

# IBM Emulation Mode Printer Commands

## Section 3

This section provides a detailed description of IBM emulation mode commands you can use with your printer.

### Control Codes

Control codes are one-character printer commands that are used to:

- Manage the printing of a job.
- Control the movement of the cursor, which changes the current print position.
- Control primary and secondary font selection.

The first 32 characters of the Standard ASCII table are control codes. This printer uses the following control codes.

Code Name	Symbol	Description	Value (Dec)	Value (Hex)
Backspace	BS	Causes the printer to move the current print position one character position to the left.	8	08
Cancel Data	CAN	Clears current line buffer of data already received to print on the current line since last Form Feed, Line Feed, Carrier Return, or Cancel.	24	18
Carriage Return	CR	Moves the current print position to the left margin of the current line.	13	0D
Deselect Printer	DC3	Signals the printer to stop accepting data from the computer. This control code has no effect on the parallel interface.	19	13
Form Feed	FF	Advances the paper to the top of the next page and does a carriage return.	12	0C
Horizontal Tab	HT	Moves the printhead to the horizontal tabulation stops.	9	09
Line Feed	LF	Advances the paper one line on the page.	10	0A

Code Name	Symbol	Description	Value (Dec)	Value (Hex)
Null	NUL	Null character.	0	00
Select Printer	DC1	Selects the printer.	17	11
Sound Beeper	BEL	Sounds the printer beeper for approximately 1 second.	7	07
Space	SP	Moves the print position one character space to the right.	32	20
Vertical Tab	VT	Moves the paper to the next vertical tabulation stop set with the printer command Set Vertical Tabulation Stops (ESC B).	11	0B

## Escape Sequences

An escape sequence (two or more characters of information) lets you change the way the printer is currently printing. Like a control code, it gives you control over the printed output. The escape sequence begins with the character ESC (decimal 027, hexadecimal 1B). The printer recognizes this character as the beginning of a printer command signalling that the information that follows is control information and not data to be printed.

## Printer Command Parameters

A command parameter sets the value for a command. This value stays constant until either a different value resets the command or a command resets the printer to its default values. For example, after the printer receives a command that selects a right margin beginning at column 63, the right margin of each printed page begins at column 63. The margin remains constant until a right margin command with a different value resets the margin, or the printer is reset.

In this section, command parameters are indicated by a lowercase **n**. Usage Notes explain how to compute this parameter.

# Command Structure

The printer commands use ASCII; the decimal and hexadecimal digits are shown for your convenience.

Most commands have the following structure (spaces have been added for readability; do not include spaces when you type the command):

ESC & a n C data

- & Parameterized character from ASCII table range 33-47 decimal.
- a Group character from ASCII table range 96-126 decimal that specifies a group type of control.
- n Value within specified numeric range, from ASCII table range 48-57, 45, 46 decimal. If a value is not specified, a value of 0 is assumed.
- C Termination character from ASCII table range 64-90 (47-122 w/chaining) decimal.
- data Binary 8-bit data (from graphics, and so on). The value field specifies the number of bytes of binary data.

## Example of IBM Emulation Mode Printer Command

### Begin Italic Print (*name of command*)

(A short description of the command follows)

This command placed before the first character sets the character as italic print.

(The printer command format follows with the decimal and hexadecimal values).

Format	ESC	[	@	4	0	<b>m1</b>	0	<b>m3</b>	<b>m4</b>
Decimal	27	91	64	4	0	<b>m1</b>	0	<b>m3</b>	<b>m4</b>
Hex	1B	5B	40	04	00	<b>m1</b>	00	<b>m3</b>	<b>m4</b>

where **m** is: (explanation and description of variable)

<b>m=</b>	<b>Description</b>	<b>Dec</b>	<b>Hex</b>
0	No change	0	00
1	Begin Italic Print	1	01
2	End Italic Print	2	02

The variable **m** is shown in bold print and is always ASCII. You substitute a value for **m**. The values are shown after the print command format. If you must compute the value of **m**, a formula is given. If there are several variables, a table presents the values you can use.

In this example, if you wanted to select italic printing, this is how the command would appear. The variable selection is in bold print.

Decimal	27	91	64	4	0	<b>1</b>	0	<b>0</b>	<b>0</b>
Hex	1B	5B	40	04	00	<b>01</b>	00	<b>00</b>	<b>00</b>

*Related commands* list other commands that can or should be used with the printer command being described.

*Usage Notes* give additional information for that command, such as:

- how the command reacts with other commands
- any other command that is required, or that supplements the command
- how the datastream is affected by the command

Pay attention to the uppercase (capital letter) and the lowercase letters. If the format shows an uppercase letter, enter the command with an uppercase letter. If the letter in the command format is lowercase, enter it as lowercase. The printer looks at the uppercase and lowercase letters as separate command instructions.

The uppercase letter O is different from the numeral 0 (zero). Notice that the uppercase O is wider and rounder than the zero. To help you with this distinction, the text that describes the command shows the numeral 0 and also spells out zero.

# Printer Command Quick Reference (IBM Emulation Mode)

Function	Command	Dec	Hex	For more information see...
Begin/End Continuous Underline	ESC _	27 45 <b>n</b>	1B 2D <b>n</b>	page 35
Set Line Space to 1/8 inch	ESC 0	27 48	1B 30	page 44
Set Line Space to 7/72 inch	ESC 1	27 49	1B 31	page 44
Activate Line Spacing for Text	ESC 2	27 50	1B 32	page 45
Set Line Spacing for Graphics	ESC 3	27 51 <b>n</b>	1B 33 <b>n</b>	page 45
Set Top of Form	ESC 4	27 52	1B 34	page 46
Automatic Line Feed	ESC 5	27 53 <b>n</b>	1B 35 <b>n</b>	page 42
Select Character Set 2	ESC 6	27 54	1B 36	page 25
Select Character Set 1	ESC 7	27 55	1B 37	page 24
Download a Character Set	ESC =	27 61	1B 3D	page 27
Set Line Spacing for Text	ESC A	27 65 <b>n</b>	1B 41 <b>n</b>	page 45
Set Vertical Tab Stops	ESC B	27 66 <b>n,n1,n2...</b>	1B 42 <b>n,n1,n2...</b>	page 44
Set Page Length in Lines	ESC C	27 67 <b>n</b>	1B 43 <b>n</b>	page 46
Set Page Length in Inches	ESC C 0	27 67 0 <b>n</b>	1B 43 00 <b>n</b>	page 46
Set Horizontal Tab Stops	ESC D	27 68 <b>n,n1,n2... 0</b>	1B 44 <b>n,n1,n2... 00</b>	page 40
Begin Emphasized (Bold) Print	ESC E	27 69	1B 45	page 33
End Emphasized (Bold) Print	ESC F	27 70	1B 46	page 33
Begin Double-Strike Print	ESC G	27 71	1B 47	page 33
End Double-Strike Print	ESC H	27 72	1B 48	page 33
Move Paper Vertically	ESC J	27 74 <b>n</b>	1B 4A <b>n</b>	page 43
Normal Density Bit Image Graphics	ESC K	27 75 <b>Ln Hn data</b>	1B 4B <b>Ln Hn data</b>	page 37
Dual-Density Bit Image Graphics (Half-Speed)	ESC L	27 76 <b>Ln Hn data</b>	1B 4C <b>Ln Hn data</b>	page 39
Set Skip Perforation	ESC N	27 78 <b>n</b>	1B 4E <b>n</b>	page 47
Cancel Skip Perforation	ESC O	27 79	1B 4F	page 47
Set Default Tab Stops	ESC R	27 82	1B 52	page 41
Begin Subscript/Superscript	ESC S	27 83 <b>n</b>	1B 53 <b>n</b>	page 34
End Subscript/Superscript	ESC T	27 84	1B 54	page 34
Set Horizontal Margins	ESC X	27 88 <b>n1,n2</b>	1B 58 <b>n1,n2</b>	page 41
Dual-Density Bit Image Graphics (Normal Speed)	ESC Y	27 89 <b>Ln Hn data</b>	1B 59 <b>Ln Hn data</b>	page 39

Function	Command	Dec	Hex	For more information see...
High-Density Bit Image Graphics	ESC Z	27 90 Ln Hn data	1B 5A Ln Hn data	page 40
Score Select (239x Plus only)	ESC [ -	27 91 45 2 0 <i>loc type</i>	1B 5B 2B 02 00 <i>loc type</i>	page 34
Select Print Type Style	ESC [ @	27 91 64 4 0 m1 0 m3 m4	1B 5B 40 04 00 m1 00 m3 m4	page 31
Select Font and Pitch	ESC [	27 91 73 2 0 Hf Lf	1B 5B 49 02 00 Hf Lf	page 28
Select Code Page	ESC [ T	27 91 84 4 0 0 0 Hc Lc	1B 5B 54 4 0 0 0 Hc Lc	page 37
Set Vertical Units (239x Plus only)	ESC [ \	27 91 92 4 0 0 0 Lu Hu	1B 5B 5C 04 00 00 00 Lu Hu	page 43
Set Print Quality	ESC [ d	27 91 100 1 0 n	1B 5B 64 01 00 n	page 36
Graphics Print Modes (239x Plus Only)	ESC [ g	27 91 103 Ln Hn mode data	1B 5B 67 Ln Hn mode data	page 37
Print Characters from Code Page	ESC \	27 92 Ln Hn n1,n2...	1B 5C Ln Hn n1,n2...	page 26
Reverse Line Feed	ESC ]	27 93	1B 5D	page 43
Print One Character	ESC ^	27 94 n	1B 5E n	page 27
Begin/End Continuous Overscore	ESC _	27 95 n	1B 5F n	page 35
Move Current Print Position	ESC d	27 100 Ln Hn	1B 64 Ln Hn	page 42

## Selecting a Character Set

### Select Character Set 1

Character set 1 contains characters and symbols that are used in the English language.

Format      ESC 7

Decimal    27 55

Hex            1B 37

See page 182 for more information.

## Select Character Set 2

Character set 2 contains characters and symbols that are used in English and non-English languages.

Format        ESC 6  
Decimal       27 54  
Hex            1B 36

See page 183 for more information.

## Select Code Page

Use this printer command to change the active code page.

Format        ESC [    T    4        0 0 0 Hc Lc  
Decimal       27 91 84 4        0 0 0 Hc Lc  
Hex            1B 5B 54 04 00 00 00 Hc Lc

### Usage Notes

The digits **4 0 0 0** (decimal), **04 00 00 00** (hexadecimal) are constants.

To calculate **Hc Lc** for a code page that is not shown:

- Divide the code page number, such as 437, by 256.
  - The whole number result is the Hc value.
  - The remainder is the Lc value.

- If your code page has an alphabetic character, such as 437G, add 10,000 to the code page number, then divide by 256.
- Code page information begins on page 165.

## Print From Code Page

### *Print Characters from a Code Page*

Use this command to print characters from the all Characters Chart of a Code Page (see “Printing a Code Page” on page 171).

Format	ESC \	<b>Ln</b>	<b>Hn</b>	<b>n1.....nn</b>
Decimal	27 92	<b>Ln</b>	<b>Hn</b>	<b>n1.....nn</b>
Hex	1B 5C	<b>Ln</b>	<b>Hn</b>	<b>n1.....nn</b>

#### **Ln Hn**

Ln (low number) and Hn (high number) identify the number of characters that you want to print.

See below for ways to calculate this variable.

#### **n1 n2 n3.....nn**

The variables, **n1 n2 n3** and so on, are the number of characters that you want to print. For example, for each character, **n1 n2 n3....**, that you want to print, you substitute the decimal or hexadecimal digit for that character.

Use the code page tables for the decimal or the hexadecimal digit (see “Code Pages” on page 165).

- Locate the character on the code page table.
- Use the decimal or hexadecimal digit for that character in the printer command format.

### **Usage Notes**

To print less than 256 characters:

- **Hn** is 0.
- **Ln** is the number of characters you want to print.

To print more than 256 characters:

- Divide the number of characters you want to print by 256.
  - The result is **Hn**.
  - The remainder is **Ln**.

You must input a decimal or hexadecimal digit for each character



(**n1.....nn**) you want to print. The decimal and hexadecimal digits are located in the code page tables beginning on page 166.

## Print One Character

Use this command to print a character from the All Characters Chart of a Code Page (see “Code Pages” on page 165).

Format	ESC ^	<b>n</b>
Decimal	27 94	<b>n</b>
Hex	1B 5E	<b>n</b>

### Usage Note

Substitute the decimal or hexadecimal digit of the character you want to print for the variable **n**.

## Download a Character Set

This command downloads a character set to the printer and starts a character font image download. Up to 256 consecutive characters can be downloaded in each ESC = sequence.

To download to the 238x Plus printer, download must be enabled in the Setup menu.

To download to the 239x Plus printer, you must have the FontSet Module installed to supply the additional memory necessary for downloading.

Format	ESC =	<b>count low/high id start low/high data</b>
Decimal	27 61	<b>count low/high id start low/high data</b>
Hex	1B 3D	<b>count low/high id start low/high data</b>

### Usage Notes

#### **count low/count high**

The number of bytes of data being downloaded starting with the printer **id** byte.

#### **id**

A 1-byte number identifying the printer.

Printer	Dec	Hex
2380 Plus	182	B6

Printer	Dec	Hex
2381 Plus	184	B8
2390 Plus	183	B7
2391 Plus	185	B9

### start low/start high

When character data is downloaded, the start address is the absolute address of the start of the character data. When the lookup table data is downloaded, the start address is the address of the new entry in the lookup table.

### data

Character data from the character design, or lookup table data.

## Select Font and Pitch

This command allows you to vary the font and pitch type style within a file.

Format	ESC	[	I	2	0	Hf	Lf
Decimal	27	91	73	2	0	Hf	Lf
Hex	1B	5B	49	02	00	Hf	Lf

### Usage Notes

- The digits 2 and 0 are constants.
- If Font Lock and Pitch Lock are active, this command is ignored.
- The **Hf** and **Lf** variables identify the pitch and font typestyle you want to print. Tables 1 and 2 on page 29 and 30 describe the **Hf** and **Lf** variables. To use the tables:
  - 1 Locate the type style (pitch and font) you want in the left column (**Pitch**).
  - 2 For the decimal digits for **Hf Lf**, look across the row to the second column (**Decimal Hf Lf**).
  - 3 For the hexadecimal digits for **Hf Lf**, look across the row to the third column (**Hex Hf Lf**).
  - 4 Substitute these digits for **Hf Lf** in the printer command syntax.

**Table 1. 238x Plus: Select Font and Pitch**

Pitch	Decimal Hf Lf	Hex Hf Lf	Decimal Value (Hf x 256 + Lf)
<b>Courier</b>			
10	0 11	00 0B	11
12	1 235	01 EB	491
15	1 236	01 EC	492
17	1 237	01 ED	493
20	1 238	01 EE	494
24	1 30	01 1E	286
PS	0 171	00 AB	171
<b>Gothic</b>			
10	0 36	00 24	36
12	1 143	01 8F	399
15	1 142	01 8E	398
17	1 141	01 8D	397
20	1 140	01 8C	396
24	1 32	01 20	288
PS	0 174	00 AE	174

**Table 2. 239x Plus: Select Font and Pitch**

Pitch	Decimal Hf Lf	Hex Hf Lf	Decimal Value (Hf x 256 + Lf)
<b>Courier</b>			
10	0 11	00 0B	11
12	1 235	01 EB	491
15	1 236	01 EC	492
17	1 237	01 ED	493
20	1 238	01 EE	494
24	1 30	01 1E	286
PS	1 171	00 AB	171
<b>Prestige</b>			
10	0 12	00 0C	12
12	1 239	01 EF	495
15	1 240	01 F0	496
17	1 201	01 C9	457
20	1 202	01 CA	458
24	1 31	01 1F	287
PS	1 164	00 A4	164

**Table 2. 239x Plus: Select Font and Pitch (Continued)**

Pitch	Decimal Hf Lf	Hex Hf Lf	Decimal Value (Hf x 256 + Lf)
<b>Gothic</b>			
10	0 36	00 24	36
12	1 143	01 8F	399
15	1 142	01 8E	398
17	1 141	01 8D	397
20	1 140	01 8C	396
24	1 32	01 20	288
PS	0 174	00 AE	174
<b>Presentor</b>			
10	0 25	00 19	25
12	1 208	01 D0	464
15	1 209	01 D1	465
17	1 210	01 D1	466
20	1 211	01 D3	467
24	1 35	01 23	291
PS	0 199	00 C7	199
<b>Orator</b>			
10	0 5	00 05	5
12	1 203	01 CB	459
15	1 204	01 CC	460
17	1 205	01 CD	461
20	1 206	01 CE	462
24	1 33	01 21	289
PS	0 198	00 C6	198
<b>Script</b>			
10	1 212	01 D4	468
12	1 213	01 D5	469
15	1 214	01 D6	470
17	1 215	01 D7	471
20	1 216	01 D8	472
24	1 36	01 24	292
PS	0 200	00 C8	200

# Select Print Type Style

This command is used for varying the type style of the character and the number of line spacing. Use this printer command for:

- Italic print
- Single-high character
- Double-high character
- Single-wide character
- Double-wide character
- Single line feed
- Double line feed
- Shadow (for 239x Plus only)
- Outline (for 239x Plus only)

Format	ESC	[	@	4	0	<b>m1</b>	0	<b>m3</b>	<b>m4</b>
Decimal	27	91	64	4	0	<b>m1</b>	0	<b>m3</b>	<b>m4</b>
Hex	1B	5B	40	04	00	<b>m1</b>	00	<b>m3</b>	<b>m4</b>

## Usage Note

- You may combine these selections; for example, italic print with double-high, double-wide character, and double line feed.

See the following table for **m1**, **m3**, and **m4** selections.

<b>m1</b>	<b>Dec</b>	<b>Hex</b>
No Change	0	00
Start Italic Print	1	01
Stop Italic Print	2	02
Start Outline Print (239x Plus only)	4	04
Stop Outline Print (239x Plus only)	8	08
Start Shadow Print (239x Plus only)	16	10
Stop Shadow Print (239x Plus only)	32	20
<b>m3</b>	<b>Dec</b>	<b>Hex</b>
No Change	0	00
Single-high Character	1	01
Double-high Character	2	02
Single Line Feed	16	10
Double Line Feed	32	20
<b>m4</b>	<b>Dec</b>	<b>Hex</b>
No Change	0	00
Single-wide Character	1	01
Double-wide Character	2	02
Single Line Feed	16	10
Double Line Feed	32	20

## ***Emphasized (Bold) Print***

Use this command for bold print.

To begin bold print:

Format	ESC	E
Decimal	27	69
Hex	1B	45

To end bold print:

Format	ESC	F
Decimal	27	70
Hex	1B	46

## ***Double-Strike Print***

Double-strike print results in a darker print because the printhead strikes the character twice.

To begin double-strike print:

Format	ESC	G
Decimal	27	71
Hex	1B	47

To end double-strike print:

Format	ESC	H
Decimal	27	72
Hex	1B	47

## Superscript or Subscript

To begin superscript:

Format	ESC	S	<b>n</b>
Decimal	27	83	<b>0</b>
Hex	1B	53	<b>00</b>

To end superscript:

Format	ESC	T
Decimal	27	84
Hex	1B	54

To begin subscript:

Format	ESC	S	<b>n</b>
Decimal	27	83	<b>1</b>
Hex	1B	53	<b>01</b>

To end subscript:

Format	ESC	T
Decimal	27	84
Hex	1B	54

## Score Select

For 239x Plus printers only.

This command selects several forms of overscore, underscore, and strikethrough.

Format	ESC	[	-	<b>2</b>	<b>0</b>	<b>loc type</b>
Decimal	27	83	45	<b>2</b>	<b>0</b>	<b>loc type</b>
Hex	1B	53	2D	<b>02</b>	<b>00</b>	<b>loc type</b>

To select **loc**:

	Underscore	Strikethrough	Overscore
Decimal	1	2	3
Hex	01	02	03



To select **type**:

	<b>Underscore</b>	<b>Strikethrough</b>	<b>Overscore</b>
Decimal	0	1	2
Hex	00	01	02

## Usage Note

To cancel this command, designate type as Dec 255 or Hex FF.

## ***Continuous Underline***

This command begins and ends continuous underline of spaces and characters.

To begin Continuous Underline:

Format	ESC	-	<b>n</b>
Decimal	27	95	<b>1</b>
Hex	1B	5F	<b>01</b>

To end Continuous Underline:

Format	ESC	-	<b>n</b>
Decimal	27	95	<b>0</b>
Hex	1B	5F	<b>00</b>

## ***Continuous Overscore***

This command prints a line above spaces and characters.

To begin Continuous Overscore:

Format	ESC	_	<b>n</b>
Decimal	27	95	<b>1</b>
Hex	1B	5F	<b>01</b>

To end Continuous Overscore:

Format	ESC	_	<b>n</b>
Decimal	27	95	<b>0</b>
Hex	1B	5F	<b>00</b>

# Set Print Quality

This command sets the print quality to draft or letter quality.

Format	ESC	[	d	1	0	n
Decimal	27	75	100	1	0	n
Hex	1B	4B	64	01	00	n

## Usage Notes

- For 2380 Plus printers, the value of **n** can be any of the following:

Decimal	Hex	
0	00	No Change
1 to 63	01 to 3F	Fast Draft
64 to 127	40 to 7F	Draft
128 to 254	80 to FE	Near Letter Quality
255	FF	Default Quality

- For 2390 Plus printers, the value of **n** can be any of the following:

Decimal	Hex	
0	00	No Change
1 to 63	01 to 3F	Fast Draft
64 to 127	40 to 7F	Draft
128 to 191	80 to BF	Letter Quality
192 to 254	C0 to FE	Enhanced Letter Quality
255	FF	Default Quality

# Graphics Print Modes

## *Normal Density Bit Image Graphics*

Use this command to print normal density bit images at 60 dots per inch (dpi) horizontally and 72 dpi vertically.

Format	ESC	K	<b>Ln</b>	<b>Hn</b>	<b>data</b>
Decimal	27	75	<b>Ln</b>	<b>Hn</b>	<b>data</b>
Hex	1B	4B	<b>Ln</b>	<b>Hn</b>	<b>data</b>

### Usage Notes

- **Ln** and **Hn** identify the number of bytes in data.  
To print less than 256 bytes:
  - **Hn** is 0.
  - **Ln** is the number of bytes you want to print.To print more than 256 bytes:
  - Divide the number of bytes you want to print by 256.
  - The result is **Hn**.
  - The remainder is **Ln**.
- **data** is the bit-mapped graphics information.

## *Mode and Horizontal Density (239x Plus Only)*

For 239x Plus printers only.

Use this command to select the mode and horizontal density for dot matrix graphics.

Format	ESC	[	g	<b>Ln</b>	<b>Hn</b>	<b>mode</b>	<b>data</b>
Decimal	27	91	103	<b>Ln</b>	<b>Hn</b>	<b>mode</b>	<b>data</b>
Hex	1B	5B	67	<b>Ln</b>	<b>Hn</b>	<b>mode</b>	<b>data</b>

### Usage Notes

- **Ln** and **Hn** identify the number of bytes in **mode** and **data**.  
To print less than 256 bytes:
  - **Hn** is 0.
  - **Ln** is the number of bytes you want to print, plus 1 for the mode byte.

To print more than 256 bytes:

- Divide the number of bytes you want to print (plus 1 mode byte) by 256.
- The result is **Hn**.
- The remainder is **Ln**.
- **mode** is the vertical wire count and the horizontal density in dots per inch. Select mode from the following table.

Mode		Horizontal Density	Wires
Dec	Hex		
0	00	60	8
1	01	120	8
2	02	120	8
3	03	240	8
8	08	60	24
9	09	120	24
11	0B	180	24
12	0C	360	24
16	10	360	48

- **data** is the bit-mapped graphics information. The printhead moves at half the speed of mode 2, giving better resolution.

## Dual-Density Bit Image Graphics (Half Speed)

Use this command to print normal density bit images at 120 dpi horizontally and 72 dpi vertically.

Format	ESC L	<b>Ln</b>	<b>Hn</b>	<b>data</b>
Decimal	27 76	<b>Ln</b>	<b>Hn</b>	<b>data</b>
Hex	1B 4C	<b>Ln</b>	<b>Hn</b>	<b>data</b>

### Usage Notes

- **Ln** and **Hn** identify the number of bytes in data.  
To print less than 256 bytes:
  - **Hn** is 0.
  - **Ln** is the number of bytes you want to print.To print more than 256 bytes:
  - Divide the number of bytes you want to print by 256.
  - The result is **Hn**.
  - The remainder is **Ln**.
- **data** is the bit-mapped graphics information.

## Dual-Density Bit Image Graphics (Normal Speed)

Use this command to print dual-density bit images at 120 dpi horizontally and 72 dpi vertically.

Format	ESC Y	<b>Ln</b>	<b>Hn</b>	<b>data</b>
Decimal	27 89	<b>Ln</b>	<b>Hn</b>	<b>data</b>
Hex	1B 59	<b>Ln</b>	<b>Hn</b>	<b>data</b>

### Usage Notes

- **Ln** and **Hn** identify the number of bytes in data.  
To print less than 256 bytes:
  - **Hn** is 0.
  - **Ln** is the number of bytes you want to print.To print more than 256 bytes:
  - Divide the number of bytes you want to print by 256.
  - The result is **Hn**.
  - The remainder is **Ln**.
- **data** is the bit-mapped graphics information.

## High-Density Bit Image Graphics

Use this command to print high-density bit images at 240 dpi horizontally and 72 dpi vertically.

Format	ESC	Z	<b>Ln</b>	<b>Hn</b>	<b>data</b>
Decimal	27	90	<b>Ln</b>	<b>Hn</b>	<b>data</b>
Hex	1B	5A	<b>Ln</b>	<b>Hn</b>	<b>data</b>

### Usage Notes

- **Ln** and **Hn** identify the number of bytes in data.  
To print less than 256 bytes:
  - **Hn** is 0.
  - **Ln** is the number of bytes you want to print.To print more than 256 bytes:
  - Divide the number of bytes you want to print by 256.
  - The result is **Hn**.
  - The remainder is **Ln**.
- **data** is the bit-mapped graphics information.

## Horizontal Movement

### Set Horizontal Tabulation Stops

This command sets up to 28 tabulation stops to be used with the printer command HT, Horizontal Tabulation.

Format	ESC	D	<b>tab stops</b>	0
Decimal	27	90	<b>n1.....n28</b>	0
Hex	1B	5A	<b>n1.....n28</b>	00

### Usage Notes

**n1.....n28** is used to set the tabulator stop positions.

- ESC D is terminated by a 0 entry.
- The first tabulation stop is at the leftmost column.
- Input the tabulation stops (**n1.....n28**) in ascending numerical order.

- The printer command ESC R resets to the default horizontal tabulation stops, which are set at every eight positions beginning at column 9 (9, 17, 25, and so on).
- The printer command HT, Horizontal Tabulation, activates the tabulation stops set by this printer command.

## ***Set Default Tabulation Stops***

This command sets the tabulation stops to the default settings. The default tabulation stops are set to every 8 columns, beginning at column 9 (9, 17, 25, and so on).

Format	ESC R		
Decimal	27	82	
Hex	1B	52	

### **Usage Notes**

- ESC R clears all vertical tabulation stops.
- To set user-defined tabulation stops, use printer command ESC D.

## ***Set Horizontal Margins***

This command sets the left and right margins.

Format	ESC X	<b>n1</b>	<b>n2</b>
Decimal	27	88	<b>n1 n2</b>
Hex	1B	58	<b>n1 n2</b>

### **Usage Notes**

- Use **n1** to select the left margin position.
- Use **n2** to select the right margin position.

## Move Current Print Position

This command moves the current print position to the right in increments of 1/120 inch.

Format	ESC	d	<b>increment</b>	
Decimal	27	100	<b>Ln</b>	<b>Hn</b>
Hex	1B	64	<b>Ln</b>	<b>Hn</b>

### Usage Notes

To move less than 256 increments:

- **Hn** is 0.
- **Ln** is the increment you want to move.

To move more than 256 increments:

- Divide the number of increments you want to move by 256.
  - The result is **Hn**.
  - The remainder is **Ln**.

## Line Control

### Automatic Line Feed (LF)

Sends an automatic line feed on a carriage return.

To begin automatic line feed (LF) on carriage return (CR):

Format	ESC	5	<b>Begin</b>
Decimal	27	53	<b>1</b>
Hex	1B	35	<b>01</b>

To end automatic line feed (LF) on carriage return (CR):

Format	ESC	5	<b>End</b>
Decimal	27	53	<b>0</b>
Hex	1B	35	<b>00</b>

### Usage Note

Use this command to enable the carriage return (CR) printer command for both a line feed and a carriage return.



## Reverse Line Feed

Causes a reverse line feed; the paper is reversed according to the current line spacing.

Format	ESC	]
Decimal	27	93
Hex	1B	5D

We do *not* recommend using this command.

## Move Paper Vertically

Advances the paper in a vertical movement a distance of  $n/216$  inches relative to the current print position.

Format	ESC	J
Decimal	27	74
Hex	1B	4A

### Usage Notes

- $n$  is a value from 0 to 255 (decimal) or 0 to FF (hex).
- $n$  must be a multiple of 3 to advance exactly  $n/216$  inch.

## Set Vertical Units

For 239x Plus printers only.

This command lets you set the size of the increments for the following commands:

- Set Line Spacing for Graphics (ESC 3)
- Move Paper Vertically (ESC J).

Format	ESC	[	\	4	0	0	0	<b>Lu</b>	<b>Hu</b>
Decimal	27	91	92	4	0	0	0	<b>Lu</b>	<b>Hu</b>
Hex	1B	5B	5C	04	00	00	00	<b>Lu</b>	<b>Hu</b>

### Usage Notes

- This command designates the denominator (the lower number) of a two-part fraction. The denominator can be 180, 216, or 360.
- **4 0 0 0** (decimal), **04 00 00 00** (hex) are constant digits.

# Vertical Tabulation

## ***Set Vertical Tabulation Stops***

Sets as many as 64 tabulation stops by line number.

Format	ESC B	<b>tab settings</b>	0
Decimal	27 66	<b>n1.....n64</b>	0
Hex	1B 42	<b>n1.....n64</b>	00

### **Usage Notes**

- Use ESC B to set the tabulation stops and to advance paper to the next tabulation stop (VT) to activate them.
- ESC R (Set Default Tabulation Stops) will clear all vertical tab stops.
- Set the tabulation stops in ascending order (n1.....n64).
- The last digit in the sequence must be a 0 to terminate the command.

# Line Spacing

## ***Set Line Spacing to 1/8 Inch***

This command (ESC zero) sets the line spacing at 1/8 inch between each line, which is 8 lines per inch (lpi).

Format	ESC 0
Decimal	27 48
Hex	1B 30

## ***Set Line Spacing to 7/72 Inch***

This command sets the line spacing at 7/72 inch between each line, which is 10.3 lpi.

Format	ESC 1
Decimal	27 49
Hex	1B 31

## ***Activate Line Spacing for Text***

This command activates the line spacing designated by the Set Line Spacing for Text (ESC A) printer command.

Format	ESC	2
Decimal	27	50
Hex	1B	32

## ***Set Line Spacing for Text***

This command sets line spacing in  $n/72$  inch increments. To activate the line spacing, use the printer command Activate Line Spacing for Text (ESC 2).

Format	ESC	A	<b>n</b>
Decimal	27	65	<b>n</b>
Hex	1B	41	<b>n</b>

## ***Set Line Spacing for Graphics***

This command sets line spacing to  $n/216$  inches. It does not cause the form to move. It changes the vertical distance moved when a line feed command is received.

Format	ESC	3	<b>n</b>
Decimal	27	51	<b>n</b>
Hex	1B	33	<b>n</b>

### **Usage Note**

The number can be from 0 to 255 (decimal), 00 to FF (hexadecimal).

**n** must be a multiple of 3 to advance exactly  $n/216$  inches.

# Set Top of Form and Page Length

## *Set Top of Form*

This command sets the first line of printing on each page to the current paper position.

Format	ESC	4
Decimal	27	52
Hex	1B	34

## *Set Page Length in Inches*

This command sets the page length to a specified number of inches.

Format	ESC	C	0	<b>inches</b>
Decimal	27	67	0	<b>n</b>
Hex	1B	43	00	<b>n</b>

### **Usage Note**

The value of **n** is the number of inches you want to set as the page length.

## *Set Page Length in Lines*

This command sets the page length to a specified number of lines.

Format	ESC	C	<b>lines</b>
Decimal	27	67	<b>n</b>
Hex	1B	43	<b>n</b>

### **Usage Notes**

- The value of **n** is the number of lines you want to set as the page length and works in conjunction with the current line spacing (ESC A).
- If the printer command Set Skip Perforation (ESC N) is active, or if "skip over perforation" is On in the printer setup, this printer command deactivates it.

## ***Set Skip Perforation***

This command specifies the number of lines to be skipped at the bottom of each page, which creates a bottom margin.

Format	ESC N	<b>lines</b>
Decimal	27 78	<b>n</b>
Hex	1B 4E	<b>n</b>

### **Usage Notes**

- This command remains in effect until:
  - Cancel Skip Perforation (ESC O) printer command is received.
  - Set Page Length in Lines (ESC C) printer command is received.
- Valid values for n are 0 through 255 (decimal), 00 through FF (hexadecimal).
- To cancel this printer command, use Cancel Skip Perforation (ESC O).

## ***Cancel Skip Perforation***

This command cancels Set Skip Perforation (ESC N).

Format	ESC O
Decimal	27 79
Hex	1B 4F

