a SWAP1.SYS swap file large enough to hold 20 jobs even though the monitor could only support a maximum of 10 jobs. The installation procedure now creates a 10-job SWAP1.SYS file.

- In V9.7, if you installed Monitor ODT, the file SY0:[0,1]ODT.SYS is set NODELETABLE. This caused a `?Protection violation` error when you updated your RSTS/E system. In RSTS/E V10.0, the file _SY0:[0,1]ODT.SYS is set to DELETEABLE before it is replaced during an upgrade.

- Before RSTS/E V10.0, if you typed a question mark (?) in response to the `Do you want _SY0:[0,1]SWAP1.SYS created (at n blocks)?` prompt, the installation procedure redisplayed the `What size would you like SWAPMAX to be?` prompt after displaying its help text. This has been fixed to display the proper prompt.
- Previously, if you were doing a target installation using an ANSI Scope terminal, some messages would not be readable, and some disk initialization prompts would overwrite each other. These problems have been fixed in RSTS/E V10.0.
- Online help is now available at the following prompt:

  ```
  You may now transfer the layered product update components from the
  Installation kit.  Do you wish to do the transfer?
  ```

  The display prior to the `Product updates to transfer` prompt has been changed to include `ALL, NOprod[,...]` as options. The help message for this prompt has been updated to show that `prod[,...]` is a valid response for transferring multiple layered products.
- When you updated your system to RSTS/E V9.7, you could not have the RSTS/E Installation kit on a different device than the one you used to boot your RSTS/E Installation kit. For V10.0, you can use a different device.

5.2 INIT.SYS

- In certain cases, systems with multiple DH11 multiplexers crashed during system startup. The patch to correct this problem, described in article 1.1.14 of the *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- Systems with DEQNA/DELQA Ethernet devices assigned vector addresses of 400_8 or greater sometimes crashed during system startup. The patch to correct this problem, described in article 1.1.15 of the *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- Certain unexpected hardware errors on RQDX controllers (for RD53/54 type disks) sometimes caused INIT to hang. This happened during the DSKINT option or while rebuilding the disk after a system crash. This problem has been corrected in V10.0. INIT will now print an error message and retry the operation.

5.3 Monitor

- In some circumstances, the job number cell of the Job Data Block was corrupted, causing the system to crash. The patch to correct this problem, described in article 3.1.9 of the September 1989 *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- If the input buffer quota was reached while processing C1 control characters, the system could crash. This problem was corrected by a patch in the August 1989 *RSTS/E Software Dispatch*, sequence number 3.3.23. This patch is no longer needed and should not be applied.

- If a terminal was set to RESUME=ANY and the terminal was stalled, extraneous characters were displayed in place of the next character to be displayed. This problem was corrected by a patch in the August 1989 *RSTS/E Software Dispatch*, sequence number 3.3.24. This patch is no longer needed and should not be applied.
- Under certain conditions, a user's LOGIN.COM procedure could loop infinitely trying to exit. The patch to correct this problem, described in article 3.3.25 of the January 1990 *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- Previously, the STATUS command in the KMCUT program (included with the HP 2780/3780 and 3271 PE products available from DECUS) could crash the system or cause other random system errors. The patch to correct this problem, described in article 3.5.17 of the October 1989 *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- Under certain conditions, use of asynchronous I/O to extend a disk file could cause the file to grow excessively, exhausting all the remaining free space on the disk. The patch to correct this problem, described in article 3.5.18 of the December 1989 *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- Some applications that used RMS in Supervisor mode did not act properly when Ctrl/C was typed. This problem was corrected by a patch in the November 1989 *RSTS/E Software Dispatch*, sequence number 3.1.10. This patch is no longer needed and should not be applied.
- Issuing the Swap Console command when the console was a dynamic keyboard, as for LAT lines, could cause the system to crash. The patch to correct this problem, described in article 3.5.20 of the August 1990 *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- Terminal lines set to DIALUP and AUTOBAUD might fail to autobaud correctly. The patch to correct this problem, described in article 3.3.28 of the August 1990 *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- If a detached job tried to reattach to a keyboard line that had pending input, the system might crash. The patch to correct this problem, described in article 3.3.29 of the August 1990 *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- Spawning a logged-in job on a static keyboard that has pending input could cause the system to crash. The patch to correct this problem, described in article 3.3.27 of the April 1990 *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- Setting a port on a terminal server to NOAUTOPROMPT to prevent the automatic starting of LOGIN could corrupt memory allocated to XBUF. The patch to correct this problem, described in article 3.3.26 of the March 1990 *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- Detaching, reattaching, or swapping console from a dynamic keyboard could crash the system if that keyboard was opened on another channel at the time of the detach. The patch to correct this problem, described in article 3.5.19 of the May 1990 *RSTS/E Software Dispatch*, is no longer required and should not be applied.

- Prior to V10.0, if a program used the UU.ATT directive to reattach to a detached terminal without deassigning the console or closing its I/O channels, the terminal open modes, delimiter mask, and input buffer were cleared. Since the terminal was still owned by the detached job, these terminal attributes should not have been cleared. The patch to correct this problem, described in Article 3.5.20 of the November 1990 *RSTS/E Software Dispatch*, is no longer required and should not be applied.
- Prior to V10.0, if a program issued a conditional SLEEP of 0 seconds, the monitor erroneously caused the program to sleep for 32768 seconds. The *RSTS/E Programming Manual* discusses this in the section SLEEP and Conditional SLEEP Statements, in the chapter "System Programming Hints." It describes the format of a conditional sleep statement as `SLEEP expression + 32767% + 1%`, where *expression* is defined as the number of seconds to stop execution. Thus, a sleep value of `0% + 32767% + 1%` should cause the program to sleep for 0 seconds, not 32768 seconds. This problem has been corrected in V10.0.

5.3.1 DEQNA/DELQA Device Driver

- In previous versions of RSTS/E, the Ethernet SYSID message, sent periodically by the operating system to identify itself to other network nodes, had an invalid value in one of its fields. This has been corrected in V10.0.
- An inconsistency existed in the error handling for the .SPEC call which loads Ethernet multicast addresses. This problem allowed invalid addresses passed to the monitor to exist in the internal data structures maintained for the driver. This has been corrected in V10.0.

5.4 DCL

This section describes problems that have been corrected in the DCL run-time system or its associated commands and services in V10.0.

5.4.1 CREATE/ACCOUNT Command

The CREATE/ACCOUNT command has the following corrections:

- In previous versions of RSTS/E, if you attempted to create an account on a disk that was not mounted you received the misleading error message `?Invalid DEV:[P,PN] specification`. The CREATE/ACCOUNT command now displays the error message `?Disk pack is not mounted`.
- If you issue a command of the form CREATE/ACCOUNT *disk:[ppn]* and the disk you specify is physically dismounted (that is, spun down), but not logically dismounted, you now receive the error message `?Device not available`. Previously, the error message displayed was `?Disk RDS level 0.0 not allowed`.
- The CREATE/ACCOUNT command now clears the privileges and name on accounts created using a template account on an RDS level 1.1 disk. The privileges default to None and the account name defaults to `(no name)`. If the /PRIVILEGES or /NAME qualifier is used in addition to the /TEMPLATE qualifier, then the characteristics you specifiy are applied instead of the defaults.

Previously, the privileges were set to match those of the account you were logged into, the name defaulted to <no name>, and the /NAME qualifier was ignored.

5.4.2 GOSUB Command

Previously, if a GOSUB command in a DCL command procedure included a continuation line, the subroutine referenced by the GOSUB command was executed multiple times. For example, the following command would cause the subroutine GET_ARG to execute twice:

```
$ IF P1 .EQS. "" THEN -
        GOSUB GET_ARG
    .
    .
    .
```

This has been corrected in RSTS/E V10.0 to execute the subroutine only once.

5.4.3 INITIALIZE Command

Prior to RSTS/E V10.0, the INITIALIZE command sometimes failed with the error `?Protection violation` even though you had the necessary privileges (WRTNFS and RDNFS) to initialize a disk. This problem has been corrected in V10.0. Users with WRTNFS and RDNFS privileges are authorized to initialize a disk, as stated in the documentation.

5.4.4 MOUNT Command

The MOUNT qualifier /NOSHAREABLE only accepted the keyword /NOSHARE. The qualifier now accepts the full keyword /NOSHAREABLE.

5.4.5 REMOVE/OVERLAY

The REMOVE/OVERLAY command now displayes the error message `?Overlay file not installed` if there is no OVR.SYS file in use. Previously, the message displayed was `Overlay file removed`.

5.4.6 SET NODE/LAT/ACCESS=DIALUP

The SET NODE/LAT/ACCESS=DIALUP command now displays the error message `?SWCFG privilege required` if you do not have this privilege. Previously, SET NODE displayed the message `?Protection violation at line 1`.

5.4.7 SET PASSWORD

Previously, if you issued the SET PASSWORD command with a wildcard PPN (for example, [10,*]) to change the password of multiple accounts, and you specified a password longer than six characters, SET PASSWORD sometimes truncated the password to six characters for NOLOOKUP accounts, even though NOLOOKUP accounts can support passwords up to 14 characters.

This problem occurred if SET PASSWORD encountered a LOOKUP account, requiring it to truncate the password to six characters. If SET PASSWORD then encountered any NOLOOKUP accounts, it assigned them the *truncated* password instead of the original (non-truncated) password.

In V10.0, the SET PASSWORD command correctly assigns the specified password to all accounts. If an account is LOOKUP, then SET PASSWORD truncates the password as necessary to a maximum of six characters. For NOLOOKUP account, SET PASSWORD assigns the specified password, up to a maximum of 14 characters.

5.4.8 SET TERMINAL Command

Several corrections have been made to the SET TERMINAL command for V10.0:

- Previously, you could specify /HOST_SYNC for a terminal with the attribute RESUME=ANY, or /RESUME=ANY for a terminal with HOST_SYNC. These attributes conflict. In V10.0, a terminal that has the HOST_SYNC attribute enabled cannot be set to RESUME=ANY, and vice versa.
- Also, you could previously specify /AUTOBAUD for a terminal with ANSWERBACK , or vice versa. These attributes conflict. In V10.0, a terminal that has AUTOBAUD enabled cannot be set to ANSWERBACK, and vice versa.
- Previously, the SET TERMINAL command did not require /PERMANENT if the /BUFFER_QUOTA qualifier was specified. This allowed users without HWCTL privilege to change their terminal's buffer quota. In V10.0, the SET TERMINAL command requires /PERMANENT, and therefore HWCTL privilege, to specify /BUFFER_QUOTA.
- The terminal input buffer quota range allowed in V9.6 and V9.7 was incorrect. Previously, a terminal's buffer quota range was 180 to 7650 characters. The buffer quota range in V10.0 is 168 to 7140 characters.
- The SET TERMINAL/DELIMITER command now disallows eight-bit characters as private delimiters and displays the error message `?Invalid private delimiter`. Previously, eight-bit characters were not trapped, the sign bit was stripped from the argument, and the wrong character was set up as the private delimiter.
- The SET TERMINAL/INQUIRE command now clears any private delimiters you have set. Previously, if you had a private delimiter set, this command failed, displaying the error message `?Terminal type could not be determined`.

5.4.9 SHOW DEVICE Command

The SHOW DEVICE command now displays `Disabled by INIT` instead of `Restricted` when this is a device's actual status. The command SHOW DEVICE SY: now displays information about the system disk. In previous versions no information was displayed.

5.4.10 SHOW NODE/LAT

The SHOW NODE/LAT command now displays the setting of the /ACCESS qualifier.

5.4.11 SHOW QUOTA Command

Previously, the SHOW QUOTA command displayed an error if your account had a default protection set. This has been corrected in V10.0. Also, if you specify a nonexistent account or an account that you do not have the privileges to access, earlier versions of RSTS/E displayed quota information for your own account. In V10.0, the SHOW QUOTA command displays an error message under these circumstances.

5.4.12 Time Format

DCL now correctly interprets 12:00 PM as noon, not midnight, in all DCL commands.

5.5 BACKUP/RESTORE Package

Several problems have been corrected in the BACKUP/RESTORE Package for V10.0:

- BACKUP/DIRECTORY incorrectly displayed protection codes with 512 added to the actual protection code for files marked NODELETEABLE.
- BACKUP/DIRECTORY did not display an error if the /DIRECTORY qualifier was not specified immediately following the BACKUP command. Because BACKUP/DIRECTORY is a single command, the /DIRECTORY qualifier must always appear immediately after the BACKUP verb, similar to the RESTORE/DIRECTORY command.
- During RESTORE of a backup set created with a groupsize other than 10, if an error occurred reading the first block of the backup set, BACKUP did not restore all the backup set data correctly and sometimes exited prematurely with a `??Memory management trap` error. V10.0 BACKUP correctly recovers data after an error reading the first block of the backup set.
- During BACKUP of a large number of 0-length files, BACKUP sometimes hung in a sleep state indefinitely and failed to finish the BACKUP. V10.0 BACKUP performs BACKUP on any number of 0-length or NOBACKUP files.
- BACKUP/DIRECTORY did not correctly report pack cluster sizes larger than 16 when listing pack attributes. If the disk was initialized with a pack clustersize larger than 16, BACKUP always displayed the clustersize as 16. BACKUP/DIRECTORY now reports the correct clustersize.
- If the last group of data blocks was smaller than the group size, BACKUP did not write an XOR block to the backup set after completing all the data for the backup set. That meant that, if there was an error reading any block in the last group, RESTORE was unable to recover the data for that block and also failed to restore the data in any subsequent block in the last group. V10.0 BACKUP writes a final XOR block at the end of every backup set and recovers data from any bad block in the last group.
- If the user did not have the appropriate WACNT or GACNT privilege, RESTORE returned the error `?Illegal SYS () usage` when it tried to create an account other than the user's account. It also returned a `?Protection violation` error for each account attribute it tried to update, even though it was unable to create the account in the first place. BACKUP now gives the error `?Protection violation` if it can't create the account, and will not try to update the account attributes afterward. Note that RESTORE,

BACKUP/IMAGE, and BACKUP/COPY give the following errors if the user does not have the required WACNT or GACNT privilege even if the account already exists:

```
?Error creating directory [PPN]
?Protection violation
```

- If BACKUP recovered the data in the last data block of a backup set using its XOR block, BACKUP could hang in an infinite sleep state. This has been corrected for V10.0.
- Under some circumstances, BACKUP entered an infinite sleep state waiting for streaming tapes to start on the last of their data blocks. V10.0 BACKUP makes sure streaming tapes start properly on their last blocks.
- Previously, if you specified `/CREATED=BEFORE=date`, then BACKUP selected all files created *on or before* the date you specified, rather than only those files created *before* that date. The same behavior occurred if you specified `/MODIFIED=BEFORE=date`.

  This problem has been corrected for V10.0. BACKUP will now select only those files created (/CREATED) or modified (/MODIFIED) *before* the date you specify.

5.6 Print/Batch Services (PBS)

The Print/Batch Services (PBS) package now sends a carriage return instead of a null character to a print device on a keyboard server when the print device is first opened. Some LP devices connected to keyboard lines (via a serial to parallel converter) will echo null characters as spaces which skews the output to the printer.

The PBS package will still send null characters to keyboard print servers for two reasons:

- The FILL characteristic for the keyboard line is non-zero.
- There are null characters in the file being printed and the print server is set to /CONTROLS.

5.7 Commonly Used System Programs (CUSPs)

This section describes problems that have been corrected in various CUSPs in V10.0.

5.7.1 ANALYS

- ANALYS incorrectly displayed virtual disk memory above 1024K as being locked out.
- The number of buffers covered by the SESQ and XMTQ annotations were incorrect. ANALYS has been changed to report their correct size.

5.7.2 DSKSEK

Previously, DSKSEK sometimes failed on certain disk types.

5.7.3 MEMORY

MEMORY incorrectly displayed virtual disk memory above 1024K as being locked out.

5.7.4 OPSER

An OPSER Batch job sometimes failed when run under an account with detached jobs. This has been corrected so that batch jobs will always respond with `Return` to the LOGIN prompt `Job number to attach to?`, meaning the batch job will not attach to any detached jobs running in the same account.

5.7.5 PIP

- PIP incorrectly handled page sizes when copying large files (greater than 32,767 blocks) to the line printer.
- A `?TRAP TO 4` error sometimes occurred when copying a file to a dismounted disk.
- PIP issued an incorrect error message if wildcards were included in the input specification of a disk copy command and the disk was not mounted.

5.7.6 RECOVR.COM

The [0,1]RECOVR.COM recovery procedure creates a special recovery version of the file [0,1]SYSINI.COM. This version of [0,1]SYSINI.COM displays the message `You may now proceed to recover your system by using the RESTORE command.`

In V9.7, the recovery version of [0,1]SYSINI.COM tried to delete itself upon completion. This was done so that the standard version of SYSINI.COM could be restored later. However, the DELETE command failed, displaying `Message text not available.`

In RSTS/E V10.0, the file [0,1]RECOVR.COM no longer includes a DELETE command in the special recovery version of [0,1]SYSINI.COM, eliminating the DELETE error that occurred in V9.7. However, you must now ensure that the special recovery version of [0,1]SYSINI.COM is replaced by the standard version of [0,1]SYSINI.COM when you restore your system. See Chapter 16 of the *RSTS/E System Manager's Guide* for instructions on recovering your system disk.

5.7.7 SYSTAT

SYSTAT incorrectly displayed virtual disk memory above 1024K as being locked out.

5.7.8 ODT

Previously, ODT stayed in a run state when accessing RA82 and RA90 disks in non-file-structured mode. Although this problem still exists for RA90 disks, it has been corrected for RA82 disks.

5.8 RMS-11

This section describes problems that have been corrected in RMS-11 and its utilities in V10.0.

5.8.1 RMS-11 Access Methods

The modules R0RSET and R1CONP in the RMSLIB.OLB and the RMS libraries have been changed to correct remote $CONNECT operations so that the User Buffer address is copied to the Record Buffer address as a preparation for locate mode. This behavior is now consistent with the local RMS-11 $CONNECT operation.

The module R0OPFL in the RMSLIB.OLB and the RMS libraries has been changed to remove an earlier correction that interpreted a RSTS/E native stream file as having implied carriage control. While this achieved some compatibility with VMS, it introduced a RSTS/E incompatibility, specifically, RT-11 map files after a network copy had incorrect carriage control.

5.8.2 RMS-11 Remote Access Methods

The module R0NFRT in RMSDAP.OLB and the DAPRES library has been corrected to handle records larger than 510 bytes when the file's Maximum Record Size (MRS) equals zero. At time of file creation, an MRS of zero indicates that RMS should never consider a record too large for insertion in the file.

Chapter 6

Restrictions

This chapter describes known problems and restrictions in RSTS/E V10.0. Some of the restrictions decribed in this chapter are under investigation and may be resolved in a future release of RSTS/E. For restrictions on layered products running on RSTS/E, see Chapter 4.

6.1 Small Memory Systems

RSTS/E V10.0 contains several changes that may impact systems that have a limited amount of memory, such as the PDP-11/34 (limited to a maximum of 124K words of memory). The following V10.0 changes increase the amount of memory required during timesharing:

- Additional code added to the V10.0 executive can increase the size of your monitor up to 3K words.
- The new Job Header data structure increases each job's maximum memory (SWAP MAX) by 2K words.
- The RESTORE command, when used to restore backup sets created with a large block size (up to 28K bytes in V10.0), requires a larger dynamic region for its buffers.

RSTS/E requires that there be enough memory to hold the installed monitor, XBUF (minimum 3K words), and at least one job at the defined SWAP MAX (34K words for non-I & D space systems). Additional memory is also required (as needed) for other run-time systems, resident libraries and dynamic regions.

Depending on their hardware and software configurations, some small-memory systems may not be able to use all of the features available in RSTS/E. Such systems may encounter problems installing or using V10.0 because of the increased memory usage. These problems can exhibit themselves in a variety of ways:

- INIT will not start timesharing if there is not sufficient user memory to support one job at the defined SWAP MAX size.
- The V10.0 installation may fail when restoring files from the Installation kit if there is insufficient memory for the RESTORE command's dynamic region (a 9K word region is required).
- Installation of resident libraries or run-time systems may fail if there is not enough available memory to hold them.
- BACKUP and RESTORE operations may fail if there is insufficient memory for the required dynamic region.

The following guidelines are suggested to help deal with insufficient memory problems on small memory systems:

1. Do not configure optional hardware or software in the monitor that is not required. Use the INIT HARDWARE DISABLE option to disable any hardware included but not used on your system.
2. Create a second minimum configuration monitor that can be used whenever additional user memory is required. Use the SET SYSTEM/MONITOR_NAME command and reboot the system to switch between monitors.
3. If using DECnet/E, do not include network routing support unless required. Routing code adds several K words of code to the monitor.
4. DECnet/E code is automatically included in the installed monitor at startup if the nodes database file is present (SY0:[0,1]NETPRM.SYS). Rename the nodes database file and reboot the system to eliminate the DECnet/E code from the installed monitor at startup. DECnet/E adds up to 13K words to the installed monitor.
5. Reduce the number of small buffers configured in your monitor. Only do this if your system statistics indicate a consistently large number of available small buffers (more than 200).
6. Reduce XBUF to its minimum required value (3K words). Note that reducing the size of XBUF may reduce overall performance because of less directory and data caching.
7. Do not allocate memory for the virtual disk (DV0:).
8. Avoid installing run-time systems and resident libraries that are not required.

6.2 Installation

The following restrictions apply to the RSTS/E installation procedure:

- If you install V10.0 onto a multi-disk public structure, then the monitor .SIL, [0,1]LOGIN.COM, [0,1]START.COM, and the BASIC-PLUS run-time system file(s) may be installed on a public disk other than SY0:. If the monitor .SIL and [0,1]START.COM files are not installed on SY0:, then you will not be able to successfully start your new system.

  The workaround is to manually copy these files to the system disk, once installation is complete. The following example shows such a copy operation:

```
$ COPY _SY:[0,1]RSTS.SIL _SY0:[0,1]RSTS.SIL
$ COPY _SY:[0,1]START.COM _SY0:[0,1]START.COM
```

- During installation, the SORT/MERGE installation program lists the defaults that it uses, then asks you whether these defaults are acceptable. If you are using a video terminal, part of this list may scroll off of the screen before the question is asked, thus making it impossible to tell whether or not all of the defaults are correct.

  To prevent this, either install SORT/MERGE using a hardcopy terminal or use the Hold Screen key to freeze and release the screen as you read the list of defaults.

- If you press Ctrl/C and abort a target installation, the system logical PATCH$: may still be assigned to the target disk and not restored to its original assignment. This can cause problems during or after target installation, since the logical may not refer to its expected location.

To avoid this, reassign the logical manually after a target disk installation.

- During installation, if you specify that the installation kit is on a device other than the default device, then you cannot answer NO to any of the `Are you ready to proceed?` prompts. If you do answer YES to any of the prompts and then proceed, the installation will try to use the default device instead of the device you specified.

6.3 INIT.SYS

An unnecessary error message prints when an 800 BPI magnetic tape on a TE16 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 indicate an actual hardware error.

6.4 Monitor

This section describes the known problems and restrictions for the RSTS/E monitor.

6.4.1 Escape Sequences in Prompts

When performing command line editing, the monitor relies heavily on the position of the cursor after a prompt has been issued. If the DCL prompt or program prompt contains an escape sequence, the monitor is unable to compute the position of the cursor.

If your prompt contains an escape sequence, your command may be displayed incorrectly when deleting characters in the middle of the command line. Your command may also shift to the left, clearing part of the prompt, when you type Ctrl/R to redisplay the command. After you type Ctrl/R, although the line may not be aligned with the prompt, line editing will behave correctly.

One suggested workaround is to include a RETURN character (without a LINE FEED) to reset the position after the escape sequences. For example, if your DCL prompt ensures your terminal is in VT220 mode, you might have your prompt defined as follows:

```
$ SET PROMPT F$CHR(27)+"[62;0""pCOMMAND> "
```

In this situation, command line editing would not work properly as described above. However, this can be solved by adding a RETURN in the prompt right before the `COMMAND>` string, as follows:

```
$ SET PROMPT F$CHR(27)+"[62;0""p"+F$CHR(13)+"COMMAND> "
```

6.4.2 UU.ATR Directive

When you issue the Write Account Attributes form of the UU.ATR directive to update the disk and detached job quota information, the new quotas maintained on disk for that PPN are updated immediately. However, if the account has users logged into it or open files, then the in-memory copy of this data is not updated. This presents two problems:

1. The new quotas do not take effect until all users have logged out of the account and all files open in the account have been closed.
2. Issuing the SHOW ACCOUNT/FULL command shows the old quota values for the logged-out and logged-in disk quotas rather than the new values. This is because the monitor returns the in-memory copy of this data whenever it is available, which is the case when users are logged into the account or the account has open files.

If you use the DCL command SET ACCOUNT or the UU.CHU directive to change the quotas, then you will not encounter this problem. The SET ACCOUNT command uses the UU.CHU directive which changes both the disk and in-memory copy of the quotas.

BACKUP/RESTORE, on the other hand, uses the UU.ATR directive when updating the accounting data. If an account being updated has any users logged into it or any open files, the current in-memory quotas are still enforced and displayed by the SHOW ACCOUNT command.

6.5 DCL

This section describes known problems and restrictions in the DCL run-time system and associated commands and utilities.

6.5.1 DCL Command Parsing

In certain rare cases, DCL may interprete a null DCL command as an @ command without a parameter, causing it to prompt for a command file. This can occur if SET VERIFY is in effect and DCL executes the @ command to start a command procedure, and the first line in the command file is of the form `$_` or `$_!comment`. In such cases, DCL mistakenly displays the prompt `Command File:`, as if the @ command was issued without a file parameter.

If this condition occurs in a batch or command procedure, DCL will satisfy the `Command File:` prompt with Ctrl/Z and the command procedure will continue normally. If the condition occurs interactively (very rare), you must type Ctrl/Z to exit the extraneous prompt.

To avoid this condition, do not prefix comment lines with the underscore character. In general, you should only use the underscore prefix to prevent automatic symbol substituion on DCL command keywords that represent valid DCL symbols. Special DCL characters like @ and ! cannot be redefined as valid DCL symbols.

6.5.2 DCL Error Handling

If you specify an ON *severity* THEN _GOTO *label* command in a .COM file, and the label is not defined in your .COM file, then if an error occurs, DCL redisplays — as part of its error message — the command line that caused the error, rather than the ON *severity* THEN _GOTO *label* command that contained the undefined label.

6.5.3 F$ENVIRONMENT

The following restrictions apply to the DCL function F$ENVIRONMENT in V10.0:

- If you execute the function F$ENVIRONMENT("LOG_FILE") with a log file open, DCL inserts an extra <CR><LF> into the log file immediately before the F$ENVIRONMENT function call. Terminal output is not affected. For example, the following command:

  ```
  $ _WRITE 0 "Log file = ",F$ENVIRONMENT("LOG_FILE")
  ```

  will appear in the log file as the following entry:

  ```
  Log file =
  _DU1:[10,10]TEST.LOG
  ```

  As a workaround, you can assign the function's value to a DCL symbol before displaying the desired result. For example:

  ```
  $ LOG_FILE = F$ENVIRONMENT("LOG_FILE")
  $ _WRITE 0 "Log file = ",LOG_FILE
  ```

  While this does not eliminate the extra <CR><LF> in the log file, it does avoid splitting any WRITE 0 text.

- If you execute the function F$ENVIRONMENT("LOG_FILE") with a log file open, the log file closes and then reopens (in APPEND mode). This causes the log file to expand by one block each time the F$ENVIRONMENT("LOG_FILE") function is invoked.

  The suggested workaround to this problem is to avoid excessive calls to the F$ENVIRONMENT("LOG_FILE") function. As illustrated above, you can assign the function value to a DCL symbol if you need to refer to it more than once.

6.5.4 Language Compiler Commands

If you issue the DCL language compiler commands COBOL, DIBOL, FORTRAN/F77 or MACRO, DCL returns a `?Protection violation` error if the source file is on a disk that is mounted read-only and you do not specify the /OBJECT= qualifier. The workaround is to copy the source file to the system disk, or remount the source disk write-enabled.

6.5.5 LOGIN Command

The V10.0 feature that allows you log in using a system logical name instead of a PPN is not available with the DCL LOGIN command. That is, you cannot issue the command `LOGIN SMITH` if you are already logged in. This is because the DCL LOGIN command only accepts a PPN parameter, even though the LOGIN program itself can accept either a PPN or a logical name.

If the system command HELLO is defined on your system, then you can issue the command `HELLO SMITH` to log into the account pointed to by the logical name SMITH.

6.5.6 MOUNT/NOSHAREABLE Restriction

If you try to mount a disk and assign ownership of it to another job by using the MOUNT/NOSHAREABLE=*job-number* command, you get an `?Account or device in use` error message, followed by a register dump, and then possibly another error message. RSTS/E mounts the disk and assigns the requested job, but the disk is restricted. (This will be shown as a status of `Lck` in a SHOW DISKS display).

The workaround is to ignore these errors, and then to use the SET DEVICE/NORESTRICT command to unrestrict the disk if needed.

6.5.7 /OUTPUT Qualifier

For certain DCL commands, if you specify /OUTPUT=*disk_file* and *disk_file* already exists, then the command's output will be appended to the existing file rather than replacing it.

This applies to all DCL commands processed by the SYSTAT program, given in the following list:

- SHOW BUFFERS
- SHOW DISKS
- SHOW JOBS
- SHOW LIBRARIES
- SHOW MEMORY
- SHOW RUNTIME_SYSTEMS
- SHOW USERS

6.5.8 RETURN Command

If the DCL command RETURN is executed with SET VERIFY in effect, DCL echoes the GOSUB command line that called the subroutine. The problem does not occur if SET NOVERIFY is in effect. The extraneous GOSUB command is echoed — at your terminal or in a batch log file—but is not executed.

6.5.9 SET TERMINAL Restrictions

If you use the command SET TERMINAL/AUTOBAUD to change the autobaud characteristic of a terminal which is connected to RSTS/E via LAT or DECnet/E, the /AUTOBAUD qualifier is ignored and the terminal's attribute is not changed. No error message is displayed, even though the /AUTOBAUD qualifier is invalid under these conditions.

If you use the command SET TERMINAL/SPEED=(input-rate,output-rate) to change the baud rate of a terminal whose speed is not settable, the qualifier is ignored and the terminal's attribute is not changed. No error message is displayed, even though the terminal may not support different input and output baud rates.

6.5.10 System Command Error Messages

If DCL displays the error `?Can't find file or account` in response to a system command (CCL), DCL's arrow may not be pointing to the part of the command that caused the error.

6.6 BACKUP/RESTORE Package

This section describes known restrictions in the RSTS/E BACKUP/RESTORE package.

6.6.1 AFTER File Selection

BACKUP interprets the keyword AFTER to mean "on or after" the date/time specified, similar to the DIRECTORY command's /SINCE qualifier. This may cause more files to be selected than expected. For example, if you issue the following command, you might expect BACKUP to only select files with a creation date *later* (newer) than 20-Jun-90:

```
$ BACKUP/CREATED=AFTER=20-JUN-90 *.* BACKUP.BCK
```

Instead, BACKUP will select all files created *on or after* 20-JUN-90.

If you include both a date and time value with AFTER, then BACKUP will select all files created on or after the specified date/time.

6.6.2 BACKUP/COPY Command

BACKUP/COPY, like RESTORE, always places output files in NEW FILES LAST (NFL) order so that they will be in the same order with respect to each other as they were on the input disk. If the output disk is initialized as NEW FILES FIRST (NFF), the files are still created in NFL order.

6.6.3 BACKUP/IMAGE Command

This section describes known restrictions for the new BACKUP/IMAGE command.

6.6.3.1 HOOK Failure

BACKUP/IMAGE will fail to HOOK the output disk if:

- The output disk is dismounted when BACKUP/IMAGE is run
- The output disk is mounted /NOSHAREABLE
- /INITIALIZE is specified in the BACKUP command line

Under any of these conditions, HOOK displays the error `?Can't open [0,1]SY0:INIT.SYS`, then BACKUP/IMAGE displays the error `%Unable to hook output volume.`

This happens because, when the output disk is not mounted, BACKUP/IMAGE mounts it /NOSHAREABLE to protect it from access during the backup operation. BACKUP/IMAGE runs HOOK at a pseudo keyboard from a spawned job, and HOOK fails because it cannot reach the /NOSHAREABLE disk. If you mount the disk /SHAREABLE first and specify /INITIALIZE, then BACKUP/IMAGE dismounts the disk to do the initialization and then remounts it /NOSHAREABLE for the backup, which causes the same result for HOOK.

To allow BACKUP/IMAGE to HOOK the output disk, mount it /NOSHAREABLE before running BACKUP/IMAGE, and do not specify /INITIALIZE in the BACKUP/IMAGE command line.

If the HOOK fails, you can still HOOK the output disk after BACKUP/IMAGE has completed by running SYSGEN$:HOOK. At HOOK's prompt, type:

```
dev:[0,1]INIT.SYS,,dev:[0,1]INIT.SYS
```

where `dev:` is the output disk device name.

NOTE

BACKUP/IMAGE will try to HOOK the output disk only if:

- It copies [0,1]INIT.SYS to the output disk, and
- The input disk is hooked.

6.6.3.2 Initialization Errors

BACKUP/IMAGE/INITIALIZE initializes the output disk with a clustersize of zero by default, which tells DSKINT to use the device clustersize as the pack clustersize. In some cases, this may cause errors during backup or verification. If you want BACKUP to use a clustersize other than zero, use the /INITIALIZE=CLUSTER_SIZE=nn qualifier.

Possible errors are:

- A directory attribute verification error for each directory on the disk. These happen because the directory attribute that contains the total allocation is different on disks with different cluster sizes.

  NOTE

  Even on disks with the same cluster size, you may get two directory attribute verification errors for each of the accounts [1,1] and [1,2] if DSKINT was used to create those accounts on the source disk. This happens because DSKINT places the date/time attributes before the disk quota attribute, while BACKUP places the disk quota attribute before the date/time attributes. BACKUP compares attributes by looking them up by index on each disk, and therefore will get a compare error on each attribute because the ordering is different.

- If a directory on a source disk with a larger clustersize contains a large enough number of files, then the target directory on the disk with a smaller clustersize may not be able to hold all the files, resulting in a `?No room for user on device` error for each file that does not fit into that directory, and resulting in the files not being copied to the output disk.

6.6.4 BEFORE File Selection

If you specify both a date *and* a time value with the BEFORE keyword argument, BACKUP interprets BEFORE to mean "on or before" the date/time specified. For example, if you issue the following command, then BACKUP will select any file it encounters with the creation date/time 20-JUN-90 11:50 PM:

```
$ BACKUP/CREATED=BEFORE=20-JUN-90:11:50PM *.* BACKUP.BCK
```

(It will, of course, also select all files with an earlier creation date/time.)

If you include a date but no time value with the BEFORE keyword, then BACKUP selects only those files with a creation date earlier than the date specified.

6.6.5 /MODIFIED Times

RSTS/E maintains for each file a creation date, creation time and modification (access) date, but no modification time.

BACKUP allows you to specify a time value for the /MODIFIED qualifier, since BACKUP can select files from VMS savesets that include modification times for VMS files. Because there is no modification time for RSTS/E files, BACKUP assumes a modification time of 00:00 — the earliest time of day — for the file's modification date.

This can produce unexpected results when you include a time value with the /MODIFIED qualifier. For example, if you include the following qualifier, then you might expect BACKUP to select only those files with a modification date/time on or after 16-Jun-90 10:00 AM:

```
/MODIFIED=AFTER=16-JUN-90:10:00AM
```

However, since all RSTS/E files are treated as having a modification time of 00:00 (start of day), BACKUP does not select any files modified on 16-Jun-90; only files modified on 17-Jun-90 or later are selected.

Similarly, if you specified the following qualifier, then BACKUP will select all files modified on or before 16-JUN-90 00:00 (start of day):

```
/MODIFIED=BEFORE=16-JUN-90:00:00
```

Since BACKUP considers all RSTS/E files as having a modification time of 00:00, BACKUP selects *all* files modified on 16-Jun-90 instead of only those files created on or before 16-Jun-90 00:00.

To avoid these problems, do not specify a time value with /MODIFIED when backing up or restoring RSTS/E files.

6.6.6 RESTORE Command

This section describes known restrictions for the RESTORE command.

6.6.6.1 Error Recovery Handling

When BACKUP restores a backup set and encounters an error reading a block, it tries to recover the data. Example errors:

```
%CRC error detected for block
?Error reading backup set
?Data error on device
```

If the recovery procedure is successful, BACKUP simply continues with the restore operation without issuing any message to indicate that the recovery was successful. However, if the recovery is not successful, BACKUP issues the following message:

```
?Unable to recover part of Backup set
```

It may follow this with other error messages about missing data or attributes for a specific file.

NOTE

Because BACKUP has no way of knowing the contents of an unrecoverable bad block in the backup set, parts of files or entire files may be lost with no error messages displaying the name of the lost file(s).

6.6.6.2 Restoring VMS Savesets

The following restrictions apply to restoring files from savesets created on VMS:

- Some VMS savesets restored on RSTS/E may produce the error message `?Invalid record length in Backup set - record skipped` one or more times. This is because VMS BACKUP uses a data structure within its savesets that RSTS/E does not recognize. These error messages have no effect on the validity of the restored data and may be ignored.
- Some files transferred from RSTS/E to VMS, then backed up to a VMS saveset and restored with RSTS/E BACKUP, may cause the error `?Some file data in file [PPN]FILENAME may be missing`. This is caused by the fact that a file can be created at a larger size on VMS than it was originally on RSTS/E, even though only the original number of disk blocks contain valid file data. VMS BACKUP then puts the larger size in the saveset attribute record that describes the file, but copies only the smaller number of valid file data blocks to the saveset.

  When the file is restored to RSTS/E it is created at the larger size specified in the file attribute record, but there is only enough data in the saveset to fill up the original smaller size. This causes BACKUP to note the discrepancy and print the above error. The restored file is bigger than the original file, but the USED:m:n attribute provides the correct original size information to other RSTS/E operations. The file data is complete and correct, and the error may be ignored.

6.7 Print/Batch Services (PBS)

Under certain conditions, some Print/Batch Services (PBS) commands may fail with the error message `?Packet error -1600`.

The conditions that cause this error are rare, generally requiring multiple users to issue PRINT or SUBMIT commands at the same time that PBS wraps the sequence number around from 9999 to 1. Should this error occur, simply reissue the command that triggered the error.

6.8 Operator/Message Services Package

The /SINCE qualifier of the SHOW REQUESTS command defaults to 12:00AM if no time is specified with the qualifier. The *RSTS/E System Manager's Guide* and the online help text incorrectly state that the time defaults to 11:59PM.

6.9 Commonly Used System Programs (CUSPs)

This section describes known problems and restrictions in various RSTS/E CUSPs.

6.9.1 BPCREF

The BPCREF program accepts the /QUE qualifier to queue its output file for printing under the OPSER print facility. Queueing is accomplished by chaining to the QUE program.

BPCREF continues to rely on the OPSER package for queueing its cross reference file for printing if requested. It does not use the newer Print/Batch Services (PBS) package. If you need to use the print queueing capability of BPCREF, then you must continue running the OPSER print package (you can use both PBS and OPSER concurrently). Alternatively, you can use the DCL PRINT command to queue the cross reference file for printing after the BPCREF completes.

6.9.2 COPY

The COPY program, located in AUXLIB$, may abort with the error `?Maximum memory exceeded` if you attempt to copy or verify a magtape with too large a block size. This is not a new restriction, but may now occur due to the introduction of larger block sizes in BACKUP and the monitor.

6.9.3 ODT

ODT.TSK hangs if you use it to access an RA90 disk non-file-structured. If you have the problem, type Ctrl/C to exit ODT. ODT.TSK works correctly in file-structured mode, when used to access the contents of individual files on RA90 disks.

6.9.4 RUNOFF

The RUNOFF program accepts the /QUE qualifier to queue its output file for printing under the OPSER print facility. Queueing is accomplished by chaining to the QUE program.

RUNOFF continues to rely on the OPSER package for print queueing if requested. It does not use the newer Print/Batch Services (PBS) package. If you need to use the print queueing capability of RUNOFF, then you must continue running the OPSER print package (you can use both PBS and OPSER concurrently). Alternatively, you can use the DCL PRINT command to queue the RUNOFF output file for printing after RUNOFF completes.

6.9.5 PIP

Because of buffersize limitations, PIP cannot copy or read magtape backup sets created by BACKUP with a /BLOCK_SIZE value of 4096 or larger. If you need to copy or read a magtape backup set with PIP, create it with a /BLOCK_SIZE value of 4080 or less.

6.10 RSX

The RSX-11 LBR utility does not support the new extended logicals. Only logical names of six characters or less are valid in LBR.

6.11 RMS-11

- RMS-11 does not correctly handle a file specification which contains an underscore in front of the device name. RMS-11 ignores the underscore.
- Keyed access on a remote indexed file will incorrectly report a Record Not Found error when the target record's key size is described as zero on a key whose datatype is non-string. This is documented as a correct way to pass a nonstring key, but currently works correctly only for local operations.

6.11.1 RMS-11 Utilities

The RMS-11 utilities RMSDSP, RMSDEF, RMSBCK, and RMSRST do not support underscores in logical names.

Index

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

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