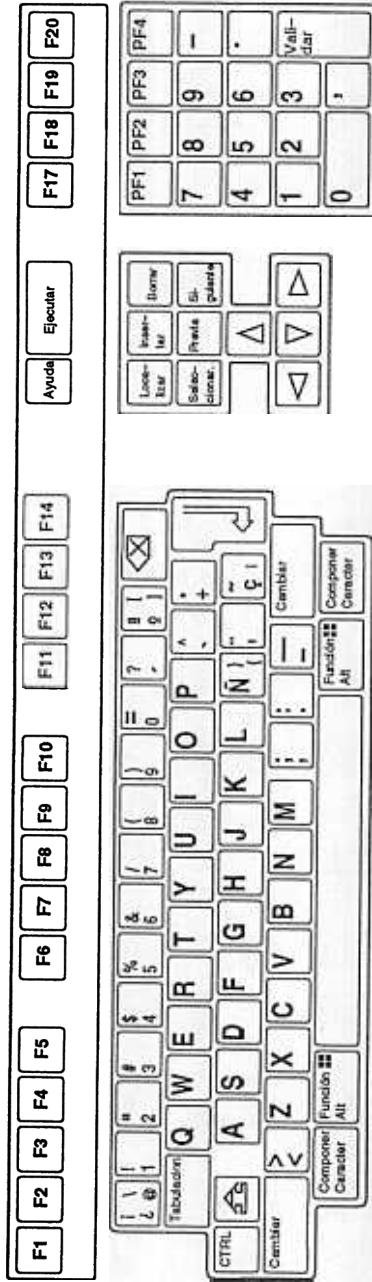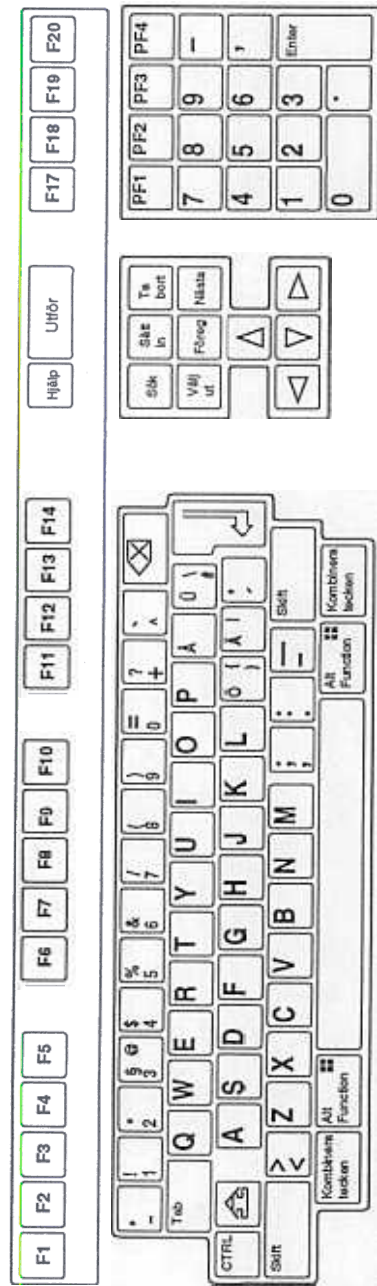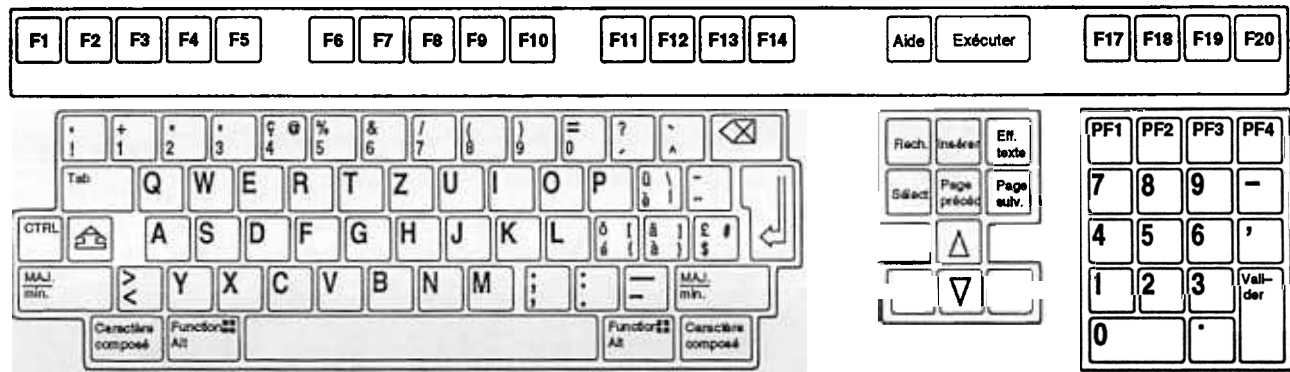Norway

Portugal

Spain

Sweden

Switzerland (French)
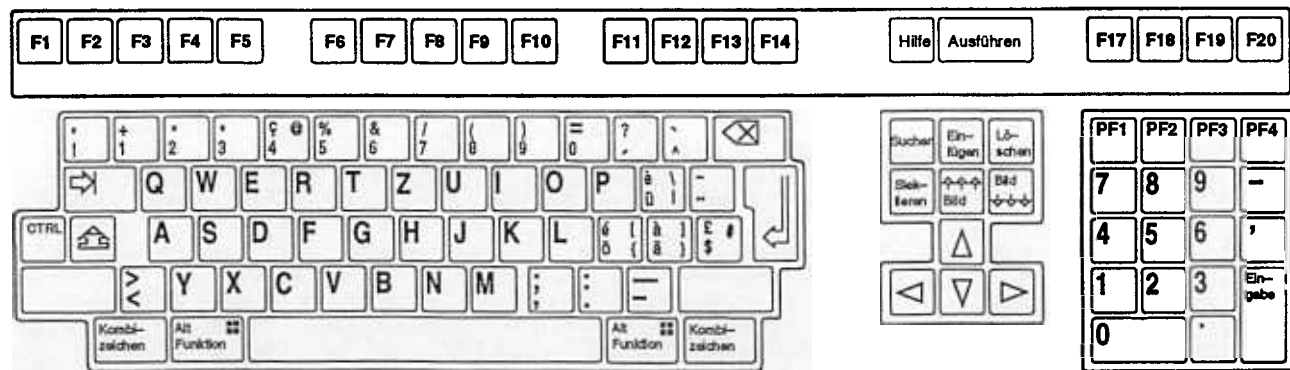


Switzerland (German)

Chapter 7

# TECHNICAL SPECIFICATIONS

## Display Features

- 24 lines 80 characters per line or 24 lines 132 characters per line + status line
- Paged Memory, max. 6 pages
- Normal, inverse, blinking, underline, bold and invisible attributes
- Double – height, double – width characters
- Line – drawing character set
- Selective erase

## Screen

- Technology: Thin-film AC Electroluminescent (EL)
- Color: Broadband yellow (peak 580nm)
- Resolution: 640 x 400 pixels
- Active display area: 195 x 123 mm (7.68 x 4.8 in.)
- Viewing angle: 160 degrees
- 25 lines x 80 columns
- 6 x 9 pixel character matrix in 8 x 16 cell

**Table 7–1      Text Features**

| Feature | Description |
|---|---|
| Character sets | 5 sets of 94 characters each<br>1 set of 96 characters<br>Down–line–loadable character set<br>(94 or 96 characters) |
| Top–Row function keys | 5 local function keys<br>15 user–definable keys |
| Editing function | All VT300 editing functions<br>Erasure mode<br>Local editing. |
| Video attributes | Inverse, Blinking, Bold, Blank, Underline |
| Line attributes | Single–width/single–height lines<br>Double–width/single–height lines<br>Double–width/double–height lines |
| Character protection styles | Independent (not based on visual character attributes),<br>Visual attributes |
| Control functions | 7–bit and 8–bit control characters<br>ANSI control functions<br>DEC private control functions<br>Ability to display control functions |

## Character Sets

The terminal has the following built–in character sets.
- ASCII
- DEC Supplemental Graphic
- ISO Latin 1
- 12 National Replacement Character Sets
- DEC Technical (See Appendix C)
- DEC Special Graphic (VT100 line drawing)
- Dynamically Redefinable Character Set (soft characters)

## Communication Interfaces

1) Serial asynchronous EIA/RS–232–C (CCITT V.24/V.28) host port for host or external modem (9 pin "D" style connector).

2) Serial asynchronous EIA/RS–423 host port, allowing longer distances between the terminal and host (6 pin, RJ–11 DEC connector).

- Data flow control: XON/XOFF protocol.
- Baud rate: Up to 38.4K baud software selectable
- The receiver and transmitter baud rate may be different.
- Data format: Standard formats (7–8 bits, parity, stop bits) software selectable

## Printer Interface

- Serial, asynchronous EIA/RS–423 (6 pin, RJ–11 DEC connector)
- Data flow control: Printer busy signal checking, XON/XOFF protocol
- Baud rate: Up to 19.2K baud software selectable
- Data format: Standard format (7–8 bits, parity, stop bits) software selectable

## Keyboard

- DEC VT420 Layout, 108 Keys

## Operating Modes

- VT300 7-bit control
- VT300 8-bit control
- VT100 mode
- VT52 mode

## Operating States

### On–Line
The on–line state lets the terminal communicate with a host system. The terminal sends data entered at the keyboard to the host, and the terminal displays on the screen the data received from the host.

### Local
The local state lets you place the host system on hold. Data entered at the keyboard is sent to the screen, but not to the host. The terminal stores data received from the host, until you put the terminal back on–line.

## Terminal Memory
| | |
|---|---|
| Display and CPU RAM | 64 Kbyte |
| EPROM | 128 Kbyte |
| EEPROM | 2 Kbyte |
| Character generator RAM | 8 Kbyte |

## Environmental Conditions
| | |
|---|---|
| Operating temperature | +0°C to +40°C (32° to 104°F) |
| Storage temperature | –10°C to +50°C (14° to 122°F) |
| Relative humidity | 5% to 95 % (Non–condensing) |
| Operating altitude | 0 to 3,050 m (0 to 10,000 ft) |

## Electrical Specifications
| | |
|---|---|
| AC Input voltage | 90 to 270VAC, 47–63 Hz |
| AC Power consumption | 35 W max |
| Terminal power | 12 VDC, 2.5 A max |

## Physical Specifications
| | |
|---|---|
| Terminal Unit weight | 2.0kg (4.3 lbs.) |
| Terminal Unit (w/deskstand) weight | 3.4kg (7.5 lbs.) |
| Keyboard weight | 1.2 kg (2.5 lbs.) |
| Power Module weight | 0.6 kg (1.2 lbs.) |

Dimensions (width x depth x height)
- Terminal Unit (w/deskstand)     27 x 17 x 25 cm (10.7 x 6.7 x 9.9 in)
- Keyboard     48 x 5 x 19 cm (19 x 1.9 x 7.6 in)
- Power Module     8 x 14 x 6 cm (3.2 x 5.5 x 2.3 in)

## Installation options
- Desk stand
- Wall mount
- Articulating swing–arm
- Medical system mount

**Note:** Accessory Kits are available to convert from one type of mounting to the other. Consult your dealer or factory representative for details.

## Connector signals

The Host EIA/RS–232–C Connector pin assignments ("D" style)

| 9–Pin Cable End | Mnemonic | Function | 25–Pin Cable End |
|---|---|---|---|
| 1 | – RLSD | Receive line signal detect | 8 |
| 2 | – RXD | Received data | 3 |
| 3 | – TXD | Transmitted data | 2 |
| 4 | – DTR | Data terminal ready | 20 |
| 5 | – GND | Signal ground | 7 |
| 6 | – DSR | Data set ready | 6 |
| 7 | – RTS | Request to send | 4 |
| 8 | – CTS | Clear to send | 5 |
| 9 | – NC | Not connected | 22 |
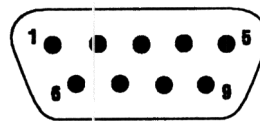
The Host EIA/RS–423 Connector pin assignments (RJ–11 DEC "Telephone" style)

| Pin | Mnemonic | Function |
|---|---|---|
| 1 | – DTR | Data terminal ready |
| 2 | – TXD | Transmitted data |
| 3 | – GND | Signal ground |
| 4 | – RXD RET | Received data return |
| 5 | – RXD | Received data |
| 6 | – DSR | Data set ready |

The PRINTER pin assignments (RJ–11 DEC "Telephone" style)

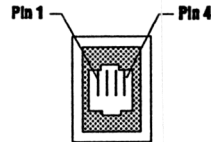| Pin | Mnemonic | Function |
|---|---|---|
| 1 | – DTRP | Data terminal ready |
| 2 | – TXDP | Transmitted data |
| 3 | – GND | Signal ground |
| 4 | – RXDP RET | Received data return |
| 5 | – RXDP | Received data |
| 6 | – DSRP | Data set ready |
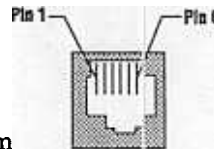
• Host and printer diagram

# The Keyboard Connection

The keyboard can be connected to the terminal unit through a 4 pin telephone connector (DEC compatible keyboard) or a 5 pin DIN 41524 connector (IBM PC/AT compatible keyboard).

## The telephone connector pin assignments for the DEC compatible keyboard

| Pin | Mnemonic | Function |
|-----|----------|----------|
| 1 | – TXD | Keyboard output data |
| 2 | – GND | Signal ground |
| 3 | – +12V | Power |
| 4 | – RXD | Keyboard input data |



## The DIN connector pin assignments for the IBM PC/AT–Keyboard

| Pin | Mnemonic | Function |
|-----|----------|----------|
| 1 | – KCK | Keyboard clock |
| 2 | – KBD | Keyboard data |
| 3 | – NC | Not connected |
| 4 | – GND | Signal ground |
| 5 | – +5V | Power |
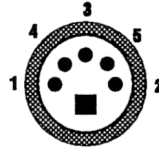


## The DIN connector pin assignments for the DC power input

| Pin | Function |
|-----|----------|
| 1 | +12V |
| 2 | +12V |
| 3 | Not connected |
| 4 | ground |
| 5 | ground |
| 6 | Not connected |

# Appendix A

# REGULATORY COMPLIANCE

## U.S. Federal Communications Commission (FCC) Requirements

The Planar ELT320 Terminal has been designed for operation in a commercial environment. It is not intended for this equipment to be operated in a residential area. The user of the ELT320 must use all shielded interconnect cables provided with the product or specified in this manual to ensure continued compliance with Electromagnetic Emissions Limits, as stated in Subpart J of Part 15 of FCC Rules.

**Note:**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**Caution:**

The ELT320 generates, uses, and can radiate radio frequency energy. Any and all changes or modifications NOT expressly approved in writing by Planar could void the user's authority to operate the equipment.

## Canadian Emissions Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Réglement sur le brouillage radioélectrique édicté par le ministére des Communications du Canada.

# Appendix B

# ADDITIONAL REFERENCE INFORMATION

## Other Useful Control Sequences

To generate an escape sequence (ESC) press and hold the control key (CTRL) and press the [ key. "CTRL" + " [ " = ESC

You can represent any 8 bit control character as a 2-character 7 bit escape sequence:

| 8 bit Control Character | 7 bit Code Extension Escape Sequence | |
|---|---|---|
| SS2 | ESC | N |
| 8/14 | 1/11 | 4/14 |
| SS3 | ESC | O |
| 8/15 | 1/11 | 4/15 |
| DCS | ESC | P |
| 9/0 | 1/11 | 5/0 |
| CSI | ESC | |
| 9/11 | 1/11 | 5/11 |
| ST | ESC | \ |
| 9/12 | 1/11 | 5/12 |

# Appendix C

# DEC TECHNICAL CHARACTER SET

## Mapping DEC Technical Character Set into GL

The following sequence designates the DEC Technical character set as G1, then maps G1 into GL:

ESC)>                     SO     (where: SO = CtrlN)

Designate as G1 map G1 into GL

See DEC VT330 Programming manual (PNEK-VT3XX-TP-002) chapter 5 for additional details.

| BITS B8 B7 B6 B5 / B4 B3 B2 B1 | COLUMN ROW | • 0 1 0 / GL 2 | GR 10 | • 0 1 1 / GL 3 | GR 11 | • 1 0 0 / GL 4 | GR 12 | • 1 0 1 / GL 5 | GR 13 | • 1 1 0 / GL 6 | GR 14 | • 1 1 1 / GL 7 | GR 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 0 0 0 | 0 | | | ⊢ | 60 48 30 | 260 176 B0 | •• 100 64 40 | 300 192 C0 | Ⅱ 120 80 50 | 320 208 D0 | ¬ 140 96 60 | 340 224 E0 | π 160 112 70 | 360 240 F0 |
| 0 0 0 1 | 1 | ⊣ 41 33 21 | 241 161 A1 | ⊽ 61 49 31 | 261 177 B1 | ∝ 101 65 41 | 301 193 C1 | Ψ 121 81 51 | 321 209 D1 | α 141 97 61 | 341 225 E1 | Ψ 161 113 71 | 361 241 F1 |
| 0 0 1 0 | 2 | ⌐ 42 34 22 | 242 162 A2 | ∠ 62 50 32 | 262 178 B2 | ∞ 102 66 42 | 302 194 C2 | ς 122 82 52 | 322 210 D2 | β 142 98 62 | 342 226 E2 | ρ 162 114 72 | 362 242 F2 |
| 0 0 1 1 | 3 | — 43 35 23 | 243 163 A3 | ╲ 63 51 33 | 263 179 B3 | ÷ 103 67 43 | 303 195 C3 | Σ 123 83 53 | 323 211 D3 | χ 143 99 63 | 343 227 E3 | σ 163 115 73 | 363 243 F3 |
| 0 1 0 0 | 4 | ⌠ 44 36 24 | 244 164 A4 | / 64 52 34 | 264 180 B4 | Δ 104 68 44 | 304 196 C4 | 124 84 54 | 324 212 D4 | δ 144 100 64 | 344 228 E4 | τ 164 116 74 | 364 244 F4 |
| 0 1 0 1 | 5 | ↓ 45 37 25 | 245 165 A5 | ¬ 65 53 35 | 265 181 B5 | ∇ 105 69 45 | 305 197 C5 | 125 85 55 | 325 213 D5 | ε 145 101 65 | 345 229 E5 | 165 117 75 | 365 245 F5 |
| 0 1 1 0 | 6 | ∣ 46 38 26 | 246 166 A6 | ⌟ 66 54 36 | 266 182 B6 | Φ 106 70 46 | 306 198 C6 | √ 126 86 56 | 326 214 D6 | φ 146 102 66 | 346 230 E6 | ∫ 166 118 76 | 366 246 F6 |
| 0 1 1 1 | 7 | ⌈ 47 39 27 | 247 167 A7 | ⟩ 67 55 37 | 267 183 B7 | Γ 107 71 47 | 307 199 C7 | Ω 127 87 57 | 327 215 D7 | γ 147 103 67 | 347 231 E7 | ω 167 119 77 | 367 247 F7 |
| 1 0 0 0 | 8 | ⌊ 50 40 28 | 250 168 A8 | 70 56 38 | 270 184 B8 | ~ 110 72 48 | 310 200 C8 | Ξ 130 88 58 | 330 216 D8 | η 150 104 68 | 350 232 E8 | ξ 170 120 78 | 370 248 F8 |
| 1 0 0 1 | 9 | ⌉ 51 41 29 | 251 169 A9 | 71 57 39 | 271 185 B9 | ≃ 111 73 49 | 311 201 C9 | Τ 131 89 59 | 331 217 D9 | ι 151 105 69 | 351 233 E9 | υ 171 121 79 | 371 249 F9 |
| 1 0 1 0 | 10 | ⌋ 52 42 2A | 252 170 AA | 72 58 3A | 272 186 BA | Θ 112 74 4A | 312 202 CA | ⊂ 132 90 5A | 332 218 DA | θ 152 106 6A | 352 234 EA | ζ 172 122 7A | 372 250 FA |
| 1 0 1 1 | 11 | ⎰ 53 43 2B | 253 171 AB | 73 59 3B | 273 187 BB | × 113 75 4B | 313 203 CB | ⊃ 133 91 5B | 333 219 DB | κ 153 107 6B | 353 235 EB | ← 173 123 7B | 373 251 FB |
| 1 1 0 0 | 12 | ⎱ 54 44 2C | 254 172 AC | ≤ 74 60 3C | 274 188 BC | Λ 114 76 4C | 314 204 CC | ∩ 134 92 5C | 334 220 DC | λ 154 108 6C | 354 236 EC | ↑ 174 124 7C | 374 252 FC |
| 1 1 0 1 | 13 | ⎰ 55 45 2D | 255 173 AD | ≠ 75 61 3D | 275 189 BD | ⇔ 115 77 4D | 315 205 CD | ∪ 135 93 5D | 335 221 DD | 155 109 6D | 355 237 ED | → 175 125 7D | 375 253 FD |
| 1 1 1 0 | 14 | ⎱ 56 46 2E | 256 174 AE | ≥ 76 62 3E | 276 190 BE | ⇒ 116 78 4E | 316 206 CE | ∧ 136 94 5E | 336 222 DE | ∨ 156 110 6E | 356 238 EE | ↓ 176 126 7E | 376 254 FE |
| 1 1 1 1 | 15 | ⊣ 57 47 2F | 257 175 AF | ∫ 77 63 3F | 277 191 BF | ≡ 117 79 4F | 317 207 CF | ∨ 137 95 5F | 337 223 DF | ∂ 157 111 6F | 357 239 EF | | |

**LEGEND**

| ∝ | 4/1 101 65 41 | 12/1 301 193 C1 | COLUMN/ROW OCTAL DECIMAL HEX |
|---|---|---|---|

**igure Appendix C–1    DEC echnical Character Chart**

# Appendix D

# ELT320 PROGRAMMERS REFERENCE

## About the Programmers Reference Appendix

This Appendix is included in this manual as a reference for ELT320 programmers. It is not a complete listing or tutorial. It does not supply all the information required to program the ELT320. To get complete information use one of two other reference sources, the Digital Equipment Corporation *VT320 Programmer Reference Manual* (DEC P/N: Ek–VT320–RM–001) or the VT320 Programming Summary found in Appendix D of the *VT320 Installing and Using* manual for the same product.

The control functions and commands listed in this appendix are exclusive or additional features of the ELT320. The information that fits into chapters of the *VT320 Programmer Reference Manual* is referenced in this appendix to that chapter. Some of the functions or commands may be like those found in the VT320 manual, and are included here for your convenience. Sections A and B can not be directly referenced to the VT320 manual as these are enhanced features of the ELT320.

| ELT320 Appendix D Section | VT320 Programmer Manual Chapter |
|---|---|
| | 2—Character Encoding |
| | 3—Keyboard Codes |
| | 4—Emulating VT Series Terminals |
| A—Soft Character Set | 5—Using Character Sets |
| | |
| B—What is Page Memory | 6—Screen Display Commands |
| C—Panning and cursor movement | |
| | 7—Visual Character and Line Attributes |
| D—Editing and Character Protection | 8—Editing |
| E—Local Editing | |
| | 9—Controlling the Cursor |
| F—Keyboard,Printing and Display Commands | 10—Keyboard and Printing Commands |
| G—Reports | 11—Reports |
| | 12—Resetting and Testing |

# Section A—SOFT CHARACTER SETS

Soft character sets are down-loadable from the host computer into the terminal.
This feature lets you design your own soft character sets for use with the terminal.
You can only down-load soft character sets in VT300 mode.
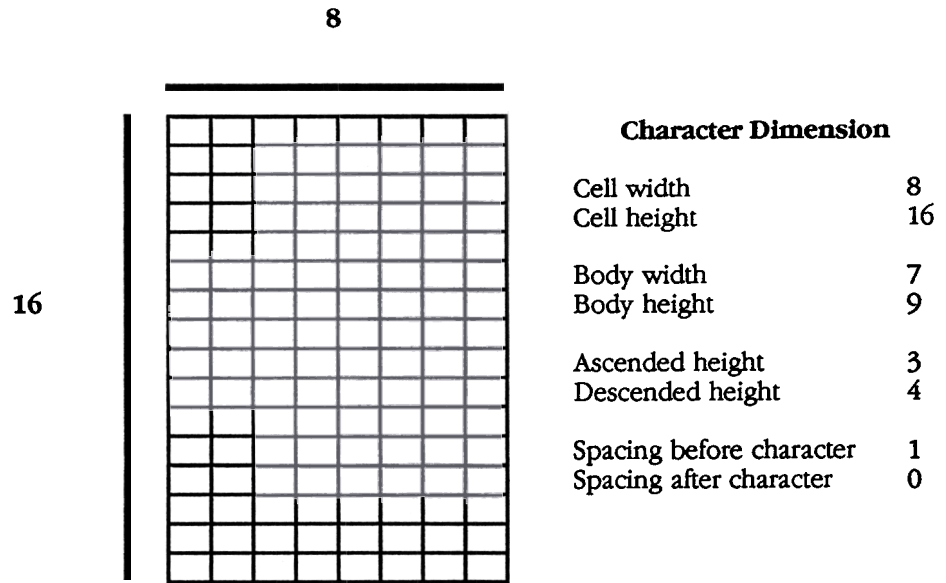The largest character cell available is the default size of 8 x 16 pixels.

**8**

**16**

| Character Dimension | |
|---|---|
| Cell width | 8 |
| Cell height | 16 |
| Body width | 7 |
| Body height | 9 |
| Ascended height | 3 |
| Descended height | 4 |
| Spacing before character | 1 |
| Spacing after character | 0 |

**Figure Appendix D–1    Character Cell Size**

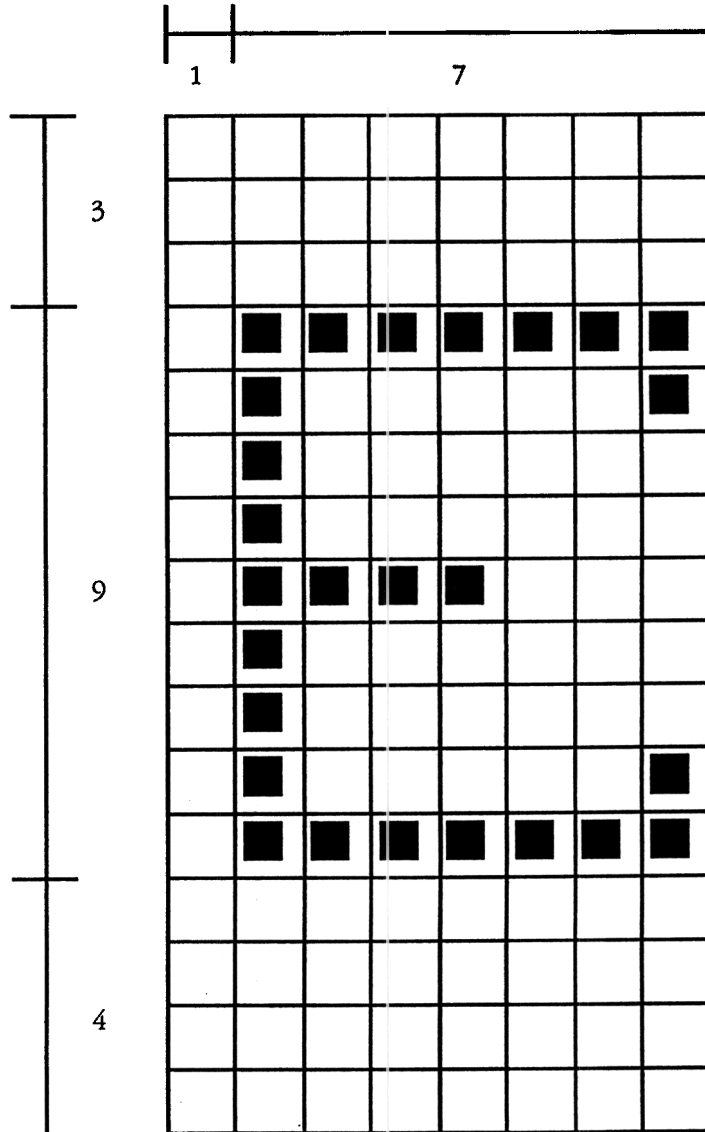An example of this spacing for an upper-case E character is shown in Figure Appendix D-2.



**Figure Appendix D-2     Character Body Sizes**

## Coding the Soft Character Set

Each pixel of a soft character cell receives a binary value of 0 or 1. A 1 bit indicates the pixel is on, and a 0 bit indicates the pixel is off.
The terminal receives the code for a soft character in sections, called sixels. A sixel is a 6-bit binary code that represents a vertical column of 6 pixels on the screen. Each bit in a sixel corresponds to a pixel on the screen. The following example describes how to design and code a soft character.

Sixel codes are restricted to characters in the range of Hex 3F (?) to Hex 7E (~), so you must add an offset of Hex 3F to the hex value of each column.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
|----|---|---|---|---|---|---|---|---|---|
| b0 | | | | | | | | | |
| b1 | | | | | | | | | |
| b2 | | | | | | | | | |
| b3 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | GROUP A |
| b4 | | ■ | | | | | | ■ | |
| b5 | | ■ | | | | | | | |
| b0 | | ■ | | | | | | | |
| b1 | | ■ | ■ | ■ | ■ | | | | |
| b2 | | ■ | | | | | | | |
| b3 | | ■ | | | | | | | GROUP B |
| b4 | | ■ | | | | | | ■ | |
| b5 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| b0 | | | | | | | | | |
| b1 | | | | | | | | | |
| b2 | | | | | | | | | GROUP C |
| b3 | | | | | | | | | |

**Figure Appendix D–3**     **Character Sixel Coding**

**Table Appendix D–1**     **Converting Binary Code to ASCII Character**

| Binary Value | Hex. Value | Hex Value +3F Offset | Character Equivalent |
|---|---|---|---|
| 000000 | 00 | 3F | ? |
| 000001 | 01 | 40 | @ |
| 000010 | 02 | 41 | A |
| 000011 | 03 | 42 | B |
| 000100 | 04 | 43 | C |
| 000101 | 05 | 44 | D |
| 000110 | 06 | 45 | E |
| 000111 | 07 | 46 | F |
| 001000 | 08 | 47 | G |
| 001001 | 09 | 48 | H |
| 001010 | A | 49 | I |
| 001011 | B | 4A | J |
| 001100 | C | 4B | K |
| 001101 | D | 4C | L |
| 001110 | E | 4D | M |
| 001111 | F | 4E | N |
| 010000 | 10 | 4F | O |
| 010001 | 11 | 50 | P |
| 010010 | 12 | 51 | Q |
| 010011 | 13 | 52 | R |
| 010100 | 14 | 53 | S |
| 010101 | 15 | 54 | T |
| 010110 | 16 | 55 | U |
| 010111 | 17 | 56 | V |
| 011000 | 18 | 57 | W |
| 011001 | 19 | 58 | X |
| 011010 | 1A | 59 | Y |
| 011011 | 1B | 5A | Z |
| 011100 | 1C | 5B | [ |
| 011101 | 1D | 5C | \ |
| 011110 | 1E | 5D | ] |
| 011111 | 1F | 5E | ^ |
| 100000 | 20 | 5F | _ |
| 100001 | 21 | 60 | ' |
| 100010 | 22 | 61 | a |
| 100011 | 23 | 62 | b |
| 100100 | 24 | 63 | c |
| 100101 | 25 | 64 | d |

## Table Appendix D–1 continued

| Binary Value | Hex. Value | Hex Value +3F Offset | Character Equivalent |
|---|---|---|---|
| 100110 | 26 | 65 | e |
| 100111 | 27 | 66 | f |
| | | | |
| 101000 | 28 | 67 | g |
| 101001 | 29 | 68 | h |
| 101010 | 2A | 69 | i |
| 101011 | 2B | 6A | j |
| 101100 | 2C | 6B | k |
| | | | |
| 101101 | 2D | 6C | l |
| 101110 | 2E | 6D | m |
| 101111 | 2F | 6E | n |
| 110000 | 30 | 6F | o |
| 110001 | 31 | 70 | p |
| | | | |
| 110010 | 32 | 71 | q |
| 110011 | 33 | 72 | r |
| 100100 | 34 | 73 | s |
| 110101 | 35 | 74 | t |
| 110001 | 36 | 75 | u |
| | | | |
| 110111 | 37 | 76 | v |
| 111000 | 38 | 77 | w |
| 111001 | 39 | 78 | x |
| 111010 | 3A | 79 | y |
| 111011 | 3B | 7A | z |
| | | | |
| 111100 | 3C | 7B | { |
| 111101 | 3D | 7C | |
| 111110 | 3E | 7D | |
| 111111 | 3F | 7E | |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
|---|---|---|---|---|---|---|---|---|---|



**GROUP A**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| 000000 | 111000 | 001000 | 001000 | 001000 | 001000 | 001000 | 011000 |
| ? | w | G | G | G | G | G | W |
| (3/15) | (7/7) | (4/7) | (4/7) | (4/7) | (4/7) | (4/7) | (5/7) |

**GROUP B**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| 000000 | 111111 | 100010 | 100010 | 100010 | 100000 | 100000 | 110000 |
| ? | ~ | a | a | a | — | — | o |
| (3/15) | (7/14) | (6/1) | (6/1) | (6/1) | (5/15) | (5/15) | (6/15) |

**GROUP C**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| 000000 | 000000 | 000000 | 000000 | 000000 | 000000 | 000000 | 000000 |
| ? | ? | ? | ? | ? | ? | ? | ? |
| (3/15) | (3/15) | (3/15) | (3/15) | (3/15) | (3/15) | (3/15) | (3/15) |
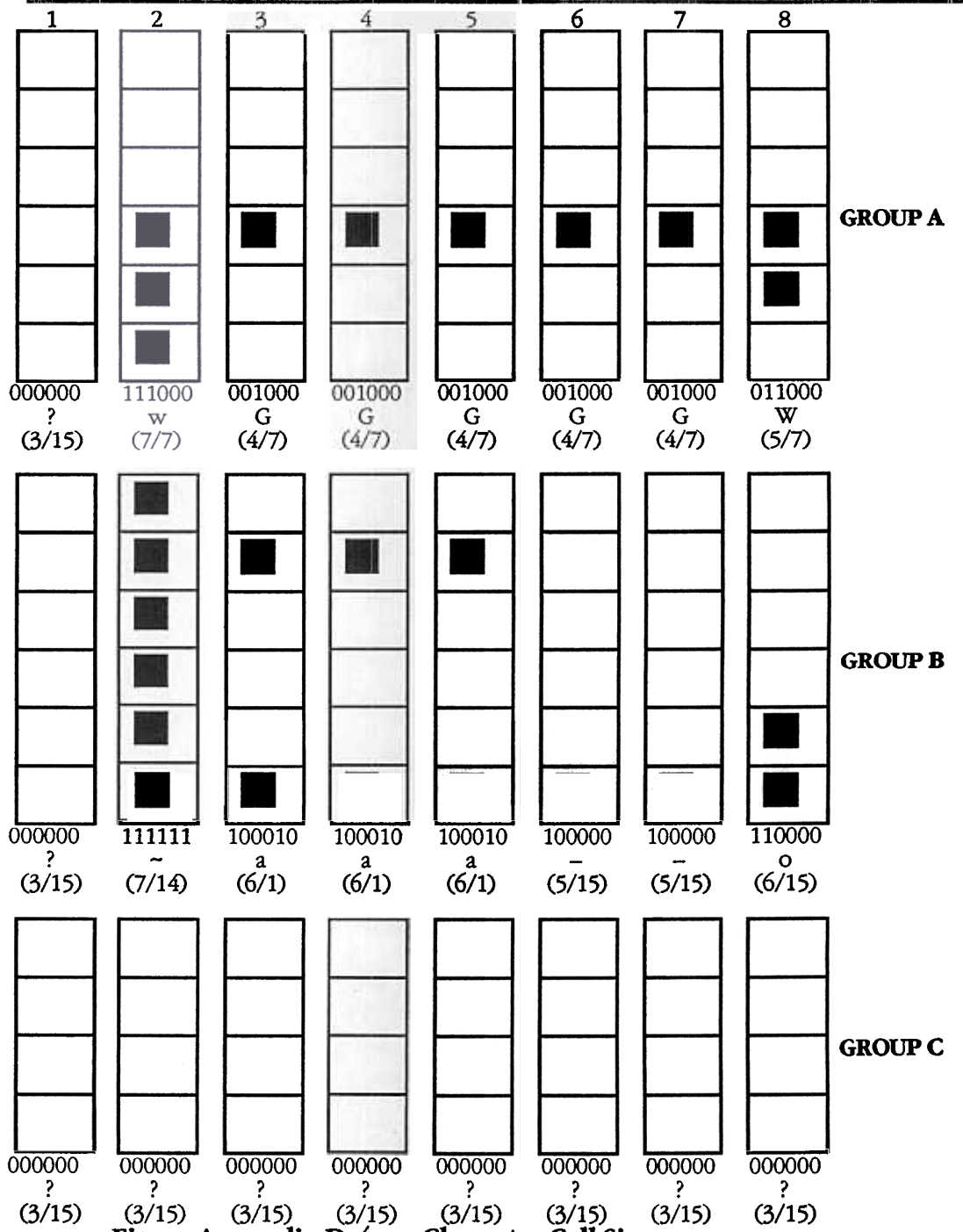
**Figure Appendix D-4    Character Cell Size**

# Down–Line–Loading Soft Characters

You load your soft character set with a DECDLD device control string. This control string has the following format.

**DCS Pfn;Pcn;Pe;Pcmw;Pw;Pt;Pcmh;Pcss{**
**Dscs Sxbp1;Sxbp2;..;Sxbpn ST**

### Table Appendix D–2    Device Control String Segment Description

| Control String Segment | Description |
|---|---|
| **DCS** (9/0) | Device Control String command. When coding for a 7–bit environment, you can use the equivalent 7–bit sequence ESC P (1/11, 5/0) |
| **Pfn;Pcn;Pe;Pcmw;Pw;Pt;Pcmh;Pcss** (see Table Appendix B–3) | These are parameter characters, separated by semicolons. Table Appen. B–3. describes these parameters and their possible values. |
| (7/11) | This is the final character. It marks the end of the parameter characters and indicates that this string is a DECDLD function. |
| **Dscs** | Defines the name of the soft character set. You use this name in the select character set (SCS) escape sequence. You use the following format for the Dscs name. |
| **I** | I is 0, 1, or 2 intermediate characters from the range 2/0 to 2/15 in the ASCII character set. |
| **F** | F is a final character in the range 3/0 to 7/14 |
| Examples of Dscs Names | |
| **sp    @** (2/0)  (4/0) | Defines the character set as an unregistered soft set. |
| **A** (4/2) | If Pcss is 0, A defines the soft character set as the U.K. National Supplemental Character Set. |
| | If Pcss is 1 A defines the soft character set as the ISO Latin–1 Supplemental Character Set. |

## Table Appendix D-2 continued (Device Control String Segment Description)

| Control String Segment | Description |
|---|---|
| **Sxbp1 ; Sxbp2 ;....; Sxbpn** | These are the pixel patterns for individual characters, separated by semicolons (3/11). Your character set can have 1 to 94 patterns or 1 to 96 patterns, depending on the setting of the character set size parameter (Pcss). Each sixel bit pattern is in the following format. |
| **S...S/S...S/S...S/S...S** | |
| **S...S** | This represents the pixels in Group A, B, or C of the soft character |
| **/** (2/5) | The / advances the pixel pattern to the next Group (B, or C) of the soft character. |
| **ST** (9/12) | This is the string terminator. ST is an 8-bit C1 character. You can use the equivalent 7-bit sequences ESC \ (1/11, 5/12) when coding for a 7-bit environment. |

## Table Appendix D-3   DECDLD Parameter Characters

| Parameter | Name | Description |
|---|---|---|
| | Font number | Selects the DRCS font buffer to load. Pfn has two valid values, 0 and 1. |
| | Starting character | Selects where to load the first character in the DRCS font buffer. The location corresponds to a location in the ASCII code table. For example, a Pcn value of 0 means that the first soft character is loaded into position 2/0 of the character table for a 96-character set and 2/1 for a 94-character set. |
| **Pe** | Erase control | 0 = erase all characters in the DRCS buffer with this number, width and rendition.<br>1 = erase only characters in locations being reloaded.<br>2 = erase all renditions of the soft character set. |

## Table Appendix D–3 continued (DECDLD Parameter Characters )

| Parameter | Name | Description |
|---|---|---|
| **Pcmw** | Character matrix width | Selects the maximum character cell width.<br>**0 =   8 pixels wide (default)**<br>1 =   illegal<br>2 =   5 x 10 pixel cell (VT200 compatible)<br>3 =   6 x 10 pixel cell (VT200 compatible)<br>4 =   7 x 10 pixel cell (VT200 compatible)<br>5 =   5 pixels wide<br>6 =   6 pixels wide<br>7 =   7 pixels wide<br>8 =   8 pixels wide<br><br>For VT200 compatible software use a Pcmw value 2, 3 or 4. You may use a Pcmw value of 0 to make the soft set the same height as the hard sets. Remember that the VT200 and VT300 fonts may appear different on the ELT320 because of the different display sizes.<br><br>The Pcmh attribute has been disabled. The default is always 16, making the ELT320 compatible with the DEC VT 320 Firmware version AV1.2. |
| **Pw** | Font Width | Selects the number of columns per line.<br>**0 = 80 columns (default)**<br>1 = 80 columns<br>2 = 132 columns<br><br>The ELT320 uses only the 80 column font. |
| **Pt** | Text or full–cell | Defines the font as a text font or full–cell font.<br><br>**0 = text (default)**<br>1 = text<br>2 = full cell<br><br>Full-cell fonts can individually address all pixels in a cell.<br><br>Text fonts cannot individually address all pixels. If you specify a text cell, the terminal automatically performs spacing. |

## Table Appendix D–3 continued (DECDLD Parameter Characters )

| Parameter | Name | Description |
|---|---|---|
| **Pcmh** | Character matrix height | This attribute has been disabled. The default is always 16, making the ELT320 compatible with the DEC VT320 Firmware version AV1.2. |
| **Pcss** | Character set size | Defines the characters set as a 94- or 96-character graphic set.<br>**0 = 94 character set.(default)**<br>1 = 96 character set |

## Soft Character Set Example

### To create a soft character set
- down–line–load set
- designate the set as G0–G3
- map G0 – G3 set into GL or GR

### Example:
You can load an E character by using the following DECCDLD string.

DCS (ESC P)

```
1 ; 1 ; 0 ; 8 ; 1 ; 1 ; 16 ; 0 { s p @
?wGGGGGW/?~aaa_ _ o/???????
ST
```

You can designate the character set as G1 by the "ESC ) sp @ " SCS sequence.
You can map G1 into GL by sending a SO control character. (CTRL N)

### To Clear a Soft Character Set
You can clear a soft character set by using the following DECDLD string.

DCS    1;1;2    { sp @ ST

Any of the following actions also clear the character set.
- Performing the power–up self–test.
- Selecting the Recall Saved Settings or Recall Factory Default Settings
- Using a reset to initial state (RIS) sequence.

# Section B—WHAT IS PAGE MEMORY

The ELT320 always displays 24 lines by 80 columns but the terminal has a page memory to store more data than you can display on the screen. This memory is equal to 144 lines by 80 or 132 columns.
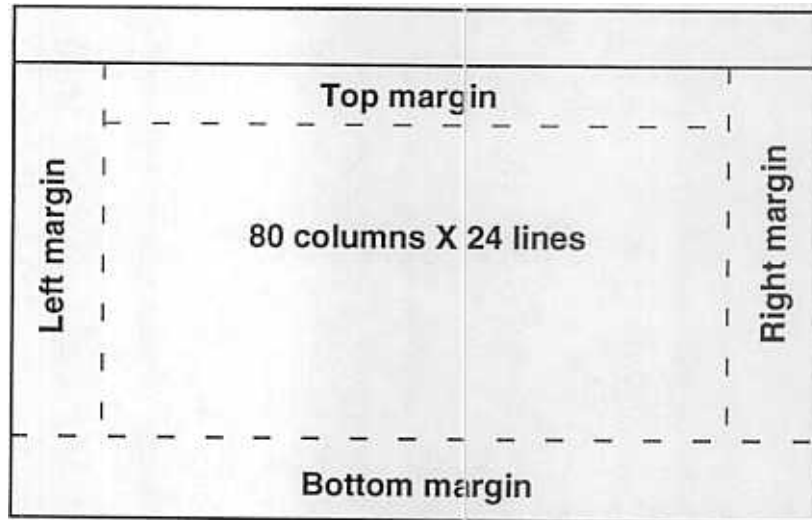


**Figure Appendix D-5      Page Memory Margins**

You can divide this memory into the following page sizes.

- 6 pages of 24 lines x 80 or 132 columns
- 4 pages of 36 lines x 80 or 132 columns
- 2 pages of 72 lines x 80 or 132 columns
- 1 page of 144 lines x 80 or 132 columns

**Figure Appendix D-6      Page Memory Divisions (see next page)**

6 pages of
24 lines x 80 or
132 columns

| PAGE 1 |
|---|
| PAGE 2 |
| PAGE 3 |
| PAGE 4 |
| PAGE 5 |
| PAGE 6 |

4 pages of
36 lines x 80 or
132 columns

| PAGE 1 |
|---|
| PAGE 2 |
| PAGE 3 |
| PAGE 4 |

2 pages of
72 lines x 80 or
132 columns

| PAGE 1 |
|---|
| PAGE 2 |

1 page of
144 lines x 80 or
132 columns

| PAGE 1 |
|---|

## Controlling The Page Format

### Selecting 80 or 132 Columns per Page

There are two control functions which can set the page width to 80 or 132 columns, DECSCPP and DECCOLM. We recommend that new applications use DECSCPP rather than DECCOLM. DECSCPP does not clear page memory or reset the scrolling regions, as does DECCOLM. DECCOLM is provided mainly for compatibility with previous products.

### Set Columns per Page (DECSCPP)

**Default:** 80 columns

**Table Appendix D–5**      **Set Columns per Page (DECSCPP)**

| Sequence | | | | | | Action |
|---|---|---|---|---|---|---|
| CSI<br>9/11 | $<br>2/4 | 7/12 | | | | Sets each page to 80 columns |
| CSI<br>9/11 | 0<br>3/0 | $<br>2/4 | 7/12 | | | sets each page to 80 columns |
| CSI<br>9/11 | 8<br>3/8 | 0<br>3/0 | $<br>2/4 | 7/12 | | Sets each page to 80 columns |
| CSI<br>9/11 | 1<br>3/1 | 3<br>3/3 | 2<br>3/2 | $<br>2/4 | 7/12 | Sets each page to 132 columns |

**Note:**
• If you switch from 132–column to 80–column pages, you can lose data from page memory.

Column mode    ECCOLM)

Default: 80 col

Table Appendix D–6        Column mode (DECCOLM)

| Mode | Sequence | Action |
|------|----------|--------|
| Set (132) | CSI | Selects the 132-column mode |
| Reset (80) | CSI ? 3 <br> 9/1  3/15 3/    6/12 | Selects the 80-column mode. |

N(

the top and bottom scrolling margins to their default positions

all data page memory

### Set Lines per Page (DECSLPP)

**Default:** 6 pages of 24 lines

This control function sets the number of lines for each page in page memory.

**Table Appendix D–7      Set Lines per Page (DECSLPP)**

| Sequence | | | | | Page Length |
|---|---|---|---|---|---|
| CSI 9/11 | 2 3/2 | 4 3/4 | t 7/4 | | 6 pages of 24 lines |
| CSI 9/11 | 3 3/3 | 6 3/6 | t 7/4 | | 4 pages of 36 lines |
| CSI 9/11 | 7 3/7 | 2 3/2 | t 7/4 | | 2 pages of 72 lines |
| CSI 9/11 | 1 3/1 | 4 3/4 | 4 3/4 | t 7/4 | 1 page of 144 lines |

**Note:**
* If you switch to a smaller page size, data that was on the larger page may be split across the smaller pages. To avoid confusion, make sure you set the lines per page before you enter data into page memory.

* DECSLPP usually does not change the top and bottom scrolling margins. However, if you change the page size, and the current scrolling margins exceed the new page size, the terminal resets the margins to the page limits.

## Origin Mode (DECOM)

This control function allows cursor addressing relative to the top and bottom margins or the complete page. DECOM determines if the cursor position is restricted to inside the page margins. When you power up or reset the terminal, you reset origin mode.

**Default:** Origin at upper–left screen, independent of margins.

### Table Appendix D–8     Origin Mode (DECOM)

| Mode | Sequence | | | | Action |
|---|---|---|---|---|---|
| Set (Margin dependant) | CSI 9/11 | ? 3/15 | 6 3/6 | h 6/8 | Sets the home cursor position at the upper left corner of the screen, within the margins. The starting point for line numbers depends on the current top margin setting. The cursor cannot move outside of the margins. |
| Reset (Margin independent) | CSI 9/11 | ? 3/15 | 6 3/6 | l 6/8 | Sets the home cursor position at the upper left corner of the screen. The starting point for line numbers is independent of the margins. The cursor can move outside of the margin. |

### Set Top and Bottom Margins (DECSTBM)

Default: Margins at page limits.

| CSI | Pt | ; | Pb | r |
|-----|-----|------|-----|-----|
| 9/11 | 3/? | 3/11 | 3/? | 7/2 |

where:

**Pt**  is the line number for the top margin
Default:Pt = 1.

**Pb**  is the line number for the bottom margin.
Default:Pb=24, 36, 48, 72 or 144

**Note:**
- The value of Pt must be less than Pb.

- The maximum size of the scrolling region is the page size.

- DECSTBM moves the cursor to column 1, line 1 of the page.

## Moving To Another Page

### Next Page (Np)

This control function moves the cursor forward to the home position on one of the following pages in page memory. If there is only one page, the terminal ignores Np.

| CSI | Pn | U |
|-----|------|-----|
| 9/11 | 3/? | 5/5 |

Where:

**Pn**    Indicates how many pages to move the cursor forward.

**Default:** Pn = 0.


### Preceding Page (Pp)

This control function moves the cursor backward to the home position on one of the preceding pages in page memory. If there is only one page, the terminal ignores Pp.

| CSI | Pn | V |
|-----|------|-----|
| 9/11 | 3/? | 5/6 |

Where:

**Pn**    Indicates how many pages to move the cursor backward.

**Default:** Pn = 0.

If Pn 0 or 1, the cursor moves to the preceding page. If Pn tries to move the cursor back farther than the first page in memory, the cursor stops at the first page.

## Page Position Absolute (Ppa)

This control function can move the cursor to the corresponding row and column on any page in page memory. You select the page by its number. If there is only one page, the terminal ignores Ppa.

**Default:** Move to the next page

| CSI | Pn | Sp | P |
|-----|-----|-----|-----|
| 9/11 | 3/? | 2/0 | 5/0 |

Where:

**Pn**   Is the number of the page to move the cursor to.

## Page Position Backward (Ppb)

This control function moves the cursor backward to the corresponding row and column on one of the preceding pages in page memory. If there is only one page, the terminal ignores Ppb.

**Default:** Move backward one page

| CSI | Pn | Sp | R |
|-----|-----|-----|-----|
| 9/11 | 3/? | 2/0 | 5/2 |

Where

**Pn**   Indicates the number of pages to move the cursor backward. If Pn tries to move the cursor back farther than the first page in page memory, the cursor stops at the first page.

## Page Position Relative (Ppr)

This control function moves the cursor forward to the corresponding row and column on one of the following pages in page memory. If there is only one page, the terminal ignores Ppr.

**Default:** Move to the next page

| CSI | Pn | Sp | Q |
|-----|-----|-----|-----|
| 9/11 | 3/? | 2/0 | 5/1 |

Where:

**Pn**   Indicates the number of pages to move the cursor forward. If Pn tries to move the cursor beyond the last page in memory, the cursor stops at the last page.

# Section C—PANNING AND CURSOR MOVEMENT

The ELT320 is capable of 80 or 132 column mode with a maximum of 80 columns being displayed (viewed) at any one time. Through panning or cursor position you can view any additional data either on the current page when in 132 column mode or in page memory. Additional information about this subject is available in Chapter 9 of the *VT320 Programmer Reference Manual* and Chapter 10 of the *VT420 Programmer Reference Manual*.

## Panning

This control function will let you pan the user window up or down, left or right. When panning right, the data will appear to be scrolling left, or in the opposite direction of the pan.

**Table Appendix D–9      Panning**

| Mode | Sequence | | | Action |
|------|----------|--|--|--------|
| Pan Down<br>(SU) | CSI<br>9/11 | Pn<br>3/? | S<br>5/3 | Moves the user window down Pn lines in page memory. You can not pan past the bottom margin of the current page. |
| Pan up<br>(SD) | CSI<br>9/11 | Pn<br>3/? | T<br>5/4 | Moves the user window up Pn lines in page memory. You can not pan past the top margin of the current page. |
| Pan right<br>(SL) | CSI<br>9/11 | Pn<br>3/? | sp @<br>2/0 4/0 | Moves the user window right along Pn columns in page memory. You can not page past the right page border. |
| Pan left<br>(SR) | CSI<br>9/11 | Pn<br>3/? | sp A<br>2/0 4/. | Moves the user window left along Pn columns in page memory. You can not page past the left page border. |

**Note:**
* Pn indicates cursor position, the terminal uses a default value of 1 if omitted or a value of 0 if used.
* ANSI mnemonics in parentheses. For example, an ANSI mnemonics for pan down is SU (scroll up).

## Panning Using the Editing Keypad

You can pan a window up or down, right or left by using the following keystrokes:

| To pan: | Left | **Press:** | CTRL ◁ |
|---|---|---|---|
| | Right | | CTRL ▷ |
| | Up | | CTRL △ |
| | Down | | CTRL ▽ |

## Cursor Movement

This section describes the control functions used to move the cursor on the screen.

**Table Appendix D–10     Cursor Movement**

| Mode | Sequence | Action |
|---|---|---|
| Cursor position (CUP) | CSI  P1  ;  Pc  H<br>9/11  3/?  3/11  3/?  4/8 | Moves the cursor to line Pl, column Pc. The starting point for line or columns depends on the sitting of the origin mode (DECOM). CUP applies only to the current page. |
| Cursor forward (CUF) | CSI  Pn  C<br>9/11  3/?  4/3 | Moves the cursor right Pn columns. The cursor stops at the right border of the page border. |
| Cursor backward (CUB) | CSI  Pn  D<br>9/11  3/?  4/4 | Moves the cursor left Pn columns. The cursor stops at the left border of the page border. |
| Cursor up (CUU) | CSI  Pn  A<br>9/11  3/?  4/1 | Moves the cursor up Pn lines in the same column. The cursor stops at the top margin. If the cursor is already above the top margin, the cursor stops at the top line. |
| Cursor down (CUD) | CSI  Pn  B<br>9/11  3?  4/2 | Moves the cursor down Pn lines in the same column. The cursor stops at the bottom margin. If the cursor is already below the margin, the cursor stops at the bottom line. |

**Note:**
• The parameters Pn, P1, and Pc indicate cursor position.
• These control functions will allow you to move the cursor only on the current page.

# Section D—EDITING AND CHARACTER PROTECTION

Additional information about this subject is available in Chapter 8 of the *VT320 Programmers Reference Manual.*

## Editing

This section describes the editing control functions available in the ELT320. The cursor does not move when you use these functions.

### Erasure Mode (ERM)

**Default:** Unprotected

**Table Appendix D–11    Erasure Mode (ERM)**

| Mode | Sequence | | | Action |
|------|---|---|---|--------|
| Set (All) | CSI<br>9/11 | 6<br>3/6 | h<br>6/8 | Erasure functions (ED, EL, and ECH) can affect all characters, protected and unprotected. |
| Reset (unprotected) | CSI<br>9/11 | 6<br>3/6 | l<br>6/12 | Erasure functions (ED, EL, ECH) can affect only unprotected characters. |

**Table Appendix D–12    Control Functions Affected by Character Protection**

| Always | | If Edit Mode (DECEDM) is set | |
|--------|---|--------|---|
| Erase character | (ECH) | Insert character | (ICH) |
| Erase in line | (EL) | Insert line | (IL) |
| Erase in display | (ED) | Delete Character | (DCH) |
| | | Delete line | (DL) |

### Insert/Replace Mode (IRM)

This control function selects how the terminal adds characters to page memory. The terminal always adds characters at the cursor position.

**Default:** Replace

**Table Appendix D–13      Insert/Replace Mode (IRM)**

| Mode | Sequence | Action |
|------|----------|--------|
| Set (Insert) | CSI  4  h<br>9/11  3/4  6/8 | Selects insert mode. New characters move characters in page memory to the right. Characters moved past the right page border are lost from page memory. |
| Reset (Replace) | CSI  4  1<br>9/11  3/4  6/12 | Selects replace mode. New characters replace the character at the cursor position. |

**Note:**
- If erasure mode (ERM) is reset, text moved into a protected character field is lost.

### Delete Line (DL)

This control function deletes one or more lines in the scrolling region, starting with the line that has the cursor.

**CSI    Pn      M**
9/11    3/?     4/13

where:

**Pn**    is the number of lines to delete.

**Default:**   Pn = 1

**Note:**
- In edit mode (DECEDM): If erasure mode (ERM) is reset, DL cannot delete lines that have protected characters. As lines are deleted, the area moved up is bounded by the bottom of the scrolling region, or by the next line with a protected character field.

## Insert Line (IL)

This control function inserts one or more blank lines, starting at the cursor.

| CSI | Pn | L |
|---|---|---|
| 9/11 | 3/? | 4/12 |

where:

**Pn**   is the number of lines to insert.

**Default:**   Pn =1

**Note:**
- In edit mode (DECEDM): If erasure mode (ERM) is reset, lines that move down into a line with a protected character field are lost.

## Delete Character (DCH)

This control function deletes one or more characters, from the cursor position to the right.

| CSI | Pn | P |
|---|---|---|
| 9/11 | 3/? | 5/0 |

where:

**Pn**   is the number of characters to delete.

**Default:**   Pn =1

**Note:**
- If erasure mode (ERM) is reset. DCH cannot delete protected characters.

## Insert Character (ICH)

This control function inserts one or more space (SP) characters, starting at the cursor position. (Available in: VT300 mode only.)

| CSI | Pn | @ |
|---|---|---|
| 9/11 | 3/? | 4/13 |

where:

**Pn**   is the number of characters to insert.

**Note:**
- In edit mode (DECEDM): If erasure mode (ERM) is reset, text moved into a protected character field is lost.

### Erase in Display (ED)

This control function erases characters from part or all of the display. When you erase complete lines, they become single-height and single-width, with all visual character attributes cleared. ED works inside or outside the current margins.

| CSI | Ps | J |
|-----|-----|-----|
| 9/11 | 3/? | 4/10 |

where:

**Ps** represents the amount of the display area to erase, as follows:

| Ps | Area Erased |
|-----|-----|

| **Default:** | 0 | From the cursor through the end of the display |
|-----|-----|-----|
| | 1 | From the beginning of the display through the cursor |
| | 2 | The complete display |

**Note:**
- If erasure mode (ERM) is reset, ED cannot erase protected character positions.

### Erase in Line (EL)

This control function erases characters on the line that has the cursor. EL clears all character attributes from erased character positions.

| CSI | Ps | K |
|-----|-----|-----|
| 9/11 | 3/? | 4/11 |

where:

**Ps** represents the section of the line to erase, as follows.

| Ps | Section Erased |
|-----|-----|

| **Default:** | 0 | From the cursor through the end of the line |
|-----|-----|-----|
| | 1 | From the beginning of the line through the cursor |
| | 2 | The complete line |

**Note:**
- If erasure mode (ERM) is reset, EL cannot erase protected characters.

### Erase Character (ECH)

This control function erases one or more characters, from the cursor position to the right. (Available in: VT300 mode only)

| CSI  | Pn  | X   |
|------|-----|-----|
| 9/11 | 3/? | 5/8 |

where:

**Pn**  is the number of characters to erase. A Pn value of 0 or 1 erases one character.

**Default:** Pn = 1

**Note:**
- If erasure mode (ERM) is reset, ECH cannot erase protected characters.

### Selective Erase in Display (DECSED)

This control function erases some or all of the erasable characters in the display. (Available in: VT300 mode only.)

| CSI  | ?    | Ps  | J    |
|------|------|-----|------|
| 9/11 | 3/15 | 3/? | 4/10 |

where:

**Ps**  represents the area of the display to erase, as follows.

**Ps  Area erased**

| Default: | | |
|----------|---|---|
| | 0 | From the cursor through the end of the display |
| | 1 | From the beginning of the display through the cursor |
| | 2 | The complete display |

**Note:**
- DECSED is not affected by erasure mode (ERM)

DECSED does not affect visual character attributes set by the select graphic (SGR) function, or selection attributes set with SSA or ESA functions.

DECSED provides full compatibility with applications that use the VT220 selective erase feature.

### Selective Erase in Line (DECSEL)

This control function erases some or all of the erasable characters in a single line of text. Available in: VT300 mode only

| CSI | ? | Ps | K |
|-----|-----|-----|-----|
| 9/11 | 3/15 | 3/? | 4/11 |

where:

**Ps**    represents the section of the line to erase, as follows.

**Ps    Section Erased**

**Default:**    **0**    From the cursor through the end of the line
**1**    From the beginning of the line through the cursor
**2**    The complete line

**Note:**

- DECSEL is not affected by erasure mode (ERM)

- DECSEL does not affect visual character attributes set by the select graphic rendition (SGR) function.

- DECSEL provides full compatibility with applications that use the VT220 selective erase feature.

# Character Protection

You can protect character positions in the terminal's page memory. Protected characters cannot be changed, erased, or moved by certain editing control functions (such as ED, EL, or ECH).

There are two styles of character protection available.

- Independent protection
- Visual attribute protection

You should use only one style of protection at a time.

## Independent Protection

This style of character protection lets you protect all the characters in an area of page memory, independent of their visual attributes. When you use independent protection, the following control functions cannot change, erase, or move the protected characters.

Erase in display    (ED)
Erase in line    (EL)
Erase character    (ECH)

In addition, if you set edit mode (DECEDM), the following control functions cannot change, delete, or move protected characters.

Insert line    (IL)
Insert character    (ICH)
Delete line    (DL)

### How it differs from Visual Attribute Protection

There are three basic differences between independent protection and visual attribute protection.

Independent protection lets you protect characters independent of their visual character attributes. Visual attribute protection applies to characters with the same visual character attribute.

You can use independent protection in any operating mode. You can use visual attribute protection only in edit mode.

Independent protection depends on the current setting of erasure mode (ERM), visual attribute protection does not.
ERM determines whether or not independently protected characters can be changed, erased, or moved.

**ERM set**    All characters can be changed, erased, or moved, regardless of protection.
**ERM reset**    Only unprotected characters can be changed, erased, or moved.

### Select Character Protection Attribute (DECSCA)

This control function defines successive characters written to page memory as protected or unprotected. (Available in: VT300 mode only )

| CSI | Ps | " | q |
|-----|----|---|---|
| 9/11 | 3/? | 2/2 | 7/1 |

where:

**Ps**   defines all following characters as protected or unprotected

|  | Ps | Meaning |
|--|----|---------|
| **Default:** | 0 | Not protected. |
|  | 1 | Protected. |
|  | 2 | Not protected. Same as default setting |

**Note:**
- DECSCA does not affect visual character attributes set by the select graphic rendition (SGR) function.

  If erasure mode (ERM) is set, you can erase protected characters by using the ED, EL, or ECH functions.

## Start Protected Area (SPA)

## End Protected Area (EPA)

These control functions define the beginning and end of a protected area in page memory.

**Table Appendix D–14     Start (SPA)/End (EPA) Protected Area**

| Name | 8-bit | 7-bit | | Action |
|---|---|---|---|---|
| Start of protected area (SPA) | SPA 9/6 | ESC 1/11 | V 5/6 | Defines the cursor position as the beginning of a series of protected characters. |
| End of protected area (EPA) | EPA 9/7 | ESC 1/11 | W 5/7 | Defines the cursor position as the end of a series of protected characters. |

**Note:**

• the terminal ignores any EPA received before an SPA.

• If SPA is not followed by an EPA on the same page SPA has no effect on the page.

## Visual Attribute Protection

This style of character protection lets you protect characters with the same visual attribute in an area of page memory. When you use visual attribute protection the following control functions cannot change, erase or move protected characters.

| | |
|---|---|
| Insert character | (ICH) |
| Insert line | (IL) |
| Delete character | (DCH) |
| Delete line | (DL) |
| Erase character | (ECH) |
| Erase in line | (EL) |
| Erase in display | (ED) |

### How it Differs from Independent Protection

There are three basic differences between visual attribute protection and independent protection.

Visual attribute protection applies to characters with the same visual character attribute. For example, you can protect all characters with the bold attribute or underline attribute. Independent protection is independent of visual attributes.

Visual attribute protection is only available in edit mode (DECEDM). You can use independent protection in all operating modes.

Visual attribute protection is not affected by erasure mode (ERM). Independent protection is affected.

### Protected Fields Attributes (DECPRO)

This control function selects protection based on visual attributes.
(Available in: edit mode DECEDM)

| CSI | Ps | ... | Psn | |
|-----|-----|-----|-----|------|
| 9/11 | 3/? | ... | 3/? | 7/13 |

Ps  defines characters with a certain character attribute as protected or unprotected. You can select more than one attribute.

| Ps | Protection | Character Affected |
|-----|-----|-----|
| 0 | Off | All characters |
| 1 | On | Bold characters |
| 4 | On | Underlined characters |
| 5 | On | Blinking characters |
| 7 | On | Negative image characters |
| 8 | On | Invisible characters |
| 22 | Off | Bold characters |
| 24 | Off | Underlined characters |
| 25 | Off | Blinking characters |
| 27 | Off | Negative image characters |
| 28 | Off | Invisible characters |
| **Default:** 254 | On | Characters with no attribute |

# Section E—LOCAL EDITING

Additional information about this subject is available in Chapter 8 of the *VT330 Programmers Reference Manual.*

## How Local Editing Works

As an editing terminal, the ELT320 does not send your typed characters immediately to the host. Instead, the terminal stores the characters in its page memory and displays them on the screen. You can edit the displayed characters, then send them to the host in a single block. The terminal performs your editing function locally.

### Selecting Edit Mode

There are two ways to select edit mode. Applications can use the edit mode sequence, or you can press Shift–Select. You can also check the status line to see if the terminal is in interactive mode.

### Edit Mode (DECEDM)

This control function selects edit mode or interactive mode. This function determines when the terminal sends data to the host.

**Default:** Interactive mode

**Table Appendix D–15      Edit mode (DECEDM)**

| Mode | Sequence | | | | | Action |
|---|---|---|---|---|---|---|
| Set (Edit mode) | CSI 9/11 | ? 3/15 | 1 3/1 | 0 3/0 | h 6/8 | Selects edit mode. The terminal stores all typed characters in page memory, for local editing. |
| Reset (Interactive mode) | CSI 9/11 | ? 3/15 | 1 3/1 | 0 3/0 | l 6/12 | Selects interactive mode. The terminal immediately sends typed characters to the host. |

**Note:**
If edit mode is set to unavailable

You can not use SHIFT-SELECT to enter or leave the edit mode.

The host system can not put the ELT320 into the edit mode

**Edit Key Execution Mode (DECEKEM)**

You can switch between edit mode and interactive mode by pressing **Shift-Select.** This control function determines if the terminal switches modes immediately or when the application decides.

**Default:** Immediate

**Table Appendix D–16      Edit Key Execution Mode (DECEKEM)**

| Mode | Sequence | | | | | Action |
|------|------|------|------|------|------|--------|
| Set (Immediate) | CSI 9/11 | ? 3/15 | 1 3/1 | 0 3/0 | h 6/8 | When you press **Shift-Select**, the terminal immediately switches between interactive and edit modes. |
| Reset (Deferred) | CSI 9/11 | ? 3/15 | 1 3/1 | 0 3/0 | l 6/12 | When you press **Shift-Select**, the terminal sends DECEDM to the host to switch modes. Then the terminal waits for the host to return DECEDM to change the terminal's current mode. |

# Defining the Size of the Character Block

In edit mode, you can select which data the terminal sends to the host. The amount of data sent depends on two factors.

- the size of the character block you define
- the areas of text selected as eligible to send

You can send up to a page of data at one time. You can use three control functions to define the size of the character block sent to the host.

- Line transmit mode (DECLTM)
- Transmit termination mode (TTM)
- VT131 transmit mode (DEC131TM)

Table Appendix B–15 lists the block sizes you can select with these functions. You can select from four different block sizes.

**VT131 partial page**

Includes the text on the current page between the partial page marker and the cursor. The partial page marker does not appear on the screen. The terminal automatically places the marker at the position of the last character sent. If there is no marker, or the marker is after the cursor, the terminal sends all eligible characters between the top margin and the cursor.

**ANSI partial page**

Includes the text on the current page from the beginning of a selected area to the cursor. A selected area is a block of text that is selected as eligible to send to the host.

**Scrolling region**

Includes the text of the current page that is inside the margins.

**Table Appen D–17   Defining the Character Block Size for Transmission**

| Block Size | Line Transmit Mode (DECLTM) | Transfer Termination Mode (TTM) | VT131 Transfer Mode (DEC131TM) |
|---|---|---|---|
| Line | enabled | – – – | – – – |
| VT131 partial page | disabled | disabled | VT131 |
| ANSI partial page | disabled | disabled | ANSI |
| Scrolling region | disabled | enabled | |

**Line Transmit Mode (DECLTM)**

This control function lets you select one of two options for the size of the character block.

- a line of characters
- a full or partial page

In a line transmission, the terminal sends eligible characters from the line with the cursor. These characters are followed by any end–of–line characters and end–of–block characters. To start a line transmission you can press the **Return** or **Enter** key. If you press **Return** to start a line transmission, the cursor moves to the left page border of the active line. If you press **Enter** to start a line transmission, the cursor does not initially move.

If line feed/new line mode is set, the cursor moves to the first unprotected field in the next line. If the cursor is at the end of the scrolling region, the cursor moves to the first unprotected field on the current line.

**Default:** Page of characters

**Table Appendix D–18      Line Transmit Mode (DECLTM)**

| Mode | Sequence | | | | | Action |
|------|------|--|--|--|--|--------|
| enabled (Line) | CSI 9/11 | ? 3/15 | 1 3/1 | 1 3/1 | h 6/8 | Selects line transmission. |
| disabled (Page) | CSI 9/11 | ? 3/15 | 1 3/1 | 1 3/1 | l 6/12 | Selects full or partial page transmission, depending on the settings of transmit termination mode (TTM) and VT131 transmit mode (VT131TM). |

**Note:**
- When DECLTM is disabled (page), TTM and VT131TM let you select from three block sizes. VT131 partial page. ANSI partial page, or the scrolling region.

**Transmit Termination Mode (TTM)**

If line transmit mode (DECLTM) is disabled (page), transmit termination mode (TTM) and VT131 transfer mode (DEC131TM) define the size of the character block. TTM determines whether the terminal includes the cursor position as part of the criteria that ends a block transmission.

**Default:** Scrolling region

**Table Appendix D–19      Transmit Termination Mode (TTM)**

| Mode | Sequence | | | | Action |
|------|------|--|--|--|--------|
| enabled (Scrolling region) | CSI 9/11 | 1 3/1 | 6 3/6 | h 6/8 | The terminal sends the scrolling region. |
| disabled (Partial page) | CSI 9/11 | 1 3/1 | 6 3/6 | l 6/12 | The terminal sends a VT131 or ANSI partial page, based on VT131 transmit mode (DEC131TM). |

**VT131 Transmit Mode (DEC131TM)**

If line transmit mode (DECLTM) is disabled (page), DEC131TM and transmit termination mode (TTM) together define the size of the character block that the terminal can send to the host. You cannot use DEC131TM and TTM separately.

**Default: ANSI**

**Table Appendix D–20     VT131 Transmit Mode (DEC131TM)**

| Mode | Sequence | | | | | Action |
|---|---|---|---|---|---|---|
| enabled VT131 | CSI 9/11 | ? 3/15 | 5 3/15 | 3 3/3 | h 6/8 | The terminal works like a VT131 terminal. |
| disabled ANSI | CSI 9/11 | ? 3/15 | 5 3/15 | 3 3/3 | l 6/12 | The terminal works according to ANSI rules. |

**Table Appendix D–21     Selecting Character Fields for Transmission**

| Fields Selected | Guarded Area Transfer Mode (GATM) | Selected Area Transfer Mode (SATM) | Multiple Area Transfer Mode (MATM) |
|---|---|---|---|
| All fields | All | All | Not available |
| Unprotected fields only | Unprotected | All | Not available |
| Selected fields only | All | Selected | Multiple |
| Selected field with cursor only | All | Selected | Single |
| Unprotected and selected fields | Unprotected | Selected | Multiple |
| Unprotected fields and selected field with cursor. | Unprotected | Selected | Single |

## Selecting The Characters To Send

There are five control functions that select which characters the terminal can send to the host.

| Function | Use |
|---|---|
| Guarded area transfer mode (GATM) | Send protected areas |
| Selected area transfer mode (SATM) | Send all the selected areas |
| Multiple area transfer mode (MATM) | Send one or all selected areas |
| Start selected area (SSA) | Define a selected area |
| End selected area (ESA) | |

### Guarded Area Transfer Mode (GATM)

This control function selects whether the terminal can send all characters or only unprotected characters to the host.

**Default:** All characters

**Table Appendix D–22    Guarded Area Transfer Mode (GATM)**

| Mode | Sequence | Action |
|---|---|---|
| All | CSI 1 h<br>9/11 3/1 6/8 | Selects all characters. During block transmission, the terminal can send all protected and unprotected characters to the host. |
| Unprotected | CSI 1 l<br>9/11 3/1 6/12 | Selects unprotected characters. During a block transmission, the terminal can send only unprotected characters to the host. |

**Note:**
- When GATM is unprotected, the terminal sends a record separator (RS) to the host in place of a protected field. The terminal sends a space character (SP) to a printer in place of a protected field.

**Selected Area Transfer Mode (SATM)**

This control function determines whether the terminal can send all characters or only selected characters to the host. Selected characters are characters defined as eligible to send to the host. You can define selected areas on the current page with the start selected area (SSA) and end selected area (ESA) control functions.

**Default:** All characters

**Table Appendix D–23    Selected Area Transfer Mode (SATM)**

| Mode | Sequence | Action |
|---|---|---|
| All | CSI 1 7 h<br>9/11 3/1 3/7 6/8 | Selects all characters. |
| Selected only | CSI 1 7 l<br>9/11 3/1 3/7 6/12 | Selects only selected characters. |

**Multiple Area Transfer Mode (MATM)**

This control function determines what selected character areas the terminal can send to the host. MATM only works when selected area transfer mode (SATM) is reset.

**Default:** All selected areas

**Table Appendix D–24    Multiple Area Transfer Mode (MATM)**

| Mode | Sequence | Action |
|---|---|---|
| Multiple | CSI 1 5 h<br>9/11 3/1 3/15 6/8 | The terminal can send all selected areas on the page to the host. |
| Single | CSI 1 5 l<br>9/11 3/1 3/15 6/12 | Selects one area. The terminal can send only the selected area with the cursor. |

**Note:**
- If MATM is single and the cursor is not in a selected field, the cursor moves to the next selected field.

### Defining Selected Areas

These two control functions select which characters on the current page the
terminal can send to the host. SSA and ESA only work when selected area transfer
mode (SATM) is selected.

**Table Appendix D–25    Defining Selected Areas**

| Name | 8–bit | 7–bit | | Action |
|---|---|---|---|---|
| Start selected area (SSA) | SSA 8/6 | ESC 1/11 | F 4/6 | Marks the cursor position as the first of a string of character positions the terminal can send to the host. |
| End selected area (ESA) | ESA 8/7 | ESC 1/11 | G 4/7 | Defines the cursor position as the last of a string of character fields the terminal can send to host. |

**Note:**
- If the terminal receives ESA before SSA, the terminal ignores ESA.
- If SSA is not followed by ESA on the same page, the SSA has no effect on that page. Selected areas must always end with ESA.
- Selected areas cannot be changed by the ED, EL, or ECH control functions.

## End-Of-Block and Unused SpaceCharacters

These control functions affect the way the terminal sends end–of–block, end–of–line, and space characters to the host in edit mode.

### Set Transmit Termination Character (DECTTC)

This control function lets you select a character to indicate the end of a block transmission.

| CSI | Ps | |
|---|---|---|
| 9/11 | 3/? | 7/12 |

where:

Ps    represents the end–of–block character, as follows.

| | | | |
|---|---|---|---|
| 0 | | | No character |
| 1 | FF | 0/12 | form feed |
| 2 | ETX | 0/3 | end of text |
| 3 | EOT | 0/4 | end of transmission |
| 4 | CR | 0/13 | carriage return |
| 5 | DC3 | 1/3 | XOFF |

**Default:**  Ps=0

### Extended Form

An extended form of the DECTTC control function lets you select a string of characters to indicate the end of a block.

| CSI | ? | Pn1 | | Pn6 | |
|---|---|---|---|---|---|
| 9/11 | 3/15 | 3/? | 3/11 | 3/? | 7/12 |

where:

Pn1 through Pn6 are decimal for characters that you can define as end–of–block characters.

**Transmit Line Termination Characters (DECTLTC)**

This control function lets you select the character(s) that the terminal sends to the host at the end of each line of transmitted data.

**Default:** CR
0/13

| CSI | ? | Pn1 | | ...Pn6 | ` | s |
|-----|-----|-----|-----|------|-----|-----|
| 9/11 | 3/15 | 3/? | 3/11 | 3/? | 2/7 | 7/3 |

where:

Pn1 through Pn6 are decimal codes for characters that you can define as end–of–line characters.

**Space Compression Mode (DECSCFDM)**

This control function determines whether the terminal sends space characters (SP) at the end of character fields. If the terminal does not send spaces, it uses the record separator character (RS) to indicate the end of a field.

**Default:** Disabled

**Table Appendix D–26   Space Compression Mode (DECSCFDM)**

| Mode | Sequence | | | | | Action |
|------|----------|---|---|---|---|--------|
| Enabled | CSI<br>9/11 | ?<br>3/15 | 1<br>3/1 | 3<br>3/3 | h<br>6/8 | Selects space compression. The terminal does not send space characters at the end of a character field. All fields sent end with a single record separator (RS) character, except the last field on a line. The last field ends with the end–of–block character defined by the transmit termination character function (DECTTC). |
| Disabled | CSI<br>9/11 | ?<br>3/15 | 1<br>3/1 | 3<br>3/3 | l<br>6/12 | Selects no space compression. The terminal sends space characters to the host at the end of a character field. The terminal sends characters as they appear on the page. |

## Transmit Execution Mode (DECTEM)

When you press **Enter**, this control function determines whether the terminal sends data immediately or waits for the host's permission.

**Default:** Immediate

**Table Appendix D–27     Transmit Execution Mode (DECTEM)**

| Mode | Sequence | | | | | Action |
|---|---|---|---|---|---|---|
| Immediate | CSI<br>9/11 | ?<br>3/15 | 1<br>3/1 | 4<br>3/4 | h<br>6/8 | When you press **Enter**, the terminal immediately sends a block of character to the host. |
| Deferred | CSI<br>9/11 | ?<br>3/15 | 1<br>3/1 | 4<br>3/4 | l<br>6/12 | When you press **Enter**, the terminal sends a request to the host, asking if the host is ready to receive a block of characters. Then the terminal waits until the host responds. |

**Note:**
- When DECTEM is deferred, the terminal requests a block transmission by sending the set transmit state (STS) sequence to the host. The host must respond with the DECXMIT sequence.

### Set Transmit State (STS) – From terminal

The terminal sends this escape sequence to the host to request a block transmission. The terminal only sends STS when transmit execution mode (DECTEM) is deferred.

| ESC | S |
|---|---|
| 1/11 | 5/3 |

### Transmit (DECXMIT) – From Host

The host responds to set transmit state (STS) sequence by sending a DECXMIT sequence to the terminal.

| ESC | 5 |
|---|---|
| 1/11 | 3/5 |

## Character Sets and Block Transmission

The terminal can send characters from several possible character sets during a block transmission. The ELT320 sends characters based on the following general rules.

If space compression mode is disabled, the terminal sends unwritten character positions as SP.

The terminal never sends characters from the control representation font.

- Characters that are in page memory, but not available in the character sets in the in-use table, are sent as SUB.

## Block Transmission in an 8–bit Environment

If the national replacement character set mode is reset, and the terminal is in VT300 mode, the terminal selects the character set for each transmitted character as follows:

**Note:**
- If the current host communication line is set to 7 bits, the terminal cannot correctly send 8–bit characters in a block transmission.

1. At the beginning of a block transmission, the terminal assumes the ASCII set is in GL and the user–preferred supplemental set is in GR.

2. The terminal sends ASCII graphic and SP characters with their eighth bit set to 0. The terminal never sends a designating sequence for ASCII or space characters.

3. For characters that are not ASCII characters or spaces, the terminal sends the appropriate G2 designating sequence for the character set containing those characters.

   **Note:**
   - If the application sends the ISO Latin–1 announcer at the beginning of execution, the terminal sends the appropriate G1 designating sequence.

4. If the same character is in more than one character set, the terminal uses the following priority system.

   - ASCII
   - User–preferred Supplemental
   - DEC Technical
   - DEC Special Graphic

   After the ELT320 selects the appropriate character set, the ELT320 sends the designating sequence, followed by the characters from the designated set.

5. If the user–preferred character set is not in GR at the end of a block transmission, the ELT320 sends a designating sequence to the host. This sequences specifies the current user–preferred supplemental set. The terminal sends the designating sequence before the end–of–block character, if any.

**Block Transmission in a 7–Bit Environment**

If the national replacement character set mode is set and the terminal is in VT100 mode, the terminal selects the character set for each transmitted character as follows.

At the beginning of a block transmission, the terminal assumes that the ASCII set is in GL.

2. The terminal sends ASCII graphic and SP characters with their eighth bit set to 0. The terminal never sends a designating sequence for ASCII or space characters.

3. For characters not in the ASCII set, the terminal sends the appropriate G0 designating sequence for the character set containing those characters. The terminal always sends the actual designating sequence for the desired NRC set.

4. If the same character is in more than one character set, the terminal uses the following priority system.

   – ASCII
   – DEC Technical
   – DEC Special Graphic

5. If the NRC set is not in G0 at the end of a block transmission, the terminal sends a designating sequence to the host. This designator specifies the current NRC set. The terminal sends the designating sequence before the end–of–block character, if any.

# Section F—Keyboard, Printing and Display Commands

Additional information about this subject is available in Chapter 10 of the *VT320 Programmers Reference Manual.*

## Keyboard Control Functions

### Backarrow Key Mode (DECBKM)

**Default:** Delete key

**Table Appendix D–28    Backarrow Key Mode (DECBKM)**

| Mode | Sequence | | | | Action |
|------|------|------|------|------|--------|
| Backspace | CSI<br>9/11 | ?<br>3/15 | 6<br>3/6 | 7<br>3/7 | h<br>6/8 | The ⊗ key works as a backspace key. When you press ⊗ , the terminal sends a BS character to the host. |
| Delete | CSI<br>9/11 | ?<br>3/15 | 6<br>3/6 | 7<br>3/7 | l<br>6/12 | The ⊗ key works as a delete key. When you press ⊗ , the terminal sends a DEL character to the host. |

**Note:**
- In edit mode, DECBKM will always delete.

### Print All Pages
This control function prints all pages in page memory.

**CSI ? 11 i**

### Start Printer–to–Host
This control function enables communication from the printer port to the host.

**CSI ? 9 i**

### Stop Printer–to–Host
This control functions disables communication from the printer port to the host.

**CSI ? 8 i**

## Printing Visual Attributes

### Selecting the Indicator or Host – Writable Status Line

The twenty–fifth line at the bottom of the screen is reserved for the status line, the terminal lets you use the status line in two ways – as an indicator of the terminal's current state or as a window the host can use to display application–specific messages.

The indicator status line displays the following information about the terminal:

- Page number
- Text cursor position (line, column)
- Edit mode setting (in edit mode only)
- Insert/replace mode setting
- Printer status
- Modem status

# Section G—REPORTS

Additional information about this subject is available in Chapter 11 of the *VT320 Programmers Reference Manual.*

The ELT320 sends reports in response to requests from the host computer. The host can use the reports to adjust the computing environment to match the terminal.

## Device Attributes (DA)

The terminal and host computer exchange DA sequences to provide the host with the following information.

> Conformance level (1, 2, or 3) and extensions
> Basic features
> Identification code
> Firmware version level
> Hardware options

## Primary DA

The ELT320 does not report a 4 (Sixel Graphics) in its response. This is compatible with DEC VT320 Firmware version AV1.2. The ELT320 does, however, display 11 (25th Status Line) and 14 (8-bit interface architecture) because it supports these features.

**Host Request**

| CSI | c   | or  | CSI | 0   | c   |
|-----|-----|-----|-----|-----|-----|
| 9/11 | 6/3 |     | 9/11 | 3/0 | 6/3 |

**Terminal Response**

| CSI | ?   | Psc | ;   | Ps1 | ;   | .... | Psn | c   |
|-----|-----|-----|-----|-----|-----|------|-----|-----|
| 9/11 | 3/15 | 3/? | 3/11 | 3/? | 3/11 | ..... | 3/? | 6/3 |

where:

**Psc**      Indicates the terminal's service class code. The value of Psc depends on the terminal's current operating level, as follows.

**Psc**      **Operating level**

> **61** Level 1 (VT100 family )
> **63** Level 3 (VT200 or VT300 family)

**Ps1.....Psn**       Indicate which of the following extensions the terminal supports.

| Ps | Meaning |
|----|---------|
| 1 | 132 columns |
| 2 | Printer port |
| 6 | Selective erase |
| 7 | Soft character set (DRCS) |

| Ps | Action |
|----|--------|
| 8 | User–defined keys (UDK) |
| 9 | National replacement character sets |
| 11 | 25th status line |
| 13 | Local editing mode |
| 14 | 8-bit interface architecture |
| 15 | Technical character set |
| 17 | Terminal state interrogation |
| 18 | Windowing capability |

**Alias Primary DA Responses from the Terminal**

**Table Appen. D–29  Alias Primary DA Responses from the Terminal**

| Terminal | Identification Sequence | Meaning |
|----------|------------------------|---------|
| VT100  DA | ESC[?1;2c | VT100  terminal |
| VT101  DA | ESC[?1;0c | VT101  terminal |
| VT102  DA | ESC[?6c | VT102  terminal |
| VT125  DA | ESC[?12;7;1;10;102c | VT125  terminal |
| VT131  DA | ESC[?7c | VT131  terminal |
| VT220  DA | CSI?62;1;2;6;7;8;9c | VT220  terminal |
| ELT320  DA | CSI?63;1;2;6;7;8;9;11;13;14;15;17;18;c | ELT320  terminal |

Example:

Host: CSI c

ELT320 Terminal:       **CSI ?    63;  1;   2;   6;   7;   8;   9;**
                       **11;  13;  14;  15;  17;  18;  c**

**Device Status Report (DSR)**

The host computer and terminal exchange DSR sequences to provide the host the operating status of the following seven features:

VT300 operating status
Cursor position
Cursor position with page
Printer port
User–defined keys
Keyboard dialect
Locator device port

DSR requests and reports follow one of two formats:

| ANSI standard | **CSI** | **Ps** | **n** | |
|---|---|---|---|---|
| | 9/11 | 3/? | 6/14 | |

| DEC private | **CSI** | **?** | **Ps** | **n** |
|---|---|---|---|---|
| | 9/11 | 3/15 | 3/? | 6/14 |

where:
**Ps**   indicates the type of DSR requested.

**DSR – ELT320 Operating Status**

**Table Appendix D–30     DSR – ELT320 Operating Status**

| Name | Sequence | Meaning |
|---|---|---|
| Request | **CSI 5 n** | The host requests the terminal's operating status. The host asks if the terminal is in good operating condition. |
| Response | **CSI 0 n** | The terminal indicates that it is in good operating condition. |
| | **CSI 3 n** | The terminal indicates that it has a malfunction. |

DSR – Cursor Position Report (CPR)

**Table Appendix D–31    DSR – Cursor Position Report (CPR)**

| Exchange | Sequence | Meaning |
|---|---|---|
| Request | CSI 6 n | The host asks for a cursor position report. |
| CPR Response | CSI Pl;Pc R | The terminal indicates that the cursor is currently at line Pl, column Pc. |

## Control Function Settings

The host can request the current selection or setting of any control function listed in Table Appendix B–27.

**Table Appendix D–32    Control Function Settings**

| Mode | Mnemonic | Intermediate and Final Character |
|---|---|---|
| Protected fields attributes | DECPRO | |
| Select active status display | DECSASD | $} |
| Set character attribute | DECSCA | "q |
| Set conformance level | DECSCL | "p |
| Set columns per page | DECSCPP | $ I |
| Set lines per page | DECSLPP | t |
| Set status line type | DECSSDT | $~ |
| Set top and bottom margins | DECSTBM | r |
| Set transmit termination character | DECTTC | |
| Transmit line termination character | DECTLTC | 's |
| Select graphic rendition | SGR | m |

### Request Displayed Extent (DECRQDE)

The host sends this control function to ask how much of the current page is displayed on the screen. The terminal responds with a report displayed extent sequence.

| CSI | " | v |
|-----|-----|-----|
| 9/11 | 2/2 | 7/6 |

### Report Displayed Extent (DECRPDE)

| CSI | Pn | ; | Pw;Pm1;Pmt;Pmp | " | w |
|-----|-----|-----|-----|-----|-----|
| 9/11 | ** | 3/11 | **..... ** | 2/2 | 7/7 |

where:

**Pn**      is the number of lines of the current page

is the number of columns of the current page

is the number of the current page column displayed in the left-most column of the screen.

is the number of the current page line displayed in the top line of the screen.

is the number of the current page.

# GLOSSARY

**Action fields**
Features in set-up that make the ELT320 perform an immediate action.

**Application software**
A program that performs a specific function for a particular class of computer user. Examples: spreadsheets and word processing programs.

**ASCII**
American Standard Code for Information Interchange

**ANSI**
American National Standards Institute

**Auto print mode**
A method of printing information directly from the host system. The ELT320 sends a display line to the printer after a carriage return or form feed character.

**CCITT**
Comite Consultatif International de Telegraphique et Telephonique (International Telegraph and Telephone Consultative Committee). A standards committee for the communication industry in Europe.

**Character set**
A group of graphic characters and control characters stored as a unit in the terminal. Graphic characters are characters you can display on the screen. Control characters perform special functions.

**Compose character**
A character produced when you press two or three keys in a certain sequence. You can use compose sequences to produce characters that do not appear as standard keys on your keyboard.

**Cursor**
An indicator that highlights the active position on the screen. The ELT320 uses different cursor characters for (1) text, and (2) set-up.

**DEC Multinational character set**
The default character set for the ELT320. The DEC Multinational set is one of two 8-bit sets built into the ELT320. The other set is ISO Latin-1. Both sets include the standard ASCII character set and a supplemental set.

**Diacritical marks**
Marks or symbols that indicate a change in the standard pronunciation of a letter. Examples of diacritics are acute accent ('), grave accent (`), and tilde mark (~). On the ELT320, you can use compose sequences to display characters with accent marks.

**Factory default**
A standard setting for an operating feature of the terminal, set at the factory. The
ELT320 uses factory-default settings, unless you select a new setting. For example,
many set-up features have default settings.

**Full-duplex modem**
A modem that can handle simultaneous, two-way communications.

**Host system**
The computer system you connect to the ELT320.

**ISO**
International Standards Organization. ISO Latin-1 is one of the two 8-bit
multinational character sets built into the ELT320. The other set is the DEC
Multinational set.

**Modem**
Modulator - demodulator. A device that converts data from a computer or terminal
into signals that can be sent over a telephone line.

**Monochrome monitor**
A video screen that displays images in one color.

**Nonvolatile memory**
Random access memory (RAM) that does not lose its contents when you turn the
terminal off. The ELT320 uses this memory to store the saved settings of set-up
features.

**Pixel**
Picture elements. The smallest displayable unit on a video screen. To display a
character, the terminal turns on a series of pixels.

**Port**
Another term for connector. All the ELT320 connectors are on the rear of the
terminal.

**Saved settings**
The stored settings for set-up features. The ELT320 uses these settings when you
turn the terminal on. Initially, the saved settings are the factory-default settings. You
can change the settings in set-up.

**Scrolling**
Moving information on the screen upward or downward to display more data.

**Scrolling region**
The area on the screen where you can scroll information. The default scrolling
region is the complete screen. Some applications may only use part of the screen.

**Set-up**
A set of display screens on the ELT320 that list the settings of the terminal's
operating features. You can use the keyboard to change settings.

**Sixel**
A sixel is a 6-bit binary code that represents a vertical column of 6 pixels on the screen. Each bit in a sixel corresponds to a pixel on the screen.

**Status line**
A display line that provides information about the terminal's current operating state. The status line appears on line 25 at the bottom of the screen. Usually, the status line appears only when you display set-up screens. You can select when to display the status line, using the Status Line feature in the Display Set-Up screen.

**Terminal server**
An intelligent device that can connect a number of asynchronous devices (terminals and printers) to a host system. For example, Digital's DECserver 200 can link eight ELT320 terminals to a system in a local area network (LAN) using a high-speed Ethernet cable.

**User-defined keys (UDKs)**
Any of the 15 keys (F6 through F20) on the top row of the keyboard for which a programmer has defined special functions. UDKs can store frequently used text and commands.

**Visual character attribute**
A quality of a display character that highlights the character, such as bolding and underlining.

# INDEX

## A

AC power consumption, 92
Action and parameter fields, 24
Acute accent ´, 62
Additional reference information, 97
Alias primary DA responses from the terminal, 149
Altitude, 92
ANSI partial page, 135
Answerback message, 34, 38
Arrow keys, 12, 24, 45, 122
ASCII, 28, 40, 44, 105, 109
Audible, 9
Austrian keyboard, see German/Austrian keyboard
Auto answerback, 34, 38
Auto print mode, 16, 20, 40
Auto repeat, 29, 43, 45
Auto wrap, 30, 33

## B

Backarrow key mode (DECBKM), 146
Baud rate, 6, 35, 41, 91
Belgium (Flemish) keyboard, 71, 81
Bell tone, 5, 7, 45
Block transmission in a 7–bit environment, 145
Block transmission in an 8–bit environment, 144
Break, 17, 43, 46
Brightness, 6
British keyboard, 47, 69, 79, 80

## C

Cable, 5, 7, 37, 94
Canadian (French) keyboard, 47, 71, 79, 81
Canadian emissions requirements, 96
Cancel, 25
Caps lock, 43, 46
Character block size for transmission, 135
Character body size, 103
Character cell size, 102, 107
Character dimension, 102
Character fields for transmission, 137

# C continued

Character format, 34, 36
Character protection, 90, 123, 128
Character set mode, 27, 28, 29
Character sets and block transmission, 2, 40, 90, 102, 144, 149
Character sixel coding, 104
Characters to send, 138
Circumflex accent ^, 62
Cleaning, 7
Clear, 5, 23, 111
Clear all character attributes, 126
Clear all keys, 48, 49
Clear all tabs, 58
Clear display, 25
Clear page/clear field, 55
Clear this key, 48, 49
Clear to send, 93
Coding the soft character set, 104
Column mode (DECCOLM), 30, 31, 115
Columns, 1, 58, 110, 114, 149, 151, 152
Comma key, 14, 46
Communication interfaces, 91
Communication port, 34, 37
Communications, 2, 23, 25, 35, 36, 37, 38
Communications Set-up, 34,
Compose, 43
Compose character, 12, 62, 64, 65, 66, 67, 68, 78
Compose character sequences, 69, 77, 85
Compose key, 46
Conceal answerback, 34, 38
Connection to host computer, 5
Connector signals, 93
Connectors, 4
Contrast, 6
Control function settings, 90, 151
Control representation mode, 30, 33
Control sequences, 97
Controls, 9
Converting binary code, 104
CR ^, 50
Ctrl key, 11
Ctrl-break/Ctrl-local, 16,17
Current setting, 27, 30, 39, 43, 50, 59
Cursor key mode, 43, 45
Cursor movement, 122
Cursor position, 19
Cursor style, 30, 33

# D

# E

# F

Factory-default, 6
Federal Communications Commission (FCC), 95
Finnish keyboard, 44, 70, 82
Flemish keyboard, 44, 71, 81
Flow control, 39, 41
France (Belgium) keyboard, 83
French Canadian keyboard, 44
French/Belgian keyboard, 44, 71
Function keys, 16

# G

General set-up, 27
German/Austrian keyboard, 44, 72
German keyboard functionality, 78, 83
Glossary, 153
Grave accent `, 62
Group shift, 78
Guarded area transfer mode (GATM), 50, 52, 138

# H

Hexadecimal compose key sequence, 63
Hold screen (F1), 18
Holland (Dutch) keyboard, 44, 70, 84
Home cursor, 55
Horizontal coupling, 30, 32
Host EIA/RS–232 connector, 93
Host EIA/RS–423 connector, 93
Host External Loopback, 59, 60
Host port, 6
Host request, 148
Humidity, 92

## IJ

## K

## L

# M

Main keypad, 11
Maintenance, 7
Margin bell, 43, 45
Modem control, 34
Mounting options, 2
Moving to another page, 119
Multinational mode character sequences, 37, 28, 64
Multiple area transfer mode (MATM), 50, 53, 139

# N

National mode character sequences, 28, 69,
National mode data processing keys, 77
New line mode, 33
Next page (NP), 56 119
North American keyboard, 43, 44, 80
Norwegian keyboard, 44, 74, 85
NRC (National Replacement Charictor Set), 28, 145
Numeric, 43

# O

On-line/local, 27, 92
Operating modes, 91, 92
Origin mode (DECOM), 117
Overstrike mode, 55

# PQ

Page arrangement, 30, 31
Page coupling, 30, 32
Page format, 114
Page memory, 112
Page position,120
Panning, 121, 122
Physical specifications, 92
Portuguese keyboard, 44, 74, 85
Power, 92
Power-up test, 59, 60
Preceding page (Pp), 56, 119
Primary DA, 148
Print all pages, 146
Print mode, 39, 40, 41
Printed data, 39, 40
Printer external, 59, 60

# PQ   continued

# R

# S

# S   continued

# T

## T continued

Transfer, 53
Transfer termination mode, 50
Transmit (DECXMIT) – from host, 143
Transmit execution (DECTEM), 50, 51,143
Transmit flow control, 34, 36
Transmit key, 57
Transmit line termination characters (DECTLTC), 142
Transmit rate limiting, 34, 36
Transmit speed, 334. 35
Transmit termination mode (TTM), 136
Typewriter, 43

## U

UDK characters remaining, 48
Umlaut¨, 62
United Kingdom keyboard, 44, 69, 80
User features lock, 27, 29
User preference character set, 27, 29
User-defined key set-up, 48

## V

Vertical coupling, 30, 32   ·
Video attributes, 90
Visual attribute protection, 131
VT100, 28
VT131 partial page, 135
VT131 transmit mode (DEC131TM), 50, 54, 137
VT300-7 bit, 27, 28
VT300-8 bit, 28
VT320, 27, 101
VT52, 28

## WXYZ

Warning Bell, 43, 45

## Miscellaneous

⊠ Key 12, 46, 57
80 columns 89