

Before investigating the various print modes, consider how the computer communicates with the printer.

All the information is sent to the printer as numbers between 0 and 255 decimal (00-FF hexadecimal). The printer interprets these numbers according to the American Standard Code for Information Interchange, commonly referred to as the ASCII code. Most numbers (or codes) are printed as letters, numbers, or symbols. However, the numbers 0-31, as well as some special sequences of code numbers, are used to "control" various printer functions. These control code numbers let you change character sets, select print modes, underline, superscript, subscript, and perform other special functions. The control codes have different meanings, depending on the current print mode. If a code is not recognized by the printer, it is ignored.

IBM OR EPSON CODE SET

When you select the code set for IBM, the printer emulates the IBM Pro-Printer X24/XL24 code set. When you select the code set for Epson, the printer emulates the Epson LQ-850/1050 code set. When you select the appropriate operation mode, you can use the printer with an MS-DOS compatible system without code conversion and get the same results as you would with an IBM or Epson Printer. Detailed information is in the section, "Selecting a Code Set and a Character Set."

SELECTING A CODE SET AND A CHARACTER SET

The printer provides two operation modes with different capabilities. These modes operate independently of each other. Four different character sets are also provided so that you can print different characters.

CODE SET SELECTION

Three types of code sets are available with the printer. One is the Epson code set. The other two are code sets for IBM. The two IBM modes (IBM PPR and IBM AGM) are almost identical: the differences are mainly in how they handle the graphics and line feeds.

Select these three operation modes by using the Emulation Menu. For details, refer to the Getting Started manual for your printer.

CHARACTER SET SELECTION

Your printer has five kinds of character sets. One is the Epson italics character set, which can print 94 ASCII characters. The other character sets are the Epson graphics character sets, and IBM character sets 1 and 2 plus All Characters Set, which can print 94 ASCII characters and 48 block graphics characters. To select a character set from either Epson or IBM emulation mode:

IN IBM MODE:

```
LPRINT CHR$(27);"7" for character set 1
LPRINT CHR$(27);"6" for character set 2
LPRINT CHR$(27);"\" ;n1,n2 for All characters Set.
```

IN EPSON MODE:

```
LPRINT CHR$(27);"t" for Italic Table
LPRINT CHR$(27)"t";CHR$(27);"7"; for Graphic Character Set.
```

SENDING CONTROL CODES FROM BASIC

Some printer features are activated by a single code, but many functions require a sequence of two or more codes. Most multiple-code sequences begin with decimal 27 referred to as the ESC (escape) code. The ESC code notifies the printer that a special sequence is on its way. The next code(s) sent determines which printer feature is selected. The IBM and Epson sections that follow contain examples that use BASIC's CHR\$() format to send these codes to the printer.

For instance, select either IBM mode on the Emulation Mode menu and enter BASIC in the normal way.

Then, type and run the following program:

```
10 LPRINT "IBM EMULATION";CHR$(27)"J"CHR$(18z);
20 LPRINT "MODE"
```

Roll the paper forward and look at the results. The word MODE is printed just below IBM EMULATION with half line spacing. Why? The codes CHR\$(27)"J"CHR\$(18) tell the printer to change the forward line feed to 18/216" (1/12"), that is, half the normal distance.

CODE SET SELECTION

As noted earlier, there are two IBM emulation modes. One is the standard ASCII mode (PPR mode) and the other is alternate graphics mode (AGM) which emulates Epson LQ-800/1000 printers.

This manual does not make special note if the control codes operate the same in both modes. If a control code operation is different in each mode, the manual specifies the difference.

Select either IBM mode by using the Emulation menu.

IBM CONTROL CODES

CODE DEC.	HEX.	SYMBOL	PPR (ASCII)	FUNCTION
				AGM
8	(08)	BS	backspace	Backspace
9	(09)	HT	horizontal Tab	Horizontal Tab
10	(0A)	LF	Line Feed	Line Feed
11	(0B)	VT	Vertical Tab	Vertical Tab
12	(0C)	FF	Form Feed	Form Feed
13	(0D)	CR	Carriage Return	Carriage Return

14	(0E)	SO	Double Width by Line	Double Width by Line
15	(0F)	SI	Set Condensed Print 17.1 CPI	Set Condensed Print 17.1 CPI
17	(11)	DC1	Select Printer	Select Printer
18	(12)	DC2	Set 10 CPI	Set 10 CPI
20	(14)	DC4	Cancel Double Width	Cancel Double Width
24	(18)	CAN	Cancel Data	Cancel Data
27 42 m n1 n2	(1B) (2A) m n1 n2	ESC * m n1 n2	-----	Select Graphics Mode (m: Graphics mode) (n1 n2 Column length) See page 102).
27 45 n	(1B) (2D) n	ESC --- n	Set/Reset Underline (n=1:Set, n=0:Reset)	Set/Reset Underline (n=1:Set, n=0:Reset)
27 48	(1B) (30)	ESC 0	Set 1/8" Line Spacing	Set 1/8" Line Spacing
27 49	(1B) (31)	ESC 1	Set 7/72" Line Spacing	Set 7/72" Line Spacing
27 50	(1B) (32)	ESC 2	Activate LF Pitch That Was Set By ESC A	Activate LF Pitch That Was Set By ESC A
27 51 n	(1B) (33) (n)	ESC 3 n	Set n/216" Line Spacing (n: Binary, 1 < n < 255)	Set n/180" Line Spacing (n: Binary, 1 < n < 255)
27 52	(1B) (34)	ESC 4	Set Top of Form	Set Top of Form
27 53 n	(1B) (35) n	ESC 5 n	Set/Reset Auto LF (n=1: Set,n=0:Reset)	Set/Reset Auto LF (=1: Set,n=0:Reset)
27 54	(1B) (36)	ES 6	Select Character Set 2	Select Character Set 2
27 55	(1B) (37)	ESC 7	Select Character Set 1	Select Character Set 1
27 58	(1B) (3A)	ESC :	Set 12 CPI	Set 12 CPI
27 61	(1B) (3D)	ESC =	Down Line Loading	Down Line Loading
27	(1B)	ESC	Set n/72" Line Spacing	Set n/60" Line Spacing

65	(41)	A	(n:Binary, 1 < k < 255)	n:Binary, 1 < k < 255)
n	n	n		
27	(1B)	ESC	Set Vertical Tab	Set Vertical Tab
66	(42)	B	(n:Tab Position	n:Tab Position
n1	n1	n1	(1 < k < 64)	(1 < k < 64)
{	{	{		
nk	nk	nk		
0	(00)	NUL		
27	(1B)	ESC	Set Form Length	Set Form Length
67	(43)	C	(n:line(s))	n:line(s))
n	n	n	(n: Binary)	(n: Binary)
27	(1B)	ESC	Set Form Length	Set Form Length
67	(43)	C	(n inch(es))	(n inch(es))
0	(00)	NUL	(n: Binary)	(n: Binary)
n	n	n		
27	(1B)	ESC	Set Horizontal Tab	Set Horizontal Tab
68	(44)	D	n: Tab Position,	n: Tab Position,
n1	n1	n1	1 < k < 28	1 < k < 28
{	{	{		
nk	nk	nk		
0	(00)	NUL		
27	(1B)	ESC	Set Emphasized Print	Set Emphasized Print
69	(45)	E		
27	(1B)	ESC	Reset Emphasized Print	Reset Emphasized Print
70	(46)	F		
27	(1B)	ESC	Set Double-Strike Print	Set Double-Strike Print
71	(47)	G		
27	(1B)	ESC	Reset Double-Strike Print	Reset Double-Strike Print
72	(48)	H		
27	(1B)	ESC	Select Print Mode	Select Print Mode
73	(49)	I		
n	n	n		
27	(1B)	ESC	n/216" Line Spacing	n/180" Line Spacing
74	(4A)	J	(n: Binary, 1 < n < 255)	(n: Binary, 1 < n < 255)
n	n	n		
27	(1B)	ESC	Single Density Graphic	Single Density Graphic
75	(48)	K		
n1	n1	n1		
n2	n2	n2		
27	(1B)	ESC	Double Density Graphic	Double Density Graphic
76	(4C)	L		
n1	n1	n1		
n2	n2	n2		
data		data		

27	(1B)	ESC	Set Skip Over Perforation	Set Skip Over Perforation
78	(4E)	N		
n	n	n		
data		data		
27	(1B)	ESC	Reset Skip Over	Reset Skip Over
79	(4F)	O	Perforation	Perforation
27	(1B)	ESC	Proportional Spacing	Proportional Spacing
80	(50)	P	(n=1: Set, n=0: Reset)	(n=1: Set, n=0: Reset)
n	n	n		
27	(1B)	ESC	Deselect Printer	Deselect Printer
81	(51)	Q		
n	n	n		
27	(1B)	ESC	Set Default Tab	Set Default Tab
82	(52)	R		
27	(1B)	ESC	Set Super-/Subscript	Set Super-/Subscript
83	(53)	S	(n=0:Set Subscript)	(n=0:Set Subscript)
n	n	n	(n=1:Set Superscript)	(n=1:Set Superscript)
27	(1B)	ESC	Reset Super-/Subscript	Reset Super-/Subscript
84	(54)	T		
27	(1B)	ESC	Unidirectional Print	Unidirectional Print
85	(55)	U	(n=1: Set, n=0: Reset)	(n=1: Set, n=0: Reset)
n	n	n		
27	(1B)	ESC	Set Double Width	Set Double Width
87	(57)	W	(n=1: Set, n=0: Reset)	(n=1: Set, n=0: Reset)
n	n	n		
27	(1B)	ESC	Set Left/Right Margin	Set Left/Right Margin
88	(58)	X	(n1: left margin,	(n1: left margin,
n1	n1	n1	n2: right margin)	n2: right margin)
n2	n2	n2		
data		data		
27	(1B)	ESC	Double Density Graphic	Double Density Graphic
89	(59)	Y		
n1	n1	n1		
n2	n2	n2		
data		data		
27	(1B)	ESC	Quadruple Density	Quadruple Density
90	(5A)	Z	Graphic	Graphic
n1	n1	n1		
n2	n2	n2		
27	(1B)	ESC	Set Double Height	Set Double Height
91	(5B)	[
64	(40)	@		
27	(1B)	ESC	Select Vertical Units	Select Vertical Units
91	(5B)	[

92	(5C)	\		
27	(1B)	ESC	Select Graphics Mode	Select Graphics Mode
91	(5B)	[
103	(67)	g		
n1	n1	n1		
n2	n2	n2		
m	m	m		
data		data		
27	(1B)	ESC	Print Continuously from	Print Continuously from
92	(5c)	\	All Characters Chart	All Characters Chart
n1	n1	n1	(n: Character number)	(n: Character number)
n2	n2	n2		
27	(1B)	ESC	Reverse Feed	Reverse Feed
93	(5D)]		
27	(1B)	ESC	Print One Character from	Print One Character from
94	(5E)	/\	All Characters Chart	All Characters Chart
27	(1B)	ESC	Set/Reset Overscore	Set/Reset Overscore
95	(5F)	—	(n=1: Set, n=0: Reset)	(n=1: Set, n=0: Reset)
n	n	n		
27	(1B)	ESC	Move Print Position	Move Print Position
100	(64)	d	(1/120")	(1/120")
n1	n1	n1		
n2	n2	n2		
27	(1B)	ESC	Stop Printing	Stop Printing
106	(6A)	j		

EPSON CONTROL CODES

CODE			
DEC.	HEX.	SYMBOL	FUNCTION
8	(08)	BS	Backspace
9	(09)	HT	Horizontal Tab
10	(0A)	LF	Line Feed
11	(0B)	VT	Vertical Tab
12	(0C)	FF	Form Feed
13	(0D)	CR	Carriage Return
14	(0E)	SO	Double Width by Line
15	(0F)	SI	Set Condensed Print
17	(11)	DC1	Select Printer

18	(12)	DC2	Cancel Condensed Print
19	(13)	DC3	Deselect printer
20	(14)	DC4	Cancel Double Width by Line
24	(18)	CAN	Cancel Data
27 14	(1B) (0E)	ESC SO	Double Width by Line
27 15	(1B) (0F)	ESC SI	Set Condensed Print
27 32 n	(1B) (20) n	ESC SP n	Set Intercharacter Space
27 33 n	(1B) (21) n	ESC ! n	Master Select
27 35	(1B) (23)	ESC #	Cancel MSB Control
27 36 n1 n2	(1B) (24) n1 n2	ESC \$ n1 n2	Set Absolute Print Position
27 37 n	(1B) (25) n	ESC % n	DLI Font Select
27 38 0 n1 n2 d0 d1 d2	(1B) (26) 0 n1 n2 d0 d1 d2	ESC & NUL n1 n2 d0 d1 d2	Down Line Loading
27 42 m n1 n2	(1B) (2A) m n1 n2	ESC * m n1 n2	Select Graphics Mode
27 43 n	(1B) (2B) n	ESC + n	Set n/360" Line Spacing
27 45 n	(1B) (2D) n	ESC --- n	Select Underline

27	(1B)	ESC	Vertical Tab Channel
47	(2F)	/	
n	n	n	
27	(1B)	ESC	Set 1/8" Line Spacing
48	(30)	0	
27	(1B)	ESC	Set 1/6" Line Spacing
50	(32)	2	
27	(1B)	ESC	Set n/180" Line Spacing
51	(33)	3	
n	n	n	
27	(1B)	ESC	Select Italic
52	(34)	4	
27	(1B)	ESC	Cancel Italic
53	(35)	5	
27	(1B)	ESC	Set Printable Characters
54	(36)	6	
27	(1B)	ESC	Enable Upper Control Codes
55	(37)	7	
27	(1B)	ESC	Copy ROM to RAM
58	(3A)	:	
0	(00)	NUL	
n	n	n	
0	(00)	NUL	
27	(1B)	ESC	Set Unidirectional by Line
60	(3C)	<	
27	(1B)	ESC	Set MSB to 0
61	(3D)	=	
27	(1B)	ESC	Set MSB to 1
62	(3E)	>	
27	(1B)	ESC	Reassign Graphics Mode
63	(3F)	?	
n	n	n	
m	m	m	
27	(1B)	ESC	Initialize Printer
64	(40)	@	
27	(1B)	ESC	Set n/60" Line Spacing
65	(41)	A	
n	n	n	
27	(1B)	ESC	Set Vertical Tab Stops
66	(42)	B	
n1	n1	n1	
{	{	{	

nk 0	nk (00)	nk NUL	
27 67 n	(1B) (43) n	ESC C n	Set Page Length in lines
27 67 0 n	(1B) (43) (00) n	ESC C NUL n	Set Page Length in inches
27 68 n1 { nk 0	(1B) (44) n1 { nk (00)	ESC D n1 { nk NUL	Set Horizontal Tab Stops
27 69	(1B) (45)	ESC E	Set Emphasized
27 70	(1B) (46)	ESC F	Cancel Emphasized
27 71	(1B) (47)	ESC G	Set Double-Strike
27 72	(1B) (48)	ESC H	Cancel Double-Strike
27 74 n	(1B) (4A) n	ESC J n	Perform n/180" Line Spacing
27 75 n1 n2	(1B) (48) n1 n2	ESC K n1 n2	Single Density Graphic
27 76 n1 n2 data	(1B) (4C) n1 n2	ESC L n1 n2 data	Double Density Graphic
27 78 n data	(1B) (4E) n	ESC N n data	Set Skip Over Perforation
27 79	(1B) (4F)	ESC O	Cancel Skip Over Perforation
27 80	(1B) (50)	ESC P	Set 12 CPI

27	(1B)	ESC	Set Right Margin
81	(51)	Q	
n	n	n	
27	(1B)	ESC	Set International Character
82	(52)	R	
n	n	n	
27	(1B)	ESC	Set Super-/Subscript
83	(53)	S	
n	n	n	
27	(1B)	ESC	Cancel Super-/Subscript
84	(54)	T	
27	(1B)	ESC	Set/Reset Unidirectional
85	(55)	U	
n	n	n	
27	(1B)	ESC	Set/Reset Double Width
87	(57)	W	
n	n	n	
27	(1B)	ESC	High Speed Double Density Graphic
89	(59)	Y	
n1	n1	n1	
n2	n2	n2	
data		data	
27	(1B)	ESC	Quadruple Density Graphic
90	(5A)	Z	
n1	n1	n1	
n2	n2	n2	
27	(1B)	ESC	Set Relative Position
92	(5c)	\	
n1	n1	n1	
n2	n2	n2	
27	(1B)	ESC	Auto Justification
97	(61)	a	
n	n	n	
27	(1B)	ESC	Set Vertical Format Unit
98	(62)	b	
m	m	m	
n1	n1	n1	
}	}	}	
nk	nk	nk	
0	(00)	NUL	
27	(1B)	ESC	Set Relative Tab Stops
101	(65)	e	
n1	n1	n1	
n2	n2	n2	
27	(1B)	ESC	Set Relative Print Position

102	(66)	f	
n	n	n	
m	m	m	
27	(1B)	ESC	Set 15 CPI
103	(67)	g	
27	(1B)	ESC	Set n/180" Reverse Line Feed
106	(6A)	j	
n	n	n	
27	(1B)	ESC	Select Typestyle
107	(6B)	k	
27	(1B)	ESC	Set Left Margin
108	(6C)	l	
27	(1B)	ESC	Set Proportional Spacing
112	(70)	p	
n	n	n	
27	(1B)	ESC	Set Character Style
113	(71)	q	
n	n	n	
27	(1B)	ESC	Set/Reset Half Spaced Mode
115	(73)	s	
n	n	n	
27	(1B)	ESC	Select Character Table
116	(74)	t	
n	n	n	
27	(1B)	ESC	Set/Reset Double Height
119	(77)	w	
n	n	n	
27	(1B)	ESC	Set Letter Quality
120	(7B)	x	
n	n	n	
127	7F	DEL	Delete Character

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