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Programmers Guide

DEC Emulation LA 324 / LA 424

Quick Reference

For Printer PP 40x

DEC LA 324 / LA 424 Quick Reference

Acknowledgement

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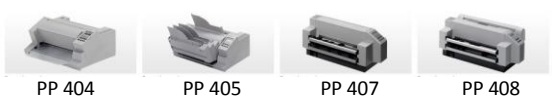
Great care has been taken to ensure that the information in this handbook is accurate and complete. However, should any errors or omissions be discovered or should any user wish to make suggestions for improving this handbook, please feel encouraged to send us the relevant details.

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This appendix contains basic information on the EPSON LQ 2550 and ESC/P2 Printer Emulation commands supported in those Printer types:



The PINTER NAME as shown above, to which printer a command will indicate it or parameter applies.

- 1) Only PP405
- 2) Only PP404 and PP 405
- 3) Only PP 407, PP 408
- *) Option PP 405
- **) Function only PP 408

Characters used in control functions appear in monospaced type. Table 1 explains some of the conventions used.

A pair of numbers separated by a slash (/) character indicates Column/Row notation. This notation refers to the location of a character in a standard code table, such as ASCII. (Example: 1/B = 1B is the hex-code for Escape)

Spaces appear between characters in sequence for clarity; they are not part of the format.

At the end of this chapter, you will find a listing of the IBM ProPrinter Emulation commands classified by Hex Code and a Hex - Decimal conversion table.

The following conventions will be used in the command listings:

Table 1 Conventions

ESC	Escape (1/11), introduces an escape sequence
CSI	Control Sequence Introducer (9/11) introduces a control sequence. CSI can also be represented by the equivalent escape sequence ESC [(1/11 5/11).
DCS	Device Control String (9/0) introduces a device control string. DCS can also be represented by the equivalent escape sequence ESC P (1/11 5/0).
ST	String Terminator (9/12) indicates the end of a control string. ST can also be represented by the equivalent escape sequence ESC \ (1/11 5/12).
Pn	Numeric parameter, or number of units that specify a distance or quantity pertaining to the escape sequence, control function or control string.
P1	Selective parameter, or one which identifies a list of options pertaining to the specific command. If ">" (3/14) or "?" (3/15) occurs at the beginning of a string of parameters, the parameters that follow are Digital private parameters. ">" or "?", if present, must occur only once at the beginning of the parameter string.
ln	Intermediate character --- component of an escape sequence, control sequence or control string
F	Final character --- component of an escape sequence, control sequence or control string.
SP	Space (2/0).

Note: Both numeric and selective parameters are interpreted as unsigned decimal integers, with the most significant digit sent first. For instance, the value 16 is coded as "16" (3/1 3/6). Leading zeros are allowed but are ignored. Plus and minus signs are not allowed.

Table 2: Control Codes

Esc ape c	Mne moni	Function	7-Bit Equivalent Sequence	
0/8	BS	Backspace		
0/9	HT	Horizontal Tab		
0/1	LF	Line Feed		
0/1	VT	Vertical Tab		
0/1	FF	Form Feed		
0/1	CR	Carriage return		
0/1	SO	Shift Out		
0/1	SI	Shift In		
1/8	CAN	Cancel		
1/1	SUB	Substitute		
1/1	ESC	Escape		
2/0	SP	Space		
8/4	IND	Forward Index	ESC D	1/11
8/5	NEL	Next Line	ESC E	1/11
8/8	HTS	Horizontal Tab Set	ESC H	1/11
8/1	VTS	Vertical Tab Set	ESC J	1/11
8/1	PLD	Partial Line Down	ESC K	1/11
8/1	PLU	Partial Line Up	ESC L	1/11
8/1	SS2	Single Shift 2	ESC N	1/11
8/1	SS3	Single Shift 3	ESC O	1/11
9/0	DCS	Device Control String	ESC P	1/11
9/1	CSI	Control String Introducer	ESC [1/11
9/1	ST	String Terminator	ESC \	1/11

Table 3: Vertical Form Handling

Escape Sequence	Mnemonic	Function
ESC 4	DECAVT	Clear All Vertical Tabs
CSI P1 ; ;...; Pn u	DECSHTS	Set Horizontal Tab Stops P1 = first tabs top position Pn = last tabs top position
CSI P1 ; ;...; Pn v	DECSVTS	Set Vertical Tab Stops P1 = first tabs top position Pn = last tabs top position
CSI P1 ; ... ; Pn g	TBC	Tab Clear P1 = 0: clear horizontal tab at active position P1 = 1: clear vertical tab at active position P1 = 2 or 3: clear all horizontal tabs P1 = 4: clear all vert. tabs
CSI P1 `	HPA	Set Horizontal Position Absolute P1 = print column (P1 = 0...9999)
CSI P1 a	HPR	Set Horizontal Position Relative P1 = print column (P1 = 0...9999)
CSI P1 d	VPA	Set Vertical Position Absolute P1 = 0 or 1: Top of Form / Top Margin P1 = 2... 9999: Vertical Line
CSI P1 e	VPR	Set Vertical Position Relative P1 = 0 or 1: moves the position one line P1 = 2... 9999: Vertical Line
ESC K	PLD	Partial Line down Advance paper 1/12 inch
ESC L	PLU	Partial Line Up Reverse paper 1/12 inch

Table 4 Sheet Size and Margins

Escape Sequence	Mnemonic	Function
CSI P1 t		DECSLPP Set Lines per Physical Page P1 = number of lines/page P1 = 0: No-forms mode
CSI P1 ; P2 s	DECSLRM	Set Left and Right Margins P1 = left margin P2 = right margin
CSI P1 ; P2 " s	DECHPWA	Set Page Width Alignment P1 = origin (Units are 1/12 inch) P2 = paper width (Units are 1/12 inch)
CSI P1 ; P2 r	DECSTBM	Set Top and Bottom Margins
P1 = top margin (line number)		
P2 = bottom margin (line number)		

Table 5 Type Size and Spacing Management Implicit Cursor Motion

Escape Sequence	Mnemonic	Function
CSI ? 7 h	DECAWM	Set auto wrap mode
CSI ? 7 l		Reset auto wrap mode
CSI ? 40 h	DECCRNLM	CR acts as New Line
CSI ? 40 l		CR acts as Carriage Return
CSI P1 w	DECSHORP	Set Horizontal Pitch P1 = 0, 1, missing 10 CPI P1 = 2: 12 CPI P1 = 3: 13.2 CPI P1 = 4: 16.5 CPI P1 = 5: 5 CPI P1 = 6: 6 CPI P1 = 7: 6.6 CPI P1 = 8: 8.25 CPI P1 = 9: 15 CPI P1 = 11: 17.1 CPI P1 = 12: 8.55 CPI P1 = 13: 18 CPI P1 = 14: 9 CPI P1 = 15: 10 CPI
CSI P1 z	DECVERP	Set Vertical Pitch P1 = 0, 1, 10, 11: 6 LPI P1 = 2 or 12 : 8 LPI P1 = 3 or 13 : 12 LPI P1 = 4 or 14 : 2 LPI P1 = 5 or 15 : 3 LPI P1 = 6 or 16 : 4 LPI
CSI 20 h	LNLM	LF acts as New Line
CSI 20 l		LF acts as Line Feed

Escape Sequence	Mnemonic	Function
ESC E		Select Emphasized Printing (bold)
ESC F		Cancel Emphasized Printing
ESC G		Select Double Strike Printing (bold)
ESC H		Cancel Double Strike Printing
ESC I P1		Select Character Mode P1 = 0/0 : Draft, 10 cpi P1 = 0/1 : Draft, Proportional P1 = 0/2 : Courier, 10 cpi P1 = 0/3 : Courier, Proportional P1 = 0/8 : Draft, 12 cpi P1 = 0/A : Courier, 12 cpi P1 = 1/0 : Draft, 17 cpi P1 = 1/2 : Courier, 17 cpi Cancel / Select Proportional Printing P1 = 0/0 or 0 : cancel Proportional P1 = 0/1 or 1 : select Proportional
ESC R		Restore Horizontal Tabs to Default
ESC S P1		Select Superscript/Subscript P1 = 0/0 or 0 : select Superscript P1 = 0/1 or 1 : select Subscript
ESC T		Cancel Superscript/Subscript
ESC U P1		Cancel / Select Unidirectional Printing P1 = 0/0 or 0 : cancel Unidirectional P1 = 0/1 or 1 : select Unidirectional

Table 6 Font Management and Attribute Selection

Escape Sequence	Mnemonic	Function
CSI P1 " z	DEC DEN	Printing Density Selection P1 = 0, 1 or none: Select draft P1 = 2: Select letter quality P1 = 3 or 4: Select near letter quality
ESC [P1 ; P2 SP B <i>Native Command,</i>	GSM	Graphic Size Modification P1 = 100 : normal height P1 = 200 : double height P1 = 300 : triple height P1 = 400 : quadruple height P1 = max. 800 in steps of 100 P2 = 100 : normal width P2 = 200 : double width P2 = 300 : triple width P2 = 400 : quadruple width P2 = max. 800 in steps of 100 Graphic Size Modification for DATA LARGE P1 = 100 : normal height P2 = 100 : normal width P1 and P2 max. 9 9 0 0 in steps of 100
CSI P1 m <i>Selecting Fonts</i>	SGR	Select Graphic Rendition (DEC DEN P1 = 2, 3, or 4 selected) P1 = 10 : Courier P1 = 11 : Roman P1 = 12 : Sans Serif P1 = 13 : Prestige P1 = 14 : Script P1 = 17 : Optional card font P1 = 18 : OCR-A P1 = 19 : OCR-B
CSI P1 m <i>Selecting Attributes</i>	SGR	Select Graphic Rendition - P1 = 0 or none: Turn off all attributes P1 = 1: Bold on P1 = 3: Slant on P1 = 4: Underline on P1 = 9: Strike-through on P1 = 21: Double underline on P1 = 22: Bold off P1 = 23: Slant off P1 = 24: Any underline off P1 = 29: Strike through off P1 = 37: Print text in "white" (no printing) P1 = 39: Print text in black P1 = 53: Overline on P1 = 55: Overline off P1 = ?4: Superscript on P1 = ?5: Subscript on P1 = ?24: Script off

Table 7 Selecting Character Set

Escape Sequence	Mnemonic	Function
ESC SP L	ASCEF	Announce Subset of Code Extension Facilities ASCII in G0 and GL ISO Latin-1 in G1 and GR.
ESC SP M		Same as ESC SP L
ESC SP N		ASCII in G0 and GL.
DCS P1 ! u D ... D ST	DECAUPSS	Assign User Preference Supplemental P1 = 0 or none: 94-character set P1 = 1: 96-character set D ... D: SCS designating Set sequence.
ESC N	SS2	Single Shift 2 Take the next char. from G2
ESC O	SS3	Single Shift 3 Take the next char. from G3
SI	LS0	Locking Shift 0 (or Shift In) Invoke G0 into GL
SO	LS1	Locking Shift 1 (or Shift Out) Invoke G1 into GL
ESC n	LS2	Locking Shift 2 Invoke G2 into GL
ESC o	LS3	Locking Shift 3 Invoke G3 into GL
ESC -	LS1R	Locking Shift 1 Right Invoke G1 into GR
ESC }	LS2R	Locking Shift 1 Right Invoke G2 into GR
ESC	LS3R	Locking Shift 1 Right Invoke G3 into GR
ESC P1 P2 F	SCS	Select Character Set P1 = "(": Invoke 94-char. set into G0 P1 = ")": Invoke 94-char. set into G1 P1 = "*": Invoke 94-char. set into G2 P1 = "+": Invoke 94-char. set into G3 P1 = "-": Invoke 96-char. set into G1 P1 = ".": Invoke 96-char. set into G2 P1 = "/" : Invoke 96-char. set into G3 P2 F = additional char. from Table 9, on the next page.

Table 8 SCS Final Characters

Escape Sequence	P ₂ F Designator	Code
94-Character Sets		
British	A	4/1
ASCII	B	4/2
DEC Dutch	4	3/4
DEC Finnish	5	3/5
French	R	5/2
DEC French-Canadian	9	3/9
German	K	4/11
DEC Hebrew Supplemental	"4	2/2, 3/4
DEC 7-Bit Hebrew	%=	2/5, 3/13
ISO Italian	Y	5/9
Legal	%4	2/5, 3/4
JIS Katakana	I	4/9
JIS Roman	J	4/10
DEC Norwegian/Danish	6	3/6
ISO Spanish	Z	5/10
DEC Swedish	7	3/7
DEC Swiss	=	3/13
Norwegian/Danish	`	6/0
DEC Supplemental	%5	2/5, 3/5
DEC Technical	>	3/14
DEC Special Graphics	0	3/0
DEC Portuguese	%6	2/5, 3/6
7-Bit Turkish	%2	2/5, 3/2
DEC 8-Bit Turkish Supplemental	%0	2/5, 3/0
DEC 8-Bit Greek Supplemental	" ?	2/2, 3/15
User Preference Supplemental	<	3/12
96-Character Sets		
ISO Latin-1 Supplemental	A	4/1
ISO Latin-2 Supplemental	B	4/2
ISO Latin-Greek Supplemental	F	4/6
ISO Latin-Hebrew Supplemental	H	4/8
ISO Latin/Cyrillic Supplemental	L	4/12
ISO Latin-5 Supplemental	M	4/13
ISO Latin-9 Supplemental	b	6/2

Table 9 Barcodes

Escape Sequence	Mnemonic	Function
ESC % SP 0 ESC % @	DECBAR	Start Bar Code Stop Bar Code
CSI P1 ; P2 ; ... ; P9 ' q	DECSBCA	Select Bar Code Attributes P1 : Bar Code Encoding P1 = 0, 2 or none : Code 39 ; all other settings are ignored P2 : Width of narrow bars and spaces in Decipoints. See <i>Note</i> . P3 : Width of quiet zone in decipoints: ignored, default = 180 P4 : Width of wide bars and wide spaces in decipoints. See <i>Note</i> . P5 : Ignored P6 : Height of bars in decipoints.Default = 96 P7 : Control character : ignored. P8 : Orientation.; ignored, default = horizontal (portrait) P9 : Human readable char. option. P9 = 0, 1 or none or >4 : No HRC P9 = 2, 3 or 4 : Print HRC, OCR-B

Note: Default setting (P2 missing) is Portrait: P2=10, 4=25.

The following settings are supported:

P2 = 9, P4 = 27, P8 = 0; the device defaults to P2 = 10, P4 = 25, P6 = 96
P2 = 18, P4 = 54 P8 = 0; the device defaults to P2 = 20, P4 = 50, P6 = 96.

Table 10 Reports

Escape Sequence	Mnemonic	Function
CSI P1 c		DA Device Attributes Request Device Attributes Report P1 (if present) must equal 0)
CSI ? P1 ; P2 ; ... ; Pn c	DAR	Device Attributes Report (printer to host) P1 = 72 P2 - Pn: 4: Sixel Graphics 5: Katakana C-set 6: Sheet Feeder (sent when installed *) 12: Hebrew C-Sets
CSI > P1 c	DA2	Secondary Device Attributes P1 must = 0
CSI > P1 ; P2 c	DA2R	Secondary Device Attributes Report (printer to host) P1 = 38 : LA324/LA424 model number P2 = 31
ESC P 3 " { D ... D ESC \	DECFSR	Font Status Report (installed cartridge) (printer to host) Font cartridge installed D ... D = typestyle (intended pitch; SGR_parameter); CR LF ... No font cartridge installed, null message sent: ESC P 3 " { ESC \
CSI P1 " {	DECRFS	Request Font Status P1 must = 3
CSI P1 n	DSR	Device Status Request P1 = 0, 5 or none: Request extended status report P1 = ?1: Disable all unsolicited reports P1 = ?2: Enable brief unsolicited reports, send extended report P1 = ?3: Enable/send extended unsolicited reports
Brief: ESC [Pn n	DSR	Device Status Report ¹⁾ Extended: brief, followed by ESC [? P1 ; P2 ; ... ; Pn n Pn = 0: No errors Pn = 3: Error Pn = 20: No malfunction Pn = 21: Hardware failure Pn = 22: Communication failure Pn = 23: Input buffer overflow Pn = 24: Printer deselected Pn = 26: Cover open Pn = 27: Paper Out Pn = 30: ASF installed *) Pn = 32: Paper jam or ASF error

- 1) The Printer in DEC ANSI mode shall be capable of answering any DSR request in any conditions, even in a fault condition, or in the off-line state, or if a Xoff character is sent by the printer.

Table 11 Miscellaneous

Escape Sequence	Mnemonic	Function
CSI P1 " p	DECSCL	Select Conformance Level P1 = 0: reset - native level P1 = 71: reset - DEC PPL1 P1 = 72: reset - DEC PPL2
CSI ! p	DECSTR	Soft Terminal Reset, Reset to initial state
ESC c	RIS	Reset to Initial State
CSI ? 58 h	DECIPEM	Enter IBM ProPrinter Emulation
CSI ? 58 /		Return from IBM ProPrinter emulation
CSI % @	ROCS	Return from Other Coding System Return to DEC PPL2 mode
ESC % =	SOCS	Select Other Coding System IBM ProPrinter Emulation
CSI 3 h	CRM	Control Representation Mode Set CRM
CSI 3 /		Reset CRM
CSI P1 ! v	DECASFC	Automatic Sheet Feeder Control *) P1 = 0: No bin change P1 = 1 - 3 : Bin 1 – 3
CSI ? 41 h	DECUPM	set unidirectional print mode
CSI ? 41 /		Reset unidirectional print mode
ESC SP 6	SnC1R	C1 Transmit - Process 7-bit, drop 8th bit
ESC SP 7	/DEC*C1	/Receive - Process 7-bit and 8-bit

Note: ESC SP F - Transmit 8-bit as 7-bit and ESC SP G - Transmit 8-bit will be ignored)

Table 12 Sixel Graphics Device Control String Envelope

Escape Sequence	Mnemonic	Function
ESC P	DCS	String Control Introducer
P1 ; P2 ; P3 q		Protocol Selector P1 : macro parameter, select horizontal grid size and pixel aspect ratio. See Table 14. P2 : ignored. P3 : horizontal grid size in Deci points. Overrides P1 for horizontal grid size, pixel aspect ratio unchanged. See Table 16. q : Final
<i>Sixel data</i>		Picture Data Includes Sixel printable characters and Sixel Data control codes, see Table 16.
ESC \	ST	String Terminator Exit Sixel Graphics mode and return to Text mode.

¹⁾ VGS = 1/72 in, unless modified by P3 or DECGRA

Table 13 Graphics Horizontal Grid Size by P3 (Aspect Ratio unchanged)

Macro Value	Hor. Grid Size (Inches)	Aspect Ratio (Vert:Hor) ¹⁾
0, 1 or none	1/144	2
2, 3, 4	1/180	2.5
5, 6, 7, 8	1/144	2
9	1/72	1
> 9	1/144	2

Table 14 Sixel Graphics Protocol Selector P1

P3	HGS (inches)
0 or none	No change to HGS and VGS defined by P1
1, 2, 3, 4	1/180
5, 6, 7	1/144
8, 9	1/90
10 - 19	1/72
20 and up	1/36

Table 15 Sixel Graphics Control Codes

Escape Sequence	Mnemonic	Function
" P1 ; P2 ; P3 ; P4	DECGRA	Set Raster Attributes Define pixel aspect ratio, overriding P1 Attributes of the protocol selector. P1 : Pixel aspect ratio numerator P2 : Pixel aspect ratio denominator P3 and P4 : ignored
# P1 ; P2 ; P3 ; P4 ; P5	DECGCI	Graphics Colour Introducer *) Assigns a colour to a colour number or selects a predefined colour number. P1 : Colour number (0 - 255) P2 : Universal coordinate system : 1 = HLS ; 2 = RGB P3 ; P4 ; P5 : colour coordinates
!	DECGRI	Graphics Repeat Introducer Begins repeat sequence
\$	DECGCR	Graphics Carriage Return Returns active position to graphics left margin
-	DECGNL	Graphics Next Line Returns active position to graphics left margin and increments to next graphics line
0 - 9		Parameter Characters Parameters used in DECGRA and DECGRI
;		Parameter Separator Used in DECGRA and DECGRI

Table 16 Select Paper Source, Destination, Print Gap and Cut-Mode

Escape Sequence	Mnemonic	Function
ESC] > s <i>Native Command</i>	IF	Insert Form
ESC [> P1 ; P2 ; P3 ; P4 s <i>Native Command:</i> <i>See following alternative command sequences); > = Insert Form</i>	SPSIF	Select Paper Source and Insert Form, Print Gap, Paper Exit, Cut-Mode (any parameter > or P1 to P4 may be skipped,
ESC [P1 s <i>Native Command</i>	SPS	Select Paper Source: P1 = 0 : Manual Feed P1 = 1 : ASF, Bin 1 *) P1 = 2 : ASF, Bin 2 *) P1 = 3 : ASF, Bin 3 *) P1 = 6 : upper Tractor ***) P1 = 7 : Tractor Feed (lower Tractor) P1 = 8 : ASF, Bins 1 or 2 *) P1 = 9 : ASF, Bins 2 or 3 *) P1 = 10 : ASF, Bins 1 or 2 or 3 *) P1 = 15 : upper and lower tractor ***)
ESC [; P2 s <i>Native Command,</i>	AGC/PCC	Print Gap Control: P2 = 0 : Automatic Gap Control P2 = 1 : Print Gap for 1-ply copy P2 = 2 : Print Gap for 2-ply copies P2 = 3 : Print Gap for 3-ply copies P2 = 4 : Print Gap for 4-ply copies P2 = 5 : Print Gap for 5-ply copies P2 = 6 : Print Gap for 6-ply copies **)
ESC [; ; P3 s <i>Native Command</i>		Paper Exit: P3 = 0: Paper Exit Stacker ***) P3 = 1: Paper Exit Front Side **) (Confirmed by Start/Stop key) P3 = 2: Paper Exit Front Side **) <i>(Not confirmed by Start/Stop key, controlled by application)</i> P3 = 3: Batch output; rear side
ESC [; ; ; P4 s <i>Native Command</i>		Cut Mode On/Off: ***) P4 = 0: Cut Mode Off P4 = 1: Cut Mode On P4 = 2: Cut on actual position <i>(Cutting edge is approximate 4 mm above the base of the actual line)</i>

Table 17 Font Selection, National Version and Code Table Handling

Escape Sequence	Mnemonic	Function
ESC [P1 ; P2 x Native Command,	CPL	Select Font and Character Pitch (any parameter P1 or P2 may be skipped, see following alternative command sequences)
ESC [P1 x <i>possible format of</i>		P1 selects the font: P1 = 0 or missing : Font is unchanged P1 = 1 : DATA P1 = 2 : ROMAN P1 = 3 : SAN SERIF P1 = 4 : COURIER P1 = 5 : PRESTIGE P1 = 6 : SCRIPT P1 = 7 : OCR B P1 = 8 : OCR A P1 = 9 : ORATOR-C P1 = 10 : ORATOR P1 = 11 : DATA LARGE
ESC [; P2 x <i>possible format of</i>		P2 selects the character pitch: P2 = 0 or missing : Pitch is unchanged P2 = 1 : 10 cpi P2 = 2 : 12 cpi P2 = 3 : 15 cpi P2 = 5 : proportional P2 = 6 : 14.4 cpi P2 = 7 : 18 cpi P2 = 8 : 17.1 cpi P2 = 9 : 20 cpi

Table 17 Select Macro and Emulation

Escape Sequence	Mnemonic	Function
ESC [P1 ; P2 SP r	SM #	Select Macro P1 = 1: Macro 1 P1 = 2: Macro 2 P1 = 3: Macro 3 P1 = 4: Macro 4 Select Emulation P2 = 0: no change of emulation P2 = 1: DEC ANSI P2 = 2: IBM ProPrinter Emulation P2 = 3: IBM ProPrinter AGM Emulation P2 = 4: EPSON Emulation

Table 19 Barcode mode (Native Commands) for more information see Psi Barcode Reference Manual

Escape Sequence	Mnemonic	Function
ESC [; P2 ; P3 ; P4 ; P5 ; P6 ; P7 SP z		<p><i>BARCODE</i> Programming BH Barcode Header</p> <p>P2: Barcode typ</p> <p>P3: Height of barcode</p> <p>P4: Width of the thin bars</p> <p>P5: Width of the thin gaps</p> <p>P6: Ratio width to thin (bars/gaps)</p> <p>P7: Uni-directional or bi-directional printing</p> <p>0 : or not programmed: means no changes</p> <p>1 : uni-directional printing in LQ</p> <p>2 : bi-directional printing in LQ</p> <p>3 : uni-directional printing in NLQ</p> <p>4 : bi-directional printing in NLQ</p>

Note: A switch from unidirectional to bidirectional printing is only possible if the parameter UNI-DIRECT.CMD is set to YES via operator panel or ESC-sequence.

ESC [? 0 h	SMBC	Set Mode Barcode
ESC [? 0 l	RSBC	Reset Mode Barcode

Appendix D DEC LA 324 / LA 424 Quick Reference

HEX Code	Format	Page
08	Backspace	3
09	Horizontal Tab	3
0A	Line Feed	3
0B	Vertical Tab	3
0C	Form Feed	3
0D	Carriage Return	3
0E	Shift Out or Locking Shift 1	3
0F	Shift In or Locking Shift 0	3
18	Cancel	3
1A	Substitute	3
1B	Escape	3
20	Space	3
21	Graphic Repeat Introducer	19
24	Graphic Carriage Return	19
2D	Graphic Next Line	19
3B	Parameter Separator	19
1B 20 36	C1 Transmit - Process 7-bit	16
1B 20 37	Receive - Process 7-bit	16
1B 20 4C	Announce Subset of Code Extension	10
1B 20 4D	Announce Subset of Code Extension	10
1B 20 4E	ASCII in G0 and GL	10
1B 25 20 30	Start Bar Code (DECBAR)	13
1B 25 3D	Select other Coding System	16
1B 25 40	Stop Bar Code (DECBAR)	13
1B 2D	Locking Shift 1 Right (G1 into GR)	10
1B 32	Clear All Horizontal Tabs	7
1B 34	Clear All Vertical Tabs	4
1B 44	Forward Index	3
1B 45	Next Line	3
1B 48	Horizontal Tab Set	3
1B 4A	Vertical Tab Set	3
1B 4B	Partial Line Down	3
1B 4C	Partial Line Up	3

Appendix D DEC LA 324 / LA 424 Quick Reference

1B 4E	Single Shift 2	3
1B 4F	Single Shift 3	3
1B 50	Device Control String	3
1B 50 33 22 7B D...D 1B 5C	Font Status Report	14
1B 50 P1 21 75 D ... D 1B 5C	Assign User Preference Supplemental	10
1B 50 P1 3B P2 3B P3 71	Sixel Graphics Device Control Str.	17
1B 5B	Control String Introducer	3
1B 5B 21 70	Soft Terminal Reset	16
1B 5B 25 40	Return from other Coding System	16
1B 5B 32 30 68	LF acts as New Line	6
1B 5B 32 30 6C	LF acts as Line Feed	6
1B 5B 33 68	Set Control Repress. Mode	16
1B 5B 33 6C	Reset Control Repress. Mode	16
1B 5B 3B P2 3B P3 3B P4 3B P5 3B P 3B P7 20 7A	6Barcode Header	24
1B 5B 3D 3B 3B P4 73	Cut Mode On/Off	21
1B 5B 3D 3B 3B P3 73	Paper Exit	21
1B 5B 3D 3B P2 73	AGC / PCC Procedure	20
1B 5B 3D P1 3B P2 3B P3 3B P4 73	Select Paper Source, Print Gap, Paper Exit, Cut Mode	20
1B 5B 3D P1 73	Select Paper Source	20
1B 5B 3E P1 3B P2 63	Secondary Device Attributes	14
1B 5B 3F 30 68	Set Mode Barcode	24
1B 5B 3F 30 6C	Reset Mode Barcode	24
1B 5B 3F 34 30 68	CR acts as New Line	6
1B 5B 3F 34 30 7C	CR acts as Carriage Return	6
1B 5B 3F 34 31 68	Set unidirectional Print Mode	16
1B 5B 3F 34 31 6C	Reset unidirectional Print Mode	16
1B 5B 3F 35 38 68	Enter IBM ProPrinter Emulation	16
1B 5B 3F 35 38 6C	Return from IBM ProPrinter Emu.	16
1B 5B 3F 37 68	Set Auto wrap Mode	6
1B 5B 3F 37 6C	Reset Auto wrap Mode	6
1B 5B 3F P1 3B P2 3B ... 3B Pn 63	Device Attributes Report	14
1B 5B P1 21 76	Automatic Sheet Feeder Control	16
1B 5B P1 22 70	Select Conformance Level	16
1B 5B P1 22 7A	Print Density Selection	8

Appendix D DEC LA 324 / LA 424 Quick Reference

1B 5B P1 22 7B	Request Font Status	15
1B 5B P1 3B ... 3B Pn 75	Set Horizontal Tab Stops	4/7
1B 5B P1 3B ... 3B Pn 67	Tab Clear	7
1B 5B P1 3B ... 3B P2 76	Set Vertical Tab Stops	4/7
1B 5B P1 3B P2 20 42	Graphic Size Modification	8
1B 5B P1 3B P2 20 72	Select Macro and Change Emulation	23
1B 5B P1 3B P2 22 73	Set Page Width Alignment	5
1B 5B P1 3B P2 3B ... 3B P9 60 71	DEC Bar Code	13
1B 5B P1 3B P2 72	Set Top and Bottom Margin	5
1B 5B P1 3B P2 73	Set Left and Right Margins	5
1B 5B P1 3B P2 78	Select Font and Character Pitch	22
1B 5B P1 60	Set Horizontal Position Absolute	4
1B 5B P1 61	Set Horizontal Position Relative	4
1B 5B P1 63	Device Attributes	14
1B 5B P1 64	Set Vertical Position Absolute	4
1B 5B P1 65	Set Vertical Position Relative	4
1B 5B P1 6D	Set Graphic Rendition Selecting Fonts Selecting Attributes	8/9
1B 5B P1 6E	Device Status Request	15
1B 5B P1 74	Set Line per Physical Page	5
1B 5B P1 77	Set Horizontal Pitch	6
1B 5B P1 7A	Set Vertical Pitch	6
1B 5C	String Terminator	3
1B 63	Reset to Initial State	16
1B 6E	Locking Shift 2	10
1B 6F	Locking Shift 3	10
1B 7C	Locking Shift 1 Right (G3 into GR)	10
1B 7D	Locking Shift 1 Right (G2 into GR)	11
1B P1 P2 46	Select Character Set	11
22 P1 3B P2 3B P3 3B P4	Set Raster Attributes	19
23 P1 3B P2 3B P3 3B P4 3B P5	Graphic Colour Introducer	19
Brief: 1B 5B P1 6E	Device Status Report	15

Hex - Decimal Conversion Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255