

RSTS/E Quick Reference Guide

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This manual describes the use of DCL, System Utility Programs, and general programming information on RSTS/E.

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Software Version: RSTS/E Version 10.0

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Preface

Purpose of This Guide

This manual describes the use of DCL (Digital Command Language), System Utility Programs, and general programming information on RSTS/E.

Terms Used in This Guide

The following terms are used throughout this guide:

Command Line

The part of a command string you type on one line on your terminal.

Command String

A complete command, including the command name, parameters, and switches or qualifiers (if any).

Default

A built-in value that the system assumes when you do not supply a particular value. For example, when you do not supply a device name in a file specification, the system assumes the public disk structure.

Parameter

Part of a command string that specifies what the command is acting on. For example, the COPY command acts on files, so its parameters are file specifications.

Qualifier

In DCL, part of a command string that modifies the command's action in some way. For example, the PRINT command's /COPIES qualifier lets you print several copies of a file. All qualifiers start with a slash (/).

Switch

A synonym for qualifier; that is, part of a command string that modifies the command's action in some way. For example, using the /DE switch in a PIP command causes PIP to delete the specified file. Like qualifiers, all switches start with a slash (/).

This guide uses the term switch instead of qualifier when describing system utility programs and command environments other than DCL.

Conventions

[]	Indicates an optional part of a command. This does not apply to [p,pn] where the brackets ([]) are part of the required command syntax.
{ }	Indicates a required choice of one item among two or more possibilities.
	Indicates a choice of one item among two or more possibilities.
...	Indicates that you can repeat the preceding item in the command format.
color	Indicates examples.
N	Indicates that you can use a DCL qualifier over the DECnet computer network (if your system has DECnet/E).
Ctrl/x	Represents the Ctrl key and another character, represented here by x. For example, enter Ctrl/U by holding down the Ctrl key and pressing the key labeled U. RSTS echoes or displays the character at your terminal as ^U.

Summary of Technical Changes for RSTS/E V10.0

RSTS/E V10.0 is a major release of the RSTS/E PDP-11 operating system. This manual describes the following new features:

- Extended logicals
- Host initiated (Outbound) LAT
- Command line editing and recall
- Operator/Message Services (OMS)

System Information

This chapter provides system information. Table 1–1 lists the RSTS/E control characters and terminal keys.

Table 1–1: Control Characters and Terminal Keys

Key	Function
Ctrl/A or F14	Toggles from overstrike editing mode to insert mode, or vice versa, while editing a command line. Effective only until a delimiter is entered, then the mode reverts back to the terminal setting.
Ctrl/B or Up Arrow	Recalls the previous command typed by the user at the current command level. When Ctrl/B or Up Arrow is entered, the current line, if any, is erased and the next previous command from the recall buffer is put in its place. The cursor is positioned at the end of the recalled command, regardless of the position of the cursor previous to the recall.
Ctrl/C	Halts execution of the current command or program and usually returns control to the job keyboard monitor. (In some programs, Ctrl/C may return you to the program's command level.) Ctrl/C echoes on the terminal as ^C. You can lose data with Ctrl/C because it causes an immediate halt.
Ctrl/D or Left Arrow	Moves the cursor to the left or backwards one character position in the command line. If the cursor is already at the beginning of the command line, the key is ignored.

Table 1-1 (Cont.): Control Characters and Terminal Keys

Key	Function
Ctrl/F or Right Arrow	Moves the cursor to the 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	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	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/I or TAB	Moves the cursor to the next tab stop on the terminal line. By default, tab stops are eight spaces apart (see the SET TERMINAL/TAB command).
Ctrl/J, LINE FEED, or F13	On terminals that do not support line editing, ends the current line. LINE FEED moves the cursor to the next line but does not return the cursor to the left side of the screen. On terminals that do support line editing, deletes the word to the left of the cursor.
Ctrl/L or FORM FEED	Sends a typed line to the system for processing and skips four lines on a video terminal. FORM FEED and Ctrl/L advance the paper to the top of the next page on hardcopy terminals (see the SET TERMINAL/FORM_FEED command).
Ctrl/N or Down Arrow	Performs a function similar to Ctrl/B or Up Arrow except it moves forward in the recall list, obtaining the next command entered. Requesting a forward recall when at the most recent entered command of the recall buffer results in erasing the current command line on the screen and no line is recalled.
Ctrl/O	Stops and restarts terminal output while a program is running. Ctrl/O does not affect program execution; however, the system discards all terminal output the program produces between the time you stop output and restart it again. Ctrl/O echoes on the terminal as ^O.

Table 1–1 (Cont.): Control Characters and Terminal Keys

Key	Function
Ctrl/Q	Resumes terminal output suspended by Ctrl/S while a program is running. You can use Ctrl/Q only if the DCL TTSYNC (or STALL) characteristic is set for the terminal.
Ctrl/R	Redisplays all characters you typed since the last time you terminated a line, as well as any characters you typed ahead that the system has not yet processed.
Ctrl/S	Suspends terminal output while a program is running. You can use Ctrl/S only if the DCL TTSYNC (or STALL) characteristic is set for the terminal. When you use Ctrl/S, the system saves all terminal output that the program produces instead of discarding it (as it does when you use Ctrl/O).
Ctrl/T	Displays a one-line status report for your job. The report includes your job number, keyboard number, job state, current run-time system, and other information.
Ctrl/U	Erases all characters from the beginning of the line to the cursor. The remaining characters are shifted to the beginning of the command line. Ctrl/U erases characters from the screen on terminals which support line editing. On multiline commands, deletes only the portion of the command from the cursor to the left margin.
Ctrl/X	Deletes all type-ahead including the current terminal line. Ctrl/X echoes as ^X and moves the cursor to the next line.
Ctrl/Z	Exits most RSTS/E system programs. Ctrl/Z also signals the end of a terminal input file.
Ctrl/[, ESCAPE, or ALTMODE	Sends a typed line to the system for processing or starts an escape sequence if the terminal is set /ESCAPE_SEQUENCE. ESCAPE, ALTMODE, and Ctrl/[echo on your terminal as a dollar sign (\$).

Table 1-1 (Cont.): Control Characters and Terminal Keys

Key	Function
DELETE or RUBOUT	Erases the character to the left of the cursor. Any characters to the right of the cursor are shifted to the left. On hardcopy terminals, erased characters are displayed between backslashes.
NO SCROLL	Performs the same function as Ctrl/S and Ctrl/Q on the VT100, VT101, VT125, and other VT100-family terminals. The DCL SET TERMINAL/TTSYNC (or STALL) characteristic must be set for the terminal.
HOLD SCREEN	Performs the same function as NO SCROLL on the VT200 and VT300-family terminals.
RETURN	Sends a typed line or command to the system for processing. Pressing RETURN moves the cursor to the beginning of the next line.

Files

This section provides information on the file specification format, file types, file specification switches, and file protection codes.

File Specification

A file specification is the full name and location of a file. It has the format:

`node::device:[p,pn]filename.typ/switches`

where:

node:: Specifies a node name on the DECnet network. The default node is your system. You can specify a node name only in certain DCL and DECnet/E commands. You use node names only if your system is part of a DECnet network.

device: Specifies a physical or logical device name. The default device is the public disk structure.

[p,pn] Specifies the directory on the device, identified by its project-programmer number (PPN). The default is your current account. You can include a dollar sign (\$) in place of a PPN to indicate directory [1,2], which is the system library. You can include a percent sign (%) in place of a PPN to indicate directory [1,4]. You can include an ampersand (&) in place of a PPN to indicate directory [1,5]. You can include a pound sign (#) in place of a PPN to indicate directory [your project number,0].

filename Specifies a one- to six-character file name.

typ Specifies a one- to three-character file type. The default file type depends on the command or program you are using.

/switches Specifies one or more RSTS/E file specification switches: /PROTECTION, /CLUSTERSIZE, /FILESIZE, /POSITION, /RONLY, or /MODE. These switches specify the file protection code, cluster size, and other values.

You cannot use RSTS/E file specification switches in DCL except where specified as a valid qualifier in the command description. Instead, you use DCL commands and qualifiers to set these values. Note that /MODE and /POSITION switches have no DCL equivalent.

The next three sections provide more detail on file types, file specification switches, and file protection codes. Table 1-2 lists RSTS/E file types and their meanings.

Table 1-2: File Types

File Type	Meaning
.B2S	BASIC-PLUS-2 source file
.BAC	BASIC-PLUS compiled file
.BAK	Backup file created by several types of utility programs
.BAS	BASIC-PLUS source file
.BCK	BACKUP container set (or RMSBCK container set)
.C	A program written in C language.
.CBL	COBOL source file
.CMD	Command file
.COM	DCL command file (or PBS Batch command file)
.CRF	Cross-reference listing file
.CTL	Batch control file (or OPSER based Batch)
.DAT	Data file
.DBL	DIBOL source file
.DIF	DIFFERENCES or FILCOM output file
.DIR	A file produced by the DIRECTORY command
.DOC	RUNOFF output file
.EDT	EDT initialization file
.ERR	System error file
.ESC	Terminal SETUP file
.FLB	FMS-11 form library file
.FOR	FORTTRAN-IV source file
.FTN	FORTTRAN-77 source file
.HLP	System program help text file
.LIB	Resident library file
.LNK	Input file used by the LINK command (Digital supplied)
.LOG	Batch output log file
.LST	Listing file
.MAC	MACRO source file
.MAI	DECmail/RSTS mailbox file

Table 1-2 (Cont.): File Types

File Type	Meaning
.MAP	Map file created by the LINK command or Task Builder
.MLB	MACRO Library file used by the RSX-based MACRO assembler
.MSG	DECmail message file
.OBJ	Object file, which is a compiled BASIC-PLUS-2, COBOL, DIBOL, FORTRAN, or MACRO program
.ODL	Overlay Description Language input file used by the Task Builder
.OLB	Object module library file used by the Task Builder
.OMS	Operator/Message Services log file
.PMD	Postmortem dump file
.RNO	RUNOFF input file
.RTS	Run-time system
.SAV	Executable FORTRAN-IV or MACRO program produced by the LINK command or the RT11-based LINK program
.SIL	Save Image Library used by the RSTS/E monitor or system program
.SKL	Skeleton file produced by the COBOL-81 compiler
.SML	RT11 source MACRO library
.SRT	SORT-11 file
.STB	Symbol table file produced by the Task Builder or linker
.SYS	System file, usually reserved for use by the system
.TEC	TECO source file
.TES	TECO source program
.TMP	Temporary file created by a system program (deleted when you log out or if the disk is rebuilt)
.TSK	Executable BASIC-PLUS-2, COBOL, DIBOL, FORTRAN-77, or MACRO program produced by the LINK command or the Task Builder
.TXT	ASCII text file
.ULB	A universal library
.UNI	Default file type for universal library files

File Specification Switches

This section lists the RSTS/E file specification switches.

/CLUSTERSIZE

Specifies the cluster size for a disk file. A cluster is one or more contiguous disk blocks that the system treats as a unit when it creates or extends a file. Using a large cluster size for a large file speeds access to the data.

You can specify a cluster size of 1, 2, 4, 8, 16, 32, 64, 128, or 256 blocks, depending on the type of disk. The default (and minimum) value is the disk's pack cluster size.

Format

/CL[USTERSIZE]:[-][#]n[.]

where:

- Specifies a negative cluster size, which prevents an error if you specify a cluster size less than the disk's pack cluster size.
- # Specifies that n is an octal number.
- n Specifies the cluster size in blocks.
- . Specifies that n is a decimal number. The default is decimal.

Example

/CL:-8

Assigns a cluster size of 8 or the disk's pack cluster size, whichever is larger.

/FILESIZE

/SIZE

Reserves space on disk for the file. When you create a file, use this switch to pre-extend the file to its final size. **/FILESIZE** and **/SIZE** are the same. When you do not pre-extend a file, system assigns a size of 0 blocks when it creates the file and extends the file as data is written to it.

Format

`/FI[LESIZE]:[#]n[.]` or `/SI[ZE]:[#]n[.]`

where:

- # Specifies that n is an octal number.
- n Specifies the number of blocks to pre-extend the file.
- . Specifies that n is a decimal number. The default is decimal.

Example

```
/FI:3000
```

Pre-extends a disk file to 3000 blocks.

/MODE

Lets you pass up to 15 bits of information to a device driver when you open a file. The meaning of the bits differs for each device and determines the read/write mode for data transfers.

Format

`/MO[DE]:[#]n[.]`

where:

- # Specifies that n is an octal number.
- n Specifies the mode value, which can range from 0 to 32767 (decimal).
- . Specifies that n is a decimal number. The default is decimal.

Example

```
/MO:16
```

Specifies a contiguous disk file.

/POSITION

Specifies the physical location of a file on disk.

Format

/PO[SITION]:n

where:

n specifies the device cluster number (in decimal) at which to place the first block of the file. Valid device cluster numbers depend on the disk size.

Example

/PO:4000

Causes the system to locate the disk file starting at device cluster number 4000.

/PROTECTION

Assigns a protection code to the file. The default protection code is 60.

Format

/PR[OTECTION]:[#]n[.]

where:

Specifies that n is an octal number.

n Specifies the protection code.

. Specifies that n is a decimal number. The default is decimal.

Example

/PR:40

Specifies a protection code of 40.

/ROONLY

Sets read-only mode for a disk file. /ROONLY is the same as /MODE:8192 for disk files.

Format

/RO[NLY]

File Protection Codes

You assign protection codes to files in all RSTS/E command environments except DCL by using the /PROTECTION switch. In DCL, you assign protection codes to files using the SET PROTECTION command or the /PROTECTION qualifier in several DCL commands. Table 1–3 and Table 1–4 list RSTS/E protection codes and their meanings.

Table 1–3: Individual Protection Codes

Code	Meaning
1	Protection against reading by the owner
2	Protection against writing by the owner
4	Protection against reading by the owner's group
8	Protection against writing by the owner's group
16	Protection against reading by anyone not in the owner's group
32	Protection against writing by anyone not in the owner's group
64	Executable program, which can be run
128	A protected data file; overwritten with zeros when deleted

When you add individual codes to executable protection code 64, the system interprets these codes differently from those previously listed.

Table 1–4: Executable Protection Codes

64 + Code	Meaning
1	Protection against executing by the owner
2	Protection against reading and writing by the owner
4	Protection against executing by the owner's group
8	Protection against reading and writing by the owner's group
16	Protection against executing by all others not in the owner's group
32	Protection against reading and writing by all others not in the owner's group
128	Program with privileges (cannot be used on .com files)

To determine the protection code you assign to a file, add up the individual code numbers for the types of protection you want. For example, the usual system default <60> protects against reading, writing, and deleting by all users except its owner, because it is the sum of 4, 8, 16, and 32.

Table 1–5 lists some common protection codes and their meanings.

Table 1–5: Commonly Used Protection Codes

Code	Sum of Codes	Meaning
232	128+64+32+8	Executable file that is privileged and protected against reading and writing by anyone except the owner. However, anyone can execute the file.
124	64+32+16+8+4	Executable file that is protected against reading, writing, and execution by anyone except the owner.
104	64+32+8	Executable file that is protected against reading and writing by anyone except the owner and that anyone can execute.
62	32+16+8+4+2	Protection against reading by anyone except the owner. Protection against accidental deletion or modification by the owner or anyone else.
60	32+16+8+4	Protection against reading and writing by anyone except the owner.
48	32+16	Protection against reading and writing by anyone not in the owner's group. Can be read or written by anyone in the owner's group.
42	32+8+2	Protection against writing by anyone including the owner, but is readable by everyone.
40	32+8	Protection against writing by anyone except the owner, but is readable by everyone.
0		No protection (any user can read, write, and delete).

Device Names

Each device on a RSTS/E system has a physical device name, also called a device designator or device specification.

A physical device name consists of two or three letters, an optional unit number, and a colon (:). For example, "KB0:" is a "keyboard," or terminal, with the unit number 0. Other terminals on your system have similar device names assigned to them, such as "KB7:" or "KB35:". Three letter names are valid for keyboards only (see Table 1-6).

If you do not specify a physical device name, the system assumes the public disk structure. For non-file-structured devices (line printer, and so forth), you need only specify the physical device name; the system ignores any file name, file type, or directory that you specify.

If you do not specify a unit number, the defaults are:

Disk - Public structure

Tape - Unit 0

Keyboard - Yours

Line printer - Unit 0

Flexible diskette - Unit 0

Table 1-6 lists RSTS/E device designators.

Table 1-6: RSTS/E Device Designators

Designator	Device
DK:, DL:, DM:, DP:, DR:, DB:, DU:, SY:	RSTS/E public disk structure
SY0:	System disk
DK0: to DK7:	RK05 disk units 0 through 7
DL0: to DL3:	RL01/RL02 disk units 0 through 3
DM0: to DM7:	RK06/RK07 disk units 0 through 7
DR0: to DR7:	RM02/RM03/RM05/RM80 disk units 0 through 7
DB0: to DB7:	RP04/RP05/RP06 disk units 0 through 7

Table 1–6 (Cont.): RSTS/E Device Designators

Designator	Device
DU0: to DU15:	RA60/RA70/RA80/RA81/RA82/RA90/RC25/RD31/RD32 /RD51/RD52/RD53/RD54/RX33/RX50 disk units 0 through 15
CR:	CR11 punched or CM11 mark sense card reader
CD:	CD11 punched card reader
KB:	Your terminal
KBn:	Terminal n on your system
KBAnn:	Terminal on subline nn of a DL11 A,B type single line interface
KBBnn:	Terminal on subline nn of a DL11 C,D type single line interface
KBCnn:	Terminal on subline nn of a DL11E type single line modem interface
KBDnn:	Terminal on subline nn of a static pseudo keyboard
KBFnn:	Terminal on subline nn of the DH multiplexers
KBGnn:	Terminal on subline nn of the DZ/DZV/DZQ multiplexers
KBHnn:	Terminal on subline nn of the DHV/DHU/DHQ/CX multiplexers
KBInn:	Dynamic terminal number nn
MT0: to MT7:	TE10/TU10/TS03 magnetic tape units 0 through 7
MM0: to MM7:	TE16/TU16/TU45/TU77 magnetic tape units 0 through 7
MS0: to MS3:	TS11/TU80/TS05/TK25 magnetic tape units 0 through 3
MU0: to MU1:	TK50/TU81/TU81E magnetic tape units 0 or 1
LP0: to LP7:	Line printer units 0 through 7
TTn:	Terminal n in the system (synonym for KBn:)
TT: or TI:	Your terminal (synonyms for KB:, the terminal that started the job)
NL:	The null device
PKn:	Pseudo keyboard n
DX0: to DX7: or DY0: to DY7:	RX01/RX02 flexible diskette units 0 through 7

NOTE

If your system has only TS11, TU80, or TSV05 tape units, MS: and MT: are synonyms. If your system has only TE16, TU16, TU45, or TU77 tape units, MM: and MT: are synonyms. If your system has only TK50, TU81, or TU81E tape units, MU: and MT: are synonyms. On systems that have the CD11 card reader, CR: is a synonym for CD:.

Logical Names

You can assign a logical name to a physical device name, a directory, or a device/directory combination. A logical name consists of up to 15 alphanumeric characters followed by a colon (:). Both user and system logical names allow the the underscore (_) character. However, the dollar sign (\$) character is only allowed in the system logical names.

Logical names provide a convenient way to refer to devices and directories that you use often. Logical names are also useful in programs and batch control files because they make them independent of physical locations of files and devices. For example, when you use a physical device name in a program, the program works correctly only if the device you refer to is mounted on the drive you specify. But when you use a logical name, you can mount the device on any free drive and assign the logical name to the device before running the program.

Using the ASSIGN command, you can assign a logical name in any RSTS/E command environment. The command syntax is:

```
ASSIGN dev:[[p,pn]] logical-name[:]
```

In DCL, you can include a colon at the end of the logical name. In other RSTS/E command environments, such as BASIC-PLUS, you cannot include the colon.

The following command assigns the logical name INDEX: to tape drive MM0:.

```
ASSIGN MM0: INDEX
```

Any logical name you assign applies only to your job. The logical name stays in effect until you deassign it with the DEASSIGN command or log out.

RSTS/E Multiple Privileges

Table 1-7 provides a summary of the RSTS/E multiple privileges.

Table 1-7: Summary of RSTS/E Multiple Privileges

Privilege	Description
none	Most normal activity except those listed below.
DATES	Change system clock and file dates.
DEVICE	Access restricted devices.
EXQTA	Exceed disk quota or memory maximum. (Not usually given to users; used by privileged programs.)
GACNT	Perform accounting operations on accounts in the user's group.
GREAD	Read or execute any file in the user's group, regardless of protection code.
GWRITE	Write or create/rename any file in the user's group, regardless of protection code.
HWCFG	Set hardware configuration parameters; for example, set terminal characteristics.
HWCTL	Control devices; for example, disable a device or hang up a dialup line.
INSTAL	Install run-time systems, swap files, and resident libraries.
JOBCTL	Manipulate other jobs; for example, detach or kill a job.
MOUNT	Mount or dismount disks other than NOSHARE.
OPER	Show, delete, or reply to operator requests and messages, and control the Operator/Message Services (OMS) package.
PBSCTL	Control print/batch services; for example, turn servers on or off, change printer forms.
RDMEM	PEEK at memory. (Not usually given to users; used by privileged programs.)
RDNFS	Read disks non-file-structured.
SEND	Broadcast to terminals and send messages to restricted receivers.
SETPAS	Change your own password.

Table 1-7 (Cont.): Summary of RSTS/E Multiple Privileges

Privilege	Description
SHUTUP	Shut down the system.
SWCFG	Set software configuration parameters; for example, installation name.
SWCTL	Control software components; for example, turn DECnet on and off.
SYSIO	Perform restricted I/O operations; for example, gain write access to files in account [0,*], or set the privilege bit in data files (files with the executable bit <64> not set).
SYSMOD	Perform functions that could easily modify the system; for example, poke memory.
TMPPRV	Control the setting of the privilege bit <128> in the protection code of an executable program (files with the executable bit <64> set).
TUNE	Control system tuning parameters; for example, caching or job priority.
USER1-8	Available for customer applications. Not used by RSTS/E.
WACNT	Perform accounting operations on any account.
WREAD	Read or execute any file regardless of protection code.
WRTNFS	Read/write a non-file-structured disk.
WWRITE	Write any file regardless of protection code. Create/rename any file except account [0,*].

DCL Commands

This chapter describes how to enter DCL commands. It provides information on each DCL command such as privileges required and command qualifiers.

Rules for Entering DCL Commands

This section describes the rules for entering DCL commands.

Uppercase and Lowercase Letters

You can use any combination of uppercase and lowercase letters in DCL commands.

Numbers

DCL treats all numbers as decimal integers.

Spaces and Tabs

You must enter at least one space or tab between the command name and the first parameter and at least one space between additional parameters. You can use multiple spaces and tabs in all cases where you can use a single space or tab. For example:

```
COPY DAY.DAT    NIGHT.DAT
```

DCL ignores spaces and tabs at the beginning and end of a command string; around commas, plus signs, and equal signs; and around colons that delimit qualifier values. You cannot use spaces and tabs in file specifications, dates and times, keywords, and numbers.

Qualifiers

You type a qualifier after the command name but before pressing RETURN. You must precede each qualifier with a slash (/). You can include any number of spaces or tabs before or after the slash. For example:

```
PRINT STATUS.RPT /COPIES=5
```

Entering Qualifier Arguments

Many qualifiers have arguments, which can be keywords, file specifications, character strings, or numbers. You must separate a qualifier and its argument with either an equal sign (=) or a colon (:). For example:

```
SET TERMINAL/WIDTH=132  
SET TERMINAL/WIDTH:132
```

Command Line Labels

Command line labels identify lines in a command procedure to which control passes when a GOTO or GOSUB command executes. Labels can be 1 to 255 characters long using the characters A-Z, 0-9, \$, and _. Labels must appear as the first item on a command line, must be preceded by a dollar sign (\$), and must be followed by a colon (:). For example:

```
$LABEL1:
```

You cannot use labels that begin with a dollar sign (\$), or include embedded spaces or tabs. You can specify only one label on a command line. You cannot use a label name more than once in a command procedure.

Abbreviating Commands

You can abbreviate command names, command keyword parameters, qualifiers, and qualifier keyword values:

- You can always abbreviate command names, parameters, qualifiers, and qualifier arguments to the first four characters, excluding slashes and underscores. You can further abbreviate to the first two or three characters as long as the abbreviation is unique within DCL. For example:

```
PR STATUS.RPT/FO=NORMAL
```

- Some qualifiers permit a negated form. For example, `/NOJOURNAL` is the negated form of the `/JOURNAL` qualifier. When applying the minimum four-character rule, do not include the `NO` prefix as two of the four characters. For example:

```
EDIT/NOJOUR FILE.DAT
```

Continuing Commands on More Than One Line

The entire specification of a command is called the command string, which can be one or more physical command lines. You can enter up to 132 characters on each physical line. When you use multiple physical command lines to continue a command string, type a hyphen (-) as the last character on each line before pressing RETURN. You can use as many physical lines as you want as long as the complete command string does not exceed 255 characters.

For example:

```
PRINT STATUS.RPT/COPIES=5, -  
Continue:  CHKBK.B2S/COPIES=2, -  
Continue:  CHAP3.TXT/COPIES=10
```

If you include a comment on the command line, the hyphen must be the last nonblank character before the comment. For example:

```
PRINT STATUS.RPT/COPIES=2-!THIS IS A DRILL REPORT
```

When you recall a command that has been entered on more than one line, the entire command is displayed on one line with the hyphens removed.

Entering File Specification Lists

When you enter more than one file specification, separate them with commas (,) or plus signs (+). Any number of spaces or tabs can precede and follow the commas or plus signs. For example:

```
DELETE JUNK.TXT,OLDFRG.B2S
APPEND PART1.TXT +PART2.TXT+ PART3.TXT WHOLE.TXT
```

Absolute Date Formats

You can specify any date from 1-JAN-70 to 31-DEC-99. Use one of the following formats:

- The alphanumeric format dd-mmm-yy. In this format, you specify June 13, 1989 as 13-JUN-89. You do not have to include leading zeros. You can also specify four digits for the year. When you omit the year, the current year is the default.
- The numeric format yy.mm.dd. In this format, you specify April 9, 1989 as 89.4.9. You do not have to include leading zeros. You can also specify four digits for the year.
- The keywords TODAY, TOMORROW, or YESTERDAY. The current system date determines the values for these keywords.

Absolute Time Formats

Use one of the following formats:

- The 24-hour format hh:mm. In this format, hh is the hour in the range 0 to 24 and mm is the minute in the range 0 to 59. The minute is optional.

00:00 is midnight, and is considered the beginning of the specified date.

12:00 is noon. 24:00 is midnight, and is considered the end of the specified date.

- The AM/PM format hh:mmAM, hh:mmPM, or 12:00M. In this format, hh is the hour in the range 1 to 12, mm is the minute in the range 0 to 59, and M stands for meridian (noon). Do not include a space between the minute and AM, PM, or M. Use 12:00AM to specify midnight.

Combining Absolute Dates and Times

To specify both date and time, use date:time, where date and time are any of the absolute date and time formats previously described. For example:

```
16-DEC-89:11:00AM  
TOMORROW:1:00AM
```

If you specify only a time, the date default is TODAY. If you specify only a date when using the /AFTER qualifier, the time default is 11:59PM. That is, the job is processed at the end of the specified day.

Relative Dates and Times

Use one of the following formats:

- To change the date using relative dates, use the format +nD[AYS] or -nD[AYS]. For example:

+23D, which increments the specified absolute date by 23 days. If you do not specify an absolute date, the date default is TODAY.
- To change the time in a DATE:TIME specification, use +nH[OURS] or -nH[OURS] to change the hour. To change the minute, use +nM[INUTES] or -nM[INUTES]. For example:

-2HOURS-20MINUTES indicates a time 2 hours and 20 minutes from the absolute time. If you do not specify an absolute time, the time default is the current time.

You can specify these formats in any order and in any combination.

Combining Absolute and Relative Dates and Times

When you combine absolute and relative dates and times, you must specify the absolute date and time first, immediately followed by the relative date and time. For example:

```
10-AUG-89:10:12AM-2DAYS+3HOURS+30MINUTES
```

returns 8-Aug-89 at 1:42PM.

DCL Commands and Qualifiers

This section lists RSTS/E DCL commands and qualifiers.

@file-spec [P1 [P2 [...P8]]]

Executes a DCL command procedure.

Privilege required: Read access to the command procedure file.

ALLOCATE dev[:] [logical-name[:]]

Reserves a device, if it is not currently allocated by another user, so that only you can use it. Optionally assigns a logical name to the device. A logical name consists of up to 15 alphanumeric characters and can include underscores (_).

Privilege required:

- **DEVICE** if the device is restricted
- **HWCTL** to use the **/SEIZE** or **/JOB** qualifier for an account other than your own

Command Qualifiers

/JOB=n

Allocates the device to the specified job number.

/[NO]QUEUED

Specifies the queuing characteristic of the local LAT port you are allocating. This setting is in effect until you deallocate the device. 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 queuing and the remote port is busy. If /NOQUEUED is specified and the remote port is busy, connections will not be queued and it will fail.

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

The default is the queued setting of the port when it was created or assigned.

/SEIZE

Reallocates the device currently allocated to another job to the specified job, unless the device is currently in use by the other job.

APPEND [node::]input-filespec[,...] [node::]output-filespec

Adds the contents of one or more files to the end of an existing file.

Privilege required:

- Read access to the input files
- Write access to the output file

Command Qualifiers

/BEFORE=date

/CREATED

/MODIFIED

/SINCE=date

Appends files created or modified before or since the specified date.

/[NO]CONFIRM

Indicates whether to prompt before appending files and is a synonym for /[NO]QUERY. The default is /NOCONFIRM.

/[NO]LOG \bar{N}

Indicates whether to display a confirmation message for each file appended. The default is /LOG.

/[NO]QUERY *N*

Indicates whether to prompt before appending files. The default is /NOQUERY.

/SELECT { $\begin{array}{l} =\text{SIZE}=\text{n} \\ =\text{SIZE}=\text{MINIMUM}=\text{n} \\ =\text{SIZE}=\text{MAXIMUM}=\text{n} \\ =\text{SIZE}=(\text{MINIMUM}=\text{m},\text{MAXIMUM}=\text{n}) \end{array}$ }

Selects files based on their size. The specified size can be:

n	Selects only those files with size equal to n.
MINIMUM=n	Selects only those files with size greater than or equal to n.
MAXIMUM=n	Selects only those files with size less than or equal to n.
MINIMUM=m,MAXIMUM=n	Selects only those files with size between m and n inclusive.

ASSIGN dev:[[p,pn]] logical-name[:]

Assigns a logical name to a directory or a physical device. A logical name consists of up to 15 alphanumeric characters and can include underscores (_). Systemwide logical names can also include dollar signs (\$).

Privilege required: **INSTAL** to use the /SYSTEM qualifier

Command Qualifier

/[NO]REPLACE[=QUERY]

Replaces a logical name if it already exists and is used with the /SYSTEM or /USER qualifiers. If not specified with /SYSTEM, the default is /REPLACE=QUERY. If not specified with /USER, the default is /REPLACE.

/SYSTEM

Assigns a systemwide logical name to a device and/or PPN. /USER is the default if neither /SYSTEM nor /USER is specified.

/USER

Assigns a user-defined logical name to a device and/or PPN. /USER is the default if neither /SYSTEM nor /USER is specified.

ASSIGN/PORT port-name[:] server-name

Assigns a local LAT port on the RSTS/E node to a remote terminal server. You must select a remote service and/or a remote port offered by the specified terminal server.

The port-name parameter specifies the name of the local port that will be assigned to the terminal server. The port-name must be in the form of KBI*n*: or KB*n*: where *n* is a value from 0 through 127. The server-name specifies the name of a remote terminal server to which the port can be connected. The server-name can be up to 16 alphanumeric characters in length.

Privilege required: SWCFG

Command Qualifier

/APPLICATION

Specifies that this port is to be used as an application terminal. The default is /APPLICATION.

/LAT

Assigns a LAT port. The default is /LAT.

/[NO]LOG

Indicates whether to display a confirmation message after the port is assigned. The default is /LOG.

/[NO]QUEUED

Indicates whether the connection to a terminal server will be placed on the server's queue if the remote port is busy and the server supports queuing. If /NOQUEUED is specified and the remote port is busy, the connection will not be queued and it will fail. The default is /QUEUED.

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

/REMOTE_PORT=remote-port-name

Specifies the name of a remote port on the terminal server to which the local LAT port is to be connected. The remote port name can be up to 16 alphanumeric characters in length.

You must select either a remote port or a service.

/SERVICE=service-name

Specifies the name of a remote service offered at the terminal server to which the local LAT port is to be connected. The service name can be up to 16 alphanumeric characters in length.

You must select either a remote port or a service.

ASSIGN/QUEUE queue-name[:] server-name[:]

Assigns a server to a queue.

Privilege required: PBSCTL

ATTACH job-number

Attaches you to a detached job. If the job is running under an account other than your own, you must enter the password for that account unless you have GACNT or WACNT privilege, as appropriate.

Privilege required:

- GACNT to attach to a job in your group without using a password
- WACNT to attach to a job in any account without using a password

BACKUP input-filespec[,...] output-backup-set-spec

Copies individual disk files or entire volumes onto a tape or disk backup saveset.

Privilege required:

- Read access to input files
- Create access to backup set file
- INSTAL to exceed system dynamic region limit
- TUNE to use the /BUFFER_SIZE qualifier and for better system performance
- WACNT or GACNT to use the /ACCOUNT_DATA qualifier

Command Qualifiers

/[NO]ACCOUNT_DATA

Indicates whether to create the information necessary to restore or update account data for each account that meets the selection criteria. If you specify **/NOACCOUNT_DATA**, **BACKUP** will back up file data only and will not back up account information. The default is **/ACCOUNT_DATA**.

/[NO]ASSIST

Indicates how to send media mount requests to an operator. By specifying **/ASSIST**, you can send the disk or tape media mount requests to an operator through the Operator/Message Services (OMS). The default, **/NOASSIST**, sends media mounts requests through your terminal.

/BLOCK_SIZE=n

Specifies the number of bytes written to each record (block) of the output saveset file; valid range for *n* is 2048 to 28672 for tapes and disks. Specify block size for tapes in multiples of 16; specify block size for disks in multiples of 512. You can also specify **MINIMUM** or **MAXIMUM**. The default is 28672 bytes for disks and 16384 bytes for tapes.

/BUFFER_SIZE=n

Specifies the size in k-words of the backup buffer in memory. Larger values may improve performance at the expense of greater system impact. The valid range for *n* is 3 to 255 or **MAXIMUM**. You can also specify **OPTIMUM** or 55. The default is the minimum usable size, except when using an MS- or MU-class tape drive in which case the default is 55.

/[NO]CRC

Indicates whether to calculate and include a cyclic redundancy check (CRC) value for each block of data written to the backup file. The default is **/NOCRC**.

/CREATED=date

/CREATED=(BEFORE=date:time,AFTER=date:time)

/MODIFIED=date

/MODIFIED=(BEFORE=date:time,AFTER=date:time)

Backs up files created or modified on, before, after, or between the specified date:times. The date:time argument can be any valid DCL date and/or time.

/DENSITY=n

Specifies the recording density of the output tape. Specify any valid density for the magnetic tape you are using for output. Currently available densities are 800, 1600, 6250, 6667, 8000, and 10000 bpi. You can also specify **MINIMUM** or **MAXIMUM**, which causes the system to set the density to the minimum or maximum the tape drive supports.

If you do not specify a density, **BACKUP** uses the system default density.

If you specify a density that the tape drive does not support, you receive a warning message and the system selects the next higher density the tape drive supports.

If you specify a density that is higher than the highest density the tape drive supports, you receive a warning message and the system selects the tape drive's maximum density.

/END=[(NO)REWIND | (NO)DISMOUNT]

Specifies whether to rewind the output tape drive or dismount the output disk following the successful completion of the backup operation. The default for disks is **/END=DISMOUNT**. The default for tapes is **/END=NOREWIND**.

/EXCLUDE=(filespec-list)

Excludes files transferred to the saveset.

/[NO]FILE_DATA

Indicates whether to transfer files to the saveset. The default is **/FILE_DATA**.

/[NO]GROUP_SIZE[=n]

Specifies the group size for XOR redundancy; the valid range for **n** is 0 to 100. The default is **/GROUP_SIZE=10**.

/INCLUDE=(filespec-list)

Specifies the files or accounts you want transferred to the saveset.

/[NO]INITIALIZE=[(NO)ERASE,[NO]EXERCISE,EXERCISE=n,CLUSTER_SIZE=n,[NO]QUERY]

Indicates whether to initialize the output tape or disk before creating the backup file. For tape volumes, **/INITIALIZE** specifies that the tape be initialized as a standard ANSI tape.

For disk volumes, `/INITIALIZE` specifies that the disk be initialized based on the attributes (pack ID, pack cluster size, etc.) of the input disk. The arguments allow you to have more control over the initializing of disks in the backup operation. For `/INITIALIZE=EXERCISE=n`, `n` can be 0, 1, 2, or 3. For `/INITIALIZE=CLUSTER_SIZE=n`, `n` can be 1, 2, 4, 8, 16, 32, or 64. The default is `/NOINITIALIZE`.

`/IN_LABEL=name`

Specifies the name you want compared to the source volume ID.

`/[NO]LIST_FILE[=filespec]`

Indicates whether to create a log file that catalogs the sequence of backup events. The log contains information about the accounts and files transferred, and the disk volumes used. The default is `/LIST_FILE=KB:` or your terminal.

`/OUT_LABEL=name`

Specifies the name used for the output volume ID and provides a means to ensure that you are referencing the correct output device. If the `/INITIALIZE` qualifier is not specified and the volume ID does not match the one found on the specified output device, then `BACKUP` displays an error and rejects the command. If the `/INITIALIZE` qualifier is specified, then the output device label will be set to the name specified with `/OUT_LABEL`.

`/[NO]OUTPUT[=filespec]`

Indicates whether to create a log file that catalogs the sequence of backup events and is a synonym for `/[NO]LIST_FILE`. The log contains information about the accounts and files transferred, and the disk volumes used. The default is `/OUTPUT=KB:` or your terminal.

`/[NO]PROMPT`

Indicates whether to prompt for the first volume name. The default is `/PROMPT`.

`/[NO]QUERY`

Indicates whether to prompt before transferring each file meeting the selection criteria. The default is `/NOQUERY`. Answer `Y` or `YES` to transfer the file displayed, or `N` or `NO` to skip the file and continue with the next file. The default, `/NOQUERY`, transfers each file selected without prompting.

You can also specify `/ALL` with the `YES` or `NO` reply to indicate that the reply applies to all remaining file transfers. This eliminates further queries. `YES/ALL` causes all remaining files to be transferred and `NO/ALL` causes all remaining files to be skipped.

`/[NO]REWIND`

Indicates whether to rewind a magnetic tape saveset volume before processing. The default is `/NOREWIND`.

`/[NO]VERIFY[=ONLY]`

Indicates whether to perform a comparison operation of all data transferred. If you specify `/VERIFY`, then `BACKUP` performs a second pass through the input disk, comparing each account and file transferred with that on the output backup set. `BACKUP` reports any differences found.

You can use `BACKUP/VERIFY=ONLY` to perform a verify operation without transferring any data. It also allows you to create several backup sets on one tape and verify the sets all at once; thus, you do not have to wait for the tape to rewind and position itself before each verify operation. The default is `/NOVERIFY`.

BACKUP/COPY input-filespec[,...] output-filespec

Copies files and/or accounts from one disk to another. Note that the default for the output PPN is the input PPN.

Privilege required:

- Read access to input files
- Create access to output files
- `DATES` to preserve file creation and access dates
- `INSTAL` to exceed system dynamic region limit
- `SYSIO` to copy files to [0,1]
- `TUNE` to use the `/BUFFER_SIZE` qualifier and for better system performance
- `WACNT` or `GACNT` to use the `/ACCOUNT_DATA` qualifier

Command Qualifiers

/[NO]ACCOUNT_DATA

Indicates whether to create or update accounts on the output disk. **/ACCOUNT_DATA** creates any account that does not already exist on the output disk. If the account exists on the output disk, then **BACKUP/COPY** updates the account's attributes to match those of the account on the input disk. If you specify **/NOACCOUNT_DATA**, **BACKUP/COPY** will not transfer any files to an account that does not exist on the output disk. The default is **/ACCOUNT_DATA**.

/[NO]ASSIST

Indicates how to send media mount requests to an operator. By specifying **/ASSIST**, you can send the disk media mount requests to an operator through the Operator/Message Services (OMS). The default, **/NOASSIST**, sends media mount requests through your terminal.

/BLOCK_SIZE=n

Specifies the number of bytes written to each record (block) of the output saveset file; valid range for **n** is 2048 to 28672. Specify block size in multiples of 512. You can also specify **MINIMUM** or **MAXIMUM**. The default is 28672 bytes.

/BUFFER_SIZE=n

Specifies the amount of memory in k-words to allocate for buffering data, in the range 4 to 255, or **MAXIMUM**. **BACKUP/COPY** uses buffers which are multiples of 4K-words. If you specify a value which is not a multiple of 4, **BACKUP/COPY** rounds your value down to the next lower multiple of 4.

The maximum **/BUFFER_SIZE** value allowed is the largest free area in memory with sufficient additional space to support one job at the defined "swap maximum".

/CREATED=date:time

/CREATED=(AFTER=date:time,BEFORE=date:time)

/MODIFIED=date:time

/MODIFIED=(AFTER=date:time,BEFORE=date:time)

Copies files created or modified on, before, after, or between the specified date:times. The date:time argument can be any valid DCL date and/or time.

/END=[NO]DISMOUNT

Specifies whether to dismount the output disk following the successful completion of the operation. The default is **/END=DISMOUNT**.

/EXCLUDE=filespec[,...]

Specifies one or more files that should not be transferred. This qualifier is useful when you use wildcards to select a group of files, but want to exclude particular files from the group. You do not need to list files that have been set to **IGNORE** (see "SET FILE").

/[NO]FILE_DATA

Indicates whether to transfer file data - or only account data - from the input to the output disk. Specify **/NOFILE_DATA** in conjunction with **/ACCOUNT_DATA** to create or update accounts on the output disk without transferring any files. The default is **/FILE_DATA**.

/INCLUDE=filespec[,...]

Specifies one or more files that should be transferred, regardless of any other selection criteria. For example, if you select files based on their creation date, you can still transfer files that would not otherwise be selected.

/[NO]INITIALIZE=[([NO]ERASE,[NO]EXERCISE,EXERCISE=n, CLUSTERSIZE=n, [NO]QUERY)]

Indicates whether to initialize the output disk before creating the backup file. The arguments allow you to have more control over the initializing of disks in the backup operation. For **/INITIALIZE=EXERCISE=n**, n can be 0, 1, 2, or 3. For **/INITIALIZE=CLUSTERSIZE=n**, n can be 1, 2, 4, 8, 16, 32, or 64. The default is **/NOINITIALIZE**.

If you specify **/INITIALIZE**, the output disk will be initialized based on the attributes (pack ID, pack cluster size, etc.) of the input disk. The default is **/NOINITIALIZE**.

/IN_LABEL=label

Specifies the pack ID of the input disk and provides a means to ensure that you are referencing the correct input disk. If the pack ID does not match the one found on the specified input disk, then **BACKUP** displays an error and rejects the command.

/[NO]LIST_FILE[=filespec]

Indicates whether to create a log file that catalogs the sequence of backup events. The log contains information about the accounts and files transferred, and the disk volumes used.

/[NO]OPTIMIZE

/OPTIMIZE=CLUSTER_SIZE

/OPTIMIZE=DIRECTORY

Indicates whether to optimize file cluster sizes, file directories, or both on the output disk. The default, **/OPTIMIZE**, performs both optimizations.

/OUT_LABEL=label

Specifies the name used for the pack ID of the output disk and provides a means to ensure that you are referencing the correct output disk. If the **/INITIALIZE** qualifier is not specified and the pack ID does not match the one found on the specified output disk, then **BACKUP** displays an error and rejects the command. If the **/INITIALIZE** qualifier is specified, then the output disk label will be set to the name specified with **/OUT_LABEL**.

/[NO]OUTPUT[=filespec]

Indicates whether to create a log file that catalogs the sequence of backup events and is a synonym for **/[NO]LIST_FILE**. The log contains information about the accounts and files transferred, and the disk volumes used.

/PLACED_POSITION=position

Indicates where to position files that you are transferring and are marked as placed; position can be:

INDEX	Place files near the master file index on the output disk (recommended location).
MIDDLE	Place files at the logical center of the output disk.
ORIGINAL	Places files at or after their location on the input disk. Generally, you should not use ORIGINAL when transferring placed files to an output disk whose size is different than the input disk.

The default is **/PLACED_POSITION=INDEX**.

/[NO]PROMPT

Indicates whether to prompt before beginning the **BACKUP** operation. The default is **/PROMPT**.

/[NO]QUERY

Indicates whether to prompt before copying each file selected. Specifying **/QUERY** displays the name of each file selected and asks if you want to copy that file. Answer **Y** or **YES** to copy the file displayed, or **N** or **NO** to skip the file and continue with the next file. The default, **/NOQUERY**, copies each file selected without prompting.

You can also specify **/ALL** with the **YES** or **NO** reply to indicate that the reply applies to all remaining file transfers. This eliminates further queries. **YES/ALL** causes all remaining files to be copied and **NO/ALL** causes all remaining files to be skipped.

/[NO]REPLACE[=QUERY]

Indicates what action should be taken if a file to be copied already exists on the output disk. If you specify **/REPLACE**, then **BACKUP/COPY** replaces the file if it exists; any existing file is deleted. If you specify **/NOREPLACE**, then **BACKUP** issues a warning and does not replace the file if it already exists.

The default, **/REPLACE=QUERY**, prompts you to replace any file that already exists. Answer **Y** or **YES** to replace the current file. Answer **N** or **NO** to not replace the existing file and proceed with the next file.

You can also specify **/ALL** with the **YES** or **NO** reply to indicate that the reply applies to all remaining file replacements. This eliminates further queries. **YES/ALL** causes all remaining files to be replaced and **NO/ALL** causes all remaining files to be skipped.

/[NO]VERIFY[=ONLY]

Indicates whether to perform a comparison operation of the all data transferred to the output disk. If you specify **/VERIFY**, then **BACKUP/COPY** performs a second pass through the input disk, comparing each account and file transferred with that on the output disk. **BACKUP/COPY** reports any differences found.

You can use **BACKUP/COPY/VERIFY=ONLY** to perform a verify operation without transferring any data. The default is **/NOVERIFY**.

BACKUP/DIRECTORY backup-set-spec

Lists files within a backup saveset.

Privilege required:

- Read access to the backup set file
- `INSTALL` to exceed system dynamic region limit
- `TUNE` to use the `/BUFFER_SIZE` qualifier

Command Qualifiers

`/[NO]ASSIST`

Indicates how to send media mount requests to an operator. By specifying `/ASSIST`, you can send a disk or tape media request to mount a saveset to an operator through the Operator/Message Services (OMS). The default, `/NOASSIST`, sends media mounts requests through your terminal.

`/BRIEF`

Displays a format similar to the DCL full directory (minus file attributes) and is the default qualifier. The default is `/BRIEF`.

`/BUFFER_SIZE=n`

Specifies the size in k-words of the backup buffer in memory. Larger values may improve performance at the expense of greater system impact. The valid range for `n` is 3 to 255 or `MAXIMUM`. You can also specify `OPTIMUM` or 55. The default is the minimum usable size, except when using an MS- or MU-class tape drive in which case the default is 55.

`/CREATED=date`

`/CREATED=(BEFORE=date:time,AFTER=date:time)`

`/MODIFIED=date`

`/MODIFIED=(BEFORE=date:time,AFTER=date:time)`

Lists files created or modified on, before, after, or between the specified date:times. The date:time argument can be any valid DCL date and/or time.

`/END=([NO]REWIND | [NO]DISMOUNT)`

Specifies whether to rewind the output tape drive or dismount the output disk following the successful completion of the backup operation. The default for disks is `/END=DISMOUNT`. The default for tapes is `/END=NOREWIND`.

/EXCLUDE=(filespec-list)

Specifies one or more files that should not be listed.

/FULL

Displays detailed information for each file on multiple lines.

To display information for specific files use **/SELECT** or **/EXCLUDE** with **BACKUP/DIRECTORY**.

/INCLUDE=(filespec-list)

Specifies the files or accounts that should be listed.

/IN_LABEL=name

Specifies the name you want compared to the source volume ID.

/[NO]LIST_FILE[=filespec]

Indicates whether to create a log file that catalogs the sequence of backup events. The log contains information about the accounts and files transferred, and the disk volumes used. The default is **/LIST_FILE=KB**; or your terminal.

/OCCURRENCE=number

Specifies the occurrence of the named backup set used in the **BACKUP** process. The default is the first occurrence.

/[NO]OUTPUT[=filespec]

Indicates whether to create a log file that catalogs the sequence of **BACKUP** events and is a synonym for **/[NO]LIST_FILE**. The default is **/OUTPUT=KB**; or your terminal.

/[NO]PROMPT

Indicates whether to prompt for the first volume name. The default is **/PROMPT**.

/[NO]REWIND

Indicates whether to rewind a magnetic tape saveset volume before processing. The default is **/NOREWIND**.

/SELECT=(filespec-list)

Specifies the files you want to list. The default is all files in the backup set.

BACKUP/IMAGE input-disk: output-disk:

Copies all accounts and files from one disk volume to another and makes the output volume bootable if the file [0,1]INIT.SYS is copied.

Privilege required:

- Read access to input files
- Create access to output files
- DATES to preserve file creation and access dates
- INSTAL to exceed system dynamic region limit
- RDNFS, WRTNFS, and SYSMOD to make the output disk bootable
- SYSIO to copy files to [0,1]
- TUNE to use the /BUFFER_SIZE qualifier and for better system performance

Command Qualifiers

/[NO]ASSIST

Indicates how to send media mount requests to an operator. By specifying /ASSIST, you can send the disk media mount requests to an operator through the Operator/Message Services (OMS). The default, /NOASSIST, sends media mounts requests through your terminal.

/BLOCK_SIZE=n

Specifies the number of bytes written to each record (block) of the output saveset file; valid range for n is 2048 to 28672. Specify block size in multiples of 512. You can also specify MINIMUM or MAXIMUM. The default is 28672 bytes.

/BUFFER_SIZE=n

Specifies the amount of memory in k-words to allocate for buffering data, in the range 4 to 255, or MAXIMUM. BACKUP/IMAGE uses buffers which are multiples of 4K-words. If you specify a value which is not a multiple of 4, BACKUP/IMAGE rounds your value down to the next lower multiple of 4.

The maximum /BUFFER_SIZE value allowed is the largest free area in memory with sufficient additional space to support one job at the defined "swap maximum".

/END=[NO]DISMOUNT

Specifies whether to dismount the output disk following the successful completion of the backup operation. The default is **/END=DISMOUNT**.

/IN_LABEL=label

Specifies the pack ID of the input disk and provides a means to ensure that you are referencing the correct input disk. If the pack ID does not match the one found on the specified input disk, then **BACKUP** displays an error and rejects the command.

/[NO]INITIALIZE=[([NO]ERASE,[NO]EXERCISE,EXERCISE=n, CLUSTERSIZE=n, [NO]QUERY)]

Indicates whether to initialize the output disk before creating the backup file. The arguments allow you to have more control over the initializing of disks in the backup operation. For **/INITIALIZE=EXERCISE=n**, n can be 0, 1, 2, or 3. For **/INITIALIZE=CLUSTERSIZE=n**, n can be 1, 2, 4, 8, 16, 32, or 64. The default is **/NOINITIALIZE**.

If you specify **/INITIALIZE**, the output disk will be initialized based on the attributes (pack ID, pack cluster size, etc.) of the input disk. Use the **/OUT_LABEL** qualifier to specify a different pack ID for the output disk. The default is **/NOINITIALIZE**.

/[NO]LIST_FILE[=filespec]

Indicates whether to create a log file that catalogs the sequence of backup events. The log contains information about the accounts and files transferred, and the disk volumes used.

/[NO]OPTIMIZE

/OPTIMIZE=CLUSTER_SIZE

/OPTIMIZE=DIRECTORY

Indicates whether to optimize file cluster sizes, file directories, or both on the output disk. The default, **/OPTIMIZE**, performs both optimizations.

Use **/OPTIMIZE=CLUSTER_SIZE** to perform cluster size optimization without directory optimization. Likewise, use **/OPTIMIZE=DIRECTORY** to perform directory optimization without performing cluster size optimization.

/[NO]OUTPUT[=filespec]

Indicates whether to create a log file that catalogs the sequence of backup events and is a synonym for **/[NO]LIST_FILE**. The log contains information about the accounts and files transferred, and the disk volumes used.

/OUT_LABEL=label

Specifies the name used for the pack ID of the output disk and provides a means to ensure that you are referencing the correct output disk. If the **/INITIALIZE** qualifier is not specified and the pack ID does not match the one found on the specified output disk, then **BACKUP** displays an error and rejects the command. If the **/INITIALIZE** qualifier is specified, then the output disk label will be set to the name specified with **/OUT_LABEL**.

/PLACED_POSITION=position

Indicates where to position files that you are transferring and are marked as placed; position can be:

INDEX	Place files near the master file index on the output disk (recommended location).
MIDDLE	Place files at the logical center of the output disk.
ORIGINAL	Places files at or after their location on the input disk. Generally, you should not use ORIGINAL when transferring placed files to an output disk whose size is different than the input disk.

The default is **/PLACED_POSITION=INDEX**.

/[NO]PROMPT

Indicates whether to prompt before beginning the **BACKUP** operation. The default is **/PROMPT**.

/[NO]REPLACE[=QUERY]

Indicates what action should be taken if a file to be transferred already exists on the output disk. If you specify **/REPLACE**, then **BACKUP** replaces the file if it exists. Any existing file is deleted. If you specify **/NOREPLACE**, then **BACKUP** issues a warning and does not replace the file if it already exists.

The default, **/REPLACE=QUERY**, prompts you to replace any file that already exists. Answer **Y** or **YES** to replace the current file. Answer **N** or **NO** to not replace the existing file and proceed with the next file.

You can also specify **/ALL** with the **YES** or **NO** reply to indicate that the reply applies to all remaining file replacements. This eliminates further queries. **YES/ALL** causes all remaining files to be replaced and **NO/ALL** causes all remaining files to be skipped.

[/[NO]VERIFY[=ONLY]

Indicates whether to perform a comparison operation of all data transferred to the output disk. If you specify **/VERIFY**, then **BACKUP/IMAGE** performs a second pass through the input disk, comparing each account and file transferred with that on the output disk. **BACKUP/IMAGE** reports any differences found.

You can use **BACKUP/IMAGE/VERIFY=ONLY** to perform a verify operation without transferring any data. The default is **/NOVERIFY**.

BASIC

Invokes the **BASIC-PLUS** or **BASIC-PLUS-2** programming environment.

Privilege required: none

Command Qualifiers

/BP2

Invokes the **BASIC-PLUS-2** programming environment. **/BP2** is the default when no qualifier is specified.

/BPLUS

Invokes the **BASIC-PLUS** programming environment.

BROADCAST destination[,...] "message"

Sends a message to the specified users or terminals; destinations can be PPNs that include wildcard characters or keyboard device specifications. You must specify a destination, or use the **/ALL** or **/LOGGED_IN** qualifiers. You can broadcast a single- or multiline message, or a complete file.

Privilege required: **SEND**

Command Qualifiers

/ALL

Broadcasts the message to all terminals. You cannot specify a destination with **/ALL**.

/[NO]BELL

Indicates whether to include a BELL character ahead of the message. The default is **/NOBELL**.

/[NO]HEADER

Indicates whether to include a header before the message. The default is **/HEADER**.

/LOGGED_IN

Broadcasts the message to all logged-in terminals. You cannot specify a destination with **/LOGGED_IN**.

CC filespec[,...]

Invokes the PDP-11 C compiler to compile C source programs.

Command Qualifiers

/DEFINE=("identifier[(param,...)] token-string" [...])

Defines a token string or macro to be substituted for every occurrence of a given identifier in the program.

/ENVIRONMENT=([NO]FPU,[NO]PIC)

Specifies the type of environment in which the generated code is to execute and/or in which the object module(s) is to be linked.

/[NO]ERROR_LIMIT[=qualifier]

Indicates whether to specify the error count at which compilation will stop. The default is **/ERROR_LIMIT=30**.

/[NO]INCLUDE_DIRECTORY=(pathname[,...])

Indicates whether to provide an additional level of search for include files. The default is **/NOINCLUDE_DIRECTORY**.

/[NO]LIST[=filespec]

Indicates whether to create a listing file. The default is **/NOLIST**. The default output file extension is **.LST**.

/[NO]MACRO[=filespec]

Indicates whether to create a macro listing file. The default is **/NOMACRO**. The default output file extension is **.MAC**.

/[NO]MEMORY[=qualifier]

Determines the amount of extended memory to allocate in a PDP-11 host environment. The default is **/NOMEMORY**.

/[NO]MODULE=(identifier | "string"[,identifier | "string"])

Controls the compiler produced output module header for the program file.

/[NO]OBJECT[=filespec]

Indicates whether to create an object file. The default output file extension is **.OBJ**.

/SHOW[=option,...]

Displays information about the file being compiled. Option can be:

ALL	Prints all information
[NO]CONDITIONALS	Prints condition program segments. Default is CONDITIONALS .
[NO]EXPANSION	Prints final macro expansions. The default is NOEXPANSION .
[NO]INCLUDE	Prints contents of #include files. The default is NOINCLUDE .
[NO]INTERMEDIATE	Prints intermediate macro expansions. The default is INTERMEDIATE .
NONE	Prints no listing information.
[NO]MACHINE_CODE	Prints the generated machine code. The default is MACHINE_CODE .
[NO]SOURCE	Prints the source file statements. The default is SOURCE .

/[NO]STANDARD[=(option,...)]

Determines what language features are allowed or flagged as non-standard. The default is **/STANDARD=ANSI**.

/[NO]TERMINAL[=[NO]SOURCE]

Indicates whether to display compiler messages at the terminal. The default is **/TERMINAL=NOSOURCE**, or as established during installation of PDP-11 C.

/[NO]TITLE=(identifier)

Controls the compiler produced output list header for the program file. The default is **/NOTITLE**.

/[NO]UNDEFINE=(identifier[,...])

Indicates whether to undefine the predefined PDP-11 C preprocessor constants. The default is **/NOUNDEFINE**.

/[NO]WARNINGS[=(option,...)]

Indicates whether to force the compiler to print both informationals and warnings. Option can be **NOINFORMATIONALS** or **NOWARNINGS**. The default is **/WARNINGS**.

/[NO]WORK_FILE_SIZE=integer-number

Indicates whether to allocate the number of 512-byte disk blocks for the work file. The integer-number is an integer value between 1 and 65535. The default is **/WORK_FILE_SIZE=2048**. Use with the **/LIST** qualifier to set or cancel specific listing options.

CCL system-command

Allows you to use a system CCL command that has the same name as a DCL command.

Privilege required: Execute access to the system command program

CLOSE channel-number

Closes a file that you opened using the **OPEN** command and removes the associated channel number from the list of open channels.

Privilege required: none

Command Qualifier

/ALL

Closes all currently open channels.

CLOSE/LOG_FILE

Closes a log file that you opened using the OPEN/LOG_FILE command. Use the CLOSE/LOG_FILE command to close an open log file either during a session at your terminal or within a command procedure.

Privilege required: none

CLOSE/QUEUE queue-name[:]

Closes a print or batch queue to prevent other users from placing any additional PRINT or SUBMIT requests in the queue.

Privilege required: PBSCTL

COBOL filespec

Compiles a COBOL-81 source program into an object program. You can compile only one source file at a time in COBOL-81.

Privilege required: none

Command Qualifiers

/[NO]ANSI_FORMAT

Indicates whether to specify that the source program format is ANSI COBOL instead of Digital terminal format. The default is /NOANSI_FORMAT.

/[NO]CHECK

/CHECK=[NO]BOUNDS

/CHECK=[NO]PERFORM

Indicates whether to enable checking for subscript and index ranges and nested PERFORM statements.

/C81

Specifies the COBOL-81 compiler. This is the default.

/CODE=[NO]CIS]

Indicates whether to generate Commercial Instruction Set (CIS) code.

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

Indicates whether to compile conditional compilation lines. You can specify compilation lines with letter labels A through Z. If no lines are specified, all conditional compilation lines are compiled.

/[NO]CROSS_REFERENCE

Indicates whether to include cross-reference listing in compiler listing. The default is **/NOCROSS_REFERENCE**.

/[NO]DEBUG

Indicates whether to include symbolic debugging information in the object file. The default is **/NODEBUG**.

/[NO]DIAGNOSTICS[=diagfile]

Indicates whether to generate a diagnostics file.

/[NO]LIST[=listfile]

Indicates whether to produce an output listing file. The default is **/NOLIST**.

/[NO]MAP

Indicates whether to generate **PROCEDURE** and **DATA DIVISION** maps in the LST file. This is a synonym for **/SHOW=[NO]MAP**.

/NAMES=suffix

Specifies a two-character suffix for program section names; the default is **/NAMES=SC**.

/[NO]OBJECT[=objfile]

Indicates whether to produce an object file. The default is **/OBJECT**.

/SHOW=[NO]MAP

/[NO]SHOW

Indicates whether to generate **PROCEDURE** and **DATA DIVISION** maps in the LST file. The default is **/NOSHOW**.

/[NO]STANDARD=option

Specifies either **V2** or **85** as the standard option. The default is **/NOSTANDARD**.

/[NO]SUBPROGRAM

Indicates whether to treat this program as a Sub (Main) program. The default is **/NOSUBPROGRAM**.

/TEMPORARY=device

Stores temporary work files on the specified device.

/[NO]TRUNCATE

Indicates whether to enable decimal truncation on COMP data items instead of binary truncation. The default is **/NOTRUNCATE**.

/WARNINGS[=[NO]INFORMATIONAL]

/[NO]WARNINGS

Indicates whether to enable informational diagnostics. The default is **/WARNINGS**.

COPY [node::]input-filespec[,...] [node::]output-filespec

Duplicates a file. You can:

- Copy one file to another file
- Merge one or more files into another file
- Copy a group of files to another group of files

Privilege required:

- Create/rename access to the output file
- Read access to each input file
- Write access if replacing a file
- SYSIO and Write access to set the privilege bit <128> in the protection code for non-executable files (files with the executable bit <64> not set).
- TMPPRV and Write access to set the privilege bit <128> in the protection code for executable files (files with the executable bit <64> set).

Command Qualifiers

/ALLOCATION=n

Preallocates n 512-byte blocks for the output file.

/BLOCK_SIZE=n

Specifies block size for magnetic tape output files; the valid range is even integers 18 to 4096. The default is **/BLOCK_SIZE=512**.

/CLUSTER_SIZE=n

Specifies the output disk file cluster size. The value of n must be a power of two in the range of -256 to 256, depending on the type of disk. The system uses the absolute value of the specified cluster size, or the output disk pack cluster size, whichever is greater. The default is the disk pack cluster size. To use clustersize optimization, specify **/CLUSTER_SIZE=0**.

/[NO]CONFIRM

Indicates whether to prompt before copying each file and is a synonym for **/[NO]QUERY**.

/[NO]CONTIGUOUS

Indicates whether to copy disk files into consecutive physical disk blocks.

/BEFORE=date

/CREATED

/MODIFIED

/SINCE=date

Copies files created or modified before or since the specified date.

/[NO]LOG

Indicates whether to display a confirming message for each file copied. The default is **/LOG**.

/[NO]OVERLAY

Indicates whether to copy input file to an existing output file, replacing output file data with input file data. The default is **/NOOVERLAY**.

/POSITION=position

Specifies where copied files are stored on the disk; position can be:

n Files stored at first available position after disk cluster number n; the default is **/POSITION=0**.

INDEX Files stored at first available position after the master file directory index.

MIDDLE Files stored at first available position after the middle of the disk.

/PROTECTION=n

Specifies the output file protection code.

/[NO]QUERY \bar{N}

Indicates whether to prompt before copying each file. The default is /NOQUERY.

/[NO]REPLACE

Indicates whether to delete an existing file having the same file specification as the specified output file. The default is /NOREPLACE.

/[NO]RETAIN_DATES

For disk output, indicates whether to retain the creation date-time and access date of the input file. The default is /NORETAIN_DATES.

/SELECT $\left\{ \begin{array}{l} =\text{SIZE}=\text{n} \\ =\text{SIZE}=\text{MINIMUM}=\text{n} \\ =\text{SIZE}=\text{MAXIMUM}=\text{n} \\ =\text{SIZE}=(\text{MINIMUM}=\text{m},\text{MAXIMUM}=\text{n}) \end{array} \right\}$

Selects files based on their size. The specified size can be:

n	Selects only those files with size equal to n.
MINIMUM=n	Selects only those files with size greater than or equal to n.
MAXIMUM=n	Selects only those files with size less than or equal to n.
MINIMUM=m,MAXIMUM=n	Selects only those files with size between m and n inclusive.

/TRANSFER_MODE={BLOCK | RECORD | AUTOMATIC} \bar{N}

Specifies which transfer mode, block or record, should be used to copy the file to a remote node. This qualifier only applies to network file copy operations (node included in either the input or output file specifications) and is not valid in local file copy operations.

/TRANSFER_MODE=BLOCK copies the file as binary data consisting of 512-byte blocks. This mode of transfer is generally faster than record mode. However, it is only applicable for RSTS-to-RSTS file transfers, since other operating systems may not have compatible file attributes and block sizes.

/TRANSFER_MODE=RECORD copies the file as a collection of records based on the file record format. Although it is slower than block mode, record mode allows otherwise incompatible file systems to exchange files. This mode is recommended for file transfers involving TOPS10/20, ULTRIX, RT-11, and DECnet-DOS systems.

`/TRANSFER_MODE=AUTOMATIC` selects the most appropriate mode of transfer and is the default.

CREATE filespec

Opens a file so you can enter text.

Privilege required:

- Create/replace access to the file you are creating
- Write access if you are replacing a file
- SYSIO and Write access to set the privilege bit <128> in the protection code for non-executable files (files with the executable bit <64> not set).
- TMPPRV and Write access to set the privilege bit <128> in the protection code for executable files (files with the executable bit <64> set).

Command Qualifiers

`/ALLOCATION=n`

Preallocates n 512-byte blocks for a file. The default is `/ALLOCATION=0`.

`/CLUSTER_SIZE=n`

Specifies a file cluster size of n blocks. The value of n must be a power of two in the range of -256 to 256, depending on the type of disk.

The system uses the absolute value of the specified cluster size, or the output disk pack cluster size, whichever is greater. The default is the disk pack cluster size. To use cluster size optimization, specify `/CLUSTER_SIZE=0`.

`/[NO]CONTIGUOUS`

Indicates whether to specify the file is to occupy consecutive physical disk blocks. The default is `/NOCONTIGUOUS`.

/POSITION=position

Specifies the starting position of the file you are creating on the disk; position can be:

- n** File created at first available position after the device cluster number (DCN) n; the range of n is 0 to the maximum DCN. The default is /POSITION=0.
- INDEX** File created at first available position after the storage allocation table.
- MIDDLE** File created at first available position after the middle of the device.

/PROTECTION=n

Specifies the file protection code. The default is /PROTECTION=60.

/[NO]REPLACE

Indicates whether to delete an existing file that has the same file specification as the one you specify.

CREATE/ACCOUNT [dev:][[p,pn]

Sets up a new account.

Privilege required: GACNT or WACNT

Command Qualifiers

/[NO]CAPTIVE

Indicates whether the account is to be a captive account. The default is /NOCAPTIVE.

/CLUSTER_SIZE=ufd-cluster-size

Specifies the number of 512-byte blocks in each cluster within a user file directory (UFD). The default is the pack cluster size.

/DETACHED_JOB_QUOTA=detached-job-quota

Specifies the number of detached jobs that can exist at one time for an account; detached-job-quota can be:

0 to 63 Sets detached job quota

UNLIMITED No quota enforced

The default is /DETACHED_JOB_QUOTA=0.

/[NO]DIALUP

Indicates whether to allow logins via a dial-up facility. The default is **/DIALUP**.

/[NO]EXPIRE[=date]

Indicates whether to expire at the end of the date specified. The default is **/NOEXPIRE**.

/IN_QUOTA=logged-in-quota

Specifies an account's disk space quota (in blocks) at log in; logged-in-quota can be:

0 to 16777214	Block quota
UNLIMITED	No quota enforced

The default is **/IN_QUOTA=UNLIMITED**.

/[NO]INTERACTIVE

Indicates whether to allow interactive access to the account. Batch jobs can still run under the account. The default is **/INTERACTIVE**.

/JOB_QUOTA=job-quota

Specifies the total number of jobs that can exist at one time for an account; job-quota can be:

0 to 63	Sets total job quota
UNLIMITED	No quota enforced

The default is **/JOB_QUOTA=UNLIMITED**.

/[NO]LOG

Indicates whether to display an account creation message. The default is **/LOG**.

/[NO]LOOKUP

Indicates whether to store passwords in a manner that follows RSTS/E V8.0 lookup rules. Passwords for **LOOKUP** accounts must be 6 characters long; passwords for **NOLOOKUP** accounts can be 6 to 13 characters long. The default is **/NOLOOKUP**.

/MESSAGE_QUOTA=message-quota

Specifies the number of outstanding messages that a job running under this account can request when declaring itself to be a receiver. The range for message-quota is 0 to 65534 or **UNLIMITED**. The default is **/MESSAGE_QUOTA=12**.

/NAME="account-name"

Specifies the account name; can be 1 to 13 characters from the ASCII character set whose decimal values are 9, 32 to 126, and 161 to 254.

/[NO]NETWORK

Indicates whether to let any network connections into this account. The default is **/NETWORK**.

/OUT_QUOTA=logged-out-quota

Specifies an account's disk space quota (in blocks) at log out; logged-out-quota can be:

0 to 16777214 Block quota

UNLIMITED No quota enforced

The default is **/OUT_QUOTA=UNLIMITED**.

/[NO]PASSWORD_PROMPT

Indicates whether to prompt for and require a password to log in to the account. The default is **/PASSWORD_PROMPT**.

/POSITION=position

Specifies where to create a UFD on a disk; position can be:

n	UFD created at first available position after the device cluster number (DCN) n; the range of n is 1 to the maximum DCN.
INDEX	UFD created as near as possible to the storage allocation table.
MIDDLE	UFD created as near as possible to the middle of the device.

The default is **/POSITION=INDEX**.

/PRIVILEGES=(priv[,...])

Specifies the account privileges. Priv can be:

ALL	All privileges granted
NONE	All privileges denied
Privilege keyword	Specified privilege granted
Privilege keyword with "NO" prefix	Specified privilege denied

The default is **/PRIVILEGES=SETPAS**.

See Table 1-7 for a list of RSTS/E privilege keywords.

/RIB_QUOTA=rib-quota

Specifies the maximum number of receiver ID blocks (RIBs) that a job running under this account can set up for itself as a message receiver; the range for rib-quota is 0 to 256 or UNLIMITED. The default is **/RIB_QUOTA=3**.

/SIZE=ufd-size

SPECIFIES the initial size of a new account's UFD expressed in clusters. The range of ufd-size is 1 to 7. The default is **/SIZE=1**.

/TEMPLATE=dev:[p,pn]

Indicates that the specified account's parameters are to be used as defaults for the new account's parameters. The default value for dev: is SY0. The default PPN is your PPN.

/[NO]USER

Indicates the type of account to create. **/USER** means create an account with login attributes and file storage capabilities. **/NOUSER** means create an account for file storage only and is the default.

CREATE/PORT [port-name]

Creates a logical terminal port used to connect to a remote device connected to a terminal server.

The port-name parameter specifies the name of the port to be created in the form of **KB*n*:** or **KB*n*:** where *n* is a value from 0 through 127. If the form **KB*n*:** is used, *n* must be greater than the highest keyboard number physically attached to the system or an error will occur. If the port-name is not specified, the monitor will select the first available port and report the port-name back to the user.

Privilege required: SWCTL

Command Qualifiers

/APPLICATION

Specifies that this port is to be used for the purpose of connecting to an application terminal on a terminal server. The default is **/APPLICATION**. This qualifier is allowed only for VMS compatibility and will be ignored on the **CREATE/PORT** command.

/LAT

Creates a LAT port. The default is **/LAT**.

/[NO]LOG

Indicates whether to display a confirmation message. This is useful if you have not specified a port-name because the port selected will be displayed. The default is /LOG.

/LOGICAL_NAME

Assigns a user logical name to the new port. The name you assign is in effect until you log out, log in to another account, or deassign the logical name using the DEASSIGN command.

Logical names can be up to 15 characters long. Only alphanumeric characters and underscores are allowed; dollar signs are allowed in system logical names only. Use the /SYSTEM qualifier to assign a systemwide logical name to the new port. The default is /USER.

If the logical name you specify is currently assigned, then it is replaced by the new assignment.

/[NO]QUEUED

Indicates whether the connection to a terminal server will be placed on the server's queue if the remote port is busy and the server supports queuing. If /NOQUEUED is specified and the remote port is busy, the connection will not be queued and it will fail. The default is /QUEUED.

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

/REMOTE_PORT=remote-port-name

Specifies the name of a remote port on the terminal server to which the local port is to be connected. The remote port name can be up to 16 alphanumeric characters in length. This qualifier requires /TERMINAL_SERVER.

/SERVICE=service-name

Specifies the name of a remote service offered at the terminal server to which the local port is to be connected. The service name can be up to 16 alphanumeric characters in length. This qualifier requires /TERMINAL_SERVER.

/SYSTEM

Assigns a systemwide logical name to the new port. Unlike user logicals, system logicals can be used by all jobs on the system.

System logical names are in effect until the system is shut down or you deassign the system logical name using the DEASSIGN command.

If the system logical name you specify is currently assigned, then it is replaced by the new assignment.

You must specify the /LOGICAL_NAME qualifier with /SYSTEM.

/TERMINAL_SERVER=server-name

Specifies the name of a terminal server to which the local port you are creating is to be assigned. The server name can be up to 16 alphanumeric characters in length. If you use this qualifier, you must select a remote port or service by using /REMOTE_PORT, /SERVICE, or both.

/USER

Assigns a user logical name to the new port. The name you assign is in effect until you log out, log in to another account, or deassign the logical name using the DEASSIGN command.

If the logical name you specify is currently assigned, it is replaced by the new assignment.

You must specify the /LOGICAL_NAME qualifier with /USER.

CREATE/SERVICE/LAT service-name

Creates a service which is then offered by the LAT host node. The service-name can be up to 16 characters in length. These characters include the following:

- The letters A through Z both upper case and lower case
- The numbers 0 through 9
- The dollar sign (\$), the hyphen (-), the period (.), and the underscore (_)
- The 8-bit ASCII characters from 192 to 253.

Privilege required: SWCFG

Command Qualifiers

/IDENTIFICATION="service-id"

Specifies a description for the service. This description is used to further identify the service being offered. It can be up to 64 characters in length. The characters include the 7-bit ASCII characters from 32 to 126 and the 8-bit ASCII characters from 170 to 253.

/[NO]LOG

Indicates whether to display a confirmation message for the requested action. The default is /NOLOG.

/STATIC_RATING=rating

Specifies the static rating associated with the service. This rating directs terminal server users away from or toward a particular node. The range of values is 0 to 255. A value of 255 is highly available to users while a value of 0 is not available to users. The default static rating is 255.

CREATE/VIRTUAL_DISK disk-size

Reserves a section of memory for use by the virtual disk where size is in blocks and should be a multiple of 4. If you specify a size that is not a multiple of 4, it is rounded up and an informational message is printed. You must use the INITIALIZE and MOUNT commands, as with any other RSTS/E disk.

Privileges required: HWCFG and INSTAL

Command Qualifiers

/ADDRESS=n

Specifies the physical location of the memory where n is the address in K-words. If you do not specify this qualifier, RSTS/E selects an appropriate location. The default is the highest available memory.

/[NO]LOG

Indicates whether to display a confirmation message for the requested action. The default is /LOG.

DEALLOCATE dev[:]

Releases a device that you reserved for private use so that other users may have access to the device. **DEALLOCATE** does not deassign any logical name you may have set up for the device.

Privilege required: none

Command Qualifier

/ALL

Deallocates all devices you currently have allocated. If you specify the device, the command deallocates the device only.

DEASSIGN logical-name[:]

Cancels logical name assignments you made with the **ASSIGN** or **ALLOCATE** commands.

Privilege required: **INSTAL** to use the **/SYSTEM** qualifier

Command Qualifier

/ALL

Cancels all user logical names that you assigned. If you also specify a logical name, the system cancels the specified logical name only. **/ALL** is not valid with **/SYSTEM**.

/SYSTEM

Deassigns a systemwide logical name.

/USER

Deassigns a user logical name. **/USER** is the default.

DEASSIGN/PORT port-name[:]

Deassigns a local **LAT** port on the **RSTS/E** node from the remote terminal server to which it was assigned.

The **port-name** is the local port which will be deassigned. The **port-name** must be in the form of **KBIn:** or **KBn:** where *n* is a value from 0 through 127.

Privilege required: SWCFG

Command Qualifier

/LAT

Deassigns a LAT port. The default is /LAT.

/[NO]LOG

Indicates whether to display a confirmation message. The default is /LOG.

DEASSIGN/QUEUE queue-name[:] server-name[:]

Deassigns a server or all servers from a queue. Any job already started on a deassigned server is not affected.

Privilege required: PBSCTL

Command Qualifier

/ALL

Deassigns all servers currently assigned to the queue. If you specify /ALL and a server-name, PBS deassigns the server-name only.

DEFINE/COMMAND/SYSTEM command-name program-filespec

Defines a system (CCL) command.

Privilege required: INSTAL

Command Qualifiers

/LINE_NUMBER=entry-point

Defines the entry point in the command program. The valid range for entry-point is 0 to 32,767. Other values for entry-point are:

CCL 30,000

CHAIN 31,000

DCL 30,500

The default is /LINE_NUMBER=0.

/[NO]PRIVILEGE

Indicates whether to retain program temporary privileges. The default is **/NOPRIVILEGE**.

/[NO]REPLACE[=QUERY]

Indicates what action to take if the system command specified is already defined. **/NOREPLACE** returns an error message if the system command is already defined. **/REPLACE** replaces the existing system command with the new definition. **/REPLACE=QUERY** prompts you to replace the existing system command with the new definition if the system command already exists. The default is **/NOREPLACE**.

DELETE [node::]filespec[,...]

Deletes a disk file on a local or remote node.

Privilege required: Write access to each file you want to delete

Command Qualifiers

/BEFORE=date

/CREATED

/MODIFIED

/SINCE=date

Deletes files you created or modified before or since the specified date. The default is **/CREATED**.

/[NO]CONFIRM

Indicates whether to display each file specification and prompt before deleting that file. **/[NO]CONFIRM** is a synonym for **/[NO]QUERY**. The default is **/NOCONFIRM**.

/ERASE

Zeros the file before deleting it.

/[NO]LOG **N**

Indicates whether to display a confirmation message for each file deleted. The default is **/LOG**.

/[NO]QUERY **N**

Indicates whether to display each file specification and prompt before deleting that file. The default is **/NOQUERY**.

`/SELECT` { `=SIZE=n`
`=SIZE=MINIMUM=n`
`=SIZE=MAXIMUM=n`
`=SIZE=(MINIMUM=m,MAXIMUM=n)` }

Selects files based on their size. The specified size can be:

<code>n</code>	Selects only those files with size equal to <code>n</code> .
<code>MINIMUM=n</code>	Selects only those files with size greater than or equal to <code>n</code> .
<code>MAXIMUM=n</code>	Selects only those files with size less than or equal to <code>n</code> .
<code>MINIMUM=m,MAXIMUM=n</code>	Selects only those files with size between <code>m</code> and <code>n</code> inclusive.

`/[NO]WARNINGS`

Indicates whether to display an error message if the specified files are not found. The default is `/WARNINGS`.

DELETE/ACCOUNT [dev:][p,pn]

Deletes an account from a disk.

Privilege required:

- `GACNT` or `WACNT`
- `GWRITE` or `WWRITE`
- `SYSIO` to delete an account in `[0,*]`

Command Qualifiers

`/[NO]CONFIRM`

Indicates whether to prompt before deleting the account and is a synonym for `/[NO]QUERY`. The default is `/NOCONFIRM`.

`/[NO]LOG`

Indicates whether to display a confirmation message after deleting an account. The default is `/LOG`.

`/[NO]PURGE[=QUERY]`

Indicates whether to delete files and the account. `QUERY` prompts for permission to continue if the account contains files. The default is `/PURGE=QUERY`.

/[NO]QUERY

Indicates whether to prompt before deleting the account. If you specify **/NOQUERY**, the system prompts only if the account has nonzero accounting data. The default is **/NOQUERY**.

/[NO]RESET[=QUERY]

Indicates whether to delete the account if accounting data is nonzero. **QUERY** prompts for permission to continue if the accounting data is nonzero. The default is **/RESET=QUERY**.

/[NO]USER

Restricts deletions to accounts of a specific type (user or nonuser). The default is to search all accounts.

DELETE/COMMAND/SYSTEM command

Deletes a command from the list of defined systemwide commands.

Privilege required: **INSTAL**

Command Qualifier

/ALL

Deletes all systemwide commands. If you also specify a command, the system deletes the specified command only.

DELETE/ENTRY {entry-spec | entry-number

Deletes one or more job entries from a print or batch queue.

Privilege required:

- **GACNT** to delete a job of another owner in your group
- **WACNT** to delete a job of another owner not in your group

Command Qualifiers

/BATCH

Deletes batch queue entries only.

/PRINT

Deletes print queue entries only.

DELETE/PORT port-name[:]

Deletes a logical terminal port that was created by the CREATE/PORT command. If the port has an active session, then the port is not deleted until the session is completed.

The port-name parameter specifies the name of the port to be in the form of KBI *n*: or KB*n*: where *n* is a value between 0 and 127. The port must have already been created by the CREATE/PORT command. If the form KB*n*: is used, then *n* must be greater than the highest keyboard number physically connected to the system or an error will occur.

Privilege required: SWCTL

Command Qualifiers

/[NO]ABORT

Indicates whether to abort the connection if the port is in use. Specifying /ABORT terminates the current session, if any, and deletes the port. Specifying /NOABORT marks the port for deletion and deletes it when the current session is finished. The default is /NOABORT.

/LAT

Deletes a LAT port. The default is /LAT.

/[NO]LOG

Indicates whether to display a confirmation message. The default is /LOG.

DELETE/QUEUE queue-name[:]

Deletes a print or batch queue.

Privilege required: SWCFG

DELETE/SERVER server-name[:]

Deletes a print or batch server.

Privilege required: SWCFG

DELETE/SERVICE/LAT service-name

Deletes a service currently offered by the LAT host node.

Privilege required: SWCFG

Command Qualifier

/[NO]LOG

Indicates whether to display a confirmation message for the requested action. The default is /NOLOG.

DELETE/SYMBOL symbol-name

Deletes one or more DCL symbols from your local or global symbol table.

Privilege required: none

Command Qualifiers

/ALL

Deletes all symbols. If you also specify a symbol name, the system deletes the specified symbol only.

/GLOBAL

Deletes the specified symbol from the global symbol table. This is the default for the interactive command level.

/LOCAL

Deletes the specified symbol from the local symbol table. This is the default for all command levels except interactive.

DELETE/VIRTUAL_DISK

Deletes the virtual disk. You cannot delete the virtual disk if it is mounted, assigned, or has open files.

Privileges required: HWCFG and INSTAL

Command Qualifiers

`/[NO]LOG`

Indicates whether to display a confirmation message for the requested action.

DETACH job-number

Detaches a job from its terminal.

Privilege required: `JOBCTL` to detach jobs in other accounts.

Command Qualifier

`/[NO]CLOSE`

Indicates whether to close all nonzero channels on which the job's terminal is open before detaching. The default is `/CLOSE`.

DIBOL filespec[,...]

Compiles up to six DIBOL-11 source files into a single object file.

Privilege required: Read access to the files you are compiling.

Command Qualifiers

`/[NO]DEBUG`

Indicates whether to direct the compiler to use the DIBOL Debugging Technique (DDT) when you run the program. The default is `/NODEBUG`.

`/[NO]LIST[=listfile]`

Indicates whether to generate an output listing file. The default is `/NOLIST`.

`/[NO]OBJECT[=objfile]`

Indicates whether to produce an output object file. You can specify the object file name. The default is `/OBJECT`.

`/[NO]OPTIMIZE`

Indicates whether to produce optimized code. The default is `/NOOPTIMIZE`.

/[NO]STANDARD[=ANSI | D83]

Specifies the syntax that the DIBOL compiler will accept. Specifying **/STANDARD** or **/STANDARD=ANSI** tells the compiler to accept ANSI DIBOL syntax. Specifying **/STANDARD=D83** tells the compiler to accept DIBOL-83 syntax. The default is **/NOSTANDARD**.

/[NO]WARNINGS

Indicates whether to produce diagnostic messages for warning conditions. The default is **/WARNINGS**.

DIFFERENCES input-filespec compare-filespec

Compares two text files and lists any sections of text that differ.

Privilege required:

- Read access to the files you are comparing
- Write access to any output file you create

Command Qualifiers

/IGNORE=BLANK_LINES

Ignores blank lines while comparing files.

/MATCH=size

Specifies the number of lines that must be identical to constitute a match. The default is **/MATCH=3**.

/MAXIMUM_DIFFERENCES=n

Specifies the maximum number of differences before terminating comparison. The default is **/MAXIMUM_DIFFERENCES=300**.

/OUTPUT=filespec

Writes the comparison output to a file. The default is to write the output on your terminal.

DIRECTORY [node::][filespec[,...]]

Displays information about files.

Privileges required:

- None for files in your own account

- Read or execute access for files not in your account

Command Qualifiers

/BEFORE=date

/CREATED

/MODIFIED

/SINCE=date

Lists files created or modified before or since the specified date. The default is **/CREATED**.

/BRIEF **N**

Lists only the file name and type of each file. The default is **/BRIEF**.

/[NO]DATE[=ALL | CREATED | MODIFIED]

Indicates whether to display creation date and time or date of last access or both. The default is **/NODATE**.

/FULL **N**

Displays each file's file name and type, size in blocks, protection code, date last accessed or modified, date and time created, cluster size, run-time system name, position of first block on disk, and file attributes including **IGNORE** and **BACKUP**. The default is **/BRIEF**.

/OUTPUT=filespec **N**

Creates a file containing the output of a **DIRECTORY** listing, instead of displaying the output at your terminal.

/[NO]PROTECTION

Indicates whether to include protection codes in listing. The default is **/PROTECTION**.

/SELECT $\left\{ \begin{array}{l} =\text{SIZE}=\text{n} \\ =\text{SIZE}=\text{MINIMUM}=\text{n} \\ =\text{SIZE}=\text{MAXIMUM}=\text{n} \\ =\text{SIZE}=(\text{MINIMUM}=\text{m},\text{MAXIMUM}=\text{n}) \end{array} \right\}$

Selects files based on their size. The specified size can be:

n	Selects only those files with size equal to n .
MINIMUM=n	Selects only those files with size greater than or equal to n .
MAXIMUM=n	Selects only those files with size less than or equal to n .
MINIMUM=m,MAXIMUM=n	Selects only those files with size between m and n inclusive.

If you specify /SELECT together with the /SIZE=ALLOCATION qualifier, files are selected based on allocated size.

/[NO]SIZE[=ALLOCATION | USED]

Indicates whether to display the blocks allocated or used for a file. The default is /SIZE=USED when you specify /SIZE with no argument.

/TOTAL \square

Displays the total amount of space your files require, without listing information about each file.

(For disks) DISMOUNT disk-device-name[:] [pack-id]

Releases a disk you previously mounted using the MOUNT command. DISMOUNT also deallocates the device if it was allocated to you.

Privilege required:

- None for disk drives that you own
- MOUNT for disk drives mounted /SHARE or /NOSHARE by others

Command Qualifier

/PUBLIC

Dismounts a public disk drive. You must have MOUNT privilege to dismount a public disk drive.

(For tapes) DISMOUNT tape-device-name[:] [label]

Releases a tape you previously mounted using the MOUNT command. DISMOUNT also deallocates the device if it was allocated to you.

Privilege required: none

Command Qualifier

/[NO]UNLOAD

Indicates whether to unload the tape from the drive. The default is /UNLOAD.

DUMP/SYSTEM

Records the current state of the system in the CRASH.SYS file.

Privilege required: SYSIO

EDIT filespec

Starts the EDT text editor program, which lets you create and edit text files.

Privilege required:

- Create/rename access to a file you create
- Read/write access to a file you modify
- Read access to a file you are reading (/READ_ONLY)

Command Qualifiers

/[NO]COMMAND[=filespec]

Indicates whether to read and execute the commands in a command file before beginning the editing session. The default is /COMMAND=EDTINI.EDT.

/[NO]CREATE

Indicates whether to open a new file when the specified does not exist. The default is /CREATE.

/EDT

Makes sure that the EDIT command starts EDT.

/FORMAT={STREAM | VARIABLE}

Specifies that the file format is stream ASCII or variable-length. The default is /FORMAT=STREAM.

/[NO]JOURNAL[=filespec]

Indicates whether to create a journal file for the editing session. The default is /JOURNAL.

/[NO]OUTPUT[=filespec]

Indicates whether to define the file specification of the file created during the editing session. The default is /OUTPUT.

/[NO]READ_ONLY

Indicates whether to disable journaling and the creation of an output file when you view a file. The default is **/NOREAD_ONLY**.

/[NO]RECOVER

Indicates whether to read commands from a journal file before starting the editing session. The default is **/NORECOVER**.

\$EOD

Signals the end of a data list and exits from a program within a command procedure. The dollar sign (\$) is required.

Privilege required: none

EXIT [status-code]

Ends the current-level command procedure and returns control to the next higher command level.

Privilege required: none

FORCE destination[,...] "string"

Forces a string to the specified users or terminals; destinations can be PPNs that include wildcard characters or keyboard device specifications. You must specify a destination, or use the **/ALL** or **/LOGGED_IN** qualifiers.

Privilege required: SYSIO

Command Qualifiers

/ALL

Forces the string to all terminals. You cannot specify a destination with **/ALL**.

/LOGGED_IN

Forces the string to all logged-in terminals. You cannot specify a destination with **/LOGGED_IN**.

FORTTRAN {/F77 | /FOR} filespec[,...]

Invokes the FORTRAN compiler for up to six FORTRAN source files. /F77 invokes FORTRAN-77 and /FOR invokes FORTRAN-IV. The default is /F77 unless your system manager changes it.

Privilege required:

- Read access to the files you compile
- Create/rename access to any files you create

FORTTRAN/F77 Qualifiers

/[NO]CHECK

Indicates whether to produce extra code to check for program correctness at run time. The default is /CHECK.

/CONTINUATIONS=n

Specifies the maximum number of continuation lines permitted. The valid range for n is any decimal number from 0 to 99. The default is /CONTINUATIONS=19.

/[NO]D_LINES

Indicates whether to read and compile debugging lines. The default is /NOD_LINES.

/[NO]DEBUG

Indicates whether to direct the compiler to provide symbol table information for use by the PDP-11 FORTRAN-77 symbolic debugger. When you specify /DEBUG, you should also use the /NOOPTIMIZE qualifier. The default is /NODEBUG.

/[NO]I4

Determines how the compiler interprets INTEGER and LOGICAL declarations that do not specify a length. /NOI4 causes the compiler to interpret the declarations as INTEGER2 and LOGICAL2. /I4 allocates two words (four bytes) for the default length of integer and logical variables. The default is /NOI4.

/[NO]IDENTIFICATION

Indicates whether to display the FORTRAN-77 compiler identification and version numbers on your terminal. The default is /NOIDENTIFICATION.

/[NO]LIST[=listfile]

Indicates whether to create a listing file. The default is **/NOLIST**.

/[NO]MACHINE_CODE

Indicates whether to include machine language code in the listing file. The default is **/NOMACHINE_CODE**.

/[NO]OBJECT[=objfile]

Indicates whether to create an object output file. The default is **/OBJECT**.

/[NO]OPTIMIZE

Indicates whether to produce optimized code. The default is **/OPTIMIZE**.

/[NO]STANDARD[=ALL | SOURCE | SYNTAX]

Indicates whether to check your source code for extensions to ANSI standard FORTRAN at the full-language level, where:

ALL Checks for all extensions

SOURCE Checks for lowercase letters and tab characters

SYNTAX Checks for syntax extensions

The default is **/NOSTANDARD**.

/[NO]WARNINGS

Indicates whether to produce diagnostic messages for warning conditions. The default is **/WARNINGS**.

/WORK_FILES=n

Specifies the number of temporary disk work files used during compilation. The valid range for *n* is 1 to 3. The default is **/WORK_FILES=2**.

FORTRAN/FOR Qualifiers

/CODE={EAE | EIS | FIS | THR}

Selects either EAE, EIS, or FIS hardware or threaded code.

/[NO]D_LINES

Indicates whether to read and compile debugging lines. The default is **/NOD_LINES**.

/[NO]EXTEND_SOURCE

Indicates whether to allow source lines to contain significant characters in columns 73 through 80. The default is **/NOEXTEND_SOURCE**.

/[NO]I4

Determines how the compiler interprets **INTEGER** and **LOGICAL** declarations that do not specify a length. **/NOI4** causes the compiler to interpret the declarations as **INTEGER2** and **LOGICAL2**. **/I4** allocates two words (four bytes) for the default length of integer and logical variables. The default is **/NOI4**.

/[NO]LINE_NUMBERS

Indicates whether to include internal sequence numbers in the executable program for routine diagnostics. The default is **/LINE_NUMBERS**.

/[NO]LIST[=listfile]

Indicates whether to create a listing file. The default is **/NOLIST**.

/[NO]MACHINE_CODE

Indicates whether to include machine language code in the listing file. The default is **/NOMACHINE_CODE**.

/[NO]OBJECT[=objfile]

Indicates whether to create an object output file. The default is **/OBJECT**.

/[NO]OPTIMIZE

Indicates whether to produce optimized code. The default is **/OPTIMIZE**.

/[NO]WARNINGS

Indicates whether to produce diagnostic messages for warning conditions. The default is **/WARNINGS**.

GOSUB label-name

Passes control to a labeled subroutine in a command procedure (not valid at interactive level).

Privilege required: none

GOTO label-name

Passes control to the labeled line in a command procedure (not valid at interactive level).

Privilege required: none

HANGUP KB[c]n[:]

Disconnects a dial-up terminal by dropping the carrier signal line.

Privilege required: HWCTL

HELP topic [subtopic [subsubtopic [...]]]

Displays information about DCL commands and RSTS/E.

Privilege required: none

Command Qualifiers

/OUTPUT=filespec

Writes the information to the specified file.

/[NO]PROMPT

Indicates whether to enable topic and subtopic prompting.

IF expression THEN [\$] command

Tests the value of an expression and executes the DCL command following the THEN keyword if the result of the expression is true. An expression is true if the value is odd.

Privilege required: none

(For disks) INITIALIZE disk-device-name[:] pack-id

Creates a RSTS/E file structure on a disk.

Privilege required: RDNFS and WRTNFS

Command Qualifiers

/CLUSTER_SIZE=n

Specifies the pack cluster size, which is the minimum allocation unit, in 512-byte blocks, for the disk. The valid values for n are 1, 2, 4, 8, 16, 32, and 64. The default is the device cluster size.

/DATE={ACCESSED | MODIFIED}

Maintain files by their date of last access or last modification. The default is **/DATE=MODIFIED**.

/[NO]ERASE

Indicates whether to erase data on the specified disk. The default is **/ERASE**.

/[NO]EXERCISE=n

Indicates whether to check for bad blocks on the disk. The valid values for n are 0, 1, 2, 3 and FULL. The default is **/EXERCISE=FULL**.

/INDEX=position

Specifies where the SATT.SYS file is located on the disk; position can be:

n	File located at device cluster n; valid values for n are 1 to the total device size divided by the device clustersize.
BEGINNING	File located at the beginning of the disk.
MIDDLE	File located at the middle of the disk.

The default is **/INDEX=MIDDLE**.

/MFD_CLUSTER_SIZE=n

Specifies the minimum allocation unit, in 512-byte blocks, for the Master File Directory (MFD). The valid values for n are 4, 8, or 16, which must be greater than or equal to the value entered for the CLUSTER_SIZE qualifier (but no larger than 16). The default is **/MFD_CLUSTER_SIZE=16**.

/NEW_FILES={FIRST | LAST}

Specifies whether files stored on the disk will be placed at the beginning of an account (**/NEW_FILES=FIRST**) or at the end of an account (**/NEW_FILES=LAST**). The default is **/NEW_FILES=LAST**.

/PRIVATE

Allows disk access only to users having an account on the disk.

/PUBLIC

Allows disk access to all users having an account on the system. The default is **/PRIVATE**.

/[NO]QUERY

Indicates whether to request permission to continue when you select a disk for initialization that already has a RSTS/E file structure. The default is **/QUERY**.

/[NO]RETAIN

Indicates whether to use the existing bad block file. The default is **/RETAIN**.

/[NO]WRITE

Indicates whether to allow read/write access instead of read-only access when you mount the disk. The default is **/WRITE**.

(For tapes) INITIALIZE tape-device-name[:] [label]

Writes a new label on a tape and allocates the tape drive if it is not already allocated.

Privilege required: **DEVICE** if the tape drive is restricted

Command Qualifiers

/DENSITY=n

Specifies the density in bits per inch (bpi). Depending on the tape drive, n can be in the range 2 to 32766. Currently available densities are 800, 1600, 6250, 6667, and 10000 bpi. You can also specify **MINIMUM** or **MAXIMUM**, which causes the system to set the density to the minimum or maximum the tape drive supports.

Any density you specify overrides the system default density.

If you do not specify a density, **INITIALIZE** uses the system default density. If the system default density is not valid for the tape drive, the system selects the next higher density the tape drive supports. If the system default density is higher than the highest density the drive supports, the system selects the tape drive's maximum density.

When you specify a density that the tape drive does not support, you receive an error message.

/FORMAT={ANSI | DOS}
Specifies the tape label format.

INITIALIZE/QUEUE queue-name[:]

Defines a print or batch queue.

Privilege required: SWCFG

Command Qualifiers

/BATCH

Specifies that you are initializing a batch queue.

/CLOSE

Initially closes the queue.

/CPU_LIMIT=(MAXIMUM=a,DEFAULT=b)

/CPU_LIMIT=n

Specifies the maximum and/or default CPU time limits (in minutes) you can specify when submitting a job to the queue. If you use the **/CPU_LIMIT=n** form, n specifies both the maximum and default limits. The valid range for a, b, and n is 1 to 65535 in addition to **UNLIMITED**. The default value cannot exceed the maximum value.

/DEFAULT

Initializes the default queue.

/FORMS=form-name

Specifies the name of the default forms for a print queue.

/PAGE_LIMIT=(MAXIMUM=a,DEFAULT=b)

/PAGE_LIMIT=n

Specifies the maximum and/or default page limits a user can specify when submitting a job to the queue. If you use the **/PAGE_LIMIT=n** form, n specifies both the maximum and default limits. The valid range for a, b, and n is 1 to 4294967295 in addition to **UNLIMITED**. The default value cannot exceed the maximum value. The default is **/PAGE_LIMIT=UNLIMITED**.

/PRINT

Initializes a print queue.

/PRIORITY=(MAXIMUM=a,DEFAULT=b)

/PRIORITY=n

Specifies the maximum and/or default priorities a user can specify when submitting a job to the queue. If you use the **/PRIORITY=n** form, **n** specifies both the maximum and default limits. The valid range for **a**, **b**, and **n** is 1 to 255. The default value cannot exceed the maximum value. The default is **/PRIORITY=255**.

/PRIVILEGES=(priv[,...])

Specifies the set of privileges a user must have to enter jobs in queue. Priv can be:

ALL	All privileges granted
NONE	All privileges denied
Privilege keyword	Specified privilege granted
Privilege keyword with "NO" prefix	Specified privilege denied

The default is **/PRIVILEGES=NONE**. See Table 1-7 for a list of RSTS/E privilege keywords.

/TIME_LIMIT=(MAXIMUM=a,DEFAULT=b)

/TIME_LIMIT=n

Specifies the maximum and/or default elapsed time limits (in minutes) you can specify when submitting a job to the queue. If you use the **/TIME_LIMIT=n** form, **n** specifies both the maximum and default limits. The valid range for **a**, **b**, and **n** is 1 to 65535 in addition to **UNLIMITED**. The default value cannot exceed the maximum value. The default is **/TIME_LIMIT=UNLIMITED**.

INITIALIZE/SERVER server-name[:]

Defines a print or batch server.

Privilege required: SWCFG

Command Qualifiers

/[NO]CONTROLS[=UP_ARROW]

Indicates how print servers handle control characters and escape sequences. The default is **/CONTROLS=UP_ARROW**.

/FORMS=form-name

Specifies the name of the forms installed on the printer.

/PRIORITY=n

Specifies the priority at which command procedures controlled by this batch server run. The valid range for n is -120 to 120. PBS rounds the priority down to the nearest multiple of 8. You cannot specify a priority that exceeds the PBS job priority. The default is **/PRIORITY=-8**.

/RUN_BURST=n

Specifies the run burst assigned to any command procedure controlled by this batch server. The valid range for n is 1 to 127. The default is **/RUN_BURST=6**.

/[NO]SHAREABLE

Indicates whether to share the server's device with other jobs on the system. The default is **/SHAREABLE**.

INQUIRE symbol-name ["prompt-string"]

Prompts for a value at your terminal and waits for a response. After you enter a response, INQUIRE assigns the value as a string to the specified symbol name. If you do not specify a prompt string, DCL uses the symbol name to prompt for the value.

Privilege required: none

Command Qualifiers

/[NO]ECHO

Indicates whether to display responses to prompts on your terminal. The default is **/ECHO**.

/EXIT[=label]

Specifies the action taken when you type CTRL/Z. Passes control to label, otherwise exits. The default is **/EXIT**.

/GLOBAL

Places the specified symbol in the global symbol table. The default is **/LOCAL**.

/LOCAL

Places the specified symbol in the local symbol table for the current command procedure.

/[NO]PUNCTUATION

Indicates whether to append a colon (:) and space to the displayed prompt string. The default is /PUNCTUATION.

/TIME_OUT=n

The amount of time (in seconds) the system waits for a response before continuing without changing the symbol name value.

INSTALL/ERROR_FILE [filespec]

Installs the specified file as the system error message file. If you do not specify a file, the default file `_SY0:[0,1]ERR.SYS` is used.

Privilege required:

- **INSTAL**
- Write access to the error file

Command Qualifiers

/[NO]LOG

Indicates whether to display a confirmation message after installing the error file. The default is /LOG.

/POSITION=position

Places the error file at the specified position on the disk; position can be:

- | | |
|---------------|--|
| n | Places the error file at first available position after the device cluster number (DCN) n; the range of n is 0 to the maximum DCN. |
| INDEX | Places the error file at the first available position after the storage allocation table. |
| MIDDLE | Places the error file at the first available position after the middle of the device. |

The default is /POSITION=0.

/SIZE=n

Creates an error file if one does not exist and allocates n blocks to the file.

INSTALL/LIBRARY library-name

Adds the specified library as a resident library in memory.

Privilege required:

- **INSTAL**
- Read access to the library file

Command Qualifiers

/[NO]ADDRESS[=n]

Specifies the memory address where you want to load the resident library. The valid range for n is 1K to 2043K. **/NOADDRESS** causes the system to compute a new starting address each time it loads the library. The system places the library in the highest part of memory when you specify **/ADDRESS**. The default is **/ADDRESS**.

/NOADDRESS[=RESTRICTED]

The restricted argument allows installation of size-restricted floating libraries.

/NOADDRESS=UNRESTRICTED

The unrestricted argument allows installation of unrestricted floating libraries.

/[NO]ERROR_LOGGING

Indicates whether to log library errors. The default is **/ERROR_LOGGING**.

/[NO]LOCK

Indicates whether to lock the resident library in memory. The default is **/NOLOCK**.

/PROTECTION=n

Specifies the protection code you want to assign to the resident library. The valid range for n is 0 to 63. The default is **/PROTECTION=42**.

/[NO]READ_ONLY

Determines whether you want to allow read only or read and write access to the library. The default is **/READ_ONLY**.

/[NO]SHAREABLE

Indicates whether to allow one or more than one user to access the library at the same time. The default is **/SHAREABLE**.

/[NO]UNLOAD

Indicates whether to remove the resident library from memory when it is not in use. The default is **/NOUNLOAD**.

INSTALL/OVERLAY_FILE [filespec]

Installs the file you specify as the system overlay file. If you do not specify a file, the default file **_SY0:[0,1]OVR.SYS** is used.

Privilege required:

- **INSTAL**
- Write access to the overlay file

Command Qualifiers

/[NO]LOG

Indicates whether to display a confirmation message after installing the overlay file. The default is **/LOG**.

/POSITION=position

Places the overlay file at the specified position on the disk; position can be:

- | | |
|---------------|---|
| n | Places the file at the first available position after the device cluster number (DCN) n ; the range of n is 0 to the maximum DCN. |
| INDEX | Places the file at the first available position after the storage allocation table. |
| MIDDLE | Places the file at the first available position after the middle of the device. |

The default is **/POSITION=0**.

/SIZE=n

Creates an overlay file if one does not exist and allocates **n** blocks to the file.

INSTALL/RUNTIME_SYSTEM name

Installs the specified run-time system in memory.

Privilege required:

- **INSTAL**
- Read access to the runtime system file

Command Qualifiers

/[NO]ADDRESS[=n]

Specifies the memory address where you want to load the run-time system. The valid range for n is 1K to 2043K. The system places the run-time system in the highest part of memory when you specify /ADDRESS. The system computes a new starting address each time it loads the run-time system when you specify /NOADDRESS. The default is /NOADDRESS.

/[NO]ERROR_LOGGING

Indicates whether to log run-time system errors. The default is /ERROR_LOGGING.

/[NO]KEYBOARD_MONITOR

Indicates whether to install the run-time system as a keyboard monitor. The default is /NOKEYBOARD_MONITOR.

/[NO]LOCK

Indicates whether to lock the run-time system in memory. The default is /NOLOCK.

/MAXIMUM_SIZE=n

Specifies the maximum job size you want to allow a job running under this run-time system. The valid range for n is 1K to 28K.

/MINIMUM_SIZE=n

Specifies the minimum job size you want to allow a job running under this run-time system. The valid range for n is 1K to 28K.

/POSITION=n

Places the run-time system block at position n after the primary run-time system in the linked list; the valid range for n is 0 to 255. If you do not specify this qualifier, the system places the run-time system at the end of the list.

/PREFIX[=n]

Specifies the prefix code the system uses for emulator traps. The valid range for n is 0 to 255. The default is **/PREFIX=255**.

/[NO]READ_ONLY

Determines whether to allow read-only or read/write access to the run-time system. The default is **/READ_ONLY**.

/[NO]SHAREABLE

Indicates whether to allow one or more than one user access to the run-time system. The default is **/SHAREABLE**.

/TYPE=filetype

Specifies the default file type for programs that execute under this run-time system.

/[NO]UNLOAD

Indicates whether to remove the run-time system from memory when it is not in use. The default is **/NOUNLOAD**.

INSTALL/SWAP_FILE [=]index [filespec]

Installs the specified file as a swap file. The index value can be 0, 1, or 3. If you do not specify a file, the default file **_SY0:[0,1]SWAPn.SYS** is used, where n is the index value.

Privilege required:

- **INSTAL**
- Write access to the swap file

Command Qualifiers

/DEVICE=disk-name[:]

Specifies that the disk is to be used exclusively as a non-file-structured swapping disk. Any data or structure on the disk is destroyed when jobs are swapped to it. You cannot use the **/DEVICE** qualifier with the **filespec** parameter, or with the **/POSITION** or **/SIZE** qualifiers.

/[NO]LOG

Indicates whether to display a confirmation message after installing the swap file. The default is **/LOG**.

/POSITION=position

Places the file at the specified position on the disk; position can be:

n Places the error file at first available position after the device cluster number (DCN) n; the range of n is 0 to the maximum DCN.

INDEX Places the file at the first available position after the storage allocation table.

MIDDLE Places the file at the first available position after the middle of the device.

The default is **/POSITION=0**.

/SIZE=n

Creates a swap file if one does not exist and allocates n blocks to the file.

LINK filespec[,...]

Combines one or more object files to produce an executable program. You can also specify an overlay structure for the program.

Privilege required:

- Read access for the programs you are linking
- Create/rename access to any files you create

Language Qualifiers

/BASIC

/BP2

Links BASIC-PLUS-2 object files. If you do not specify a language qualifier, RSTS/E assumes BASIC-PLUS-2 unless your system manager changes it.

/CC

Links PDP11-C object files.

/COBOL

/C81

Links COBOL-81 object files.

/DIBOL

Links DIBOL object files.

/F77

Links FORTRAN-77 object files.

/FOR

Links FORTRAN-IV object files.

/RSX11

Links object files produced by the RSX-based MACRO assembler (MAC.TSK).

/RT11

Links object files produced by the RT11-based MACRO assembler (MACRO.SAV).

Command Qualifiers

/CODE=[NO]DATA_SPACE

Indicates whether to create an instruction and data (I&D) space task. You cannot use this qualifier with the /FOR or /RT11 qualifiers. The default is /CODE=NODATA_SPACE.

/[NO]DEBUG

Indicates whether to invoke the debugger associated with a programming language. The debugging tools are:

COBOL-81	Symbolic Debugger
DIBOL	DDT (DIBOL Debugging Technique)
FMS	Debug mode
MACRO	ODT (Octal Debugging Technique)

The default is /NODEBUG.

/DESCRIPTION

Indicates that the input file is a Task Builder command file that describes how to link the program.

/[NO]DMS

Indicates whether to link your DIBOL program with Data Management Services (DMS) instead of RMS. The default is /NODMS.

/[NO]EXECUTABLE[=filespec]

Indicates whether to produce an executable file. The default is /EXECUTABLE.

/[NO]FMS[=[NO]RESIDENT]

Indicates whether to link your program with the Forms Management System (FMS) and Indicates whether to use the resident library instead of the disk library. The default is /NOFMS.

/[NO]MAP[=filespec]

Indicates whether to produce a memory map file. The default is /NOMAP.

/OTS=[NO]RESIDENT

Specifies the resident library or the disk library for the language Object Time System (OTS).

**/[NO]RMS { = [NO]RESIDENT
= SUPERVISOR
= USER }**

Indicates whether to link your program with the Record Management Services (RMS) and when using the SUPERVISOR or USER argument specifies which hardware mode the resident library should use. The default is /RMS.

/SORT_AND_MERGE=[NO]RESIDENT

Indicates whether to use the SORT/MERGE clustered resident library instead of the disk library in the user task.

/STACK=n

Resets the allocation of stack space.

/STRUCTURE

Prompts you for an overlay structure.

LOAD/INDEX [dev[:]]

Loads the SAT (Storage Allocation Table) for a disk device into memory during timesharing. By making the SAT resident in memory, you can improve the system's performance at the cost of increased memory (XBUF) usage.

If you do not specify a device, the default is the system disk (SY0:).

Privilege required: SWCTL

LOAD/OVERLAY overlay-name[,...]

Loads one or more monitor overlays into memory. Overlay-name can be:

ATTRIBUTE	Performs file and account attribute read/write operations.
DCL	Performs file-related operations for DCL.
DELETE_RENAME	Performs file deletion and renaming.
DIRECTORY	Performs disk file lookup operations.
FILE_UTILITY	Performs the monitor file utility functions.
SYSTEM_CALLS	Performs the following monitor directives: <ul style="list-style-type: none">• Gets monitor tables (parts 1, 2, and 3)• Returns open file information• Converts dates and times• Returns job status
TERMINAL	Performs the set terminal characteristics and the hangup terminal directives.

Privilege required: SWCFG

Command Qualifier

/ALL

Loads all monitor overlays into memory. If you also specify an overlay name, the system loads only the specified overlay into memory.

LOGIN [p,pn]

Creates a new job by logging in to an account at a terminal, logs in your current job under a different account, or resets your current job to its initial logged-in state. You can also log in using a system logical name; the logical name specified must be a system logical that translates into a valid PPN.

Privilege required:

- DEVICE to log in to an account at a restricted terminal

- GACNT or WACNT to log in to a new job under a different account at a terminal, or, without specifying a password

Command Qualifiers

/[NO]OVERRIDE[=NOLOGINS]

Indicates whether the job should still be created if NO LOGINS is set. The default is /NOOVERRIDE.

/TERMINAL=KB[c]n[:]

Specifies the keyboard to log in.

LOGOUT

Ends a terminal session.

Privilege required: none

Command Qualifiers

/BRIEF

Displays nothing when you log out. The default is /FULL.

/FULL

Displays complete information about your use of system resources when you log out.

MACRO {/RSX11 | /RT11} filespec[,...]

Invokes the MACRO-11 assembler for up to six MACRO-11 source files.

Privilege required:

- Read access to the files you are assembling
- Create/rename access to any files you create

Command Qualifiers

/[NO]LIST[=listfile]

Indicates whether to create an output listing file. The default is /LIST.

/[NO]OBJECT[=objfile]

Indicates whether to generate an output object file. The default is /OBJECT.

File Qualifier

/LIBRARY

Specifies that the file is a macro library.

MERGE input-filespec[,...]output-filespec

Invokes the PDP-11 MERGE Utility to combine one or more previously sorted input files into a single output file. All input files must have been sorted on the same SORT key(s).

Privilege required: none

Command Qualifiers

/[NO]CHECK_SEQUENCE

Indicates whether to examine the input files to make sure that they are in order. The default is /CHECK_SEQUENCE.

/COLLATING_SEQUENCE={ASCII | EBCDIC | MULTINATIONAL}

Specifies the collating sequence. The default is /COLLATING_SEQUENCE=ASCII.

/[NO]DUPLICATES

Indicates whether to allow duplicate records. The default is /DUPLICATES.

/KEY=(field[,...])

Defines up to 10 MERGE keys.

/SPECIFICATION[=filespec]

Specifies the file containing commands, file qualifiers, and key field definitions.

/[NO]STABLE

Indicates how input files containing records with equal keys are to be merged in the output file. The default is /NOSTABLE.

/[NO]STATISTICS

Indicates whether to display a statistical summary after the MERGE operation. The default is /NOSTATISTICS.

Input File Qualifiers

/FORMAT=(record-format[,...])

Specifies input record formats that override the existing data that MERGE normally obtains through PDP-11 RMS.

/INDEXED_SEQUENTIAL[=n]

Specifies that the input file organization is indexed-sequential and the number of keys; the valid range for n is 1 to 255. The default is /INDEXED_SEQUENTIAL=1.

/[NO]SHAREABLE

Indicates whether to open the input files in write-shareable mode. The default is /NOSHAREABLE.

/TREE_SPACE=n

Specifies the percentage distribution of available work area between SORT/MERGE tree-related data structures and I/O-related data structures; the valid range for n is 1 to 100 percent (%). The default division of work area is 30% to the merge list and 70% to I/O.

Output File Qualifiers

/ALLOCATION=n

Specifies the number of 512-byte blocks allocated for the output file; the maximum value for n is 4294967295.

/BUCKET_SIZE=n

Used with disk files, specifies the number of 512-byte blocks per bucket for the output file; the maximum value for n is 32.

/[NO]CONTIGUOUS

Indicates whether to allocate contiguous disk space for the output file. The default is /NOCONTIGUOUS.

/FORMAT=(record-format[,...])

Defines the output file record format.

/INDEXED_SEQUENTIAL[=n]

Specifies that the output file organization is indexed-sequential and the number of keys; the valid range for n is 1 to 255. The default is /INDEXED_SEQUENTIAL=1.

/LOAD_FILL

Used only with indexed files, loads the buckets according to the fill size established when the file was created.

/[NO]OVERLAY

Indicates whether to overlay an existing file with the sorted records of the input file. The default is **/NOOVERLAY**.

/RELATIVE

Specifies that the output file organization is relative.

/SEQUENTIAL

Specifies that the output file organization is sequential.

(For disks) MOUNT disk-device-name[:] pack-id [logical-name[:]]

Prepares a disk drive for processing by system commands or user programs.

Privilege required: **MOUNT** when mounting a disk drive mounted **/SHAREABLE** or **/NOSHAREABLE** by another user or mounted **/NOREBUILD** and the disk is dirty.

Command Qualifiers

/OVERRIDE[=IDENTIFICATION]

When you specify **/OVERRIDE**, **MOUNT** ignores the pack ID.

/PRIVATE

Mounts the disk as private, allowing access only to those users having an account on the disk.

/PUBLIC

Mounts the disk as public, allowing access to all system users. The default is **/PRIVATE**.

/[NO]QUOTA

Indicates whether to perform quota checking when the disk is mounted.

/[NO]REBUILD

Indicates whether to rebuild a disk regardless of whether the disk was initialized for read/write or read-only.

/[NO]RESTRICT

Indicates whether to restrict the use of **MOUNT** to those users having **MOUNT** privilege. The default is **/NORESTRICT**.

/[NO]SHAREABLE[=n]

Indicates whether to allow access to all users having an account on a private disk instead of only the specified job. **/SHAREABLE**, the default, allows access to all jobs. **/NOSHAREABLE[=n]**, where **n** specifies a job number, allows access to only that job; the default for **n** is your job.

/[NO]WRITE

Indicates whether to write data to the disk. The default is **/NOWRITE**.

(For tapes) MOUNT tape-device-name[:] [label]

Prepares a tape drive for processing by system commands or user programs.

Privilege required: **DEVICE** when mounting a restricted tape drive

Command Qualifiers

/DENSITY=n

Specifies the density, in bits per inch, at which a magnetic tape will be read or written: **n** can be in the range 2 to 32766. Currently available densities are 800, 1600, 6250, 6667, 8000 and 10000 bpi. You can also specify **MINIMUM** or **MAXIMUM**, which causes the system to set the density to the minimum or maximum the tape drive supports.

Any density you specify must match the density of the tape mounted.

If you do not specify a density, **MOUNT** automatically determines the density of the tape mounted.

/FORMAT={ANSI | DOS | FOREIGN}

Specifies the tape label format.

/OVERRIDE[=IDENTIFICATION]

When you specify **/OVERRIDE** for ANSI format tapes, **MOUNT** ignores the tape label. **DCL** ignores **/OVERRIDE** on DOS format tapes.

/[NO]WRITE

Indicates whether to write data to the tape.

ON CONTROL_C THEN [\$] command

Specifies the action taken when a Ctrl/C interrupt occurs during execution of a command procedure. ON CONTROL_C has no effect at the interactive level.

Privilege required: none

ON severity-level THEN [\$] command

Specifies an action taken when DCL detects a warning, error, or severe error in a command procedure. ON has no effect at the interactive level.

You can specify one of the following severity-level keywords:

- WARNING
- ERROR
- SEVERE_ERROR

Privilege required: none

OPEN channel-number filespec

Opens a disk file for reading or writing. The valid range for channel-number is 1 to 13.

Privilege required:

- Create/Rename access to create a new file
- Read access to open an existing file for reading
- Write access to replace or append to an existing file

Command Qualifiers

/APPEND

Appends new records to the end of an existing disk file.

/READ

Opens a file for reading. The default is /READ.

/[NO]REPLACE

Indicates whether to replace an existing file if you also specify **/WRITE**.

/WRITE

Opens a file for writing.

OPEN/LOG_FILE filespec

Opens a disk file for terminal logging.

Privilege required:

- Create/Rename access to the log file you are creating
- Write access to the file you are replacing or appending to

Command Qualifiers

/APPEND

Adds data to the end of an existing log file or opens a new file if it does not exist.

/DISABLE

Disables terminal output logging to the log file.

/ENABLE

Enables terminal output logging to the log file. The default is **/ENABLE**.

/[NO]REPLACE

Indicates whether to replace an existing log file.

/[NO]TIME_STAMP

Indicates whether to prefix each line in the log file with a date/time stamp. The default is **/NOTIME_STAMP**.

OPEN/QUEUE queue-name[:]

Opens a queue for additional requests after it has been closed using the **CLOSE/QUEUE** command.

Privilege required: **PBSCTL**

PRINT [node::]filespec[,...] [entry-spec]

Queues one or more files for printing, either on a default system printer or on a device you specify. If you specify a node name, you cannot use any qualifiers or include an entry-spec.

Privilege required:

- Read access to the file(s) you are printing
- Write access to use **/DELETE**
- **GACNT** to specify another owner in your group
- **WACNT** to specify another owner not in your group

Command Qualifiers

/AFTER=date-time

Specifies an absolute or relative date-time value after which the entry is eligible for processing.

/FORMS=form-name

Specifies the name of the form you want to use for this request.

/HOLD

Places the entry in a "hold" state in the queue.

/JOB_COUNT=n

Specifies the number of job copies you want to print; the valid range for n is 1 to 255. The default is **/JOB_COUNT=1**.

/NAME=entry-name

Specifies a 1- to 9-character name for the entry.

/[NO]NOTIFY

Indicates whether to notify your terminal session of events that occur related to your print entry. The default is **/NONOTIFY**.

/OWNER=[p,pn]

Specifies the owner of the print request.

/PAGE_LIMIT=n

Specifies the maximum number of pages in the print job. The valid range for n is 1 to 4294967295 in addition to **UNLIMITED**.

/PRIORITY=n

Specifies the priority you want to assign to the request; the valid range for n is 1 to 255.

/QUEUE=queue-name[:]

Names the queue you want to handle the request.

File Qualifiers

/[NO]CONVERT

Indicates whether to convert all 0 ("zero") characters to O ("oh") characters. The default is **/NOCONVERT**.

/COPIES=n

Specifies the number of file copies you want to print; the valid range for n is 1 to 255. The default is **/COPIES=1**.

/[NO]DELETE

Indicates whether to delete the file after printing. The default is **/NODELETE**.

/[NO]FEED

Indicates whether to execute a form-feed sequence at the bottom margin of each page. The default is **/FEED**.

/[NO]FLAG_PAGES

Indicates whether to print flag (header) pages at the top of each file copy. The default is **/FLAG_PAGES**.

/[NO]TRUNCATE

Indicates whether to truncate lines that exceed the form's width. The default is **/NOTRUNCATE**.

/[NO]WRAP

Indicates whether the characters that exceed the form width should print on the next line. **/NOWRAP** causes the characters to print on the same line. The default is **/WRAP**.

READ channel-number symbol-name

Reads the next record from a disk file that you have open for reading and assigns the contents of the record to the specified symbol name.

Privilege required: none

Command Qualifiers

/[NO]DELIMITER

Indicates whether to include the record delimiter in the symbol name.

/END_OF_FILE=label

Specifies the label of the command file line to which you want to pass control when the system detects an end-of-file (EOF) condition during a read.

/GLOBAL

Searches the global symbol table for the specified symbol. The default is **/LOCAL**.

/LOCAL

Searches the current local symbol table for the specified symbol name.

RECALL {[integer] | leading-substring}

Displays the command line specified by the integer or most recent command line that matches the substring. Leading-substring refers to the first several characters in a command string.

Privilege required: none

Command Qualifiers

/ALL

Displays all commands currently stored in the recall buffer along with their command numbers.

/ERASE

Erases the contents of the recall buffer. **/ERASE** is ignored if the **/ALL** qualifier is specified.

REMOVE/ERROR_FILE

Removes the system error file.

Privilege required: **INSTAL**

Command Qualifiers

/[NO]LOG

Indicates whether to display a confirmation message after removing the error file. The default is /LOG.

REMOVE/JOB job-number

Immediately terminates the specified job and logs it off the system.

Privilege required: JOBCTL

Command Qualifiers

/[NO]CONFIRM

Indicates whether to prompt before terminating the specified job and is a synonym for /[NO]QUERY. The default is /CONFIRM.

/[NO]QUERY

Indicates whether to prompt before terminating the specified job and is a synonym for /[NO]CONFIRM. The default is /QUERY.

REMOVE/LIBRARY library-name

Removes the specified resident library from the list of installed resident libraries.

Privilege required: INSTAL

REMOVE/OVERLAY_FILE

Removes the system overlay file.

Privilege required: INSTAL

Command Qualifiers

/[NO]LOG

Indicates whether to display a confirmation message after removing the overlay file. The default is /LOG.

REMOVE/RUNTIME_SYSTEM name

Removes the specified run-time system from the list of installed run-time systems.

Privilege required: INSTAL

REMOVE/SWAP_FILE [=]index

Removes the specified system swap file. Index can be 0, 1, or 3.

Privilege required: INSTAL

Command Qualifiers

/[NO]LOG

Indicates whether to display a confirmation message after removing the swap file. The default is /LOG.

RENAME old-filespec[,...] new-filespec

Changes the file name or type of an existing file.

Privilege required:

- Create/rename access to the file you are renaming
- Write access to the file you are replacing
- SYSIO and Write access to set the privilege bit <128> in the protection code for non-executable files (files with the executable bit <64> not set).
- TMPPRV and Write access to set the privilege bit <128> in the protection code for executable files (files with the executable bit <64> set).

Command Qualifiers

/BEFORE=date

/CREATED

/MODIFIED

/SINCE=date

Renames files you created or modified before or since the specified date.

/[NO]CONFIRM

Indicates whether to prompt before renaming files and is a synonym for **/[NO]QUERY**. The default is **/NOCONFIRM**.

/[NO]LOG

Indicates whether to display a confirmation message on your terminal for each file renamed. The default is **/LOG**.

/PROTECTION=n

Specifies a protection code for the renamed file.

/[NO]QUERY

Indicates whether to prompt before renaming files and is a synonym for **/[NO]CONFIRM**. The default is **/NOQUERY**.

/[NO]REPLACE

Indicates whether to replace existing files having the same file name. The default is **/NOREPLACE**.

/SELECT { $\left. \begin{array}{l} =\text{SIZE}=n \\ =\text{SIZE}=\text{MINIMUM}=n \\ =\text{SIZE}=\text{MAXIMUM}=n \\ =\text{SIZE}=(\text{MINIMUM}=m,\text{MAXIMUM}=n) \end{array} \right\}$

Selects files based on their size. The specified size can be:

n	Selects only those files with size equal to n.
MINIMUM=n	Selects only those files with size greater than or equal to n.
MAXIMUM=n	Selects only those files with size less than or equal to n.
MINIMUM=m,MAXIMUM=n	Selects only those files with size between m and n inclusive.

/[NO]WARNINGS

Indicates whether to display an error message if you try to rename a file to the name of a file that already exists. The default is **/WARNINGS**.

REPLY [{"message-text"}]

Responds to user and application requests and stores the reply in the Operator/Message Services (OMS) work file. Message-text specifies the text of the reply. Enclose strings containing lowercase letters or nonalphanumeric characters (including spaces) in quotation marks.

Privilege required: OPER

Command Qualifier

/ABORT=identification-number

Answers the request from a user or application corresponding to the identification number and aborts the request.

/ANSWER=identification-number

Sends the reply text to the user or application corresponding to the identification number and successfully completes the request.

/DISABLE

Indicates that the terminal will not perform as an operator services console. **REPLY/DISABLE** is a synonym for **SET TERMINAL/NOOPERATOR_SERVICES**.

/ENABLE

Indicates that the terminal is enabled as an operator services console. **REPLY/ENABLE** is a synonym for **SET TERMINAL/OPERATOR_SERVICES=ALL**.

/PENDING=identification-number

Answers the request from a user or application corresponding to the identification number but does not fulfill the request. The request remains pending until the operator aborts or answers the request.

/PROMPT

Prompts the user for multiple lines of text that make up the reply. The reply is entered similarly to the **CREATE** and **BROADCAST** commands. By using this qualifier, the length of the reply text can have a maximum of 500 characters.

This qualifier conflicts with the message-text parameter, and will cause an error if both are specified on the same command line.

/STATUS

Displays the pending requests from work files.

/TO=identification-number

Answers the request from a user or application corresponding to the identification number and successfully completes the request. This qualifier is a synonym for the /ANSWER qualifier and is provided for VMS compatibility.

REQUEST [""]request-text[""]

Broadcasts a message or request to all operators and operator terminals on the system. It stores the message or reply in the Operator/Message Services (OMS) work file.

Privilege required: none

Command Qualifiers

/PROMPT

Prompts for multiple lines of text that will make up the text of the request. The text is entered in a manner similar to the CREATE and BROADCAST commands. The length of the request text can have a maximum of 500 characters. This qualifier conflicts with the request-text parameter, and will cause an error if both are specified on the same command line.

/[NO]REPLY

Indicates whether a reply is expected. /REPLY indicates that a reply is required. The job will be placed in a wait state until an operator replies to or terminates your request, or until you type CTRL/C to terminate your request. /NOREPLY indicates that no reply is expected, and control returns to DCL after the REQUEST has been sent. The default is /REPLY.

/[NO]TIME_OUT[=wait-minutes]

Specifies the length of time (in minutes) to wait for a reply. If no reply is given after the amount of time specified, the request will be aborted. You can specify any integer in the range 1 to 255. By default, there is no time limit imposed on the REQUEST command.

RESTORE input-backup-set-spec output-filespec[:]

Lets you selectively restore accounts or files from a BACKUP media onto a specified disk.

Privilege required:

- Read access to the backup set file
- Create access to restored filespecs
- DATES to restore the file's original creation and access dates
- INSTAL to exceed system dynamic region limit
- SYSIO to restore files to [0,1]
- TUNE to use the /BUFFER_SIZE qualifier and for better system performance
- WACNT and GACNT to use the /ACCOUNT_DATA qualifier

Command Qualifiers

/[NO]ACCOUNT_DATA

Indicates whether to create accounts that meet the selection criteria. The default is /ACCOUNT_DATA. This qualifier has no effect unless you specified /ACCOUNT_DATA for the backup process.

/[NO]ASSIST

Indicates how to send media mount requests to an operator. By specifying /ASSIST, you can send the media mount requests to an operator through the Operator/Message Services (OMS). The default, /NOASSIST, sends media mounts requests through your terminal.

/BUFFER_SIZE=n

Overrides the default dynamic region size. Larger values may improve performance at the expense of greater system impact. The valid range for n is 3 to 255 or MAXIMUM. You can also specify OPTIMUM or 55. The default is the minimum usable size, except when using an MS- or MU-class tape drive in which case the default is 55.

/CREATED=date:time

/CREATED=(AFTER=date:time,BEFORE=date:time)

/MODIFIED=date:time

/MODIFIED=(AFTER=date:time,BEFORE=date:time)

Restores files created or modified on, before, after, or between the specified date:times. The date:time argument can be any valid DCL date and/or time.

/END={([NO]REWIND | [NO]DISMOUNT)}

Specifies whether to rewind the output tape drive or dismount the output disk following the successful completion of the backup operation. The default for disks is **/END=DISMOUNT**. The default for tapes is **/END=NOREWIND**.

/EXCLUDE=(filespec-list)

Specifies one or more files that should not be restored from the saveset.

/[NO]FILE_DATA

Indicates whether to transfer files from the saveset. Use this qualifier with the **/ACCOUNT_DATA** qualifier to create accounts only. The default is **/FILE_DATA**.

/INCLUDE=(filespec-list)

Specifies the files or accounts you want unconditionally processed.

/IN_LABEL=name

Specifies the name you want compared to the source volume ID.

/[NO]INITIALIZE[=([NO]ERASE, [NO]EXERCISE, EXERCISE=n, CLUSTER_SIZE=n, [NO]QUERY)]

Indicates whether to initialize the output disk before creating the backup file. The arguments allow you to have more control over the initializing of disks in the backup operation. For **/INITIALIZE=EXERCISE=n**, n can be 0, 1, 2, or 3. For **/INITIALIZE=CLUSTER_SIZE=n**, n can be 1, 2, 4, 8, 16, 32, or 64.

If you specify **/INITIALIZE**, the output disk will be initialized based on the attributes (pack ID, pack cluster size, etc.) of the input disk. The default is **/NOINITIALIZE**.

/[NO]LIST_FILE[=filespec]

Indicates whether to create a directory-like listing file that catalogs the sequence of **RESTORE** events and is a synonym for **/[NO]OUTPUT**. The default is **/LIST_FILE=KB:** or your terminal.

/OCCURRENCE=number

Specifies the occurrence of the named backup set used in the **RESTORE** process. The default is the first occurrence.

/[NO]OPTIMIZE

/OPTIMIZE=CLUSTER_SIZE

/OPTIMIZE=DIRECTORY

Indicates whether to optimize file cluster sizes, file directories, or both on the output disk. The default, **/OPTIMIZE**, performs both optimizations.

/OUT_LABEL=name

Specifies the name used for the pack ID of the output disk and provides a means to ensure that you are referencing the correct output disk. If the **/INITIALIZE** qualifier is not specified and the pack ID does not match the one found on the specified output disk, then **BACKUP** displays an error and rejects the command. If the **/INITIALIZE** qualifier is specified, then the output disk label will be set to the name specified with **/OUT_LABEL**.

/[NO]OUTPUT[=filespec]

Creates a directory-like listing file that catalogs the sequence of **RESTORE** events and is a synonym for **/[NO]LIST_FILE**. The default is **/OUTPUT=KB:** or your terminal.

/PLACED_POSITION=position

Specifies where **RESTORE** attempts to place files marked as placed at a specific location; position can be:

INDEX	Places the files near the storage allocation table.
MIDDLE	Places the files near the middle of the disk.
ORIGINAL	Places the files at the position on the source file.

The default is **/PLACED_POSITION=INDEX**.

/[NO]PROMPT

Indicates whether to prompt for the first volume name. The default is **/PROMPT**.

/[NO]QUERY

Indicates whether to prompt before restoring each file selected. Specifying **/QUERY** displays the name of each file selected and asks if you want to restore that file. Answer **Y** or **YES** to restore the file displayed, or **N** or **NO** to skip the file and continue with the next file. The default, **/NOQUERY**, restores each file selected without prompting.

You can also specify **/ALL** with the **YES** or **NO** reply to indicate that the reply applies to all remaining file transfers. This eliminates further queries. **YES/ALL** causes all remaining files to be restored and **NO/ALL** causes all remaining files to be skipped.

/[NO]REPLACE[=QUERY]

Indicates whether to replace an existing file on the destination device when a file being transferred has the same name. **/REPLACE** indicates that new files should replace existing files of the same name. **/NOREPLACE** indicates that existing files should not be replaced.

The default, **/REPLACE=QUERY**, indicates that **RESTORE** should prompt you before replace each existing file. Answer **Y** or **YES** to replace the current file. Answer **N** or **NO** to not replace the existing file and proceed with the next file.

You can also specify **/ALL** with the **YES** or **NO** reply to indicate that the reply applies to all remaining file replacements. This eliminates further queries. **YES/ALL** causes all remaining files to be replaced and **NO/ALL** causes all remaining files to be skipped.

/[NO]REWIND

Indicates whether to rewind a magnetic tape saveset volume before processing. The default is **/NOREWIND**.

/SELECT=(filespec-list)

Specifies the files you want to restore. The default is all files in the backup set.

/[NO]VERIFY[=ONLY]

Indicates whether to perform a comparison operation of all data transferred to the output disk. If you specify **/VERIFY**, then **RESTORE** performs a second pass through the input disk, comparing each account and file transferred with that on the output disk. **RESTORE** reports any differences found.

You can use **RESTORE/VERIFY=ONLY** to perform a verify operation without transferring any data. The default is **/NOVERIFY**.

RESTORE/DIRECTORY backup-set-spec

Lists files within a backup saveset.

Privilege required:

- Read access to the backup set file
- TUNE to use the /BUFFER_SIZE qualifier
- INSTAL to exceed system dynamic region limit

Command Qualifiers

/[NO]ASSIST

Indicates how to send media mount requests to an operator. By specifying /ASSIST, you can send the disk or tape media mount requests to an operator through the Operator/Message Services (OMS). The default, /NOASSIST, sends media mounts requests through your terminal.

/BRIEF

Displays a format similar to the DCL full directory (minus file attributes) and is the default qualifier. The default is /BRIEF.

/BUFFER_SIZE=n

Specifies the size in k-words of the RESTORE buffer in memory. Larger values may improve performance at the expense of greater system impact. The valid range for n is 3 to 255 or MAXIMUM. You can also specify OPTIMUM or 55. The default is the minimum usable size, except when using an MS- or MU-class tape drive in which case the default is 55.

/CREATED=date

/CREATED=(BEFORE=date:time,AFTER=date:time)

/MODIFIED=date

/MODIFIED=(BEFORE=date:time,AFTER=date:time)

Lists files created or modified on, before, after, or between the specified date:times. The date:time argument can be any valid DCL date and/or time.

/END={([NO]REWIND | [NO]DISMOUNT)}

Specifies whether to rewind the output tape drive or dismount the output disk following the successful completion of the RESTORE operation. The default for disks is /END=DISMOUNT. The default for tapes is /END=NOREWIND.

/EXCLUDE=(filespec-list)

Specifies one or more files that should not be listed.

/FULL

Displays detailed information for each file on multiple lines.

To display information for specific files use **/SELECT** or **/EXCLUDE** with **RESTORE/DIRECTORY**.

/INCLUDE=(filespec-list)

Specifies the files or accounts you want transferred to the saveset.

/IN_LABEL=name

Specifies the name you want compared to the source volume ID.

/[NO]LIST_FILE[=filespec]

Indicates whether to create a log file that catalogs the sequence of **RESTORE** events. The log contains information about the accounts and files transferred, and the disk volumes used. The default is **/LIST_FILE=KB:** or your terminal.

/OCCURRENCE=number

Specifies the occurrence of the named backup set used in the **RESTORE** process. The default is the first occurrence.

/[NO]OUTPUT[=filespec]

Creates a directory-like listing file that catalogs the sequence of **RESTORE** events and is a synonym for **/[NO]LIST_FILE**. The default is **/OUTPUT=KB:** or your terminal.

/[NO]PROMPT

Indicates whether to prompt for the first volume name. The default is **/PROMPT**.

/[NO]REWIND

Indicates whether to rewind a magnetic tape saveset volume before processing. The default is **/NOREWIND**.

/SELECT=(filespec-list)

Specifies the files you want to list. The default is all files in the backup set.

RETURN [status-code]

Returns control to the command following the calling GOSUB command. If you specify a status-code, DCL uses this value to set the \$STATUS and \$SEVERITY symbols that determine the exit status for this command. Status-code can be an expression.

Privilege required: none

RUN filespec

Executes a program or a command file.

Privilege required: Execute access to the program

SET ACCOUNT dev:[p,pn]

Modifies one or more account attributes.

Privilege required: GACNT or WACNT

Command Qualifiers

/[NO]CAPTIVE

Indicates whether the account is to be a captive account.

/DETACHED_JOB_QUOTA=detached-job-quota

Specifies the maximum number of jobs that can exist in a detached state for an account at one time. The valid range for detached-job-quota is 0 to 63 or UNLIMITED.

/[NO]DIALUP

Indicates whether to allow logins via a dialup facility.

/[NO]EXPIRE[=date]

Specifies the account expiration date. The account is marked as expired when you specify /EXPIRE. The account never expires when you specify /NOEXPIRE.

/IN_QUOTA=logged-in-quota

Specifies the number of disk blocks the system allows you to allocate while logged in. The valid range for logged-in-quota is 0 to 16777214 or UNLIMITED.

Privilege keyword	Specified privilege granted.
Privilege keyword with "NO" prefix	Specified privilege denied.

Modifications to privileges do not take affect until the next time you log in to the account. See Table 1-7 for a list of RSTS/E privilege keywords.

/RIB_QUOTA=rib-quota

Specifies the number of receiver ID blocks (RIBs) that a job running under this account can set up for itself as a message receiver. The valid range for n is from 0 to 256 or UNLIMITED.

/[NO]USER

Specifies the type of account. /USER specifies an account with login attributes and file storage capabilities. /NOUSER specifies an account with file storage capabilities only. The default is all accounts.

SET CACHE

Enables directory and data caching.

Privilege required: TUNE

Command Qualifiers

/ALL

Caches all data transfers.

/CLUSTERSIZE=n

Specifies the cache cluster size. The valid values for n are 1, 2, 4, or 8. The default is 4.

/DATA_MAXIMUM=n

Specifies the maximum number of cache clusters you want to use for data caching. The valid range for n is 0 to 65535 in addition to UNLIMITED.

/DIRECTORY_MAXIMUM=n

Specifies the maximum number of cache clusters you want to use for directory caching. The valid range for n is 0 to 65535 in addition to UNLIMITED.

/DISABLE

Disables data and directory caching. The default is **/ENABLE**.

/ENABLE

Enables data and directory caching, using previous settings as defaults.

/[NO]FILE

Indicates whether to allow file data caching. The default is **/FILE**.

/KEEP=n

Specifies the cache replacement time, in seconds, an unused cache cluster remains in memory before being used for another cache cluster. The valid range for n is 0 to 65535.

/MAXIMUM=n

Specifies the maximum number of data and directory cache clusters. The valid range for n is 0 to 65535 in addition to **UNLIMITED**.

SET CONTROL=C

Re-enables Ctrl/C checking within a command procedure. See also **SET NOCONTROL=C**.

Privilege required: none

SET DATA

Allows you to supply data to a program from within a command procedure. See also **SET NODATA**.

Privilege required: none

Command Qualifier

/END_OF_DATA="char"

Specifies an alternate prefix character to signal the end of data. The default is **/END_OF_DATA="\$"**.

SET DATE date[:time]

Sets the system date. You can specify any valid DCL relative or absolute date/time string. For additional information on entering dates and times, see the section, "Rules for Entering DCL Commands."

Privilege required: DATES

SET DEVICE dev[:]

Sets the characteristics of a device.

Privilege required:

- HWCTL and HWCFG to use the /DISABLE qualifier
- HWCFG to use /RESTRICT
- HWCTL to use /ENABLE
- HWCFG and DEVICE to use /NORESTRIC

Command Qualifiers

/DISABLE

Disables the specified device.

/ENABLE

Enables the specified device that you previously disabled.

/[NO]RESTRICT

Indicates whether to restrict allocating and opening the specified device only to users having DEVICE privilege.

SET ECHO

Re-enables terminal output during execution of a command procedure. See also SET NOECHO.

Privilege required: none

SET ENTRY {entry-spec | entry-number}

Modifies one or more entry attributes for an entry or entries on a queue. You can also use SET ENTRY to hold or release an entry.

Privilege required:

- None to change entries you own
- PBSCTL to use the /PRIORITY, HOLD, and /RELEASE qualifiers for any entry you do not own
- WACNT to use the /AFTER, /CPU_LIMIT, /FORMS, /HOLD, /JOB_COUNT, /PAGE_LIMIT, /PRIORITY, /RELEASE, and /TIME_LIMIT qualifiers for an entry not in your group
- GACNT to use the /AFTER, /CPU_LIMIT, /FORMS, /HOLD, /JOB_COUNT, /PAGE_LIMIT, /PRIORITY, /RELEASE, and /TIME_LIMIT qualifiers for an entry in your group

Command Qualifiers

[/NO]AFTER=date:time

Indicates an absolute or relative date:time value after which Print/Batch Services (PBS) processes the entry.

/BATCH

Selects only batch queue entries for modification.

/CPU_LIMIT=n

Specifies the maximum CPU time, in minutes, allowed for the batch job. The valid range for n is 1 to 65535 in addition to UNLIMITED. You cannot specify a value for n that exceeds the maximum CPU limit assigned to the queue.

/FORMS=form-name

Specifies the name of the form you want to use for this entry.

/HOLD

Places the entry in a hold state. To process the entry, you must release it by using the SET ENTRY/RELEASE command.

/JOB_COUNT=n

Specifies the number of job copies you want printed. The valid range for n is 1 to 255.

/PAGE_LIMIT=n

Specifies the maximum number of pages in the print job. The valid range for n is 1 to 4294967295 in addition to UNLIMITED. You cannot specify a value for n that exceeds the maximum page limit assigned to the queue.

/PRINT

Selects only print queue entries for modification.

/PRIORITY=n

Specifies the priority you want to assign to the request. The valid range for n is 1 to 255. You cannot specify a value for n that is higher than the maximum priority assigned to the queue.

/RELEASE

Releases the entry from its hold state so Print/Batch Services (PBS) can process it.

/TIME_LIMIT=n

Specifies the maximum elapsed time, in minutes, you want to allow for the requested batch job. The valid range for n is 1 to 65535 in addition to UNLIMITED. You cannot specify a value for n that exceeds the maximum time limit assigned to the associated queue.

SET FILE filespec

Sets the characteristics of a file.

Privilege required:

- Create/rename to use the /PROTECTION qualifier
- Write access to use the /NOCONTIGUOUS, /[NO]PLACED, and /RUNTIME_SYSTEM qualifiers
- SYSIO and Write access to use the /[NO]DELETABLE qualifier and to set the privilege bit <128> in the protection code for non-executable files (files with the executable bit <64> not set).
- TMPPRV and Write access to set the privilege bit <128> in the protection code for executable files (files with the executable bit <64> set).
- TUNE and Write access to use the /[NO]CACHE qualifier

Command Qualifiers

/[NO]BACKUP

Indicates whether to backup the contents of the file during a backup operation. When you specify **/NOBACKUP**, the file's attributes are included in the backup operation but the file's contents are not. The default is **/BACKUP**.

/[NO]CACHE[=RANDOM | SEQUENTIAL]

Indicates whether to cache data in an open file. The default is **/CACHE=RANDOM** if you specify **/CACHE** with no argument.

/NOCONTIGUOUS

Marks a contiguous file as noncontiguous, allowing extension of the file.

/[NO]DELETABLE

Indicates whether to mark a file for deletion and renaming.

/[NO]IGNORE

Indicates whether to ignore the file for all backup operations. The default is **/NOIGNORE**.

/[NO]LOG

Indicates whether to log the file specification of each modified file to your terminal. The default is **/NOLOG**.

/[NO]PLACED

Indicates whether to mark a file as being placed in its present position.

/PROTECTION=n

Specifies the protection code you want to assign to a file; the valid range for **n** is 0 to 255.

/RUNTIME_SYSTEM=name

Names the run-time system.

SET HOST [=] [_]node[:][_node:][...]

Allows you to log in to another computer from the system you first logged in to.

Privilege required: none

SET JOB [job-number]

Defines the characteristics of the current or specified job.

Privilege required: TUNE to use all qualifiers except /KEYBOARD_MONITOR and /PRIVILEGES

Command Qualifiers

/HOLD

Sets the job priority to -128, preventing further execution.

/KEYBOARD_MONITOR[=name]

Changes your keyboard monitor.

/PRIORITY[=n]

Specifies the priority for a job. The valid range for n is -128 to 120, in multiples of 8. If you do not specify n, the default is -8.

/PRIVILEGES=(priv[,...])

Modifies the set of your current job privileges. Priv can be:

ALL	All privileges granted.
NONE	All privileges denied.
Privilege keyword	Specified privilege granted.
Privilege keyword with "NO" prefix	Specified privilege denied.

See Table 1–7 for a list of RSTS/E privilege keywords.

/RELEASE

Sets the job priority to the default priority, allowing the job to continue execution.

/RUN_BURST[=n]

Specifies the job run burst. The valid range for n is 1 to 127. If you do not specify n, the default is 6.

/SIZE=n

Specifies the maximum job size. The valid range for n is 1 to 255.

SET LOG_FILE

Selectively enables or disables output to a log file that you previously opened using the OPEN/LOG_FILE command.

Privilege required: none

Command Qualifiers

/DISABLE

Disables logging of terminal and command file output.

/ENABLE

Enables logging of terminal and command file output to the log file.

/[NO]TIME_STAMP

Indicates whether to prefix each line in the log file with a date/time stamp.

SET NOCONTROL=C

Disables Ctrl/C checking within a command procedure. See also SET CONTROL=C.

Privilege required: none

SET NODATA

Tells DCL to read all data required by a program or a command from the user's terminal, instead of a command file. See also SET DATA.

Privilege required: none

SET NODE/LAT

Initially sets or changes the LAT host node characteristics.

Privilege required: SWCFG

Command Qualifiers

/ACCESS={LOCAL | DIALUP}

Specifies whether connections on the terminal server should be treated as LOCAL or DIALUP. This qualifier only determines the access type for terminal servers that do not supply an access type. If a terminal server includes an access type, RSTS/E will ignore any /ACCESS setting and use the server's access type instead.

CAUTION

Setting the access type to LOCAL for a terminal server that provides access to the system through dialup lines could compromise security.

/DISABLE={(group-code[,...]) | ALL}

Removes the specified group codes from the list of group codes associated with the LAT host node. The group list can include multiple codes separated by commas. For example, /DISABLE=(0,1,4,10) disables group codes 0, 1, 4, and 10. The keyword ALL can be specified to indicate codes 0-255. The /DISABLE qualifier may be specified only once on a command line. No error is returned if a specified group code is not enabled.

/ENABLE={(group-code[,...]) | ALL}

Adds the specified group codes to the list of group codes associated with the LAT host node. The group list can include multiple codes separated by commas. For example, /ENABLE=(5,6,8,10) enables group codes 5, 6, 8, and 10. The keyword ALL can be specified to indicate codes 0-255. The /ENABLE qualifier may be specified only once on a command line. No error is returned if a specified group code is already enabled.

/IDENTIFICATION="node-id"

Specifies a description for the LAT host node. This description can be used as an announcement string or to further identify the node. It may be up to 64 characters in length.

/[NO]LOG

Indicates whether to display a confirmation message for the requested action. The default is /NOLOG.

/MULTICAST_TIMER=seconds

Specifies the interval, in seconds, between the multicast messages sent for service announcements. The minimum value is 10 seconds, the maximum value is 255 seconds. The default when the first SET NODE/LAT command is issued is 60 seconds. The following is an example of this command:

```
$ SET NODE RSTS /MULTICAST_TIMER=50
```

SET NOECHO

Disables terminal output during execution of a command procedure. See also SET ECHO.

Privilege required: none

Command Qualifier

/[NO]WARNINGS

Indicates whether to display warning and error messages on your terminal. The default is /WARNINGS.

SET NOON

Overrides default error checking within a command procedure. See also SET ON.

Privilege required: none

SET NOVERIFY

Informs DCL not to display lines in a command procedure as it executes them. See also SET VERIFY.

Privilege required: none

SET ON

Controls whether DCL performs error checking following the execution of commands in a command procedure. See also SET NOON.

Privilege required: none

SET OPERATOR_SERVICES

Modifies the type of requests stored in the operator services work file.

Privilege required: OPER

Command Qualifier

`/[NO]KEEP=(keyword[,...])`

Specifies the type of requests that will be kept in the operator services work file. Valid keywords are ALL, [NO]MESSAGES, [NO]REQUESTS, and NONE. The /NOKEEP qualifier is a synonym for /KEEP=NONE.

SET PASSWORD [dev:[p,pn]]

Specifies the password for an account. Passwords for lookup accounts must be 6 characters long; passwords for NOLOOKUP accounts can be 6 to 13 characters long.

Privilege required:

- GACNT or WACNT to specify a password for other accounts, or for the system password
- SETPAS to specify a password for your own account

Command Qualifiers

`/[NO]LOG`

Indicates whether to display a message on your terminal confirming the password change. The default is /LOG.

`/SYSTEM`

The specified password replaces the current system password.

SET PORT port-name[:]

Changes the current characteristics of a local LAT port that was created by the CREATE/PORT command on a RSTS/E node. Note that the server name cannot be changed by the SET PORT command; to assign the local LAT port to a different terminal server, use the ASSIGN/PORT command.

The port-name parameter specifies the name of the local port. The port-name must be in the form of KBI*n*: or KB*n*:, where *n* is a value from 0 through 127.

Privilege required: SWCFG

Command Qualifiers

/LAT

Sets the characteristics of a LAT port. The default is /LAT.

/[NO]LOG

Indicates whether to display a confirmation message after the port is set. The default is /LOG.

/[NO]QUEUED

Indicates whether the connection to a terminal server will be placed on the server's queue if the server supports queuing and the remote port is currently busy. If /NOQUEUED is specified and the remote port is busy, the connection will not be queued and it will fail.

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

/[NO]REMOTE_PORT[=*remote-port-name*]

Specifies the name of a remote port on the terminal server to which the local port is to be connected. The remote port name can be up to 16 alphanumeric characters in length.

If /NOREMOTE_PORT is specified, the local port is deassigned from the current remote port. If you use this qualifier, you must select a service using the /SERVICE qualifier.

/[NO]SERVICE[=service-name]

Specifies the name of a remote service offered at the terminal server to which the local LAT port is to be connected. The service name can be up to 16 alphanumeric characters in length.

If **/NOSERVICE** is specified, the local port is deassigned from the current remote service. If you use this qualifier, you must select a remote port using the **/REMOTE_PORT** qualifier.

SET PRINTER dev[:]

Changes the characteristics of the specified line printer.

Privilege required: **HWCFG**

Command Qualifiers

/BACKSPACE[=mode]

Determines how the system handles backspace characters. Possible modes are:

CONTROL	Handled like other nonprinting characters
REAL	System sends backspaces
SIMULATE	System sends a Carriage Return and the required number of spaces

The default is **/BACKSPACE=REAL**.

/[NO]CONTROLS

Determines what the system sends the printer when processing nonprinting characters. When you specify **/CONTROLS**, the system sends untranslated characters to the printer. When you specify **/NOCONTROLS**, the system discards nonprinting characters or uses the up arrow (^) mode.

/[NO]CR_PREFIX

Indicates whether to insert a Carriage Return before **LF**, **VT**, and **FF** characters.

/DEVICE_TYPE=type

Specifies the characteristics of the line printer. Valid types are **LN01**, **LP11**, and **LA180**.

/[NO]EIGHT_BIT

Indicates whether to send 8-bit characters to the printer.

/[NO]EOT

Determines how the system handles the end-of-transmission (EOT) character (^D). When you specify /EOT, the system sends the EOT character to the printer without translation. When you specify /NOEOT, the system handles EOT as a nonprinting character.

/[NO]FILL

Indicates whether to insert fill characters after FF characters.

/LOWERCASE

Sends untranslated lowercase characters to the printer.

/[NO]OMIT_CR

Indicates whether to send a Carriage Return to the printer if the next character is a LF character.

/PAGE_LENGTH=n

Specifies the printer default page length; the valid range for n is 1 to 255.

/[NO]SPECIAL_CHARACTER[=char]

Determines whether the printer prints its special character. When you specify char, the printer substitutes its special character for each occurrence. You can specify char by using its binary value (0 to 255) or by enclosing char in quotation marks, providing char is a printable character.

/[NO]TAB

Indicates whether to send tab characters to the printer instead of spaces.

/UPPERCASE

Converts lowercase characters to uppercase characters before sending them to the printer.

/WIDTH=n

Specifies the width of the printer; the valid range for n is 1 to 254.

SET PROMPT [prompt]

Allows you to change your prompt text. The prompt can be an expression or a quoted string. The maximum length allowed is 255 characters.

Privilege required: none

Command Qualifier

/LOG_FILE

Enables the specified prompt only while logging your terminal session.

SET PROTECTION[=*n*] filespec[,...]

Specifies the protection code of a file.

Privilege required:

- Create/Rename access to the file you specify
- SYSIO and Write access to set the privilege bit <128> in the protection code for non-executable files (files with the executable bit <64> not set).
- TMPPRV and Write access to set the privilege bit <128> in the protection code for executable files (files with the executable bit <64> set).

Command Qualifiers

/BEFORE=date

/CREATED

/MODIFIED

/SINCE=date

Sets the protection of files created or modified before or since the specified date.

/[NO]CONFIRM

Indicates whether to prompt you before changing a file protection code and is a synonym for **/[NO]QUERY**. The default is **/NOCONFIRM**.

/DEFAULT

Specifies the protection code to assign to every file you create until you log out. Do not include a file specification when you use this qualifier.

/[NO]LOG

Indicates whether to display a confirming message for each file whose protection code you change. The default is **/LOG**.

/[NO]QUERY

Indicates whether to prompt you before changing a file protection code. The default is **/NOQUERY**.

/SELECT $\left\{ \begin{array}{l} =\text{SIZE}=\text{n} \\ =\text{SIZE}=\text{MINIMUM}=\text{n} \\ =\text{SIZE}=\text{MAXIMUM}=\text{n} \\ =\text{SIZE}=(\text{MINIMUM}=\text{m},\text{MAXIMUM}=\text{n}) \end{array} \right\}$

Selects files based on their size. The specified size can be:

n	Selects only those files with size equal to n .
MINIMUM=n	Selects only those files with size greater than or equal to n .
MAXIMUM=n	Selects only those files with size less than or equal to n .
MINIMUM=m,MAXIMUM=n	Selects only those files with size between m and n inclusive.

SET QUEUE queue-name[:]

Modifies one or more queue characteristics. When you change a queue characteristic, the change does not affect entries already in the queue; however, the change affects all later entries.

Privilege required: **PBSCTL**

Command Qualifiers

/ALL

Modifies all queues.

/BATCH

Modifies only batch queues.

/CPU_LIMIT=(MAXIMUM=a,DEFAULT=b)

/CPU_LIMIT=n

Specifies the maximum and/or default CPU time limits (in minutes) you can specify when submitting a job to the queue. If you use the **/CPU_**

LIMIT=n form, n specifies both the maximum and default limits. The valid range for a, b, and n is 1 to 65535 in addition to UNLIMITED.

/[NO]DEFAULT

Indicates whether to establish the specified queue as the default queue.

/FORMS=form-name

Specifies the name of the default forms for the print queue.

/PAGE_LIMIT=(MAXIMUM=a,DEFAULT=b)

/PAGE_LIMIT=n

Specifies the maximum and/or default page limits a user can specify when submitting a job to the queue. If you use the /PAGE_LIMIT=n form, n specifies both the maximum and default limits. The valid range for a, b, and n is 1 to 4294967295 in addition to UNLIMITED.

/PRINT

Modifies only print queues.

/PRIORITY=(MAXIMUM=a,DEFAULT=b)

/PRIORITY=n

Specifies the maximum and/or default priorities a user can specify when submitting a job to the queue. If you use the /PRIORITY=n form, n specifies both the maximum and default limits. The valid range for a, b, and n is 1 to 255.

/PRIVILEGES=(priv[,...])

Specifies the set of privileges a user must have to enter jobs in queue.

Priv can be:

ALL	All privileges granted
NONE	All privileges denied
Privilege keyword	Specified privilege granted
Privilege keyword with "NO" prefix	Specified privilege denied

See Table 1-7 for a list of RSTS/E privilege keywords.

/TIME_LIMIT=(MAXIMUM=a,DEFAULT=b)

/TIME_LIMIT=n

Specifies the maximum and/or default elapsed time limits (in minutes) you can specify when submitting a job to the queue. If you use the /TIME_LIMIT=n form, n specifies both the maximum and default limits. The valid range for a, b, and n is 1 to 65535 in addition to UNLIMITED.

SET SERVER server-name[:]

Changes one or more characteristics for print and/or batch servers. For example, changing forms for print servers.

Privilege required:

- PBSCTL
- TUNE to specify the /PRIORITY or /RUN_BURST qualifiers

Command Qualifiers

/ALL

Modifies all servers.

/BATCH

Modifies only batch servers.

/[NO]CONTROLS[=UP_ARROW]

Indicates how print servers handle control characters and escape sequences. If you do not specify this qualifier, then the current **CONTROLS** setting is not changed.

/FORMS=form-name

Specifies the name of the forms Print/Batch Services (PBS) installs for the specified print server. If you do not specify this qualifier, then the server's current form is not changed.

/PRINT

Modifies only print servers.

/PRIORITY[=n]

Indicates the priority at which PBS runs command procedures controlled by the specified batch server. The valid range for *n* is -120 to 120. PBS rounds *n* to the nearest multiple of 8. If *n* is not specified, the default is -8. If you do not specify this qualifier, then the batch server's priority is not changed.

/RUN_BURST[=n]

Indicates the run burst PBS assigns to any command procedures controlled by this batch server. The valid range for *n* is 1 to 127. If *n* is not specified, the default is 6. If you do not specify this qualifier, then the batch server's run burst is not changed.

/[NO]SHAREABLE

Indicates whether to allow other jobs to share the printer. If you do not specify this qualifier, then the [NO]SHAREABLE characteristic is not changed.

SET SERVICE/LAT service-name

Modifies the information associated with a particular service being offered by the node.

Privilege required: SWCFG

Command Qualifiers

/IDENTIFICATION="service-id"

Modifies the description for the service. This description is used to further identify the service being offered. It may be up to 64 characters in length.

/[NO]LOG

Indicates whether to display a confirmation message for the requested action. The default is /LOG.

/STATIC_RATING=rating

Specifies the static rating associated with the service. This rating directs terminal server users away from or toward a particular node. The range of values is 0 to 255. A value of 255 is highly available to users while a value of 0 is not available to users. The default static rating is 255.

SET SYSTEM

Sets the system default characteristics.

Privilege required:

- SWCFG to use the /DATE_FORMAT, /DYNAMIC_REGION_LIMIT, /[NO]FMS, /HANGUP, /LABEL, /[NO]LAT, /NAME, /POWERFAIL_DELAY, /PSEUDO_KEYBOARD, and /TIME_FORMAT qualifiers
- HWCTL to use the /HOLD and /RELEASE qualifiers
- HWCFG to use the /DENSITY qualifier

- SWCTL to use the /ANSWERBACK, /EMT_LOGGING, /[NO]LOGINS, and /[NO]STATISTICS qualifiers
- SYSIO to use the /MONITOR_NAME qualifier
- TUNE to use the /SWAP_MAXIMUM qualifier
- WACNT to use the /[NO]PASSWORD_PROMPT qualifier

Command Qualifiers

/[NO]ANSWERBACK="text"

Indicates whether to define a systemwide response for electronic messaging systems.

/DATE_FORMAT={ALPHABETIC | NUMERIC}

Specifies the system date format. The alphabetic format is dd-mmm-yy. The numeric format is yy.mm.dd.

/DENSITY=default

Specifies the magnetic tape default density; default can be in the range 2 to 32766. Currently available densities are 800, 1600, 6250, 6667, 8000, and 10000 bpi. You can also specify MINIMUM, or MAXIMUM.

The default density you specify applies to all tape drives on the system.

If you specify a default density that the tape drive does not support, the system selects the next higher density the tape drive supports.

If you specify a default density that is higher than the highest density the tape drive supports, the system selects the tape drive's maximum density.

If you do not specify a system default density, the default is 1600 bpi.

/DYNAMIC_REGION_LIMIT=n

Sets the limit for the total size of all dynamic regions and FORTRAN virtual arrays that users can create without the **INSTAL** privilege. Any user having the **INSTAL** privilege can override this systemwide limit. This limit is also used by **BACKUP** when user does not have **INSTAL** privilege.

/EMT_LOGGING=(emt[,...])

Enables or disables **EMT** logging for the specified **EMT(s)**, where "emt" is a valid **EMT** mnemonic, such as **CRE**. See *System Directives Manual* for a list of valid **EMT** mnemonics.

/[NO]FMS

Indicates whether the FMS software is to be loaded upon system reboot. After issuing the SET SYSTEM command, you must shutdown the system and restart before FMS is available for use.

/HANGUP={DELAYED | IMMEDIATE}

Specifies when dial-up lines are placed in an on-hook state when carrier is lost. The default is DELAYED, which means the system waits approximately five seconds before hanging up a dialup line. Setting IMMEDIATE means the system hangs up a dialup line as soon as the carrier is dropped.

/HOLD

Suspends all currently active jobs except the one issuing the command.

/LABEL={ANSI | DOS}

Specifies the tape default label.

/[NO]LAT

Indicates whether the LAT software is to be loaded upon system reboot. The system must be shut down and restarted after issuing the SET SYSTEM command before that state of LAT will change.

/[NO]LOG

Used in conjunction with the /EMT_LOGGING qualifier, indicates whether to display the status of each EMT specified. The default is /LOG.

/[NO]LOGINS[=n]

Indicates whether to allow additional logins and specifies the maximum number of logged-in users on the system. The minimum abbreviation for this qualifier is four characters. The default is job maximum.

/MONITOR_NAME=name

Sets the monitor file name that is started the next time the system is rebooted.

/NAME="installation-name"

Assigns "installation-name" to the system name. The maximum length is 15 characters.

/[NO]PASSWORD_PROMPT[=(type[,...])]

Indicates whether to enable password prompting and specifies the types of users, if any, who must type the system password when logging in. Type can be DIALUP and NETWORK.

/POWERFAIL_DELAY=n

Specifies the power fail delay. The valid range for n is 1 to 300.

/PSEUDO_KEYBOARDS=n

Specifies the maximum number of static pseudo-keyboards which will be available on the system. The minimum value allowed is 1, the maximum is 127. The parameter change will take effect upon system reboot. The default is **/PSEUDO_KEYBOARDS=4**.

/RELEASE

Resumes execution of all suspended (**/HOLD**) jobs.

[/NO]STATISTICS[=RESET]

Turns the monitor statistics on and off. Note that this qualifier takes effect immediately, and is not stored between system reboots. The **RESET** parameter will reset the statistics counters to 0. The system starts with statistics turned off. Once statistics have been turned on, the **SET SYSTEM/NOSTATISTICS** command will cause the statistics to be frozen. The **SET SYSTEM/STATISTICS** command will unfreeze them. The default is **/NOSTATISTICS**.

/SWAP_MAXIMUM=n

Sets the value that will be in effect the next time the system is rebooted. The minimum value is 34K and the maximum is 66K.

/TIME_FORMAT={AM_PM | 24_HOUR}

Specifies the system time format.

SET TERMINAL [KB[c]n[:]]

Allows you to specify the characteristics of a terminal.

Privilege required: **HWCFG** to set the characteristics of terminals of others or to use the **/BUFFER_QUOTA** and **/PERMANENT** qualifiers

Command Qualifiers

[/NO]132_COLUMNS

Indicates whether to enable the terminal to display single-width characters in an array of 24 lines by 132 columns.

/[NO]ADVANCED_VIDEO

Indicates whether the terminal supports the Advanced Video Option (AVO) package that includes character attributes, added screen memory and ROM sockets.

/[NO]ALT_MODE

If you specify **/ALT_MODE**, the system treats ASCII 027, 125, and, 126 as **ESCAPE**; otherwise, the system treats only ASCII 027 as **ESCAPE**.

/[NO]ANSI

Indicates whether the terminal supports ANSI escape sequences.

/[NO]ANSWERBACK/PERMANENT

Indicates whether to enable reception of electronic messages on a given terminal line. You can use the terminal for normal logins as well.

/ANSWERBACK is not valid if terminal is set **/AUTOBAUD**.

/[NO]AUTOBAUD/PERMANENT

Indicates whether the system automatically monitors the terminal line to detect and set the terminal baud rates. **/AUTOBAUD** is not valid if terminal is set **/ANSWERBACK**.

/[NO]BREAK

Indicates whether to translate the **BREAK** key as a **Ctrl/C** character (Binary 3) instead of **NULL** character (Binary 0).

/[NO]BROADCAST

Indicates whether to enable the system broadcast capability for the terminal.

/BUFFER_QUOTA=n

Specifies the number of input characters the system buffers before instructing the terminal to stop transmitting. The valid range for **n** is 168 to 7140, rounded to the nearest multiple of 28. The default is **/BUFFER_QUOTA=168**.

/[NO]CONTROL[=(option[,...])]

Indicates how the terminal handles Control key combinations. Options can be:

- R** Indicates whether to enable the **Ctrl/R** retype facility
- T** Indicates whether to enable the **Ctrl/T** job status display facility
- C** Indicates whether to enable **Ctrl/C** trapping
- X** Indicates whether to enable the **Ctrl/X** clear type-ahead facility

/[NO]CRFILL[=n]

Indicates whether to enable carriage return filling and specifies the fill factor. The valid range for n is 0 to 6.

/[NO]DELIMITER[=c]

Specifies a private delimiter or removes a previously specified delimiter. The delimiter (c) can be:

A quoted character

The character is the delimiter

1 to 127

The character whose binary value is the specified number is the delimiter

/DEVICE_TYPE=terminal-type

Associates the default characteristics with the specified terminal type.

/[NO]DIALUP/PERMANENT

Indicates whether to enable modem control for the specified terminal.

/[NO]EIGHT_BIT

Indicates whether to allow support of 8-bit characters.

/[NO]ESCAPE_SEQUENCE

If you specify **/ESCAPE_SEQUENCE**, the system treats an ESC character as an indication of an incoming escape sequence; otherwise, the system treats an ESC character as a line terminator.

/[NO]FORM_FEED

Indicates whether to enable hardware form feed and vertical tab control.

/HARDCOPY

Specifies that the terminal is not a CRT display.

/[NO]HOST_SYNC

Indicates whether the terminal has special hardware that allows the host computer to send XON and XOFF characters. **/HOSTSYNC** is not valid if the terminal is set **/RESUME=ANY**.

/INQUIRE

Interrogates the terminal by sending an ANSI ESCAPE identifying sequence, determines the terminal type, and sets the appropriate terminal characteristics.

`/[NO]INSERT`

`/[NO]OVERSTRIKE`

Allows you to insert characters (INSERT MODE) when editing a command line or type over the current character (OVERSTRIKE MODE). This mode becomes the default whenever a new command is entered. The default is `/OVERSTRIKE`.

`/[NO]INTERACTIVE/PERMANENT`

Indicates whether the terminal is to be used interactively. If you specify `/NOINTERACTIVE`, the system ignores all input from the terminal but the terminal still displays system output.

`/[NO]KATAKANA`

Indicates whether the terminal supports the Katakana character set.

`/[NO]LINE_EDITING`

Indicates whether to enable line editing capabilities on the terminal. This qualifier is valid only at the application level; it is ignored at the DCL level or at other run-time systems levels.

`/[NO]LOADABLE_CHARACTERS`

Indicates whether the terminal supports dynamically redefinable character sets.

`/[NO]LOCAL_ECHO`

Indicates whether to disable echoing of characters received from the terminal.

`/LOWERCASE[=INPUT,OUTPUT]`

Enables use of lowercase character for terminal INPUT and/or OUTPUT.

`/[NO]OPERATOR_SERVICES[=(keyword[,...])]`

Indicates whether to enable the terminal as an operator services console. The keyword argument specifies the type of requests that will be broadcast to the specified terminal. Valid keywords are ALL, `[NO]MESSAGES`, `[NO]REQUESTS`, and NONE. `/NOOPERATOR_SERVICES` is a synonym for `/OPERATOR_SERVICES=NONE`. This qualifier requires the OPER privilege.

`/[NO]PARITY[=option]`

Indicates whether to enable parity bit checking and specify if parity checking is ODD or EVEN.

/[NO]PERMANENT

Indicates whether to modify the terminal's permanent characteristics instead of the terminal's current characteristics.

/[NO]PRINTER_PORT

Indicates whether the terminal has a printer port.

/[NO]RECALL

Indicates whether to enable command recall capabilities on the terminal. This qualifier is valid only at the application level; it is ignored at the DCL level or in other run-time systems.

/[NO]REGIS

Indicates whether the terminal supports the Remote Graphic Instruction Set (ReGIS).

/RESET

Resets the terminal characteristics to its permanent characteristics.

/[NO]RESTRICT/PERMANENT

Indicates whether to restrict terminal access to only those users having DEVICE privilege instead of allowing access by all users.

/RESUME={ANY | CONTROL_C}

Defines the XON/XOFF processing. The ANY argument enables typeout and echo when any character is typed after XOFF. /RESUME=ANY is not valid when the terminal is set /HOST_SYNC. The argument CONTROL_C enables typeout and echo only when XON or Ctrl/C are typed after XOFF.

/SCOPE

Specifies the terminal is a CRT display.

/[NO]SELECT_ERASE

Indicates whether the terminal supports the selectively erasable character attribute.

/SETUP=filespec

Specifies a file used to initialize the terminal.

/[NO]SIXEL

Indicates whether the terminal supports Sixel Graphics.

/SPEED=(input[,output])

/SPEED=n

Specifies the speed at which the terminal sends (output) and receives (input) data. If you use the **/SPEED=n** form, **n** specifies both the input and output values.

/[NO]TAB

Indicates whether to enable hardware tab control.

/[NO]TTSYNC

Indicates whether to inform the host computer to ignore XON and XOFF characters sent by the terminal.

/TYPE=n

Specifies the terminal's type code. The valid range for **n** is 0 to 255, with 0 to 128 reserved for DIGITAL's use.

/[NO]UP_ARROW

Indicates whether to inform the system to echo a control and graphic character combination as the circumflex (^) character (value 94) followed by the proper graphic instead of the control and graphic character combination as is.

/UPPERCASE[=INPUT,OUTPUT]

Disables use of lowercase character for terminal INPUT and/or OUTPUT.

/[NO]USER_DEFINED_KEYS

Indicates whether the terminal supports user-defined keys.

/WIDTH=n

Specifies the terminal print line width. The valid range for **n** is 1 to 254.

SET TIME [date:]time

Sets the system time. You can specify any valid DCL relative or absolute date/time string. For additional information on entering dates and times, see the section, "Rules for Entering DCL Commands."

Privilege required: DATES

SET VERIFY

Informs DCL to display lines in a command procedure as it executes them. See also SET NOVERIFY.

Privilege required: none

Command Qualifier

/[NO]DEBUG

Indicates whether to enable command debugging. The default is /NODEBUG.

SHOW ACCOUNT [dev:[p,pn]]

Displays information about one or more accounts.

Privilege required: GACNT or WACNT to display data for accounts other than your own or to reset the accounting data

Command Qualifiers

/ACCOUNTING_DATA

Displays the PPN, account name, allocation, kilo-core-ticks, CPU-time, connect time, and device usage time.

/ALL

Displays information about all accounts on the disk. If you specify an account and this qualifier, the command displays information about the specified account only.

/BRIEF

Displays the PPN, account name, allocation, account attribute flags, last login time, and expiration date. The default is /BRIEF.

/FULL

Displays complete information about the account including the User File Directory (UFD) Size and UFD Used fields. The default is /BRIEF.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify /NOOUTPUT, the information is suppressed and not displayed. If the optional filespec argument is omitted, the output displays on the terminal.

/[NO]RESET

Resets the accounting data after displaying the account information.
The default is /NORESET.

/[NO]USER

Indicates whether to include only those accounts that have login attributes instead of those accounts that do not have login attributes.
The default is all accounts.

SHOW BUFFERS

Displays information about buffer usage on your system.

Privilege required: none

Command Qualifier

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify /NOOUTPUT, the information is suppressed and not displayed. If the optional filespec argument is omitted, the output displays on the terminal.

SHOW CACHE

Displays the current cache settings.

Privilege required: none

Command Qualifier

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify /NOOUTPUT, the information is suppressed and not displayed. If the optional filespec argument is omitted, the output displays on the terminal.

SHOW COMMAND/SYSTEM [command-name]

Displays information about a Concise Command Language (CCL) or systemwide command.

Privilege required: INSTAL

Command Qualifier

/ALL

Displays information about all systemwide commands.

[/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

SHOW COUNTERS/LAT [server-name]

Displays information about counters that is relevant to managing LAT on the host node. There are three types of counter information: LAT host node counters, Terminal Server counters, and Ethernet portal counters. These are displayed using the **/NODE**, **/TERMINAL_SERVER**, or **/DEVICE** qualifiers. Only one of these qualifiers may appear on the command line.

Privilege required: **SWCTL** to use the **/ZERO** qualifier.

Command Qualifiers

/DEVICE

Displays information about counters for all Ethernet portals open for LAT service.

/NODE

Displays information about counters for the LAT host node. **/NODE** is the default if neither **/DEVICE** nor **/TERMINAL_SERVER** is specified.

[/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

/TERMINAL_SERVER

Displays information for counters for the terminal server(s) known to the LAT host node. If a server name parameter is specified, only the counters for that server are displayed. If no parameter is specified, then counters for all servers known to the LAT host node are displayed.

/ZERO

Zeroes the counters after they are displayed. This qualifier acts only on the counters that are being displayed.

SHOW DATE

Displays the current date and time. You can use the `OPEN/LOG_FILE` command to create a log file to save the output.

Privilege required: none

SHOW DAYTIME

Displays the current date and time. You can use the `OPEN/LOG_FILE` command to create a log file to save the output.

Privilege required: none

SHOW DEVICE [dev[:]]

Displays information about one or more devices.

Privilege required: none

Command Qualifier

/ALL

Displays information about all devices on the system.

/ALLOCATED

Displays information about all devices that are currently open or allocated.

[/NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify `/NOOUTPUT`, the information is suppressed and not displayed. If the optional `filespec` argument is omitted, the output displays on the terminal.

SHOW DEVICE/ALLOCATED

Displays information about devices currently opened or allocated by jobs on the system.

Privilege required: none

Command Qualifier

`/[NO]OUTPUT[=filespec]`

Writes the information to the specified file. If you specify `/NOOUTPUT`, the information is suppressed and not displayed. If the optional `filespec` argument is omitted, the output displays on the terminal.

SHOW DISKS

Displays the status of disks currently mounted or open on your system.

Privilege required: none

Command Qualifier

`/[NO]OUTPUT[=filespec]`

Writes the information to the specified file. If you specify `/NOOUTPUT`, the information is suppressed and not displayed. If the optional `filespec` argument is omitted, the output displays on the terminal.

SHOW ENTRY [`entry-spec` | `entry-number`]

Displays information about one or more print or batch entries.

Privilege required: `WREAD` for entries you do not own

Command Qualifiers

`/ALL`

Displays the status of all entries. This is equivalent to an `entry-spec` of `*:[*,*]*`.

`/BATCH`

Displays the status of batch queue entries only.

/BRIEF

Displays with column headings the position, type, number, queue name, owner account number, entry name, entry form name, and status using a one-entry-per-line format. The default is /BRIEF.

/BY_JOB_STATUS[=(keyword[,...])]

Displays all of the entries in PRINT or BATCH queues with the specified status that are currently being processed or waiting to be processed. /BY_JOB_STATUS is supported for VMS compatibility and is a synonym for /STATUS. Keyword represents the status of entries to be displayed; keyword can be:

TIME_RELEASE	Displays entries with the status AFTER; indicates they are waiting for their specified after date-time to elapse.
HOLDING	Displays entries with the status HOLD; indicates they cannot start until they are taken off HOLD status via the SET ENTRY/RELEASE command.
PENDING	Displays entries with the status READY; indicates they are waiting for a print or batch server to become available for processing.
EXECUTING	Displays entries with the status STARTED; indicates they are currently being processed by a print or batch server.

/FILES

Displays all filespecs and their qualifiers for the entry.

/FULL

Displays the position, type, number, queue name, owner account number, entry name, and status, priority, date/time of submission, date/time of modification, date/time entry started, the after date/time, the server name, and whether or not the PRINT or SUBMIT command included the /NOTIFY qualifier. The default is /BRIEF.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify /NOOUTPUT, the information is suppressed and not displayed. If the optional filespec argument is omitted, the output displays on the terminal.

/PRINT

Displays the status of print queue entries only.

/STATUS[=(keyword[,...])]

Displays all of the entries in PRINT or BATCH queues with the specified status that are currently being processed or waiting to be processed. Keyword represents the status of entries to be displayed; keyword can be:

AFTER	Indicates entries that are waiting for their specified after date-time to elapse.
ABORTING	Indicates entries that have started but are being terminated.
FORMS_WAIT	Indicates print entries that are waiting for their required form to be installed on an assigned print server.
HOLD	Indicates entries that are on hold until the SET ENTRY/RELEASE command is issued.
READY	Indicates entries that are waiting for a print or batch server to become available for processing.
STARTED	Indicates entries that are currently being processed by a print or batch server.

SHOW FILES/OPEN [disk-name[:]]

Displays the status of files open on the system or the specified disk.

Privilege required: WREAD

Command Qualifiers

/JOB[=n]

Displays the job numbers of the jobs that have open files. Specifying a job number limits the display to files opened by that job.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify /NOOUTPUT, the information is suppressed and not displayed. If the optional filespec argument is omitted, the output displays on the terminal.

SHOW FILE/SYSTEM

Displays information about one or more system files.

Privilege required: none

Command Qualifiers

/ALL

Displays information about all system files.

/ERROR_FILE

Displays information about the system error file.

/NETWORK_FILE

Displays information about the network database file.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

/OVERLAY_FILE

Displays information about the overlay file.

/SWAP_FILE[=n]

Displays information about the specified swap file. The value of **n** can be 0, 1, or 3. The default is all swap files.

SHOW JOB [job-number]

Displays information about the status of jobs on the system.

Privilege required: **TUNE** to display a job's priority and run burst

Command Qualifiers

/ALL

Displays status of all jobs.

/ATTACHED

Displays status of attached jobs only.

/DETACHED

Displays status of detached jobs only.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

/TERMINAL=KB[c]n[:]

Displays the status of the job attached to the specified keyboard.

SHOW JOB/PRIVILEGE [job-number]

Displays the set of current privileges for your job or another job.

Privilege required:

- None to display privileges for a job you own
- JOBCTL to display privileges for a job not your own

Command Qualifiers

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

SHOW LIBRARY

Displays the status of resident libraries currently installed on your system.

Privilege required: none

Command Qualifier

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

SHOW LOGICALS [logical-name]

Displays all the currently assigned systemwide and user-defined logical names. You can include wildcards when specifying a logical name.

Privilege required: none

Command Qualifier

/ALL

Displays information about all systemwide and user-defined logical names. /ALL is the default.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify /NOOUTPUT, the information is suppressed and not displayed. If the optional filespec argument is omitted, the output displays on the terminal.

/SYSTEM

Displays all systemwide logical names.

/USER

Displays your currently assigned logical names.

SHOW MEMORY

Displays the current memory configuration of your system.

Privilege required: none

Command Qualifier

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify /NOOUTPUT, the information is suppressed and not displayed. If the optional filespec argument is omitted, the output displays on the terminal.

SHOW NETWORK

Displays the systems you can connect to over the network. If the network is operational, RSTS/E displays the names of the nodes that your system can access. You can use the OPEN/LOG_FILE command create a log file to save the output.

Privilege required: none

SHOW NODE/LAT

Displays information about the current LAT host node characteristics. The information displayed includes the LAT version number, the node name and identification, the multicast timer, the groups to which the LAT host node is associated, and the Ethernet line(s) on which LAT is enabled.

Privilege required: none

Command Qualifier

`[/[NO]OUTPUT[=filespec]`

Writes the information to the specified file. If you specify `/NOOUTPUT`, the information is suppressed and not displayed. If the optional `filespec` argument is omitted, the output displays on the terminal.

SHOW OPERATOR_SERVICES

Displays the current status of the Operator/Message Services (OMS) package (the current version, the types of requests being stored in the work file, and the status of all operator services consoles currently defined on the system).

Privilege required: none

`[/[NO]OUTPUT[=filespec]`

Writes the information to the specified file. If you specify `/NOOUTPUT`, the information is suppressed and not displayed. If the optional `filespec` argument is omitted, the output displays on the terminal.

SHOW PORT [port-name]

Displays the characteristics of LAT ports on the RSTS/E node. The default is to display both interactive and application ports. The system displays the local port name, the port type (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, only the local port name and type are displayed.

If the port is assigned, but not yet connected, the terminal server, the remote service, and the remote port are displayed.

If the port is waiting to connect, the connection status "In Progress" is displayed; if the connection is queued, the queue position is also displayed.

If the port is connected, the terminal server, the remote service, the remote port, and the job number are displayed.

If the port is allocated, the current queued setting is displayed. Otherwise, the default setting, either queued or noqueued, is displayed.

An asterisk (*) is displayed after the local port name if it is a dial-up line.

The port-name parameter specifies the name of the port for which the characteristics are displayed. The port-name must be in the form of KBI *n*: or KB*n*., where *n* is a value from 0 to 127. If no port name is specified, then the characteristics for all LAT ports will be displayed.

Privilege required: none

Command Qualifiers

/ALL

Generates a display of all LAT ports, both application and interactive. /ALL is the default.

/[NO]APPLICATION

Generates a display of all LAT application ports. This qualifier is ignored if a port name is specified. If you specify /NOAPPLICATION, then only interactive ports are displayed.

/[NO]INTERACTIVE

Generates a display of all LAT interactive ports. This qualifier is ignored if a port name is specified. If you specify /NOAPPLICATION, then only application ports are displayed.

/LAT

Indicates that LAT ports are to be displayed. /LAT is the default.

/[NO]OUTPUT[=filespec]

Controls where the output of the command is sent. If the qualifier is not specified, or /OUTPUT is used without a file specification, the output is sent to the user's terminal.

If you specify `/NOOUTPUT`, then the output is suppressed.

SHOW PRINTER [dev[:]]

Displays the characteristics of an LP-type printer.

Privilege required: none

Command Qualifier

/ALL

Displays the characteristics of all LP-type printers on the system.

[/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify `/NOOUTPUT`, the information is suppressed and not displayed. If the optional `filespec` argument is omitted, the output displays on the terminal.

SHOW QUEUE [queue-name[:]]

Displays the status and attributes of one or more print or batch queues.

Privilege required: none

Command Qualifiers

/ALL

Displays the status of all queues.

/BATCH

Displays the status of batch queues only.

/BRIEF

Displays the queue name, type, and status only. The default is `/BRIEF`.

/FULL

Displays the queue name, privileges, type, status, the default forms name for print queues, the default and maximum priorities, the default and maximum page limits for print queues, the default and maximum CPU limits for batch queues, the default and maximum time limits for batch queues, and the assigned queue servers. The default is `/BRIEF`.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

/PRINT

Displays the status of print queues only.

SHOW RECEIVERS

Displays the status of declared message receivers on your system.

Privilege required: none

Command Qualifier

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

SHOW REQUESTS

Displays messages, requests, and replies to requests stored in the Operator/Message Services (OMS) work file.

Privilege required: OPER

Command Qualifier

/ALL

Displays both messages and requests. This qualifier conflicts with the **/[NO]REPLY** qualifier. If both qualifiers are specified on the same command line, only the rightmost qualifier is used.

/BEFORE=date-time

Displays messages or requests or both made before the specified date and time. Either an absolute or relative date and time can be specified. If no date is specified, then **TODAY** is used. If no time is specified, then **12:00AM** is used.

/BRIEF

When displaying requests made with the **/REPLY** qualifier, only requests will be displayed. This qualifier conflicts with the **/FULL** qualifier. If both qualifiers are specified on the same command line, the rightmost qualifier is used.

/[NO]EXACT

Controls whether the text specified with the **/TEXT** qualifier matches the text of a request exactly or treats uppercase and lowercase letters as equivalents. By default, case differences in letters are ignored.

/FACILITY=(facility-list)

Displays messages or requests or both made from the specified facilities. Up to eight facilities can be specified. Parentheses are not required when only one facility is specified.

The **NO** prefix can be used to display messages or requests or both from facilities other than those specified. For example, **/FACILITY=(LOGIN, LOGOUT)** displays only messages from the **LOGIN** and **LOGOUT** programs. **/FACILITY=(NOPBS,NOOMS)** displays all messages or requests or both from facilities other than **PBS** and **OMS**. If you use the **NO** prefix with one facility name, you must specify it on *all* the facility names in the list.

/FULL

Indicates that replies to requests are displayed. This qualifier conflicts with the **/BRIEF** qualifier. If both qualifiers are specified on the same command line, the rightmost qualifier is used.

/INPUT=filespec

Selects an alternate input file (or files) to be examined. Can be used to display requests from a previous OMS log file. Wildcards are allowed for the file name and extension fields. You must have read access to the file specified.

If this qualifier is not specified, requests are displayed from the current OMS log file, **OMS\$:REQLOG.OMS**.

/JOB=job-number

Displays messages or requests made by the specified job-number.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional filespec argument is omitted, the output displays on the terminal.

/[NO]REPLY

Indicates whether messages or requests are displayed. **/NOREPLY** is used to display messages. The default is **/ALL**.

/SINCE=date-time

Displays messages or requests or both made since the specified date and time. Either an absolute or relative date and time can be specified. If no date is specified, then **TODAY** is used. If no time is specified, then **11:59PM** is used.

/TERMINAL=KB[c]n[:]

Displays messages or requests or both made from the specified terminal. The keyword **DETACHED** can be specified in place of the device name to select requests made by detached jobs.

/TEXT=["]string["]

Displays messages or requests or both containing the specified string. Enclose strings containing lowercase letters or nonalphanumeric characters (including spaces) in quotation marks. You can use the **/EXACT** qualifier to alter the way that the text string is matched against the text of a message or request.

/USER=[p,pn]

Displays messages or requests made by the specified user.

SHOW RUNTIME_SYSTEM

Displays the status of currently installed run-time systems.

Privilege required: none

Command Qualifier

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

SHOW SERVER [server-name[:]]

Displays the status and attributes of one or more print or batch servers.

Privilege required: none

Command Qualifiers

/ALL

Displays the status of all servers.

/BATCH

Displays the status of batch servers only.

/BRIEF

Displays the server name, type, and status only. The default is **/BRIEF**.

/FULL

Displays the server name, type, status, current entry, and assigned queues. The default is **/BRIEF**.

[/NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

/PRINT

Displays the status for print servers only.

SHOW SERVICES/LAT [service-name]

Displays information about the service(s) offered by the LAT host node. If a service name is specified, only that service will be displayed. Otherwise, all services offered by the LAT host will be displayed.

Privilege required: none

Command Qualifier

[/NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

SHOW SESSIONS [server-name]

Displays information about the sessions currently running LAT on the host node. The server name is optional and, if omitted, information is displayed about all servers known to RSTS. The information includes the RSTS keyboard number of the terminal on which the user is logged in, the terminal server on which the user is physically connected, and the name of the service the user is currently running. An asterisk (*) appears after the keyboard number if the session was started from a dialup LAT line.

Command Qualifiers

/DEVICE=Ethernet-device:

Restricts the search to those users who are currently running LAT on the particular Ethernet device specified.

/LAT

Indicates that LAT sessions are to be displayed. /LAT is the default.

[/NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify /NOOUTPUT, the information is suppressed and not displayed. If the optional filespec argument is omitted, the output displays on the terminal.

SHOW SYMBOL [symbol-name]

Displays the value of one or more DCL local or global symbols. You can use the OPEN/LOG_FILE command to create a log file to save the output.

Privilege required: none

Command Qualifiers

/ALL

Displays the value of all symbols in the specified symbol table.

/GLOBAL

Displays the value of the specified global symbol.

/LOCAL

Displays the value of the specified local symbol.

SHOW SYSTEM

Displays the specified system default characteristics.

Privilege required: none

Command Qualifiers

/EMT_LOGGING

Displays the status of each EMT specified.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

SHOW TERMINAL [KB[c]n[:]]

Displays the characteristics of your terminal or another terminal.

Privilege required:

- None to display the characteristics of your own terminal
- **HWCFG** to display the characteristics of terminals other than your own

Command Qualifiers

/ALL

Displays the characteristics of all terminals on the system.

/BRIEF

Displays a subset of the terminal characteristics. The default is **/BRIEF**.

/FULL

Displays the full set of terminal characteristics. The default is **/BRIEF**.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

/[NO]PERMANENT

Indicates whether to display the permanent terminal characteristics instead of the current terminal characteristics. The default is **/NOPERMANENT**.

SHOW TERMINAL_SERVERS/LAT [server-name]

Displays information about the terminal server(s) known to the LAT host node. The server name is optional and, if omitted, information is displayed about all servers known to RSTS.

Command Qualifier

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

SHOW TIME

Displays the current date and time. You can use the **OPEN/LOG_FILE** command to create a log file to save the output.

Privilege required: none

SHOW USER [[p,pn]]

Displays the status of one or more users on the system.

Privilege required: **TUNE** to display information about a user's priority and run burst attributes

Command Qualifiers

/ALL

Displays the status for all users.

/ATTACHED

Displays the status for all attached jobs.

/DETACHED

Displays the status for all detached jobs.

/[NO]OUTPUT[=filespec]

Writes the information to the specified file. If you specify **/NOOUTPUT**, the information is suppressed and not displayed. If the optional **filespec** argument is omitted, the output displays on the terminal.

/TERMINAL=KB[c]n[:]

Displays the status of the job attached to the specified keyboard.

SORT input-filespec[,...] output-filespec

Invokes the PDP-11 SORT Utility to reorder the records in one or more input files into a single output file.

Privilege required: none

Command Qualifiers

/COLLATING_SEQUENCE={ASCII | EBCDIC | MULTINATIONAL}
Specifies the collating sequence. The default is **/COLLATING_SEQUENCE=ASCII**.

/[NO]DUPLICATES

Indicates whether to allow duplicate record keys. The default is **/DUPLICATES**.

/KEY=(field[,...])

Specifies one or more sort keys.

/PROCESS={ADDRESS | INDEX | RECORD | TAG}

Specifies the sort type. The default is **/PROCESS=RECORD**.

/SPECIFICATION[=filespec]

Specifies the name of a SORT specification file containing SORT command qualifiers and other instructions.

/[NO]STABLE

Indicates whether to keep records having equal keys in their original order.

/[NO]STATISTICS

Indicates whether to display a statistical summary after the SORT operation completes. The default is **/NOSTATISTICS**.

/WORK_FILES=(NUMBER=n)[,DEVICE=dev[:ppn]]

[,ALLOCATION=m][,[NO]CONTIGUOUS][,SIZE=s)

Specifies the number of temporary work files you want to use during the sort process, an alternate device and directory where you want to assign the files and options to optimize the files. The valid values for n are 0 and 3 to 10. The valid range for m is 1 to 4294967295. The valid range for s is 1 to 255.

Input File Qualifiers

/FORMAT=(record-format[,...])

Specifies the record format of the input or output file to override the existing data that SORT normally obtains through RMS-11.

/INDEXED_SEQUENTIAL[=n]

Specifies that the organization of the input or output file is indexed-sequential and the number of keys used.

/[NO]SHAREABLE

Indicates whether the input file can be opened in a write-shareable mode.

/TREE_SPACE=n

Specifies the percentage of the work area for use by the SORT tree data structure. The valid range for n is 1 to 100. The default is TREE_SPACE=55.

Output File Qualifiers

/ALLOCATION=n

Specifies the number of 512-byte blocks allocated for the output file. The valid range for n is 1 to 4294967295.

/BUCKET_SIZE=n

Specifies the number of 512-byte blocks per bucket for the output file. The valid range for n is 1 to 15. The default is /BUCKET_SIZE=1.

/[NO]CONTIGUOUS

Indicates that the output file disk space allocation is contiguous. The default is /NOCONTIGUOUS.

/FORMAT=(record-format[,...])

Specifies the record format of the input or output file to override the existing data that SORT normally obtains through RMS-11.

/INDEXED_SEQUENTIAL[=n]

Specifies that the organization of the input or output file is indexed-sequential and the number of keys used.

/LOAD_FILL

Loads the buckets according to the fill size established when the disk file was created.

/[NO]OVERLAY

Indicates whether to overlay the existing file with the sorted records of the input file. The default is **/NOOVERLAY**.

/RELATIVE

Specifies that the organization of the output file is relative.

/SEQUENTIAL

Specifies that the organization of the output file is sequential.

START/LAT Ethernet-device:

Starts up LAT on the specified Ethernet device. Note that Ethernet devices can only be XH0: or XE0: (UNA/LUA-0 or QNA/LQA-0). It is required that a **SET NODE/LAT** command be executed prior to issuing the first **START/LAT** command.

Privilege required: **SWCTL**

Command Qualifiers

/[NO]LOG

Indicates whether to display a confirmation message indicating that LAT has started up. The default is **/LOG**.

START/OPERATOR_SERVICES

Starts the Operator/Message Services (OMS) package. Include this command in the system start command file (**START.COM**) to make operator services available during timesharing.

Privilege required: **SWCTL** and **OPER**

Command Qualifier

/[NO]KEEP=(keyword[,...])

Specifies the type of requests that will be kept in the operator services work file. Valid keywords are ALL, [NO]MESSAGES, [NO]REQUESTS, and NONE. The /NOKEEP qualifier is a synonym for /KEEP=NONE.

/PRIORITY=n

Specifies the priority of the operator services job. By default, OMS is started at priority -8, the default system priority. You can specify any priority value in the range -120 to +120. If necessary, OMS will round the value to the next lower multiple of 8.

/RUN_BURST=n

Specifies the run burst of the operator services job. By default, OMS is started with a run burst of 6, the default system run burst. You can specify any run burst value in the range 1 to 127.

START/QUEUE queue-name[:]

Restarts a queue that has been stopped.

Privilege required: PBSCTL

START/QUEUE/MANAGER

Starts the Print/Batch Services (PBS) facility.

Privilege required: PBSCTL

Command Qualifiers

/PRIORITY=n

Specifies the priority of the PBS primary and secondary jobs. The valid range for n is -120 to +120, which is rounded down to a multiple of 8. The default is /PRIORITY=-8.

/RUN_BURST=n

Specifies the run burst of the PBS primary and secondary jobs. The valid range for n is 1 to 127. The default is /RUN_BURST=6.

START/SERVER server-name[:]

Starts a server that was stopped using the STOP/SERVER command.

Privilege required: PBSCTL

Command Qualifiers

/BACKSPACE[=n]

Restarts the current print job n pages back in the current file copy. If you do not specify n, printing resumes one page back in the current file copy.

/FORWARDSPACE[=n]

Restarts the current print job n pages forward in the current file copy. If you do not specify n, the default is that printing resumes one page forward in the current file copy.

/NEXT_JOB

Resumes printing or batch processing at the beginning of the next job, thus terminating the current job.

/PAGE=n

Restarts the current print job at page n in the current file copy.

/RESTART

Restarts the current print job at the beginning of the current job copy.

/TOP_OF_FILE

Starts the current print job at the beginning of the current file copy.

STOP

Ends a command procedure and immediately returns control to the interactive command level.

Privilege required: none

STOP/LAT [Ethernet-device:]

Disables LAT service on a particular Ethernet device or on all Ethernet devices. If no Ethernet-device parameter is specified, LAT is disabled on all Ethernet devices. All jobs running on an Ethernet device that is to be disabled will detach.

Command Qualifier

/[NO]LOG

Indicates whether to display a confirmation message indicating that LAT has stopped. The default is /LOG.

STOP/OPERATOR_SERVICES

Manually shuts down the Operator/Message Services (OMS) package in an orderly manner, either immediately or after all currently pending requests have been completed.

Privilege required: SWCTL and OPER

Command Qualifier

/[NO]ABORT

Indicates whether to abort any requests that are currently pending, or allow them to complete before shutting down the package. /NOABORT is the default.

STOP/QUEUE queue-name[:]

Stops a queue to prevent Print/Batch Services (PBS) from processing any pending requests.

Privilege required: PBSCTL

STOP/QUEUE/MANAGER

Shuts down the Print/Batch Services (PBS) facility. If you specify `/ABORT`, `RSTS/E` shuts down PBS immediately; otherwise, PBS processes all currently active jobs and then shuts down.

Privilege required: `PBSCTL`

Command Qualifier

`/[NO]ABORT`

Indicates whether to immediately terminate queue processing, thus aborting all currently active jobs. The default is `/NOABORT`.

STOP/SERVER server-name[:]

Stops a print or batch server, preventing the processing of any new requests.

Privilege required: `PBSCTL`

Command Qualifiers

`/FILE_END`

Stops the print server after printing the current file copy.

`/JOB_END`

Stops the batch or print server after finishing the current batch or print job.

`/PAGE_END`

Stops the print server after printing the current page.

SUBMIT filespec[,...] [entry-spec]

Enters a request for batch processing of one or more DCL command procedures and places the request on a batch queue.

Privilege required:

- Read access to the command files you are submitting
- Write access to use the `/DELETE` qualifier

- GACNT to specify another owner in your group
- WACNT to specify another owner not in your group

Command Qualifiers

/AFTER=date:time

Specifies a date:time value after which the entry is eligible for batch processing.

/CPU_LIMIT=n

Specifies the maximum CPU time, in minutes, allowed for the batch job. The valid range for n is 1 to 65535, in addition to UNLIMITED.

/HOLD

Places the entry in a "hold" state. To process the entry, you must release the entry using the SET ENTRY/RELEASE command.

/[NO]LOG_DELETE

Indicates whether to delete the log file after printing. The default is /NOLOG_DELETE.

/[NO]LOG_FILE[=filespec]

Indicates whether to create and specify a log file for the batch job. The default is /LOG_FILE.

/[NO]LOG_QUEUE[=queue-name]

Indicates whether to queue the log file for printing when batch processing is completed and specifies the log file name. The default is /NOLOG_QUEUE.

/NAME=entry-name

Assigns a name to the entry.

/[NO]NOTIFY

Indicates whether to notify your terminal session of events that occur related to your batch entry. The default is /NONOTIFY.

/OWNER=[p,pn]

Specifies the owner of the request.

/PARAMETERS=(parameter[,...])

Specifies from 1 to 8 optional parameters you want to pass to the job.

/PRIORITY=n

Specifies the priority you want to assign to the request. The valid range for n is 1 to 255. You cannot specify a value for n that is higher than the maximum priority assigned to the queue.

/QUEUE=queue-name

Specifies the name of the queue that you want to process the entry.

/TIME_LIMIT=n

Specifies the maximum elapsed time, in minutes, you want to allow for the requested batch job. The valid range for n is 1 to 65535, in addition to UNLIMITED.

File Qualifier

/[NO]DELETE

Indicates whether to delete the command file after processing is completed. The default is /NODELETE.

TYPE [node::]filespec[,...]

Displays the contents of a text file on your terminal.

Privilege required: Read access to the file you are displaying

Command Qualifiers

/BEFORE=date

/CREATED

/MODIFIED

/SINCE=date

Displays the files created or modified before or since the specified date.

/[NO]CONFIRM

Indicates whether to prompt before displaying each file and is a synonym for /[NO]QUERY.

/[NO]LOG

Indicates whether to display a confirmation message on your terminal for each file displayed. The default is /NOLOG.

/[NO]QUERY

Indicates whether to prompt before displaying each file and is a synonym for /[NO]CONFIRM.

/SELECT $\left\{ \begin{array}{l} =\text{SIZE}=\text{n} \\ =\text{SIZE}=\text{MINIMUM}=\text{n} \\ =\text{SIZE}=\text{MAXIMUM}=\text{n} \\ =\text{SIZE}=(\text{MINIMUM}=\text{m},\text{MAXIMUM}=\text{n}) \end{array} \right\}$

Selects files based on their size. The specified size can be:

n	Selects only those files with size equal to n.
MINIMUM=n	Selects only those files with size greater than or equal to n.
MAXIMUM=n	Selects only those files with size less than or equal to n.
MINIMUM=m,MAXIMUM=n	Selects only those files with size between m and n inclusive.

UNLOAD/INDEX [dev[:]]

Unloads a disk's SAT (Storage Allocation Table) from memory.

If you do not specify a device name, the default is the system disk (SY0:).

Privilege required: SWCTL

UNLOAD/LIBRARY library-name

Unloads a resident library from memory.

Privilege required: INSTAL

UNLOAD/OVERLAY overlay-name[,...]

Unloads one or more monitor overlays from memory. See **LOAD/OVERLAY** for a list of valid overlay names.

Privilege required: SWCFG

Command Qualifier

/ALL

Unloads all overlay monitors.

UNLOAD/RUNTIME_SYSTEM name

Unloads a run-time system from memory.

Privilege required: INSTAL

WAIT [delta-time]

Places the current job in a wait state until a specified period of time has elapsed. The WAIT command is useful in DCL command files that wish to suspend execution for some period of time.

The optional parameter delta-time specifies hours, minutes, and seconds using the format: hh:mm:ss. If not specified, the delta-time 00:00:00 is used.

The maximum value that can be specified for each field is: 23 for hours, 59 for minutes, and 59 for seconds. Specify 60 minutes as 01:00:00 (one hour).

Fields of the delta-time may be omitted but the delta-time must not begin with a colon even if the number of hours is zero.

Privilege required: none

WRITE channel-number data[,...]

Writes records to a file you open for writing or appending using the OPEN command.

Privilege required: none

Command Qualifier

/[NO]DELIMITER

Specifies what type of string delimiter WRITE uses. By default, WRITE places CR LF characters at the end of the data it writes. When you specify /NODELIMITER, WRITE writes the data as a single string or places a specified delimiter at the end of the data.

DCL Functions

This chapter provides information on DCL functions. Use DCL functions to manipulate strings or integers or return information about a file, a job, or the system. You can use DCL functions in the same places you use symbols, expressions, or literal values. In command procedures, DCL functions perform operations such as:

- Translating logical names
- Manipulating strings
- Determining the current processing mode of the procedure

Format of DCL Functions

A DCL function has the general format:

`F$function-name([arg,...])`

where:

- | | |
|----------------------------|---|
| <code>F\$</code> | Indicates a DCL function. |
| <code>function-name</code> | Is the function DCL evaluates. You can truncate function names to any unique abbreviation with a minimum of two characters. |
| <code>()</code> | Are parentheses that enclose function arguments. You do not need to include parentheses if the function has no arguments. |

arg,... Specifies one or more function arguments, if any. Function arguments can consist of symbols, integer expressions, string expressions, or other DCL functions.

DCL performs automatic symbol substitution on all function arguments. Therefore, when you use a symbol name as a DCL function argument, you should not enclose the symbol name in apostrophes.

In some cases, one or more arguments are optional. If an argument is optional, you can exclude it from the argument list. You can also use commas to indicate which argument you are excluding from the list. For example, the F\$PARSE function has three optional arguments. You can specify the first argument only, as follows:

```
F$PARSE (ARG1)
```

In this example, you do not specify the second and third arguments. You could also use commas to indicate that you are excluding the second and third arguments. For example:

```
F$PARSE (ARG1, , )
```

To specify the first and second arguments but omit the third, you can use either format:

```
F$PARSE (ARG1, ARG2)  
F$PARSE (ARG1, ARG2, )
```

To specify the first and third arguments but omit the second, you must use commas to separate the arguments. For example:

```
F$PARSE (ARG1, , ARG3)
```

If a function accepts arguments but you omit all arguments, you can also omit the parentheses.

Note that in some cases, specifying an argument as a NULL string or as the integer zero is not the same as excluding the argument from an argument list.

This section shows the format and briefly describes each of the DCL functions. See the *RSTS/E Guide to Writing Command Procedures* for complete descriptions of the DCL functions.

F\$ACCESS

access-mode=F\$ACCESS

Returns one of BATCH, DIALUP, LOCAL, NETWORK, or SERVER indicating the current job access mode.

F\$ASCII

number = F\$ASCII(string)

Converts the first character in a string to its ASCII value.

F\$CHR

string = F\$CHR(number)

Converts an integer to an ASCII character.

F\$CVTIME

string = F\$CVTIME([date])

Converts a date-time string to a string suitable for comparisons.

F\$EDIT

string = F\$EDIT(string,edit-code)

Edits a string. See Table 3-1 for a description of valid edit-codes.

F\$ENVIRONMENT

value = F\$ENVIRONMENT(keyword)

Returns information regarding the current job environment. See Table 3-2 for a description of keywords and return values.

F\$INSTR

position = F\$INSTR(position,string,substring)

Returns the location of a substring.

F\$INTEGER

number = F\$INTEGER(string)

Converts a string to an integer.

F\$JOB

job-number = F\$JOB

Returns the current job number.

F\$LEFT

substring = F\$LEFT(string,position)

Extracts a substring from a string, beginning at position 1 and ending at the position you specify.

F\$LENGTH

length = F\$LENGTH(string)

Returns the length of a string.

F\$MESSAGE

text = F\$MESSAGE(error-number)

Returns the message text associated with a RSTS/E error number.

F\$MID

string = F\$MID(string,position,length)

Extracts a substring from a string beginning at the position you specify.

F\$NODE

node-name = F\$NODE

Returns the current DECnet node name.

F\$PARSE

filespec = F\$PARSE([filespec],[default-spec],[field])

Returns a complete RSTS/E file specification or a specified field within the file specification. See Table 3-3 for a description of valid field keywords.

F\$PRIVILEGE

truth-value = F\$PRIVILEGE(privilege-list)

Returns the status of a job's privileges.

F\$RIGHT

substring = F\$RIGHT(string,position)

Extracts a substring from a string, beginning at the position you specify, and ending at the rightmost position of the string.

F\$SEARCH

filespec = F\$SEARCH([filespec])

Searches a disk directory for a file and returns the complete RSTS/E file specification of the next occurrence of the file.

F\$STRING

string = F\$STRING(number)

Converts an integer to a string.

F\$TERMINAL

keyboard_number = F\$TERMINAL

Returns the keyboard number for your job.

F\$TIME

date = F\$TIME

Returns the current time and date.

F\$TYPE

type = F\$TYPE(expression)

Returns one of **STRING**, **INTEGER**, or the **NULL STRING** indicating the type of a symbol or expression.

F\$USER

ppn = F\$USER

Returns the project-programmer number for your job.

F\$VERIFY

old-setting = F\$VERIFY([new-setting])

Enables or disables the verification setting and returns the previous setting.

Table 3–1 lists the edit-code values for F\$EDIT.

Table 3–1: Edit-Code Values for F\$EDIT Function

Edit-Code	Effect
2	Discards spaces and tabs.
4	Discards RET, LF, FF, ESC, DEL, and fill or null characters.
8	Discards leading spaces and tabs.
16	Reduces spaces and tabs to one space.
32	Converts lowercase to uppercase.
64	Converts square brackets to parentheses. For example, "[" to "(" and "]" to ")".
128	Discards trailing spaces and tabs.
256	Prevents alteration of characters inside single or double quotation marks, except parity bit trimming.

Table 3–2 lists the keywords and return values for F\$ENVIRONMENT.

Table 3–2: Keywords and Return Values for F\$ENVIRONMENT Function

Keyword	Type	Description
CAPTIVE	string	Returns “TRUE” if executing in a captive account, or “FALSE” otherwise.
CONTROL	string	Returns "" if SET NOCONTROL=C is in effect or at the interactive level, or “C” if SET CONTROL=C is in effect.
DATA	string	Returns current SET DATA status. Possible values are: "" Job is at interactive level “DATA” SET DATA is in effect with end of data character “\$” “DATA/END_OF_DATA="x"” SET DATA is in effect; “x” is the currently defined end-of-data character “NODATA” SET NODATA is in effect
DEFAULT	string	Returns the user’s account; the account you are logged in to.
DEPTH	integer	Returns current command procedure depth level. The DCL command prompt (interactive) DEPTH is 0. The command procedure DEPTH is 1 when a command procedure is invoked interactively, or 2 within a Batch job. A nested command procedure has the DEPTH of 1 greater than the level from which the command procedure was executed.
ECHO	string	Returns current SET ECHO status. Possible values are: “ECHO”, “NOECHO/WARNINGS”, and “NOECHO/NOWARNINGS”.
FREE_CHANNELS	integer	Returns number of free channels available to the user.
INTERACTIVE	string	Returns “TRUE” if the current job’s access mode is INTERACTIVE, or “FALSE” otherwise.
LOG_FILE	string	Returns currently open log file.

Table 3-2 (Cont.): Keywords and Return Values for F\$ENVIRONMENT Function

Keyword	Type	Description
LOGFILE_PROMPT	string	Returns the currently defined log file prompt; identical to the reserved symbol \$LOGFILE_PROMPT.
MAX_DEPTH	integer	Returns maximum number of command procedure levels.
NOCONTROL	string	Returns "" if SET CONTROL=C is in effect or at the interactive level, or "C" if SET CONTROL=C is in effect.
ON_CONTROL_C	string	Returns "TRUE" if an ON_CONTROL_C command is specified, or "FALSE" if at the interactive level or if an ON_CONTROL_C command is not specified.
ON_SEVERITY	string	Returns severity level of the current ON severity THEN command. Possible values are: "NONE", "ERROR", "WARNING", "SEVERE_ERROR".
PROCEDURE	string	Returns command procedure currently executing.
PROMPT	string	Returns currently defined DCL prompt string; identical to the reserved symbol \$PROMPT.
PROTECTION	integer	Returns default file protection code.
TIME_STAMP	string	Returns "TRUE" if time stamps are currently enabled for batch log files, or "FALSE" otherwise.
VERIFY	string	Returns "VERIFY[/DEBUG]" if SET VERIFY is in effect, or "NOVERIFY" if SET NOVERIFY is in effect.

Table 3-3 lists the valid field keywords for F\$PARSE.

Table 3-3: Field Keywords for F\$PARSE Function

Keyword	Meaning
DEVICE	Returns device name string.
PPN	Returns project-programmer number string.
NAME	Returns file name string.
TYPE	Returns file type string.
STATUS	Returns device status word integer.
FLAGS	Returns filespec flag word integer.

System Utility Programs

This chapter describes the system programs available on RSTS/E; they are arranged in alphabetical order. See Appendix A for OPSER and obsolete system utility programs.

COPY

Copies all of the information from one device to another device of the same type. You can also use COPY to verify that the information on two like devices is identical. You cannot specify individual files.

Privilege Required

- **DEVICE** privilege if either or both tape drives is a restricted device
- **RDNFS** privilege for the input disk and **WRNFS** privilege for the output disk

To Run the Program

```
RUN AUXLIB$:COPY
```

Format

new device=old device/switches

Usage Notes

You must specify the fast copy switch (/FC) or the no copy switch (/NC) in the command string to copy information from one device to another.

Switches

/BL:n

Specifies block size you can use to speed up copying or to copy magnetic tapes written with nonstandard record sizes. To speed up copying, specify a larger block size.

/DE:n

Specifies a density setting other than the default when accessing magnetic tape. Currently available densities are 800, 1600, 6250, 6667, 8000, and 10000 bpi. You can also specify **MINIMUM** and **MAXIMUM**, which causes the system to set the density to the minimum or maximum the tape drive supports.

/FC

Specifies fast copy. Copies information from one device to another.

/HE

Prints an online **HELP** message for the **COPY** program.

/NC

Specifies no copy. You use **/NC** in conjunction with **/VE** to verify that the information on two devices is identical.

/PA:n

Specifies a parity setting other than the default when accessing magnetic tape where **n** can be **ODD** or **EVEN**.

/VE

Verifies whether the information on a device unit has been copied correctly. You must specify either **/FC** or **/NC** with this switch.

DIRECT

DIRECT lists information about files from a disk or tape directory.

Privilege Required

- Create/Rename access to any output file you specify
- Read access to any file you display from accounts other than your own

To Run the Program

```
RUN $DIRECT
```

Format

#[output=*i*input/switches, input/switches,...

Usage Notes

Output is optional and can be a device specification or a disk file specification. If you do not specify output, omit the equal sign (=). By default, DIRECT displays output on your terminal. Input can be any number of disk file specifications. The disk file specification on input can include a device, file name, file type and project/programmer number (PPN).

If you do not specify a device, DIRECT uses the public disk structure and denotes it by the SY: specification.

You can substitute the asterisk (*) character and the question mark (?) character wildcards in the file name and file type fields. In addition, you can substitute the * character in the PPN field.

You can substitute the * character for the entire file name, the entire file type, both the file name and file type, and the entire file specification.

Switches

/AL

Lists the file name, type, and number of blocks of each file.

/AT

/SA

Lists the file name, type, symbolic file attributes, and caching status.

/BK

Lists the directory for the specified device in reverse order.

/BR

/F

Lists the file name, type, and a brief summary message.

/CL

Lists the file name, type, and cluster size.

/DA

Lists the file name, type, and date of creation.

/DI

/LI

RET

Lists most important data to include heading, file name, type, size, protection code, creation date, and an ending summary message.

/DI:S

/LI:S

/S

Lists all relevant data to include heading, file name, type, size, protection code, date of last access, date of creation, time of creation, cluster size, associated run-time system, file position, symbolic attributes, open status (if possible to display on the same line), files marked for deletion (see **/MD**), and an ending summary message.

/EX or /TY

Lists file name and type.

/FU

Lists heading, file name, type, size, protection code, date of last access, date of creation, time of creation, cluster size, associated run-time system, file position, open status, and an ending summary message.

/HD

Displays heading at top of columns in the listing for those listings that normally do not include a heading. If you specify **/HD** without another switch, **DIRECT** displays an error message.

/HE

Displays the file **DIRECT.HLP**, which describes the **DIRECT** program.

/LA

Lists the file name, type, and date of last access or update, depending on disk initialization.

/MD

Lists all files, and flags those files marked for deletion by appending an * character after the file name. Tentative files are marked for deletion until closed.

/N

Lists only those entries that do not match the specified input file specification.

/NA

Lists file name only.

/OA

Lists file names, types, and a series of octal numbers that represent file attributes.

/OP

Lists file name, type, open status, and access count.

/PO

Lists file names, types, and the position of the files on disk (the device cluster number of the file's first block).

/PR

Lists file name, type, and file protection code.

/RT

Lists the name of the run-time system that created the file.

/SI

/SZ

Lists file name, type, size (in blocks) of each file.

/SU

Lists summary data only to include number of designated files and total number of blocks occupied by designated files.

/TI

Lists file name, type, and the date and time each file was created.

/W

Lists data across the width of a line rather than one item per line.

File Attributes

File attributes are system attributes or file description data that RMS-11 software requires. For instance, both COBOL and BASIC-PLUS-2 use RMS-11. The User File Directory (UFD) for a given file contains the file attributes for that file. You can list file attributes symbolically, using the /SA, /AT, and /S switches and octally, using the /OA switch. The symbolic file description attribute fields are:

BK

Displays if the file organization is relative or indexed; indicates the bucket size in block.

CC

Displays the type of carriage control as **IMP** (implied) or **FOR** (FORTRAN).

EX

If you do not use the default, indicates the number of blocks added to the file each time you increase its size.

FO

Displays type of file organization as **SEQ** (sequential), **REL** (relative), and **IDX** (indexed).

HS

If you do not use the default, indicates the fixed header size.

NOSPAN

If displayed, indicates that records are not allowed to span block boundaries.

RECSI

Displays the size, in bytes, of the largest file record.

RF

Displays the maximum record length of the file. The possible formats are **UDF** (undefined), **FIX** (fixed), **VAR** (variable), **VFC** (variable /fixed control), and **STM** (stream).

USED

Displays the number of blocks currently in use, followed by the number of bytes used in the last block.

The symbolic system attribute fields are:

CACHE

Indicates that the file is cached.

SEQ

Indicates that caching is done using sequential mode.

RND

Indicates that caching is done using random mode.

NOBACKUP

Indicates that the file data is not backed up; only the file attributes are backed up.

IGNORE

Indicates that the file is completely ignored by BACKUP.

FILCOM

FILCOM (File Compare) lets you compare two ASCII files, line by line, and identifies differences. When you run the program, specify the files you want to compare and any switches that direct that comparison.

Privilege Required

- Read access to the files you want to compare
- Create/Rename access for any output file you create

To Run the Program

```
RUN $FILCOM
```

Usage Notes

After **FILCOM** prompts "OUTPUT TO <KB:>?", type one of the three responses:

- The device designator or file specification to which **FILCOM** writes the comparison data. Your terminal is the default.

If you respond with a device designator or a RETURN key, **FILCOM** displays a series of additional prompts. These prompts request:

- The files you want to compare.

When you specify the files to be compared, include the file type. You can use the wildcard specifications asterisk (*) and question mark (?) to designate the input files.

- The number of successive lines in the files that constitute a match.

As **FILCOM** compares lines in a file, it prints the differences until it finds a series of lines that are identical. The number of lines that constitute a series are determined by your answer to this prompt. The default is three lines.

- Whether **FILCOM** should consider BASIC-PLUS continuation lines as part of a numbered line.

By default, **FILCOM** treats continuation lines as new lines.

- Whether FILCOM should compare blank lines.

You can also specify one or more switches in response to FILCOM's initial prompt. These switches override the prompts and provide an alternative way to set comparison parameters.

- A single command line that contains all the information FILCOM needs to make the file comparison:

```
OUTPUT TO <KB:>? output=input1,input2,/switches
```

Output can be:

- A complete RSTS/E file specification.
- A wildcard specification (description in "Wildcards" section).
- No specification. If you specify only input, FILCOM displays output at your terminal.

The equal sign (=) is required only if you specify output. An equal sign with no output specification causes FILCOM to output the result of its comparison to a file on the public structure. FILCOM creates this file in the current account with a file name taken from the first input file and a .DIF file type.

The input files represent the two files you want FILCOM to compare. You can describe these files with full file specifications, file names and types, or wildcards.

If you specify the full command line, FILCOM does not display any other prompt and begins the file comparison. Using the command lets you specify wildcards (*) and (?) in the file specifications and one or more switches.

- A command line that contains an indirect file name. The indirect command file is an ASCII text file you can create with PIP or an editor. The file must contain all of the information FILCOM needs to make the file comparison:

```
output to <kb:> ? @filename
```

In the previous command line above, the file name is an indirect command file. The indirect command file can contain a single line command, or it can contain multiple line answers to the FILCOM prompts. If the command file contains answers to the FILCOM prompts, each prompt must be answered in the four step sequence. You cannot nest indirect command files. FILCOM processes an at sign (@) in the command file as an assignable account specification.

Wildcards

You can specify FILCOM input files as full RSTS/E file specifications or as wildcard characters. When you use wildcards, FILCOM bases its search for files on the first input file specification. FILCOM output files can contain a wildcard for either the file name or type. You cannot use wildcards in both fields.

With wildcards, you can cause FILCOM to make multiple file comparisons based on a single command line specification. When you use this method, FILCOM displays the differences found in each set of files in the standard manner. After it finishes comparing the files, FILCOM displays a summary of the format:

```
X DIFFERENCES FOUND IN Y FILES OF Z TOTAL FILES  
COMPARED
```

Where X is the number of differences in all files, Y is the number of files that contain differences and Z is the number of files compared.

Switches

/AP

Directs FILCOM to open the output file for APPEND. If you omit this switch, FILCOM deletes any existing output file of the same name before writing differences. With the /AP switch, you can direct FILCOM to write differences into an existing output file.

/[NO]BA

Specifies whether FILCOM considers BASIC-PLUS continuation lines as part of a numbered program line. The default is /NOBA.

/[NO]BL

Specifies whether FILCOM considers blank lines in its comparison. The default is /NOBL.

/CO[:m:n]

Converts tabs to the appropriate number of spaces and directs FILCOM to compare characters starting in column position m and continuing for n characters. If you include the /COMPARE switch but do not specify m or n, FILCOM defaults m to column position 1 and n to 72 characters.

/LI[:n]

Specifies the maximum number of lines that are allowed to differ before FILCOM stops examining the file. If you include the /LIMIT switch but do not specify a limit in n, the default is 60 differing lines.

/MA[:n]

Specifies the number of lines in the file that constitute a match. The default is three.

/SU

Directs FILCOM to list the total number of differences found in the files without listing individual lines.

FIT

FIT (File Transfer) performs file transfers between devices. With **FIT** you can:

- Transfer files between RSTS/E-structured devices and RT11-structured devices.
- Transfer files from a DOS disk to a RSTS/E device.
- List the directory of a RSTS/E-, RT11- or DOS-structured device, including RX01 and RX02 flexible diskettes.
- Delete files on an RT11-structured device.
- Initialize (zero) an RT11-structured device.
- Compress (squeeze) the files on an RT11-structured device.

Privilege Required

- Read access to input files and files included in a directory listing
- Create/Rename access to any output files you create
- Write access to any files you delete
- **DEVICE** privilege for restricted tape drives and restricted RX01/RX02 disk drives
- **RDNFS** privilege for input disk devices that are not RSTS/E devices
- **WRNFS** privilege for output disk devices that are not RSTS/E devices
- **SYSIO** privilege to set the protection/privilege bit when transferring files to a RSTS/E system

To Run the Program

```
RUN AUXLIB$:FIT
```

Transferring Files

In response to the FIT> prompt, specify the files in the format:

output[/switch]=input[/switch]

Listing a Directory

In response to the FIT> prompt, specify the directory in the format:

dev:[proj,prog]filename.type/L[I]/sw]

Deleting Files on RT11-Structured Devices

In response to the FIT> prompt, specify files in the format:

dev:filename.type/DE[/switch]

Initializing RT11-Structured Devices

In response to the FIT> prompt, specify the device in the format:

dev:/ZE:m[/switch]

Compressing RT11-Structured Devices

In response to the FIT> prompt, specify the device in the format:

dev:/SQ[/sw]

Switches

/D

Deletes a file on an RT11 device.

/DOS

Specifies a file on a DOS format disk.

/HE

Prints HELP text for FIT.

/DI, /LI

Lists the directory of the device.

/N:n

Use with /ZE to create n directory segments on the initialized device. Each segment consists of two 512-byte blocks. The value n (range 1-31) determines the size of the directory on the device; and, therefore, the number of files stored on the device.

/RSTS

Specifies a file on a RSTS/E disk or device.

/RT11

Specifies a file on an RT11-structured device or specifies an RT11-structured device.

/SQ

Compresses (squeezes) an RT11-structured device.

/W

Lists all file transfers and deletions on your terminal.

/ZE[:m]

Initializes (zeros) an RT11-structured device.

GRYPE

GRYPE lets you send messages to your system manager. The comments you type are written to a common file kept by your system manager.

Privilege Required

You do not need any special privilege to run the GRYPE program and send a message to the system manager. However, you need WACNT privilege to use the *LIST and *RESET commands.

To Run the Program

```
RUN AUXLIB$:GRYPE
```

Commands

***LIST**

Allows you to display the contents of the GRYPE.TXT file on your terminal, print it on a line printer, or write it to a file.

***RESET**

Deletes the GRYPE.TXT file.

HELP

HELP displays information about system programs and system commands.

Privilege Required

- Create/rename access to any file you create using the /OUTPUT switch

To Run the Program

```
RUN HELP$:HELP
```

Usage Notes

HELP prints an identifying header line and prompts for a topic. In response to the Topic? prompt, type one of the following:

- The name of the topic about which you want information. If you abbreviate the name, HELP displays information on all topics that match the abbreviation. In addition to the topic you can specify one or more subtopics (separated by spaces) associated with that topic. The level to which you can nest subtopics depends on the particular topic about which you want information.
- A * wildcard character, which directs HELP to display information on all available topics.
- The ? character, which directs HELP to display a list of available topics.

To exit from the HELP program, enter CTRL/Z at any prompt. You can also exit HELP by pressing RETURN at the Topic? prompt.

Switches

/OUTPUT

Use only with the HELP CCL command. By default, HELP displays the information you request at your terminal. /OUTPUT overrides the default and writes the requested information to a file. For example:

```
HELP/OUTPUT:filespec topic [subtopic [...]]
```

or

```
HELP/OUTPUT:filespec * [...]
```

/PROMPT

Use only with the HELP CCL command. When you specify /PROMPT with a topic, HELP displays the information you request, and HELP then displays the Topic? prompt. When you specify /PROMPT with no topic, HELP displays only the Topic? prompt.

ODT

The ODT program opens a file, a peripheral device, or memory as an address space and allows you to examine and change word or byte locations within that address space. You can also list the contents of certain table locations in the operating system.

Privilege Required

- RDMEM privilege to read memory
- RDMEM and SYSMOD privileges to read and change memory
- RDWFS privilege to read a non-file-structured device
- WRTWFS privilege to write to a non-file-structured device
- Read access to read a file
- Read and write access to read and change a file

ODT Characters and Symbols

You access and manipulate memory locations and data by typing characters and symbols that ODT recognizes. The special characters and symbols are listed in Table 4-1.

Table 4-1: ODT Characters and Symbols

Character Symbols	Meaning
/	Opens the previously open location as a word, or opens the location designated by k as a word.
k/	
'	Opens the previously open location as a byte, or opens the location designated by k as a byte.
k'	
"	Gives the ASCII representation of the currently open or last open location, or of the location specified by k.
k"	
%	Gives the ASCII representation of the Radix-50 value in the currently open or last open location, or in the location specified by k.
k%	
RET	Closes the currently open location, or modifies the contents of k followed by the currently open location with the value k and closes it.
k RET	

Table 4-1 (Cont.): ODT Characters and Symbols

Character Symbols	Meaning
LF kLF	Closes the currently open location and opens the next sequential location, or modifies the contents of the currently open location with the value of k before closing it and opening the next sequential location.
^	Closes the currently open location and opens the preceding sequential location.
--	Takes the contents of the currently open location as a program counter relative offset and calculates the next location to be opened; closes the currently open location and opens the location thus evaluated.
@ k@	Takes the contents of the currently open location as an absolute address, closes the currently open location; opens and prints the contents of the location thus evaluated. If k precedes @, the value k replaces the contents of the currently open location before it is closed.
> k>	Takes the low order byte of the currently open location as a relative branch offset and calculates the address of the next location to be opened. Closes the currently open location and opens and prints the contents of the relative branch location thus evaluated. If k precedes >, the value k replaces the contents of the currently open location before it is closed.
<	Closes the currently open location and opens the last location explicitly open. Returns ODT to the origin of a sequence of relative locations determined by _, @, and > character operations.
,	Separates a relocation register number from an octal value. ODT adds the contents of the specified relocation register to the octal value following the comma, and forms a relocatable address.
;	Separates multiple values in a list request using the L character and in a register operation using the R character.
.	Specifies the last explicitly open location similar to that used by the < character.

Table 4-1 (Cont.): ODT Characters and Symbols

Character Symbols	Meaning
+	Adds the preceding value and following value and uses the result.
space bar	
-	Subtracts the following value from the preceding value and uses the result.
R	Resets all relocation registers to -1 (177777).
nR	Resets relocation register n to -1 (177777).
k;nR	Sets relocation register n to the value k.
F	Sets relocation calculation for list requests using the L character.
1F	Disables relocation calculation set by the F character.
C	Prints out monitor table symbolic names and memory addresses.
\$S	Prints out the processor status word.
Q	Uses the last quantity printed by ODT.
k1;k2L	Prints the contents of locations k1 through k2 at the terminal.
1;k1;k2L	Prints the contents of location k1 through k2 on line printer unit 0.
2;k1;k2L	Prints the contents of location k1 through k2 on another device. ODT asks for a device designator by printing the DEVICE question.

To Run the Program

```
RUN AUXLIB$:ODT
```

After you type the command line and press RETURN, ODT displays the FILE<MEMORY>? prompt. Your response to this question determines the way ODT runs and what address space ODT accesses. The responses you can type are listed in Table 4-2.

Table 4-2: ODT Question Responses

Response	Meaning
Press RETURN only.	Allows Read access to memory only if you have RDMEM privilege.
Type a file specification, then press RETURN.	Allows Read access to the file on the device specified. If you specify no device, ODT uses the system disk.
Press LINE FEED only.	Allows Read and Write access to memory only if you have RDMEM and SYSMOD privileges.
Type the file specification, then press LINE FEED.	Allows Read and Write access to the file specified.

PIP

PIP (Peripheral Interchange Program) copies files from one RSTS/E device to another, concatenates, deletes, and renames files, changes protection codes and file attribute data, initializes accounts, and lists directories.

Privilege Required

- Read access to any input files you read
- Create/Rename access to any output files you create
- Write access to any output files you write to
- Create/Rename access to any input files you rename
- TUNE privilege if you use the /LOCK and /PRIOR switches
- DEVICE privilege for any restricted devices you access

To Run the Program

```
RUN $PIP
```

Format

```
[output[/sw]=]input[/sw][,input[/sw],...]
```

Usage Notes

Specify input and output file specifications in the standard format. Note that both input and output file specifications can contain the file specification switches /PROTECT, /FILESIZE, /CLUSTERSIZE, /MODE, /RONLY, and /POSITION.

PIP lets you specify a PIP indirect command file in response to its prompt. You must type the at sign (@) as the first character following the prompt. If you do not include the file type, the default is .CMD. Nesting is permitted. The number of files you can nest depends on the amount of memory available. If a line in the indirect command file begins with a semicolon (;), PIP interprets the line as a comment and skips to the next line in the file.

PIP allows you to use the asterisk (*) and question mark (?) wildcard characters in input and output file specifications.

Informational Switch

/HELP

Prints a text message at your terminal that describes file specifications, switches, and options.

File Transfer Switches

/ACCESS

For disk input only, changes the file's last access date to the current date. If you do not specify this switch, PIP preserves the last access date.

/APPEND

/EXTEND

For disk output only, appends the input file to the output file (extends the output file). If no output file exists, PIP displays a warning message and creates the file.

/ASCII

Formatted ASCII transfer; PIP discards NULL characters, parity bits, and rub-out characters.

/BLOCK

Performs a block-by-block transfer with no data translation.

/BSIZE

For magnetic tape output only. PIP uses the physical block size specified by n (in bytes) for data written to the tape.

/CLUSTERSIZE:n

For disk only, sets the output file cluster size to n. You must place this switch adjacent to the output file specification. To use the RSTS/E automatic clustersize optimization feature, specify /CLUSTERSIZE:0. The specified cluster size cannot be less than the pack cluster size.

/IGNORE

/GO

Ignores ?Data error on device errors.

/MODE:n

Sets the mode n in which PIP opens the file. You must place this switch adjacent to the file specification.

/NEW

For disk output only, creates a new file with the current date of creation and access.

/NOATTRIBUTE

Transfers the file without writing attributes to the output file. No file or record conversion takes place (see /RMS for record conversion options).

/RETAIN

For disk output only, retains creation and access date of the input file.

/RTS:name

Sets the output file's run-time system name to that specified in name. If you omit the output file specification, PIP renames the input file's run-time system.

/NOSUPERSEDE

/NOS:NOWARN

/NOS:QUERY

/NOS:INSPECT

Displays an error message and ignores the operation if an output file already exists. If you include the :NOWARN option, PIP does not display the error message. The :QUERY and :INSPECT options are synonymous. They cause PIP to display the prompt "OK to replace file filespec?" if the output file already exists. Type Y, YE, or YES to replace the file.

/PROTECT

/PR:NOWARN

/PR:QUERY

/PR:INSPECT

Same as NOSUPERSEDE. DIGITAL recommends NOSUPERSEDE to avoid conflict with protection code option.

/UPDATE

Opens a pre-existing disk file and overwrites the existing data. If no file exists, PIP creates a new one.

Files with Attributes, Translation Switches

/RMS

For input disk files, translates RMS format to formatted ASCII or formatted binary. For output disk files, PIP translates formatted ASCII or formatted binary to RMS variable length records. For nondisk transfers, PIP's translation depends on current format. If you do not specify the /RMS switch for disk files, PIP performs no translation. You cannot apply the switch to both input and output files in the same command line.

/RMS:FA

For input or output files, specifies formatted ASCII in the translation.

/RMS:FB

For input or output files, specifies formatted binary in the translation.

/RMS:FTN

For input files, translates FORTRAN carriage control to formatted ASCII. For nondisk output files, translation is automatic.

/RMS:IM

For input files only, performs the same as /RMS but does not transfer attributes. However, PIP does remove RMS variable length header information.

/RMS:PRN

For input disk files, translates RMS print files to formatted ASCII.

Date Switches

/AFTER:dd-mmm-yy

Includes only files that were created after, but not on, the given date.

/BEFORE:dd-mmm-yy

Includes only files that were created before, but not on, the given date.

/CREATION

Uses the date of creation in file operations.

/DLA

For disk only, uses the date of last access in file operations.

/ON:dd-mmm-yy

Includes only files that were created on the given date.

/SINCE:dd-mmm-yy

Includes only files that were created on or after the given date.

/TODAY

Includes only files that were created on the current date.

/UNTIL:dd-mmm-yy

Includes only files that were created on or before the given date.

Size Switches

/EQ:n

Includes only files with size equal to n.

/GE:n

Includes only files with size greater than or equal to n.

/LE:n

Includes only files with size less than or equal to n.

You can combine the /LE and /GE switches to select files between a minimum and maximum size (inclusive). If you use any of these switches together with the directory switch argument :AL, files are selected based on allocated size.

File Operation Switches - General

/HALT

Halts a magnetic tape wildcard search as soon as it detects a file that does not match.

/INSPECT

/QUERY

Displays the file specifications (one at a time) that match a wildcard specification. If used in transfer or /DELETE operations, as each file specification is displayed, type Y (for Yes) to transfer or delete; type any other character to omit. Enter CTRL/Z to end the display and operation.

/IN:SLOW

Prints file name, type, file size, protection code, creation date, and last access date.

/LOG

/WATCH

Displays a report on all actions taken during execution. PIP prints the report at your terminal.

/NOLOG

Displays nothing for actions taken during execution.

/NOREWIND

/RW:NO

Does not rewind the magnetic tape before an input file search.

/VERSION

/IDENTIFY

Displays the program's current version number.

File Operation Switches - Deletion

/DELETE

For disk and DECTape only, deletes the specified file.

/DELETE:NO

Does not display an error message if the file to be deleted does not exist.

/ERASE
/WIPEOUT
/WO

For disk, overwrites the file with zeros before deletion. These switches are the same; you must use one of them in conjunction with the **/DELETE** switch.

File Operation Switch - Rename

/RENAME:option

For disk and DECtape only, renames the input file to that of the output file.

/RENAME:NO

Does not display an error message if you try to rename a file to the name of a file that already exists. The file is not renamed.

File Operation Switches - Zeroing

/ZERO

Zeros (initializes) the directory of an account or device or initializes the labels on a magnetic tape.

/ZERO/DENSITY:n

For magnetic tape only, sets the tape density before the zero operation.

/ZERO/PARITY:ODD

/ZERO/PARITY:EVEN

For magnetic tape only, sets the parity of the tape before the zero operation.

Privileged-Only Switches

/LOCK

The system locks PIP in memory for the duration of the current operation. Note that you cannot abbreviate **/LOCK**.

/PRIORITY

The system runs PIP at special priority for the duration of the current operation. Note that you cannot abbreviate **/PRIOR**.

File Operation Switches - Listing

/BRIEF

/FAST

Displays a brief directory listing.

/DIRECTORY

/LIST

/SLOW

Displays a full directory listing. The listing switches accept option specifications that modify the directory listing.

/MDELETE

Includes files that are marked for deletion in the directory listing.

PIP Directory Listing Options

:AL

Lists file name, type, and the number of blocks allocated to the file.

:CL

Lists file name, type, and file cluster size.

:DA

Lists file name, type, and file creation date.

:DI

Lists file name, type, size, protection code, creation date, and column headers.

:EX

Lists file name and type same as **:TY** (provided for compatibility with previous versions of RSTS/E).

:FU

Lists heading, file name, type, size, protection code, date of last access, date of creation, time of creation, cluster size, associated run-time system, file position, open status, and summary.

:HD

Includes column headers in the listing.

:LA

Lists file name, type, and date of last access or date of last write (depending on disk initialization).

:NA

Lists file name.

:OA

Lists file name, type, and octal representation of file attributes.

:PR

Lists file name, type, and protection code.

:RT

Lists file name, type, and associated run-time system.

:S

Lists all information.

:SA

:AT

Lists file name, type, symbolic file attributes, caching status, and backup status.

Caching is indicated by one of the following entries:

- **CACHE:ON:RAN**; file is automatically cached randomly when open.
- **CACHE:ON:SEQ**; file is automatically cached sequentially when open.
- **CACHE:OFF:SEQ**; file is not automatically cached, but if cached, it is cached sequentially.

Backup status is indicated by one of the following entries:

- **NOBACKUP** - the file data is not backed up; only the file attributes are backed up.
- **IGNORE** - the file is completely ignored for BACKUP purposes.

:SI

:SZ

Lists file name, type, and file size.

:SU

Lists only summary data to include number of designated files and total number of blocks occupied by designated files.

:TI

Lists file name, type, and date and time of creation.

:TY

Lists file name and type.

:W

Lists file name and type across the width of the page or screen.

:WI

Lists file name only across the width of the page or screen.

NOTE

The **:OA**, **:SA**, **:AT**, and **:S** options cause PIP to display file attributes in octal or symbolic representation.

PMDUMP

PMDUMP formats the contents of a postmortem dump into readable form and lets you copy it to a file on any RSTS/E device.

Privilege Required

- Read access to the input file
- Create/Rename access to the output file

To Run the Program

```
RUN AUXLIB$:PMDUMP
```

Format

```
outfil.typ=infil.typ
```

Usage Notes

Input and output file specifications are in the standard format.

If you press RETURN or LINE FEED in response to the prompt, PMDUMP applies the following defaults:

Device	SY:
account	The current account
file name	The input file name
type	.PMD for input, .LST for output

For PMDUMP to be successful in formatting the dump:

- The run-time system that controls your job must be RSX or RSX-based.
- The task to be dumped must have already aborted.
- You must request a postmortem dump with the /PM switch when you link the program with the Task Builder. The /PM switch causes the Task Builder to set an indicator in your executable program file. This means that, if your program terminates abnormally when it is executed, the system automatically writes the memory contents to a disk file.

SYSTAT

SYSTAT displays current system information about jobs, devices, disks, buffer status, run-time systems, resident libraries, and message receivers.

Privilege Required

- WREAD privilege to use the /O and /W switches to obtain information about open files
- SYSIO privilege to obtain status of temporary privileges for jobs
- TUNE privilege to obtain maximum size, priority, and run burst information about jobs

To Run the Program

```
RUN $SYSTAT
```

Usage Notes

At this point you can specify any RSTS/E device or a file specification for the status report output. Possible replies are:

Output Response	Meaning
RET	Displays report on your terminal. This is equivalent to KB: response.
LP:	Sends the report to the system line printer if only one line printer is on the system, or to line printer 0 if multiple line printers are on the system.
LPn:	Sends the report to line printer n if that printer is not currently in use.
KB:	Displays the report on your terminal. This is equivalent to pressing RETURN.
KBn:	Displays the report on terminal n in the system if that terminal is on line and not currently in use.
dev:filename.type	Writes the report to the file specified. The default device is the system device. No file type is appended unless specified.
?	Writes the report to a file on the public structure, and displays the file name on your terminal. SYSTAT names the file according to the current date and time of day; its type is .RPT.

NOTE

You can specify switches separately or in any combination. If you specify more than one switch, only one slash is required.

Switches

/A

Reports status of attached jobs only.

/B

Reports status of busy devices only.

/C

Reports memory allocation on system.

/D

Reports status of disk structure only.

/F

Reports status of free buffers only.

/Kn

Displays report on terminal n in the system.

/L

Reports status of resident libraries only.

/M

Reports status of message receivers only.

/n

Reports status of job n only.

/n,m

Reports status of account [n,m] only.

/n,*

Reports status of jobs having project number n only.

***,n**

Reports status of jobs having programmer number n only

NULL

Reports complete system status to include jobs, run-time systems, resident libraries, busy devices, disk structure, free buffers, and message receivers.

/O

/O[:dev:]

/O[:job]

/O[:dev:job]

Reports all nonsystem files that are open, on a specific device "dev:", by a specific job "job".

/W

/W[:dev:]

/W[:job]

/W[:dev:job]

Reports all nonsystem files that are open, on a specific device "dev:", by a specific job "job", along with the jobs accessing them, the block number being accessed, the blocks currently locked, and the use of special extend mode.

/R

Reports status of run-time system only.

/S

Reports status of jobs only.

/U

Reports status of detached jobs only.

/O,0

Reports status of jobs not logged into the system only.

Several of the DCL SHOW commands perform the same functions as many of the SYSTAT switches. The following list is a cross reference between the DCL SHOW commands and the equivalent SYSTAT switches:

DCL Command	SYSTAT Switches
SHOW BUFFERS	/F
SHOW DEVICE/ALLOCATED	/B
SHOW DISKS	/D
SHOW FILES/OPEN	/O, /W
SHOW JOB	/A, /S, /U
SHOW LIBRARY	/L
SHOW MEMORY	/C
SHOW RECEIVERS	/M
SHOW RUNTIME_SYSTEM	/R
SHOW USER	/A, /S, /U

The abbreviations listed in Table 4–3 appear in the full status report.

Table 4–3: Abbreviations for Full SYSTAT Report

Abbreviation	Meaning
	Job Status (State)
??	Job's state cannot be determined.
,	Job is not logged into the system.
^C	Job is in Ctrl/C state, awaiting input from the keyboard monitor.
BF	Job is waiting for buffers (no space is available for I/O buffers).
CR	Job is waiting for card reader input.
DB, DF, DK, DL, DM, DR, or DU	Job is waiting to perform disk I/O.
DET	Job is detached from all terminals.
DT	Job is waiting for DECTape I/O.
DX	Job is waiting for flexible diskette I/O.
FP	Job is waiting for file processing action by the system (opening or closing a file, file search).
HB	Job is detached and waiting to perform I/O to or from a terminal.
KB	Job is waiting for input from a terminal.
	KB _n * Job is waiting for input from a dialup terminal.
	KB _n ! Job is waiting for input from a LAT terminal.
	KB _n *! Job is waiting for input from a terminal dialed up into a LAT server.
	KB _n J _m Pseudo keyboard is being controlled by Job <i>n</i> , such as a batch job or a job that is set host to the system.
LP	Job is waiting to perform line printer output.
MM, MS, MT, or MU	Job is waiting for magnetic tape I/O.

Table 4-3 (Cont.): Abbreviations for Full SYSTAT Report

Abbreviation	Meaning
<hr/> Job Status (State) <hr/>	
PP	Job is waiting to perform output on the high-speed paper tape punch.
PR	Job is waiting for input from the high-speed paper tape reader.
RJ	Job is waiting for RJ2780 I/O.
RN	Job is running or waiting to run.
RS	Job is waiting for residency.
SL	Job is sleeping (SLEEP statement).
SR	Job is sleeping and is a message receiver.
TT	Job is waiting to perform output to a terminal.

The following status descriptions may appear after one or more of the other job state abbreviations:

Lck	Job is locked in memory for the current operation.
Nsw	Job has requested that it not be swapped from memory and cannot be swapped unless it requests additional memory.
Swi	Job is currently being swapped into memory.
Swo	Job is currently being swapped out of memory.
Xnn	Job is swapped out and occupies slot nn in swap file X; file is denoted by A,B,C, or D to represent files 0 through 3 of the swapping structure.

Busy Devices (Why)

ANSI	Magnetic tape is assigned with ANSI standard labeling format.
AS	Device is explicitly assigned to a job.
DOS	Magnetic tape is assigned with DOS labeling format.
OPEN	Device is open on a channel.

Table 4-3 (Cont.): Abbreviations for Full SYSTAT Report

Abbreviation	Meaning
	Disk Structure (Comments)
Dirty	Disk needs cleaning.
DLW	Date of last write (modify), rather than date of last access, is stored in file accounting entries.
DP	A "DB" or "DR" disk that is dual ported.
Job n	Private disk is assigned to job n.
Lck	Disk is in a locked state.
LDX	Disk's SAT is loaded.
NFF	New files on this disk are put at beginning of directory.
NFS	Disk is open as non-file-structured device.
PRI	Cartridge or pack is private.
PUB	Cartridge or pack is public.
R-O	Disk unit is read-only (write-locked).

Table 4-3 (Cont.): Abbreviations for Full SYSTAT Report

Abbreviation	Meaning
Run-time Systems and Resident Libraries (Comments)	
Addr:xxx	Denotes the starting address of the run-time system or library.
CSZ	Proper job image size (in K words) to run a program can be computed as $K\text{-size}=(\text{filesize}+3)/4$.
DF KBM	Run-time system is the default keyboard monitor.
EMT:yyy	Denotes the EMT code for special EMT prefix.
KBM	Run-time system can serve as keyboard monitor.
Loading	Run-time system or library is being loaded into memory.
Monitor	Denotes monitor RSX emulation.
NER	Errors occurring within run-time system or library will not be sent to system error log.
Non-Res	Run-time system or library is nonresident.
Perm	Run-time system or library will stay in memory when not being used.
Primary	Denotes the primary run-time system.
Rem	Run-time system or library will be removed from memory as soon as all its jobs switch to another run-time system or library.
R/W	Run-time system or library allows read/write access.
Temp	Run-time system or library will be removed from memory when not being used.
1US	Run-time system or library can serve only 1 user.

Table 4-3 (Cont.): Abbreviations for Full SYSTAT Report

Abbreviation	Meaning
Message Receivers (Access)	
Evt	Indicates the DECnet event logger.
Lcl	Local senders are allowed for this receiver ID.
Net	Network senders are allowed for this receiver ID.
One	User has indicated that job should handle only one network link.
Prv	Local senders must be privileged to send to this receiver ID.

The abbreviations listed in Table 4-4 appear in the open file reports.

Table 4-4: Abbreviations for Open File Reports

Abbreviation	Meaning
Open Files (Status)	
Ctg	File is contiguous.
MDL	File is marked for deletion.
NoK	File cannot be renamed or deleted.
None	No files are open on the disk.
Pla	File is placed.
System files only	Only swap files or run-time systems are open on the disk.
Tent	Tentative file.
UFD	File is a UFD-type entry.
Upd	File is open in UPDATE mode.

Table 4-4 (Cont.): Abbreviations for Open File Reports

Abbreviation	Meaning
Jobs Accessing Open Files (Access)	
Aex	File is open in mode 8.
Ca	File is open for user data caching.
Lock	File has an implicit lock.
Lock n+m	File has an explicit lock starting at block n plus m blocks in length.
NFS	File is non-file-structured.
Rd	User has read access to the file.
Rnd	File is open for random user data caching.
RR	File is open read regardless.
SpUp	File is open in special UPDATE mode.
Seq	File is open for sequential user data caching.
Tent	Tentative file.
UFD	File is a UFD-type entry.
Up	File is open for UPDATE.
Wr	User has write access to the file.

TALK

The TALK program allows you to communicate with other terminals on your system. You can send a message to a user's terminal or to the system console.

Privilege Required

Usually your system manager assigns a protection code of <232>, which permits all users to run TALK. However, your system manager can restrict the use of TALK by assigning a protection code of <124>. Check with your system manager to find out if you have access to TALK.

To Run the Program

```
RUN AUXLIB$:TALK
```

Usage Notes

After TALK displays the To which keyboard? prompt, type the number of the keyboard to which you want to send a message.

After you enter a keyboard number and press RETURN, TALK displays the following instructions:

Enter message below (CTRL/Z to end):

Message:

Enter as many message lines as you want.

Programming Information

This chapter provides the RSTS/E programming information.

RMSDES Utility Summary

The RMS-11 File Design Utility (RMSDES) allows you to design and create sequential, relative, and indexed files.

The command line for the RMSDES utility is:

DES filename[.typ] [type]

Table 5–1 lists the RMSDES attribute settings and commands.

Table 5–1: Attribute Settings

Section	Keyword	Attribute Keyword and Variable	Default
System		TARGET1 argument	
		argument must be one of:	
		RSX	User's system
		RSTS	
		VMS	
File		SOURCE	User's system
		FILE PLACEMENT1 logical	NO
		NAME string	FILE.DAT
		ORGANIZATION argument	

Table 5-1 (Cont.): Attribute Settings

Section	Keyword	Attribute Keyword and Variable	Default
		argument must be one of:	
		SEQUENTIAL	SEQUENTIAL
		RELATIVE	
		INDEXED	
		CLUSTER_SIZE number	0 blocks
		ALLOCATION number	0 blocks
		EXTENSION number	0 blocks
		BUCKET_SIZE number	1 block
		PROTECTION string	System protection
		OWNER string (RSX-11M/M PLUS only)	User's UIC
		MAGTAPE_BLOCK_SIZE number	512 bytes
		REWIND_MAGTAPE logical	NO
		MAX_RECORD_NUMBER number	0 records
		CONTIGUOUS logical	NO
		SUPERSEDE logical	NO
Record		SIZE number	0 bytes
		FORMAT argument	
		argument must be one of:	
		VARIABLE	VARIABLE
		STREAM	
		FIXED	
		VFC	
		CONTROL_FIELD_SIZE number	2 bytes
		BLOCK_SPAN logical	YES
		CARRIAGE_CONTROL argument	
		argument must be one of:	
		CARRIAGE_RETURN	NONE
		FORTRAN	
		PRINT	
		NONE	

Table 5–1 (Cont.): Attribute Settings

Section	Attribute Keyword and Variable	Default
Key n	NAME string	No name
	TYPE argument argument must be one of:	
	STRING	STRING
	BIN2	
	BIN4	
	INT2	
	INT4	
	DECIMAL	
	NULL_KEY logical	NO
	NULL_VALUE argument argument must be one of:	
	An ASCII character	' ' (space)
	A decimal number	
	DUPLICATES logical	NO (primary key) YES (alternate key)
	SEGN_POSITION3 number	Byte 0
	SEGN_LENGTH3 number	0 bytes
	SEGO_POSITION number	Byte 0
	CHANGES logical	YES (alternate key)
	DATA_FILL number	100%
	DATA_AREA number	Area 0
	INDEX_FILL number	100%
LEVEL1_INDEX_AREA number	Area 0	
INDEX_AREA number	Area 0	
Area n	ALLOCATION number	0 blocks
	EXTENSION number	0 blocks
	BUCKET_SIZE number	0 blocks
	CONTIGUOUS logical	NO
	POSITION argument	

Table 5-1 (Cont.): Attribute Settings

Section	Keyword	Attribute Keyword and Variable	Default
		argument must be one of:	
		NONE	NONE
		LOGICAL number	

Commands

CLEAR ALL

Restores all attribute values in all sections to their default values.

CLEAR section ALL

Restores all attribute values in the specified section to their default values.

CLEAR section attribute

Restores the specified attribute value in the specified section to its default value.

CREATE [filename[.typ]]

Creates an empty data file that has the attribute values specified in the design buffer. For indexed files in which areas are not defined, RMSDES prompts for whether areas are to be defined by default.

If you do not specify a file name and type, the file will have those specified in the design buffer. If you did not specify a file name and type in the design buffer, the file will be created as FILE.DAT.

Ctrl/Z

Terminates RMSDES without saving the design or creating an empty data file.

ESC

In response to any prompt, returns the RMSDES utility prompt and preserves all attribute values in the design buffer.

EXIT filename[.typ]

Stores the file design in the description file specified in the command line and terminates RMSDES. The default file type is .DES.

GET filename[.typ] [type]

Reads the file design specified in a description file, and sets the appropriate attribute values in the design buffer. Reads the attribute values of a data file, and sets the appropriate attribute values in the design buffer. The default file type is .DES. If the file is a data file, you must specify .DAT.

HELP

Lists all available help topics and gives instructions for displaying the text.

HELP command

Displays help text for the specified command.

HELP SECTIONS

Lists all available help topics for all sections and gives instructions for displaying the text.

HELP section

Displays help text for the specified section and lists all available help topics for all attributes in the specified section.

HELP section attribute

Displays help text for the specified attribute in the specified section.

?

Displays HELP text for the section, attribute, or value for which you are being prompted. Note also that you can type ? instead of HELP for any form of the HELP command.

QUIT

Terminates RMSDES, without storing the design or creating an empty data file.

SAVE filename[.typ]

Stores the file design in the description file specified in the command line. The default file type is .DES.

SET ALL

Prompts for setting all attribute values in all sections. For indexed files in which areas are not defined, prompts for whether areas are to be defined by default.

SET section ALL

Prompts for setting all attribute values in the specified section.

SET section attribute value

Sets the specified attribute value in the specified section.

SHOW ALL

Displays all attribute values in all sections.

SHOW section ALL

Displays all attribute values in the specified section.

SHOW section attribute

Displays the specified attribute value in the specified section.

SHOW ID

Identifies the current level and patch version of RMSDES.

RMSIFL Utility Summary

The RMS-11 Indexed File Load Utility (RMSIFL) reads records from an RMS-11 file of any organization and loads them into an indexed file.

The command line for the RMSIFL utility is:

`outfile[/switch...]=infile[/switch...]`

Type **HELP** or **?** for a help message.

Global Switch

/ID

Identifies the current version. The default is to provide no identification.

Output File Switches

/ER[:filespec]

Writes primary keys of exception records to your terminal if no filespec; or writes exception records to the specified file. The default is to write primary keys of exception records to your terminal.

/NOER[:S]

Stops processing if input record is incompatible. The default is to write primary keys of exception records to your terminal.

/LO

Honors bucket fill size. The default is to fill buckets to capacity.

/PD[:[#]x]

Pads input records to output record length. The default is to handle input records as exception records if the lengths differ.

/TR

Truncates input records to output record length. The default is to handle input records as exception records if the lengths differ.

Input File Switches

/CL:nnn

Sets sort work files cluster size.

/DE: dvn1:[dvn2:...dvn5:]

Reassigns devices for sort work files. The default is to create and use sort work files on SY:.

/KR:n

Uses key of reference number. The default is to use primary key (0).

/NOSO

Does not sort records before loading. The default is to sort records in the input file before loading.

RMSCNV Utility Summary

The RMS-11 File Conversion Utility (RMSCNV) reads records from an RMS-11 file of any organization and loads them into another RMS-11 file of any organization.

The command line for the RMSCNV utility has the format:

[outfile[/switch...]=]infile[/switch...]

Global Switches

/AP

Appends records to an existing sequential file. The default is to not append records.

/BL:[n]

Sets magnetic tape block size. The default is 512 bytes.

/CA:[filespec]

Creates an output file with the attributes of the existing input file.

/EO

Converts Ctrl/Z EOF character in an ASCII stream file to null and pads the file with nulls to the physical EOF. The default is to assume a null-filled stream file.

/FO:x

Sets output file organization, where **x** is S, R, or I. The default is S.

/ID

Identifies the current version. The default is to provide no identification.

/IM

Processes files in block mode. The default is to use standard RMS-11 access modes.

/KN:["]keyname["]

Reads an indexed file using the key of reference specified by **keyname**. The default is to use the primary key.

/KR:n

Reads an indexed file using the key of reference specified by **n**. The default is to use primary key (0).

/LO

Honors bucket fill size when filling buckets in an indexed file. The default is to fill buckets to capacity.

/MA

Uses mass-insertion mode and sequential PUT operations. The default is to use random PUT operations.

/ML:n

Explicitly sets limit of buffer allocation.

/PD:[#]["]x["]]

Pads input records to the output record length, if necessary. The default is to not pad records.

/SL[:filespec]

Provides summary listing to terminal or in file, if specified. The default is to not provide a summary.

/SU

Supersedes existing sequential file. The default is to not supersede existing files.

/TR

Truncates input records to output record length, if necessary. The default is to not truncate records.

/WF

Writes or read fixed-control area. The default is to ignore fixed-control area.

RMSDSP Utility Summary

The RMS-11 File Display Utility (RMSDSP) produces a concise description of any RMS-11 file, including backup files.

The command line for the RMSDSP utility has the format:

`[outfile=]infile[/switch...][,infile[/switch...]]...`

Global Switches

/BP

Lists contents of backup files. The default is to provide basic display only.

/FU

Provides detailed display for indexed files or backup files. The default is to provide basic display only.

/ID

Identifies the current version. The default is to provide no identification.

RMSBCK Utility Summary

The RMS-11 File Back-Up Utility (RMSBCK) transfers the contents of an RMS-11 file to another file, on another device, to maintain the file should the original file be lost or damaged.

The command line for the RMSBCK utility has the format:

`outfile[/switch...]=infile[/switch...][,infile[/switch...]]...`

Global Switches

/ID

Identifies the current version. The default is to provide no identification.

/[NO]QU

Enables or disables query mode. The default is to enable query mode.

/SL[:filespec]

Provides summary listing to terminal or in file, if specified. The default is to provide no summary.

Output File Switches

/RW

Rewinds magnetic tape before winding. The default is to not rewind magnetic tape.

/SU

Supersedes existing file. The default is to not supersede files.

Input File Switches

/CD:dd-mmm-yy[:v]

Backs up files based on creation date: specify *v* as A to back up all files created after the date specified or as B to back up all files created before the date specified. If *v* is not specified, all files created on the date specified will be backed up. The default is to perform no date checking.

/RD:dd-mmm-yy[:v]

Backs up files based on revision date: specify *v* as A to back up all files revised after the date specified or as B to back up all files revised before the date specified. If *v* is not specified, all files revised on the date specified will be backed up. The default is to perform no date checking.

RMSRST Utility Summary

The RMS-11 File Restoration Utility (RMSRST) restores files that were backed up using RMSBCK and produces standard RMS-11 files as output, so your programs can access them.

The command line for the RMSRST utility has the format:

```
outfile[/switch...]=infile[/switch...][,infile[/switch...]]...
```

Global Switches

/ID

Identifies the current version. The default is to provide no identification.

/[NO]QU

Enables or disables query mode. The default is to enable query mode.

/SL[:filespec]

Provides summary listing to terminal or in file, if specified. The default is to provide no summary.

Output File Switches

/FR

Changes protection code. The default is to use the original protection.

/SU

Supersedes existing files. The default is to not supersede existing files.

Input File Switches

/BD:dd-mmm-yy

Restores disk files based on backup date. The default is to perform no date checking.

/OA:[p,pn]

Restores files based on original account (PPN). Note that in this case, the square brackets are required syntax. The default is to apply no account criterion.

/SE:filespec or

/SE:(filespec1,filespec2[,...,filespec10])

Restores specified files from container file. The default is to restore all files on the container file.

BASIC-PLUS

The following sections summarize information about BASIC-PLUS commands, statements, statement modifiers, variable types, functions, relational operators, data storage, keywords, and the BASIC-PLUS Cross-Reference Program.

Commands

This section describes BASIC-PLUS commands. Following each command format is a brief description of the command function and where appropriate, an example. See the *RSTS/E System User's Guide* for additional information about the commands marked with an asterisk. See the *BASIC-PLUS Language Manual* for additional information about the commands not marked with an asterisk (*).

APPEND [filespec]

Merges the lines from the saved source, overwriting any lines that exist in the current program.

```
APPEND DM0:[12,12]PROG1.V2
```

ASSIGN [dev]:[(proj,prog)] [logical name]

Reserves an I/O device for use by a job. You can also use ASSIGN to assign a logical name to a device, assign an account to the @ character, or set the default protection code. ASSIGN can also accept extended user logical names.

```
ASSIGN MT0:  
ASSIGN (200,200)  
ASSIGN DL3:[1,3] FOOBAR
```

BYE

You can use BYE as a system command only if the system manager has installed it as a system command.

After you type BYE, press RETURN, and answer Y to the confirm prompt, the system logs you out and closes any open files. If you have defined BYE to be LOGOUT, the system logs you out without displaying the confirm prompt.

BYE

CATALOG [dev:][(proj,prog)]

Displays a directory of your files. The default device is the system disk, but you can specify another device or account in the CATALOG command line.

CATALOG DR3: [5,214]

CCONT

Continues execution of the current program after execution of a STOP statement but detaches the job from the terminal. Requires the JOBCTL privilege.

CCONT

COMPILE [filespec]

Saves a translated image of the current program in a disk file. The default file name is the current program name; the default file type is .BAC.

COMPILE DL1: [3,200]PROG1/PROT:40

CONT

Continues execution of the current program after execution of a STOP statement.

CONT

DEASSIGN [dev:][(proj,prog)] [logical name]

Releases a device for use by other jobs. DEASSIGN also releases a logical name for a device, cancels the association between an account and the @ character, and changes the current default protection code back to the system default. The system performs an automatic DEASSIGN when you log out.

DEASSIGN MTO:
DEASSIGN (200,200)

DELETE [line number(s)]

Removes one or more lines from the program in memory. Enter the **DELETE** command followed by the line number to delete the specified line, or a range of line numbers separated by a hyphen (-) to delete two or more lines. You can specify several single lines or ranges of lines by using commas to separate the line numbers or line number ranges. Typing **DELETE** with no line numbers deletes all lines from the current program.

```
DELETE 0-200,500
```

EXIT

Clears memory and returns control to the job keyboard monitor.

```
EXIT
```

EXTEND

Puts **BASIC-PLUS** in **EXTEND** mode. You can write and run programs that include **EXTEND** mode features. However, the format requirements for your program are more stringent in **EXTEND** mode than in **NOEXTEND** mode. See the *BASIC-PLUS Language Manual* for more information.

```
EXTEND
```

HELLO [(proj,prog)]

You can use **BYE** as a system command only if the system manager has installed it as a system command.

Informs **RSTS/E** that you want to log in. If you do not specify a project-programmer number, the system prompts you for one. You can also use **HELLO** to attach a detached job to your terminal or to change accounts without logging out.

```
HELLO [5,214]
```

KILL <string>

Deletes the file specified by <string>. You must enclose the file specification within quotation marks.

```
KILL "DR3:[5,200]JUNK.MAI"
```

LENGTH

Returns the length of your current program, in 1K increments, and the maximum program size allowed.

`LENGTH`

LIST [line number(s)]

Displays all or part of the program currently in memory. LIST by itself displays your entire program. LIST followed by one line number displays that line; LIST followed by two line numbers separated by a hyphen (-) displays a range of lines. You can display several single lines or ranges of lines by using commas to separate the line numbers or line number ranges.

`LIST 0-200,500`

LISTNH [line number(s)]

Same as LIST, but does not print the header.

`LISTNH 0-200`

NEW [file name]

Clears your memory area, names a new program, and lets you enter a new program at the terminal. The default program name is NONAME.

`NEW GETCHR`

NOEXTEND

Sets BASIC-PLUS to the NOEXTEND mode. In NOEXTEND mode, EXTEND features are no longer available unless the program contains an EXTEND statement.

`NOEXTEND`

OLD [filespec]

Retrieves a saved source program from disk and places it in memory. By default, OLD retrieves NONAME.BAS from your account on the public structure.

`OLD GETCHR.BAS`

REASSIGN dev:job number

Transfers control of a device to another job. When REASSIGN transfers control of the device to another job, it also prevents a third job from gaining control of that device.

```
REASSIGN KB:23
```

RENAME file name

Changes the name of the program currently in memory to the name that you specify.

```
RENAME GETLIN
```

REPLACE [filespec]

Copies the source program currently in memory onto a disk file. The default file name is the current program name and the default file type is .BAS. Unlike the SAVE command, REPLACE overwrites an existing file having the same name.

```
REPLACE NONAME.BAS
```

RUN [filespec]

Executes the program in memory. If you include a file specification, the system deletes the current program in memory, loads the specified file from disk, translates it if necessary, and executes it.

```
RUN DML:[200,233]TAXES
```

RUNNH

Executes the program in memory without printing the header, which contains the program name and current date and time. You can use RUNNH to run the current program only.

```
RUNNH
```

SAVE [filespec]

Copies the source program currently in memory onto a disk file. The default file name is the current program name and the default file type is .BAS. SAVE does not replace an existing file having the same name.

```
SAVE TAXES.BAS
```

SCALE [n]

Sets the scale factor to the value specified by n. When you do not specify n, SCALE displays the current and pending scale factors.

```
SCALE 6
```

UNSAVE [filespec]

Deletes a file from a directory. The default file name is your current program name; the default file type is .BAS.

```
UNSAVE TAXES.BAS
```

Statements

This section describes BASIC-PLUS statements. After each statement format is a brief description of what the statement does, followed by examples of how to use the statement.

![comments]

Documents what your program does. BASIC-PLUS prints your comments when you list your source file, but they do not affect your program's execution. See the REM statement.

```
100 !This is a comment
150 PRINT !Perform a CR/LF
2000 GOTO 32767 IF END.OF.FILE% ! Quit if all done &
\ PRINT 'End Pass' N% ! Else log another pass &
\ GOTO 1000 ! and start a new one
```

CHAIN <string> [[LINE]<line number>]

Transfers control from one BASIC-PLUS program to another.

```
100 CHAIN "PROG3" LINE 75% ! Enter PROG3 at line 75
```

CHANGE

CHANGE { <array name> } TO { <string variable> }
CHANGE { <string variable> } TO { <array name> }

Converts a list of numeric values to an ASCII string or an ASCII string to a list of numeric values.

```
300 CHANGE X% TO X$ ! Array X%() to string X$
450 CHANGE V$ TO V% ! String V$ to array V%()
```

CLOSE [#]<expression>[,[#]<expression>,...]

Terminates I/O between a BASIC-PLUS program and a peripheral device or file.

```
780 CLOSE #2% ! Close a single channel
800 CLOSE #2%, #3% ! Close two channels
900 CLOSE #-CHAN% ! Close without writing buffer to file
910 CLOSE #-CHAN% ! or delete a tentative file
950 CLOSE #I% FOR I% = 1% TO 12% ! Close all channels
```

DATA <value list>

Stores data for input by the READ statement.

```
1300 DATA 4.3, "STRING", 10, 1000, 1.45E9
```

DEF*FN<variable(arguments)>=<expression (arguments)>

Defines a single line of instructions to be a function. After you define a function, you can use that function as you use BASIC-PLUS-defined functions.

```
120 DEF* FNRMS(X,Y,Z) = SQR(X**2% + Y**2% + Z**2%) ! Define &
\ ! root-mean-square
```

DEF* FN <variable(arguments)> <statements> [LET]FN <variable> = <expression> FNEND

Defines multiple lines of instructions to be a function. After you define a function, you can use that function as you use BASIC-PLUS-defined functions.

```
300 DEF* FNF(M%) ! Factorial function
310 IF M% = 0% OR M% = 1% &
\ THEN FNF = 1% ! Handle terminal cases &
\ ELSE FNF = M%*FNF(M% - 1%) ! Handle others by recursion
320 FNEND
```

NOTE

BASIC-PLUS supports both DEF and DEF* in single and multiline functions for compatibility with earlier versions. Use DEF* for compatibility with BASIC-PLUS-2.

DIM <variable(dim(s))>[,<variable(dim(s))>,...]

Specifies the size of an array.

```
30 DIM A(20%), B$(6%,5%), C%(99%) ! Real, string (2-dim), &
\                               ! integer arrays
```

DIM #<constant>,<stringvar(dim(s))>[=<constant>] [,<var(dim(s))>,...]

Specifies the size of a matrix of data in a virtual array.

```
70 DIM #4, A$(100)=32%, B(50,50), C%(30) ! 3 virtual arrays on &
\                                       ! channel #4%
```

END

Closes all open I/O channels and halts program execution.

```
32767 END
```

EXTEND

Puts your program into **EXTEND** mode until the program completes its run or until the program encounters a **NOEXTEND** statement.

```
10 EXTEND ! Set EXTEND mode for following statements
```

FIELD #<exp>, <exp1> AS <string var1>[,<exp2> AS <string var2>,...]

Dynamically associates string variables with parts of an I/O buffer.

```
700 FIELD #2%, 10% AS A$, 20% AS B$, 5% AS C$ ! Define first 35 &
\                                             ! bytes as 3 strings
```

FOR <variable> = <exp> TO <exp> [STEP <exp>]

Signifies the beginning of a **FOR-NEXT** loop.

```
200 FOR I% = 2% TO 40% STEP 2% ! For I% = 2%,4%,6%...40% &
\   GOSUB 10000                ! This statement executes 20 times &
\   NEXT I%                    ! and I% is left equal to 40%
300 FOR I% = 1% TO 40% STEP 2% ! For I% = 1%,3%,5%...39% &
\   GOSUB 10000                ! This statement executes 20 times &
\   NEXT I%                    ! and I% is left equal to 39%
400 FOR N = A TO (C+S1)/A      ! Expressions can be &
\   GOSUB 10000                ! more than single terms &
\   NEXT N
```

NOTE

Implied FOR loops use less memory and execute faster than FOR-NEXT loops. The following statements compare an implied FOR-NEXT loop with an explicit FOR-NEXT loop:

```
10 R = R ^ 2% FOR I% = 1% TO 10 % ! Implied FOR loop
```

versus

```
10 FOR I% = 1% TO 10% ! A full FOR-NEXT loop &  
\ R = R ^ 2%           ! that is larger and slower  
\ NEXT I%              ! than the implied FOR loop
```

See "Statement Modifiers" for more information.

FOR

FOR <variable> = <expression> [STEP <expression>] { WHILE UNTIL } <condition>

Executes a loop while the condition that you specify is true, or until the condition that you specify is true, depending on whether you use WHILE or UNTIL.

```
450 FOR I = 1. STEP 3. WHILE I < 12 ! For I = 1, 4, 7, 10 &  
\ GOSUB 10000                       ! Executes 4 times &  
\ NEXT I                             ! and I equals 13  
470 J = 0                             ! Clear work variable &  
\ FOR I = 1. STEP 3. UNTIL J > 20 ! For I = 1, 4, 7, 10 &  
\ J = J + I                          ! Executes 4 times &  
\ NEXT I                             ! and I equals 13, J equals 22
```

NOTE

Implied FOR-WHILE and FOR-UNTIL loops use less memory and execute faster. The following examples show an implied FOR-WHILE loop and an implied FOR-UNTIL loop:

```
450 GOSUB 10000 FOR I = 1. STEP 3. WHILE I < 12 ! FOR-WHILE
```

```
470 J = J + 1 FOR I = 1. STEP 3. UNTIL J > 20 ! FOR-UNTIL
```

See "Statement Modifiers" for more information.

GET

GET<exp>, [{ **BLOCK** <exp>
RECORD <exp> } ,**COUNT** <exp>,**USING** <exp>]

Reads the next sequential block from the file opened on the channel designated by the first expression when used without the **BLOCK** or **RECORD** option. Accesses a specific record or block when used with the **BLOCK** or **RECORD** option.

```
120 GET #9%           ! Sequential read on channel 9
140 GET #2%, BLOCK 99. ! Read block 99 (record 99) on channel 4
180 GET #4%, RECORD 50%
200 GET #5% + SWAP%(3%), BLOCK 30% ! Read block 30 from channel &
\   ! 5 into channel 3's buffer. BLOCK is a real number and &
\   ! RECORD is an integer.
```

GOSUB <line number>

Transfers control to a subroutine beginning at the line number you specify. When the subroutine finishes, by encountering a **RETURN** statement, control returns to the statement following the **GOSUB** statement.

```
190 GOSUB 2000 ! Perform the subroutine beginning at line 2000 &
\             ! and then return to the statement following GOSUB
```

GOTO <line number>

Transfers control to a specific line number, with no return expected.

```
100 GOTO 150 ! Transfer control to line 150, with no &
\           ! return expected
```

IF

IF <condition> { **THEN** <statement>
THEN <line number>
GOTO <line number> }

Executes a statement or transfers control to another line if the condition you specify is true.

```
50 IF A > B OR B > C THEN PRINT "No" ! Two "conditions" tested
60 IF FNA(R) = B THEN 250             ! same as THEN GOTO 250
75 IF L < X^2% AND L <> 0. GOTO 1000 ! same as THEN GOTO 1000
90 IF TEST% THEN GOTO 300             ! if nonzero, GOTO 300
100 IF LEN(RESPONSE$) THEN PRINT "OK" ! if not null, Print "OK"
```

IF

**IF <condition> { THEN <statement>
THEN <line number> } [ELSE <statement>
GOTO <line number>]**

Executes a statement or transfers control to another line if the condition you specify is true, or executes another statement if the condition you specify is false.

```
200 IF B = A THEN PRINT 'EQUAL' ELSE PRINT 'NOT EQUAL' &  
  \ ! IF-THEN-ELSE <statement>  
220 IF B = A THEN 1000 ELSE 300 ! IF-THEN-ELSE <line number>  
230 IF B = A GOTO 2000 ELSE PRINT 'B does not equal A' &  
  \ ! IF-GOTO-ELSE
```

INPUT [#<expression>,<variable list>

Provides data to a program while the program is executing. The data can come from a device or file, depending on what you specify.

```
100 INPUT A$  
200 INPUT "Enter your name";A$  
300 INPUT #1%, ITEM$, PART
```

INPUT LINE [#<expression>,<string variable>

Accepts a line of data as a single character string, including embedded spaces and punctuation. This is different from normal string input, where the comma, apostrophe, and single and double quotation marks have special meanings.

```
300 INPUT LINE R$  
400 INPUT LINE #8%, CUSTOMER$
```

KILL "<string>"

Deletes the file specification you specify in <string>. You must enclose the file specification within quotation marks.

```
100 KILL 'OLD.DAT'
```

[LET] <variable(s)> = <expression>

Assigns a value to each variable.

```
110 LET A% = 40%  
120 B = 22.  
130 C, F1, V(0) = 0 ! Multiple assignment
```

LSET <string var>[,<string var>,...] = <string>

Stores values in the variables without moving them from the I/O buffer. If the new string is shorter than an existing string, LSET pads the string with spaces on the right.

```
100 LSET B$ = 'XYZ'
```

{ZER} MAT <matrix name> = {CON} [(dim(s))] {IDN}

Creates initial values for matrix elements.

```
100 DIM B(15,10), A(10), C%(5)
120 MAT C% = CON
130 MAT B% = IDN(10,10)
140 MAT B% = ZER(N,M)
```

MAT INPUT [#<expression>,] <list of matrices>

Accepts as input the value of each matrix element.

```
120 DIM B$(40), F1%(35)
150 OPEN "DB2:MAT2.DAT" FOR INPUT AS FILE #3%
180 MAT INPUT #3%, B$, F1%
```

MAT PRINT

MAT PRINT [#<expression>,] <matrix name> $\left\{ \begin{array}{l} [i] \\ [j] \end{array} \right\}$

Prints each element of a one- or two-dimensional matrix, except elements in row 0 and column 0.

```
150 DIM A(20), B%(15,30)
200 MAT PRINT A,          ! Print 20 elements, five on each line
250 MAT PRINT B%(10,25); ! Print 10-by-25 subset of B%, packed
300 MAT PRINT #2%, A;    ! Print on channel 2
```

MAT READ <list of matrices>

Reads values into all matrix elements from DATA statements.

```
100 DIM A(20), B$(32), C%(15,10)
200 MAT READ A, B$(25), C%
```

NAME <string> AS <string>

Renames or assigns protection codes to a disk file.

```
100 NAME "NONAME" AS "FILE1.DAT/PR:40"  
200 NAME 'DL1:MATRIX.DAT' AS 'MATA1.DAT<48>'
```

NEXT [<variable>]

Signals the end of a loop that begins with FOR, UNTIL, or WHILE.

```
100 NEXT I% ! NEXT with a variable closes out the  
200 NEXT N ! FOR with that variable.  
300 NEXT ! NEXT by itself closes UNTIL-NEXT or WHILE-NEXT loop
```

See the note under the FOR statement.

NOEXTEND

Puts your program into NOEXTEND mode until the program completes its run or until the program encounters an EXTEND statement.

```
10 NOEXTEND ! Set NOEXTEND mode for following statements
```

ON ERROR GOTO [<line number>]

Specifies the point in your program that assumes control when an error occurs.

```
100 ON ERROR GOTO 19000 ! Indicates errors handled at line 19000  
110 ON ERROR GOTO 0 ! Disables error-handling routine
```

ON <expression> GOSUB <list of line numbers>

Transfers control to a subroutine beginning at one of several line numbers, depending on the integer value of the expression.

```
230 ON X% - Y% GOSUB 2000, 2400, 3000 ! If X% - Y% = 1, then &  
\ ! control goes to the subroutine beginning at line 2000. &  
\ ! If X% - Y% = 2, then control goes to line 2400, and so forth.
```

ON <expression> GOTO <list of line numbers>

Transfers control to one of several line numbers, depending on the integer value of the expression.

```
150 ON X% GOTO 170, 570, 430, 300 ! IF X%=1, then control goes &  
\ ! to line 170. If X%=2, then control goes to line 570, and so &  
\ ! forth.
```

OPEN

OPEN <string> [{ **FOR INPUT** }] **AS FILE**[#]<expression>
[,**RECORDSIZE** <exp>][,**CLUSTERSIZE** <exp>] [, **FILESIZE**
<exp>][,**MODE** <exp>]

Associates a file or device with an I/O channel number.

```
100 OPEN 'LP:' FOR OUTPUT AS FILE #81%
200 OPEN "FOO.DAT" AS FILE #3%
300 OPEN 'DM1:DATA.TR' FOR INPUT AS FILE #10%, RECORDSIZE 1024%
```

PRINT [#<expression>,) <list>]

Prints numeric or string data at your terminal or writes formatted ASCII output to a disk file or other device.

```
130 PRINT ! Produces CR/LF
140 PRINT "Beginning of output: "; I, A*I
150 PRINT #2%, 'OUTPUT TO DEVICE'; N%
160 PRINT "Title: "; TITLE$, "Ref #"; R$
```

PRINT [#<expression>,) **USING** <string>, <list>

Tailors the output format. The PRINT USING control characters are:

For string data:

!

Prints the first character of the specified string.

\

Prints two plus the number of characters indicated by the spaces between the backslashes.

For numeric data:

#

Prints a digit for each number sign indicated. Rounding (not truncation) is performed as necessary.

,

Prints a comma before every third digit to the left of the decimal point.

.

Prints a decimal point in the position you indicate.

\$\$

Prints a dollar sign immediately before the first digit of the number. Also provides for the printing of one additional digit in the number.

**

Prints asterisks in the unused spaces to the left of the number. Also acts as additional number characters (#).

-

Prints the sign of negative numbers after the number when you end your numeric format field with a minus sign.

^

Prints the number in E notation for floating point numbers.

```
550 PRINT USING '##.##',AA
700 PRINT #7%, USING B$, A,B,C
```

PUT #

PUT #<exp>, [{ BLOCK <exp> }] [,COUNT <exp>] [,USING <exp>]

Writes the contents of the I/O buffer for the I/O channel into the next sequential file block. The PUT statement writes a single block on the device. For disk files, one PUT statement writes multiple disk blocks when you use the RECORDSIZE option in the OPEN statement to increase the I/O buffer size.

```
390 PUT #1%, COUNT 80% ! Note that BLOCK is a real number and &
\ ! RECORD is an integer.
```

RANDOM[IZE]

Provides different random numbers every time you run a program. Place the **RANDOMIZE** statement before the first **RND** function in the program.

```
40 RANDOMIZE
100 RANDOM
```

READ <variable list>

Reads values included in a **DATA** statement and stores those values in the corresponding variables of the **READ** statement.

```
100 READ A, B$, F1%, B(1%), R2
```

REM <message>

Informs **BASIC-PLUS** that <message> is a comment, which does not affect program execution.

```
100 REM - This program plays solitaire
```

RESTORE

Recycles data contained in **DATA** statements. After you use **RESTORE**, the next **READ** statement reads the data contained in the **DATA** statement having the lowest line number.

```
100 RESTORE
```

RESUME [<line number>]

Ends an error handling routine and transfers program control to the line number in which the error occurred, or optionally to a specified line number.

```
1000 RESUME 0      ! Resume at line where error occurred
2000 RESUME       ! Equivalent to RESUME 0
3000 RESUME 200   ! Resume at line 200
```

RETURN

Ends a subroutine and transfers program control to the statement following the last **ON GOSUB** or **GOSUB** statement executed.

```
375 RETURN
```

RSET <string var>[,<string var>,...] = <string>

Stores values in the specified variables without moving the values from the I/O buffer. If the new string is shorter than the existing string, RSET pads the string with spaces on the left.

```
250 RSET C$ = "12345"
```

SLEEP <expression>

Suspends program execution for the specified number of seconds.

```
260 SLEEP 20% ! Suspend job for 20 seconds
```

STOP

Halts program execution but does not close I/O channels.

```
180 STOP
```

UNLOCK #<expression>

Releases the lock that an opened file, in update mode (MODE 1%), places on accessed blocks.

```
500 UNLOCK #5%
```

UNTIL <condition>

Begins an UNTIL loop.

```
100 UNTIL LEN(A$) > 0%  
110 NEXT  
200 PRINT "Thanks for the response!"
```

WAIT <expression>

Sets a maximum period BASIC-PLUS waits for input from your terminal. If you do not type a delimiter (RETURN, LINE FEED, ESCAPE, or FORM FEED) within the specified number of seconds, program execution continues and BASIC-PLUS displays the error message ?Keyboard WAIT exhausted.

```
520 WAIT 60% ! Wait 60 seconds for response to INPUT statement  
530 INPUT Name$
```

WHILE <condition>

Begins a WHILE loop.

```
30 WHILE X < Y
40 PRINT "X IS LESS THAN Y"
50 X=X+1
60 NEXT
```

Statement Modifiers

This section describes BASIC-PLUS statement modifiers. After each statement modifier format is a brief description of what the statement modifier does, followed by examples of how to use the statement modifier.

<statement> FOR <var>=<exp> TO <exp> [STEP <exp>]
[{ WHILE } <condition>]
[{ UNTIL }]

Creates an implied FOR loop.

```
175 LET B$(I%) = C$(I%) FOR I% = 1% TO J1%
190 READ A(I%) FOR I% = 0% TO 20% STEP J%
```

<statement> IF <condition>

Executes a statement if the condition you specify is true.

```
100 PRINT T% IF T% > T1% ! Prints T% only if T% is greater than T1%
```

<statement> UNLESS <condition>

Executes a statement if the condition you specify is false.

```
350 PRINT A$ UNLESS Y% < 0% ! Prints A$ only if Y% &
\ ! is greater than 0%
```

<statement> UNTIL <condition>

Executes a statement repeatedly, until the condition you specify is true.

```
1080 X=X+1 UNTIL X<>SQR(X**2%) ! Increments X by 1 until X &
\ ! is not equal to the square root of X squared.
1200 PRINT X
```

<statement> WHILE <condition>

Executes a statement repeatedly, while the condition you specify is true.

```
230 LET A(I%) = FN(X(I%)) WHILE A < 45.5 ! Sets the value of A(I%) &
\ ! to FN(X(I%)) while A is less than 45.5
```

Variable Types

Table 5-2 describes BASIC-PLUS variable types. In EXTEND mode, a variable name can consist of a letter followed by 0 to 29 additional characters, each of which can be a letter, a digit, or a period. In NOEXTEND mode, a variable name can consist of a letter, optionally followed by a single digit.

Table 5-2: Variable Types

Type	Variable Name	Examples
Floating-Point	A variable name with no suffix.	A I X3 Year.End
Integer	Any variable name followed by a % character.	B%, D%, End.Of.File%
Character String	Any variable name followed by a \$ character.	M\$, R1\$, Last.Name\$
Floating-Point Array	Any floating-point variable name followed by one or two dimension numbers in parentheses.	S(4%) V8(3%,3%) Year.End(12%)
Integer Array	Any integer variable name followed by one or two dimension numbers in parentheses.	A%(2%), R2%(2%,1%), Units%(912%)
Character String Array	Any string variable name followed by one or two dimension numbers in parentheses.	C\$(1%), V1\$(4%,2%), Zodiac\$(12%)

Functions

This section describes BASIC-PLUS-defined functions. After each function format is a brief description of what the function does, followed by examples of how to use the function.

ABS(X)

Returns the absolute value of X.

```
100 Y%=ABS(-4) ! Y% equals the absolute value of -4, which is 4
```

ASCII(A\$)

Returns the ASCII value of the first character in string A\$.

```
90 A$='ABCDE'  
100 Y%=ASCII(A$) ! Y% equals the ASCII value for A, which is 65%
```

ATN(X)

Returns the arc tangent (in radians) of X.

```
150 Y=ATN(1.) ! Y= the arc tangent of one, which is (PI/2)
```

BUFSIZ(N%)

Returns the buffer size, in bytes, of the file or device open on channel N%. Returns zero if the channel is not open.

```
50 Y%=BUFSIZ(1%) ! Y% equals the buffer size of the device or &  
\ ! file on channel 1%
```

CCPOS(X%)

Returns the current position of the print head for I/O channel X%. Channel 0% is your terminal. CCPOS counts characters but does not keep track of ESC sequences for different terminal types.

```
100 PRINT IF CCPOS(0%)<>0 ! If the print head on the terminal &  
\ ! isn't already at the left hand margin, print a RETURN/LINE &  
\ ! FEED to put it there
```

CHR\$(X%)

Returns the character corresponding to ASCII value X%.

```
100 Y$=CHR$(65%) ! Y$ equals the character that has ASCII value &  
\ ! 65, which is uppercase A.
```

COMP%(A\$,B\$)

Returns the relative value representing the result of an arithmetic comparison between numeric strings A\$ and B\$. Returns is -1% for A\$<B\$, 0% for A\$=B\$, and 1% for A\$>B\$.

```
190 A$='20'  
195 B$='10'  
200 T%=COMP%(A$,B$) ! T% equals 1%, because A$ is arithmetically &  
  \                   ! greater than B$
```

COS(X)

Returns the cosine (in radians) of X.

```
100 PRINT COS(PI/4) ! Prints the cosine of (PI/4), which is &  
  \                   ! .707107
```

CVT%\$(I%)

Maps an integer into a two-character string.

```
100 PRINT CVT%$(16706) ! Prints AB, which is the two-character &  
  \                   ! string equivalent to the integer 16706%
```

CVT\$(A\$)

Maps the first two characters of A\$ into an integer.

```
100 PRINT CVT$('ABCD') ! Prints 16706, which is the integer $  
  \                   ! equivalent of the first two characters  
  \                   ! AB.
```

CVTF\$(X)

Depending on the math package on your system supports, maps a floating-point number into a four- or eight-character string.

```
200 FIELD #8%, 2% AS U$, 2% AS CL$, 4% AS X$, 4% AS Y$  
210 LSET U$ = CVT%$(U%) ! Stores two integers (U% and CL%) and  
220 LSET X$ = CVTF$(X) ! two floating-point numbers (X and Y) in  
230 LSET Y$ = CVTF$(Y) ! the I/O buffer for channel 8
```

CVT\$(A\$)

Depending on the math package your system supports, maps the first four or eight characters of A\$ into a floating-point number.

```
220 LET U% = CVT$(U$)
230 LET CL% = CVT$(CL$) ! Retrieves data from the I/O buffer by
240 LET X = CVT$(X$) ! converting it from string to numeric
250 LET Y = CVT$(Y$) ! form
```

CVT\$(A\$,I%)

Converts string A\$, depending on the value of I%.

```
100 A$ = 'abcde'
110 PRINT CVT$(A$,32%) ! Prints ABCDE
```

Table 5-3 lists the values for the CVT\$ function.

Table 5-3: I% Values for CVT\$ Function

I%	Effect
1	Trim the 8th bit.
2	Discard spaces and tabs.
4	Discard RET, LF, FF, ESC, DEL, and fill or null characters.
8	Discard leading spaces and tabs.
16	Reduce spaces and tabs to one space.
32	Convert lowercase to uppercase.
64	Convert square brackets to parentheses. For example, "[" to "(" and "] " to ") ".
128	Discard trailing spaces and tabs.
256	Prevent alteration of characters inside single or double quotation marks, except parity bit trimming.

DATE\$(N%)

Returns the date string corresponding to the specified calendar date N%. To determine the value of N% given a particular day of the year and the year, use this formula:

$N\% = (\text{day of year}) + [(\text{number of years since 1970}) * 1000]$.

For example, the value of N% for June 14, 1989 is:

$N\% = (165) + (19 * 1000) = 165 + 19000 = 19165$

DATE\$(19165%) returns 14-Jun-89. If your system default is the numeric date format, DATE\$(19165%) returns 89.06.14.

```
2000 PRINT "The date is ";
2010 PRINT DATE$(19365%) ! Prints 31-Dec-89
```

DATE\$(0%)

Returns the current date in one of two formats: for example, 09-Apr-89 or 89.04.09, depending on the date format your system supports.

```
100 PRINT DATE$(0%) ! Prints the current date
```

DET

Returns the determinant of X after an INV(X) operation.

```
100 DIM M(15,25), N(5,10), X(5,5)
110 MAT N=INV(X)
120 PRINT "DETERMINANT OF MATRIX X IS"; DET
```

DIF\$(A\$,B\$)

Returns the numeric string equal to the arithmetic difference of A\$ and B\$ (A\$ - B\$).

```
110 PRINT DIF$('5', '3') ! Prints the numeric string 2
```

ERL

Returns the line number at which the last error occurred, if an ON ERROR GOTO statement appears in the program.

```
120 PRINT ERL ! Prints line number at which the last error &
\           ! occurred
```

ERR

Returns the value associated with the last error encountered, if an ON ERROR GOTO statement was active.

```
1000 PRINT ERR ! Prints numeric value of last error
```

EXP(X)

Returns the value of the mathematical constant "e" (2.71828) raised to the Xth power.

```
200 Y=EXP(3.5)
```

FIX(X)

Returns the integer part of X, discarding any fractional part.

```
100 PRINT FIX(-3.14) ! PRINTS -3*
```

INSTR(N1%,A\$,B\$)

Performs a search for substring B\$ within string A\$, beginning at character position N1%. Returns the character position of B\$ if B\$ is in A\$. Returns 0 if B\$ is not in A\$. N1% is measured from the left end of A\$.

```
2000 PRINT INSTR(3%,'ABCDEABCDE','B') ! Prints 7 because that &
\   ! is the character position of the first B found after &
\   ! position 3.
```

INT(X)

Returns the largest integer in X that is less than or equal to X.

```
1000 PRINT INT(4.17), INT(-4.17) ! Prints 4 for 4.17 and &
\                               ! -5 for -4.17
```

INV(X)

Returns the inverse of matrix X.

```
10 DIM X(15,25), N(5,10), M(5,5)
90 MAT N=INV(M)
```

LEFT(A\$,N%)

Returns a substring of string A\$, starting at the left end of A\$ and ending at the N%th character.

```
100 A$='BASIC-PLUS SPEAKS MY LANGUAGE!'
110 PRINT LEFT(A$,10%) ! PRINTS BASIC-PLUS
```

LEN(A\$)

Returns the number of characters in A\$, including blanks.

```
2000 PRINT LEN(A$) ! Prints an integer representing the number &
\                ! of characters in string A$
```

LINE

Returns the line number of the statement being executed at the time of a CTRL/C interrupt.

```
100 IF LINE < 200 PRINT GOSUB 3000 ! If a CTRL/C was entered &
\ ! before line number 200, go to the subroutine beginning at &
\ ! line 3000
```

LOG(X)

Returns the natural logarithm of X ($\log(e)X$).

```
350 PRINT LOG(10.) ! Prints natural logarithm of 10., which &
\                ! is 2.30259
```

LOG10(X)

Returns the common logarithm of X ($\log_{10}X$).

```
400 PRINT LOG10(100.) ! Prints common logarithm of 100. &
\                    ! which is 2
```

MAGTAPE(F%,P%,U%)

Performs special operations on magnetic tape.

MID(A\$,N1%,N2%)

Returns a substring of A\$, starting at character position N1% and continuing for N2% characters. N1% is measured from the left end of A\$.

```
1000 PRINT MID('ABCDE',3%,2%) ! Prints 'CD'
```

NUM

Returns the number of rows input or the number of elements in a one-dimensional matrix, after input to a matrix.

```
2500 PRINT 'NUM = ';NUM ! Prints the number of rows or elements &
\ ! for the one-dimensional matrix that just received input
```

NUM\$(N%)

Returns a string of characters representing the value of N% as it would be displayed by the PRINT statement.

```
500 PRINT NUM$(4%) ! Prints the string ' 4 ', with spaces before &
\ ! and after the numeric string. If the numeric string &
\ ! represents a negative number, there is only a space after &
\ ! the numeric string (for example, NUM$(-4%) is '-4 ').
```

NUM1\$(N%)

Returns a string of characters representing the value of N%. NUM1\$ is similar to NUM\$, but does not return spaces or E format results.

```
400 PRINT NUM1$(4%) ! Prints the string '4', with no spaces &
\ ! before or after the string.
```

NUM2

Returns the number of elements entered in the last row of a two-dimensional matrix, after input to that matrix.

```
700 PRINT 'NUM2 =';NUM2 ! Prints the number of elements entered &
\ ! in the last row
```

PI

Returns the constant 3.14159...

```
550 INPUT A
560 IF A > PI GOTO 2000 ! If A is greater than 3.14159, transfers &
\ ! control to line 2000
```

PLACE\$(A\$,P%)

Returns a numeric string equal to numeric string A\$, rounded or truncated to P% places.

```
100 PRINT PLACE$('3.14159',4%) ! Prints the numeric string &
\ ! '3.14159' with the fourth character position to the right &
\ ! of the decimal point rounded off
```

POS(X%)

Returns the current position of the print head for I/O channel X%. Channel 0% is your terminal.

```
100 PRINT IF POS(0%)<>0 ! If the print head on the terminal isn't &
\ ! already at the left hand margin, print a RETURN/LINE FEED &
\ ! to put it there. POS is the same as CCPOS but you should &
\ ! use CCPOS for compatibility with BASIC-PLUS-2.
```

PROD\$(A\$,B\$,P%)

Returns the product of numeric strings A\$ and B\$ (A\$*B\$) rounded or truncated to P% places.

```
100 PRINT PROD$('3.14159','2',2%) ! Prints numeric string '6.28'
```

QUO\$(A\$,B\$,P%)

Returns the quotient of numeric strings A\$ and B\$ (A\$/B\$) rounded or truncated to P% places.

```
100 PRINT QUO$('3.14159','2',2%) ! Prints numeric string '1.6'
```

RAD\$(N%)

Converts the integer value of N% to a character string of up to three characters. Use this function to convert from Radix-50 format to ASCII. See the *RSTS/E Programming Manual* for more information.

```
12000 PRINT RAD$(1%) ! Prints the letter A
```

RECOUNT

Returns the number of characters read following an input operation. Used primarily with non-file-structured devices.

```
100 IF RECOUNT > 0 GOTO 2000 ! Transfers control to line 2000 if &
\ ! more than zero characters were read
```

RIGHT(A\$,N%)

Returns a substring of string A\$, starting at the N%th character and ending at the right end of A\$. N% is measured from the left end of A\$.

```
250 PRINT RIGHT('ABCDE',3%) ! Prints the string 'CDE'
```

RND

Returns a pseudorandom number between 0 and 1.

```
100 Y%=INT(6*RND+1) ! Y% equals a random number that simulates a
\                   ! the throw of a die
```

RND(X)

Returns a pseudorandom number between 0 and 1. X is a "dummy value", and has no effect on the random number selected.

```
100 Y%=INT(6*RND(99)+1) ! Y% equals a random number that a
\                   ! simulates the throw of a die
```

SGN(X)

Returns the sign value of X. Returns +1 if positive, 0 if zero, and -1 if negative.

```
100 PRINT SGN(-4.5) ! Prints -1
```

SIN(X)

Returns the sine (in radians) of X.

```
900 PRINT SIN(PI/2) ! Prints 1, which is the sine of PI/2
```

SPACE\$(N%)

Returns a string of N% spaces; used to insert spaces within a character string.

```
2000 PRINT SPACE$(5%); ! Prints 5 spaces
```

SPEC%

Performs special operations on disks, flexible diskettes, magnetic tapes, terminals, and pseudo keyboards.

SQR(X)

Returns the square root of X.

```
100 PRINT SQR(16.) ! Prints the square root of 16., which is 4.
```

STATUS

Returns the status of the I/O channel most recently opened.

STRING\$(N1%,N2%)

Returns a string of length N1%. The string is composed of the character represented by the ASCII value N2%.

```
100 PRINT STRING$(10%,65%) ! Print the string 'AAAAAAAAAA'
```

SUM\$(A\$,B\$)

Returns a numeric string equal to the sum of numeric strings A\$ and B\$ (A\$ + B\$).

```
200 PRINT SUM$('1.5','3.275') ! Prints the string 4.775
```

SWAP%(N%)

Causes a byte swap operation on the two bytes in the integer variable N%.

```
1000 PRINT SWAP%(1%) ! Prints 256
```

SYS

Communicates with the RSTS/E monitor. See the *RSTS/E Programming Manual* for more information.

TAB(X%)

Moves the print head to position X% in the current print record. BASIC-PLUS ignores the function if the current position is beyond X%. The first print position is 0%.

```
230 PRINT TAB(10%) ! Moves the print head to column 10 if the &  
  \ ! print head position is currently less than 10, otherwise, &  
  \ ! the print head remains where it is
```

TAN(X)

Returns the tangent (in radians) of X.

```
240 PRINT TAN(PI/4) ! Prints the tangent of PI/4, which is 1.
```

TIME(0%)

Returns the clock time, in seconds as a floating-point number, since midnight.

```
100 PRINT TIME(0%)/60 ! Prints the clock time in minutes
```

TIME(1%)

Returns the central processor time, in tenths of seconds, used by the current job.

```
2000 PRINT TIME(1%)*10 ! Prints CPU time used in seconds
```

TIME(2%)

Returns the connect time, in minutes, that you have been logged into the system for the current job.

```
120 IF TIME(2%) > 60 GOSUB 2500 ! If the connect time is greater &  
\ ! than an hour, transfer control to the subroutine beginning &  
\ ! at line 2500
```

TIME(3%)

Returns the number of kilocore ticks (KCTs) as a decimal number for the current job.

```
3000 PRINT TIME(3%) ! Print number of KCTs job has used thus far
```

TIME(4%)

Returns the number of minutes as a decimal number of device time for the current job.

```
7800 PRINT TIME(4%) ! Prints number of device time minutes that &  
\ ! current job has used thus far
```

TIME\$(0%)

Returns the current time of day as a character string.

```
270 PRINT TIME$(0%) ! Prints the time in one of two formats &  
\ ! depending on your system's default: 05:30 PM or 17:30
```

TIME\$(N%)

Returns a string corresponding to the time of N% minutes before midnight.

```
1000 PRINT TIME$(1440%) ! Prints the time in one of two formats &  
\ ! depending on your system's default: 12:00 PM or 00:00
```

VAL(A\$)

Returns the numeric value of the string of numeric characters A\$.

```
200 IF VAL(A$) > 100 GOTO 2000 ! If the numeric value of the &  
\ ! string A$ is greater than 100, control transfers to line &  
\ ! 2000
```

XLATE(A\$,B\$)

Translates A\$ to a new string, using table string B\$. See the *BASIC-PLUS Language Manual* for more information.

Arithmetic, Numeric and String Relational Operators

Table 5-4 describes the BASIC-PLUS arithmetic, numeric, and string relational operators.

Table 5-4: Relational Operators

Operator	Example	Meaning
Arithmetic Operators		
+	A+B	Adds B to A
-	A-B	Subtracts B from A
*	A*B	Multiplies A by B
/	A/B	Divides A by B
^	A^B	Calculates A to the B power
**	A**B	Calculates A to the B power

Table 5-4 (Cont.): Relational Operators

Operator	Example	Meaning
Numeric Relational Operators		
=	A=B	A is equal to B
<	A<B	A is less than B
<=	A<=B	A is less than or equal to B
>	A>B	A is greater than B
>=	A>=B	A is greater than or equal to B
<>	A<>B	A is not equal to B
==	A==B	A is approximately equal to B
String Relational Operators		
=	A\$=B\$	String A\$ and B\$ are equal, except for possible trailing spaces
<	A\$<B\$	String A\$ precedes string B\$ in ASCII sequence
<=	A\$<=B\$	String A\$ equals or precedes string B\$ in ASCII sequence
>	A\$>B\$	String A\$ follows string B\$ in ASCII sequence
>=	A\$>=B\$	String A\$ equals or follows string B\$ in ASCII sequence
<>	A\$<>B\$	Strings A\$ and B\$ are not equal
==	A\$==B\$	Strings A\$ and B\$ are identical, including trailing spaces

Numeric and String Internal Data Storage

The next three sections describe how BASIC-PLUS internally stores integer, floating-point, and string data.

Logical Operators

Truth Tables for Logical Operations

A	B	A AND B
1	1	1
0	1	0
1	0	0
0	0	0

A	B	A OR B
1	1	1
1	0	1
0	1	1
0	0	0

A	B	XOR
1	1	0
0	1	1
1	0	1
0	0	0

A	B	A EQV B
1	1	1
1	0	0
0	1	0
0	0	1

A	B	A IMP B
1	1	1
0	1	1
1	0	0
0	0	1

A	NOT A
1	0

Examples:

1 Setting (turning on) bits:

85% = 0 0 0 0 0 0 0 0 0 1 0 1 0 1 0 1
 28% = 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0
 85% **OR** 28% = 0 0 0 0 0 0 0 0 0 1 0 1 1 1 0 1

2 Clearing (turning off) bits:

85% = 0 0 0 0 0 0 0 0 0 1 0 1 0 1 0 1
 28% = 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0 0
 85% **AND** 28% = 0 0 0 0 0 0 0 0 0 0 0 1 0 1 0 0

NOTE

The NOT operator flips the bits. To get NOT(N%), add 1 algebraically and then change the sign. For example:

	<i>Add 1</i>	<i>Change Sign</i>
NOT 5%:	5% + 1% = 6% →	-6%
NOT -6%	-6% + 1% = -5% →	5%

Logical (Boolean) values in BASIC-PLUS

Boolean	Testing by BASIC-PLUS	Setting by BASIC-PLUS
True	Nonzero numbers	Set to -1%
False	Zero	Set to 0%

For example, assume a BASIC-PLUS program that has the following line:

```
100 IF A% THEN GOTO 200
```

If A% equals zero then the GOTO is not executed (A% is "false"). If A% is nonzero, A% is "true" and control passes to line 200.

NOTE

You can use non-Boolean true values, but be careful. For instance, suppose that A\$ = 'ABCD' and F\$ = '\$NOTICE.TXT'. Consider the following statement:

```
IF LEN(A$) THEN 100
```

Control passes to line 100 because 4% (the length of A\$) is "true". Now consider the following statement:

```
IF INSTR(1%, F$, '.') THEN 100
```

Again, control passes to line 100 because F\$ contains a period ('.'), and is thus true.

Be careful, however, when combining non-Boolean TRUE values (that is, true values other than -1%). For example:

```
IF LEN(A$) AND INSTR(0%, F$, '.') THEN 100
```

You might assume that if the length of A\$ is true (nonzero) and string F\$ contains a period, that the combined statements are true (true and true = true). This is not necessarily the case. If the length of A\$ is 4% and the period in F\$ is in the eighth position, for example, the 4% AND 8% = 0%, which is false. Thus, non-Boolean true AND non-Boolean true can equal false.

Keep in mind that the logical operators evaluate all 16 bits of a PDP-11 word. The standard Boolean values are all bits 0 for false, and all bits 1 (value -1%) for true.

Integer Data

BASIC-PLUS stores integer data in binary format. Each integer uses one PDP-11 word (16 bits). Integer values can range from -32768% to 32767%. The following diagram shows the internal integer format:

Bit: 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

S |← high byte →| |← low byte →|

Bits 0 through 14 each correspond to a positive power of 2. That is, if a 1 occurs in bit position 5, then the value for that bit is (2^5) or (32). Bit 15 stores the number's sign; 0 means the number is positive; 1 means the number is negative. Positive integers range from 0% to 32767% and negative integers from -1% to -32768%.

The following example shows you sample bit patterns for both positive and negative integers:

Positive Integer	Bit Pattern	Negative Integer	Bit Pattern
0	00000000 00000000		
+1	00000000 00000001	-1	11111111 11111111
+2	00000000 00000010	-2	11111111 11111110
+3	00000000 00000011	-3	11111111 11111101
.	.	.	.
.	.	.	.
+32767	01111111 11111111	-32768	10000000 00000000

Floating-Point Data

BASIC-PLUS stores floating-point data in binary format. The number of PDP-11 words that the floating-point number uses depends on the math package that your system has:

- If your system supports a single-precision math package, then each floating-point number uses two PDP-11 words. Single-precision math lets you accurately represent up to six decimal digits.
- If your system supports a double-precision math package, then each floating-point number uses four PDP-11 words. Double-precision math lets you accurately represent up to fifteen decimal digits.

Regardless of the math package that your system supports, floating-point numbers can range from approximately 10^{-38} to approximately 10^{38} .

The two diagrams that follow show the significance of each byte in single-precision and double-precision math packages:

Single-Precision Math

Byte 1		Byte 0	
S	EXP	E	HIGH
MED		LOW	
Byte 3		Byte 2	

Double-Precision Math

Byte 1		Byte 0	
S	EXP	E	HIGH
LOW-HIGH		LOW-LOW	
LOWER-HIGH		LOWER-LOW	
LOWEST-HIGH		LOWEST-LOW	
Byte 7		Byte 6	

String Data

A string is a sequence of ASCII characters treated as a unit. Theoretically, a string can contain up to 32767 characters, but in reality, the string is limited by the amount of available memory.

The following diagram shows how strings are stored in a PDP-11 computer. The diagram uses the string 'ABCDEFGH' (the numbers to the left and right of the diagram are hypothetical PDP-11 addresses; the numbers inside the boxes represent the ASCII character codes for each character in the string 'ABCDEFGH').

11	66%	65%	10
13	68%	67%	12
15	70%	69%	14
17	72%	71%	16

Note that the word at address 10 contains the ASCII codes for A and B. Byte 10 is the "low byte" of word 10, and byte 11 is the high byte of word 10.

Reserved Keywords

Table 5-5 contains all words reserved for Digital versions of BASIC-PLUS and BASIC-PLUS-2. Do not use any of the listed words for a variable or function name.

Table 5-5: Reserved Keywords for BASIC-PLUS and BASIC-PLUS-2

ABS	DESC	IF	ORGANIZATION	STR\$
ABS%	DET	IMP	OUTPUT	STREAM
ACCESS	DEF\$	INDEXED	PEEK	STRING\$
ALLOW	DIM	INPUT	PI	SUB
ALTERNATE	DIMENSION	INSTR	PLACE\$	
AND	DUPLICATES	INT	POS	SUBEXIT
APPEND	ECHO	INV	PRIMARY	SUM\$
AS	EDIT\$	KEY	PRINT	SWAP%
ASCII	ELSE	KILL	PROD\$	SYS
ATN	END	LEFT	PUT	TAB
BACK	EQ	LEFT\$	QUO\$	TAN
BEL	EQV	LEN	RAD\$	TAPE
BLOCK	ERL	LET	RANDOM	TASK
BLOCKSIZE	ERN\$	LF	RANDOMIZE	TEMPORARY
BS	ERR	LINE	RCTRLC	THEN
BUCKETSIZE	ERROR	LINPUT	RCTRLO	TIME
BUFFER	ERT\$	LOC	READ	TIME\$
BUFSIZ	ESC	LOG	RECORD	TO
BY	EXIT	LOG10	RECORDSIZE	TRM\$
CALL	EXP	LSET	RECOUNT	TRN
CCPOS	EXTEND	MAGTAPE	REF	UNDEFINED
CHAIN	FF	MAP	RELATIVE	UNLESS
CHANGE	FIELD	MAT	REM	UNLOCK
CHANGES	FILE	MID	RESET	UNTIL
CHR\$	FILE\$	MID\$	RESTORE	UPDATE

Table 5-5 (Cont.): Reserved Keywords for BASIC-PLUS and BASIC-PLUS-2

CLOSE	FILESIZE	MODE	RESUME	USEROPEN
CLUSTERSIZE	FILL	MODIFY	RETURN	USING
COM	FILL\$	MOVE	RIGHT	VAL
COMMON	FILL%	NAME	RIGHT\$	VAL%
COMP%	FIND	NEXT	RND	VALUE
CON	FIX	NOCHANGES	RSET	VARIABLE
CONNECT	FIXED	NODUPLICATES	SCRATCH	VIRTUAL
CONTIGUOUS	FNEND	NOECHO	SEG%	VT
COS	FNEXIT	NONE	SEQUENTIAL	WAIT
COUNT	FOR	NOREWIND	SGN	WHILE
CR	FORMAT\$	NOSPAN	SI	WINDOWSIZE
CTRLC	FROM	NOT	SIN	WRITE
CVT\$\$	FSP\$	NUL\$	SLEEP	WRKMAP
CVT\$%	FSS\$	NUM	SO	XLATE
CVT\$F	GE	NUM\$	SP	XOR
CVT%\$	GET	NUM1\$	SPACE\$	ZER
CVTF\$	GO	NUM2	SPAN	
DATA	GOSUB	ON	SPEC	
DATE\$	GOTO	ONECHR	SQR	
DEF	GT	ONERROR	STATUS	
DELETE	HT	OPEN	STEP	
DENSITY	IDN	OR	STOP	

BASIC-PLUS Cross-Reference Program (BPCREF)

The BPCREF (BASIC-PLUS Cross Reference) program produces a cross-reference listing of a translated BASIC-PLUS (.BAC) program. When you enter BPCREF, you must specify the files you want processed.

To Run the Program

`RUN $BPCREF`

Format

`BPCREF` command? `output.crf=input.bac[,input.bas][/switches]`

where:

<code>output.crf</code>	Is the cross-reference listing file
<code>input.bac</code>	Is the translated file to process
<code>input.bas</code>	Is the source file to include in the listing
<code>/switches</code>	One or more optional qualifiers

Usage Notes

You do not have to specify output. If you do not specify output, do not specify the equal sign (=). `BPCREF` automatically produces an output file having the same name as the input file, but having the `.CRF` file type.

BPCREF Switches

`/HEL[P]`

Displays information about `BPCREF` command formats.

`/NOD[ELETE]`

Informs the spooling program not to delete the output files after printing.

`/NOH[EADER]`

Omits header lines in the output file. The resulting `.CRF` file is more suitable as an input file to the `FILCOM` program.

`/P[AGE]:nnn`

Specifies `nnn` as the number of lines per page to print in the output listing. The default is 60 lines per page.

`/Q[UEUE]`

Automatically queues the output file to the line printer. `BPCREF` deletes the output file after printing unless you use the `/NODELETE` switch.

/S[*SOURCE*]

Includes the source file in the output file. Use this switch when the .BAS file is in the same account and has the same file name as the .BAC file. Otherwise, specify the source file in the BPCREF command.

/W[*IDTH*]:*nnn*

Sets the width of the cross reference listing to *nnn* columns per line. The default width is 132 columns; the minimum width is 72 columns.

/GL[*OW*]:*nnn*

/GH[*IGH*]:*nnn*

Used as a pair, these switches specify a global listing. BPCREF prints line numbers and variables referenced both inside and outside the program boundaries indicated by the line numbers *nnn*. BPCREF does not print line numbers or variables referenced only inside or outside the boundaries. The default value for /GL is 0 and the default value for /GH is 32767.

/LL[*OW*]:*nnn* /LH[*IGH*]:*nnn*

Used as a pair, these switches specify a local listing. BPCREF prints the line numbers and variables referenced inside the program boundaries indicated by the line numbers *nnn*. BPCREF does not print line numbers or variables referenced outside the boundaries or referenced both inside and outside the boundaries. The default value for /LL is 0 and the default value for /LH is 32767.

/NO[*CREF*]

Omits the full cross-reference listing. Use it when you want only a local or global listing.

Devices

This section contains the MODE value, RECORD value, and SPEC% information for six devices:

- Disks
- Flexible diskettes
- Magnetic tapes
- Line printers
- Terminals
- Pseudo keyboards

Disks

Table 5–6 and Table 5–7 list the MODE values for file-structured and non-file-structured disk access.

Table 5–6: MODE Values for File-Structured Disk Access (FIRQB + FQMODE)

Decimal	Octal	Function
0.	0	Normal read/write
1.	1	Update
2.	2	Append
4.	4	Guarded update
8.	10	Special extend (RSTS/E updates file's size and retrieval pointers during extend operations)
16.	20	Create contiguous file
32.	40	Create tentative file
64.	100	Create contiguous file conditionally
128.	200	No supersede
256.	400	Random data caching (requires TUNE privilege)
512.	1000	Create file and place at beginning of directory (with 2000)
1024.	2000	Create file and place at end of directory
2048.	4000	Sequential data caching (with 400)
4096.	10000	Read normally regardless
8192.	20000	Open file read-only
16384.	40000	Write UFD (requires WRTNFS privilege)

Table 5-7: MODE Values for Non-File-Structured Disk Access (FIRQB + FQMODE)

Decimal	Octal	Function
0.	0	Access device clusters.
128.	200	Access disk blocks.
512.	1000	Read beyond last writable portion of disk; suppress error logging (RSTS/E uses this mode in its online DSKINT program. Digital does not recommend this for general use).
16384.	40000	Write to a mounted disk (requires WRTNFS and SYSMOD privileges).

SPEC% Function for Disks

The SPEC% function for disk files has the format:

VALUE%=SPEC%(FUNCTION%, BLOCK, CHANNEL%, 0%)

where:

- VALUE%** Depends on the particular function code you specify in **FUNCTION%**. In most cases, **VALUE%** is equal to the **BLOCK** parameter.
- FUNCTION%** Is a function code that specifies the desired operation. During normal I/O operations, a block, or range of blocks, is implicitly locked when you read the file with a BASIC-PLUS GET statement. The SPEC% function allows you to convert implicit locks to explicit locks and to release selected locked blocks. The code specified in **FUNCTION%** determines the use of SPEC%. The codes are:

	FUNCTION% = 0%	Releases all locked blocks.
	FUNCTION% = 1%	Releases the current implicit lock.
	FUNCTION% = 2%	Converts the current implicit lock to an explicit lock.
	FUNCTION% = 3%	Releases the explicitly locked block specified in the BLOCK parameter. If BLOCK is 0, all explicitly locked blocks are released. However, implicitly locked blocks remain locked.
	FUNCTION% = 4%	Converts an implicit lock to an explicit lock and release the implicit lock.
BLOCK		Specifies the starting block number for releasing an explicit lock. Note that BLOCK must be a floating-point number.
CHANNEL%		Is the I/O channel on which the operation is to be performed.
0%		Is the handler index for disk devices.

Flexible Diskettes

Table 5–8 and Table 5–9 list the MODE and RECORD values for flexible diskettes.

Table 5–8: MODE Values for Flexible Diskettes (FIRQB + FQMODE)

Decimal	Octal	Function
0.	0	Read and write in block mode (default)
16384.	40000	Read and write in sector mode

Table 5–9: RECORD Values for Flexible Diskettes (XRB + XRBLK)

Decimal	Octal	Function
8192.	20000	Access logical record 0
16384.	40000	Write deleted data mark
32767.+1.	100000	Perform this I/O operation in block mode

SPEC% Function for Flexible Diskettes

The SPEC% function for flexible diskettes has the format:

VALUE%=SPEC%(FUNCTION%,PARAMETER,CHANNEL%,18%)

where:

VALUE Depends on the function code you specify in FUNCTION%.

FUNCTION% Is a function code that specifies the desired operation. The codes are:

FUNCTION% = 0% Returns the density of the currently mounted diskette in the format:
DENSITY% = VALUE% AND 255%
 If **DENSITY%=1%**, the diskette is single-density; if **DENSITY%=2%**, the diskette is double-density. Note that **PARAMETER** must also be 0.

FUNCTION% = 1% Causes the diskette driver to recompute density. If the diskette has been changed in the drive without closing and reopening the I/O channel, issue this code prior to any I/O operation on the diskette. This function also returns the computed density as described in **FUNCTION%=0%**. Note that **PARAMETER** must be 0.

FUNCTION% = 2% Reformats the current diskette to the density in **PARAMETER**. **PARAMETER** equals 1 for single-density and 2 for double-density. Note that this operation is allowed only on RX02 drives and that any data on the diskette before the operation is lost.

PARAMETER See the previous description of **FUNCTION%**.

CHANNEL% Is the I/O channel on which the operation is to be performed.

18% Is the handler index for flexible diskettes.

Magnetic Tape

Table 5–10 lists the MODE values for file-structured magnetic tapes.

Table 5–10: MODE Values for File-Structured Magnetic Tape (FIRQB + FQMODE)

Decimal	Octal	Function
0.	0	Read file label at current tape position
2.	2	Do not rewind tape when searching for file
16.	20	Write over existing file
32.	40	Rewind tape before searching for file
64.	100	Rewind on CLOSE
128.	200	Open for append
512.	1000	Write new file label without searching
1024.	2000	For ANSI tapes. When record length (values 0 - 4095) of the clustersize is 0, set the record length equal to the value specified for filesize
16384.	40000	Search for DOS-formatted file label
24576.	60000	Search for ANSI-formatted file label

MODE Values for Non-File-Structured Magnetic Tape (FIRQB + FQMODE)

MODE values in non-file-structured magnetic tape processing have the format:

$$\text{MODE(FIRQB+FQMODE)} = D + P + S$$

where:

- D(density) Is 12.(14) for 800 bpi and 256.(400) for 1600 bpi, phase-encoded.
- P(parity) Is 0.(0) for odd and 1.(1) for even. Digital recommends the use of odd parity, because you cannot write binary data when you use even parity.

S(stay) Is 0.(0) to clear MODE value after CLOSE and 8192.(20000) to retain MODE value after CLOSE.

SPEC% Function for Magnetic Tape

The SPEC% function for magnetic tape has the format:

VALUE%=SPEC%(FUNCTION%,PARAMETER,CHANNEL%,14%)

where:

VALUE%	Depends on the function code specified in FUNCTION%.
FUNCTION%	Is the function code. The SPEC% function performs various operations on tapes as determined by the FUNCTION% code. These codes are: FUNCTION% = 1% Rewinds and puts it off line FUNCTION% = 2% Writes tape mark FUNCTION% = 3% Rewinds FUNCTION% = 4% Skips record FUNCTION% = 5% Backspaces over record FUNCTION% = 6% Sets density and parity FUNCTION% = 7% Returns tape status function FUNCTION% = 8% Returns file characteristics FUNCTION% = 9% Rewinds on CLOSE FUNCTION% = 10% Writes EOF labels on CLOSE FUNCTION% = 11% Acknowledges error condition (for asynchronous I/O) FUNCTION% = 12% Sets extended density
PARAMETER	Depends on the function code specified in FUNCTION%.
CHANNEL%	Is the I/O channel on which the operation is to be performed.
14%	Is the handler index for magnetic tape.

Line Printers

Table 5-11 and Table 5-12 list the MODE and RECORD values for line printers.

Table 5-11: MODE Values for Line Printers (FIRQB + FQMODE)

Decimal	Octal	Function
1. to 127.	1 to 177	Sets form length to number of lines per page for software formatting (512., 1000) and automatic page skip (2048., 4000). (This is the QUE system program's LPFORM option.)
128.	200	Changes the character 0 (zero) to O (letter O).
256.	400	Truncates lines that are longer than unit was configured for instead of printing the rest of the line on the next physical line on the page.
512.	1000	Enables software formatting. Forms control characters are >= 200(8).
1024.	2000	Translates lowercase characters to uppercase characters. Applies only to uppercase and lowercase line printers.
2048.	4000	Skips six lines (that is, skips over perforation line) at the bottom of each form.
4096.	10000	Moves paper to top of hardware form.
8192.	20000	Suppresses form feed on close.

Table 5-12: RECORD Values for Line Printers (XRB + XRMODE)

Decimal	Octal	Function
2.	2	Prints over perforation (disables MODE 4000 for this output step).
4.	4	Does not return control to program until output is complete or an error occurs.
8.	10	Clears pending output buffers before buffering characters for the request.
32.	40	Truncates long lines (enables MODE 256% for this output step).
4096	10000	Enables binary output, pass all characters to the device "as is".

Table 5–12 (Cont.): RECORD Values for Line Printers (XRB + XRMODE)

Decimal	Octal	Function
8192.	20000	Returns control to program if output stall is to occur. (See .WRITE directive for more information.)

Terminals

Table 5–13, Table 5–14, and Table 5–15 list the MODE and RECORD values for terminals and terminal input/output.

Table 5–13: MODE Values for Terminals (FIRQB + FQMOD)

Decimal	Octal	Function
1.	1	Enables binary input from a terminal
2.	2	Is reserved for TECO
4.	4	Suppresses automatic CR/LF at right margin
8.	10	Enables echo control (turns off other modes and automatically enables MODE 4)
16.	20	Guards program against CTRL/C interruption and dial-up line hibernation
32.	40	Enables incoming XON/XOFF processing
64.	100	Is reserved
128.	200	Enables use of RUBOUT as a delimiter on video terminals
256.	400	Sets escape sequence mode
512.	1000	Uses no conditional sleep mode
16384	40000	Enables transparent control character output

Table 5-14: RECORD Values for Terminal Input (XRB + XRMOD)

Decimal and Octal Values	Function
8192. 20000	Performs conditional input (executes input request without waiting for data to be available).
32767.+1.+K 100000+K	Performs multiterminal service input from assigned keyboard number K.
32767.+1.+16384.+S 140000+S	Performs multiterminal service input from any assigned keyboard: S = 0 Waits until input is available from any terminal. The err ?Data error on device may occur due to a race condition with CTRL/C. 1.<S<255. 1<S<377 Waits up to S seconds for input from any terminal and then return ?Data error on device if no input is available. S = 8192. S = 20000 Requests input immediately; return ?Data error on device if no input is pending.

Table 5-15: RECORD Values for Terminal Output (XRB + XRMOD)

Decimal	Octal	Function
256.	400	Declares echo control field (use with MODE 10).
4096.	10000	Outputs binary data to terminal.
8192.	20000	Returns control to program if output stall is to occur. (See .WRITE directive for more information.)
16384.	40000	Uses transparent control character output.
32767.+1.+K	100000+K	Performs multiterminal service output to assigned keyboard K.

SPEC% Function for Terminals

The SPEC% function for terminals has the format:

VALUE%=SPEC%(FUNCTION%,PARAMETER,CHANNEL%,2%)

where:

VALUE%	Depends on the function code specified in FUNCTION%.
FUNCTION%	Is the function code. The SPEC% function performs various operations on terminals as determined by the FUNCTION% code. These codes are: FUNCTION% = 0 Cancels Ctrl/O FUNCTION% = 1 Sets tape mode FUNCTION% = 2 Enables echo and clear tape mode FUNCTION% = 3 Disables echo FUNCTION% = 4 Sets ODT mode FUNCTION% = 7 Cancels all type ahead FUNCTION% = 9 Clears all private delimiters
PARAMETER	Specifies the terminal on which the operation is to take place. If PARAMETER is 0, the operation is performed on the currently open terminal. If you specify a keyboard number in PARAMETER, the operation is performed on that terminal. Note that the keyboard must be assigned to the calling job but must not be open.
CHANNEL% 2%	Specifies the I/O channel for the terminal in PARAMETER. Is the handler index for terminals.

Pseudo Keyboards

Table 5–16 and Table 5–17 list the MODE and RECORD values for pseudo keyboards.

Table 5–16: MODE Values for Pseudo Keyboards (FIRQB + FQMODE)

Decimal	Octal	Function
0.	0	Kills controlled job when the pseudo keyboard is closed
1.	1	Detaches controlled job when the pseudo keyboard is closed
16.	16	Creates a new pseudo keyboard when used with PK0

Table 5–17: RECORD Option Bit Values for Pseudo Keyboard Output (XRB + XRMOD)

Bit	Value		Result
	Decimal	Octal	
0	1.	1	If set, the system does not check job status before sending data to the pseudo keyboard.
1	2.	2	If set, the system tests whether pseudo keyboard is waiting for a system command (CTRL/C state) or is waiting for program input (KB wait state).
2	4.	4	If set, the system does not send data to the pseudo keyboard but instead returns control to the controlling job.
3	8.	10	If set, and there are no small buffers for keyboard input, the system waits until small buffers are available. However, your program receives the NOROOM error if the output buffer chain is full.
4	16.	20	If set, the system kills the job currently running at the pseudo keyboard.

SPEC% Function for Pseudo Keyboards

The SPEC% function for pseudo keyboards has the format:

VALUE% = SPEC%(0%, PARAMETER%, CHANNEL%, 16%)

where:

VALUE%	Is a flag word that contains information about the controlled job's keyboard. By testing bit 5 in VALUE%, you can determine whether keyboard echo is enabled or disabled. The tests are: VALUE% AND 32% <> 0% Keyboard echo is disabled VALUE% AND 32% = 0% Keyboard echo is enabled
PARAMETER%	Specifies the operation to perform: 0% Reads the flag word 255% Enables echo -1% Disables echo
CHANNEL%	Specifies the I/O channel where the pseudo keyboard is open.
16%	Is the device handler index for pseudo keyboards.

Character Sets

This section contains the decimal and octal numerics for the following character sets:

- ASCII
- RADIX-50
- 8-BIT

RADIX-50 Character/Position Table

This format allows three characters to be stored as a two-byte integer (one 16-bit word). The RAD\$ function converts a Radix-50 word to its three-character representation.

Table 5–18 shows the complete set of characters that can be represented in Radix-50 format, their ASCII octal equivalents, and the Radix-50 value for each character.

Table 5–18: RADIX-50 Character/Position Numeric Values

Character	ASCII OCTAL EQUIVALENT	RADIX-50 Equivalent (Octal)
space	40	0
A-Z	101-132	1-32
\$	44	33
.	56	34
?	77	35
0-9	60-71	36-47

The following table lets you easily translate between the ASCII character set and its Radix-50 equivalents based on position within a string. The table contains the decimal value of each character as well as its octal value.

Table 5-19: ASCII-to-RADIX-50 Conversion

Single or First Character			Second Character			Third Character		
	Octal	Decimal		Octal	Decimal		Octal	Decimal
A	000001	1600	A	000050	40	A	000001	1
B	006200	3200	B	000120	80	B	000002	2
C	011300	4800	C	000170	120	C	000003	3
D	014400	6400	D	000240	160	D	000004	4
E	017500	8000	E	000310	200	E	000005	5
F	022600	9600	F	000360	240	F	000006	6
G	025700	11200	G	000430	280	G	000007	7
H	031000	12800	H	000500	320	H	000010	8
I	034100	14400	I	000550	360	I	000011	9
J	037200	16000	J	000620	400	J	000012	10
K	042300	17600	K	000670	440	K	000013	11
L	045400	19200	L	000740	480	L	000014	12
M	050500	20800	M	001010	520	M	000015	13
N	053600	22400	N	001060	560	N	000016	14
O	056700	24000	O	001130	600	O	000017	15
P	062000	25600	P	001200	640	P	000020	16
Q	065100	27200	Q	001250	680	Q	000021	17
R	070200	28800	R	001320	720	R	000022	18
S	073300	30400	S	001370	760	S	000023	19
T	076400	32000	T	001440	800	T	000024	20
U	101500	33600	U	001510	840	U	000025	21
V	104600	35200	V	001560	880	V	000026	22
W	107700	36800	W	001630	920	W	000027	23
X	113000	38400	X	001700	960	X	000030	24
Y	116100	40000	Y	001750	1000	Y	000031	25
Z	121200	41600	Z	002020	1040	Z	000032	26
\$	124300	43200	\$	002070	1080	\$	000033	27
.	127400	44800	.	002140	1120	.	000034	28
?	132500	46400	?	002210	1160	?	000035	29
0	135600	48000	0	002260	1200	0	000036	30
1	140700	49600	1	002330	1240	1	000037	31
2	144000	51200	2	002400	1280	2	000040	32
3	147100	52800	3	002450	1320	3	000041	33
4	152200	54400	4	002520	1360	4	000042	34
5	155300	56000	5	002570	1400	5	000043	35
6	160400	57600	6	002640	1440	6	000044	36
7	163500	59200	7	002710	1480	7	000045	37
8	166600	60800	8	002760	1520	8	000046	38
9	171700	62400	9	003030	1560	9	000047	39

Table 5–20: ASCII Character Set

ASCII			
Decimal	Octal	Character	Remarks
0	000	NUL	Null, FILL character
1	001	SOH	CTRL/A
2	002	STX	CTRL/B
3	003	ETX	CTRL/C
4	004	EOT	End of transmission, CTRL/D
5	005	ENQ	CTRL/E
6	006	ACK	CTRL/F
7	007	BEL	Bell, CTRL/G
8	010	BS	Backspace, CTRL/H
9	011	HT	Horizontal tab, CTRL/I
10	012	LF	Line feed, CTRL/J
11	013	VT	Vertical tab, CTRL/K
12	014	FF	Form feed, page, CTRL/L
13	015	CR	Carriage return, CTRL/M
14	016	SO	CTRL/N
15	017	SI	CTRL/O
16	020	DLE	CTRL/P
17	021	DC1	CTRL/Q*, XON
18	022	DC2	CTRL/R
19	023	DC3	CTRL/S**, XOFF
20	024	DC4	CTRL/T
21	025	NAK	CTRL/U
22	026	SYN	CTRL/V
23	027	ETB	CTRL/W
24	030	CAN	CTRL/X
25	031	EM	CTRL/Y
26	032	SUB	CTRL/Z, end of file
27	033	ESC	Escape***
28	034	FS	File Separator
29	035	GS	Group Separator
30	036	RS	Record Separator
31	037	US	Unit Separator
32	040	SP	Space or blank
33	041	!	Exclamation point
34	042	"	Quotation mark
35	043	#	Number sign

*CTRL/Q, or XON, resumes output if the TTSYNC terminal characteristic is set.
 **CTRL/S, or XOFF, stops output if the TTSYNC terminal characteristic is set.
 ***ALTMODE(ASCII 125) or PREFIX (ASCII 126) keys, which appear on some terminals, are translated internally into ESCAPE if the ALT MODE terminal characteristic is set.

Table 5–20 (Cont.): ASCII Character Set

ASCII			
Decimal	Octal	Character	Remarks
36	044	\$	Dollar sign
37	045	%	Percent sign
38	046	&	Ampersand
39	047	'	Apostrophe
40	050	(Left parenthesis
41	051)	Right parenthesis
42	052	*	Asterisk
43	053	+	Plus
44	054	,	Comma
45	055	-	Hyphen or minus
46	056	.	Period or decimal point
47	057	/	Slash
48	060	0	Zero
49	061	1	One
50	062	2	Two
51	063	3	Three
52	064	4	Four
53	065	5	Five
54	066	6	Six
55	067	7	Seven
56	070	8	Eight
57	071	9	Nine
58	072	:	Colon
59	073	;	Semicolon
60	074	<	Left angle bracket, "less than" sign
61	075	=	Equal sign
62	076	>	Right angle bracket, "greater than" sign
63	077	?	Question mark
64	100	@	At sign
65	101	A	Uppercase A
66	102	B	Uppercase B
67	103	C	Uppercase C
68	104	D	Uppercase D
69	105	E	Uppercase E

Table 5–20 (Cont.): ASCII Character Set

ASCII			
Decimal	Octal	Character	Remarks
70	106	F	Uppercase F
71	107	G	Uppercase G
72	110	H	Uppercase H
73	111	I	Uppercase I
74	112	J	Uppercase J
75	113	K	Uppercase K
76	114	L	Uppercase L
77	115	M	Uppercase M
78	116	N	Uppercase N
79	117	O	Uppercase O
80	120	P	Uppercase P
81	121	Q	Uppercase Q
82	122	R	Uppercase R
83	123	S	Uppercase S
84	124	T	Uppercase T
85	125	U	Uppercase U
86	126	V	Uppercase V
87	127	W	Uppercase W
88	130	X	Uppercase X
89	131	Y	Uppercase Y
90	132	Z	Uppercase Z
91	133	[Left square bracket
92	134	\	Backslash
93	135]	Right square bracket
94	136	^	Circumflex
95	137	_	Underscore
96	140	`	Grave accent
97	141	a	Lowercase a
98	142	b	Lowercase b
99	143	c	Lowercase c
100	144	d	Lowercase d
101	145	e	Lowercase e
102	146	f	Lowercase f
103	147	g	Lowercase g

Table 5-20 (Cont.): ASCII Character Set

ASCII			
Decimal	Octal	Character	Remarks
104	150	h	Lowercase h
105	151	i	Lowercase i
106	152	j	Lowercase j
107	153	k	Lowercase k
108	154	l	Lowercase l
109	155	m	Lowercase m
110	156	n	Lowercase n
111	157	o	Lowercase o
112	160	p	Lowercase p
113	161	q	Lowercase q
114	162	r	Lowercase r
115	163	s	Lowercase s
116	164	t	Lowercase t
117	165	u	Lowercase u
118	166	v	Lowercase v
119	167	w	Lowercase w
120	170	x	Lowercase x
121	171	y	Lowercase y
122	172	z	Lowercase z
123	173	{	Left brace
124	174		Vertical line
125	175	}	Right brace ***
126	176	~	Tilde ***
127	177	DEL	Delete
128	200		Reserved
129	201		Reserved
130	202		Reserved
131	203		Reserved
132	204	IND	Index
133	205	NEL	New line
134	206	SSA	
135	207	ESA	
136	210	HTS	Horizontal tab set
137	211	HTJ	
138	212	VTS	Vertical tab set

*CTRL/Q, or XON, resumes output if the TTSYNC terminal characteristic is set.
 **CTRL/S, or XOFF, stops output if the TTSYNC terminal characteristic is set.
 ***ALTMODE(ASCII 125) or PREFIX (ASCII 126) keys, which appear on some terminals, are translated internally into ESCAPE if the ALT MODE terminal characteristic is set.

Table 5–20 (Cont.): ASCII Character Set

ASCII			
Decimal	Octal	Character	Remarks
139	213	PLD	Partial line down
140	214	PLU	Partial line up
141	215	RI	Reverse Index
142	216	SS2	Single shift 2
143	217	SS3	Single shift 3
144	220	DCS	Device control string
145	221	PU1	
146	222	PU2	
147	223	STS	
148	224	CCH	
149	225	MW	
150	226	SPA	
151	227	EPA	
152	230		Reserved
153	231		Reserved
154	232		Reserved
155	233	CSI	Control sequence introducer
156	234	ST	String terminator
157	235	OSC	
158	236	PM	
159	237	APC	
160	240		Reserved
161	241	¡	Inverted exclamation point
162	242	¢	Cent sign
163	243	£	Pound sign
164	244		Reserved
165	245	¥	Yen sign
166	246		Reserved
167	247	§	Section sign
168	250	¤	General currency sign
169	251	©	Copyright sign
170	252	ª	Feminine ordinal indicator
171	253	«	Angle quotation mark left
172	254		Reserved

Table 5–20 (Cont.): ASCII Character Set

ASCII			
Decimal	Octal	Character	Remarks
173	255		Reserved
174	256		Reserved
175	257		Reserved
176	260	°	Degree sign
177	261	±	Plus/minus sign
178	262	²	Superscript 2
179	263	³	Superscript 3
180	264		Reserved
181	265	μ	Micro sign
182	266	¶	Paragraph sign, pilcrow
183	267	·	Middle dot
184	270		Reserved
185	271	¹	Superscript 1
186	272	Ω	Masculine ordinal indicator
187	273	»	Angle quotation mark right
188	274	¼	Fraction one quarter
189	275	½	Fraction one half
190	276		Reserved
191	277	¿	Inverted question mark
192	300	À	Uppercase A with grave accent
193	301	Á	Uppercase A with acute accent
194	302	Â	Uppercase A with circumflex accent
195	303	Ã	Uppercase A with tilde
196	304	Ä	Uppercase A with diaeresis or umlaut mark
197	305	Å	Uppercase A with ring
198	306	Æ	Uppercase A with diphthong
199	307	Ç	Uppercase C with cedilla
200	310	È	Uppercase E with grave accent
201	311	É	Uppercase E with acute accent
202	312	Ê	Uppercase E with circumflex accent
203	313	Ë	Uppercase E with diaeresis or umlaut mark
204	314	Ì	Uppercase I with grave accent
205	315	Í	Uppercase I with acute accent
206	316	Î	Uppercase I with circumflex accent

Table 5–20 (Cont.): ASCII Character Set

ASCII			
Decimal	Octal	Character	Remarks
207	317	Ï	Uppercase I with diaeresis or umlaut mark
208	320		Reserved
209	321	Ñ	Uppercase N with tilde
210	322	Ò	Uppercase O with grave accent
211	323	Ó	Uppercase O with acute accent
212	324	Ô	Uppercase O with circumflex accent
213	325	Õ	Uppercase O with tilde
214	326	Ö	Uppercase O with diaeresis or umlaut mark
215	327	Œ	Uppercase OE ligature
216	330	Ø	Uppercase O with slash
217	331	Ù	Uppercase U with grave accent
218	332	Ú	Uppercase U with acute accent
219	333	Û	Uppercase U with circumflex accent
220	334	Ü	Uppercase U with diaeresis or umlaut mark
221	335	ÿ	Uppercase Y with diaeresis or umlaut mark
222	336		Reserved
223	337	ß	German lowercase sharp s
224	340	à	Lowercase a with grave accent
225	341	á	Lowercase a with acute accent
226	342	â	Lowercase a with circumflex accent
227	343	ã	Lowercase a with tilde
228	344	ä	Lowercase a with diaeresis or umlaut mark
229	345	å	Lowercase a with ring
230	346	æ	Lowercase ae dipthong
231	347	ç	Lowercase c with cedilla
232	350	è	Lowercase e with grave accent
233	351	é	Lowercase e with acute accent
234	352	ê	Lowercase e with circumflex accent
235	353	ë	Lowercase e with diaeresis or umlaut mark
236	354	ì	Lowercase i with grave accent
237	355	í	Lowercase i with acute accent
238	356	î	Lowercase i with circumflex accent
239	357	ï	Lowercase i with diaeresis or umlaut mark
240	360		Reserved

Table 5-20 (Cont.): ASCII Character Set

ASCII			
Decimal	Octal	Character	Remarks
241	361	ñ	Lowercase n with tilde
242	362	ò	Lowercase o with grave accent
243	363	ó	Lowercase o with acute accent
244	364	ô	Lowercase o with circumflex accent
245	365	õ	Lowercase o with tilde
246	366	ö	Lowercase o with diaeresis or umlaut mark
247	367	œ	Lowercase oe ligature
248	370	ø	Lowercase o with slash
249	371	ù	Lowercase u with grave accent
250	372	ú	Lowercase u with acute accent
251	373	û	Lowercase u with circumflex accent
252	374	ü	Lowercase u with diaeresis or umlaut mark
253	375	ÿ	Lowercase y with diaeresis or umlaut mark
254	376		Reserved
255	377		Reserved

RSTS/E System Errors

Table 5–21 lists the severity standard in RSTS/E error messages.

Table 5–21: Severity Standard in Error Messages

Character	Severity	Meaning
%	Warning	Execution of the program can continue but may not generate the expected results.
?	Error	Execution cannot continue unless you remove the cause of the error.
??	Severe Error	Execution cannot continue, and you probably cannot remove the cause of the error. In most cases, there is no opportunity for recovery.
none	Information	A message beginning with neither a question mark nor a percent is for information only.

Table 5–22 lists the RSTS/E error messages.

Table 5–22: RSTS/E Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
BADDIR	1	1	??Bad directory for device
BADNAM	2	2	?Illegal file name
INUSE	3	3	?Account or device in use
NOROOM	4	4	?No room for user on device
NOSUCH	5	5	?Can't find file or account
NODEVC	6	6	?Not a valid device
NOTCLS	7	7	?I/O channel already open
NOTAVL	8	10	?Device not available
NOTOPN	9	11	?I/O channel not open
PRVIOL	10	12	?Protection violation

Table 5-22 (Cont.): RSTS/E Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
EOF	11	13	?End of file on device
ABORT	12	14	??Fatal system I/O failure
DATERR	13	15	?Data error on device
HNGDEV	14	16	?Device hung or write locked
HNGTTY	15	17	?Keyboard wait exhausted
FIEXST	16	20	?Name or account now exists
DTOOOF	17	21	?Too many open files on unit
BADFUO	18	22	?Illegal SYS() usage
INTLCK	19	23	?Disk block is interlocked
WRGPAK	20	24	?Pack IDs don't match
NOTMNT	21	25	?Disk pack is not mounted
PAKLCK	22	26	?Disk pack is locked out
BADCLU	23	27	?Illegal cluster size
PRIVAT	24	30	?Account does not exist
INTPAK	25	31	%Disk pack needs REBUILDing
BADPAK	26	32	??Disk pack mount error
DETKEY	27	33	?I/O to detached keyboard
CTRLCE	28	34	Programmable ^C trap
SATTBD	29	35	??Corrupted file structure
DEVNFS	30	36	?Device not file-structured
BADCNT	31	37	?Illegal byte count for I/O
NOBUFS	32	40	?No buffer space available
B.4	33	41	?Odd address trap
B.10	34	42	?Reserved instruction trap
B.250	35	43	?Memory management violation
B.STAK	36	44	??SP stack overflow
B.SWAP	37	45	??Disk error during swap
B.PRTY	38	46	??Memory parity failure

Table 5–22 (Cont.): RSTS/E Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
MAGSEL	39	47	?Maptape select error
MAGRLE	40	50	?Maptape record length error
NRRTS	41	51	??Non-res run-time system
VCSERR	42	52	?Virtual buffer too large
VCAERR	43	53	?Virtual array not on disk
SIZERR	44	54	?Matrix or array too big
VCOERR	45	55	?Virtual array not yet open
BSERR	46	56	?Illegal I/O Channel
LINERR	47	57	?Line too long
FLTERR	48	60	%Floating point error
EXPERR	49	61	%Argument too large in EXP
FMTERR	50	62	%Data format error
FIXERR	51	63	%Integer error
BDNERR	52	64	%Illegal number
LOGERR	53	65	%Illegal argument in LOG
SQRERR	54	66	%Imaginary square roots
SUBERR	55	67	?Subscript out of range
MINVER	56	70	?Can't invert matrix
ODD	57	71	?Out of data
ONBAD	58	72	?ON statement out of range
NEDERR	59	73	?Not enough data in record
IOLERR	60	74	?Integer overflow, FOR loop
DIVBY0	61	75	%Division by 0
NORTS	62	76	?No run-time system
FIELDE	63	77	?FIELD overflows buffer
NORACS	64	100	?Not a random access device
NOTMTA	65	101	?Illegal MAGTAPE() usage
ERRERR	66	102	?Missing special feature

Table 5–22 (Cont.): RSTS/E Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
BADSWT	67	103	?Illegal switch usage
EOV	68	104	?End of volume
QUOTA	69	105	?Quota exceeded
–	70	106	??Unused error message 70
STMERR	71	107	?Statement not found
EXITTM	72	110	?RETURN without GOSUB
EXITNR	73	111	?FNEND without function call
UNDFNI	74	112	?Undefined function called
COSERR	75	113	?Illegal symbol
TLOPNV	76	114	?Illegal verb
TLNZSP	77	115	?Illegal expression
TLNOIT	78	116	?Illegal mode mixing
TLIFFE	79	117	?Illegal IF statement
TLCONI	80	120	?Illegal conditional clause
TLNOTF	81	121	?Illegal function name
TLQDUM	82	122	?Illegal dummy variable
TLMFND	83	123	?Illegal FN redefinition
TLRNNM	84	124	?Illegal line number(s)
MODERR	85	125	?Modifier error
–	86	126	?Can't Compile Statement
OUTAS	87	127	?Expression too complicated
FUNERR	88	130	?Arguments don't match
TLTMAF	89	131	?Too many arguments
TLINCD	90	132	%Inconsistent function usage
CPNSDF	91	133	?Illegal DEF nesting
CPUPFR	92	134	?FOR without NEXT
CPUFNX	93	135	?NEXT without FOR
CPUPDF	94	136	?DEF without FNEND

Table 5–22 (Cont.): RSTS/E Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
CPUPED	95	137	?FNEND without DEF
TLJNKY	96	140	?Literal string needed
TLNOFN	97	141	?Too few arguments
SASYNE	98	142	?Syntax error
SAFNOS	99	143	?String is needed
SASNOI	100	144	?Number is needed
TLURTP	101	145	?Data type error
TLXDIM	102	146	?1 or 2 dimensions only
FUCORE	103	147	??Program lost-Sorry
RESERR	104	150	?RESUME and no error
DIMED2	105	151	?Redimensioned array
TLIDIM	106	152	%Inconsistent subscript use
NOGOTO	107	153	?ON statement needs GOTO
EOSERR	108	154	?End of statement not seen
TLCNTD	109	155	?What?
TLPRNM	110	156	?Bad line number pair
EDBMCE	111	157	?Not enough available memory
EDEXON	112	160	?Execute only file
NRNERR	113	161	?Please use the RUN command
EDCONE	114	162	?Can't CONTinue
EDARSV	115	163	?File exists-RENAME/REPLACE
PRERRS	116	164	?PRINT-USING format error
UDMERR	117	165	?Matrix or array without DIM
PRNER1	118	166	?Bad number in PRINT-USING
NONOIM	119	167	?Illegal in immediate mode
PRNER2	120	170	?PRINT-USING buffer overflow
BADERR	121	171	?Illegal statement
DISERR	122	172	?Illegal FIELD variable

Table 5–22 (Cont.): RSTS/E Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
STPERR	123	173	Stop
DIMERR	124	174	?Matrix dimension error
NOMATH	125	175	?Wrong math package
XCDCOR	126	176	??Maximum memory exceeded
SCAERR	127	177	%SCALE factor interlock
–	128	200	?Tape records not ANSI
–	129	201	?Tape BOT detected
–	130	202	?Key not changeable
–	131	203	?No current record
–	132	204	?Record has been deleted
–	133	205	?Illegal usage for device
–	134	206	?Duplicate key detected
–	135	207	?Illegal usage
–	136	210	?Illegal or illogical access
–	137	211	?Illegal key attributes
–	138	212	?File is locked
–	139	213	?Invalid file options
–	140	214	?Index not initialized
–	141	215	?Illegal operation
–	142	216	?Illegal record on file
–	143	217	?Bad record identifier
–	144	220	?Invalid key of reference
–	145	221	?Key size too large
–	146	222	?Tape not ANSI labeled
–	147	223	?RECORD number exceeds max
–	148	224	?Bad RECORDSIZE on OPEN
–	149	225	?Not at end of file
–	150	226	?No primary key specified

Table 5–22 (Cont.): RSTS/E Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
–	151	227	?Key field beyond record end
–	152	230	?Illogical record accessing
–	153	231	?Record already exists
–	154	232	?Record/bucket locked
–	155	233	?Record not found
–	156	234	?Size of record invalid
–	157	235	?Record on file too big
–	158	236	?Primary key out of sequence
–	159	237	?Key larger than record
–	160	240	?File attributes not matched
–	161	241	?Move overflows buffer
–	162	242	?Cannot open file
–	163	243	?No file name
–	164	244	?Terminal fmt file required
–	165	245	?Cannot position to EOF
–	166	246	?Negative fill or string len
–	167	247	?Illegal record format
–	168	250	?Illegal ALLOW clause
–	169	251	??Unused ERROR message 169
–	170	252	?Indexed not fully optimized
–	171	253	?RRV not fully updated
–	172	254	?Record LOCK failed
–	173	255	?Invalid RFA field
–	174	256	?Unexpired file date
–	175	257	?Node name error
–	176	260	?Negative TAB not allowed
–	177	261	?Too much data in record
–	178	262	?OPEN error - file corrupted

Table 5–22 (Cont.): RSTS/E Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
–	179	263	??Unused ERROR message 179
–	180	264	?No support for op in task
–	181	265	?Decimal overflow
–	182	266	?Network operation rejected
–	183	267	?REMAP overflows buffer
–	184	270	?Unaligned REMAP variable
–	185	271	%RECORDSIZE overflows MAP
–	186	272	?Improper error handling
–	187	273	?Illegal record lock clause
–	188	274	??Unused ERROR message 188
–	189	275	??Unused ERROR message 189
–	190	276	??Unused ERROR message 190
–	191	277	??Unused ERROR message 191
–	192	300	??Unused ERROR message 192
–	193	301	??Unused ERROR message 193
–	194	302	??Unused ERROR message 194
–	195	303	??Unused ERROR message 195
–	196	304	?REMAP string is not static
–	197	305	??Unused ERROR message 197
–	198	306	??Unused ERROR message 198
–	199	307	??Unused ERROR message 199
–	200	310	??Unused ERROR message 200
–	201	311	??Unused ERROR message 201
–	202	312	??Unused ERROR message 202
–	203	313	??Unused ERROR message 203
–	204	314	??Unused ERROR message 204
–	205	315	??Unused ERROR message 205
–	206	316	??Unused ERROR message 206

Table 5–22 (Cont.): RSTS/E Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
–	207	317	??Unused ERROR message 207
–	208	320	??Unused ERROR message 208
–	209	321	??Unused ERROR message 209
–	210	322	??Unused ERROR message 210
–	211	323	??Unused ERROR message 211
–	212	324	??Unused ERROR message 212
–	213	325	??Unused ERROR message 213
–	214	326	??Unused ERROR message 214
–	215	327	??Unused ERROR message 215
–	216	330	??Unused ERROR message 216
–	217	331	??Unused ERROR message 217
–	218	332	??Unused ERROR message 218
–	219	333	??Unused ERROR message 219
–	220	334	??Unused ERROR message 220
–	221	335	??Unused ERROR message 221
–	222	336	??Unused ERROR message 222
–	223	337	??Unused ERROR message 223
–	224	340	??Unused ERROR message 224
–	225	341	??Unused ERROR message 225
–	226	342	??Unused ERROR message 226
–	227	343	?String too long
–	228	344	?RECORDTYPES not matched
–	229	345	??Unused ERROR message 229
–	230	346	?No fields in image
–	231	347	?Illegal string image
–	232	350	?Null image
–	233	351	?Illegal numeric image
–	234	352	?Numeric image for string

Table 5–22 (Cont.): RSTS/E Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
–	235	353	?String image for numeric
–	236	354	?TIME limit exceeded
–	237	355	?1st arg to SEQ\$ > 2nd
–	238	356	?Arrays must be same DIM
–	239	357	?Arrays must be square
–	240	360	?Cannot change array DIMs
–	241	361	?Floating overflow
–	242	362	?Floating underflow
–	243	363	?CHAIN to non-existent line
–	244	364	?Exponentiation error
–	245	365	?Illegal exit from DEF*
–	246	366	?Error trap needs RESUME
–	247	367	?Illegal RESUME to SUBR
–	248	370	?Illegal subroutine return
–	249	371	?Argument out of bounds
–	250	372	?Not implemented
–	251	373	?Recursive subroutine call
–	252	374	?FILE ACP failure
–	253	375	?Directive error
–	254	376	??Unused ERROR message 254
–	255	377	??Unused ERROR message 255

Table 5–23 lists the RMS error messages.

Table 5-23: RMS Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
COMPLETION CODES			
SU\$SUC	1	000001	Operation succeeded
SU\$DUP	2	000002	Inserted record has duplicate key
SU\$IDX	3	000003	Error updating index
ER\$ACC	-32	177740	File access error
ER\$ACT	-48	177720	Activity precludes operation
ER\$AID	-64	177700	Bad value in AID field
ER\$ALN	-80	177660	Bad mask in ALN field
ER\$ALQ	-96	177640	Bad value in ALQ field
ER\$ANI	-112	177620	Bad ANSI-format magtape file
ER\$AOP	-128	177600	Bad mask in AOP field
ER\$ATR	-160	177540	Error reading attributes
ER\$ATW	-176	177520	Error writing attributes
ER\$BKS	-192	177500	Bad value in BKS field
ER\$BKZ	-208	177460	Bad value in BKZ field
ER\$BOF	-232	177430	Beginning-of-file found
ER\$BPA	-240	177420	Bad address in BPA field
ER\$BPS	-256	177400	Bad value in BPS field
ER\$CCR	-288	177340	RAB already in use
ER\$CHG	-304	177320	Illegal record key change
ER\$CHK	-320	177300	Bad bucket header
ER\$CLS	-336	177260	File processor error
ER\$COD	-352	177240	Bad code in COD field
ER\$CRE	-368	177220	File processor error
ER\$CUR	-384	177200	Undefined current-record context
ER\$DAN	-416	177140	Bad value in DAN field

Table 5-23 (Cont.): RMS Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
COMPLETION CODES			
ER\$DEL	-432	177120	Record having RFA deleted
ER\$DEV	-448	177100	Bad device specification
ER\$DFW	-456	177070	File processor error
ER\$DIR	-464	177060	Bad directory specification
ER\$DME	-480	177040	Pool exhausted
ER\$DNA	-488	177030	Bad address in DNA field
ER\$DNF	-496	177020	No such directory
ER\$DNR	-512	177000	Device not ready
ER\$DPE	-520	176770	Device positioning error
ER\$DTP	-528	176760	Bad code in DTP field
ER\$DUP	-544	176740	Duplicate key not allowed
ER\$ENV	-576	176700	Feature not in selected RMS-11 environment
ER\$EOF	-592	176660	End-of-file reached
ER\$ESA	-600	176650	Bad address in ESA field
ER\$ESL	-604	176644	Bad value in ESL field
ER\$ESS	-608	176640	ESS field value too small
ER\$EXP	-616	176630	File expiration date not yet reached
ER\$EXT	-624	176620	File processor error
ER\$FAC	-656	176560	FAC field forbids operation
ER\$FAL	-664	176550	Operation not supported by remote node
ER\$FEX	-672	176540	File already exists
ER\$FID	-680	177530	Bad value in FID field
ER\$FLG	-688	176520	Bad mask in FLG field
ER\$FLK	-704	176500	File locked by another task

Table 5-23 (Cont.): RMS Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
COMPLETION CODES			
ER\$FNA	-712	176470	Bad address in FNA field
ER\$FNF	-736	176440	File not found
ER\$FNM	-752	176420	Bad file name
ER\$FOP	-768	176400	Bad mask in FOP field
ER\$FSS	-776	176370	Bad merged string
ER\$FUL	-784	176360	Device or file allocation failure
ER\$IAN	-800	176340	Bad value in IAN field
ER\$IDX	-816	176320	Index not initialized
ER\$IFI	-832	176300	Bad value in IFI field
ER\$IMX	-848	176260	Too many XABs of same type
ER\$IOP	-880	176220	Illegal operation for file
ER\$IRC	-896	176200	Illegal record found in sequential file
ER\$ISI	-912	176160	Bad value in ISI field
ER\$KBF	-928	176140	Bad address in KBF field
ER\$KEY	-944	176120	Bad key
ER\$KRF	-960	176100	Bad value in KRF field
ER\$KSZ	-976	176060	Bad value in KSZ field
ER\$LAN	-992	176040	Bad value in LAN field
ER\$LBL	-1008	176020	Bad magtape label
ER\$LBY	-1024	176000	Logical channel busy
ER\$LCH	-1040	175760	Bad value in LCH field
ER\$LEX	-1048	175750	Extension not needed
ER\$LOC	-1056	175740	Bad value in LOC field
ER\$MEM	-1080	175710	Memory address rollover
ER\$MKD	-1088	175700	File processor error

Table 5–23 (Cont.): RMS Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
COMPLETION CODES			
ER\$MRN	-1104	175660	Bad value in MRN field or bad record number
ER\$MRS	-1120	175640	Bad value in MRS field
ER\$NAE	-1128	175630	Unmappable network access error
ER\$NAM	-1136	175620	Bad address in NAM field
ER\$NEF	-1152	175600	Context not end-of-file
ER\$NET	-1160	175570	Network link lost
ER\$NMF	-1172	175554	No more matching files
ER\$NOD	-1176	175550	Bad Node Name
ER\$NPK	-1184	175540	No primary key for indexed file
ER\$OPN	-1200	175520	File processor error
ER\$ORD	-1216	175500	Ordering of XABs illegal
ER\$ORG	-1232	175460	Bad mask in ORG field
ER\$PLG	-1248	175440	Error reading file prologue
ER\$PLV	-1256	175430	File prologue version level unsupported
ER\$POS	-1264	175420	Bad value in POS field
ER\$PRM	-1280	175400	Bad file date read
ER\$PRV	-1296	175360	Privilege violation
ER\$RAC	-1328	175320	Bad mask in RAC field
ER\$RAT	-1344	175300	Bad mask in RAT field
ER\$RBF	-1360	175260	Bad address in RBF field
ER\$RER	-1376	175240	File processor error
ER\$REX	-1392	175220	Record already exists
ER\$RFA	-1408	175200	Bad value in RFA field
ER\$RFM	-1424	175160	Bad code in RFM field

Table 5-23 (Cont.): RMS Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
COMPLETION CODES			
ER\$RLK	-1440	175140	Record locked
ER\$RNF	-1472	175100	No such record
ER\$RNL	-1488	175060	Record not locked
ER\$ROP	-1504	175040	Bad mask in ROP field
ER\$RPL	-1520	175020	File processor error
ER\$RRV	-1536	175000	Bad internal pointer
ER\$RSL	-1556	174754	Bad value in RLS field
ER\$RSS	-1560	174750	Bad value in RSS field
ER\$RST	-1564	174744	Bad address in RSA field
ER\$RSZ	-1568	174740	Bad value in RSZ field
ER\$RTB	-1584	174720	Record too big for user buffer
ER\$RVU	-1592	174710	Internal pointer corrupted
ER\$SEQ	-1600	174700	Sequential insertion records not in order
ER\$SHR	-1616	174660	Bad mask in SHR field
ER\$SIZ	-1632	174640	Bad value in SIZ field
ER\$SUP	-1656	175610	Operation not supported over network
ER\$SYS	-1664	174600	System error
ER\$TRE	-1680	174560	Index error
ER\$TYP	-1696	174540	Bad file extension
ER\$UBF	-1712	174520	Bad address in UBF field
ER\$UIN	-1720	174510	Field value rejected by FAL
ER\$USZ	-1728	174500	Bad value in USZ field
ER\$VER	-1744	174460	Bad file version number
ER\$WCD	-1768	174430	Illegal wildcard in merged string

Table 5–23 (Cont.): RMS Error Messages

Mnemonic	Decimal Value	Octal Value	Full Error Text
COMPLETION CODES			
ER\$WER	-1776	174420	File processor error
ER\$WLK	-1784	174410	Device write-locked
ER\$WPL	-1792	174400	File processor error
ER\$XAB	-1808	174360	Bad address in XAB field
ER\$XTR	-1824	174340	Extraneous data in file specification
FATAL ERROR COMPLETIONS			
ER\$ACT	-48	177720	Illegal concurrent operation
ER\$AST	-144	177560	Illegal operation at AST level
ER\$BUG	-272	177360	Error in RMS-11 internal data
ER\$CPB	-360	177230	Bad parameter block
ER\$FAB	-640	176600	Bad FAB
ER\$LIB	-1052	175744	Resident library not available
ER\$MAP	-1072	175720	Error in internal buffer mapping data
ER\$RAB	-1312	175340	Bad RAB

Syntax and Parsing

The following sections provide information on Command Syntax and Parsing.

Command Syntax

The following lines show the proper syntax for a CCL command called **COMMAND**. (Note that '<anything>' represents characters that the CCL parser does not process):

```
COM[MAND] [<switch(es)>] [/<anything>]
```

COM[MAND] [<switch(es)>] [<space><anything>]

The command line may contain two switches: /SI and /DET.

The format for the /SI switch is:

[<space>]/SI[ZE]:[+][#]<digits>[.]

where:

/SI	Denotes the size in K words to which the program must expand.
:	Terminates the /SIZE switch.
+	Designates an increment in size over the program's usual size. Without the plus sign, the digit's value is the total size in K words to which the program should expand.
#	Indicates the digit's value is given in octal. The default is decimal.
<digits>	Is the value for size, in K words. Size can be neither less than 1 nor greater than 32 (decimal).
.	Explicitly indicates a decimal value for digits.

The format for the /DET switch is:

[<space>]/DET[ACH]

Where /DET indicates that the program is to run detached from the job's console terminal.

Command Parsing

The run-time system passes the command line to the CCL parser. When the CCL parser receives a command string, it:

1. Translates the string
2. Checks the string for a valid CCL command
3. Writes the fully expanded CCL command into core common, and ensures that it is delimited by a space
4. Checks the remaining string for both of the valid CCL switches
5. Writes the remaining line (excluding CCL switches) to core common
6. Sets up the CCL program to run
7. Sets a flag from data in the CCL command definition block

8. Passes control back to the program's run-time system, which, in turn, runs the program (at the appropriate line number for BASIC-PLUS programs)

The BASIC-PLUS run-time system then:

1. Sets the STATUS variable
2. Checks the line number at which the program is to be entered
3. Checks whether the program is to be detached

BASIC-PLUS sets the STATUS variable according to the rules in Table 5-24.

Table 5-24: BPSTATUS Variable Bits

Bit	Test	Meaning
0-7	(STATUS AND 255%)	If bit 13 is 0, this byte must be 0. If bit 13 is 1, this byte is the size value n (in decimal) passed in the /SIZE:n switch or is -n to indicate that the size value was passed in the /SIZE:+n switch (the plus character preceded the size value). (To determine whether the size value is negative, check the most significant bit by the (STATUS AND 128%) test.)
8-12	—	Reserved for future use.
13	(STATUS AND 8192%)	If the /SIZE:n switch was specified, this bit is 1.
14	(STATUS AND 16384%)	If the /DET switch was specified, this bit is 1.
15	(STATUS < 0%)	This bit is always 1 (the value of STATUS is always negative for a CCL entry.0

OPSER and Obsolete System Utility Programs

This appendix describes the OPSER and obsolete system programs.

BATCH (OPSER-based)

BATCH lets you process work that can be run in your absence. You run a batch job by first putting batch commands into a control file that you create.

Privilege Required

- Read access to the files you are submitting
- Write access to use /DELETE

To Run the Program

```
RUN $QUE
```

Format

```
#Q BA:BATJOB.LOG=FILE1.CMD,FILE2.CTL
```

\$BASIC Command

Calls a BASIC compiler to compile a source program.

Format

```
$BASIC[/switches][specification field]/switch][specification fields]
```

Switches

/BP1

Uses the BASIC-PLUS compiler. The default is /BP1. The default file type is .BAS.

/BP2

Uses the BASIC-PLUS-2 compiler. The default is /BP1. The default file type is .B2S.

/EXECUTE

Creates an executable file. You can choose the file type according to the following rules:

- If you use BASIC-PLUS, give the file a .BAC file type.
- If you use BASIC-PLUS-2, give the file a .TSK file type.

/NOEXECUTE

Creates a temporary executable file, if one is needed, and deletes the file when \$BASIC processing completes.

/LIST

Produces the listing file filename .LST. The default is /NOLIST.

/NOLIST

Does not produce a listing file. The default is /NOLIST.

/MAP

Creates the Task Builder map file filename .MAP. This switch causes BASIC-PLUS-2 to run; it also causes a Task Build operation. The default is /NOMAP.

/NOMAP

Does not create a map file. This switch causes BASIC-PLUS-2 to run. The default is /NOMAP.

/OBJECT

Creates the object file filename .OBJ. The /OBJECT switch causes the BASIC-PLUS-2 compiler to run; it also causes a Task Build operation.

/NOOBJECT

Creates the object file filename .TMP. This switch causes the BASIC-PLUS-2 compiler to run.

/RUN

Executes a previously compiled and task built program. If you use /RUN, you can indicate only one file specification and only one switch: /EXECUTE.

/NORUN

Performs the compiled and task build procedure, but does not execute the final file.

\$COPY Command

Copies files.

Format

\$COPY file1/output file2/input

Usage Notes

You cannot use an asterisk (*) in file specifications with this command.

Switches

/INPUT

Copies files.

/OUTPUT

Creates new files.

\$CREATE Command

Creates an ASCII file in the specification field.

Format

\$CREATE file

Usage Notes

The ASCII file you create must follow the \$CREATE command. You must type \$EOD as the last line of the ASCII file; otherwise, you receive an error message. When it encounters a dollar sign (\$) in the first column of a line, \$CREATE terminates. Therefore, do not specify any commands preceding the ASCII file you create.

\$DATA Command

Enters data to a program that is compiled and run by one of the language commands (for example, \$BASIC). \$DATA also makes sure that the program runs (unless you specify the /NORUN switch).

Format

\$DATA

Usage Notes

\$DATA is typed without specification fields or switches.

\$DELETE Command

Deletes the files you specify.

Format

\$DELETE file1.typ[file2.typ ...]

Usage Notes

You must include a file name and file type in the specification field. You cannot use an asterisk (*) in either the file name or file type field. \$DELETE has no switches.

\$DIRECTORY Command

Lists files in an account you specify.

Format

\$DIRECTORY [specification field]

Usage Notes

You can include file specifications in the specification field. If you do not include any file specifications, \$DIRECTORY lists the contents of the current account in the batch log file. You can use an asterisk (*) in either the file name or file type fields.

Switches

/DIRECTORY

Creates a directory listing in a disk file instead of the batch log device.

/INPUT

Designates which files are to be listed.

\$DISMOUNT Command

Cancel the logical to physical device assignment made by the \$MOUNT command.

Format

\$DISMOUNT [/switch] logical name:

Switch

/WAIT

Holds the job until a response (as with the \$MESSAGE command) is received from the operator.

\$EOD Command

Marks the end of data records included in data you input after commands such as \$BASIC, \$CREATE, \$DATA, and \$RUN.

Format

\$EOD

\$EOJ Command

Marks the end of a job. The \$EOJ command dismounts all devices mounted by the job and prints an appropriate message to the operator that the logical device should be dismounted.

Format

\$EOJ

Usage Notes

When BATCH reaches the end of a control file (or another \$JOB control statement) while processing a control file, the \$EOJ command is implied.

\$FORTRAN Command

Calls the FORTRAN-IV compiler to compile a source program and generate an object program.

Format

\$FORTRAN[/switches][specification field]

Switches

/LIBRARY

Indicates a library file to link with the FORTRAN program.

/LIST

Produces the listing file filename .LST. The default is /NOLIST.

/NOLIST

Does not produce a listing file. The default is /NOLIST.

/MAP

Creates the map file filename .MAP. The default is /NOMAP.

/NOMAP

Does not create a map file. The default is /NOMAP.

/OBJECT

Creates the compiled file filename .OBJ. The default is /NOOBJECT.

/NOOBJECT

Does not create an object file. The default is /NOOBJECT.

/RUN

Executes the previously compiled file. You must specify an object file.

/NORUN

Compiles the source program, but does not execute the object file.

\$JOB Command

Marks the beginning of a batch job.

Format

\$JOB [/switches] [n,m]

Switches

/CCL

Uses the system's interactive Concise Command Language (CCL). If you specify this switch, any of the system commands that do not conflict with existing BATCH commands can follow the dollar sign (\$) character.

/CPU=nn

Assigns a CPU time limit to the job. The value of nn is a decimal number that is interpreted as seconds. If you specify /CPU without /LIMIT, no elapsed time limit is enforced, and the only time limit is on CPU time. If you specify /CPU and /LIMIT, both limits are enforced.

/NOCPU

Gives the job an unlimited amount of CPU time to complete.

/DCL

Disables all current BATCH commands that conflict with DCL commands and allows them to be processed by DCL. The job is spawned under the DCL run-time system. If you do not include this switch, the job is spawned under the RT11 run-time system.

/ERROR=[operand]

Specifies the level of error the batch processor accepts without terminating the job. The level is indicated by [operand], which can be FATAL, WARNING, or NONE. If FATAL, all errors are accepted until completion. If WARNING, a fatal error terminates the job, but warning errors are accepted. If NONE, any error terminates the job. The default error level is determined at system start-up.

/LIMIT=nn

Assigns an elapsed time limit to the job. The value of nn is a decimal number that is interpreted as minutes. Note that the elapsed time taken to execute a job depends heavily on overall system loading.

/NOLIMIT

Gives the job an unlimited amount of elapsed time to complete. If you do not specify /LIMIT=nn or /NOLIMIT, the job is given ten minutes elapsed time to complete execution before BATCH terminates it.

/NAME=job

Assigns a name to the job. Job names can be one to six characters long. This name overrides the control file name as the identifier of the job.

/NONAME

Indicates that no job name is defined. The system assigns a default job name, which is the name of the control file.

/PRIORITY=n

Sets the job priority to n (or the next lowest multiple of 8) for batch processing. If you are privileged, n can be between -120 and +127. If you are nonprivileged, n is limited to a value between -120 and -8. The default is -8.

/QUE

Queues the batch log file to LP0: (the default) or the device specified at system start-up.

/NOQUE

Suppresses printing of the batch log file.

\$MESSAGE Command

Logs a message on the operator services console.

Format

\$MESSAGE[/switch] message-string

Switch**/WAIT**

Makes the program pause to wait for operator action. This condition stays in effect until the operator responds to the message on the operator services console. See the *RSTS/E System Manager's Guide* for information on response procedures.

\$MOUNT Command

Causes a logical to physical device assignment.

Format

\$MOUNT devn:[/switch] devm:[/switch]

Usage Notes

You must specify both the logical and physical devices. The physical device refers to the physical device type. Enter the device and unit number in the standard format (for example, MT1:). You can specify logical device names that have one to six characters. Use the colon (:) as the terminator for each device specification.

Physical Device Switches

/DENSITY:nn

Specifies density for magnetic tape.

**/PARITY:[ODD]
[EVEN]**

Specifies odd or even parity for magnetic tape.

/PHYSICAL

Identifies the device specification as the physical device. This is the default.

/VID:[string]

Identifies the volume for the operator.

/WRITE

Tells the operator to write-enable the device or volume.

/NOWRITE

Tells the operator to write-protect the volume.

Logical Device Switch

/LOGICAL

Identifies the device specification as the logical device name. This specification must correspond to the pack-id label for RSTS/E disks.

\$PRINT Command

Prints the contents of files on the line printer.

Format

\$PRINT file1.typ/switches [file2.typ...]

Usage Notes

You can use the switches available with the QUE system program for all file specifications. See the QUE command for a description of the switches. You can use an asterisk (*) in file specifications.

\$RUN Command

Executes system programs.

Format

\$RUN [file.typ]

Usage Notes

The file specifies the executable program. If you omit the file, the system runs the current program.

\$SORT Command

Executes the SORT-11 program that is supplied on RSTS/E systems. See the *PDP-11 SORT/MERGE User's Guide* for more information on SORT-11.

Format

\$SORT [/switches] [output [/OUTPUT]] [input [/INPUT]] [spec/SPEC]

Usage Notes

You can abbreviate job switches to the first three letters. If you specify more than one switch, separate them with slashes (/).

If you specify /SPECIFICATION, you cannot use the /KEYS and /PROCESS switches in the command line. However, if you do not use a specification file in the control statement, you must include the /KEYS switch in the command field to control the sorting process.

You must always include the /FORMAT switch in the command field. A file specification without a switch is used as the file to be sorted. If you omit the file type in the file specification, the default is .SRT.

Switches

/ALLOCATION:n

Allocates space for an output file. The value *n* can range from 0 to 65535 blocks. If you do not specify the allocation, the default depends on the sort process (see /PROCESS). If /PROCESS is Record or Tag, the default is the input file size. If /PROCESS is Index or Address Routing, the default is the number of records sorted.

/BLOCKSIZE:n

Specifies the tape block size for input or output. The default is a 512-byte block.

/BUCKETSIZE:n

Specifies the file's bucket size for output. The default is the bucket size of the input file.

/CONTIGUOUS

Specifies a contiguous file for output. The default is noncontiguous.

/DEVICE:x

Specifies the device used for scratch files for input. The value of *x* is a one- to four-character device name.

/FILES:n

Specifies the number of scratch files for input. The value *n* can range from three to ten.

/FORMAT:x:n

Specifies the file's record format (*x*) and maximum record size (*n*) for input. The value *x* can be FIXED, STREAM, VARIABLE, or UNKNOWN and can be abbreviated to the first letter. You must specify this switch and the record size if you use \$SORT. The default format is VARIABLE.

/INDEXED_SEQUENTIAL[:x]

Specifies indexed file organization for input. The value *x* specifies the number of keys.

/KEYS:abm.n

Specifies the sorting key field for input. You must specify this switch if you do not include a specification file in the command line. You can specify a maximum of ten keys separated by colons. For example:

/KEY:abm.n:abm.n:...abm.n

/PROCESS:x

Specifies the sorting process for input. The value x can be Record sort (the default), Tag sort, Address Routing, or Index sort. You can abbreviate each process to the first letter.

/RELATIVE

Specifies relative file organization for output.

/SEQUENTIAL

Specifies sequential file organization for output.

/SIZE:n

Specifies the file's cluster size for output.

You can specify up to three file specifications (separated by spaces) in the \$SORT control statement: an input file, an output file, and a specification file. Use the following switches to distinguish these files (they can be abbreviated to the first three letters):

/INPUT

Specifies the file to be sorted.

/OUTPUT

Specifies the file containing the sorted data.

/SPECIFICATION

Specifies the file containing the control information for the sorting process.

QUE

QUE submits requests to the OPSER-based spooling programs. QUE also lists pending requests, kills pending requests, and modifies pending requests.

Privilege Required

- Read access to input files.
- Write access to files specified using /DE (delete)
- GACNT or WACNT privilege to submit requests under a PPN other than your own

To Run the Program

```
RUN OPSER$:QUE
```

Usage Notes

You can use wildcard characters for the file name and type, but not for the PPN.

QUE Program Commands

Q

Specifies one or more files you want to process.

L

Displays a list of the currently pending requests for the spooling program on your terminal.

S

Same as the L command, except that QUE displays a short form list.

K

Removes one or more jobs you indicate in the device specification and job name.

M

Modifies the parameters of a job already in the queue.

F

Directs QUE to abort all current jobs in the queue.

H

Displays an informational message on your terminal.

E

Terminates QUE and returns control to system command level.

Q Command Output Switches

/MO:n

The value n specifies the MODE that the spooling program uses in its OPEN statement for the line printer.

/LE:nnn

Set forms length to nnn (1 to 127) lines per page.

/CO

Changes number 0 (zero) to letter O (oh).

/TR

Truncates lines longer than unit's configured length.

/LP

Enables software formatting.

/UP

Translates lowercase to uppercase characters.

/SK

Skips six lines at bottom of each form.

/AF:spec

Initiates the current request after the value given in spec. Spec can be one or more of the following:

dd-mmm-yy

H:mm

yy.mm.dd

H:mm:am/pm

+n D[AYS]

+n H[OURS]

/PR:n

QUE sets the priority to the value of n, which can be in the range 0 and 255. The default priority is 128.

/TY:xxx

Uses the format specified by xxx for printing the file; xxx can be:

FORTTRAN forms control

Embedded forms control

Implied FORMS control

LF and CR printed before each record

/FO:form-name

Form-name specifies the name of the form on which the job is printed; form-name cannot exceed six characters, and the first character cannot be a digit.

/JC:n

The value of n specifies is the number of job copies you want to print.

Q Command File Name Switches

/CO:n

SPOOL prints the number of copies indicated by the decimal integer n. The default is one copy.

/NH

SPOOL suppresses printing of the file header.

/DE

SPOOL deletes the file after it is printed, if the protection code of the file permits.

/MORE

Indicates to QUE that you have more text to type on the next physical line. Used only at the end of a command line.

/BI

Indicates a binary file to the RJ2780 program, which must be in transparent mode.

/RE

SPOOL restarts the file or job if a malfunction occurs in printing.

RESTOR

The RSTS/E RESTOR program lets you return files you backed up before RSTS/E V9.0 (using the BACKUP program) to online use. The RSTS/E V9.0 RESTOR utility includes the restore features previously included in the BACKUP utility. RESTOR provides three operational modes:

- Restore, to rebuild Backup-created files onto a RSTS/E disk
- Loadindex, to copy the primary index file from the last volume of the Backup Set to a RSTS/E formatted disk
- List, to print directory information contained in a Backup index file

Privilege Required

To run RESTOR, you need WACNT, WREAD, and WWRITE privileges.

To Run the Program

```
RUN RESTOR$:RESTOR
```

The dialogue begins when you run RESTOR. The first question asks which of the three operational modes (Restore, Loadindex, or List) you want to perform. If you choose, you may create an indirect command file. The dialogue then asks you where to create the work file into which it will write the directory and error information. Additional questions ask for information on which files and accounts to transfer. When the dialogue ends, the program writes a summary of your commands into the listing file. Table A-1, Table A-2, and Table A-3, summaries of the Restore, Loadindex, and List dialogues, follow.

Table A-1: RESTOR Dialogue Summary

Question	Response and Meaning
1	RES[TORE], LOA[DINDEX], or LIS[T]? RES[TORE] (/SA[VE]) Restores files. If you append /SA[VE], RESTOR creates an indirect command file and asks question 1a.
1a	INDIRECT FILE NAME<_SY:[CUR ACT]RESTOR.CMD>? File specification Creates an indirect command file with the specified name. Valid output devices are disk and tape. Asked only if the SAVE switch is appended in question 1.
2	WORK-FILE NAME<_SY:[CUR ACT] Bddmmm.Jnn>? File specification Uses the specified file as the work file. If the default is accepted, RESTOR uses either Bddmmm or Bymmdd as the file name format. If the system date format, selected during installation, is alphabetic, the default name format is Bddmmm. where: dd Specifies the day of the month mmm Specifies the first three characters of the month If the system date format is numeric, Bymmdd is the default name format.

Table A-1 (Cont.): RESTOR Dialogue Summary

Question	Response and Meaning
	where:
	y Specifies the last digit of the current year
	mm Specifies the number of the month
	dd Specifies the day of the month
	In the .Jnn file type, nn represents the job number RESTOR is running under. You can substitute any mounted, write-enabled disk for SY:.
3	<p>LISTING FILE<_KB:>? KBn: or LPn: Writes the listing file to the specified keyboard or line printer unit. File specification Writes the listing file to the specified file on disk or tape. The default file name is SY: [CUR ACT] RESTOR.LST.</p>
4	<p>INDEX FILE<PRIMARY>? File specification Uses the specified file as the index file. You can specify an auxiliary index file or an index file created during a Loadindex operation. If you accept the default, RESTOR uses the primary index file that is on the final volume of the Backup Set.</p>
5	<p>FROM DEVICE<_MT:>? MT:, MM:, MS:, or disk name Restores backed-up files from the specified medium. (Do not specify a unit number here, only a device type. RESTOR requests the unit number later.)</p>
6	<p>FROM FILE(S) <[CUR ACT]*.*>? BACKUP File specification(s) Restores the specified files.</p>
7	<p>TO DISK<_SY:[*,*]>? Disk name Restores the specified files to the designated disk.</p>
8	<p>BEGIN AT<[*,*]*.*>? BACKUP File specification Restores starting with the file specified here. The default starts with the first file matching the file specification in question 6. The answer must be a single file specification. No EXCEPT modifiers are allowed.</p>

Table A-1 (Cont.): RESTOR Dialogue Summary

Question	Response and Meaning
9	<p>ENTER ACCOUNTS<YES>? YES</p> <p>Creates, on the destination disk, all accounts on the Backup Set that do not already exist on the destination disk.</p> <p>NO</p> <p>Does not create any accounts. You cannot selectively create accounts.</p>
10	<p>SUPERSEDE<NONE>? BACKUP File specification(s)</p> <p>Overwrites the specified files on the destination disk with the backup versions. If you accept the default, RESTOR does not supersede any files. (To supersede files, you must include a file specification. RESTOR does not supersede all files on the destination volume if you type ALL or YES. Instead of superseding the entire volume, RESTOR replaces only files that have a file specification of ALL or YES.)</p>
11	<p>COMPARE FILE(S)<NONE>? BACKUP File specification(s)</p> <p>Compares the restored files to the backup versions after transfer. As in the SUPERSEDE question, you must provide a file specification here instead of an answer such as ALL or YES.</p>

Table A-2: LOADINDEX Dialogue Summary

Question	Response and Meaning
1	<p>RES[TORE], LOA[DINDEX], or LIS[T]? LOA[DINDEX]?</p> <p>Copies index file from the Backup Set to a RSTS/E formatted disk. If you attach /SA[VE] to the LOA[DINDEX] response, RESTOR creates an indirect command file and asks question 1a.</p>
1a	<p>INDIRECT FILE NAME <_SY:[CUR ACT]LOADIN.CMD>? File specification</p> <p>Creates an indirect command file with the specified name. Valid output devices are disk and tape. This question is asked only if you use the /SA[VE] switch in response to question 1.</p>

Table A-2 (Cont.): LOADINDEX Dialogue Summary

Question	Response and Meaning
2	<p>WORK-FILE NAME<_SY:[CUR ACT]Bddmmm.Jnn>? File specification</p> <p>Uses the specified file as the work file. If you accept the default, LOADINDEX uses either Bddmmm or Bymmdd as the file name format.</p> <p>where:</p> <p>dd Specifies the day of the month mmm Specifies the first three characters of the month y Specifies the last digit of the year mm Specifies the number of the month</p> <p>In the file type .Jnn, nn represents the job number RESTOR is running under. You can substitute any mounted, write-enabled disk for SY.</p>
3	<p>LISTING FILE<_KB:>? KB: or LP:</p> <p>Writes the listing file to the keyboard or the line printer. If you press RETURN or LINE FEED, RESTOR sends the listing file to the keyboard <KB:>.</p> <p>File specification</p> <p>Writes the listing file to the specified disk or tape. If you type SY: and then press RETURN, the RESTOR program creates the default listing file [CUR ACT]LOADIN.LST.</p>
4	<p>FROM DEVICE<_MT:>? MT:, MM:, MS:, or Disk Name</p> <p>Copies the index file from the specified Backup Set device.</p>
5	<p>TO FILE<_SY:[CUR ACT] [BINDdd.IND]? File specification</p> <p>Loads the Backup Set index file into the specified file. You can copy the index to a disk device only. The format for the default file name is BINDdd.IND, where dd is the numeric day of the month.</p>

Table A-3: LIST Dialogue Summary

Question	Response and Meaning
1	<p>RES[TORE], LOA[DINDEX], or LIS[T]? LIS[T]/SA[VE]</p> <p>Runs the LIST dialogue. When you attach the /SA[VE] switch to the LIST response, RESTOR creates a DCL command file after you respond to question 1a.</p>
1a	<p>INDIRECT FILE NAME<_SY:[CUR ACT][LIST .CMD]>? File specification</p> <p>Creates a DCL command file with the specified name. Question 1a appears only if you use the /SA[VE] switch in response to question 1. Valid output devices are disk and tape.</p>
2	<p>WORK-FILE NAME<_SY:[CUR ACT]Bddmmm.Jnn>? File specification</p> <p>Uses the specified file as the work file. If you accept the default by pressing RETURN or LINE FEED, LIST uses either Bddmmm or Bymmdd as the file name format.</p> <p>where:</p> <p>dd Specifies the day of the month</p> <p>mmm Specifies the first three letters of the month</p> <p>mm Specifies the number of the month</p> <p>In the file type .Jnn, nn represents the job number RESTOR is running under. You can substitute any mounted, write-enabled disk for SY.</p>
3	<p>LISTING FILE<_KB:>? KB: or LP:</p> <p>Writes the backup directory information to the specified device. If you press RETURN or LINE FEED, the backup directory is written to your keyboard. Type LP: and press RETURN for a line printer listing.</p> <p>File specification</p> <p>Writes the backup directory information to the specified file. Type SY:, and press RETURN if you want RESTOR to create the default listing file, [CUR ACT]LIST.LST.</p>

Table A-3 (Cont.): LIST Dialogue Summary

Question	Response and Meaning
4	<p>INDEX FILE<PRIMARY>? File specification</p> <p>Extracts the index file from the specified file and writes it to the listing file. If you accept the default by pressing RETURN or LINE FEED, LIST requests the index volume. It then takes the directory information from the index volume and writes the information to the listing file.</p>
5	<p>FROM DEVICE<_MT:>? File specification</p> <p>Asked only if you accept the default in the INDEX FILE<PRIMARY> question. The file specification response must identify the device on which the index resides. You can accept the magnetic tape default <_MT:> by pressing RETURN or LINE FEED. The LIST program begins a MOUNT dialogue, which asks you to mount the Backup Set index volume and identify the target device.</p>

File Specifications

Several questions in the dialogue require you to respond with a file specification. The specification can include file name, account, and dates of creation and last access. In addition, you can specify one or more files as exceptions from a process.

The file specification has the format:

filename/keyword:comparison:date:time/exception (filename . . .)

where:

filename	Is a standard RSTS/E file specification.
keyword	Is either CR[EATION] or AC[CESS] and specifies that RESTOR is to interpret the date and time as either file creation or access dates and times.
comparison	Is either BEF[ORE] or AFT[ER] and specifies that RESTOR is to process files created or accessed before or after the date and time.
date	Specifies the date RESTOR uses to process files.

time	Optionally specifies the time RESTOR uses to process files only when you specify CREATION. Use the 24-hour format such as 14:49. The default is 00:01 on the specified date.
exception	Is EXC[EPT] and specifies that RESTOR is to exclude from processing the specified files that follow. You can include all of the previous elements in an EXCEPT phrase but do not include another EXCEPT phrase. Separate multiple file specification commas and enclose the list in parentheses.

RESTOR Interruption Commands

The RESTOR package includes interruption commands for your convenience. These commands enable you to detach, terminate, suspend, and continue processing and to check the status of the run.

RESTOR shows it is ready to accept interruption commands by printing an asterisk on the job's console terminal after the dialogue is complete. You can type an interruption command as a response to a request in the mount procedure or any time after the asterisk appears. Table A-4 provides a summary of the interruption commands.

Table A-4: RESTOR Interruption Commands

Command and Meaning	
ABO[RT]	Terminates processing immediately and returns control to your keyboard monitor.
CON[TINUE]	Continues processing after a PAUSE command.
DET[ACH]	Detaches job from KB:. RESTOR detaches if three conditions are met: <ul style="list-style-type: none"> • OPSER is running • The listing file is not on KB: • No messages are currently pending for this copy of RESTOR. RESTOR is given a receiver identification of BACKnn, where nn is its job number. All interaction with RESTOR is done through OPSER.
END	Terminates after processing the current file.

Table A-4 (Cont.): RESTOR Interruption Commands

Command and Meaning	
LAS[T]	Reprints, on KB:, the last text printed. If the program is awaiting a response, reprints the question or prompt. If not, reprints the last message.
LEG[AL]	Prints (on KB:) a list of the commands and responses that are legal now. In the list, **OTHER** means that a request for information from you is pending (for example, Backup Set name). The response to such a request is any appropriate string. You do not need to use quotation marks (") unless the response can be interpreted as an interruption command. For example, you can legally name the Backup Set PAUSE, but you must type the name in quotes ("PAUSE")
NOT[ICE]	Writes the specified text in the listing file. The NOTICE command has the format: NOT[ICE] message Message represents one line of text. No line terminators are allowed in the message.
OFF[LINE]	Same function as ABORT.
PAU[SE]	Suspends execution until you type CONTINUE. Any legal command typed during a PAUSE is executed immediately.
STA[TUS]	Prints, on KB:, RESTOR status information.
TER[MINATE]	Closes the current volume at the end of the current file or at the end of the current output volume, whichever comes first.

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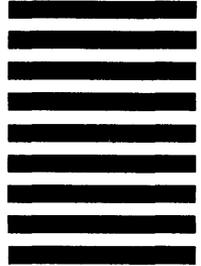
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