

Appendix A

Full List of Errors

| ERR.STB 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 |
| 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 | ?Disk pack is private |
| INTPAK | 25 | 31 | ?Disk pack needs 'REBUILDing' |
| BADPAK | 26 | 32 | ?Fatal 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 |

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|--------|----|-----|------------------------------|
| 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 |
| MAGSEL | 39 | 47 | ?Magtape select error |
| MAGRLE | 40 | 50 | ?Magtape 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 |
| FIELD | 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 |
| BADSWT | 67 | 103 | ?Illegal switch usage |
| | 68 | 104 | Unused error message |
| | 69 | 105 | Unused error message |
| | 70 | 106 | Unused error message |
| 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 | Unused error message |
| OUTCAS | 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 |
| 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 |
| BADSWT | 117 | 165 | ?Illegal switch usage |
| 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 |
| 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 |

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Appendix B

Device Information

This appendix summarizes MODE and RECORD values and other useful information for:

- Disks
- Flexible diskettes
- Magnetic tape
- Line printers
- Terminals
- Pseudo keyboards

For your convenience, values are given in both decimal and octal, and FIRQB and XRB offsets are listed. All decimal values have a decimal point; values without a decimal point are in octal.

This appendix is a “quick reference.” See the *RSTS/E Programming Manual* if you need more detail on any topic, except where otherwise noted.

B.1 Disks

This section summarizes disk MODE values and lists the device cluster size and total size for each disk that RSTS/E supports.

B.1.1 MODE Values

Tables B-1 and B-2 summarize disk MODE values for file-structured and non-file-structured access.

Table B-1: 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 (4 + 1) |
| 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 |
| 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 (privileged) |
| 8192. | 20000 | Open file read-only |
| 16384. | 40000 | Write UFD (privileged) |

Table B-2: 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; it is not recommended for general use.) |

B.1.2 Disk Device Sizes

Table B-3 lists the device cluster size and device size (in 512-byte blocks) for each disk that RSTS/E supports. All values are in decimal.

Table B-3: Disk Device Sizes

| Disk | Device Cluster Size | Device Size |
|-------|---------------------|---------------------------------------|
| RX50 | 1 | 800 |
| RF11 | 1 | 1024 times number of platters |
| RS03 | 1 | 1024 |
| RS04 | 1 | 2048 |
| RK05 | 1 | 4800 |
| RK05F | 1 | 4800 per unit; 2 units for each drive |
| RL01 | 1 | 10220 |
| RL02 | 1 | 20460 |
| RD51 | 1 | 21600 |
| RK06 | 1 | 27104 |
| RK07 | 1 | 53768 |
| RC25 | 1 | 50902 per unit; 2 units per spindle |
| RP02 | 2 | 40000 |
| RP03 | 2 | 80000 |
| RM02 | 4 | 131648 |
| RM03 | 4 | 131648 |
| RP04 | 4 | 171796 |
| RP05 | 4 | 171796 |
| RA80 | 4 | 237208 |
| RM80 | 4 | 242575 |
| RP06 | 8 | 340664 |
| RA60 | 8 | 400175 |
| RM05 | 8 | 500352 |
| RA81 | 16 | 888012 |

B.2 Flexible Diskettes

Tables B-4 and B-5 summarize MODE and RECORD values for flexible diskettes.

Table B-4: Flexible Diskette MODE Values (FIRQB + FQMODE)

| Decimal | Octal | Function |
|---------|-------|-------------|
| 0. | 0 | Block mode |
| 16384. | 40000 | Sector mode |

Table B-5: Flexible Diskette RECORD Values (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 |

B.3 Magnetic Tape

This section summarizes MODE and CLUSTERSIZE values for magnetic tape.

B.3.1 File-Structured Processing

Tables B-6 and B-7 summarize MODE and CLUSTERSIZE values for file-structured magnetic tape.

Table B-6: 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 |
| 16384. | 40000 | Search for DOS-formatted file label |
| 24576. | 60000 | Search for ANSI-formatted file label |

Table B-7: CLUSTERSIZE Values for ANSI Magnetic Tape Files

| Label Field Name | CLUSTERSIZE (FIRQB + FQCLUS) | | Label Result |
|--|---------------------------------|--------------------|---|
| | Decimal | Octal | |
| Record format | 0. | 0 | U = undefined.* |
| | 16384. | 40000 | F = fixed-length. |
| | 32767. + 1. | 100000 | D = variable length. |
| | -16384. | 140000 | S = spanned.** |
| Record length (in bytes) | Betw 0. and 4095. | Betw 0 and 7777 | For U, always 0. For F, fixed record length. For D, maximum record length. For S, not used.** |
| System Dependent (File characteristics) | 0. | 0 | M = carriage control embedded. |
| | 4096. | 10000 | A = FORTRAN carriage control. |
| | 8192. | 20000 | (space) = implied carriage control. When printed, line feed precedes and carriage return follows each record. |
| * RSTS/E undefined record formats cannot be processed directly by other operating systems. | | | |
| ** RSTS/E does not support ANSI format S records. | | | |

B.3.2 Non-File-Structured Processing

MODE values in non-file-structured magnetic tape processing have the form:

$$\text{MODE}(\text{FIRQB} + \text{FQMODE}) = \text{D} + \text{P} + \text{S}$$

where:

D (density) = 12.(14) for 800 BPI
256.(400) for 1600 BPI, phase-encoded

P (parity) = 0.(0) for odd
1.(1) for even

S (stay) = 0.(0) to clear MODE value after CLOSE
8192.(20000) to retain MODE value after CLOSE

Note that DIGITAL recommends the use of odd parity. When you use even parity, you cannot write binary data. In addition, many operating systems and tape drives do not support even parity.

For information on magnetic tape special functions, the magnetic tape status word, and the file characteristics word, see the description of .SPEC for magnetic tape (Section 3.23.3).

B.4 Line Printers

This section summarizes line printer MODE and RECORD values.

Table B-8: Line Printer MODE Values (FIRQB + FQMODE)

| Decimal | Octal | Function |
|-----------|---------|--|
| 1. – 127. | 1 – 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 $\geq 200_8$. |
| 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 B-9: Line Printer RECORD Values (XRB + XRMOD)

| Decimal | Octal | Function |
|---------|-------|---|
| 2. | 2 | Print over perforation (disables MODE 4000 for this output step). |
| 4. | 4 | Do not return control to program until output is complete or an error occurs. |
| 8. | 10 | Clear pending output buffers before buffering characters for the request. |
| 8192. | 20000 | Return control to program if output stall is to occur. (See .WRITE directive for more information.) |

B.5 Terminals

This section summarizes MODE and RECORD values for terminals. It also includes information about echo control mode and VT100 ANSI-compatible escape sequences.

B.5.1 Terminal MODE and RECORD Values

Tables B-10 through B-12 summarize terminal MODE values and RECORD values for terminal input and output.

Table B-10: Terminal MODE Values (FIRQB + FQMODE)

| Decimal | Octal | Function |
|---------|-------|--|
| 1. | 1 | Enable binary input from a terminal |
| 2. | 2 | Reserved for TECO |
| 4. | 4 | Suppress automatic CR/LF at right margin |
| 8. | 10 | Enable echo control (turns off other modes and automatically enables MODE 4) |
| 16. | 20 | Guard program against CTRL/C interruption and dial-up line hibernation |
| 32. | 40 | Enable incoming XON/XOFF processing |
| 64. | 100 | Reserved |
| 128. | 200 | Enable use of RUBOUT as a delimiter on video terminals |
| 256. | 400 | Set escape sequence mode |

Table B-11: RECORD Values for Terminal Input (XRB + XRMOD)

| Decimal and Octal Values | Function |
|--|---|
| 8192. 20000 | Perform conditional input (execute input request without waiting for data to be available). |
| 32767. + 1. + K 100000 + K | Perform multiterminal service input from assigned keyboard number K. |
| 32767. + 1. + 16384. + S 140000 + S | Perform multiterminal service input from any assigned keyboard: <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>S = 0</p> <p>1. < S < 255. 1 < S < 377</p> <p>S = 8192. S = 20000</p> </div> <div style="width: 65%;"> <p>Wait until input is available from any terminal. The error ?Data error on device may occur due to a race condition with CTRL/C.</p> <p>Wait up to S seconds for input from any terminal and then return ?Data error on device if no input is available.</p> <p>Request input immediately; return ?Data error on device if no input is pending.</p> </div> </div> |

Table B-12: RECORD Values for Terminal Output (XRB + XRMOD)

| Decimal | Octal | Function |
|-----------------|------------|---|
| 256. | 400 | Declare echo control field (use with MODE 10). |
| 4096. | 10000 | Output binary data to terminal. |
| 8192. | 20000 | Return control to program if output stall is to occur. (See .WRITE directive for more information.) |
| 32767. + 1. + K | 100000 + K | Perform multiterminal service output to assigned keyboard K. |

B.5.2 Echo Control Mode

In echo control mode, the system strips the parity bit from all characters. All characters returned to your program have ASCII values in the range 1 to 177 (octal). The system does not pass synchronization or editing characters to your program. Delimiters are passed to your program but are never echoed. Table B-13 summarizes the echo control mode character set.

Table B-13: Echo Control Mode Character Set

| Type of Character | ASCII Code (Octal) | Code Returned to User | Comments |
|-------------------|--------------------|-----------------------|--|
| Ignored | 0 | | Used as filler for timing. |
| Delimiters | Private | ? | Private delimiter. |
| | 3 | 3 | ^C (CTRL/C). |
| | 4 | 4 | ^D (CTRL/D). |
| | 12 | 12 | Line feed. |
| | 14 | 14 | Form feed. |
| | 15 | 15,12 | Carriage return (with line feed appended). |
| | 32 | 32 | ^Z (CTRL/Z); generates error 11 ₁₀ . |
| | 33 | 33 | If "NO ESC SEQ" is in effect and escape character is received, 33 is returned to user and is treated as a delimiter. If "ESC SEQ" is in effect, escape character triggers an escape sequence. The escape sequence is returned to user and the whole sequence is considered the delimiter. |
| | 175 | 33 or 175 | If "NO ESC" is in effect, 175 is translated to escape (33). If "ESC" is in effect, 175 is data. |
| | 176 | 33 or 176 | If "NO ESC" is in effect, 176 is translated to escape (33). If "ESC" is in effect, 176 is data. |

Table B-13: Echo Control Mode Character Set (Cont.)

| Type of Character | ASCII Code (Octal) | Code Returned to User | Comments |
|-------------------|---|-----------------------|--|
| Editing | 177 | — | RUBOUT (DEL character); on video terminals, generates a backspace followed by the paint character and another backspace; on hard-copy terminals, echoes deleted characters between backslashes (\\). |
| | 25 | — | ^U (CTRL/U); repeatedly simulates RUBOUT until no characters remain in field. |
| Data | 40-137 | 40-137 | Normal 64-character graphic set. |
| | 140-176 | 100-136 | If "NO LC INPUT," lowercase letters are translated to uppercase. |
| | 140-176 | 140-176 | If "LC INPUT," lowercase letters are returned to user. |
| Synchronization | 21 | — | XON (CTRL/Q). Resume suspended output (if the STALL characteristic is set). |
| | 23 | — | XOFF (CTRL/S). Suspend output (if the STALL characteristic is set). |
| Other | 1,2,5,6, 7,10,11, 13,16-20, 22,24, 26-31, 34-37, | — | Echoed as BEL (code 7) but otherwise ignored. |
| | 21,23 | — | If the terminal is set "NO STALL," synchronization characters are also echoed as BEL (code 7) and ignored. |

Declaring a Field in Echo Control Mode

Use `.WRITE` to declare a field. The `.WRITE` must include the value 256.(400) at `XRB+XRMOD` and the value `N` at `XRB+XRBC`. `N`, which must be between 1 and the size of the buffer, describes how many bytes in the buffer represent the field declaration:

N = 1 The byte contains field size and overflow handling information. The field size must be in the range 1. to 127.(1 - 177). Adding 128.(200) to the field size specifies keypunch overflow handling instead of normal overflow handling.

- $N = 2$ The first byte contains field size and overflow handling as described for $N = 1$. The second byte contains the ASCII value of the paint character. If this byte is 0 or $N = 1$, a space is the paint character.
- $N > 2$ The first $(N-2)$ bytes contain a prompt to display on the terminal before the field. Byte $(N-1)$ is the field size declaration as described for $N = 1$. The last byte is the paint character as described for $N = 2$.

B.5.3 Escape Sequences

Table B-14 summarizes the VT100 ANSI-compatible escape sequences that move the cursor, erase all or part of the screen, and control line size and VT100 character attributes (bold, underscore, blink, and reverse video). The table uses the symbols Pl, Pc, and Pn, where:

Pl Means line number.

Pc Means column number.

Pn Is a decimal parameter expressed as a string of ASCII digits. The parameter's meaning for each escape sequence is explained in the table. Separate multiple parameters with a semicolon (;). If you omit a parameter or specify 0, the terminal uses the default parameter value for that escape sequence.

Be sure to include the left square bracket ([) in the escape sequence prefix where shown in the table. Escape sequences cannot contain embedded spaces. Refer to the *VT100 User Guide* for a complete description of VT100 escape sequences.

Table B-14: VT100 ANSI-compatible Escape Sequences for Screen Control

| Escape Sequence | Description |
|------------------------|--|
| Cursor Movement | |
| ESC[PnA | Moves the cursor up n lines without affecting the column position. The parameter Pn specifies the number of lines. The default value is one line. |
| ESC[PnB | Moves the cursor down n lines without affecting the column position. The parameter Pn specifies the number of lines. The default value is one line. |
| ESC[PnC | Moves the cursor forward (right) n columns without affecting the line position. The parameter Pn specifies the number of columns. The default value is one column. |
| ESC[PnD | Moves the cursor backward (left) n columns without affecting the line position. The parameter Pn specifies the number of columns. The default value is one column. |

(continued on next page)

Table B-14: VT100 ANSI-compatible Escape Sequences for Screen Control (Cont.)

| Escape Sequence | | Description | | | | | | | | | | |
|--|--|-------------|-----------|--------------------|---|---------|---|---------------|---|----------|---|------------------|
| Cursor Movement | | | | | | | | | | | | |
| ESC[P _l ;P _c H | Direct cursor address – moves the cursor to the specified line and column position. If you do not specify a line or column position, the cursor moves to the home position, which is the top left corner of the screen. | | | | | | | | | | | |
| ESCD | Index – moves the cursor to the current column position on the next line. | | | | | | | | | | | |
| ESCM | Reverse index – moves the cursor to the current column position on the preceding line. | | | | | | | | | | | |
| ESCE | Moves the cursor to the first column position on the next line. | | | | | | | | | | | |
| Erasing | | | | | | | | | | | | |
| ESC[K or ESC[OK | Erases from the current cursor position to the end of the line. | | | | | | | | | | | |
| ESC[1K | Erases from the beginning of the current line to the cursor. | | | | | | | | | | | |
| ESC[2K | Erases the entire line containing the cursor. | | | | | | | | | | | |
| ESC[J or ESC[0J | Erases from the current cursor position to the end of the screen. | | | | | | | | | | | |
| ESC[1J | Erases from the beginning of the screen to the current cursor position. | | | | | | | | | | | |
| ESC[2J | Erases the entire screen. | | | | | | | | | | | |
| Line Size (Double Height and Double Width) | | | | | | | | | | | | |
| ESC#3 | Changes the current line to the top half of a double-height double-width line. | | | | | | | | | | | |
| ESC#4 | Changes the current line to the bottom half of a double-height double-width line. | | | | | | | | | | | |
| ESC#6 | Changes the current line to a double-width single-height line. | | | | | | | | | | | |
| To display double-height characters, use the ESC#3 and ESC#4 sequences as a pair on adjacent lines and send the same characters to both lines. The use of double-width characters reduces the number of characters per line by half. | | | | | | | | | | | | |
| Character Attributes (require Advanced Video Option) | | | | | | | | | | | | |
| ESC[P _n ;P _n ;P _n ;...;m | <div>Turns bold, underscore, blink, and reverse video attributes on and off. P_n can have the following values:</div> <table><tr><td>0 or none</td><td>All attributes off</td></tr><tr><td>1</td><td>Bold on</td></tr><tr><td>4</td><td>Underscore on</td></tr><tr><td>5</td><td>Blink on</td></tr><tr><td>7</td><td>Reverse video on</td></tr></table> <div>The terminal executes the parameters in order and ignores any other parameter values. Unlike line size commands, which affect only the current line, the character attributes affect the entire screen. Remember to turn them off before ending your program.</div> | | 0 or none | All attributes off | 1 | Bold on | 4 | Underscore on | 5 | Blink on | 7 | Reverse video on |
| 0 or none | All attributes off | | | | | | | | | | | |
| 1 | Bold on | | | | | | | | | | | |
| 4 | Underscore on | | | | | | | | | | | |
| 5 | Blink on | | | | | | | | | | | |
| 7 | Reverse video on | | | | | | | | | | | |

B.6 Pseudo Keyboards

This section summarizes MODE and RECORD values for pseudo keyboards. It also lists errors your program can receive on a pseudo keyboard output request.

Table B-15: Pseudo Keyboard MODE Values (FIRQB + FQMODE)

| Decimal | Octal | Function |
|---------|-------|--|
| 0. | 0 | System kills controlled job when the pseudo keyboard is closed. |
| 1. | 1 | System detaches controlled job when the pseudo keyboard is closed. |

Table B-16: 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. |

Table B-17: Possible Errors on Pseudo Keyboard Output Request

| Error | Meaning |
|--------|---|
| INUSE | Job at pseudo keyboard is not ready for input |
| NOROOM | No buffer space is available |
| NOSUCH | No controlled job exists at pseudo keyboard |
| CTRLCE | Job at pseudo keyboard is not in CTRL/C state |

Appendix C

Supplementary RSX Directives for Resident Libraries

The RSX emulator directives that deal with resident libraries (ATRG\$, DTRG\$, CRAW\$, ELAW\$, MAP\$, and UMAP\$) use 8-word areas to pass and receive data to and from the emulator. These areas, called the resident library definition block (RDB) and window definition block (WDB), can be defined or defined and filled using supplementary directives included in the RSXMAC.SML file.

Note that the expansions for these directives are the same as in the RSX-11M environment, where their use is more extensive. Only the arguments relevant to RSTS/E are described here.

C.1 RDB Directives

Two directives are available for use with resident library definition blocks (RDBs): RDBDF\$ and RDBBK\$.

The RDBDF\$ directive simply assigns literal values to the offsets and status bit mnemonics shown in Chapter 5 for the RDB areas for the ATRG\$ and DTRG\$ directives. You can use these mnemonics to reference offsets and bit values in an RDB you have allocated space for in your program.

The RDBBK\$ directive defines these offsets and, in addition, generates code to allocate space for the RDB and fills it with values you specify in the call.

The form for the relevant arguments in the ATRG\$ call is:

RDBBK\$,,*libnam*,,<RS.WRT> (for read/write access)

or

RDBBK\$,,*libnam*,,<RS.RED> (for read-only access)

where *libnam* is the name of the resident library to be attached.

For example, the RDBBK\$ call below expands to the instructions that follow.

```
RDBBK$ , ,DATLIB , ,<RS.WRT>
```

Expansion

```
.WORD 0
.WORD 0
.RAD50 /DATLIB/
.WORD 0
.WORD 0
.WORD RS.WRT
.WORD 0
```

(RS.WRT is assigned to a literal value of 2, so bit 1 is set in the seventh word of the RDB, requesting read/write access.)

In addition, all the offsets necessary to reference the data returned in the RDB by ATRG\$ or DTRG\$ are generated. For example, you can use the mnemonic RS.UNM to test bit 14 of the word at offset R.GSTS in the RDB after execution of a DTRG\$ directive. RS.UNM is assigned to a literal value of 40000₈ by the RDBBK\$ directive.

C.2 WDB Directives

Two directives are available for use with window definition blocks (WDBs): WDBDF\$ and WDBBK\$.

The WDBDF\$ directive simply assigns literal values to the offsets and status bit mnemonics shown in Chapter 5 for the WDB areas for the CRAW\$, ELAW\$, MAP\$, and UMAP\$ directives. You can use these mnemonics to reference offsets and bit values in a WDB you have allocated space for in your program.

The WDBBK\$ directive defines these offsets and, in addition, generates code to allocate space for the WDB and fills it with values you specify in the call.

The form for the relevant arguments in a CRAW\$ call is:

WDBBK\$ *apr,siz,rid,off,len,<bit1![bit2!bit3]>*

apr = The base *apr*.

siz = The size of the window.

rid = The resident library ID.

off = The offset into the library, in 32-word blocks.

len = The length to be mapped.

bit... = Mnemonic values for bit settings, separated by exclamation points. Relevant mnemonics for CRAW\$ are:

WS.MAP = Window is to be mapped.

WS.WRT = Map with read/write access.

WS.RED = Map with read-only access.

For example, the WDBBK\$ call below expands to the instructions that follow.

```
WDBBK$ 7,128,,0,0,0,<WS,MAP!WS,RED>
```

Expansion

```
.BYTE 0,7
.WORD 0
.WORD 128,
.WORD 0
.WORD 0
.WORD 0
.WORD 0
.WORD WS,MAP!WS,RED
```

This WDB, when used in a CRAW\$ directive, would create a window 4K words long (128₁₀ 32-word blocks) in APR 7. The call also specifies an offset and map length of zero and read-only mapping. Note that to use this WDB, you have to supply the resident library ID, which you get from the RDB returned by an ATRG\$ call. To fill in the library ID, move the word at offset R.GID in the RDB to offset W.NRID in the WDB.

The WDBBK\$ directive also defines the offsets and bit settings referred to in the discussion of ELAW\$, MAP\$, and UMAP\$.

)

1

)

)

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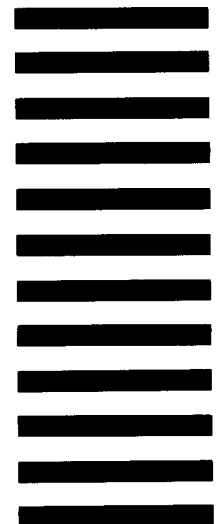
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